CITY OF ROSEVILLE CALIFORNIA

AGENDA

June 16, 2021

CITY COUNCIL
FINANCE AUTHORITY
HOUSING AUTHORITY
NATURAL GAS FINANCING AUTHORITY
6:00 p.m.
Council Chambers
311 Vernon Street
Roseville, California
www.roseville.ca.us/CORTV

The meeting will be open to limited in-person attendance. To remain in compliance with the state's public health guidance, attendance will be limited to 25% of the room's capacity (15 seats) and will require 6 feet of social distancing inside and outside the council chambers. Face coverings are required and will be provided to those who don't have a mask.

Due to the limited capacity in the chambers, the public is highly encouraged to participate virtually. The meeting may be viewed on Comcast channel 14, Consolidated Communications channel 73, and AT&T U-Verse. City Council meetings are also video streamed live and are available on the City's website and YouTube channel.

Members of the public may offer public comment by phone:

Dial in Phone Number: 916-774-5353

If you need disability-related modification or accommodation to participate in this meeting, please contact: Voice: 916-774-5200, TDD: 916-774-5220. Requests must be made as early as possible.

THE CITY OF ROSEVILLE WELCOMES YOUR PARTICIPATION

If an agenda item is open to public comment, such public comment shall be addressed to the chair of the meeting.

Public Comment - Speakers have three minutes under Public Comment to speak on issues that are not listed on the agenda and are within the City's jurisdiction. The Brown Act does not permit any action or discussion on items not listed on the agenda.

Consent Calendar - If applicable, the Consent Calendar consists of routine items that may be approved by one motion. Any person can remove an item from the Consent Calendar to be discussed separately.

Agenda Items - Speakers have five minutes to address items that are listed on the agenda.

Americans with Disabilities Act - Notify the City Clerk or Secretary at least 72 hours in advance if special assistance is required to participate in a meeting including the need of auxiliary aids or services.

Audio/Visual Presentations - If making a presentation regarding an agenda item, audio/visual materials must be submitted to the City Clerk or Secretary at least 72 hours in advance.

Security procedures are in place to attend Roseville City Council meetings. All attendees must successfully pass through a security metal detector. Any person with a prohibited item will not be allowed entry. Prohibited items include, but are not limited to: firearms (even with valid CCW), knives, pepper spray/mace, explosives of any kind/ any weapons and/or dangerous devices of any kind, illegal drugs and alcohol.

Roseville City Clerk 311 Vernon Street, Roseville, CA 916-774-5200 TDD 916-774-5220

1. CALL TO ORDER

2. ROLL CALL

3. PLEDGE OF ALLEGIANCE

4. MEETING PROCEDURES

5. PRESENTATIONS

5.1. Resolution - Williams + Paddon 40th Anniversary

Commend Williams + Paddon on the celebration of their 40th anniversary, congratulate them on the vital role they have played in improving the quality of life in the Roseville community, and extend best wishes for continued success in the future.

CONTACT: Blair Hutchison 916-774-5266 bmhutchison@roseville.ca.us

6. PUBLIC COMMENTS

7. CONSENT CALENDAR

BEGINNING OF CONSENT CALENDAR

Minutes

7.1. Minutes of Prior Meeting

Memo from Assistant City Clerk Helen Dreyer and City Clerk Sonia Orozco recommending the City Council approve the minutes of the May 5, 2021 City Council meeting.

CC #: 1525

File #: 0102-03

CONTACT: Helen Dreyer 916-774-5356 hdreyer@roseville.ca.us

Bids / Purchases / Services

7.2. Asphalt Products (RFQ 10-3301) - Purchase Order

Memo from Buyer Sue Jessup and Assistant City Manager/Chief Financial Officer Dennis Kauffman recommending the City Council adopt RESOLUTION NO. 21-260 APPROVING A PURCHASE ORDER FOR ASPHALT PRODUCTS. Staff requests City Council authorize open purchase orders with CalMat Co. dba Vulcan Materials as the lowest responsive and responsible bidder for the purchase of asphalt products on an as-needed basis in response to RFQ 10-3301. The estimated total of the award for FY2021-22 is $420,000. Funding is included in the proposed FY2021-22 budget for the Public Works Department's Street Maintenance Division and the Environmental Utilities Department's Water and Wastewater Divisions.

CC #: 1525

File #: 0203-13-1

CONTACT: Sue Jessup 916-746-1702 sjessup@roseville.ca.us

7.3. Enterprise Asset Management Consulting Services – Sole Source Contract Purchase Agreement

Memo from Data Management Systems Administrator Duke Arakaki and Environmental Utilities Director Richard Plecker recommending the City Council adopt RESOLUTION NO. 21-273 APPROVING A CONTRACT PURCHASE AGREEMENT, BY AND BETWEEN THE CITY OF ROSEVILLE AND SIXTY SEVEN SOLUTIONS, INC., AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE (3001219). Staff requests approval of a Sole Source Contract Purchase Agreement with Sixty Seven Solutions, Inc. to continue development support of Roseville's Enterprise Asset Management system and integrations support as part of the Advanced Metering Infrastructure project. The total cost of the service for FY2021-22 is not to exceed $250,000, pending budget approval. Funding for the first year is included in the proposed Environmental Utilities and Electric funds budget for FY2021-22. Staff also requests authorization for two additional one-year renewals of the contract purchase agreement for a total not-to-exceed amount of $750,000 over a three-year period without further Council approval contingent upon Council approval of future year budgets, or unless City staff determines that continuing with the same vendor is not in the City's best interest. Funding for this project is from Environmental Utilities and Electric funds.

CC #: 1541

File #: 0800-02

CONTACT: Duke Arakaki 916-774-5212 darakaki@roseville.ca.us

7.4. Liquid Aluminum Sulfate (BACC 01-2021) - Contract Purchase Agreement

Memo from Buyer Becky Philipp and Assistant City Manager/Chief Financial Officer Dennis Kauffman recommending City Council adopt RESOLUTION NO. 21-265 APPROVING A CONTRACT PURCHASE AGREEMENT, BY AND BETWEEN THE CITY OF ROSEVILLE AND THATCHER COMPANY

OF CALIFORNIA, INC., AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE (3001194). Staff recommends the City Council approve a contract purchase agreement with Thatcher Company of California, Inc. as the lowest responsive bidder for Bay Area Chemical Consortium Bid No. 01-2021 for the supply and delivery of liquid aluminum sulfate for the City's Water Treatment Plant. The annual cost is $175,000. Funding is included in the Environmental Utilities Department's proposed FY2021-22 budget.

CC #: 1532

File #: 0203-03

CONTACT: Becky Philipp 916-774-5724 bphilipp@roseville.ca.us

7.5. Landscape Bark and Playground Engineered Wood Fiber - Contract Purchase Agreement

Memo from Parks, Recreation & Libraries Superintendent Brian Castelluccio and Parks, Recreation & Libraries Director Jill Geller recommending the City Council adopt RESOLUTION NO. 21-274 APPROVING A CONTRACT PURCHASE AGREEMENT, BY AND BETWEEN THE CITY OF ROSEVILLE AND APPLIED LANDSCAPE MATERIALS, INC. DBA NORCAL WHOLESALE BARK, AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE (3001199). This item recommends Council approval of a contract purchase agreement with Applied Landscapes Materials Inc., for the purchase and installation of landscape bark and playground wood fiber within parks, facilities and streetscapes. The amount of the contract purchase agreement for FY2021-22 is not to exceed $300,000. Funding is included in the Park, Recreation & Libraries Department's General Fund, Community Facilities Districts and Landscaping and Lighting Districts proposed FY2021-22 budgets.

CC #: 1542

File #: 0203-10

CONTACT: Brian Castelluccio 916-746-1755 bcastelluccio@roseville.ca.us

7.6. Securing Facilities Services - Contract Purchase Agreement

Memo from Parks, Recreation & Libraries Superintendent Brian Castelluccio and Parks, Recreation & Libraries Director Jill Geller recommending the City Council adopt RESOLUTION NO. 21-266 APPROVING A CONTRACT PURCHASE AGREEMENT, BY AND BETWEEN THE CITY OF ROSEVILLE AND CAL TAC SECURITY, AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE (3001178). This item recommends Council approval of a contract purchase agreement with CAL TAC Security to perform security inspections, locking of park facilities and on-call security services, with the option of four (4) additional one (1) year extensions. The amount of the service agreement for FY2021-22 is not to exceed $100,000. Funding is included in the Park, Recreation & Libraries Department's proposed FY2021-22 budget. The funding sources include the General Fund in the amount of $70,000 and Community Facilities Districts in the amount of $30,000.

CC #: 1535

File #: 0704

CONTACT: Brian Castelluccio 916-746-1755 bcastelluccio@roseville.ca.us

7.7. William "Bill" Hughes Park Shade Sails – Contract Purchase Agreement

Memo from the Park Planning & Development Superintendent Tara Gee and Parks, Recreation & Libraries Director Jill Geller recommending the City Council adopt RESOLUTION NO. 21-279 APPROVING A CONTRACT PURCHASE AGREEMENT, BY AND BETWEEN THE CITY OF ROSEVILLE AND ROSS RECREATION EQUIPMENT COMPANY, INC., AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE (3001165). The contract purchase agreement outlines a cost of $117,026, which includes all labor, materials, bonds and structural calculations. A budget adjustment was approved in May 2020 allocating funds from Diamond Creek Community Facilities District 1 towards specific projects at Duke Davis and Bill Hughes Parks. These upgrades will require no General Fund resources.

CC #: 1547

File #: 0704-01

CONTACT: Tara Gee 916-774-5253 tgee@roseville.ca.us

7.8. Vehicle – Purchase Orders

Memo from Fleet Manager Brian Craighead and Public Works Director Jason Shykowski recommending the City Council approve a purchase order to Global Machinery International West LLC dba Global Machinery for two Hogg & Davis Hydra 985 cable pulling trailers utilizing RFQ 10-3303 in the amount of $335,050; and approve a purchase order to Owen Equipment Sales for one Elgin Whirlwind street sweeper utilizing Sourcewell contract# 122017-FSC in the amount of $359,986. Funding for these vehicles is included in the FY2020-21 Fleet Replacement budget.

CC #: 1521

File #: 0203-01

CONTACT: Brian Craighead 916-774-5731 bcraighead@roseville.ca.us

7.9. 2021 Sewer Collection System Cured-in-Place Pipe Rehabilitation Project – Award of Contract

Memo from Associate Engineer Jonathan Cummings and Environmental Utilities Director Richard Plecker recommending the City Council adopt RESOLUTION NO. 21-275 APPROVING AN AGREEMENT, BY AND BETWEEN INSITUFORM TECHNOLOGIES, LLC AND THE CITY OF ROSEVILLE, AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE. This item requests approval and award of a construction contract for the 2021 Sewer Collection System Cured-in-Place Pipe Rehabilitation project to Insituform Technologies, LLC in the amount of $1,584,796, and authorization for the City Manager or his designee to approve and pay for contract change orders for the project that could increase the contract amount by no more than 10% or $158,480. The budget for the construction contract is within the existing capital improvement

project budget, which is funded through the Wastewater Rehabilitation Fund.

CC #: 1543

File #: 0900-02

CONTACT: Jonathan Cummings 916-774-5566 jcummings@roseville.ca.us

Resolutions

7.10. Parks, Recreation & Libraries Strategic Master Plan - Professional Services Agreement

Memo from the Park Planning & Development Superintendent Tara Gee and Parks, Recreation & Libraries Director Jill Geller recommending the City Council adopt RESOLUTION NO. 21-284 APPROVING A PROFESSIONAL SERVICES AGREEMENT, BY AND BETWEEN THE CITY OF ROSEVILLE AND PROS CONSULTING, INC., AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE. The project consists of a comprehensive strategic master plan and a sports tourism plan that analyzes existing services provided, seeks input from the community through public outreach and statistically valid surveys, identifies gaps and needs of the community, outlines recreation and library program trends for the future, reviews access to public spaces as well as parks/facility needs and makes recommendations for future action based on findings over the next ten to fifteen years. The strategic master plan is intended to be a road map for future decisions. The total not-to-exceed amount is $199,958. Funding for this project was allocated through the General Fund Contingency budget during FY2020-21.

CC #: 1556

File #: 0704

CONTACT: Tara Gee 916-774-5253 tgee@roseville.ca.us

7.11. Parks Design & Construction Standards - 2021 Update

Memo from the Park Planning & Development Superintendent Tara Gee and Parks, Recreation & Libraries Director Jill Geller recommending the City Council adopt RESOLUTION NO. 21-269 ADOPTING THE 2021 PARKS DESIGN & CONSTRUCTION STANDARDS. The Parks Design & Construction Standards is a guiding document that outlines design and construction standards applied to parks, neighborhood and citywide, and streetscapes. This document is updated every two years in order to ensure new codes, regulations and requirements are updated or added, address typographical errors, provide clarity in areas that may cause multiple interpretations or misinterpretations, and to ensure the latest technology in irrigation, lighting and other systems. Feedback from contractors and staff is collected over each two-year period which provides the basis for updates/revisions. The changes described above will have no fiscal impact to projects and could potentially reduce costs by identifying equipment and materials that are less labor intensive to install and maintain. There is no General Fund impact.

CC #: 1537

File #: 0704

CONTACT: Joel De Jong 916-774-5924 jdejong@roseville.ca.us

7.12. Park Naming Policy Revisions

Memo from the Park Planning & Development Superintendent Tara Gee and Parks, Recreation & Libraries Director Jill Geller recommending Council adopt RESOLUTION NO. 21-264 APPROVING REVISIONS TO THE PARK NAMING POLICY PROGRAM FOR THE CITY OF ROSEVILLE. This public process solicits name suggestions every July for new parks that will be under construction in that fiscal year. Two recent changes have occurred that caused staff to re-evaluate the process: 1) The Parks & Recreation Commission no longer appoints a Secretary position; and 2) Attorney review of the Subcommittee has determined that the Subcommittee is subject to the Brown Act. These changes create a need to change the process. The changes to the park naming process has no fiscal impact.

CC #: 1529

File #: 0704

CONTACT: Tara Gee 916-774-5253 tgee@roseville.ca.us

7.13. Roseville Electric Utility Security Plan

Memo from Electric Risk and Compliance Supervisor Petra Wallace and Electric Utility Director Michelle Bertolino recommending the City Council adopt RESOLUTION NO. 21-277 APPROVING THE ROSEVILLE ELECTRIC UTILITY SECURITY PLAN. The plan report describes Roseville Electric Utility's conformance with the industry standard and describes the approach that Roseville is taking to identify and protect the City's critical infrastructure, Covered Distribution Facilities, from physical security threats. There is no cost associated with the approval of the plan.

CC #: 1545

File #: 0800-03

CONTACT: Petra Wallace 916-774-5510 pwallace@roseville.ca.us

7.14. Maidu Soccer Arena Improvement Project - Notice of Completion

Memo from Park Development Analyst Heather Buck and Parks, Recreation & Libraries Director Jill Geller recommending the City Council adopt RESOLUTION NO. 21-263 ACCEPTING THE PUBLIC WORK KNOWN AS THE MAIDU SOCCER ARENA IMPROVEMENT PROJECT, APPROVING THE "NOTICE OF COMPLETION", AND AUTHORIZING THE PARKS, RECREATION AND LIBRARIES DIRECTOR TO EXECUTE SAID NOTICE ON BEHALF OF THE CITY OF ROSEVILLE. The Parks, Recreation & Libraries Department has made a final inspection of the Maidu Covered Soccer Arena Improvements Project and has found that all contract work has been completed in accordance with the improvement plans and specifications. The project is now ready for acceptance. Funding for the park improvements was provided through the Parks, Recreation & Library Capital Projects Fund in FY2019-20. Maintenance of the existing citywide park is paid from the General Fund and remains unchanged.

CC #: 1528
File #: 0704-01

CONTACT: Heather Buck 916-774-5254 hcbuck@roseville.ca.us

7.15. Rotation Tow Program - Service Agreements

Memo from Police Lieutenant Scott Blynn and Police Chief Troy Bergstrom recommending the City Council adopt RESOLUTION NO. 21-278 APPROVING TOW SERVICE AGREEMENTS AND AUTHORIZING THE POLICE CHIEF OR HIS DESIGNEE TO EXECUTE THEM ON BEHALF OF THE CITY OF ROSEVILLE. Six tow companies will be included on the Police Department's rotation tow list for the two-year period following execution of the agreements. Vehicle owners are responsible to pay towing companies for the towing and storage of their vehicles. There is no cost to the City.

CC #: 1546

File #: 0323-02

CONTACT: Scott Blynn 916-746-1076 sblynn@roseville.ca.us

7.16. Transit Bus Shelter Construction Fee Agreements

Memo from Alternative Transportation Analyst Alison Winter and Public Utilities Director Jason Shykowski recommending the City Council adopt RESOLUTION NO. 21-276 APPROVING THE FORM OF TWO TRANSIT BUS SHELTER CONSTRUCTION FEE AGREEMENTS, AUTHORIZING THE CITY MANAGER TO EXECUTE THEM ON BEHALF OF THE CITY OF ROSEVILLE AND AUTHORIZING THE CITY ATTORNEY TO MODIFY THE FORMS AS NECESSARY. Staff requests Council approve the form of two template Transit Bus Shelter Construction Fee Agreements, authorizing the City Manager to execute all pending and future Agreements, and authorizing the City Attorney to make any non-substantive changes to the form of the template Agreements. The current construction fee of $10,000 per shelter provides security for future installation of transit improvements with no fiscal impact to the City's General Fund or Transportation Development Act funds.

CC #: 1544

File #: 0721

CONTACT: Alison Winter 916-774-5365 awinter@roseville.ca.us

7.17. Roseville Transit System Management, Operations and Call Center Services - Agreement Amendment

Memo from Transit Operations Analyst Ed Scofield and Public Works Director Jason Shykowski recommending the City Council adopt RESOLUTION NO. 21-272 APPROVING AMENDMENT NO. 1 TO AGREEMENT FOR CITY OF ROSEVILLE TRANSIT SYSTEM MANAGEMENT, OPERATIONS AND CALL CENTER SERVICES, BY AND BETWEEN MV TRANSPORTATION, INC. AND THE CITY OF ROSEVILLE, AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE. The proposed amendment would extend the term of the Agreement two additional years to an end date of June 30, 2023. All provisions of the existing agreement remain unchanged and in force. Since

Roseville Transit receives Federal Transit Administration (FTA) funds, the proposed Amendment incorporates additional federal contracting clauses which were not included in the existing Agreement. Costs for option years FY2021-22 and FY2022-23 were established in the existing Agreement. The maximum obligation to the City for MV Transportation to manage and operate Roseville Transit and the Call Center are as follows: FY2021-22 is $4,244,102.52 to manage and operate Roseville Transit and $378,656.11 to manage and operate the South Placer County Transit Information Center; FY2022-23 is $4,509,198.27 to manage and operate Roseville Transit and $385,561.41 to manage and operate the South Placer County Transit Information Center. Funding for transit services is provided primarily through FTA funds, Transportation Development Act (TDA) funds and fare revenue through the City's Transit fund. The call center is funded through the Consolidated Transportation Services Agency (CTSA) fund, with TDA revenues provided by the West Placer CTSA. General Fund resources are not used for either transit operations or the call center.

CC #: 1540

File #: 0721

CONTACT: Ed Scofield 916-774-5449 ecscofield@roseville.ca.us

7.18. Transportation Impact Studies - On-Call Professional Services Agreements

Memo from Management Analyst Brandy LeBeau and Development Services Director Mike Isom recommending the City Council adopt RESOLUTION NO. 21-256 APPROVING AN ON-CALL PROFESSIONAL SERVICES AGREEMENT, BY AND BETWEEN THE CITY OF ROSEVILLE AND FEHR & PEERS, AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE; and adopt RESOLUTION NO. 21-257 APPROVING AN ON-CALL PROFESSIONAL SERVICES AGREEMENT, BY AND BETWEEN THE CITY OF ROSEVILLE AND KIMLEY-HORN AND ASSOCIATES, AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE; and adopt RESOLUTION NO. 21-258 APPROVING AN ON-CALL PROFESSIONAL SERVICES AGREEMENT, BY AND BETWEEN THE CITY OF ROSEVILLE AND DKS ASSOCIATES, AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE; and adopt RESOLUTION NO. 21-259 APPROVING AN ON-CALL PROFESSIONAL SERVICES AGREEMENT, BY AND BETWEEN THE CITY OF ROSEVILLE AND T J K M, AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE. Staff requests Council approve four professional services agreements with Fehr & Peers, Kimley-Horn and Associates, DKS Associates, and T J K M, for on-call traffic study services. The full cost of these agreements are paid by development applicants at the time services are rendered and have no impact on the General Fund.

CC #: 1520

File #: 0800-06

CONTACT: Brandy LeBeau 916-774-5278 blebeau@roseville.ca.us

7.19. Creekview - Phase 1 Village 10, 11 & 15 - Notice of Completion

Memo from Construction Inspector Ignacio Vizcarra and Development Services Director Mike Isom recommending the City Council adopt RESOLUTION NO. 21-267 ACCEPTING THE PUBLIC WORK KNOWN AS CREEKVIEW PHASE 1, VILLAGE 10, 11 & 15 PROJECT, APPROVING THE "NOTICE OF COMPLETION", AND AUTHORIZING AND DIRECTING THE CITY ENGINEER TO EXECUTE SAID NOTICE ON BEHALF OF THE CITY OF ROSEVILLE, THEREFORE, AND ACCEPTING ALL DEDICATIONS OFFERED ON THE RECORDED MAP OF THE SUBDIVISION. The Engineering Division has made final inspection of the project and has found the civil improvement work complete in accordance with the improvement plans and City specifications. This action has no impact to the City's General Fund. Construction costs were paid by the developer.

CC #: 1514

File #: 0400-04-13-1

CONTACT: Ignacio Vizcarra 916-774-5578 ivizcarra@roseville.ca.us

7.20. Creekview Phase 1 Village 13 & 14 - Notice of Completion

Memo from Construction Inspector Ignacio Vizcarra and Development Services Director Mike Isom recommending the City Council adopt RESOLUTION NO. 21-253 ACCEPTING THE PUBLIC WORK KNOWN AS CREEKVIEW PHASE 1, VILLAGE 13 & 14 PROJECT, APPROVING THE "NOTICE OF COMPLETION", AND AUTHORIZING AND DIRECTING THE CITY ENGINEER TO EXECUTE SAID NOTICE ON BEHALF OF THE CITY OF ROSEVILLE, THEREFORE, AND ACCEPTING ALL DEDICATIONS OFFERED ON THE RECORDED MAP OF THE SUBDIVISION. The Engineering Division has made final inspection of the project and has found the civil improvement work complete in accordance with the improvement plans and City specifications. This action has no impact to the City's General Fund. Construction costs were paid by the developer.

CC #: 1515

File #: 0400-04-13-1

CONTACT: Ignacio Vizcarra 916-774-5578 ivizcarra@roseville.ca.us

7.21. Sierra Vista - Village JM-21 - Final Map and Subdivision Agreement

Memo from Associate Engineer Jeff Hendrix and Development Services Director Mike Isom recommending Council adopt RESOLUTION NO. 21-254 APPROVING A SUBDIVISION AGREEMENT, BY AND BETWEEN THE CITY OF ROSEVILLE AND JOHN MOURIER CONSTRUCTION, INC., AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE; and approve the Sierra Vista Village JM-21 final map. Staff has completed its review of the final map and found that it is in compliance with the approved tentative map. This map will create 80 residential lots, 1 public landscape lot, 4 private common area lots and 1 private roads lot. The actions requested have no fiscal impact to the City's General Fund.

CC #: 1518

File #: 0400-04-12-1

CONTACT: Jeff Hendrix 916-774-5463 jhendrix@roseville.ca.us

7.22. Sierra Vista - Village JM-40 - Final Map and Subdivision Agreement

Memo from Associate Engineer Edward Winston and Development Services Director Mike Isom recommending the City Council adopt RESOLUTION NO. 21-255 APPROVING A SUBDIVISION AGREEMENT, BY AND BETWEEN THE CITY OF ROSEVILLE AND JOHN MOURIER CONSTRUCTION, INC., AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE; and approve the Sierra Vista Village JM-40 final map. Staff has completed its review of the final map and found that it is in compliance with the approved tentative map. This map will create 35 residential lots and 1 public landscape lot. The actions requested have no fiscal impact to the City's General Fund.

CC #: 1519

File #: 0400-04-12-1

CONTACT: Edward Winston 916-774-5432 ewinston@roseville.ca.us

7.23. Community Facilities District No. 3 (Municipal Services) - Annexation No. 25 (Villages at Sierra Vista - Phase B) - Resolution of Intention to Annex Territory

Memo from Management Analyst Jeannine Thrash and Assistant City Manager/Chief Financial Officer Dennis Kauffman recommending the City Council adopt RESOLUTION NO. 21-282 A RESOLUTION OF INTENTION TO ANNEX TERRITORY TO COMMUNITY FACILITIES DISTRICT AND TO AUTHORIZE THE LEVY OF SPECIAL TAXES THEREIN. The landowner is obligated per the Developer Agreement by and between the City and the developers relative to the Sierra Vista Specific Plan, to annex into the Municipal Services Community Facilities District (CFD) No. 3 prior to the issuance of the first residential building permit. The CFD will generate special taxes levied on the landowner's annual property tax bill. Annexation into Community Facilities District No. 3, Municipal Services, helps offset the property's impact on City General Fund resources available to pay for municipal services and therefore will not negatively impact the General Fund.

CC #: 1552

File #: 0400-04-17-1

CONTACT: Jeannine Thrash 916-774-5473 jthrash@roseville.ca.us
Dennis Kauffman 916-774-5313 dkauffman@roseville.ca.us

7.24. Audit Services - Agreement

Memo from Accounting Manager Nick Rosas and Assistant City Manager/Chief Financial Officer Dennis Kauffman recommending the City Council adopt RESOLUTION NO. 21-271 APPROVING AN AGREEMENT FOR AUDIT SERVICES, BY AND BETWEEN THE CITY OF ROSEVILLE AND LANCE, SOLL & LUNGHARD, LLP, AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE. The term of the agreement is for a two-year period ending in May 2023 with two options to extend the term of the contract for an additional two years. The cost of the audit services is $157,160 per year, for a total of

$314,320 over the two-year period, part of which will be paid for by the General Fund. The cost of the first year of the audit services has been included in the proposed FY2021-22 budget. The cost of the second year of the audit services will be included in the FY2022-23 budget, pending City Council approval.

CC #: 1539

File #: 0200

CONTACT: Nick Rosas 916-774-5314 nrosas@roseville.ca.us

7.25. General Financial Analysis Services - Professional Services Agreement

Memo from Management Analyst Jeannine Thrash and Assistant City Manger/Chief Financial Officer Dennis Kauffman recommending the City Council adopt RESOLUTION NO. 21-261 APPROVING A PROFESSIONAL SERVICES AGREEMENT, BY AND BETWEEN THE CITY OF ROSEVILLE AND ECONOMIC & PLANNING SYSTEMS, INC., AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE. Staff recommends approval of an agreement with Economic & Planning Systems, Inc. to provide various financial consulting services, including fiscal and economic impact analyses, district formation and annexation support, development impact fee studies, and other feasibility analyses. There will be no fiscal impact from this agreement since the consulting services it covers will be for projects that will either be charged to an external party or, if not already budgeted, require staff to return to Council to recommend a budget adjustment. The recommended three-year agreement allows services up to $100,000 per year, for an overall total compensation not to exceed $300,000.

CC #: 1526

File #: 0200

CONTACT: Jeannine Thrash 916-774-5473 jthrash@roseville.ca.us
Dennis Kauffman 916-774-5313 dkauffman@roseville.ca.us

7.26. Read-Only Sublicense To License and Software Services - Agreement

Memo from Power Supply & Portfolio Administrator William Forsythe recommending the City Council adopt RESOLUTION NO. 21-268 APPROVING AN AGREEMENT, BY AND BETWEEN SACRAMENTO MUNICIPAL UTILITY DISTRICT AND THE CITY OF ROSEVILLE, AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE. This item requests approval of a Sublicense To License and Software Services Agreement with the Sacramento Municipal Utility District and its software vendor PowerSettlements. This agreement is required due to the Balancing Authority of Northern California (BANC) selecting PowerSettlements as its vendor to perform settlements for BANC and its members participating in the California Independent System Operator Energy Imbalance Market. There is no added fiscal impact to executing the sublicense Agreement. The funds for the software were budgeted in the Electric Department FY2020-21 budget and will be in future years' budget requests for ongoing costs.

CC #: 1536

File #: 0800-03

CONTACT: William Forsythe 916-774-5619 wforsythe@roseville.ca.us

7.27. Roseville Natural Gas Financing Authority - Fiscal Year 2021-22 Budget

Memo from Accounting Manager Nick Rosas and Assistant City Manager/Chief Financial Officer Dennis Kauffman recommending the City Council adopt ROSEVILLE NATURAL GAS FINANCING AUTHORITY RESOLUTION NO. 2-21 ADOPTING THE ANNUAL BUDGET FOR THE FISCAL YEAR 2021-22. This item requests approval of the $16.8M Roseville Natural Gas Financing Authority (RNGFA) budget for FY2021-22. The RNGFA issued the 2007 Gas Revenue Bonds which financed the prepayment of natural gas used for power generation at the Roseville Energy Park. Approval of the annual budget has no new fiscal impact.

CC #: 1530

File #: 0103-17 & 0201

CONTACT: Nick Rosas 916-774-5314 nrosas@roseville.ca.us

7.28. Pleasant Grove Wastewater Treatment Plant Energy Recovery Project Design-Assist and Construction Contract - Change Order Allowance Increase

Memo from Senior Engineer Tracie Mueller and Environmental Utilities Director Richard Plecker recommending the City Council adopt RESOLUTION NO. 21-270 APPROVING AN INCREASE IN CHANGE ORDER AUTHORITY. This item requests authorization for the Environmental Utilities Director or his designee to approve and pay for contract change orders for the Design-Assist and Construction Agreement to W.M. Lyles Company for the Pleasant Grove Wastewater Treatment Plant Energy Recovery Project that could increase the original contract amount of $23,349,729, by no more than 10% or $2,334,973. Funding for this agreement is provided by the South Placer Wastewater Authority capital improvement projects fund.

CC #: 1538

File #: 0800-02

CONTACT: Tracie Mueller 916-774-5688 trmueller@roseville.ca.us

Ordinances (for introduction and adoption - appropriation/urgency measures)

7.29. Local Road Safety Plan - Professional Services Agreement Amendment and Budget Adjustment

Memo from Junior Engineer Heather Chan and Public Works Director Jason Shykowski recommending the City Council adopt RESOLUTION NO. 21-2 6 2 APPROVING A FIRST AMENDMENT TO PROFESSIONAL SERVICES AGREEMENT, BY AND BETWEEN THE CITY OF ROSEVILLE AND KIMLEY-HORN AND ASSOCIATES, INC., AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE; and adopt ORDINANCE NO. 6374 OF THE COUNCIL OF THE CITY OF ROSEVILLE AUTHORIZING CERTAIN AMENDMENTS TO THE FISCAL YEAR 2020-21 BUDGET AND DECLARING THIS ORDINANCE TO BE IMMEDIATELY EFFECTIVE AS AN APPROPRIATION MEASURE. Staff requests approval of a budget

adjustment for $61,000 and an amendment to the professional service agreement with Kimley-Horn and Associates in an amount not to exceed $52,684.66 (original contract amount of $79, 881.29) for the purpose of continuing the development of a Local Road Safety Plan for the City, with $47,700 coming from state grant funding and $13,300 from the Highway User Tax Fund. Updated contract amount would be $132,566.95. No General Fund resources will be used for the project.

CC #: 1527

File #: 0800-04 & 0201-01

CONTACT: Heather Chan 916-746-1300 hcchan@roseville.ca.us

7.30. Dry Creek Wastewater Treatment Plant Cogeneration Project - Budget Adjustment

Memo from Environmental Utilities Process Engineer Todd Jordan and Environmental Utilities Director Richard Plecker recommending the City Council adopt ORDINANCE NO. 6373 OF THE CITY OF ROSEVILLE AUTHORIZING CERTAIN AMENDMENTS TO THE FISCAL YEAR 2020-21 BUDGET AND DECLARING THIS ORDINANCE TO BE IMMEDIATELY EFFECTIVE AS AN APPROPRIATION MEASURE. Staff requests approval of a budget adjustment for the Dry Creek Wastewater Treatment Plant Cogeneration Project budget to cover the higher than anticipated costs for City staff labor. Approval of the attached budget adjustment authorizes an additional $239,368 in funding from the Wastewater Rehabilitation Fund, increasing the total project budget to $10,143,725.

CC #: 1516

File #: 0900-02-02-1 & 0201-01

CONTACT: Todd Jordan 916-746-1829 tjordan@roseville.ca.us

Ordinances (for second reading and adoption)

7.31. Second Reading - Roseville Municipal Code Amendment to Rate Assistance Program

ORDINANCE NO. 6376 OF THE COUNCIL OF THE CITY OF ROSEVILLE AMENDING SECTION 14.24.079 OF CHAPTER 14.24 OF TITLE 14 OF THE ROSEVILLE MUNICIPAL CODE REGARDING LOW INCOME RATE REDUCTION, for second reading and adoption.

CC #: 1557

File #: 0324

CONTACT: Eric Campbell 916-774-5626 ecampbell@roseville.ca.us

Reports / Requests

7.32. Annual City of Roseville Interest Rate Swaps Report for Fiscal Year 2019-20

Memo from Accounting Manager Nick Rosas and Assistant City Manager/Chief Financial Officer Dennis Kauffman recommending the City Council accept an informational report on the performance of the City's outstanding interest rate swaps for the Electric Department system debt. This is an informational item

only. As such, there is no fiscal impact.

CC #: 1523

File #: 0202

CONTACT: Nick Rosas 916-774-5314 nrosas@roseville.ca.us

7.33. Mahany Park Open Space Multi-Use Trail Feasibility Study

Memo from Administrative Analyst Jeannie Gandler and Public Works Director Jason Shykowski recommending the City Council accept the Mahany Park Open Space Multi-Use Trail Feasibility Study and direct staff to pursue funding opportunities for the next steps including environmental documents, permits, design and construction. The study resulted in a proposed trail alignment through the open space that will connect existing trails leading into the study area and close gaps in the City's bikeway network. The study process included evaluation of existing trails, approved planning documents, field walks with assessment of existing conditions, monthly Project Development Team meetings including consultant and City staff, consultation with regulatory agencies, interviews with nearby stakeholders, and a robust community engagement program. The proposed alignment through the Mahany open space provides various lengths of recreational loop trails along with important active transportation connections between residential areas, schools, employment, shopping, and recreational amenities. Funding for the next steps of this project have not been identified. At City Council direction, staff will pursue funding through various federal, state, and local sources over the next several years to complete the project. General Fund resources were not used for this study and are not used for multi-use trail construction.

CC #: 1529

File #: 0721-05

CONTACT: Jeannie Gandler 916-746-1289 jgandler@roseville.ca.us

7.34. Out-of-State Travel Request - Police Department

Memo from Management Analyst Mark Peinado and Police Chief Troy Bergstrom recommending the City Council approve four police officers to travel to San Antonio, Texas in July for the 2021 Campus Safety Conference. The Roseville Joint Union High School District will pay all costs associated with the training, airfare, lodging, transportation and meals for three police officers. The total cost to the City for the fourth officer to attend this conference is $1,616. There are sufficient funds in the proposed FY2021-22 Police Social Services training budget in the General Fund to cover the expense.

CC #: 1524

File #: 0600-02

CONTACT: Mark Peinado 916-774-5021 mcpeinado@roseville.ca.us

7.35. Roseville 80 - North Van Parking Lot - Parcel Map

Memo from Associate Engineer David Samuelson and Development Services Director Mike Isom recommending the City Council approve the Roseville 80 - North Van Parking Lot Parcel Map. Staff has completed its review of the parcel map and found that it is in compliance with the approved tentative map.

This map will create 4 industrial lots. The actions requested have no fiscal impact to the City's General Fund.

CC #: 1517

File #: 0400-07

CONTACT: David Samuelson 916-774-5442 dsamuelson@roseville.ca.us

END OF CONSENT CALENDAR

8. SPECIAL REQUESTS/REPORTS/PRESENTATION

8.1. Council Discretionary Funds - Roseville Crime Stoppers

Memo from Management Assistant Heather Blanco and City Clerk Sonia Orozco requesting the City Council consider a request for $2,000 from Council Discretionary Funds for Roseville Crime Stoppers for the annual Fourth of July Fun Run. The funds raised through runners' fees and sponsorship are used for cash rewards for information leading to arrests and convictions in serious crimes committed in Roseville. The funds are also used to grant scholarships for Roseville youth pursuing careers in public safety, and community education on public safety issues.

CC #: 1522

File #: 0102

CONTACT: Heather Blanco 916-746-1171 hblanco@roseville.ca.us
Sonia Orozco 916-774-5269 sorozco@roseville.ca.us

8.2. Placer County 2021 Redistricting Process and Timeline

Memo from City Clerk Sonia Orozco recommending City Council accept a presentation by Jane Christenson, Placer County Assistant Chief Executive Officer regarding Placer County's 2021 Redistricting process and timeline.

CC #: 1534

File #: 0103-33

CONTACT: Sonia Orozco 916-774-5269 sorozco@roseville.ca.us

8.3. Results of National Community Survey

Memo from Deputy City Manager Megan MacPherson Scheid and City Manager Dominick Casey presenting the results of the National Community Survey conducted among Roseville residents in Spring 2021. Roseville rose to the top of the rankings among hundreds of cities nationwide in a variety of categories related to utilities, city services, economic vibrancy, and quality of life.

CC #: 1554

File #: 0108

CONTACT: Megan MacPherson Scheid 916-774-5455 mscheid@roseville.ca.us

8.4. City Policy on Display of Flags

Memo from Assistant City Manager Dion Louthan and Senior Deputy City

Attorney Joe Speaker recommending the City Council consider two proposed versions of a "City of Roseville Policy on Display of Flags" and either adopt RESOLUTION NO. 21-283 ADOPTING A CITY OF ROSEVILLE POLICY ON DISPLAY OF FLAGS, approving one of the two proposed policies or provide Staff with further direction. This was a requested item from the City Council at the May 6, 2021, City Council meeting and is an opportunity for City Council to approve a formal policy on display of flags going forward. One version of the proposed policy memorializes the longstanding past practice of the City in displaying only legally required and governmentally recognized flags at City-owned properties (i.e. the U.S. flag, California State flag, City of Roseville flag, and POW-MIA flag). The other version of the proposed policy would allow for the additional display of a "commemorative flag" (i.e. a flag that is not formally recognized nationally and congressionally as a governmental flag or associated with a local government) and otherwise consistent with the policy.

CC #: 1553

File #: 0102

CONTACT: Dion Louthan 916-774-5362 dlouthan@roseville.ca.us

9. ORDINANCES

9.1. FY2021-22 Citywide Budget, Position Allocation Schedule, Housing Authority Budget and Roseville Finance Authority Budget

Memo from Budget Manager Scott Pettingell and Assistant City Manager/Chief Financial Officer Dennis Kauffman recommending the City Council adopt ORDINANCE NO. 6375 ADOPTING THE ANNUAL BUDGET FOR THE FISCAL YEAR 2021-2022, ADOPTING BUDGET CONTROL POLICIES, ADOPTING AN APPROPRIATIONS LIMIT, ADOPTING THE BUDGET FOR THE SUCCESSOR AGENCY OF THE ROSEVILLE REDEVELOPMENT AGENCY, TO BE EFFECTIVE IMMEDIATELY AS AN URGENCY MEASURE; and approve out-of-state travel requests, new vehicle requests, and the Citywide position allocation schedule as incorporated into the FY2021-22 budget document, effective July 1, 2021; and the City Council, acting as the Board of Directors for the Roseville Housing Authority, adopt HOUSING AUTHORITY OF THE CITY OF ROSEVILLE RESOLUTION NO. 6-21 APPROVING THE ANNUAL BUDGET FOR FISCAL YEAR 2021-22; and adopt a ROSEVILLE FINANCE AUTHORITY RESOLUTION NO. 3-21 ADOPTING THE ANNUAL BUDGET FOR THE FISCAL YEAR 2021-22. The FY2021-22 proposed citywide budget totals $571 million from all funding sources. The budget for the General Fund is $183 million, which includes operating ($176 million) and non-operating expenditures ($6 million). The FY2021-22 Housing Authority program expenditure budget is $6.6 million and is primarily comprised of funding from the federally-funded Housing Choice Voucher Program for the purpose of providing rental assistance to over 700 very-low income households in Roseville and Rocklin. The cost to the General Fund for the administration of this program is $76,019 and is included in the City's proposed FY2021-22 budget. The FY2021-22 Roseville Finance Authority Budget includes debt service payments of $2,377,715 reflecting scheduled payments on the Certificates of Participation (COPs) for the Corporation Yard and 316 Vernon Street. The Finance Authority has issued other bonds and COPs, but that debt service is reflected in the City's budget within each respective fund. For community facilities district bond issues, the Finance Authority acts as a

conduit to collect payments through the County property tax levy process for the repayment of outstanding debt of these special districts. Transfers out of the capital improvement fund of $414,351 represents money transferred to the Citywide Parks Fund for the repayment of a loan from the Fleet Replacement Fund which partially funded the construction of Harry Crabb Park.

CC #: 1555

File #: 0201 & 0103-03-02 & 0103-29-02

CONTACT:Scott Pettingell 916-774-1306 spettingell@roseville.ca.us

10. PUBLIC HEARING

NOTICE TO THE PUBLIC

City Council, when considering the matter scheduled for hearing, will take the following actions:

1. Open the Public Hearing
2. Presentation by Staff
3. Presentation by applicant or Appellant
4. Accept Public Testimony
5. Appellant or Applicant Rebuttal Period
6. Close the Public Hearing
7. City Council Comments and Questions
8. City Council Action

In the future, if you wish to challenge in court any of the matters on this agenda for which a public hearing is to be conducted, you may be limited to raising only those issues, which you, or someone else raised orally at the Public Hearing or in written correspondence received by the City or before the hearing

Public Hearings listed for continuance will be continued as noted and posting of this agenda serves as notice of continuation.

10.1. Draft 2020 Urban Water Management Plan – Public Hearing for Review and Receive Comments

Memo from Hydrogeologist Trevor Joseph and Environmental Utilities Director Richard Plecker recommending the City Council hold a public hearing to review and receive comments on the Draft 2020 Urban Water Management Plan (UWMP). Holding a public hearing that provides an overview of the UWMP is a requirement of the City by the Urban Water Management Planning Act and the Water Conservation Act of 2009.

CC #: 1549

File #: 0800-02

CONTACT: Trevor Joseph 916-746-1708 tjoseph@roseville.ca.us

10.2. Draft 2020 Urban Water Management Plan – Public Hearing for Consideration of Adoption

Memo from Hydrogeologist Trevor Joseph and Environmental Utilities Director Richard Plecker recommending the City Council adopt RESOLUTION NO. 21-

280 ADOPTING THE URBAN WATER MANAGEMENT PLAN AND AUTHORIZING STAFF TO SUBMIT TO THE CALIFORNIA DEPARTMENT OF WATER RESOURCES. Staff requests Council consider the adoption of the Draft 2020 Urban Water Management Plan (UWMP) following a public hearing allowing for the City to receive comments. The approval of this plan is a requirement of the City by the Urban Water Management Planning Act and the Water Conservation Act of 2009.

CC #: 1548

File #: 0800-02

CONTACT: Trevor Joseph 916-746-1708 tjoseph@roseville.ca.us

10.3. Draft Water Shortage Contingency Plan – Public Hearing to Review and Receive Comments

Memo from Hydrogeologist Trevor Joseph and Environmental Utilities Director Richard Plecker recommending the City Council hold a public hearing to review and receive comments on the Draft Water Shortage Contingency Plan (WSCP). Holding a public hearing that provides an overview of the WSCP is a requirement of the City by the Urban Water Management Planning Act and the Water Conservation Act of 2009.

CC #: 1551

File #: 0800-02

CONTACT: Trevor Joseph 916-746-1708 tjoseph@roseville.ca.us

10.4. Draft Water Shortage Contingency Plan – Public Hearing for Consideration of Adoption

Memo from Hydrogeologist Trevor Joseph and Environmental Utilities Director Richard Plecker recommending the City Council adopt RESOLUTION NO. 21-282 ADOPTING THE WATER SHORTAGE CONTINGENCY PLAN AND AUTHORIZING STAFF TO SUBMIT TO THE CALIFORNIA DEPARTMENT OF WATER RESOURCES. This item serves as a public hearing to consider adoption the Draft Water Shortage Contingency Plan (WSCP) and requests approval to include the WSCP as a chapter in the 2020 Urban Water Management Plan. The approval of these plans are a requirement of the City of Roseville by the Urban Water Management Planning Act and the Water Conservation Act of 2009.

CC #: 1550

File #: 0800-02

CONTACT: Trevor Joseph 916-746-1708 tjoseph@roseville.ca.us

11. REPORTS / PUBLIC COMMENTS

12. ADJOURNMENT

COUNCIL COMMUNICATION

CC #: 1533
File #: 0102-10

Title: Resolution - Williams + Paddon 40th Anniversary
Contact: Blair Hutchison 916-774-5266 bmhutchison@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 5.1.

RECOMMENDATION TO COUNCIL

Commend Williams + Paddon on the celebration of their 40th anniversary, congratulate them on the vital role they have played in improving the quality of life in the Roseville community, and extend best wishes for continued success in the future.

BACKGROUND

Not applicable.

FISCAL IMPACT

Not applicable.

ENVIRONMENTAL REVIEW

The California Environmental Quality Act (CEQA) does not apply to activities that will not result in a direct or reasonably foreseeable indirect physical change in the environment, or is otherwise not considered a project as defined by CEQA Statute §21065 and CEQA State Guidelines §15060(c)(3) and §15378. Ceremonial documents meet the above criteria and are not subject to CEQA. No additional environmental review is required.

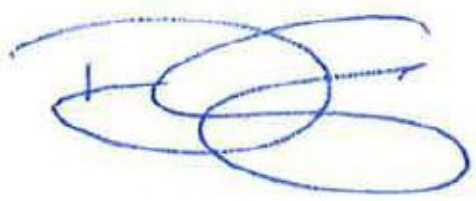
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Not applicable.

Respectfully Submitted,

Blair Hutchison, Deputy Clerk

Sonia Orozco, City Clerk



Dominick Casey, City Manager

ATTACHMENTS:

Description

Resolution - Williams + Paddon 40th Anniversary

Resolution

WHEREAS, Jim Williams and Jack Paddon founded Williams + Paddon Architects + Planners, Inc. in 1981 with four employees and an office at 730 Sunrise Boulevard in Roseville; and

WHEREAS, Williams + Paddon was significantly involved with the planning and design of the City of Roseville's first specific plan, the Southeast Roseville Specific Plan, and they then designed and relocated the first major business park on Douglas Boulevard; and

WHEREAS, in 1988, the Roseville Telephone Company hired Williams + Paddon to design their corporate campus on Industrial Boulevard, a site that now serves as corporate headquarters for SureWest; and

WHEREAS, a number of other notable Roseville projects were all designed, or significantly influenced by, Williams + Paddon, including the City of Roseville Civic Center expansion, Martha Riley Community Library, Roseville and Oakmont High School campus modernizations, Roseville Chamber of Commerce, Maidu Interpretive Center, Downtown Specific Plan, and Blue Line Gallery; and

WHEREAS, the recent renovation of Placer County Fair Grounds (@ The Grounds) including the addition of the Event Center which is the first and largest indoor sporting facility of its kind in the region, was also designed, or significantly influenced by, Williams + Paddon; and

WHEREAS, the creative talents of Williams + Paddon extend beyond Roseville and include innovative new housing in both Sacramento and Lake Tahoe as well as K-12 schools, Community Clubhouses, Retail and Corporate Offices in the greater Sacramento region, Williams + Paddon has also extended their reach to design office and hospitality spaces for a large corporate client in China; and

WHEREAS, community service has always been an important part of the Williams + Paddon culture, whereby staff members have served on a wide variety of local boards, commissions, chamber boards, and charity committees, including two terms as the Chair of the Roseville Chamber of Commerce; and

WHEREAS, Williams + Paddon have continually maintained an office in the City of Roseville, including their current location at 2237 Douglas Boulevard, which they, of course, designed; and

NOW, THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE CITY OF ROSEVILLE, CALIFORNIA, that **WILLIAMS + PADDON** be commended on the celebration of their 40th anniversary, congratulated on the vital role they have played in improving the quality of life in the Roseville community, and extended best wishes for continued success in the future.

SIGNED AND APPROVED this 16th day of June, 2021.

KRISTA BERNASCONI, MAYOR

CITY OF ROSEVILLE
INCORPORATED APRIL 10, 1909

COUNCIL COMMUNICATION

CC #: 1525
File #: 0102-03

Title: Minutes of Prior Meeting
Contact: Helen Dreyer 916-774-5356 hdreyer@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 7.1.

RECOMMENDATION TO COUNCIL

Recommend the City Council approve the minutes of the May 5, 2021 City Council meeting.

BACKGROUND

There is no background associated with this item. The request is to approve the minutes of previous meetings.

FISCAL IMPACT

Not applicable.

ENVIRONMENTAL REVIEW

The California Environmental Quality Act (CEQA) does not apply to activities that will not result in a direct or reasonably foreseeable indirect physical change in the environment CEQA Guidelines §15061(b)(3). The approval of minutes does not include the potential for a significant environmental effect, and therefore is not subject to CEQA.

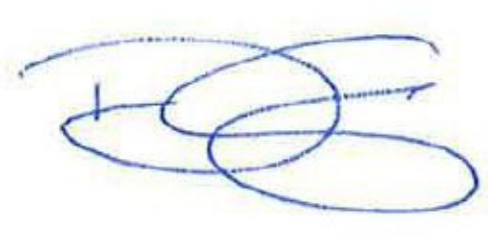
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Goal B - Support community engagement and advocacy

Respectfully Submitted,

Helen Dreyer, Assistant City Clerk

Sonia Orozco, City Clerk



Dominick Casey, City Manager

ATTACHMENTS:

Description

May 5, 2021 City Council Minutes

MINUTES
May 5, 2021

CITY COUNCIL
6:00 p.m.
Council Chambers
311 Vernon Street
Roseville, California
www.roseville.ca.us/CORTV

The meeting will be open to limited in-person attendance. To remain in compliance with the state's public health guidance, attendance will be limited to 25% of the room's capacity (15 seats) and will require 6 feet of social distancing inside and outside the council chambers. Face coverings are required and will be provided to those who don't have a mask.

Due to the limited capacity in the chambers, the public is highly encouraged to participate virtually. The meeting may be viewed on Comcast channel 14, Consolidated Communications channel 73, and AT&T U-Verse. City Council meetings are also video streamed live and are available on the City's website and YouTube channel.

Members of the public may offer public comment by phone:

Dial in Phone Number: 916-774-5353

If you need disability-related modification or accommodation to participate in this meeting, please contact: Voice: 916-774-5200, TDD: 916-774-5220. Requests must be made as early as possible.

1. CALL TO ORDER

Mayor Krista Bernasconi called the meeting to order at 6:00 p.m.

2. ROLL CALL

Present: Houdesheldt, Alvord, Roccucci, Mendonsa, Bernasconi

3. PLEDGE OF ALLEGIANCE

Roseville Joint Union High School District Vice President Scott Huber led the Pledge of Allegiance.

4. MEETING PROCEDURES

City Clerk Sonia Orozco announced the procedures for addressing the City Council.

5. PRESENTATIONS

5.1. Proclamation - Public Service Recognition Week

Proclaim May 2-8, 2021 as Public Service Recognition Week and encourage all citizens to recognize the accomplishments and contributions of government employees at all levels.

Below is the video link highlighting why employees appreciate working for the City of Roseville:

https://youtu.be/RJ-kbufu6Xw

CONTACT: Blair Hutchison 916-774-5266 bmhutchison@roseville.ca.us

Mayor Krista Bernasoni made the presentation to City Manager Dominick Casey, who responded.

No public comment received.

5.2. Placer County Whole Person Care Program Presentation

Presentation by Dr. Rob Oldham, Placer County Health and Human Services Director regarding the County's Whole Person Care Program and Keith Diederich, President and CEO of The Gathering Inn regarding permanent supportive housing within the City of Roseville.

CONTACT: Laura Matteoli 916-774-5284 lmatteoli@roseville.ca.us

Economic Development Director Laura Matteoli introduced Placer County Health and Human Services Director Dr. Rob Oldham, Whole Person Care Program Manager Geoff Smith, and Gathering Inn President and CEO Keith Diederich.

Placer County Health and Human Services Director Dr. Rob Oldham made the presentation to the City Council.

Whole Person Care Program Manager Geoff Smith continued the presentation to the City Council.

Gathering Inn Director and CEO Keith Diederich continued the presentation to the City Council.

Gary (no last name given) - Spoke in opposition to permanent supportive housing in

Fiddyment Farm neighborhood with school aged children and cited disturbing incidences with residents.

Natalie Grand - Spoke in opposition to permanent supportive housing and on impact to housing values.

Julie Hirota - Requested the City Council focus on result-oriented partnership solutions to house the unhoused community in Roseville.

Paul Boudier - Spoke in support of the Whole Person Care program.

Bill Boudier - Spoke in support of the Whole Person Care program.

Kathleen Crawford - Spoke in support of the Whole Person Care program.

Frank Thomas - Spoke in opposition to the Whole Person Care program.

For information only. No action required as Roseville has no authority over program.

6. PUBLIC COMMENTS

Barbara Brass - Spoke in support of the proposed honor LGBTQ proclamation and requested the City fly the rainbow Pride flag on downtown flag pole.

Retired Colonel Patsy Thompson - Spoke on her military service and requested the City fly the rainbow Pride flag.

Wendy Gerig - representing Roseville Area Chamber of Commerce - Thanked the City's Economic Development Department for partnering with the Chamber in applying for the Placer Shares Grant #3 in the amount of $200,000 and thanked the City Council for help in distributing

Holly Zefferson - Read excerpt of her letter in support of a Pride Month proclamation and of the City flying the rainbow flag.

Paul Griffin - Spoke in acknowledgement of Public Service Recognition Week and thanked Engineering and Planning employees for their work, and spoke in support of police officer worn body cameras.

Kathleen Crawford - Spoke in support of a Pride Month proclamation and of the City flying the rainbow flag as a thoughtful gesture.

Ellen Debach-Riley - Spoke in support of the City flying the rainbow Pride flag.

M (no last name given) - Spoke in support of the City flying the rainbow Pride flag.

Bob Tallman Jessup - Spoke in opposition to flying the rainbow flag and in support of only flying the United States and State of California flags.

Roseville Joint Union High School District Vice President Scott Huber - Recommended the City create a flag policy.

7. CONSENT CALENDAR

BEGINNING OF CONSENT CALENDAR

No public comment received.

Motion by Bruce Houdesheldt, seconded by Pauline Roccucci, to approve The Consent Calendar as recommended. The Motion Passed.

Roll call vote: Ayes: Alvord, Bernasconi, Houdesheldt, Mendonsa, Roccucci

Bids / Purchases / Services

7.1. City Council/Housing Authority - 316 Vernon Street Front Counter Security Renovation and Coronavirus Aid, Relief, and Economic Security Act COVID-19 Project (RFQ 10-3285) – Contract Purchase Agreement, Budget Adjustment and Housing Authority Budget Adjustment

Memo from Buyer Tiffany Valdez and Assistant City Manager/Chief Financial Officer Dennis Kauffman recommending the City Council adopt RESOLUTION NO. 21-191 APPROVING A CONTRACT PURCHASE AGREEMENT, BY AND BETWEEN THE CITY OF ROSEVILLE AND OLEG KOVRIZHNYKH DBA OK CONSTRUCTION, AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE (3001130); and adopt ORDINANCE NO. 6358 OF THE COUNCIL OF THE CITY OF ROSEVILLE AUTHORIZING CERTAIN AMENDMENTS TO THE FISCAL YEAR 2020-21 BUDGET AND DECLARING THIS ORDINANCE TO BE IMMEDIATELY EFFECTIVE AS AN APPROPRIATION MEASURE; and adopt RESOLUTION NO. 4-21 APPROVING A BUDGET ADJUSTMENT FOR FISCAL YEAR 2020-21. Staff requests Council authorize a contract purchase agreement with Oleg Kovrizhnykh dba OK Construction for the materials and labor to complete the front counter security renovations at 316 Vernon Street. The cost of the agreement is $289,000. Staff also requests approval of change order requests for this project up to 10% or $28,900 as a construction contingency. Additionally, a budget adjustment of $44,931 from the Transit Fund and $44,941 from the Transportation Fund, as well as a budget adjustment of $116,618 from Housing Authority funds from the Coronavirus Aid, Relief, and Economic Security Act funding is also requested. There are adequate resources available in both of these funds for the recommended budget adjustments.

CC #: 1443

File #: 0900-08 & 0103-03-02 & 0201-01

CONTACT: Tiffany Valdez 916-774-5708 tvaldez@roseville.ca.us

7.2. On-Call Roadway and Trail Maintenance Services - Approval of Project Manual and Authorization to Call for Bids

Memo from Assistant Engineer Jesse Khatkar and Public Works Director Jason Shykowski recommending the City Council approve the project manual, including the Special Provisions, for the On-Call Roadway and Trail Maintenance Services and authorize staff to call for bids. The scope of the services consists of various resurfacing treatments in order to maintain the City's network of existing roadways and trails. The first areas anticipated to be resurfaced by the contractor selected for the work is a portion of the Sun City Neighborhood in 2021 and the Hillcrest Neighborhood in 2022. The engineer's estimate for the annual contract is estimated at $6.4 million. Funding sources identified for use on this contract include State Gas Tax, Highway Users Fund, SB-1 Road Maintenance and Rehabilitation Account, and the Local Transportation Fund. Funds will be allocated based on Council approved Capital Improvement Program project budgets. No General Fund resources will be used.

CC #: 1436

File #: 0900-04-02

CONTACT: Jesse Khatkar 916-774-5434 jskhatkar@roseville.ca.us

7.3. Four Corners Park (W-50C) Project - Approval of Plans and Specifications and Authorization to Call for Bids

Memo from Park Development Project Manager Joel De Jong and Parks, Recreation & Libraries Director Jill Geller recommending the City Council approve the plans and specifications for the Four Corners Park (W-50C) project and authorize staff to call for bids. This 1.2-acre park site is located at the intersection of Garland Way and Stanwyck Way in the West Roseville Specific Plan. The project includes a children's play area, swings, a basketball half court, bocce ball court area, pedestrian pathways, tricycle track, shade trees, open turf areas, benches, picnic tables, landscape, and irrigation. In order to meet budget constraints, additive alternates have been identified and include a shade structure for the picnic area and sod for the turf areas in lieu of seed. The estimate for construction of the base bids is $859,000. Funding for the park construction is provided through the West Roseville Neighborhood Park Development Fund and was allocated in the FY2020-21 budget. Maintenance of the park will be funded from the Westpark Community Facilities District No. 2 (Public Services).

CC #: 1434

File #: 0704-01

CONTACT: Joel De Jong 916-774-5924 jdejong@roseville.ca.us

7.4. Vehicle – Purchase Orders

Memo from Fleet Manager Brian Craighead and Public Works Director Jason Shykowski recommending the City Council approve a purchase order to Dobbs Heavy Duty Holdings LLC dba Western Truck Center for one Autocar CNG truck with AMREP roll-off body utilizing RFQ 10-3292 in the amount of $277,484; and approve a purchase order to Dobbs Heavy Duty Holdings LLC dba Western Truck Center for one Volvo diesel truck with AMREP roll-off body utilizing RFQ 10-3293 in the amount of $190,611; and approve a purchase order to Dobbs Heavy Duty Holdings LLC dba Western Truck Center for one Autocar diesel truck with Bridgeport side loading body utilizing RFQ 10-3294 in the amount of $338,931;

and approve a purchase order to Dobbs Heavy Duty Holdings LLC dba Western Truck Center for seven Autocar CNG trucks with Bridgeport side loading bodies utilizing RFQ 10-3295 in the amount of $2,560,541. Funding for these vehicles is included in the FY2020-21 Fleet Replacement budget.

CC #: 1441

File #: 0203-01

CONTACT: Brian Craighead 916-774-5731 bcraighead@roseville.ca.us

Resolutions

7.5. Roseville Firefighters Employer Paid Member Contributions - California Public Employees' Retirement System Resolution

Memo from Human Resources Manager Linda Hampton and Human Resources Director Stacey Peterson recommending the City Council adopt RESOLUTION NO. 21-196 FOR PAYING AND REPORTING THE VALUE OF EMPLOYER PAID MEMBER CONTRIBUTIONS. Staff recommends that Council adopt the resolution formally authorizing the City of Roseville to implement the provisions of Government Code 20636(c)(4) as provided for in the January 5, 2017, through December 31, 2018, Roseville Firefighters (RFF) bargaining agreement. In accordance with this and subsequent agreements, the City discontinued reporting Employer Paid Member Contributions to California Public Employees' Retirement System (CalPERS) as additional compensation for Classic RFF public safety employees effective January 6, 2018. While the City has been reporting compensation correctly to CalPERS in accordance with the agreements with RFF, an updated resolution was not filed with CalPERS. To administratively correct the required CalPERS documentation, staff recommends adopting the resolution to file with CalPERS. These provisions have reduced retirement costs since implementation and cost savings will continue to be realized going forward. This recommended action has no fiscal impact.

CC #: 1450

File #: 0600-01

CONTACT: Linda Hampton 916-774-5215 lhampton@roseville.ca.us

7.6. Fiddyment Ranch Lot D and F-66 (Lot 21) - Disposition of City Interests and Acceptance of a Portion of Property for Monitoring Well Purposes

Memo from Assistant Engineer Kerry Andrews and Development Services Director Mike Isom recommending the City Council adopt RESOLUTION NO. 21-199 ORDERING SUMMARY VACATION OF EXCESS RIGHT OF WAY, PUBLIC UTILITY EASEMENT, AND ALL OTHER INTERESTS, IF ANY, IN LOT D IN THE FIDDYMENT RANCH PHASE 2 VILLAGE 16A SUBDIVISION, FINDING AND DECLARING LOT D AS EXEMPT SURPLUS LAND, AND AUTHORIZING THE CITY MANAGER TO EXECUTE A QUITCLAIM DEED, ESCROW INSTRUCTIONS AND ANY OTHER DOCUMENTS REQUIRED TO EFFECTUATE THE CONVEYANCE OF THE ABANDONED INTERESTS IN LOT D, FINDING IT TO BE IN THE CITY'S BEST INTEREST; and adopt RESOLUTION NO. 21-200 TERMINATING THE IN FEE IRREVOCABLE OFFER OF DEDICATION OF LOT 21 IN THE

FIDDYMENT RANCH PHASE 2 VILLAGE 16A SUBDIVISION, AUTHORIZING THE CITY MANAGER TO EXECUTE A QUITCLAIM DEED AND AUTHORIZING THE CITY MANAGER TO EXECUTE ESCROW INSTRUCTIONS AND ANY OTHER DOCUMENTS REQUIRED TO EFFECTUATE THE TERMINATION OF THE IN FEE IRREVOCABLE OFFER OF DEDICATION; and adopt RESOLUTION NO. 21-201 APPROVING THE ACCEPTANCE OF A GRANT DEED FOR A PORTION OF LOT 21 OF FIDDYMENT RANCH PHASE 2 VILLAGE 16A AND AUTHORIZING THE CITY MANAGER TO EXECUTE THE GRANT DEED, ESCROW INSTRUCTIONS, AND ANY OTHER REQUIRED DOCUMENTS AND AUTHORIZING THE CITY CLERK OR DESIGNEE TO RECORD ANY REQUIRED DOCUMENTS AT THE PLACER COUNTY OFFICE OF THE COUNTY RECORDER. These actions will facilitate a lot line adjustment pursuant to an agreement made in the Fiddyment Ranch Development Agreement Amendment #8. These actions have no fiscal impact to the City's General Fund.

CC #: 1453

File #: 0400-04-09-1

CONTACT: Kerry Andrews 916-774-5346 kandrews@roseville.ca.us

7.7. Sierra Vista - Phase 1B & 1C Westbrook Boulevard (STA 29+35.43 to End) & Vista Grande Boulevard - Notice of Completion

Memo from Construction Inspector Andrew Druck and Development Services Director Mike Isom recommending the City Council adopt RESOLUTION NO. 21-198 OF THE CITY OF ROSEVILLE ACCEPTING THE PUBLIC WORK KNOWN AS SIERRA VISTA - PHASE 1B & 1C WESTBROOK BL. (STA 29+35.43 To END) & VISTA GRANDE BL. PROJECT, APPROVING THE "NOTICE OF COMPLETION", AND AUTHORIZING AND DIRECTING THE CITY ENGINEER TO EXECUTE SAID NOTICE ON BEHALF OF THE CITY OF ROSEVILLE, THEREFORE, AND ACCEPTING A PORTION OF THE DEDICATIONS OFFERED ON THE RECORDED MAP OF THE SUBDIVISION. The Engineering Division has made final inspection of the project and has found the civil improvement work complete in accordance with the improvement plans and City specifications. This action has no impact to the City's General Fund. Construction costs were paid by the developer.

CC #: 1452

File #: 0400-04-12-1

CONTACT: Andrew Druck 916-223-7577 adruck@roseville.ca.us

7.8. Federico Phase 1 - Village 22B - Notice of Completion

Memo from Construction Inspector Andrew Druck and Development Services Director Mike Isom recommending the City Council adopt RESOLUTION NO. 21-185 OF THE COUNCIL OF THE CITY OF ROSEVILLE ACCEPTING THE PUBLIC WORK KNOWN AS FEDERICO PHASE 1 - VILLAGE 22B, APPROVING THE “NOTICE OF COMPLETION”, AND AUTHORIZING AND DIRECTING THE CITY ENGINEER TO EXECUTE SAID NOTICE ON BEHALF OF THE CITY OF ROSEVILLE, THEREFORE, AND ACCEPTING

ALL DEDICATIONS OFFERED ON THE RECORDED MAP OF THE SUBDIVISION. The Engineering Division has made final inspection of the project and has found the civil improvement work complete in accordance with the improvement plans and City specifications. This action has no impact to the City's General Fund. Construction costs were paid by the developer.

CC #: 1431

File #: 0400-04-09-01

CONTACT:Andrew Druck 916-223-7577 adruck@roseville.ca.us

7.9. Federico Phase 1 - Village 3 - Notice of Completion

Memo from Construction Inspector Andrew Druck and Development Services Director Mike Isom recommending the City Council adopt RESOLUTION NO. 21-186 OF THE COUNCIL OF THE CITY OF ROSEVILLE ACCEPTING THE PUBLIC WORK KNOWN AS FEDERICO PHASE 1 – VILLAGE 3 PROJECT, APPROVING THE "NOTICE OF COMPLETION", AND AUTHORIZING AND DIRECTING THE CITY ENGINEER TO EXECUTE SAID NOTICE ON BEHALF OF THE CITY OF ROSEVILLE, THEREFORE, AND ACCEPTING ALL DEDICATIONS OFFERED ON THE RECORDED MAP OF THE SUBDIVISION. The Engineering Division has made final inspection of the project and has found the civil improvement work complete in accordance with the improvement plans and City specifications. This action has no impact to the City's General Fund. Construction costs were paid by the developer.

CC #: 1432

File #: 0400-04-09-01

CONTACT: Andrew Druck 916-223-7577 adruck@roseville.ca.us

7.10. Cresthaven Tennis Court Renovation Project - Notice of Completion

Memo from Park Development Project Manager Heather Buck and Parks, Recreation & Libraries Director Jill Geller recommending the City Council ADOPT RESOLUTION NO. 21-184 ACCEPTING THE PUBLIC WORK KNOWN AS THE CRESTHAVEN TENNIS COURT RENOVATION PROJECT, APPROVING THE “NOTICE OF COMPLETION”, AND AUTHORIZING THE PARKS, RECREATION AND LIBRARIES DIRECTOR TO EXECUTE SAID NOTICE ON BEHALF OF THE CITY OF ROSEVILLE. The Parks, Recreation & Libraries Department has made a final inspection of the Cresthaven Tennis Court Renovation project and has found that all contract work has been completed in accordance with the improvement plans and specifications. The project is now ready for acceptance. The project included removal and replacement of the existing tennis court surfacing, new striping for one tennis court and two pickleball courts, and new seating. In accordance with City specifications, the contractor shall guarantee the installation of these improvements for a period of twelve (12) months from the date of this Notice of Completion. Funding for the park improvements was provided through the Parks, Recreation & Libraries Capital Projects Fund. Maintenance of the existing neighborhood park is funded by the General Fund and will remain unchanged.

CC #: 1430

File #: 0704-01

CONTACT: Heather Buck 916-774-5254 hcbuck@roseville.ca.us

7.11. Roseville Aquatics Complex - Concession Agreement

Memo from Parks, Recreation & Libraries Superintendent Jeff Nereson and Parks, Recreation & Libraries Director Jill Geller recommending the City Council adopt RESOLUTION NO. 21-189 APPROVING AN AGREEMENT GRANTING AN EXCLUSIVE REVOCABLE LICENSE TO OPERATE A CONCESSION STAND AT THE ROSEVILLE AQUATICS COMPLEX, BY AND BETWEEN THE CITY OF ROSEVILLE AND DAVE'S DAWGS, LTD LLC, AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE. The City will receive 15% of all net sales, reducing General Fund support needed for the Aquatics Complex. Net sales shall be defined as gross sales, less the cost of goods sold and payroll expense. In addition, staff requests Council authorize the City Manager or his designee to approve two (2) additional one (1) year renewals without further Council approval, potentially extending this contract through September of 2024. There is no impact to the City's General Fund associated with this agreement as the revenue is already included in the budget.

CC #: 1439

File #: 0707

CONTACT: Jeff Nereson 916-774-5974 jnereson@roseville.ca.us

7.12. Sun City - Phase I Resurfacing Project - Road Maintenance and Rehabilitation Account Project Identification

Memo from Assistant Engineer Jesse Khatkar and Public Works Director Jason Shykowski recommending the City Council adopt RESOLUTION NO. 21-197 ADOPTING THE SUN CITY PHASE I - RESURFACING PROJECT FUNDED BY SENATE BILL 1: THE ROAD REPAIR AND ACCOUNTABILITY ACT OF 2017. Local agencies are required to list all proposed projects scheduled to receive Senate Bill 1 (SB 1) funding by resolution prior to receiving an apportionment of Road Maintenance and Rehabilitation Account (RMRA) funds in a fiscal year. This item identifies the City's 2021 Residential Resurfacing Project for use of the 2021-2022 funding allotment. The project will repair damaged asphalt and apply a maintenance surface treatments to a portion of the Sun City neighborhood. The construction estimate for the first phase is $4.42 million and is funded by $2.73 million from the RMRA Fund (SB 1), with the remaining costs covered by Highway Users Tax and Roadway funds. No General Fund resources will be used on this project.

CC #: 1451

File #: 0900-04-01

CONTACT: Jesse Khatkar 916-774-5434 jskhatkar@roseville.ca.us

7.13. Northern California Power Agency - Support Services Program Agreement

Memo from Electric Resource Analyst Brian Schinstock and Electric Utility Director

Michelle Bertolino recommending the City Council adopt RESOLUTION NO. 21-194 APPROVING A SUPPORT SERVICES PROGRAM AGREEMENT, BY AND BETWEEN THE CITY OF ROSEVILLE AND NORTHERN CALIFORNIA POWER AGENCY, AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE. The Support Services Program Agreement allows Roseville to utilize various support services available through Northern California Power Agency. This item request is increasing the limit from $50,000 to $74,999 to be consistent with the new City Ordinance. There is no fiscal impact associated with the increased limit as it is only an enabling agreement.

CC #: 1447

File #: 0800-03

CONTACT: Brian Schinstock 916-746-1658 bschinstock@roseville.ca.us

7.14. Network Integration Transmission Service - Service Agreement Amendment

Memo from Electric Resource Analyst Brian Schinstock and Electric Utility Director Michelle Bertolino recommending the City Council adopt RESOLUTION NO. 21-188 APPROVING AMENDMENT 1 TO THE SERVICE AGREEMENT FOR NETWORK INTEGRATION TRANSMISSION SERVICE, BY AND BETWEEN THE CITY OF ROSEVILLE AND THE UNITED STATES DEPARTMENT OF ENERGY, WESTERN AREA POWER ADMINISTRATION, SIERRA NEVADA REGION, AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE. This item requests approval of an amendment to the Network Integration Transmission Service with Western Area Power Administration which allows Roseville to import electricity into Roseville's service territory. This amendment will conform Roseville's network resources listed in the contract to their current capacity. There is no fiscal impact associated with the Amendment as it only updates the capacity of the Roseville Energy Park.

CC #: 1435

File #: 0800-03

CONTACT: Brian Schinstock 916-746-1658 bschinstock@roseville.ca.us

7.15. Pleasant Grove Wastewater Treatment Plant Energy Recovery Project - Pacific Gas & Electric Agreement

Memo from Senior Engineer Tracie Mueller and Environmental Utilities Director Richard Plecker recommending the City Council adopt RESOLUTION NO. 21-195 APPROVING A PACIFIC GAS & ELECTRIC AGREEMENT FOR TRANSPORTATION OF NATURAL GAS FOR COMPRESSION AS A MOTOR-VEHICLE FUEL, AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSVILLE. Natural gas from Pacific Gas & Electric (PG&E) is needed to supplement the digester gas flow from the Pleasant Grove Wastewater Treatment Plant Expansion Project to meet vehicle fuel demands at the high-pressure compressors. The cost for the PG&E gas service supplied under this agreement will be funded by the Waste Services Operations Fund.

CC #: 1448

File #: 0800-02

CONTACT: Tracie Mueller 916-774-5688 trmueller@roseville.ca.us

7.16. Downtown Roseville Property and Business Improvement District - 2020 Annual Report and 2021 Budget

Memo from Economic Development Manager Wayne Wiley and Economic Development Director Laura Matteoli recommending the City Council adopt RESOLUTION NO. 21-193 APPROVING THE 2020 DOWNTOWN ROSEVILLE PROPERTY AND BUSINESS IMPROVEMENT DISTRICT ANNUAL REPORT AND 2021 BUDGET. Staff requests Council receive an update regarding the Downtown Property and Business Improvement District's Annual Report for 2020 including current activities and future operations and adopt a resolution to approve the annual report and the 2021 budget for the Downtown Roseville Partnership.

CC #: 1445

File #: 0206-10-01

CONTACT: Wayne Wiley 916 774-5283 wwiley@roseville.ca.us

7.17. City of Roseville Financial Policies for Fiscal Year 2021-22

Memo from Assistant City Manager/Chief Financial Officer Dennis Kauffman recommending the City Council adopt RESOLUTION NO. 21-187 ADOPTING THE CITY OF ROSEVILLE FINANCIAL POLICIES, EFFECTIVE JULY 1, 2021. The financial policies recommended for adoption include the Investment Policy, the Debt Management Policy, the Swap Policy, the Budget Development Policy, the General Fund Emergency Reserve Policy, the Federal Stimulus Reserve Fund Policy, the Internal Service Funds - Operating and Replacement Reserves Policy, the Capital Improvement Program Rehabilitation Funding Policy, the Other Post-Employment Benefits Funding Policy, the Workers' Compensation and General Liability Funding Policy, and the Requests for Proposals Policy. The Internal Service Funds - Operating and Replacement Reserves Policy is a new policy to formalize existing operating reserve practices and document long-term replacement reserve funding processes. Approval of the policies has no fiscal impact. However, implementation of the policies is expected to improve the fiscal position and financial health of the City. The Fiscal Year 2021-22 Proposed Budget is being developed based on these recommended financial policies.

CC #: 1433

File #: 0200

CONTACT: Dennis Kauffman 916-774-5313 dkauffman@roseville.ca.us

Ordinances (for introduction and adoption - appropriation/urgency measures)

7.18. South Placer Transit Project - Low Carbon Transportation Operations Program Allocation Authorization and Budget Adjustment

Memo from Transportation Analyst Ed Scofield and Public Works Director Jason

Shykowski recommending the City Council adopt RESOLUTION NO. 21-183 AUTHORIZING THE CITY MANAGER OR HIS DESIGNEE TO EXECUTE THE CERTIFICATIONS AND ASSURANCES AND AUTHORIZED AGENT FORMS FOR THE LOW CARBON TRANSIT OPERATIONS PROGRAM FOR THE REGIONAL SOUTH PLACER TRANSIT PROJECT; and ADOPT ORDINANCE NO. 6356 OF THE COUNCIL OF THE CITY OF ROSEVILLE AUTHORIZING CERTAIN AMENDMENTS TO THE FISCAL YEAR 2020-21 BUDGET AND DECLARING THIS ORDINANCE TO BE IMMEDIATELY EFFECTIVE AS AN APPROPRIATION MEASURE. Staff is requesting Council receive the FY2020-21 Low Carbon Transportation Operations Program (LCTOP) grant funds, receive FY2019-20 LCTOP grant funds from Placer County Transportation Planning Agency, and approve a budget adjustment for the South Placer Transit Project. The Transit Fund balance will be reduced by $80,000 for staff costs. LCTOP allocations totaling $961,799 will be used toward operation of the South Placer Transit Project. These actions have no fiscal impact to the City's General Fund.

CC #: 1429

File #: 0721 & 0214 & 0201-01

CONTACT: Ed Scofield 916-869-9109 ecscofield@roseville.ca.us

7.19. Washington Boulevard/Andora Bridge Widening Phase 1 (Washington Boulevard Bikeway and Pedestrian Pathways Project) - Award of Contract and Budget Adjustment

Memo from Assistant Engineer Beth Taylor and Public Works Director Jason Shykowski recommending the City Council adopt RESOLUTION NO. 21-190 APPROVING AN AGREEMENT, BY AND BETWEEN A. TEICHERT & SON, INC. DBA TEICHERT CONSTRUCTION AND THE CITY OF ROSEVILLE, AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE; and adopt ORDINANCE NO. 6357 OF THE COUNCIL OF THE CITY OF ROSEVILLE AUTHORIZING CERTAIN AMENDMENTS TO THE FISCAL YEAR 2020-21 BUDGET AND DECLARING THIS ORDINANCE TO BE IMMEDIATELY EFFECTIVE AS AN APPROPRIATION MEASURE. Staff recommends Council award the Washington Boulevard/Andora Bridge Widening Phase 1 (Washington Boulevard Bikeway and Pedestrian Pathways Project) to the lowest responsive bidder, A. Teichert & Son, Inc. dba Teichert Construction, in the amount of $4,399,428 with authorization for staff to exceed the award amount by 10% or $439,943 as a construction contingency. The construction scope of this project consists of clearing and grubbing, excavation, pedestrian and bicycle facilities construction and paving, street lighting, new and modification of traffic signals, grading, drainage, utilities, widening, and striping. A budget adjustment is necessary in the amount of $6,416,119 which will cover the construction, construction contingency, permit fees, staff time, and construction management. The project will be funded by an Active Transportation Program grant; a Congestion Mitigation Air Quality grant; and Local Transportation Fund, Electric Fund - Traffic Signal Maintenance, and Traffic Mitigation Fund resources. No General Fund resources are allocated for this project.

CC #: 1442

File #: 0900-04-02 & 0201-01

CONTACT: Beth Taylor 916-746-1300 bftaylor@roseville.ca.us

7.20. Maidu Soccer Complex Turf Conversion Project - Budget Adjustment

Memo from Parks, Recreation & Libraries Superintendent Kristi LaRoche and Parks, Recreation & Libraries Director Jill Geller recommending the City Council adopt ORDINANCE NO. 6355 OF THE COUNCIL OF THE CITY OF ROSEVILLE AUTHORIZING CERTAIN AMENDMENTS TO THE FISCAL YEAR 2020-21 BUDGET AND DECLARING THIS ORDINANCE TO BE IMMEDIATELY EFFECTIVE AS AN APPROPRIATION MEASURE. Staff requests approval of a budget adjustment for the completed Maidu Soccer Complex turf conversion project in the amount of $100,625 from the Youth Sports Coalition Fund and reducing project funding from anticipated revenue in the Parks, Recreation & Libraries Capital Project Fund by $100,625. This request has no impact on the overall project budget, or on the General Fund.

CC #: 1427

File #: 0900-07 & 0201-01

CONTACT: Kristi LaRoche 916-774-5962 klaroche@roseville.ca.us

7.21. International Brotherhood of Electrical Workers, Local 1245 - Implementation of Labor Market Salary Adjustments

Memo from Human Resources Manager Linda Hampton and Human Resources Director Stacey Peterson recommending the City Council adopt ORDINANCE NO. 6359 OF THE COUNCIL OF THE CITY OF ROSEVILLE AMENDING ORDINANCE NO. 6250, THE SALARY ORDINANCE FOR ELECTRIC PERSONNEL REPRESENTED BY THE INTERNATIONAL BROTHERHOOD OF ELECTRICAL WORKERS, AFL-CIO, LOCAL NO. 1245, IBEW-A AND IBEW-B, AS AMENDED BY APPENDIX “D” TO BE EFFECTIVE MAY 8, 2021, AS AN URGENCY MEASURE; and adopt ORDINANCE NO. 6360 OF THE COUNCIL OF THE CITY OF ROSEVILLE AUTHORIZING CERTAIN AMENDMENTS TO THE FISCAL YEAR 2020-21 BUDGET AND DECLARING THIS ORDINANCE TO BE IMMEDIATELY EFFECTIVE AS AN APPROPRIATION MEASURE. As part of the City Council approved International Brotherhood of Electrical Workers, Local 1245 Memorandum of Understanding, effective April 27, 2019, through April 30, 2022, the City agreed to conduct a labor market survey and adjust the job classes salary ranges that are behind in the labor market starting the first pay period of May 2021. Staff is recommending that Council approve new IBEW A and B salary schedules to reflect the labor market adjustments. The estimated cost of the recommended labor market adjustments totals is $110,622 for the remainder of FY2020-21. Staff recommends that the City Council consider a budget adjustment of $97,347 to fund the increases in the Electric Fund. The Waste Operations and Wastewater Operations Funds have adequate resources to absorb the cost for the remainder of the fiscal year. The ongoing cost of $719,045 will be incorporated into the FY2021-22 budget.

CC #: 1446

File #: 0600-01 & 0202-01

CONTACT: Linda Hampton 916-774-5215 lhampton@roseville.ca.us

Ordinances (for second reading and adoption)

7.22. Second Reading - Accessory Dwelling Unit Ordinance and Fee Policy Update

ORDINANCE NO. 6361 OF THE COUNCIL OF THE CITY OF ROSEVILLE AMENDING ZONING ORDINANCE CHAPTER 19.60 OF TITLE 19 OF THE ROSEVILLE MUNICIPAL CODE REGARDING ACCESSORY DWELLING UNITS, for seconding reading and adoption.

CC #: 1455

File #: 0800-06 & 0400-02

CONTACT: Sean Morales 916-774-5282 smorales@roseville.ca.us

7.23. Second Reading - Density Bonus Ordinance Update

ORDINANCE NO. 6362 OF THE COUNCIL OF THE CITY OF ROSEVILLE AMENDING CHAPTER 19.28 OF TITLE 19 OF THE ROSEVILLE MUNICIPAL CODE REGARDING RESIDENTIAL DENSITY BONUS, second reading and adoption.

CC #: 1457

File #: 0709-03

CONTACT: Lauren Hocker 916-774-5272 lhocker@roseville.ca.us

7.24. Second Reading - Objective Design Standards

ORDINANCE NO. 6363 OF THE COUNCIL OF THE CITY OF ROSEVILLE AMENDING SECTION 19.74.010 OF CHAPTER 19.74 AND SECTION 19.95.030 OF CHAPTER 19.95 OF TITLE 19 OF THE ROSEVILLE MUNICIPAL CODE REGARDING PERMIT AND VARIANCE REQUIREMENTS AND ZONING DEFINITIONS, for second reading and adoption.

CC #: 1456

File #: 0800-06

CONTACT: Gina McColl 916-774-5452 gmccoll@roseville.ca.us

Ceremonial Documents

7.25. Resolution - Teresa Hedges

Commend Teresa Hedges for her 23 years of outstanding service and dedication to the City of Roseville, congratulate her on her many accomplishments, and extend wishes for a long, healthy, and enjoyable retirement.

CC #: 1437

File #: 0102-10

CONTACT: Blair Hutchison 916-774-5266 bmhutchison@roseville.ca.us

7.26. Resolution - Vicki Sisneroz

Commend Vicki Sisneroz for her 20 years of outstanding service and dedication to the City of Roseville, congratulate her on her many accomplishments, and extend wishes for a long, healthy, and enjoyable retirement.

CC #: 1438

File #: 0102-10

CONTACT: Blair Hutchison 916-774-5266 bmhutchison@roseville.ca.us

END OF CONSENT CALENDAR

8. SPECIAL REQUESTS/REPORTS/PRESENTATION

8.1. Status Report on Space Planning Efforts and Future Real Estate Needs for Expanded Operations

Memo from Refuse and Stormwater Manager Devin Whittington and Environmental Utilities Director Richard Plecker recommending the City Council receive a report requesting guidance and direction related to acquiring property necessary for operational expansion over the next 30 years. The Environmental Utilities Department has $14,858,274.23 in its Land Acquisition Capital Improvement Project for the acquisition of property and site planning.

CC #: 1440

File #: 0800-02

CONTACT: Devin Whittington 916-774-5783 dwhittington@roseville.ca.us

Refuse and Stormwater Manager Devin Whittington made the presentation to the City Council.

No public comment received.

Mayor Krista Bernasconi recessed the meeting at 8:00 p.m.

Mayor Krista Bernasconi reconvened the meeting at 8:06 p.m.

Motion by Pauline Roccucci, seconded by Tracy Mendonsa, Authorize staff to locate a site in the City limits of Roseville that provides a collective of approximately thirty acres that will allow room for future growth of the City's solid waste, water, and technical services division to be co-located at one site with the property being compatible with commercial/industrial uses of nearby properties, and to seek a location close to the future centroid of the city service area as the City continues to develop the north and westerly portions of vacant land. The Motion Passed.

Roll call vote: Ayes: Alvord, Bernasconi, Houdesheldt, Mendonsa, Roccucci

8.2. Environmental Utilities Department - Budget Update

Memo from Environmental Utilities Business Administrator Janet Vargas and Environmental Utilities Director Richard Plecker recommending the City Council receive a budget update from the Environmental Utilities Department. No fiscal impact associated with this report.

CC #: 1454

File #: 0800-02

CONTACT: Janet Vargas 916-774-5557 jvargas@roseville.ca.us

Environmental Utilities Director Rich Plecker made the presentation to the City Council.

No public comment received.

For information only. No action required.

8.3. Roseville Electric Utility - Budget Update

Memo from Electric Utility Finance Administrator Eric Campbell and Electric Utility Director Michelle Bertolino recommending the City Council receive an update from the Roseville Electric Utility Department on their budget development. This is an informational presentation that has no fiscal impact.

CC #: 1428

File #: 0800-03

CONTACT: Eric Campbell 916-774-5626 ecampbell@roseville.ca.us

Electric Utility Director Michelle Bertolino made the presentation to the City Council.

No public comment received.

For information only. No action required.

9. PUBLIC HEARING

9.1. Community Development Block Grant - 2021 Annual Action Plan and Substantial Amendment to 2020-2024 Consolidated Plan

Memo from Housing Analyst Kristine Faelz and Economic Development Director Laura Matteoli recommending the City Council adopt RESOLUTION NO. 21-193 APPROVING THE 2021 ANNUAL ACTION PLAN, APPROVING THE PROPOSED AMENDMENT TO THE 2020-2024 CONSOLIDATED PLAN, AND AUTHORIZING THE CITY MANAGER TO EXECUTE NECESSARY DOCUMENTS AND CERTIFICATIONS ON BEHALF OF THE CITY OF ROSEVILLE. This item requests approval of the City's FY2021-22 Annual Action Plan for the federal Community Development Block Grant Program and approval of the Substantial Amendment to the 2020-2024 Consolidated Plan, and

authorization to submit the Annual Action Plan to the federal Department of Housing and Urban Development. This item does not result in any impact to the City's General Fund.

CC #: 1444

File #: 0113-02

CONTACT: Kristine Faelz 916-774-5451 kpfaelz@roseville.ca.us

Mayor Krista Bernasconi opened the public hearing.

Housing Manager Trisha Isom made the presentation to the City Council.

No public comment received.

Mayor Krista Bernasconi closed the public hearing.

Motion by Scott Alvord, seconded by Pauline Roccucci, to adopt RESOLUTION NO. 21-193 APPROVING THE 2021 ANNUAL ACTION PLAN, APPROVING THE PROPOSED AMENDMENT TO THE 2020-2024 CONSOLIDATED PLAN, AND AUTHORIZING THE CITY MANAGER TO EXECUTE NECESSARY DOCUMENTS AND CERTIFICATIONS ON BEHALF OF THE CITY OF ROSEVILLE. The Motion Passed.

Roll call vote: Ayes: Alvord, Bernasconi, Houdesheldt, Mendonsa, Roccucci

9.2. Proposed Water, Wastewater, and Waste Services Utility Rate Adjustments and Municipal Code Revisions for Fiscal Year 2021-22 and Fiscal Year 2022-23

Memo from Environmental Utilities Business Administrator Janet Vargas and Environmental Utilities Director Richard Plecker recommending the City Council conduct a public hearing to receive public comment regarding proposed rate adjustments effective July 1, 2021, and July 1, 2022, for water, wastewater, and waste services utility rates and associated amendments to the Roseville Municipal Code; and introduce for first reading ORDINANCE OF THE COUNCIL OF THE CITY OF ROSEVILLE AMENDING SECTION 9.12.100 OF CHAPTER 9.12 OF TITLE 9 REGARDING GARBAGE, AMENDING SECTIONS 14.08.090 AND 14.08.100 OF CHAPTER 14.08, AMENDING SECTIONS 14.16.200, 14.16.201 AND 14.16.220 OF CHAPTER 14.16, AND AMENDING SECTION 14.17.080 OF CHAPTER 14.17 OF TITLE 14 OF THE ROSEVILLE MUNICIPAL CODE REGARDING PUBLIC UTILITY FEES, CHARGES AND RATES. The proposed rate adjustments would result in increased revenue necessary to maintain current levels of service for Environmental Utilities.

CC #: 1449

File #: 0800-02

CONTACT: Janet Vargas 916-774-5557 jvargas@roseville.ca.us
Nancy Rothlisberger 916-774-5564 nrothlisberger@roseville.ca.us

Mayor Krista Bernasconi opened the public hearing.

Environmental Utilities Director Rich Plecker introduced Environmental Utilities Business Administrator Janet Vargas.

Environmental Utilities Business Administrator Janet Vargas made the presentation to the City Council.

Environmental Utilities Director Richard Plecker continued the presentation to the City Council.

Paul Griffin - Inquired if WIFIA funds could help mitigate the need for some water reliability rate increases and in reference to allowing time to plan to upgrade current water meters and to use WIFIA funds for maintenance and rehabilitation projects in town, and also inquired if displaced organic waste could be used for park and recreation areas.

Herman Williams - Spoke on past rate increases, unrestricted cash income, and future capital outlay projects.

Environmental Utilities Director Rich Plecker provided clarification.

Mayor Krista Bernasconi closed the public hearing.

Motion by Bruce Houdesheldt, seconded by Pauline Roccucci, to introduce for first reading ORDINANCE OF THE COUNCIL OF THE CITY OF ROSEVILLE AMENDING SECTION 9.12.100 OF CHAPTER 9.12 OF TITLE 9 REGARDING GARBAGE, AMENDING SECTIONS 14.08.090 AND 14.08.100 OF CHAPTER 14.08, AMENDING SECTIONS 14.16.200, 14.16.201 AND 14.16.220 OF CHAPTER 14.16, AND AMENDING SECTION 14.17.080 OF CHAPTER 14.17 OF TITLE 14 OF THE ROSEVILLE MUNICIPAL CODE REGARDING PUBLIC UTILITY FEES, CHARGES AND RATES, as amended. The Motion Passed.

Roll call vote: Ayes: Alvord, Bernasconi, Houdesheldt, Mendonsa, Roccucci

10. REPORTS / PUBLIC COMMENTS

Former Mayor June Wanish - Mayor Krista Bernasconi, Councilmember Scott Alvord, Councilmember Tracy Mendonsa, and Councilmember Pauline Roccucci spoke on the passing of June Wanish and expressed condolences to the family.

Flag Policy - Councilmember Scott Alvord requested Council consensus to direct staff to develop a City flag policy. Consensus received.

International Firefighters Day - Vice Mayor Bruce Houdesheldt announced today was International Firefighters Day and National Peace Officers Day is May 15th.

Gift Cards for Grocery Store Workers - Vice Mayor Bruce Houdesheldt spoke

on delivering gift cards to Whole Foods employees.

Homeless Camps - Councilmember Tracy Mendonsa expressed excitement that most of not all, homeless camps in the City have been cleaned up at this time.

Water Related Meetings - Councilmember Pauline Roccucci spoke on the affects of the drought on various stakeholders.

Regional Water Association Meeting - Councilmember Pauline Roccucci announced upcoming meeting on May 6.

City Council Workshop - Mayor Krista Bernasconi expressed appreciation for the City Council's goal setting and strategy workshop.

Lincoln Estates Park Clean-Up - Mayor Krista Bernasconi announced event to be held May 16 at 9:00 a.m.

Mayor's Cup Event - Mayor Krista Bernasconi announced her attendance at the sold out event to be held May 7.

11. ADJOURNMENT

City Council consensus to adjourn the meeting at 9:51 p.m. in memory of Roseville's first female mayor, June Wanish.

COUNCIL COMMUNICATION

CC #: 1525
File #: 0203-13-1

Title: Asphalt Products (RFQ 10-3301) - Purchase Order
Contact: Sue Jessup 916-746-1702 sjessup@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 7.2.

RECOMMENDATION TO COUNCIL

Staff recommends the City Council adopt a resolution to approve a purchase order with CalMat Co. dba Vulcan Materials as the lowest responsive and responsible bidder for the purchase of asphalt products in response to RFQ 10-3301.

The bid allowed for four optional renewal years at one-year intervals. Staff requests authorization to continue utilizing the remaining optional renewal years without further Council approvals until the contract expires or until City staff determines that continuing with the same vendor is not in the City's best interest.

BACKGROUND

Various City departments, including the Public Works Department's Street Maintenance Division and the Environmental Utilities (EU) Department's Water and Wastewater Divisions, have ongoing requirements for asphalt products. The Street Maintenance Division uses asphalt materials for street repair work, to include: routine maintenance, emergency pothole repairs, and preparing streets for resurfacing projects. The EU Water Division uses asphalt products for street patching due to utility maintenance and water service line repairs, and the Wastewater Division uses asphalt products for trench patching repairs.

Bidders were asked to quote “will call” pricing for the asphalt products. The purchases will be made on an as-needed basis throughout the City’s fiscal year. The difference between the estimated annual spend of $420,000 and the bid total of $821,300 is because the estimated annual usage in the bid specification reflects the potential for higher than usual requirements if needed.

After evaluating all of the bid submittals, Vulcan Company was deemed the lowest responsive bidder because the bid award is based on the lump sum total of all asphalt products, and none of the other bidders were able to supply all of the specified asphalt products. Therefore, they were deemed non-responsive.

A formal bid was issued with the following vendor responses:

Vendor	**Total**
Vulcan Materials Company Roseville, CA	**$821,300.00 + $5 per load environmental fee**
Vulcan Materials Company Grass Valley, CA	$903,500.00 + $5 per load environmental fee
Granite Construction Co. Sacramento, CA	$658,250.00
Syar Industries, Inc. Napa, CA	$23,266.25

FISCAL IMPACT

The estimated total annual spend is $420,000 for FY2021-22 contingent upon Council approval of budgets. Funding is included in the proposed FY2021-22 budget for the Street Maintenance Division in the General Fund, Gas Tax Fund, and Highway Users Tax Fund. Funding for Environmental Utilities' Water Division is included in the Water Rehabilitation Fund budget and funding for the Wastewater Division is included in the Wastewater Rehabilitation Fund budget. Spending for future renewals will be contingent upon Council approval of budgets. Estimated spending for the optional renewal years is as follows: FY2022-23, $444,000; FY2023-24 $468,400; FY2024-25 $493,240; FY2025-26 $518,564.

ENVIRONMENTAL REVIEW

The California Environmental Quality Act (CEQA) does not apply to activities that will not result in a direct or reasonably foreseeable indirect physical change in the environment, or is otherwise not considered a project as defined by CEQA Statute §21065 and CEQA State Guidelines §15060(c)(3) and §15378. Approval for the purchase of asphalt meets the above criteria and is not subject to CEQA. No additional environmental review is required.

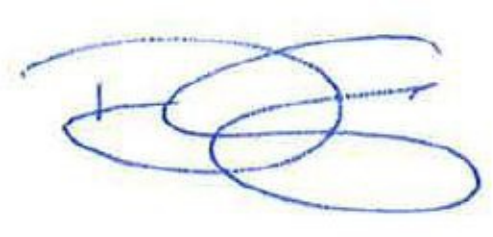
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Goal F - Invest in well-planned infrastructure and growth

Respectfully Submitted,

Sue Jessup, Buyer

Dennis Kauffman, Assistant City Manager/Chief Financial Officer



Dominick Casey, City Manager

ATTACHMENTS:

Description

Resolution 21-260

RESOLUTION NO. 21-260

APPROVING A PURCHASE ORDER FOR ASPHALT PRODUCTS

WHEREAS, a purchase order for asphalt products, between the City of Roseville and CalMat Co. dba Vulcan Materials, has been reviewed by the Council; and

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Roseville that said purchase order is hereby approved and the City Manager or his designee is additionally authorized to execute four (4) optional one (1) year renewals of the purchase order, provided that the applicable budget is approved by the City Council, or until City staff determines that continuing with the same vendor is not in the City's best interest.

PASSED AND ADOPTED by the Council of the City of Roseville this____day of _____, 2021, by the following vote on roll call:

AYES COUNCILMEMBERS:

NOES COUNCILMEMBERS:

ABSENT COUNCILMEMBERS:

_____
MAYOR

ATTEST:

_____
City Clerk

COUNCIL COMMUNICATION

CC #: 1541
File #: 0800-02

Title:	Enterprise Asset Management Consulting Services – Sole Source Contract Purchase Agreement
Contact:	Duke Arakaki 916-774-5212 darakaki@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 7.3.

RECOMMENDATION TO COUNCIL

Staff recommends City Council adopt a resolution to approve a contract purchase agreement with Sixty Seven Solutions, Inc. for operational support of the City's Enterprise Asset Management (EAM) system. Staff requests authorization for two additional one-year renewals of the contract purchase agreement without further Council approval contingent upon Council approval of future year budgets, or unless City staff determines that continuing with the same vendor is not in the City's best interest.

BACKGROUND

The City's Enterprise Asset Management (EAM) system provides tracking and maintenance of critical department assets, providing the ability to report on regulatory compliance, work order efficiencies, and cost benefit analysis. The EAM program will complete its final stage of implementation and will transition to an operational support structure. Improvements to Utilities' asset groups will continue, as well as support for critical integrations for the AMI project.

Sixty Seven Solutions has provided specialized expertise in resolving production support issues, improving system performance, and advancing project tasks and goals. Upon approval of this service agreement, Sixty Seven Solutions, Inc., will assist IT and the EAM project team to manage system improvements, including software and integration upgrades, transition to site specific work types, and process efficiencies. Sixty Seven Solutions, Inc., will also assist and train the City to facilitate the support and maintenance of the EAM system for the long term.

FISCAL IMPACT

The contract purchase agreement is not to exceed $250,000 per year for a total not-to-exceed amount of $750,000 over the three-year period. Funding for this project is from Environmental Utilities and Electric funds.

ENVIRONMENTAL REVIEW

The California Environmental Quality Act (CEQA) only applies to projects which have the potential to cause a significant effect on the environment. Where it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment, the activity is not subject to CEQA. (CEQA Guidelines §15061(b)(3)).

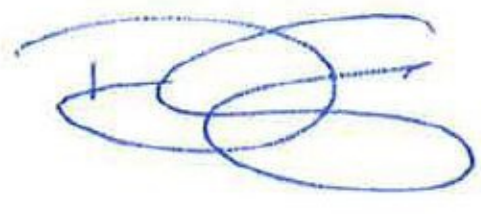
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Goal F - Invest in well-planned infrastructure and growth

Respectfully Submitted,

Duke Arakaki, Data Management Systems Administrator

Richard Plecker, Environmental Utilities Director



_____
Dominick Casey, City Manager

ATTACHMENTS:

Description

Resolution 21-273

signed CPA

Sixty Seven SOW

RESOLUTION NO. 21-273

APPROVING A CONTRACT PURCHASE AGREEMENT, BY AND BETWEEN THE CITY OF ROSEVILLE AND SIXTY SEVEN SOLUTIONS, INC., AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE

WHEREAS, a contract purchase agreement (3001219) for development support of Roseville's Enterprise Asset Management System and integration support services, between the City of Roseville and Sixty Seven Solutions, Inc., has been reviewed by the Council; and

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Roseville that said agreement is approved and the City Manager is authorized to execute it on behalf of the City of Roseville.

BE IT FURTHER RESOLVED that the City Manager or his designee is authorized to execute two (2) additional one (1) year renewals without further City Council approval, provided that the applicable budget is approved by the City Council each year, or until City staff determines that continuing with the same vendor is not in the City's best interest.

PASSED AND ADOPTED by the Council of the City of Roseville this____day of _____, 2021, by the following vote on roll call:

AYES COUNCILMEMBERS:

NOES COUNCILMEMBERS:

ABSENT COUNCILMEMBERS:

_____
MAYOR

ATTEST:

_____
City Clerk

Contract Purchase Agreement 3001219

Supplier Details:

Company	Sixty Seven Solutions Inc
Contact	
Address	6940 Country Court
	Granite Bay, CA 95746

Submit your response to:

Company	City of Roseville
Contact	"Becky" Rebecca Philipp
Address	Purchasing Division
	2075 Hilltop Circle
	Roseville, CA 95747
Phone	(916) 774-5724
Fax	(916) 774-5736
E-mail	BPhilipp@roseville.ca.us

This Contract Purchase Agreement is sent for your review and acceptance. Notify the Buyer via email of any needed changes to the company name, address, and contact information. The Buyer will update the agreement prior to you signing the document.

Return signed copies of the agreement to the Buyer noted on the agreement. Alterations or modifications to the agreement are not allowed. Upon receipt of all necessary documents, the City will sign the agreement and return a fully executed copy to you. Receipt of the signed copy will be your notice to proceed with the work in accordance with the terms and conditions of the agreement. Work must not begin until the contract has been fully executed.

The following guidelines must be followed for the signature block on the agreement:

Sole proprietorship - **By owner**

Partnership - **Any general partner**

Corporation - **Two options:**
(1) A signature from the President and the corporate seal; **OR**
(2) One signature from the Chairman of the Board, President, or any Vice President **AND** one signature from the Secretary, any Assistant Secretary, Chief Financial Officer, or any Treasurer or Assistant Treasurer of the corporation

*General Manager, Office Manager and/or Sales Manager are **not** corporate officer titles. The agreement will be rejected if not signed in accordance with these guidelines.

Insurance requirements:
The City's insurance requirements are referenced on Attachment A of the agreement. By signing the agreement, you are confirming that your company has the minimum insurance limits required.

CITY OF ROSEVILLE CALIFORNIA

Contract Purchase Agreement 3001219

Agreement	3001219
Agreement Date	01-JUN-2021
Revision	0
Agreement Amount	250,000.00 USD

Invoice To
City of Roseville
Accounts Payable
311 Vernon St
ROSEVILLE CA 95678
Phone: (916) 774-5488
Fax: (916) 784-3796
Email: accountspayable@roseville.ca.us

Supplier
Sixty Seven Solutions Inc
6940 Country Court

Granite Bay, CA 95746
Phone: ()
Fax: ()
Email: kevinmwiley@gmail.com

Description of Labor, equipment and/or materials

VENDOR WILL PROVIDE OPERATIONAL SUPPORT, ADMINISTRATION AND IMPLEMENTATION OF THE CITY'S ENTERPRISE ASSET MANAGEMENT SYSTEMS ON AN AS-NEEDED BASIS AS DIRECTED BY THE CITY OF ROSEVILLE ENTERPRISE ASSET MANAGEMENT TEAM IN ACCORDANCE WITH THE ATTACHED SIXTY SEVEN SOLUTIONS, INC. SCOPE OF SERVICES DATED 5/5/21. ALL WORK MUST BE QUOTED AND APPROVED IN ADVANCE BY DUKE ARAKAKI.

START DATE: EXECUTED AGREEMENT
END DATE: 9/30/22

PLEASE CONTACT DUKE ARAKAKI AT (916)774-5212 OR VIA EMAIL AT DARAKAKI@ROSEVILLE.CA.US FOR QUESTIONS REGARDING THIS CONTRACT.

*Total cost listed below is an approximation only. The City does not guarantee whatsoever the actual value of this agreement.

Customer #	Supplier #	Payment Terms	Freight Terms	FOB	Shipping Method
	12942	**Net 30**	**Freight on Board at the destination**	**Destination**	**Best Method**

Start Date	End Date	Confirm To
		"Becky" Rebecca Philipp Phone **1-916-774-5724**

Attention: Total Cost not to exceed the agreement amount without prior approval of the Purchasing office.

Contract Terms and Conditions

1. To the fullest extent allowed by law, Consultant agrees to indemnify, including the cost to defend City, and its officers, agents, employees and volunteers from any and all claims, demands, costs or liability that arise out of, or pertain to, or relate to the negligence, recklessness, or willful misconduct of Consultant and its agents in the performance of services under this contract, but this indemnity does not apply to liability for damages for death or bodily injury to persons, injury to property, or other loss, arising from the sole negligence, willful misconduct or defects in design by City or the agents, servants, or independent contractors who are directly responsible to City, or arising from the active negligence of City. Consultant's responsibility for such defense and indemnity obligations shall survive the termination or completion of this Agreement for the full period of time allowed by law. The defense and indemnity obligations of this Agreement are undertaken in addition to, and shall not in any way be limited by, the insurance obligations contained in this Agreement.

2. Consultant is an independent contractor, and shall not be considered an officer, agent or employee of the City.

3. Without the written consent of the City, this Agreement is not assignable by Consultant either in whole or in part.

4. Time is of the essence of this Agreement.

5. At any time during the term of this Agreement, the City has the right to terminate this Agreement, provided Consultant is given thirty (30) days written notice. City's termination shall be without further liability to City; however, Consultant shall be entitled to all costs reasonably incurred prior to the date of termination. Consultant acknowledges that City may terminate this Agreement should funds not be appropriated by its governing body to continue services under this Agreement.

6. This Agreement may only be amended or modified in writing. It is integrated and contains the complete understanding of the parties.

7. All equipment, supplies and services sold to the City of Roseville shall conform to the general safety orders of the State of California.

8. Unless notified to the contrary, in writing, the City assumes that the Consultant has accepted the work in accordance with the plans and specifications (if any) and agrees to do the work in compliance with this Agreement. Any work product created for City pursuant to this Agreement is deemed owned by City.

9. All prevailing wages and fair employment practices must be adhered to. For prevailing wage contracts over $25,000, copies of certified payroll must be submitted with invoices. Prevailing wage rates may be obtained from the State Department of Industrial Relations and/or the following website address:
http://www.dir.ca.gov/dlsr/DPreWageDetermination.htm
10. Consultant agrees to the below insurance requirements:

    a. Unless otherwise specified, the Consultant shall maintain the policies of insurance outlined in Attachment A, incorporated herein by this reference, in full force and effect during the term of this Agreement. The City of Roseville retains sole discretion in determining the types and proper levels of insurance coverage.

    b. Form. Consultant shall submit a certificate evidencing such coverage for the period covered by this Agreement in a form satisfactory to Risk Management and the City

Attorney, prior to undertaking any work hereunder. Any insurance written on a claims made basis is subject to the approval of Risk Management and the City Attorney.

c. Additional Insureds. Consultant shall also provide a separate endorsement or section of the policy showing City, its officers, agents, employees, and volunteers as additional insureds for each type of coverage, except for Workers' Compensation and Professional Liability. Such insurance shall specifically cover the contractual liability of Consultant. The additional insured coverage under the Consultant's policy shall be primary and noncontributory, as evidenced by a separate endorsement or section of the policy, and shall not seek contribution from City's insurance or self-insurance. In addition, the additional insured coverage shall be at least as broad as the Insurance Services Office (ISO) CG 20 01 Endorsement. Any available insurance proceeds in excess of the specified minimum insurance coverage requirements and limits shall be available to the additional insureds. Furthermore, the requirements for coverage and limits shall be:

(1) the minimum coverage and limits specified in this Agreement; or

(2) the full coverage and maximum limits of any insurance proceeds available to the named insureds, whichever is greater

d. Cancellation/Modification. Consultant shall provide ten (10) days written notice to City prior to cancellation or modification of any insurance required by this Agreement.

e. Umbrella/Excess Insurance. The limits of insurance required in this Agreement may be satisfied by a combination of primary and excess insurance. Any excess insurance shall contain or be endorsed to contain a provision that such coverage shall also apply on a primary and noncontributory basis for the benefit of City (if agreed to in a written contract) before City's own insurance shall be called upon to protect it as a named insured.

f. Subconsultants. Consultant agrees to include in its contracts with all subconsultants the same requirements and provisions of this Agreement, including the indemnity and insurance requirements, to the extent they apply to the scope of the subconsultants work. Furthermore, Consultant shall require its subconsultants to agree to be bound to Consultant and City in the same manner and to the same extent as Consultant is bound to City under this Agreement. Additionally, Consultant shall obligate its subconsultants to comply with these same provisions with respect to any tertiary subconsultant, regardless of tier. A copy of City's indemnity and insurance provisions will be furnished to the subconsultant or tertiary subconsultant upon request.

g. Self-Insured Retentions. All self-insured retentions (SIR) must be disclosed to Risk Management for approval and shall not reduce the limits of liability. Policies containing any SIR provision shall provide or be endorsed to provide that the SIR may be satisfied by either the named insured or City. City reserves the right to obtain a full certified copy of any insurance policy and endorsements. The failure to exercise this right shall not constitute a waiver of such right.

h. Waiver of Subrogation. Consultant hereby agrees to waive subrogation which any insurer of Consultant may acquire from Consultant by virtue of the payment of any loss under a Workers Compensation, Commercial General Liability or Automobile Liability policy. All Workers Compensation, Commercial General Liability and Automobile Liability policies shall be endorsed with a waiver of subrogation in favor of City, its officers, agents, employees and volunteers for all worked performed by Consultant, its employees, agents and sub consultants.

i. Liability/Remedies. Insurance coverage in the minimum amounts set forth herein shall not be construed to relieve Consultant of liability in excess of such coverage, nor shall it preclude City from taking such other actions as are available to it under any other

provisions of this Agreement or law.

11. Consultant shall comply with all federal, state, local laws, ordinances and policies as may be applicable to the performance of services under this Agreement. Failure to comply with local ordinances may result in monetary fines and cancellation of this Agreement.

12. In the event that the terms of any attachment or exhibit conflict with any terms of this Agreement, the terms of this Agreement shall control.

13. This Agreement may be executed in one or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. In the event that any signature is delivered by facsimile transmission or by e-mail delivery of a ".pdf" format data file, such signature shall create a valid and binding obligation of the party executing (or on whose behalf such signature is executed) with the same force and effect as if such facsimile or ".pdf" signature page were an original thereof.

14. If either party commences any legal action against the other party arising out of this Agreement or the performance thereof, the prevailing party in such action shall be entitled to recover its reasonable litigation expenses, including but not limited to, court costs, expert witness fees, discovery expenses, and attorneys' fees. Any action arising out of this Agreement shall be brought in Placer County, California, regardless of where else venue may lie. This Agreement shall be governed by and construed in accordance with the laws of the State of California.

15. This Agreement shall be binding upon the heirs, successors, executors, administrators and assigns of the respective parties hereto.

16. If any of the provisions contained in this Agreement are for any reason held invalid or unenforceable, such holding shall not affect the remaining provisions or the validity and enforceability of the Agreement as a whole.

17. For purposes of this Agreement, the terms "Contractor," "Consultant," and "Supplier" are used interchangeably.

18. Consultant agrees that any and all information furnished by City shall be deemed proprietary and confidential. All such information, to the extent previously, presently or subsequently disclosed to Consultant and/or processed and derived by Consultant services is the property of City and such property shall be deemed and treated as "Confidential Information" of City. Consultant acknowledges that such Confidential Information may contain information provided and/or generated by third-parties. Consultant agrees that such Confidential Information shall not be disclosed to any third party without written permission from City, except as required by law. Consultant shall not use the Confidential Information except to perform Consultant's services as directed by City.

19. All facilities, devices, networks and services used to store, deliver, process, backup or purge Confidential Information will employ administrative, physical, technical, and procedural safeguards and best practices at a level sufficient to secure Confidential Information from unauthorized access, destruction, use, modification, or disclosure. Such measures will be no less protective than those used to secure Consultant's own information of a similar type, and in no event less than reasonable in view of the type and nature of the information involved. It is the City's expectation that Consultant, at its own expense, shall perform annual audits for any data centers that house Confidential Information, using an independent third-party audit that meets industry standards applicable to the services under this Agreement, and provide the audit report or certification upon request to City.

20. Consultant will retain Confidential Information until deleted by City or City-authorized third party, or for a time period mutually agreed upon by the parties to this Agreement.

21. Upon termination or expiration of this Agreement, Consultant will ensure that all Confidential Information is securely transferred to City within thirty (30) calendar days. Consultant will ensure that any transfer of Confidential Information is accomplished by methods that are compatible with the relevant City systems, and that City will have access to all Confidential Information during any such transfer. Consultant shall securely dispose of all Confidential Information when requested by City and Consultant will provide written notification to City once all Confidential Information has been securely disposed of.

22. Consultant shall report to City any data compromise or unauthorized access to Confidential Information within twenty-four (24) hours after Consultant discovers such data compromise or unauthorized access. Consultant will take commercially reasonable measures to address any such data compromise or unauthorized access in a timely manner. Except as otherwise required by law, Consultant will not provide notice to end users or other entities of any such data compromise or unauthorized access without written permission from City. Consultant will promptly reimburse City in full for all fees and costs incurred by City in any investigation, remediation or litigation resulting from any such data compromise or unauthorized access, including identity protection and restoration services for each person, who in the City's sole discretion, could be impacted by identity theft.

23. Consultant may not advertise that City is a client, list City as a reference or otherwise use City's name, logos, trademarks, or service marks without prior written permission from City.

24. Consultant acknowledges that services rendered under this agreement (including but not limited to service levels and operational levels) shall be performed in accordance with industry standards.

25. If the project referenced on this agreement is a Public Works project, then the following shall apply: No contractor or subcontractor may work on a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5. During the performance of this agreement, Contractor and its subcontractors shall have a continuing legal obligation to maintain current registration with the Department of Industrial Relations. Contractor is hereby notified that this project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

26. If the project referenced on this agreement is a Public Works project, then the following shall apply: Contractor must submit all claims as defined in and in accordance with the claim resolution process set forth in Section 9204 of the Public Contract Code. Each such claim must be sent to the City by registered mail or certified mail with return receipt requested and must contain reasonable documentation to support the claim. All claims must be received prior to acceptance of the work.

27. Contractor agrees to defend and indemnify City if, despite the parties intent and practice, any venue, agency, or court with competent jurisdiction determines that Contractor and/or any of its agents, officers, employees, volunteers, independent contractors, or subcontractors, are characterized as employee(s) of City.

Contractor and City agree that: (a) Contractor is free from the control and direction of City in connection with the performance of the work; (b) Contractor is providing services directly to City; (c) Contractor has and will maintain at all relevant times a business license; (d) Contractor maintains a business location that is separate from City; (e) Contractor is customarily engaged in an independently established business of the same nature as that involved in the work performed hereunder; (f) Contractor actually contracts with other businesses to provide the same or similar services and maintains a clientele without restrictions from City; (g) Contractor advertises and holds itself out to the public as available to provide the same or similar services; (h) Contractor provides its own tools, vehicles, and equipment to perform the services; (i) Contractor has negotiated its own rates; (j) Contractor

set its own hours and location of work in accomplishing City's on-call needs; and (k) Contractor has the right to control the manner and means of accomplishing the result desired and exercises its own expert independent judgement.

The supplier named hereon by the acceptance of this order agrees to the provisions of this document titled "Contract Purchase Agreement" and all accompanying terms, conditions, and attachments.

Roseville Business License No. _____

Contractor License No. _____

DIR Registration No. _____

Check mark the applicable company type below:


Corporation

_____ Limited Liability Company

_____ Partnership

_____ Sole Proprietor

City reserves the right to withhold any payments to Consultant in the event of noncompliance with insurance requirements or if required by law.
Information Technology T&C, AB5
REV 3/26/2020 JS

ATTACHMENT A
HUMAN RESOURCES/RISK MANAGEMENT DIVISION
INSURANCE REQUIREMENTS
AGREEMENT OVER FORMAL BID LIMIT OR INVOLVING HIGH RISK ACTIVITIES

General - Required Coverage/Documentation

- General Liability: $1 Million per occurrence /$2 Million aggregate
- Automobile Liability: $1 Million combined single limit
- Workers' Compensation: Statutory *Must provide a Waiver of subrogation
- Additional Insured Endorsement (AIE) - General Liability policy: CG 20 38 04 13 or an equivalent, blanket endorsement or section of the policy. Endorsement shall cover the City of Roseville, its officers, agents, employees and volunteers as additional insured.
- Policies must be primary and non-contributory
- A 30 day notice of cancellation must be provided
- List certificate holder as: The City of Roseville - Insurance Compliance, PO Box 100085-R1, Duluth, GA 30096

Additional Liability/Insurance Requirements if required by Agreement (and marked below):

Construction:____
General Liability:
$2 Million/occurrence
$4 Million aggregate

Design Professional:____
General Liability:
$2 Million/occurrence
$4 Million aggregate
Professional Liability:
$2 Million/occurrence

Professional Consultant:____
Professional Liability:
$1 Million/occurrence

IT Services:__X__
Professional Liability:
$1 Million/occurrence
No auto required

Hazardous Materials:____
Pollution Liability:
$1 Million/occurrence

Special Events/Caterers-Vendors:____
No auto required
No workers' comp required

Professional Counseling/ Psychological:____
Professional Liability:
$1 Million/occurrence
No auto required

Pyrotechnics:____
General Liability:
$5 Million/occurrence
$10 Million aggregate
Auto - $2 Million/occurrence

Chemical/Environmental:____
General Liability:
$3 Million/occurrence
$6 Million aggregate
Pollution – $2 Million/Occurrence
Auto - $2 Million/Occurrence

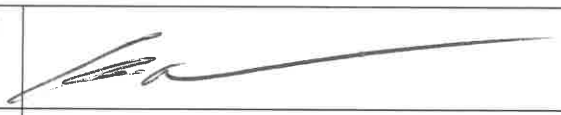
Insurance Submission Process

The City of Roseville Human Resources/Risk Management Department uses a service called EBIX to manage our insurance certificate tracking.

How It Works

- The vendor's contact information is entered into EBIX. EBIX will contact the vendor to request proof of insurance.
- The Vendor can forward the request to their Insurance Agent(s) if necessary.
- Vendor/Insurance Agent submits insurance to EBIX by email to roseville@ebix.com or by fax to (770) 325-5727. After faxing or emailing the certificate, please DO NOT send the certificate by mail to EBIX. Please do not mail, email or fax any certificates to the City of Roseville.
- Once submitted, EBIX reviews the insurance documentation. If there are deficiencies, EBIX will send a follow up letter or email requesting additional information.

Questions Regarding Insurance Submission: Contact EBIX at (951) 652-4239
Questions Regarding Insurance Requirements Contact Risk Management at (916) 774-5202

Supplier	
Signature:	
Print Name:	KEVIN KILEY
Title:	PRESIDENT

Supplier	
Signature:	
Print Name:	KEVIN KILEY
Title:	CEO/SECRETARY

City of Roseville, A Municipal Corporation	
Signature:	
Print Name:	Dominick Casey
Title:	City Manager

SIXTY SEVEN SOLUTIONS
6940 COUNTRY CT, GRANITE BAY, CA 95746
(916) 539-0865

CITY OF ROSEVILLE EAM SUPPORT

May 5, 2021

Scope of Services

Provide operational support, administration and implementations of the city's Enterprise Asset Management systems as directed by the City of Roseville (COR) Enterprise Asset Management Project Management Team (PM Team) for the term of July 1st, 2021 to September 30th, 2022. Systems are defined as all production and non-production hosted and maintained within the city's IT network infrastructure. Specific scope as follows:

1. EAM Support:
    a. Conversion of data from legacy EAM systems to the city's current Maximo EAM system.
    b. Development of interfaces, analytical reports, and alike technology, within the EAM to support the city's business requirements.
    c. Development of customization and configurations within the city's EAM in support of migrating the city's business within the Maximo EAM system.
    d. Provide technical assistance to the PM Team with system migrations, data loading, upgrades and documentation of the city's Maximo EAM.
    e. Evaluate, provide recommendations, and implement IBM Fix Packs, Interim Fixes and upgrades to existing Maximo Add-ons.
    f. Evaluate, provide recommendations, draft documentation and implement changes to improve system performance and align with Maximo system infrastructure best practices.
    g. Evaluate, provide recommendations, draft documentation and implement other Maximo related development efforts as directed by the PM Team.
    h. Development of BIRT reports to support the requirements of the AMI meters in the EAM system. Estimated effort is 40 hours.
    i. Assist in any go-live activities supporting the AMI project and the city's EAM system. Estimated effort is 80 hours.
    j. Provide Maximo production support assistance as needed.

Compensation

Sixty Seven Solutions, Inc. will be compensated at a rate of $120 per labor hour. EAM Support not to exceed 2086 hours or $250,000 in invoiced hours. An invoice of services will submitted by Sixty Seven Solutions for the prior month's services. Payment of services will be due within 30 calendar days of the invoice date.

SIXTY SEVEN SOLUTIONS

6940 COUNTRY CT, GRANITE BAY, CA 95746
(916) 539-0865

CITY OF ROSEVILLE EAM SUPPORT

May 5, 2021

Scope of Services

Provide operational support, administration and implementations of the city's Enterprise Asset Management systems as directed by the City of Roseville (COR) Enterprise Asset Management Project Management Team (PM Team) for the term of July 1st, 2021 to September 30th, 2022. Systems are defined as all production and non-production hosted and maintained within the city's IT network infrastructure. Specific scope as follows:

1. EAM Support:
    a. Conversion of data from legacy EAM systems to the city's current Maximo EAM system.
    b. Development of interfaces, analytical reports, and alike technology, within the EAM to support the city's business requirements.
    c. Development of customization and configurations within the city's EAM in support of migrating the city's business within the Maximo EAM system.
    d. Provide technical assistance to the PM Team with system migrations, data loading, upgrades and documentation of the city's Maximo EAM.
    e. Evaluate, provide recommendations, and implement IBM Fix Packs, Interim Fixes and upgrades to existing Maximo Add-ons.
    f. Evaluate, provide recommendations, draft documentation and implement changes to improve system performance and align with Maximo system infrastructure best practices.
    g. Evaluate, provide recommendations, draft documentation and implement other Maximo related development efforts as directed by the PM Team.
    h. Development of BIRT reports to support the requirements of the AMI meters in the EAM system. Estimated effort is 40 hours.
    i. Assist in any go-live activities supporting the AMI project and the city's EAM system. Estimated effort is 80 hours.
    j. Provide Maximo production support assistance as needed.

Compensation

Sixty Seven Solutions, Inc. will be compensated at a rate of $120 per labor hour. EAM Support not to exceed 2086 hours or $250,000 in invoiced hours. An invoice of services will submitted by Sixty Seven Solutions for the prior month's services. Payment of services will be due within 30 calendar days of the invoice date.

COUNCIL COMMUNICATION

CC #: 1532
File #: 0203-03

Title: Liquid Aluminum Sulfate (BACC 01-2021) - Contract Purchase Agreement
Contact: Becky Philipp 916-774-5724 bphilipp@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 7.4.

RECOMMENDATION TO COUNCIL

Staff recommends Council adopt a resolution to approve a contract and authorize the City Manager to execute it on behalf of the City of Roseville. The bid allowed for three optional renewal years at one-year intervals. Staff requests authorization to continue utilizing the remaining optional renewal years of the bid contract without further Council approvals until the contract expires or until City staff determines that continuing with the same vendor is not in the City's best interest.

BACKGROUND

The City's Water Treatment Plant has an ongoing requirement for liquid aluminum sulfate (liquid alum) which is used as a flocculating agent in the water purification process. This chemical will be purchased as needed throughout the year. In March 2021, the City participated in a regional chemical bid led by the Bay Area Chemical Consortium (BACC), with the East Bay Muni Utility District serving as the coordinating agency. BACC is comprised of water and wastewater agencies in the Northern California area, working together to purchase chemicals by combining bid solicitations. BACC is an informal cooperative that advertises and opens sealed competitive bids and then prepares bid recommendations. Combined bid solicitations offer vendors an opportunity to sell greater quantities of their products. Because more than 50 public agencies are now participating, significant savings for chemical purchases are being passed along to the agencies' water and wastewater customers.

FISCAL IMPACT

The annual cost is $175,000. Funding is included in the Environmental Utilities Department's proposed FY2021-22 budget. Projected spending for the optional renewal years is as follows: FY2022-23, $180,000; FY2023-24, $185,000; FY2024-25, $190,000.

ENVIRONMENTAL REVIEW

The California Environmental Quality Act (CEQA) does not apply to activities that will not result in

a direct or reasonably foreseeable indirect physical change in the environment (CEQA Guidelines §15061(b)(3)). The hauling and delivery of hazardous substances is regulated by the state. Hazardous material transport consistent with applicable safety regulations should not result in a significant environmental effect. Therefore, the proposed Service Agreement does not include the potential for significant environmental effect and is not subject to CEQA.

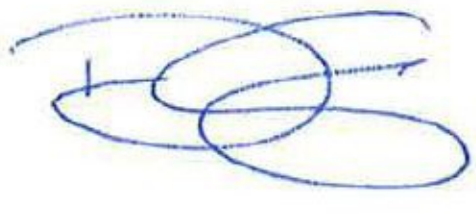
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Goal C - Maintain a safe and healthy community

Respectfully Submitted,

Becky Philipp, Buyer

Dennis Kauffman, Assistant City Manager/Chief Financial Officer



_____

Dominick Casey, City Manager

ATTACHMENTS:

Description

Resolution 21-265

Contract Purchase Agreement

RESOLUTION NO. 21-265

APPROVING A CONTRACT PURCHASE AGREEMENT, BY AND BETWEEN THE CITY OF ROSEVILLE AND THATCHER COMPANY OF CALIFORNIA, INC., AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE

WHEREAS, a contract purchase agreement (3001194) for the supply and delivery of liquid aluminum sulfate for the City's Water Treatment Plant, between the City of Roseville and Thatcher Company of California, Inc., has been reviewed by the Council; and

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Roseville that said agreement is approved and the City Manager is authorized to execute it on behalf of the City of Roseville.

BE IT FURTHER RESOLVED that the City Manager or his designee is authorized to execute three (3) additional one (1) year renewals without further City Council approval, provided that the applicable budget is approved by the City Council each year, or until City staff determines that continuing with the same vendor is not in the City's best interest.

PASSED AND ADOPTED by the Council of the City of Roseville this____day of _____, 2021, by the following vote on roll call:

AYES COUNCILMEMBERS:

NOES COUNCILMEMBERS:

ABSENT COUNCILMEMBERS:

_____
MAYOR

ATTEST:

_____
City Clerk

Contract Purchase Agreement 3001194

Supplier Details:

Company	Thatcher Company of California, Inc.
Contact	Michael Walker
Address	8625 Unsworth Ave
	Sacramento, CA 95828

Submit your response to:

Company	City of Roseville
Contact	"Becky" Rebecca Philipp
Address	Purchasing Division
	2075 Hilltop Circle
	Roseville, CA 95747
Phone	(916) 774-5724
Fax	(916) 774-5736
E-mail	BPhilipp@roseville.ca.us

This Contract Purchase Agreement is sent for your review and acceptance. Notify the Buyer via email of any needed changes to the company name, address, and contact information. The Buyer will update the agreement prior to you signing the document.

Return signed copies of the agreement to the Buyer noted on the agreement. Alterations or modifications to the agreement are not allowed. Upon receipt of all necessary documents, the City will sign the agreement and return a fully executed copy to you. Receipt of the signed copy will be your notice to proceed with the work in accordance with the terms and conditions of the agreement. Work must not begin until the contract has been fully executed.

The following guidelines must be followed for the signature block on the agreement:

Sole proprietorship - **By owner**

Partnership - **Any general partner**

Corporation - **Two options:**
(1) A signature from the President and the corporate seal; **OR**
(2) One signature from the Chairman of the Board, President, or any Vice President **AND** one signature from the Secretary, any Assistant Secretary, Chief Financial Officer, or any Treasurer or Assistant Treasurer of the corporation

*General Manager, Office Manager and/or Sales Manager are **not** corporate officer titles. The agreement will be rejected if not signed in accordance with these guidelines.

Insurance requirements:
The City's insurance requirements are referenced on Attachment A of the agreement. By signing the agreement, you are confirming that your company has the minimum insurance limits required.

Contract Purchase Agreement 3001194

Agreement	**3001194**
Agreement Date	**18-MAY-2021**
Revision	**0**
Agreement Amount	**175,000.00 USD**

Invoice To	**City of Roseville** **Accounts Payable** **311 Vernon St** **ROSEVILLE CA 95678**	Supplier	**Thatcher Company of California, Inc.** 8625 Unsworth Ave Sacramento, CA 95828
Phone:	(916) 774-5488	**Phone:**	(385) 354-5537
Fax:	(916) 784-3796	**Fax:**	()
Email:	accountspayable@roseville.ca.us	**Email:**	michael.walker@tchem.com

Description of Labor, equipment and/or materials

PROVIDE LIQUID ALUMINUM SULFATE ON AN AS NEEDED BASIS AT A COST OF $0.675 PER GALLON IN ACCORDANCE WITH ALL SPECIFICATIONS, ATTACHMENTS, AND TERMS AND CONDITIONS OF BACC BID NO. 01-2021. DELIVERIES TO BE MADE MONDAY - FRIDAY BETWEEN THE HOURS OF 7:00 AM - 3:00 PM.

START DATE: UPON EXECUTED AGREEMENT
END DATE: 6/30/22

PLEASE CONTACT STEPHEN PETERSON AT 916-746-1996 FOR QUESTIONS REGARDING THIS CONTRACT.

*Total cost listed below is an approximation only. The City does not guarantee whatsoever the actual value of this agreement.

Customer #	Supplier #	Payment Terms	Freight Terms	FOB	Shipping Method
	10928	**Net 30**	**Freight on Board at the destination**	**Destination**	**Best Method**

Start Date	End Date	Confirm To
		"Becky" Rebecca Philipp Phone **1-916-774-5724**

Attention: Total Cost not to exceed the agreement amount without prior approval of the Purchasing office.

Contract Terms and Conditions

1. To the fullest extent allowed by law, Contractor shall defend, indemnify, and save and hold harmless City, its officers, agents, employees and volunteers from any claims, suits or actions of every name, kind and description brought forth, or on account of, injuries to or death of any person (including but not limited to workers and the public), or damage to property, resulting from or arising out of Contractor's willful misconduct or negligent act or omission while engaged in the performance of obligations or exercise of rights created by this Agreement, except those matters arising from City's sole negligence or willful misconduct. The parties intend that this provision shall be broadly construed. Contractor's responsibility for such defense and indemnity obligations shall survive the termination or completion of this Agreement for the full period of time allowed by law. The defense and indemnity obligations of this Agreement are undertaken in addition to, and shall not in any way be limited by, the insurance obligations contained in this Agreement.
2. Contractor is an independent contractor, and shall not be considered an officer, agent or employee of the City.
3. Without the written consent of the City, this Agreement is not assignable by Contractor either in whole or in part.
4. Time is of the essence of this Agreement.
5. At any time during the term of this Agreement, the City has the right to terminate this Agreement, provided Contractor is given thirty (30) days written notice. City's termination shall be without further liability to City; however, Contractor shall be entitled to all costs reasonably incurred prior to the date of termination. Contractor acknowledges that City may terminate this Agreement should funds not be appropriated by its governing body to continue services under this Agreement.
6. This Agreement may only be amended or modified in writing. It is integrated and contains the complete understanding of the parties.
7. All equipment, supplies and services sold to the City of Roseville shall conform to the general safety orders of the State of California.
8. Unless notified to the contrary, in writing, the City assumes that the Contractor has accepted the work in accordance with the plans and specifications (if any) and agrees to do the work in compliance with this Agreement.
9. All fair employment practices must be adhered to. In addition, if the project referenced on this service agreement is a Public Works project, all prevailing wage laws must be complied with. For prevailing wage contracts over $25,000, copies of certified payroll must be submitted with invoices. Prevailing wage rates may be obtained from the State Department of Industrial Relations and/or the following website address: http://www.dir.ca.gov/dlsr/DPreWageDetermination.htm.
10. Contractor agrees to the below insurance requirements:
    a. Unless otherwise specified, the Contractor shall maintain the policies of insurance outlined in Attachment A, incorporated herein by this reference, in full force and effect during the term of this Agreement. The City of Roseville retains sole discretion in determining the types and proper levels of insurance coverage.
    b. Form. Contractor shall submit a certificate evidencing such coverage for the period covered by this Agreement in a form satisfactory to Risk Management and the City Attorney, prior to undertaking any work hereunder. Any insurance written on a claims made basis is subject to the approval of Risk Management and the City Attorney.
    c. Additional Insureds. Contractor shall also provide a separate endorsement or

section of the policy showing City, its officers, agents, employees, and volunteers as additional insureds for each type of coverage, except for Workers' Compensation. Such insurance shall specifically cover the contractual liability of Contractor. The additional insured coverage under the Contractor's policy shall be primary and noncontributory, as evidenced by a separate endorsement or section of the policy, and shall not seek contribution from City's insurance or self-insurance. In addition, the additional insured coverage shall be at least as broad as the Insurance Services Office (ISO) CG 20 01 Endorsement. Any available insurance proceeds in excess of the specified minimum insurance coverage requirements and limits shall be available to the additional insureds. Furthermore, the requirements for coverage and limits shall be:
(1) the minimum coverage and limits specified in this Agreement; or
(2) the full coverage and maximum limits of any insurance proceeds available to the named insureds, whichever is greater.

d. Cancellation/Modification. Contractor shall provide ten (10) days written notice to City prior to cancellation or modification of any insurance required by this Agreement.

e. Umbrella/Excess Insurance. The limits of insurance required in this Agreement may be satisfied by a combination of primary and excess insurance. Any excess insurance shall contain or be endorsed to contain a provision that such coverage shall also apply on a primary and noncontributory basis for the benefit of City (if agreed to in a written contract) before City's own insurance shall be called upon to protect it as a named insured.

f. Subcontractors. Contractor agrees to include in its contracts with all subcontractors the same requirements and provisions of this Agreement, including the indemnity and insurance requirements, to the extent they apply to the scope of the subcontractor's work. Furthermore, Contractor shall require its subcontractors to agree to be bound to Contractor and City in the same manner and to the same extent as Contractor is bound to City under this Agreement. Additionally, Contractor shall obligate its subcontractors to comply with these same provisions with respect to any tertiary subcontractor, regardless of tier. A copy of City's indemnity and insurance provisions will be furnished to the subcontractor or tertiary subcontractor upon request.

g. Self-Insured Retentions. All self-insured retentions (SIR) must be disclosed to Risk Management for approval and shall not reduce the limits of liability. Policies containing any SIR provision shall provide or be endorsed to provide that the SIR may be satisfied by either the named insured or City. City reserves the right to obtain a full certified copy of any insurance policy and endorsements. The failure to exercise this right shall not constitute a waiver of such right.

h. Waiver of Subrogation. Contractor hereby agrees to waive subrogation which any insurer of Contractor may acquire from Contractor by virtue of the payment of any loss under a Workers Compensation, Commercial General Liability or Automobile Liability policy. All Workers Compensation, Commercial General Liability and Automobile Liability policies shall be endorsed with a waiver of subrogation in favor of City, its officers, agents, employees and volunteers for all work performed by Contractor, its employees, agents and subcontractors.

i. Liability/Remedies. Insurance coverage in the minimum amounts set forth herein shall not be construed to relieve Contractor of liability in excess of such coverage, nor shall it preclude City from taking such other actions as are available to it under any other provisions of this Agreement or law.

11. Contractor shall comply with all federal, state and local laws and ordinances, including but not limited to the City's storm water regulations, as may be applicable to the performance of services under this Agreement. Failure to comply with local ordinances

may result in monetary fines and cancellation of this Agreement. Refer to www.roseville.ca.us/stormwater for links to more information on the City's storm water regulations.

12. In the event that the terms of any attachment or exhibit conflict with any terms of this Agreement, the terms of this Agreement shall control.
13. This Agreement may be executed in one or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. In the event that any signature is delivered by facsimile transmission or by e-mail delivery of a ".pdf" format data file, such signature shall create a valid and binding obligation of the party executing (or on whose behalf such signature is executed) with the same force and effect as if such facsimile or ".pdf" signature page were an original hereof.
14. If either party commences any legal action against the other party arising out of this Agreement or the performance thereof, the prevailing party in such action shall be entitled to recover its reasonable litigation expenses, including but not limited to, court costs, expert witness fees, discovery expenses, and attorneys' fees. Any action arising out of this Agreement shall be brought in Placer County, California, regardless of where else venue may lie. This Agreement shall be governed by and construed in accordance with the laws of the State of California.
15. This Agreement shall be binding upon the heirs, successors, executors, administrators and assigns of the respective parties hereto.
16. If any of the provisions contained in this Agreement are for any reason held invalid or unenforceable, such holding shall not affect the remaining provisions or the validity and enforceability of the Agreement as a whole.
17. For purposes of this Agreement, the terms "Contractor," "Consultant," and "Supplier" are used interchangeably.
18. If the project referenced on this agreement is a Public Works project, then the following shall apply: No contractor or subcontractor may work on a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5. During the performance of this agreement, Contractor and its subcontractors shall have a continuing legal obligation to maintain current registration with the Department of Industrial Relations. Contractor is hereby notified that this project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.
19. If the project referenced on this agreement is a Public Works project, then the following shall apply: Contractor must submit all claims as defined in and in accordance with the claim resolution process set forth in Section 9204 of the Public Contract Code. Each such claim must be sent to the City by registered mail or certified mail with return receipt requested and must contain reasonable documentation to support the claim. All claims must be received prior to acceptance of the work.
20. CONTRACTOR agrees to defend and indemnify CITY if, despite the parties intent and practice, any venue, agency, or court with competent jurisdiction determines that CONTRACTOR and/or any of its agents, officers, employees, volunteers, independent contractors, or subcontractors, are characterized as employee(s) of CITY.

    CONTRACTOR and CITY agree that: (a) CONTRACTOR is free from the control and direction of CITY in connection with the performance of the work; (b) CONTRACTOR is providing services directly to CITY; (c) CONTRACTOR has and will maintain at all relevant times a business license; (d) CONTRACTOR maintains a business location that is separate from CITY; (e) CONTRACTOR is customarily engaged in an independently established business of the same nature as that involved in the work performed hereunder; (f) CONTRACTOR actually contracts with other businesses to provide the same or similar services and maintains a clientele without restrictions from CITY; (g) CONTRACTOR advertises and holds itself out to the public as available to provide the same or similar services; (h) CONTRACTOR provides its own tools, vehicles, and

equipment to perform the services; (i) CONTRACTOR has negotiated its own rates; (j) CONTRACTOR set its own hours and location of work in accomplishing CITY's on-call needs; and (k) CONTRACTOR has the right to control the manner and means of accomplishing the result desired and exercises its own expert independent judgement.

21. Contractor certifies that Contractor, its employees, directors, officers, agents, subcontractors, vendors, and volunteers are not presently debarred, excluded, suspended, declared ineligible, voluntarily excluded, or proposed for debarment, exclusion, suspension or ineligibility by any federal, state, or local department or agency.
22. This Agreement may be amended via change order, but only if such change order is made in writing, approved by the City, and signed by both parties.

The supplier named hereon by the acceptance of this order agrees to the provisions of this document titled "Contract Purchase Agreement" and all accompanying terms, conditions, and attachments.

Roseville Business License No. 00834095

Contractor License No. N/A

DIR Registration No. N/A

Check mark the applicable company type below:

X **Corporation**

_____ **Limited Liability Company**

_____ **Partnership**

_____ **Sole Proprietor**

City Reserves the right to withold any payments to contractor in the event of noncompliance with insurance requirements or if required by law.
General T&C
REV 3/2/21 JS

ATTACHMENT A
HUMAN RESOURCES/RISK MANAGEMENT DIVISION
INSURANCE REQUIREMENTS
AGREEMENT OVER FORMAL BID LIMIT OR INVOLVING HIGH RISK ACTIVITIES

General - Required Coverage/Documentation

- General Liability: $1 Million per occurrence /$2 Million aggregate
- Automobile Liability: $1 Million combined single limit
- Workers' Compensation: Statutory *Must provide a Waiver of subrogation
- Additional Insured Endorsement (AIE) - General Liability policy: CG 20 38 04 13 or an equivalent, blanket endorsement or section of the policy. Endorsement shall cover the City of Roseville, its officers, agents, employees and volunteers as additional insured.
- Policies must be primary and non-contributory
- A 30 day notice of cancellation must be provided
- List certificate holder as: The City of Roseville - Insurance Compliance, PO Box 100085-R1, Duluth, GA 30096

Additional Liability/Insurance Requirements if required by Agreement (and marked below):

Construction:____
General Liability:
$2 Million/occurrence
$4 Million aggregate

Design Professional:____
General Liability:
$2 Million/occurrence
$4 Million aggregate
Professional Liability:
$2 Million/occurrence

Professional Consultant:____
Professional Liability:
$1 Million/occurrence

IT Services:____
Professional Liability:
$1 Million/occurrence
No auto required

Hazardous Materials:____
Pollution Liability:
$1 Million/occurrence

Special Events/Caterers-Vendors:____
No auto required
No workers' comp required

Professional Counseling/ Psychological:____
Professional Liability:
$1 Million/occurrence
No auto required

Pyrotechnics:____
General Liability:
$5 Million/occurrence
$10 Million aggregate
Auto - $2 Million/occurrence

Chemical/Environmental:__X__
General Liability:
$3 Million/occurrence
$6 Million aggregate
Pollution – $2 Million/Occurrence
Auto - $2 Million/Occurrence

Insurance Submission Process

The City of Roseville Human Resources/Risk Management Department uses a service called EBIX to manage our insurance certificate tracking.

How It Works

- The vendor's contact information is entered into EBIX. EBIX will contact the vendor to request proof of insurance.
- The Vendor can forward the request to their Insurance Agent(s) if necessary.
- Vendor/Insurance Agent submits insurance to EBIX by email to roseville@ebix.com or by fax to (770) 325-5727. After faxing or emailing the certificate, please DO NOT send the certificate by mail to EBIX. Please do not mail, email or fax any certificates to the City of Roseville.
- Once submitted, EBIX reviews the insurance documentation. If there are deficiencies, EBIX will send a follow up letter or email requesting additional information.

Questions Regarding Insurance Submission: Contact EBIX at (951) 652-4239
Questions Regarding Insurance Requirements Contact Risk Management at (916) 774-5202

Supplier	
Signature:	
Print Name:	
Title:	

Supplier	
Signature:	Craig N. Thatcher
Print Name:	Craig N. Thatcher
Title:	C. E. O. and President

City of Roseville, A Municipal Corporation	
Signature:	
Print Name:	Dominick Casey
Title:	City Manager

COUNCIL COMMUNICATION

CC #: 1542
File #: 0203-10

Title:	Landscape Bark and Playground Engineered Wood Fiber - Contract Purchase Agreement
Contact:	Brian Castelluccio 916-746-1755 bcastelluccio@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 7.5.

RECOMMENDATION TO COUNCIL

Recommend Council adopt a resolution authorizing the City Manager to execute a contract purchase agreement with Applied Landscapes Materials Inc., for the purchase and installation of landscape bark and play ground fiber materials. Additionally authorize the City Manager to execute the remaining renewal years without further Council approval, contingent upon approval of the Parks, Recreation & Libraries budget in subsequent years.

BACKGROUND

The Parks Division currently oversees over 80 facilities with play areas and over 300 acres of landscaping. Engineered wood fiber is the primary safety component within play areas. Sustaining acceptable levels of this material is critical to providing a safe and enjoyable experience. Landscape bark is used within our Community Facilities Districts and Landscaping and Lighting Districts to retain moisture in the soil for healthier plants and trees, reduce weeds and enhance the aesthetics of the community.

In April 2021, a Request for Proposals (RFP 13-098) was issued for Landscape Bark and Playground Engineered Wood Fiber Material and Services. Two bids were received and, after staff review, Applied Landscape Materials Inc., was chosen as the selected vendor based on experience, understanding of the project and ability to handle a project of this scope.

Staff estimates the not-to-exceed award of $300,000 based on historical data, knowledge of future requirements and potential needs.

FISCAL IMPACT

The cost of the first year of the contract is not to exceed $300,000, contingent on budget approval. This funding is included in the Parks, Recreation & Libraries proposed FY2021-22 General Fund ($100,000), Community Facilities Districts (CFD) and Landscaping and Lighting Districts (LLD) ($200,000) budgets. Subsequent years costs will be based on needs and

approved budgets. Estimated spending for FY2022-23, $300,000: FY2023-24, $300,000; FY2024-25, $300,000; FY2025-26, $300,000.

ENVIRONMENTAL REVIEW

The California Environmental Quality Act (CEQA) does not apply to activities that will not result in a direct or reasonably foreseeable indirect physical change in the environment, or is otherwise not considered a project as defined by CEQA Statute §21065 and CEQA State Guidelines §15060(c)(3) and §15378. Approval of a contract purchase agreement for the installation of bark and playground fiber meets the above criteria and is not subject to CEQA. No additional environmental review is required.

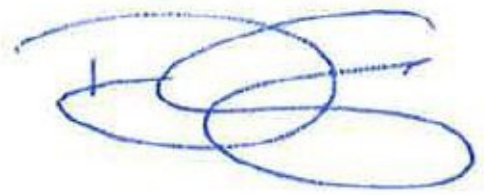
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Goal C - Maintain a safe and healthy community
Goal E - Deliver exceptional city services

Respectfully Submitted,

Brian Castelluccio, Parks, Recreation & Libraries Superintendent

Jill Geller, Parks, Recreation & Libraries Director



_____
Dominick Casey, City Manager

ATTACHMENTS:

Description

Resolution 21-274

Bark and Fiber Materials - Service Agreement

RESOLUTION NO. 21-274

APPROVING A CONTRACT PURCHASE AGREEMENT, BY AND BETWEEN THE CITY OF ROSEVILLE AND APPLIED LANDSCAPE MATERIALS, INC. DBA NORCAL WHOLESALE BARK, AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE

WHEREAS, a contract purchase agreement (3001199) to provide landscape bark and playground engineered wood fiber materials and services, between the City of Roseville and Applied Landscape Materials, Inc. dba Norcal Wholesale Bark, has been reviewed by the Council; and

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Roseville that said agreement is approved and the City Manager is authorized to execute it on behalf of the City of Roseville.

BE IT FURTHER RESOLVED that the City Manager or his designee is authorized to execute four (4) additional one (1) year renewals without further City Council approval, provided that the applicable budget is approved by the City Council each year, or until City staff determines that continuing with the same vendor is not in the City's best interest.

PASSED AND ADOPTED by the Council of the City of Roseville this____day of _____, 2021, by the following vote on roll call:

AYES COUNCILMEMBERS:

NOES COUNCILMEMBERS:

ABSENT COUNCILMEMBERS:

_____
MAYOR

ATTEST:

_____
City Clerk

Contract Purchase Agreement 3001199

Supplier Details:

Company	Applied Landscape Materials Inc dba Norcal Wholesale Bark
Contact	Brendan Immers
Address	4500 Pacific St
	Ste O
	Rocklin, CA 95677

Submit your response to:

Company	City of Roseville
Contact	Sue Jessup
Address	Purchasing Division
	2075 Hilltop Circle
	Roseville, CA 95747
Phone	(916) 746-1702
Fax	(916) 774-5736
E-mail	SJessup@roseville.ca.us

This Contract Purchase Agreement is sent for your review and acceptance. Notify the Buyer via email of any needed changes to the company name, address, and contact information. The Buyer will update the agreement prior to you signing the document.

Return signed copies of the agreement to the Buyer noted on the agreement. Alterations or modifications to the agreement are not allowed. Upon receipt of all necessary documents, the City will sign the agreement and return a fully executed copy to you. Receipt of the signed copy will be your notice to proceed with the work in accordance with the terms and conditions of the agreement. Work must not begin until the contract has been fully executed.

The following guidelines must be followed for the signature block on the agreement:

Sole proprietorship - **By owner**

Partnership - **Any general partner**

Corporation - **Two options:**
(1) A signature from the President and the corporate seal; **OR**
(2) One signature from the Chairman of the Board, President, or any Vice President **AND** one signature from the Secretary, any Assistant Secretary, Chief Financial Officer, or any Treasurer or Assistant Treasurer of the corporation

*General Manager, Office Manager and/or Sales Manager are **not** corporate officer titles. The agreement will be rejected if not signed in accordance with these guidelines.

Insurance requirements:
The City's insurance requirements are referenced on Attachment A of the agreement. By signing the agreement, you are confirming that your company has the minimum insurance limits required.

CITY OF ROSEVILLE CALIFORNIA

Contract Purchase Agreement 3001199

Agreement	**3001199**
Agreement Date	**20-MAY-2021**
Revision	**0**
Agreement Amount	**300,000.00 USD**

Invoice To
City of Roseville
Accounts Payable
311 Vernon St
ROSEVILLE CA 95678

Phone: (916) 774-5488
Fax: (916) 784-3796
Email: accountspayable@roseville.ca.us

Supplier
Applied Landscape Materials Inc dba Norcal Wholesale Bark
4500 Pacific St
Ste O
Rocklin, CA 95677

Phone: ()
Fax: ()
Email: almquotes@gmail.com

Description of Labor, equipment and/or materials

The services called for under City of Roseville Request for Proposal #13-098 and contractor's proposal thereto titled Landscape Bark and Playground Engineered Wood Fiber Materials and Services dated 4/12/2021 (hereinafter "Proposal"). The terms and scope of work of City of Roseville Request for Proposal #13-098 and contractor's Proposal are herein made part of this Service Agreement and fully incorporated by reference. All work must be quoted and approved by Patrick Daly before work can begin.

CONTACT PATRICK DALY AT (916) 774-5764 OR EMAIL PDALY@ROSEVILLE.CA.US FOR QUESTIONS REGARDING THIS CONTRACT.

*The total amount listed is an approximation only. The City does not guarantee whatsoever the actual value of this contract.

Customer #	Supplier #	Payment Terms	Freight Terms	FOB	Shipping Method
	14964	**Net 30**	**Freight on Board at the destination**	**Destination**	**Best Method**

Start Date	End Date	Confirm To
01-Jul-2021	**30-Jun-2022**	**Sue Jessup** Phone **1-916-746-1702**

Attention: Total Cost not to exceed the agreement amount without prior approval of the Purchasing office.

Contract Terms and Conditions

1. To the fullest extent allowed by law, Contractor shall defend, indemnify, and save and hold harmless the City, its officers, agents, employees and volunteers from any claims, suits or actions of every name, kind and description brought forth, or on account of, injuries to or death of any person (including but not limited to workers and the public), or damage to property, resulting from or arising out of Contractor's willful misconduct or negligent act or omission while engaged in the performance of obligations or exercise of rights created by this Agreement, except those matters arising from City's sole or active negligence or willful misconduct. The parties intend that this provision shall be broadly construed. Contractor's responsibility for such defense and indemnity obligations shall survive the termination or completion of this Agreement for the full period of time allowed by law. The defense and indemnity obligations of this Agreement are undertaken in addition to, and shall not in any way be limited by, the insurance obligations contained in this Agreement.

2. Contractor is an independent contractor, and shall not be considered an officer, agent or employee of the City.

3. Without the written consent of the City, this Agreement is not assignable by Contractor either in whole or in part.

4. Time is of the essence of this Agreement.

5. At any time during the term of this Agreement, the City has the right to terminate this Agreement, provided Contractor is given thirty (30) days written notice. City's termination shall be without further liability to City; however, Contractor shall be entitled to all costs reasonably incurred prior to the date of termination. Contractor acknowledges that City may terminate this Agreement should funds not be appropriated by its governing body to continue services under this Agreement.

6. This Agreement may only be amended or modified in writing. It is integrated and contains the complete understanding of the parties.

7. All equipment, supplies and services sold to the City of Roseville shall conform to the general safety orders of the State of California.

8. Unless notified to the contrary, in writing, the City assumes that the Contractor has accepted the work in accordance with the plans and specifications (if any) and agrees to do the work in compliance with this Agreement.

9. All prevailing wages and fair employment practices must be adhered to. For prevailing wage contracts over $25,000, copies of certified payroll must be submitted with invoices. Prevailing wage rates may be obtained from the State Department of Industrial Relations and/or the following website address: http://www.dir.ca.gov/dlsr/DPreWageDetermination.htm.

10. Contractor agrees to the below insurance requirements:

    a. Unless otherwise specified, the Contractor shall maintain the policies of insurance outlined in Attachment A, incorporated herein by this reference, in full force and effect during the term of this Agreement. The City of Roseville retains sole discretion in determining the types and proper levels of insurance coverage.

b. Form. Contractor shall submit a certificate evidencing such coverage for the period covered by this Agreement in a form satisfactory to Risk Management and the City Attorney, prior to undertaking any work hereunder. Any insurance written on a claims made basis is subject to the approval of Risk Management and the City Attorney.

c. Additional Insureds. Contractor shall also provide a separate endorsement or section of the policy showing City, its officers, agents, employees, and volunteers as additional insureds for each type of coverage (except Workers' Compensation) and for ongoing and completed operations. Such insurance shall specifically cover the contractual liability of Contractor. The additional insured coverage under the Contractor's policy shall be primary and noncontributory, as evidenced by a separate endorsement or section of the policy, and shall not seek contribution from City's insurance or self-insurance. In addition, the additional insured coverage shall be at least as broad as the Insurance Services Office (ISO) CG 20 01 Endorsement. Any available insurance proceeds in excess of the specified minimum insurance coverage requirements and limits shall be available to the additional insureds. Furthermore, the requirements for coverage and limits shall be:

(1) the minimum coverage and limits specified in this Agreement; or
(2) the full coverage and maximum limits of any insurance proceeds available to the named insureds, whichever is greater.

d. Cancellation/Modification. Contractor shall provide ten (10) days written notice to City prior to cancellation or modification of any insurance required by this Agreement.

e. Umbrella/Excess Insurance. The limits of insurance required in this Agreement may be satisfied by a combination of primary and excess insurance. Any excess insurance shall contain or be endorsed to contain a provision that such coverage shall also apply on a primary and noncontributory basis for the benefit of City (if agreed to in a written contract) before City's own insurance shall be called upon to protect it as a named insured.

f. Subcontractors. Contractor agrees to include in its contracts with all subcontractors the same requirements and provisions of this Agreement, including the indemnity and insurance requirements, to the extent they apply to the scope of the subcontractor's work. Furthermore, Contractor shall require its subcontractors to agree to be bound to Contractor and City in the same manner and to the same extent as Contractor is bound to City under this Agreement. Additionally, Contractor shall obligate its subcontractors to comply with these same provisions with respect to any tertiary subcontractor, regardless of tier. A copy of City's indemnity and insurance provisions will be furnished to the subcontractor or tertiary subcontractor upon request.

g. Self-Insured Retentions. All self-insured retentions (SIR) must be disclosed to Risk Management for approval and shall not reduce the limits of liability. Policies containing any SIR provision shall provide or be endorsed to provide that the SIR may be satisfied by either the named insured or City. City reserves the right to obtain a full certified copy of any insurance policy and endorsements. The failure to exercise this right shall not constitute a waiver of such right.

h. Waiver of Subrogation. Contractor hereby agrees to waive subrogation which any insurer of Contractor may acquire from Contractor by virtue of the payment of any loss under a Workers Compensation, Commercial General Liability or Automobile Liability policy. All Workers Compensation, Commercial General

Liability and Automobile Liability policies shall be endorsed with a waiver of subrogation in favor of City, its officers, agents, employees and volunteers for all work performed by Contractor, its employees, agents and subcontractors.

i. Liability/Remedies. Insurance coverage in the minimum amounts set forth herein shall not be construed to relieve Contractor of liability in excess of such coverage, nor shall it preclude City from taking such other actions as are available to it under any other provisions of this Agreement or law.

11. Contractor shall comply with all federal, state and local laws and ordinances, including but not limited to the City's storm water regulations, as may be applicable to the performance of services under this Agreement. Failure to comply with local ordinances may result in monetary fines and cancellation of this Agreement. Refer to www.roseville.ca.us/stormwater for links to more information on the City's storm water regulations.

12. In the event that the terms of any attachment or exhibit conflict with any terms of this Agreement, the terms of this Agreement shall control.

13. This Agreement may be executed in one or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. In the event that any signature is delivered by facsimile transmission or by e-mail delivery of a ".pdf" format data file, such signature shall create a valid and binding obligation of the party executing (or on whose behalf such signature is executed) with the same force and effect as if such facsimile or ".pdf" signature page were an original thereof.

14. If either party commences any legal action against the other party arising out of this Agreement or the performance thereof, the prevailing party in such action shall be entitled to recover its reasonable litigation expenses, including but not limited to, court costs, expert witness fees, discovery expenses, and attorneys' fees. Any action arising out of this Agreement shall be brought in Placer County, California, regardless of where else venue may lie. This Agreement shall be governed by and construed in accordance with the laws of the State of California.

15. This Agreement shall be binding upon the heirs, successors, executors, administrators and assigns of the respective parties hereto.

16. If any of the provisions contained in this Agreement are for any reason held invalid or unenforceable, such holding shall not affect the remaining provisions or the validity and enforceability of the Agreement as a whole.

17. For purposes of this Agreement, the terms "Contractor," "Consultant," and "Supplier" are used interchangeably.

18. No contractor or subcontractor may work on a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5. During the performance of this agreement, Contractor and its subcontractors shall have a continuing legal obligation to maintain current registration with the Department of Industrial Relations. Contractor is hereby notified that this project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

19. Contractor must submit all claims as defined in and in accordance with the claim resolution process set forth in Section 9204 of the Public Contract Code. Each such claim must be sent to the City by registered mail or certified mail with return receipt requested and must contain reasonable documentation to support the claim. All claims must be received prior to acceptance of the work.

20. CONTRACTOR agrees to defend and indemnify CITY if, despite the parties intent and practice, any venue, agency, or court with competent jurisdiction determines that CONTRACTOR and/or any of its agents, officers, employees, volunteers, independent contractors, or subcontractors, are characterized as employee(s) of CITY.

    CONTRACTOR and CITY agree that: (a) CONTRACTOR is free from the control and direction of CITY in connection with the performance of the work; (b) CONTRACTOR is providing services directly to CITY; (c) CONTRACTOR has and will maintain at all relevant times a business license; (d) CONTRACTOR maintains a business location that is separate from CITY; (e) CONTRACTOR is customarily engaged in an independently established business of the same nature as that involved in the work performed hereunder; (f) CONTRACTOR actually contracts with other businesses to provide the same or similar services and maintains a clientele without restrictions from CITY; (g) CONTRACTOR advertises and holds itself out to the public as available to provide the same or similar services; (h) CONTRACTOR provides its own tools, vehicles, and equipment to perform the services; (i) CONTRACTOR has negotiated its own rates; (j) CONTRACTOR set its own hours and location of work in accomplishing CITY's on-call needs; and (k) CONTRACTOR has the right to control the manner and means of accomplishing the result desired and exercises its own expert independent judgement.
21. Contractor certifies that Contractor, its employees, directors, officers, agents, subcontractors, vendors, and volunteers are not presently debarred, excluded, suspended, declared ineligible, voluntarily excluded, or proposed for debarment, exclusion, suspension or ineligibility by any federal, state, or local department or agency.

22. This Agreement may be amended via change order, but only if such change order is made in writing, approved by the City, and signed by both parties.

The supplier named hereon by the acceptance of this order agrees to the provisions of this document titled "Contract Purchase Agreement" and all accompanying terms, conditions, and attachments.

Roseville Business License No. 00827215

Contractor License No. 906546

DIR Registration No. 1000011263

Check mark the applicable company type below:

X **Corporation**

_____ **Limited Liability Company**

_____ **Partnership**

_____ **Sole Proprietor**

City Reserves the right to withold any payments to contractor in the event of noncompliance with insurance requirements or if required by law.
Construction T&C
REV 3/2/21 JS

ATTACHMENT A
HUMAN RESOURCES/RISK MANAGEMENT DIVISION
INSURANCE REQUIREMENTS
AGREEMENT OVER FORMAL BID LIMIT OR INVOLVING HIGH RISK ACTIVITIES

General - Required Coverage/Documentation

- General Liability: $1 Million per occurrence /$2 Million aggregate
- Automobile Liability: $1 Million combined single limit
- Workers' Compensation: Statutory *Must provide a Waiver of subrogation
- Additional Insured Endorsement (AIE) - General Liability policy: CG 20 38 04 13 or an equivalent, blanket endorsement or section of the policy. Endorsement shall cover the City of Roseville, its officers, agents, employees and volunteers as additional insured.
- Policies must be primary and non-contributory
- A 30 day notice of cancellation must be provided
- List certificate holder as: The City of Roseville - Insurance Compliance, PO Box 100085-R1, Duluth, GA 30096

Additional Liability/Insurance Requirements if required by Agreement (and marked below):

Construction:____
General Liability:
$2 Million/occurrence
$4 Million aggregate

Design Professional:____
General Liability:
$2 Million/occurrence
$4 Million aggregate
Professional Liability:
$2 Million/occurrence

Professional Consultant:____
Professional Liability:
$1 Million/occurrence

IT Services:____
Professional Liability:
$1 Million/occurrence
No auto required

Hazardous Materials:____
Pollution Liability:
$1 Million/occurrence

Special Events/Caterers-Vendors:____
No auto required
No workers' comp required

Professional Counseling/ Psychological:____
Professional Liability:
$1 Million/occurrence
No auto required

Pyrotechnics:____
General Liability:
$5 Million/occurrence
$10 Million aggregate
Auto - $2 Million/occurrence

Chemical/Environmental:____
General Liability:
$3 Million/occurrence
$6 Million aggregate
Pollution – $2 Million/Occurrence
Auto - $2 Million/Occurrence

Insurance Submission Process

The City of Roseville Human Resources/Risk Management Department uses a service called EBIX to manage our insurance certificate tracking.

How It Works

- The vendor's contact information is entered into EBIX. EBIX will contact the vendor to request proof of insurance.
- The Vendor can forward the request to their Insurance Agent(s) if necessary.
- Vendor/Insurance Agent submits insurance to EBIX by email to roseville@ebix.com or by fax to (770) 325-5727. After faxing or emailing the certificate, please DO NOT send the certificate by mail to EBIX. Please do not mail, email or fax any certificates to the City of Roseville.
- Once submitted, EBIX reviews the insurance documentation. If there are deficiencies, EBIX will send a follow up letter or email requesting additional information.

Questions Regarding Insurance Submission: Contact EBIX at (951) 652-4239
Questions Regarding Insurance Requirements Contact Risk Management at (916) 774-5202

Supplier	
Signature:	
Print Name:	Brendan Immers
Title:	President, CEO

Supplier	
Signature:	
Print Name:	
Title:	

City of Roseville, A Municipal Corporation	
Signature:	
Print Name:	**Dominick Casey**
Title:	**City Manager**

COUNCIL COMMUNICATION

CC #: 1535
File #: 0704

Title:	Securing Facilities Services - Contract Purchase Agreement
Contact:	Brian Castelluccio 916-746-1755 bcastelluccio@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 7.6.

RECOMMENDATION TO COUNCIL

Staff recommends Council adopt a resolution authorizing the City Manager to execute a contract purchase agreement with CAL TAC Security to perform security inspections, locking of park facilities and on-call security services. Additionally, staff recommends Council authorize the City Manager to execute four (4) optional one (1) year renewal years without further Council approval, contingent upon approval of the Parks, Recreation & Libraries Department budget in each subsequent year.

BACKGROUND

The City's Parks, Recreation & Libraries Department currently manages a park system that consists of 80 parks and facilities, 23 of which contain restrooms/gates that need to be secured on a nightly basis. Locking these facilities nightly reduces vandalism costs and ensures the safety of residents and staff. The service also provides for inspection and a security presence as each site is visited, and allows for on-call security services that may be used to have on-site security during assigned times, providing added security, if needed, and discouraging vandalism and other unwanted activity.

A request for proposals (RFP) was issued for park security services in March of 2021. Four bids were received and, after staff review, CAL TAC was chosen as the selected vendor due to their experience, organizational structure, and understanding/ability to achieve the scope of work.

FISCAL IMPACT

The cost for the first year of the contract is not to exceed $100,000, pending budget approval. The funding is included in the Park, Recreation & Libraries Department's proposed FY2021-22 budget. The funding sources include the General Fund ($70,000) and Community Facilities Districts (CFD) ($30,000). Estimated costs for FY2022-23, $100,000; FY2023-24, $100.000; FY2024-25, $100,000, and FY2025-26, $100,000.

Locking the facilities nightly has shown to create savings to Parks Operations and CFDs by reducing vandalism and the cost of repairs.

ENVIRONMENTAL REVIEW

The California Environmental Quality Act (CEQA) does not apply to activities and will not result in a direct or reasonably foreseeable indirect physical change in the environment, or is otherwise not considered a project as defined by CEQA Statute §21065 and CEQA State Guidelines §15060(c)(3) and §15378. Approval of a contract purchase agreement for securing facilities services meets the above criteria and is not subject to CEQA. No additional environmental review is required.

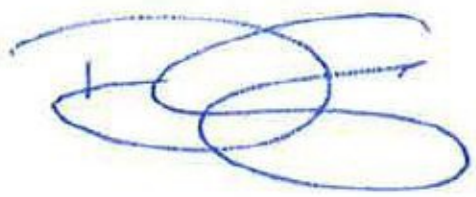
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Goal A - Remain fiscally responsible in a changing world
Goal C - Maintain a safe and healthy community

Respectfully Submitted,

Brian Castelluccio, Parks, Recreation & Libraries Superintendent

Jill Geller, Parks, Recreation & Libraries Director



_____
Dominick Casey, City Manager

ATTACHMENTS:

Description

Resolution 21-266

CAL TAC Security - Service Agreement

RESOLUTION NO. 21-266

APPROVING A CONTRACT PURCHASE AGREEMENT, BY AND BETWEEN THE CITY OF ROSEVILLE AND CAL TAC SECURITY, AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE

WHEREAS, a contract purchase agreement (3001178) for securing facilities services, between the City of Roseville and CAL TAC Security, has been reviewed by the Council; and

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Roseville that said agreement is approved and the City Manager is authorized to execute it on behalf of the City of Roseville.

BE IT FURTHER RESOLVED that the City Manager or his designee is authorized to execute four (4) additional one (1) year renewals without further City Council approval, provided that the applicable budget is approved by the City Council each year, or until City staff determines that continuing with the same vendor is not in the City's best interest.

PASSED AND ADOPTED by the Council of the City of Roseville this____day of _____, 2021, by the following vote on roll call:

AYES COUNCILMEMBERS:

NOES COUNCILMEMBERS:

ABSENT COUNCILMEMBERS:

_____
MAYOR

ATTEST:

_____
City Clerk

Contract Purchase Agreement 3001178

Supplier Details:

Company	CALTAC Security
Contact	Mike Menas
Address	1079 Sunrise Ave Ste B-25
	Roseville, CA 95661

Submit your response to:

Company	City of Roseville
Contact	Phoebe Schueler
Address	Purchasing Division
	2075 Hilltop Circle
	Roseville, CA 95747
Phone	(916) 774-5734
Fax	(916) 774-5736
E-mail	PESchueler@roseville.ca.us

This Contract Purchase Agreement is sent for your review and acceptance. Notify the Buyer via email of any needed changes to the company name, address, and contact information. The Buyer will update the agreement prior to you signing the document.

Return (2) signed originals of the agreement to the Buyer noted on the agreement. Alterations or modifications to the agreement are not allowed. Upon receipt of all necessary documents, the City will sign the agreement and return a fully executed copy to you. Receipt of the signed copy will be your notice to proceed with the work in accordance with the terms and conditions of the agreement. Work must not begin until the contract has been fully executed.

The following guidelines must be followed for the signature block on the agreement:

Sole proprietorship - **By owner**

Partnership - **Any general partner**

Corporation - **Two options:**
(1) A signature from the President and the corporate seal; **OR**
(2) One signature from the Chairman of the Board, President, or any Vice President **AND** one signature from the Secretary, any Assistant Secretary, Chief Financial Officer, or any Treasurer or Assistant Treasurer of the corporation

*General Manager, Office Manager and/or Sales Manager are **not** corporate officer titles. The agreement will be rejected if not signed in accordance with these guidelines.

Insurance requirements:
The City's insurance requirements are referenced on Attachment A of the agreement. By signing the agreement, you are confirming that your company has the minimum insurance limits required.

CITY OF ROSEVILLE CALIFORNIA

Contract Purchase Agreement 3001178

Agreement	**3001178**
Agreement Date	**13-MAY-2021**
Revision	**0**
Agreement Amount	**100,000.00 USD**

Invoice To **City of Roseville**
Accounts Payable
311 Vernon St
ROSEVILLE CA 95678
Phone: (916) 774-5488
Fax: (916) 784-3796
Email: accountspayable@roseville.ca.us

Supplier **CALTAC Security**
1079 Sunrise Ave Ste B-25

Roseville, CA 95661
Phone: (916) 422-5822
Fax: ()
Email: mike@caltacsecurity.com

Description of Labor, equipment and/or materials

The services called for under City of Roseville Request for Proposal #13-094 and contractor's proposal thereto titled Securing Facilities Services dated 4/9/2021 (hereinafter "Proposal"). The terms and scope of work of City of Roseville Request for Proposal #13-094 and contractor's Proposal are herein made part of this agreement and fully incorporated by reference. All work must be quoted and approved by Patrick Daly before work can begin.

START DATE: UPON EXECUTED AGREEMENT
END DATE: 6/30/22

Please contact Patrick Daly at (916) 774-5764 or email PDaly@roseville.ca.us for questions regarding this contract.

**The total cost listed is an approximation only. The City does not guarantee whatsoever the actual value of this agreement.

Customer #	Supplier #	Payment Terms	Freight Terms	FOB	Shipping Method
	14940	**Net 30**	**Freight on Board at the destination**	**Destination**	**Best Method**

Start Date	End Date	Confirm To
		Phoebe Schueler Phone **1-916-774-5734**

Attention: Total Cost not to exceed the agreement amount without prior approval of the Purchasing office.

Contract Terms and Conditions

1. To the fullest extent allowed by law, Contractor shall defend, indemnify, and save and hold harmless City, its officers, agents, employees and volunteers from any claims, suits or actions of every name, kind and description brought forth, or on account of, injuries to or death of any person (including but not limited to workers and the public), or damage to property, resulting from or arising out of Contractor's willful misconduct or negligent act or omission while engaged in the performance of obligations or exercise of rights created by this Agreement, except those matters arising from City's sole negligence or willful misconduct. The parties intend that this provision shall be broadly construed. Contractor's responsibility for such defense and indemnity obligations shall survive the termination or completion of this Agreement for the full period of time allowed by law. The defense and indemnity obligations of this Agreement are undertaken in addition to, and shall not in any way be limited by, the insurance obligations contained in this Agreement.

2. Contractor is an independent contractor, and shall not be considered an officer, agent or employee of the City.

3. Without the written consent of the City, this Agreement is not assignable by Contractor either in whole or in part.

4. Time is of the essence of this Agreement.

5. At any time during the term of this Agreement, the City has the right to terminate this Agreement, provided Contractor is given thirty (30) days written notice. City's termination shall be without further liability to City; however, Contractor shall be entitled to all costs reasonably incurred prior to the date of termination. Contractor acknowledges that City may terminate this Agreement should funds not be appropriated by its governing body to continue services under this Agreement.

6. This Agreement may only be amended or modified in writing. It is integrated and contains the complete understanding of the parties.

7. All equipment, supplies and services sold to the City of Roseville shall conform to the general safety orders of the State of California.

8. Unless notified to the contrary, in writing, the City assumes that the Contractor has accepted the work in accordance with the plans and specifications (if any) and agrees to do the work in compliance with this Agreement.

9. All fair employment practices must be adhered to. In addition, if the project referenced on this service agreement is a Public Works project, all prevailing wage laws must be complied with. For prevailing wage contracts over $25,000, copies of certified payroll must be submitted with invoices. Prevailing wage rates may be obtained from the State Department of Industrial Relations and/or the following website address: http://www.dir.ca.gov/dlsr/DPreWageDetermination.htm.

10. Contractor agrees to the below insurance requirements:

    a. Unless otherwise specified, the Contractor shall maintain the policies of insurance outlined in Attachment A, incorporated herein by this reference, in full force and effect during the term of this Agreement. The City of Roseville retains sole discretion in determining the types and proper levels of insurance coverage.

b. Form. Contractor shall submit a certificate evidencing such coverage for the period covered by this Agreement in a form satisfactory to Risk Management and the City Attorney, prior to undertaking any work hereunder. Any insurance written on a claims made basis is subject to the approval of Risk Management and the City Attorney.

c. Additional Insureds. Contractor shall also provide a separate endorsement or section of the policy showing City, its officers, agents, employees, and volunteers as additional insureds for each type of coverage, except for Workers' Compensation. Such insurance shall specifically cover the contractual liability of Contractor. The additional insured coverage under the Contractor's policy shall be primary and noncontributory, as evidenced by a separate endorsement or section of the policy, and shall not seek contribution from City's insurance or self-insurance. In addition, the additional insured coverage shall be at least as broad as the Insurance Services Office (ISO) CG 20 01 Endorsement. Any available insurance proceeds in excess of the specified minimum insurance coverage requirements and limits shall be available to the additional insureds. Furthermore, the requirements for coverage and limits shall be:

(1) the minimum coverage and limits specified in this Agreement; or
(2) the full coverage and maximum limits of any insurance proceeds available to the named insureds, whichever is greater.

d. Cancellation/Modification. Contractor shall provide ten (10) days written notice to City prior to cancellation or modification of any insurance required by this Agreement.

e. Umbrella/Excess Insurance. The limits of insurance required in this Agreement may be satisfied by a combination of primary and excess insurance. Any excess insurance shall contain or be endorsed to contain a provision that such coverage shall also apply on a primary and noncontributory basis for the benefit of City (if agreed to in a written contract) before City's own insurance shall be called upon to protect it as a named insured.

f. Subcontractors. Contractor agrees to include in its contracts with all subcontractors the same requirements and provisions of this Agreement, including the indemnity and insurance requirements, to the extent they apply to the scope of the subcontractor's work. Furthermore, Contractor shall require its subcontractors to agree to be bound to Contractor and City in the same manner and to the same extent as Contractor is bound to City under this Agreement. Additionally, Contractor shall obligate its subcontractors to comply with these same provisions with respect to any tertiary subcontractor, regardless of tier. A copy of City's indemnity and insurance provisions will be furnished to the subcontractor or tertiary subcontractor upon request.

g. Self-Insured Retentions. All self-insured retentions (SIR) must be disclosed to Risk Management for approval and shall not reduce the limits of liability. Policies containing any SIR provision shall provide or be endorsed to provide that the SIR may be satisfied by either the named insured or City. City reserves the right to obtain a full certified copy of any insurance policy and endorsements. The failure to exercise this right shall not constitute a waiver of such right.

h. Waiver of Subrogation. Contractor hereby agrees to waive subrogation which any insurer of Contractor may acquire from Contractor by virtue of the payment of any loss under a Workers Compensation, Commercial General Liability or Automobile Liability policy. All Workers Compensation, Commercial General Liability and Automobile Liability policies shall be endorsed with a waiver of

subrogation in favor of City, its officers, agents, employees and volunteers for all work performed by Contractor, its employees, agents and subcontractors.

i. Liability/Remedies. Insurance coverage in the minimum amounts set forth herein shall not be construed to relieve Contractor of liability in excess of such coverage, nor shall it preclude City from taking such other actions as are available to it under any other provisions of this Agreement or law.

11. Contractor shall comply with all federal, state and local laws and ordinances, including but not limited to the City's storm water regulations, as may be applicable to the performance of services under this Agreement. Failure to comply with local ordinances may result in monetary fines and cancellation of this Agreement. Refer to www.roseville.ca.us/stormwater for links to more information on the City's storm water regulations.

12. In the event that the terms of any attachment or exhibit conflict with any terms of this Agreement, the terms of this Agreement shall control.

13. This Agreement may be executed in one or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. In the event that any signature is delivered by facsimile transmission or by e-mail delivery of a ".pdf" format data file, such signature shall create a valid and binding obligation of the party executing (or on whose behalf such signature is executed) with the same force and effect as if such facsimile or ".pdf" signature page were an original hereof.

14. If either party commences any legal action against the other party arising out of this Agreement or the performance thereof, the prevailing party in such action shall be entitled to recover its reasonable litigation expenses, including but not limited to, court costs, expert witness fees, discovery expenses, and attorneys' fees. Any action arising out of this Agreement shall be brought in Placer County, California, regardless of where else venue may lie. This Agreement shall be governed by and construed in accordance with the laws of the State of California.

15. This Agreement shall be binding upon the heirs, successors, executors, administrators and assigns of the respective parties hereto.

16. If any of the provisions contained in this Agreement are for any reason held invalid or unenforceable, such holding shall not affect the remaining provisions or the validity and enforceability of the Agreement as a whole.

17. For purposes of this Agreement, the terms "Contractor," "Consultant," and "Supplier" are used interchangeably.

18. If the project referenced on this agreement is a Public Works project, then the following shall apply: No contractor or subcontractor may work on a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5. During the performance of this agreement, Contractor and its subcontractors shall have a continuing legal obligation to maintain current registration with the Department of Industrial Relations. Contractor is hereby notified that this project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

19. If the project referenced on this agreement is a Public Works project, then the following shall apply: Contractor must submit all claims as defined in and in accordance with the claim resolution process set forth in Section 9204 of the Public Contract Code. Each such claim must be sent to the City by registered mail or certified mail with return receipt requested and must contain reasonable documentation to support the claim. All claims must be received prior to acceptance of the work.

20. Contractor agrees to defend and indemnify City if, despite the parties intent and practice, any venue, agency, or court with competent jurisdiction determines that Contractor and/or any of its agents, officers, employees, volunteers, independent contractors, or subcontractors, are characterized as employee(s) of City. Contractor and City agree that: (a) Contractor is free from the control and direction of City in connection with the performance of the work; (b) Contractor is providing services directly to City; (c) Contractor has and will maintain at all relevant times a business license; (d) Contractor maintains a business location that is separate from City; (e) Contractor is customarily engaged in an independently established business of the same nature as that involved in the work performed hereunder; (f) Contractor actually contracts with other businesses to provide the same or similar services and maintains a clientele without restrictions from City; (g) Contractor advertises and holds itself out to the public as available to provide the same or similar services; (h) Contractor provides its own tools, vehicles, and equipment to perform the services; (i) Contractor has negotiated its own rates; (j) Contractor set its own hours and location of work in accomplishing City's on-call needs; and (k) Contractor has the right to control the manner and means of accomplishing the result desired and exercises its own expert independent judgement.

21. Contractor certifies that Contractor, its employees, directors, officers, agents, subcontractors, vendors, and volunteers are not presently debarred, excluded, suspended, declared ineligible, voluntarily excluded, or proposed for debarment, exclusion, suspension or ineligibility by any federal, state, or local department or agency.

22. This Agreement may be amended via change order, but only if such change order is made in writing, approved by the City, and signed by both parties.

The supplier named hereon by the acceptance of this order agrees to the provisions of this document titled "Contract Purchase Agreement" and all accompanying terms, conditions, and attachments.

Roseville Business License No. 00835400

Contractor License No. _____

DIR Registration No. N/A

Check mark the applicable company type below:

__X__ **Corporation**

_____ **Limited Liability Company**

_____ **Partnership**

_____ **Sole Proprietor**

City Reserves the right to withold any payments to contractor in the event of noncompliance with insurance requirements or if required by law.
General T&C
REV 3/2/21 JS

COR Insurance Over Bid Limit

ATTACHMENT A
HUMAN RESOURCES/RISK MANAGEMENT DIVISION
INSURANCE REQUIREMENTS
AGREEMENT OVER FORMAL BID LIMIT OR INVOLVING HIGH RISK ACTIVITIES

General - Required Coverage/Documentation

- General Liability: $1 Million per occurrence /$2 Million aggregate
- Automobile Liability: $1 Million combined single limit
- Workers' Compensation: Statutory *Must provide a Waiver of subrogation
- Additional Insured Endorsement (AIE) - General Liability policy: CG 20 38 04 13 or an equivalent, blanket endorsement or section of the policy. Endorsement shall cover the City of Roseville, its officers, agents, employees and volunteers as additional insured.
- Policies must be primary and non-contributory
- A 30 day notice of cancellation must be provided
- List certificate holder as: The City of Roseville - Insurance Compliance, PO Box 100085-R1, Duluth, GA 30096

Additional Liability/Insurance Requirements if required by Agreement (and marked below):

Construction:____
General Liability:
$2 Million/occurrence
$4 Million aggregate

Design Professional:____
General Liability:
$2 Million/occurrence
$4 Million aggregate
Professional Liability:
$2 Million/occurrence

Professional Consultant:____
Professional Liability:
$1 Million/occurrence

IT Services:____
Professional Liability:
$1 Million/occurrence
No auto required

Hazardous Materials:____
Pollution Liability:
$1 Million/occurrence

Special Events/Caterers-Vendors:____
No auto required
No workers' comp required

Professional Counseling/ Psychological:____
Professional Liability:
$1 Million/occurrence
No auto required

Pyrotechnics:____
General Liability:
$5 Million/occurrence
$10 Million aggregate
Auto - $2 Million/occurrence

Chemical/Environmental:____
General Liability:
$3 Million/occurrence
$6 Million aggregate
Pollution – $2 Million/Occurrence
Auto - $2 Million/Occurrence

Insurance Submission Process

The City of Roseville Human Resources/Risk Management Department uses a service called EBIX to manage our insurance certificate tracking.

How It Works

- The vendor's contact information is entered into EBIX. EBIX will contact the vendor to request proof of insurance.
- The Vendor can forward the request to their Insurance Agent(s) if necessary.
- Vendor/Insurance Agent submits insurance to EBIX by email to roseville@ebix.com or by fax to (770) 325-5727. After faxing or emailing the certificate, please DO NOT send the certificate by mail to EBIX. Please do not mail, email or fax any certificates to the City of Roseville.
- Once submitted, EBIX reviews the insurance documentation. If there are deficiencies, EBIX will send a follow up letter or email requesting additional information.

Questions Regarding Insurance Submission: Contact EBIX at (951) 652-4239
Questions Regarding Insurance Requirements Contact Risk Management at (916) 774-5202

Supplier	
Signature:	mike Menas
Print Name:	Mike Menas
Title:	President

Supplier	
Signature:	
Print Name:	
Title:	

City of Roseville, A Municipal Corporation	
Signature:	
Print Name:	Dominick Casey
Title:	City Manager

CALTAC SECURITY

ACCOUNTABILITY - INTEGRITY - COMMUNITY

April 9, 2021

City of Roseville
Attn: City Clerk Department
311 Vernon Street
Roseville, CA 95678
Email: cityclerkroseville@roseville.ca.us

RE: SECURING FACILITIES SERVICES
RFP 13-094

Dear City Clerk,

Thank you for allowing me to present CALTAC Security as a security service provider to check and secure Roseville facilities throughout the City park system. Our physical office is located at 1700 Eureka Road, Suite 130-A in Roseville, CA 95661.

CALTAC Security will perform the services and adhere to the requirements described in this RFP, including any addenda attached to this RFP. Questions from March 17, 2021 through April 5, 2021 for Bid RFP # 13-094 were reviewed on the Public Purchase system.

I am confident that you will be very satisfied with the services that we provide. If you have any questions, please feel free to contact me directly. As your needs change, we will be happy to help you evaluate options for services that will help you achieve your new goals. As the Owner of CALTAC Security I thank you for the opportunity to bid our services to you.

Sincerely,

Mike Menas

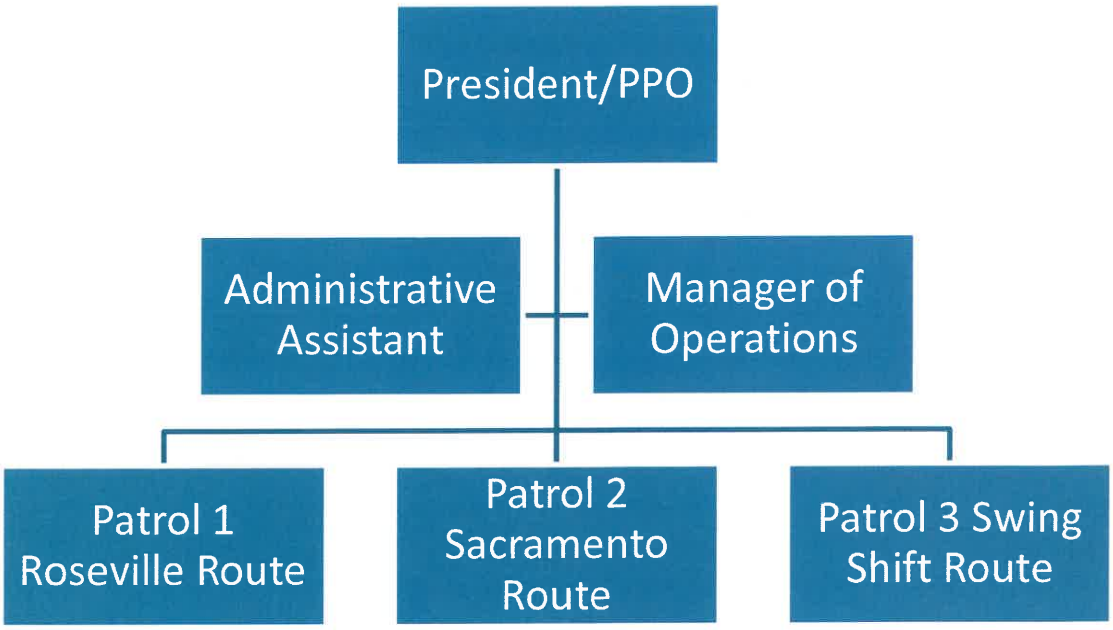
Mike Menas
President, PPO
CALTAC Security, Inc.

6.3 TAB A: Firm's Qualifications

CALTAC Security is a private security company qualified to perform the requested services by employing security guards registered with the State to provide protection services. All of our services are provided by security guards employed by the company and no sub-consultants or sub-contractors are used. All CALTAC Security patrol employees are registered with the State as a Security Guard through the Bureau of Security and Investigative Services (BSIS) and their credentials are current. During the five years CALTAC Security has been a corporation, the number of staff has grown from one to eight.

CALTAC SECURITY BUSINESS CERTIFICATIONS	NUMBER
Roseville Business License	835400
California Corporation	C3883956
California BSIS Private Patrol Operator	119779
Federal EIN	90-1130985

ORGANIZATIONAL CHART



6.4 TAB B: Experience and References

Summary of Related Experience

CALTAC Security has provided security patrol services for a variety of business at locations from El Dorado Hills, Roseville, Rocklin, Lincoln, North Highlands, Sacramento, Natomas and West Sacramento. Enforcement of trespassing laws at Business Parks, Residential Income Apartments and Commercial Strip Malls provides the experience that relates to securing Roseville facilities.

References

Reference #1 Roseville Public Cemetery District
Kelly Ehrman
421 Berry St., Roseville, CA 95678
916-783-3131
kellyrpcd@surewest.net

Service for the Roseville Cemetery began on September 1, 2016 and continues without interruption. The cemetery is unique in that it has a rotating time schedule for gates to be secured at sundown, a security patrol in the middle of the night, and patrol with unlock of the gates every morning. Solutions to challenges of the security of the cemetery have been resolved with the help of the Roseville Police always responding to our calls for help. Crimes of Vandalism, Trespassing, Driving Under the Influence, Exhibition of Speed, and use of illegal substances have been successfully handled along with clearing out people who refuse to leave at sundown.

Reference #2 NCM Property Management
Tony Zogopoulos
1700 Eureka Rd #130, Roseville, CA 95661
916-223-8284
tonyz@2NCM.com

CALTAC Security developed a business relationship with NCM with our first contract at Olympus Pointe Theater for parking lot patrol beginning April 2017 and we now provide security service to twelve of their property management locations. Commercial and Residential sites are patrolled nightly with foot patrol, vehicle patrol and parking enforcement services being provided. Ongoing protection of these sites from trespassing, vandalism, arson and transient camp development continues with CALTAC Security officers confronting subjects directly for effective crime prevention. CALTAC Security officers count on resources from seven different law enforcement agencies in three separate counties to help keep these properties secure.

Reference #3 Verdera Community Association
Leanne Luebkeman
1875 Ladera Drive, Ste. 3, Lincoln, CA 95648
(916) 253-9205
leanne@verderahoa.com

CALTAC Security patrol officers deter and detect criminal activity for the Verdera community that encompasses approximately 900 acres and has 614 home sites in Lincoln, California. Parking Enforcement is provided by using a software system developed by this community specifically for tracking violators in a fair and efficient manner with in-car, real-time systems. Our security service at this location began January 2020 and continues nightly.

6.5 TAB C: Qualifications of Team

Management

Director of Project Management
Michael Menas, President/Private Patrol Operator of CALTAC Security since March 2016
Experience and Qualifications:
Mr. Menas is a 1993 graduate of the 82nd Butte Law Enforcement Academy located in Oroville, California. Mr. Menas has extensive experience in several areas of Law Enforcement and Private Security as well as

Bachelor's degree in Business Management from National University.

Mr. Menas' private security experience is in several areas including: Starting CALTAC Security as a new business after obtaining a Private Patrol Operator's license in 2014. Prior to starting CALTAC Security, Mr. Menas worked for several private security companies to gain experience in other of the private security field such as Chief Executive Officer and Licensed Private Patrol Operator of another Roseville Security and Investigations Company, Golden State Investigating, Armed Vehicle Patrol Sergeant for two local security patrol companies, Armed, Plain-Clothes Robbery Suppression Officer for Wells Fargo Bank, and Uniformed-Armed Critical Infrastructure Protection for a large facility under Federal Contract with the Department of Energy.

Other areas of experience include ten years in Real Estate with a major accomplishment of successfully negotiating the contracts of 89 Short Sale transactions; eighteen years of retail grocery, including managing employees of the store and catching shoplifters; and six years as a Volunteer with the Placer County Sheriff's Search and Rescue Motorcycle Unit.

Designated Project Manager
Jeremy Curtis, Manager of Patrol Operations for CALTAC Security since June 2020.
Experience and Qualifications:
Previous positions held include: Security Operations Manager, Security Manager, Assistant Site Supervisor, and Day Patrol Supervisor. Supervisory and management experience including direct oversight of 6-14 guards, maintaining schedules, mentoring subordinates, and conducting update training for all officers at a secure federal facility. Management of the Security Department at a high-end country club to include budgeting, training, testing of security and fire detection systems and integration of new security hardware. Familiar with Critical Infrastructure Protection Standards as it pertains to physical security. Jeremy is licensed by the Bureau of Security and Investigative Services with a guard card, chemical agents, baton, taser, exposed firearm, and also current with first aid and CPR certifications.

Team Members

Tim Gilbert, Security Patrol Officer for CALTAC Security since April 2019
Experience and Qualifications:
Eight years of armed and unarmed security officer experience with four other security companies in the Sacramento area. Tim is licensed by the Bureau of Security and Investigative Services with a guard card, chemical agents, baton, taser, and exposed firearm permits.

Tristan Christ, Security Patrol Officer for CALTAC Security since August 2020
Experience and Qualifications:
With previous skills as a landscape foreman and as a preschool teacher, Tristan began working as a security patrol officer after being licensed by the Bureau of Security and Investigative Services with a guard card, chemical agents, taser, and is also current with first aid and CPR certifications.

Ivan Gomez, Security Patrol Officer for CALTAC Security since November 2020
Experience and Qualifications:
Bachelor of Science – Criminal Justice, has worked for three other security companies as an armed or unarmed security officer. Ivan is licensed by the Bureau of Security and Investigative Services with a guard card, chemical agents, baton, taser, and exposed firearm permits and is bilingual in Spanish.

Damion Dossett, Security Patrol Officer for CALTAC Security since February of 2021
Experience and Qualifications:

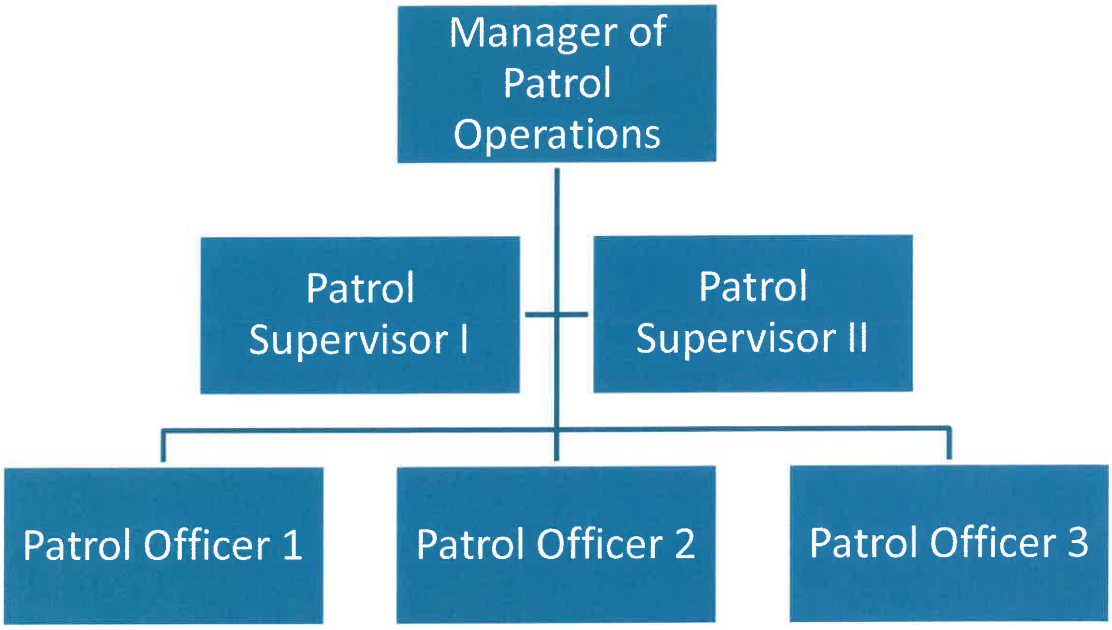
Security Guard Supervisor and Asset Protection Specialist in Shoplifter Apprehension, Mobile Security Patrol Officer and the Security Lead for event security overseeing scheduling and payroll of a staff of 40-60 employees. Damion is licensed by the Bureau of Security and Investigative Services with a guard card, and chemical agents permit.

Francisco Ramos, Security Patrol Officer for CALTAC Security since March 2021

Experience and Qualifications:

Eleven years as a Security Officer including Standing Guard, Patrol Driver, Patrol Supervisor, Doorman/Bouncer and previously with CALTAC Security for two more years. Francisco is licensed by the Bureau of Security and Investigative Services with a guard card, chemical agents, baton, and taser.

Project Team Organizational Diagram



Geographical Location of the Firm is the Roseville/Sacramento Area. No sub-consultants or sub-contractors will be used for this project.

6.6 TAB D: Project Understanding

Based on the available information, supplemental research, field observations, and experience with similar projects, our understanding of the services requested in this RFP is to contract with the City of Roseville for Securing Facilities Services where our private security officers will be locking gates and restroom doors after checking to ensure the facilities are unoccupied. The optimal working relationship would be a partnership where our team is the eyes and ears for city staff to help maintain our parks and facilities. Our approach to facilitate this is to maintain good communication between CALTAC Security management and Park Operations staff with regular reporting of park conditions. Any issues that may have required special attention were addressed in the RFP and the Addendums.

Our unique approach to this project includes training and information for the security patrol officers to be familiar with Roseville Municipal Code 8.02.316, the Park and Park Facility Exclusions regulation that covers all parks and park facilities. This regulation allows any parks, recreation and libraries employee or police officer to exclude any person who, while present in a park or park facility, violates any applicable ordinance, statute, posted rule or regulation, or city policy after being put on notice of same. Security Patrol Officer awareness of this regulation and cooperation with the Roseville Police Department will help to limit illegal activity at the Roseville parks and facilities by enforcing this regulation.

6.7 TAB E: Project Plan

Our methodology to successfully implementing this project is to integrate the newly acquired Roseville City park properties within our existing patrol routes, not to create one new route with one driver and one car. CALTAC Security deploys three patrol cars to this area nightly, with security officers servicing three different patrol routes. The system of integrating the Roseville facilities into our current patrol routes is to assign certain park facilities to all three of these patrols. This allows for a saturation of checking the facilities and providing lock-ups within a timely manner. It also provides an immediate back-up system whereby two other patrol cars are immediately available should one of the security officer/patrol car units experience a delay. Further redundancy with the back-up system is the immediate availability of the Manager of Patrol Operations being a stand-by position that is ready to continue service, if required.

The work schedule coincides with the timing to close the parks at the correct time. Staff assigned to each task includes Patrol Officer 1, 2 and 3 with the Team Members listed in Section 6.5 TAB C. No sub-consultants or sub-contractors will be used for this project. Necessary equipment will be the use of our CALTAC Security marked patrol cars, issued patrol car cell phones and the reporting software system with photos. CALTAC Security employees will be in a State approved uniform with State approved badges and patches. Training will be provided by our Manager of Patrol Operations who will lead and control this project.

Patrol Route Integration Plan

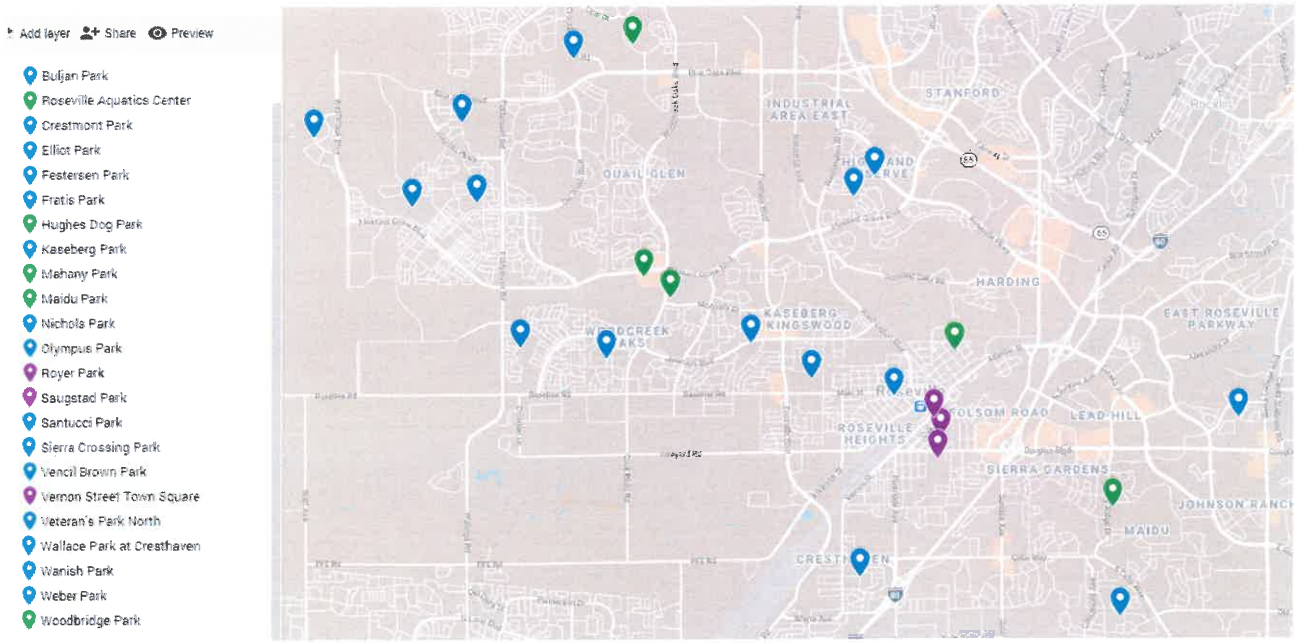
Facilities would be added to our existing patrol routes at times that coincide with park closing. The timing is dynamic to adhere to the park closing rules: Parks without sports court or field lighting shall be locked no earlier than sunset; and parks identified with sports court or field lighting will be locked no earlier than 11pm.

(continued next page)

Roseville Park Patrol Route Assignments for each patrol (Dynamic timing with sunset closures):

PATROL ROUTE - 1		PATROL ROUTE - 2		PATROL ROUTE - 3	
1	Maidu	1	Vernon Street Town Square	1	Olympus Park
2	Woodbridge	2	Royer Park	2	Crestmont
3	Roseville Aquatic Center	3	Saugstad Park & Dog Run	3	Wallace
4	Mahany			4	Weber
5	Hughes Dog Park			5	Kaseberg
				6	Wanish
				7	Elliot
				8	Santucci
				9	Sierra
				10	Fratis
				11	Festersen
				12	Nichols
				13	Veteran's Park North
				14	Vencil Brown
				15	Buljan

Roseville Park Locations for Patrol Route Assignments for each patrol:



6.8 TAB F: Cost Proposal

Total Cost Proposal

Service for facilities listed on Attachment I, per year	$61,612.00
Service for facilities listed on Attachment I, per month	$5,134.34

Breakdown of Task Cost

Add/Remove a Restroom; per unit	$5.60
Add/Remove a Gate; per unit	$4.80
Add/Remove a facility with Auto Lock Restrooms/Restroom Check; per unit	$5.60
Additional Security drive through of a facility; per unit	$5.00

Hourly Rates

Onsite Security Detail (Staff onsite entire time) Unarmed; per hour	$27.00
Onsite Security Detail (Staff onsite entire time) Armed; per hour	$37.00

Amount of time each person will be devoted to this project, nightly

Patrol - 1	One Hour
Patrol - 2	Half Hour
Patrol - 3	Two Hours

Reimbursable Expenses

There are no known reimbursable expenses at this time.

6.9 TAB G: Required Statements/Documents

Statements of assurance regarding the following requirements in the proposal:

Non-substitution for the designated members of the team without approval by City staff (Section 5.0).

Proposer assures that the designated project team, including sub-consultants or sub-contractors (if any), is used for this project. Departure or reassignment of, or substitution for, any member of the designated project team, sub-consultant(s) or sub-contractor(s) shall not be made without the prior written approval of the City.

Absence of a conflict of interest (Section 10.4)

The Contractor warrants that no official or employee of the City has an interest, has been employed or retained to solicit or aid in the procuring of the resulting contract, nor that any such person will be employed in the performance of such contract without immediate divulgence of such fact to the City. Contractor submitting this proposal in response to the RFP discloses that there are no actual, apparent, direct, indirect, or potential conflicts of interest that may exist with respect to the Contractor or the Contractor's management or employees relative to the services to be provided to the City.

Ability and agreement to fulfill the indemnification and insurance requirements contained in the sample contract (Section 10.7).

CALTAC Security agrees to the City's standard indemnification and insurance requirements that have been provided in the sample contract, included in Attachment C of the RFP. All costs of complying with the insurance requirements have been included in the pricing. CALTAC Security will provide complete and valid insurance certificates within ten (10) days of the City's written request.

Proprietary Information (Section 10.23).
Nothing contained in the submitted proposal is proprietary.

Attachment A

PROPOSER'S CERTIFICATION

I hereby propose to furnish the goods or services specified in the Request for Proposals ("RFP"). I agree that my proposal will remain firm for a period of up to ninety (90) days in order to allow the City of Roseville ("City") adequate time to evaluate the qualifications submitted.

I have carefully examined the Request for Proposals and any other documents accompanying or made a part of this RFP. The information contained in this proposal is true and correct to the best of my knowledge and is signed under penalty of perjury under the laws of the State of California. I further certify that I am duly authorized to submit this proposal on behalf of the firm as its authorized agent and that the firm is ready, willing and able to perform if awarded the contract.

I further certify that this proposal is made without prior understanding, agreement, connection, discussion, or conspiracy with any other person, firm or corporation submitting a proposal for the same product or service; that this proposal is fair and made without outside control, collusion, fraud or illegal action; that no officer, employee or agent of the City or any other proposer is financially interested in said proposal; that no undue influence or pressure was used against or in concert with any officer, employee or agent of the City in connection with the award or terms of the contract that will be executed as a result of this RFP; and that the undersigned executed this Proposer's Certification with full knowledge and understanding of the matters therein contained and was duly authorized to do so.

CALTAC Security

NAME OF BUSINESS

Michael J Menas

SIGNATURE

Michael J. Menas, President

NAME & TITLE, TYPED OR PRINTED

1079 Sunrise Avenue, Suite B-25, Roseville, CA 95661

MAILING ADDRESS

(916) 422-5822

TELEPHONE NUMBER

mike@caltacsecurity.com

EMAIL

Type of Organization: Corporation State of Incorporation: California

Attachment D

NONCOLLUSION DECLARATION TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

The undersigned declares:

I am the President of CALTAC Security, the party making the foregoing bid.

The bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation. The bid is genuine and not collusive or sham. The bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid. The bidder has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or to refrain from bidding. The bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder. All statements contained in the bid are true. The bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof, to effectuate a collusive or sham bid, and has not paid, and will not pay, any person or entity for such purpose.

Any person executing this declaration on behalf of a bidder that is a corporation, partnership, joint venture, limited liability company, limited liability partnership, or any other entity, hereby represents that he or she has full power to execute, and does execute, this declaration on behalf of the bidder.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on April 9, 2021, at Roseville, California.



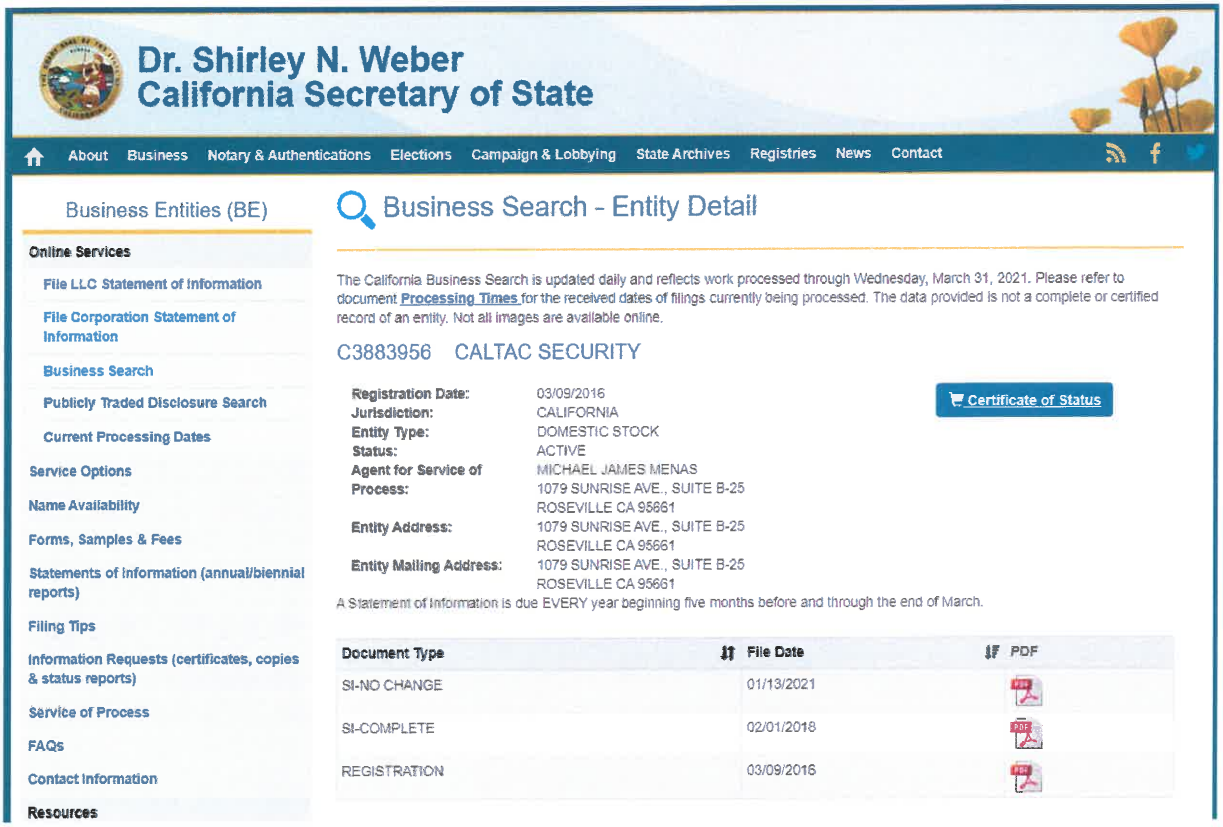
(Signature of Declarant)

Attachment E

PROOF OF REGISTRATION WITH THE CALIFORNIA SECRETARY OF STATE

CALTAC Security is registered with the State of California as a Subchapter S Corporation

Entity Number: C3883956
Registration Date: 03/09/2016
Status: ACTIVE



Dr. Shirley N. Weber
California Secretary of State

About | Business | Notary & Authentications | Elections | Campaign & Lobbying | State Archives | Registries | News | Contact

Business Entities (BE)

Online Services
- File LLC Statement of Information
- File Corporation Statement of Information
- Business Search
- Publicly Traded Disclosure Search
- Current Processing Dates

Service Options
Name Availability
Forms, Samples & Fees
Statements of Information (annual/biennial reports)
Filing Tips
Information Requests (certificates, copies & status reports)
Service of Process
FAQs
Contact Information
Resources

Business Search - Entity Detail

The California Business Search is updated daily and reflects work processed through Wednesday, March 31, 2021. Please refer to document Processing Times for the received dates of filings currently being processed. The data provided is not a complete or certified record of an entity. Not all images are available online.

C3883956 CALTAC SECURITY

Certificate of Status

Registration Date:	03/09/2016
Jurisdiction:	CALIFORNIA
Entity Type:	DOMESTIC STOCK
Status:	ACTIVE
Agent for Service of Process:	MICHAEL JAMES MENAS 1079 SUNRISE AVE., SUITE B-25 ROSEVILLE CA 95661
Entity Address:	1079 SUNRISE AVE., SUITE B-25 ROSEVILLE CA 95661
Entity Mailing Address:	1079 SUNRISE AVE., SUITE B-25 ROSEVILLE CA 95661

A Statement of Information is due EVERY year beginning five months before and through the end of March.

Document Type	File Date	PDF
SI-NO CHANGE	01/13/2021	
SI-COMPLETE	02/01/2018	
REGISTRATION	03/09/2016	

Attachment F

CONTRACTOR LICENSES

Roseville Business License

BUSINESS LICENSE CERTIFICATE

"For Services Provided in the City of Roseville, California Only"

CITY OF ROSEVILLE
TRADITION · PRIDE · PROGRESS

8839 N Cedar Ave #212
Fresno, CA 93720-1832
License Division - (916) 774-5310

BUSINESS NAME: CALTAC SECURITY, INC.

DESCRIPTION: PRIVATE SECURITY

BUSINESS LOCATION: 1079 SUNRISE AVE STE B25
ROSEVILLE, CA 95661-7009

BUSINESS OWNER: CALTAC SECURITY, INC.

Special Conditions: PRIVATE PATROL/SECURITY

LICENSE

CALTAC SECURITY, INC.
1079 SUNRISE AVE STE B-25
ROSEVILLE, CA 95661-7009

Business License Number: 00835400

Effective Date: January 01, 2021

Expiration Date: December 31, 2021

TO BE POSTED IN A CONSPICUOUS PLACE

NOT TRANSFERABLE

Private Patrol Operator License

STATE OF CALIFORNIA
dca
DEPARTMENT OF CONSUMER AFFAIRS

Renewal License

Bureau of Security and Investigative Services
P.O. Box 989002
West Sacramento, CA 95798-9002
(916) 322-4000

PRIVATE PATROL OPERATOR

License No. PPO119779

Valid Until: 05/31/2022

Receipt No. 6579

CALTAC SECURITY
1079 SUNRISE AVE STE B25
ROSEVILLE, CA 95661-7009

In accordance with the provisions of Division 3, Chapter 11.5 of the Business and Professions Code, the company named hereon is issued a Private Patrol Operator License Renewal.

---- NON-TRANSFERABLE ----- POST IN PUBLIC VIEW -----

WPIPPO 10/2015

Attachment G

SUBCONTRACTOR LIST

No subcontractors will be used for this project.

6.10 TAB H: Exceptions

CALTAC Security does not propose any exceptions, alterations or amendments to the Scope of Services or other requirements of this RFP, including the Sample Contract (Attachment B).

6.11 TAB I: Competency of Proposers

Statement of Financial Resources:

CALTAC Security has the necessary facilities, ability, experience, and financial resources to provide the services specified herein in a satisfactory and timely manner. CALTAC Security has no pending bankruptcies, liens, stop payment notices, judgments, lawsuits, arbitrations, mediations, foreclosures, or any similar actions filed or resolved in the past seven (7) years. No clients have ever terminated a contract with CALTAC Security for breach. CALTAC Security maintains the funds necessary to maintain a staff of regular employees, and to insure continuous performance of work. The equipment for the work contemplated is sufficient, adequate and suitable.

COUNCIL COMMUNICATION

CC #: 1547
File #: 0704-01

Title: William "Bill" Hughes Park Shade Sails – Contract Purchase Agreement
Contact: Tara Gee 916-774-5253 tgee@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 7.7.

RECOMMENDATION TO COUNCIL

Staff recommends City Council adopt a resolution approving Contract Purchase Agreement (CPA) #3001165 with Ross Recreation Equipment Company, Inc., and authorize the City Manager to execute it on behalf of the City of Roseville.

BACKGROUND

In May 2020, a budget adjustment was approved allocating funds from the Diamond Creek CFD 1 (Fund 3016) fund for the addition of the shade structures at William "Bill" Hughes Park. The Contract Purchase Agreement (CPA) outlines a cost of $117,026, which includes all labor, materials, bonds and structural calculations. The addition of the shade sails is consistent with the work plan outlined in the bond refunding process during FY2018-19 from Diamond Creek CFD 1 (Fund 3016).

FISCAL IMPACT

A budget adjustment was approved in May 2020 allocating funds from Diamond Creek CFD 1 (Fund 3016) towards specific projects at Duke Davis and William "Bill" Hughes Parks. The work at Duke Davis Park is complete. These upgrades will require no General Fund resources.

ENVIRONMENTAL REVIEW

The proposed project involves the minor alteration of an existing facility. This activity is categorically exempt from CEQA as a Class 1 Exemption (State CEQA Guidelines Section 15301). The Exemption has been prepared and no further CEQA action is required.

CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

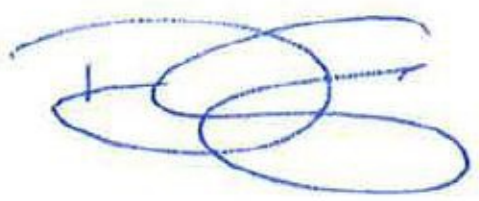
Goal C - Maintain a safe and healthy community
Goal E - Deliver exceptional city services

Goal F - Invest in well-planned infrastructure and growth

Respectfully Submitted,

Tara Gee, Park Planning & Development Superintendent

Jill Geller, Parks, Recreation & Libraries Director



_____

Dominick Casey, City Manager

ATTACHMENTS:

Description

Resolution 21-279

CPA Signed

RESOLUTION NO. 21-279

APPROVING A CONTRACT PURCHASE AGREEMENT, BY AND BETWEEN THE CITY OF ROSEVILLE AND ROSS RECREATION EQUIPMENT COMPANY, INC., AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE

WHEREAS, a contract purchase agreement (3001165), to provide and install playground shade structures at William "Bill" Hughes Park, by and between the City of Roseville and Ross Recreation Equipment Company, Inc., has been reviewed by the City Council.

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Roseville that said contract purchase agreement is approved and that the City Manager is authorized to execute it on behalf of the City of Roseville.

PASSED AND ADOPTED by the Council of the City of Roseville this____day of _____, 2021, by the following vote on roll call:

AYES COUNCILMEMBERS:

NOES COUNCILMEMBERS:

ABSENT COUNCILMEMBERS:

_____
MAYOR

ATTEST:

_____
City Clerk

CITY OF ROSEVILLE CALIFORNIA

Contract Purchase Agreement 3001165

Supplier Details:

Company	Ross Recreation Equipment
Contact	Eric Jones
Address	100 Brush Creek Rd
	#206
	Santa Rosa, CA 95404

Submit your response to:

Company	City of Roseville
Contact	Sue Jessup
Address	Purchasing Division
	2075 Hilltop Circle
	Roseville, CA 95747
Phone	(916) 746-1702
Fax	(916) 774-5736
E-mail	SJessup@roseville.ca.us

This Contract Purchase Agreement is sent for your review and acceptance. Notify the Buyer via email of any needed changes to the company name, address, and contact information. The Buyer will update the agreement prior to you signing the document.

Return signed copies of the agreement to the Buyer noted on the agreement. Alterations or modifications to the agreement are not allowed. Upon receipt of all necessary documents, the City will sign the agreement and return a fully executed copy to you. Receipt of the signed copy will be your notice to proceed with the work in accordance with the terms and conditions of the agreement. Work must not begin until the contract has been fully executed.

The following guidelines must be followed for the signature block on the agreement:

Sole proprietorship - **By owner**

Partnership - **Any general partner**

Corporation - **Two options:**
(1) A signature from the President and the corporate seal; **OR**
(2) One signature from the Chairman of the Board, President, or any Vice President **AND** one signature from the Secretary, any Assistant Secretary, Chief Financial Officer, or any Treasurer or Assistant Treasurer of the corporation

*General Manager, Office Manager and/or Sales Manager are **not** corporate officer titles. The agreement will be rejected if not signed in accordance with these guidelines.

Insurance requirements:
The City's insurance requirements are referenced on Attachment A of the agreement. By signing the agreement, you are confirming that your company has the minimum insurance limits required.

CITY OF ROSEVILLE CALIFORNIA

Contract Purchase Agreement 3001165

Agreement	**3001165**
Agreement Date	**14-MAY-2021**
Revision	**0**
Agreement Amount	**117,025.30 USD**

Invoice To	**City of Roseville** **Accounts Payable** **311 Vernon St** **ROSEVILLE CA 95678**	Supplier	**Ross Recreation Equipment** 100 Brush Creek Rd #206 Santa Rosa, CA 95404
Phone:	(916) 774-5488	**Phone:**	(855) 892-3240
Fax:	(916) 784-3796	**Fax:**	()
Email:	accountspayable@roseville.ca.us	**Email:**	ericj@rossrec.com

Description of Labor, equipment and/or materials

THE VENDOR SHALL PROVIDE AND INSTALL PLAYGROUND SHADE STRUCTURE AT WILLIAM "BILL" HUGHES PARK IN ACCORDANCE WITH THE ATTACHED ROSS RECREATION EQUIPMENT QUOTATION# 00030610 DATED 4/23/2021 UTILIZING THE NPP CONTRACT PS21070.

START DATE: EXECUTED AGREEMENT
END DATE: UPON FINAL PAYMENT

CONTACT STACIE MARCHETTI AT (916) 774 5246 OR EMAIL AT SMARCHETTI2@ROSEVILLE.CA.US FOR QUESTIONS REGARDING THIS AGREEMENT.

Customer #	Supplier #	Payment Terms	Freight Terms	FOB	Shipping Method
	10319	**Net 30**	**Freight on Board at the destination**	**Destination**	**Best Method**

Start Date	End Date	Confirm To
		Sue Jessup Phone **1-916-746-1702**

Attention: Total Cost not to exceed the agreement amount without prior approval of the Purchasing office.

practice, any venue, agency, or court with competent jurisdiction determines that Contractor and/or any of its agents, officers, employees, volunteers, independent contractors, or subcontractors, are characterized as employee(s) of City.
Contractor and City agree that: (a) Contractor is free from the control and direction of City in connection with the performance of the work; (b) Contractor is providing services directly to City; (c) Contractor has and will maintain at all relevant times a business license; (d) Contractor maintains a business location that is separate from City; (e) Contractor is customarily engaged in an independently established business of the same nature as that involved in the work performed hereunder; (f) Contractor actually contracts with other businesses to provide the same or similar services and maintains a clientele without restrictions from City; (g) Contractor advertises and holds itself out to the public as available to provide the same or similar services; (h) Contractor provides its own tools, vehicles, and equipment to perform the services; (i) Contractor has negotiated its own rates; (j) Contractor set its own hours and location of work in accomplishing City's on-call needs; and (k) Contractor has the right to control the manner and means of accomplishing the result desired and exercises its own expert independent judgement.

The supplier named hereon by the acceptance of this order agrees to the provisions of this document titled "Contract Purchase Agreement" and all accompanying terms, conditions, and attachments.

Roseville Business License No. 00828095

Contractor License No. 520752

DIR Registration No. 1000003500

Check mark the applicable company type below:

✓ **Corporation**

_____ **Limited Liability Company**

_____ **Partnership**

_____ **Sole Proprietor**

City Reserves the right to withold any payments to contractor in the event of noncompliance with insurance requirements or if required by law.
Construction T&C
REV 3/20/20 JS

ATTACHMENT A
HUMAN RESOURCES/RISK MANAGEMENT DIVISION
INSURANCE REQUIREMENTS
AGREEMENT OVER FORMAL BID LIMIT OR INVOLVING HIGH RISK ACTIVITIES

General - Required Coverage/Documentation

- General Liability: $1 Million per occurrence /$2 Million aggregate
- Automobile Liability: $1 Million combined single limit
- Workers' Compensation: Statutory *Must provide a Waiver of subrogation
- Additional Insured Endorsement (AIE) - General Liability policy: CG 20 38 04 13 or an equivalent, blanket endorsement or section of the policy. Endorsement shall cover the City of Roseville, its officers, agents, employees and volunteers as additional insured.
- Policies must be primary and non-contributory
- A 30 day notice of cancellation must be provided
- List certificate holder as: The City of Roseville - Insurance Compliance, PO Box 100085-R1, Duluth, GA 30096

Additional Liability/Insurance Requirements if required by Agreement (and marked below):

Construction:__X__
General Liability:
$2 Million/occurrence
$4 Million aggregate

Design Professional:____
General Liability:
$2 Million/occurrence
$4 Million aggregate
Professional Liability:
$2 Million/occurrence

Professional Consultant:____
Professional Liability:
$1 Million/occurrence

IT Services:____
Professional Liability:
$1 Million/occurrence
No auto required

Hazardous Materials:____
Pollution Liability:
$1 Million/occurrence

Special Events/Caterers-Vendors:____
No auto required
No workers' comp required

Professional Counseling/ Psychological:____
Professional Liability:
$1 Million/occurrence
No auto required

Pyrotechnics:____
General Liability:
$5 Million/occurrence
$10 Million aggregate
Auto - $2 Million/occurrence

Chemical/Environmental:____
General Liability:
$3 Million/occurrence
$6 Million aggregate
Pollution – $2 Million/Occurrence
Auto - $2 Million/Occurrence

Insurance Submission Process

The City of Roseville Human Resources/Risk Management Department uses a service called EBIX to manage our insurance certificate tracking.

How It Works

- The vendor's contact information is entered into EBIX. EBIX will contact the vendor to request proof of insurance.
- The Vendor can forward the request to their Insurance Agent(s) if necessary.
- Vendor/Insurance Agent submits insurance to EBIX by email to roseville@ebix.com or by fax to (770) 325-5727. After faxing or emailing the certificate, please DO NOT send the certificate by mail to EBIX. Please do not mail, email or fax any certificates to the City of Roseville.
- Once submitted, EBIX reviews the insurance documentation. If there are deficiencies, EBIX will send a follow up letter or email requesting additional information.

Questions Regarding Insurance Submission: Contact EBIX at (951) 652-4239
Questions Regarding Insurance Requirements Contact Risk Management at (916) 774-5202

Contract Terms and Conditions

1. To the fullest extent allowed by law, Contractor shall defend, indemnify, and save and hold harmless the City, its officers, agents, employees and volunteers from any claims, suits or actions of every name, kind and description brought forth, or on account of, injuries to or death of any person (including but not limited to workers and the public), or damage to property, resulting from or arising out of Contractor's willful misconduct or negligent act or omission while engaged in the performance of obligations or exercise of rights created by this Agreement, except those matters arising from City's sole or active negligence or willful misconduct. The parties intend that this provision shall be broadly construed. Contractor's responsibility for such defense and indemnity obligations shall survive the termination or completion of this Agreement for the full period of time allowed by law. The defense and indemnity obligations of this Agreement are undertaken in addition to, and shall not in any way be limited by, the insurance obligations contained in this Agreement.

2. Contractor is an independent contractor, and shall not be considered an officer, agent or employee of the City.

3. Without the written consent of the City, this Agreement is not assignable by Contractor either in whole or in part.

4. Time is of the essence of this Agreement.

5. At any time during the term of this Agreement, the City has the right to terminate this Agreement, provided Contractor is given thirty (30) days written notice. City's termination shall be without further liability to City; however, Contractor shall be entitled to all costs reasonably incurred prior to the date of termination. Contractor acknowledges that City may terminate this Agreement should funds not be appropriated by its governing body to continue services under this Agreement.

6. This Agreement may only be amended or modified in writing. It is integrated and contains the complete understanding of the parties.

7. All equipment, supplies and services sold to the City of Roseville shall conform to the general safety orders of the State of California.

8. Unless notified to the contrary, in writing, the City assumes that the Contractor has accepted the work in accordance with the plans and specifications (if any) and agrees to do the work in compliance with this Agreement.

9. All prevailing wages and fair employment practices must be adhered to. For prevailing wage contracts over $25,000, copies of certified payroll must be submitted with invoices. Prevailing wage rates may be obtained from the State Department of Industrial Relations and/or the following website address: http://www.dir.ca.gov/dlsr/DPreWageDetermination.htm.

10. Contractor agrees to the below insurance requirements:

    a. Unless otherwise specified, the Contractor shall maintain the policies of insurance outlined in Attachment A, incorporated herein by this reference, in full force and effect during the term of this Agreement. The City of Roseville retains sole discretion in determining the types and proper levels of insurance coverage.

b. Form. Contractor shall submit a certificate evidencing such coverage for the period covered by this Agreement in a form satisfactory to Risk Management and the City Attorney, prior to undertaking any work hereunder. Any insurance written on a claims made basis is subject to the approval of Risk Management and the City Attorney.

c. Additional Insureds. Contractor shall also provide a separate endorsement or section of the policy showing City, its officers, agents, employees, and volunteers as additional insureds for each type of coverage (except Workers' Compensation) and for ongoing and completed operations. Such insurance shall specifically cover the contractual liability of Contractor. The additional insured coverage under the Contractor's policy shall be primary and noncontributory, as evidenced by a separate endorsement or section of the policy, and shall not seek contribution from City's insurance or self-insurance. In addition, the additional insured coverage shall be at least as broad as the Insurance Services Office (ISO) CG 20 01 Endorsement. Any available insurance proceeds in excess of the specified minimum insurance coverage requirements and limits shall be available to the additional insureds. Furthermore, the requirements for coverage and limits shall be:

(1) the minimum coverage and limits specified in this Agreement; or
(2) the full coverage and maximum limits of any insurance proceeds available to the named insureds, whichever is greater.

d. Cancellation/Modification. Contractor shall provide ten (10) days written notice to City prior to cancellation or modification of any insurance required by this Agreement.

e. Umbrella/Excess Insurance. The limits of insurance required in this Agreement may be satisfied by a combination of primary and excess insurance. Any excess insurance shall contain or be endorsed to contain a provision that such coverage shall also apply on a primary and noncontributory basis for the benefit of City (if agreed to in a written contract) before City's own insurance shall be called upon to protect it as a named insured.

f. Subcontractors. Contractor agrees to include in its contracts with all subcontractors the same requirements and provisions of this Agreement, including the indemnity and insurance requirements, to the extent they apply to the scope of the subcontractor's work. Furthermore, Contractor shall require its subcontractors to agree to be bound to Contractor and City in the same manner and to the same extent as Contractor is bound to City under this Agreement. Additionally, Contractor shall obligate its subcontractors to comply with these same provisions with respect to any tertiary subcontractor, regardless of tier. A copy of City's indemnity and insurance provisions will be furnished to the subcontractor or tertiary subcontractor upon request.

g. Self-Insured Retentions. All self-insured retentions (SIR) must be disclosed to Risk Management for approval and shall not reduce the limits of liability. Policies containing any SIR provision shall provide or be endorsed to provide that the SIR may be satisfied by either the named insured or City. City reserves the right to obtain a full certified copy of any insurance policy and endorsements. The failure to exercise this right shall not constitute a waiver of such right.

h. Waiver of Subrogation. Contractor hereby agrees to waive subrogation which any insurer of Contractor may acquire from Contractor by virtue of the payment of any loss under a Workers Compensation, Commercial General Liability or Automobile Liability policy. All Workers Compensation, Commercial General

Liability and Automobile Liability policies shall be endorsed with a waiver of subrogation in favor of City, its officers, agents, employees and volunteers for all work performed by Contractor, its employees, agents and subcontractors.

i. Liability/Remedies. Insurance coverage in the minimum amounts set forth herein shall not be construed to relieve Contractor of liability in excess of such coverage, nor shall it preclude City from taking such other actions as are available to it under any other provisions of this Agreement or law.

11. Contractor shall comply with all federal, state and local laws and ordinances, including but not limited to the City's storm water regulations, as may be applicable to the performance of services under this Agreement. Failure to comply with local ordinances may result in monetary fines and cancellation of this Agreement. Refer to www.roseville.ca.us/stormwater for links to more information on the City's storm water regulations.

12. In the event that the terms of any attachment or exhibit conflict with any terms of this Agreement, the terms of this Agreement shall control.

13. This Agreement may be executed in one or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. In the event that any signature is delivered by facsimile transmission or by e-mail delivery of a ".pdf" format data file, such signature shall create a valid and binding obligation of the party executing (or on whose behalf such signature is executed) with the same force and effect as if such facsimile or ".pdf" signature page were an original thereof.

14. If either party commences any legal action against the other party arising out of this Agreement or the performance thereof, the prevailing party in such action shall be entitled to recover its reasonable litigation expenses, including but not limited to, court costs, expert witness fees, discovery expenses, and attorneys' fees. Any action arising out of this Agreement shall be brought in Placer County, California, regardless of where else venue may lie. This Agreement shall be governed by and construed in accordance with the laws of the State of California.

15. This Agreement shall be binding upon the heirs, successors, executors, administrators and assigns of the respective parties hereto.

16. If any of the provisions contained in this Agreement are for any reason held invalid or unenforceable, such holding shall not affect the remaining provisions or the validity and enforceability of the Agreement as a whole.

17. For purposes of this Agreement, the terms "Contractor," "Consultant," and "Supplier" are used interchangeably.

18. No contractor or subcontractor may work on a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5. During the performance of this agreement, Contractor and its subcontractors shall have a continuing legal obligation to maintain current registration with the Department of Industrial Relations. Contractor is hereby notified that this project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

19. Contractor must submit all claims as defined in and in accordance with the claim resolution process set forth in Section 9204 of the Public Contract Code. Each such claim must be sent to the City by registered mail or certified mail with return receipt requested and must contain reasonable documentation to support the claim. All claims must be received prior to acceptance of the work.

20. Contractor agrees to defend and indemnify City if, despite the parties intent and

Supplier	
Signature:	
Print Name:	Nick Philbin
Title:	General Manager/Owner

Supplier	
Signature:	
Print Name:	
Title:	

City of Roseville, A Municipal Corporation	
Signature:	
Print Name:	**Dominick Casey**
Title:	**City Manager**

R•SS
Recreation Equipment
Building Community since 1973

Opportunity Name	Hughes Park Shade
Quote Name	Hughes Park Shade Option 1
Quote Number	00030610
Quote Date	4/23/2021
Quote Exp Date	6/23/2021
Est Lead Time	5-7 weeks

Bill To Name	City of Roseville
Bill To	311 Vernon Street Roseville, California 95678 United States

Ship To Name	William "Bill" Hughes Park
Ship To	2796 McCloud Wy Roseville, California 95747 United States

Quantity	Product	Product Description	Sales Price	Total Price
1.00	Bond	Bond - Standard 3% on total project amount including tax and freight.	$3,408.00	$3,408.00
1.00	Custom Canopies	Custom Canopies (1) 35'x24' Double Hypar shade sail, 2 posts at 27' above grade, 2 posts at 23' above grade, 1 post at 15' above grade, 2 posts at 12' above grade. (1) 20'x16' Double Hypar shade sail, (1) 28'x21' Hypar shade sail, 2 posts at 20' above grade 2 posts at 15' above grade. Includes rebar cages for (11) footings and associated installation hardware. *Confirm post color_____ *Confirm canvas color_____	$40,055.00	$40,055.00
1.00	Engineering Fees	Structural Engineering Calculations May take 2-3 weeks to complete engineering. Soils Report needed. *Customer must approve before fabrication can begin. Revisions to engineering calculations may require a change order. Lead time for equipment/materials will not begin until receipt of approved engineering to ensure proper manufacturing per engineering specifications. Before Engineering can begin we need 1. Fed Ex Address to send engineering 2. Address of Structure 3. Required Building Code: Wind Load: Snow Load:	$2,880.00	$2,880.00
1.00	Install-Shade	Installation of Custom Canopies (1) 35'x24' Double Hypar shade sail, (1) 20'x16' Double Hypar shade sail, (1) 28'x21' Hypar shade sail only by a factory certified installer at prevailing wage rates. Installation of (7) direct bury of 36' x 8' footers and (4) direct bury 30" x 6' footers, 11 total. Project DIR # needed for State Prevailing Wage _____ **Installation price quoted for favorable working conditions. If rock, poor soil conditions, a high water table and/or other unforeseen site conditions exist requiring additional materials and labor, additional charges may be incurred.	$62,694.00	$62,694.00
1.00	NPP Ross Discount	NPP Ross Discount	-$2,002.75	-$2,002.75
1.00	Rentals	Security Fencing, 420 lineal feet, for duration of project.	$2,702.00	$2,702.00

Total Quote Amounts

County/ City Tax	Placer County/ Roseville	Materials Amount	$38,052.25
Tax Rate	7.7500%	Tax Amount	$2,949.05

Prepared By Eric Jones
Email ericj@rossrec.com

R•SS
Recreation Equipment

Building Community since 1973

Opportunity Name	Hughes Park Shade
Quote Name	Hughes Park Shade Option 1
Quote Number	00030610
Quote Date	4/23/2021
Quote Exp Date	6/23/2021
Est Lead Time	5-7 weeks

Bill To Name	City of Roseville
Bill To	311 Vernon Street Roseville, California 95678 United States

Ship To Name	William "Bill" Hughes Park
Ship To	2796 McCloud Wy Roseville, California 95747 United States

Credit Terms	Net 30 On Materials Shipment	Labor Amount	$71,684.00
		Freight Amount	$4,340.00
		Total	$117,025.30

Notes to Customer

Thank you for the opportunity to quote your upcoming project. PLEASE NOTE: quote does not include installation, offload, payment and performance bonds, engineering calculations, security, storage, permits, inspection, or safety surfacing unless otherwise noted.

Deposits may be required before order can be placed depending on customer credit terms. Your purchase is subject to the terms and conditions of this quote, approval of this quote agrees to those terms.

If ordering materials after the expiration date, please add 3-6% annually to materials for anticipated price increase. If this is for a BID, it is the responsibility of the General Contractor bidding to adjust their bid to accommodate anticipated pricing. Please also note that sales tax will be based on the current rate at the time of shipping, not order date. Customer will be expected to cover these taxes.

Ross Recreation will provide labor using a subcontractor for all installation and labor quoted. Neither Ross Recreation nor our subcontractors are signatory to any unions, however compliance with prevailing wage rate requirements will occur. If union enrollment is required by our subcontractor for completion of this project, Ross Recreation will require a change order to cover the costs of a per project enrollment and additional wage/benefit requirements.

Signature _____

Name _____

Title _____

Date _____

Prepared By Eric Jones

Email ericj@rossrec.com

COUNCIL COMMUNICATION

CC #: 1521
File #: 0203-01

Title: Vehicle – Purchase Orders
Contact: Brian Craighead 916-774-5731 bcraighead@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 7.8.

RECOMMENDATION TO COUNCIL

RFQ 10-3303
Staff recommends Council approve a purchase order to Global Machinery International West LLC dba Global Machinery for two Hogg & Davis Hydra 985 cable pulling trailers utilizing RFQ 10-3303 as fleet additions approved in the FY2020-21 Fleet Replacement budget. The total cost including options and sales tax is $335,050.

Sourcewell
Staff recommends Council approve a purchase order to Owen Equipment Sales for one Elgin Whirlwind street sweeper utilizing Sourcewell contract# 122017-FSC as a fleet addition approved in the FY2020-21 Fleet Replacement budget. This Sourcewell contract is a cooperative agreement in compliance with Roseville Municipal Code section 4.12.105(B). The total cost including options and sales tax is $359,986.

BACKGROUND

RFQ 10-3303
The Roseville Electric Construction and Maintenance division is purchasing two Hogg & Davis Hydra 985 cable pulling trailers as fleet additions. These trailers are designed specifically to remove underground electrical cables during cable replacement projects. The importance of these units is magnified in the fact that 85% of our electrical grid is underground. Roseville Electric has an aggressive cable replacement program which plays a key role in our historically low outage numbers. These two trailers are required in order to keep up with the growth of the City and its underground infrastructure.

A formal bid was issued with the following vendor responses:

Vendor	Total price (with all potential options)
Global Machinery	**$335,049.52**

Sacramento, CA

Vet Nation Inc. $420,225.00
Santa Barbra, CA

Terex Utilities $362,090.14
Stockton, CA

Nesco, LLC $322,676.00
Bluffton, IN

The apparent low bidder Nesco, LLC did not include sales tax in the grand total bid price and adding sales tax would increase their bid to $347,683.39. Global Machinery's bid of $335,049.52 is the low bid.

Sourcewell
The Public Works Street Sweeping division is purchasing one Elgin Whirlwind vacuum street sweeper as a fleet addition. The sweeper is used for residential and commercial street sweeping. The vehicle is used to meet state regulatory requirements for the MS4 permit. Street sweeping keeps gutters and alleys clean, improves aesthetics, and removes road debris. This Sourcewell contract is a cooperative agreement in compliance with Roseville Municipal Code section 4.12.105(B).

FISCAL IMPACT

RFQ 10-3303
The total cost of two Hogg & Davis Hydra 985 cable pulling trailers including options and sales tax is $335,050. Funding is included in the FY2020-21 Fleet Replacement budget.

Sourcewell
The total cost of one Elgin Whirlwind street sweeper including options and sales tax is $359,986. Funding is included in the FY2020-21 Fleet Replacement budget.

ENVIRONMENTAL REVIEW

The California Environmental Quality Act (CEQA) does not apply to activities that will not result in a direct or reasonably foreseeable indirect physical change in the environment, or is otherwise not considered a project as defined by CEQA Statute §21065 and CEQA State Guidelines §15060(c)(3) and §15378. The purchase of vehicles meets the above criteria and is not subject to CEQA. No additional environmental review is required.

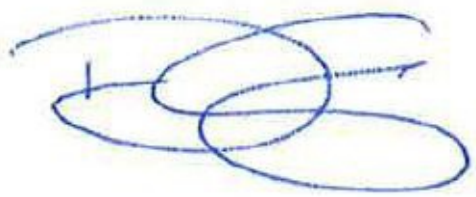
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Goal E - Deliver exceptional city services

Respectfully Submitted,

Brian Craighead, Fleet Manager

Jason Shykowski, Public Works Director



_____

Dominick Casey, City Manager

ATTACHMENTS:

Description

COUNCIL COMMUNICATION

CC #: 1543
File #: 0900-02

Title:	2021 Sewer Collection System Cured-in-Place Pipe Rehabilitation Project – Award of Contract
Contact:	Jonathan Cummings 916-774-5566 jcummings@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 7.9.

RECOMMENDATION TO COUNCIL

Staff recommends City Council:

1. Approve a construction contract with Insituform Technologies, LLC in the amount of $1,584,796 for the 2021 Sewer Collection System CIPP Rehabilitation Project (Project), and adopt a resolution authorizing the City Manager to execute it, and
2. Authorize the City Manager or his designee to approve and pay for contract change orders for the Project that could increase the contract amount by no more than 10% ($158,480) or a not-to-exceed total contract amount of $1,743,276.

BACKGROUND

The Environmental Utilities Department has an ongoing repair and maintenance program for its sewer collection system. Closed circuit television (CCTV) was used to inspect 26 miles of the pipeline interior and, based on severity of defects, segments of pipeline were prioritized for repair. To date, the rehabilitation program has repaired over 17 miles of defective sewer pipeline.

On March 17, 2021, City Council approved plans and specifications for the 2021 Sewer Collection System Cured-in-Place Pipe (CIPP) Rehabilitation Project and authorized the Environmental Utilities Department to advertise and accept bids. This year's plan will continue the repair of approximately 13,400 linear feet of the collection system that has cracked and/or deteriorated pipe, and will include repair of approximately 340 service laterals to provide a seal between the repaired sewer pipe and the lateral connection.

For City Council consideration under this memorandum is the award of the construction contract. Two (2) bids were received for the Project. The bids were opened at the City Clerk's office on April 19, 2021. The lowest responsive and responsible bid received was for a construction cost of $1,584,796. The Engineers' Estimate was $2,600,000. A summary of the bids received is attached as Exhibit A. The construction contract agreement is attached as Exhibit B.

FISCAL IMPACT

The existing project budget is $2,039,395 and is funded by the Wastewater Rehabilitation Fund. The available budget will fund the construction contract ($1,584,796), the requested construction change order allowance ($158,480), and the estimated $240,000 needed for secondary labor during construction. The total anticipated budget required to cover the costs of the Project is $1,983,276.

ENVIRONMENTAL REVIEW

The proposed project involves the repair of an existing facility. This activity is categorically exempt from CEQA as a Class 1 Exemption (State CEQA Guidelines Section 15301). The Exemption has been prepared (Exhibit C) and no further CEQA action is required.

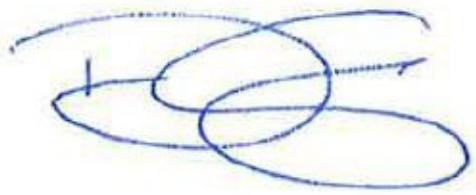
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Goal F - Invest in well-planned infrastructure and growth

Respectfully Submitted,

Jonathan Cummings, Associate Engineer

Richard Plecker, Environmental Utilities Director



_____

Dominick Casey, City Manager

ATTACHMENTS:

Description

Resolution 21-275

Attachment A - Bid Summary Sheet

Attachment B - Agreement

RESOLUTION NO. 21-275

APPROVING AN AGREEMENT, BY AND BETWEEN INSITUFORM TECHNOLOGIES, LLC AND THE CITY OF ROSEVILLE, AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE

WHEREAS, an Agreement for the 2021 Sewer Collection System Cured-In-Place Pipe Rehabilitation Project, by and between Insituform Technologies, LLC and the City of Roseville, has been reviewed by the City Council; and

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Roseville that said Agreement is hereby approved and that the City Manager is authorized to execute it on behalf of the City of Roseville, upon review and approval of the bonds by the City Attorney's office.

BE IT FURTHER RESOLVED that the City Manager or his designee is authorized to approve change orders for the project, consistent with the contract terms, provided that the net cost of all change orders shall not exceed ten percent (10%) of the contract price.

PASSED AND ADOPTED by the Council of the City of Roseville this____day of _____, 2021, by the following vote on roll call:

AYES COUNCILMEMBERS:

NOES COUNCILMEMBERS:

ABSENT COUNCILMEMBERS:

_____
MAYOR

ATTEST:

_____
City Clerk

RFP #08-086

DATE: April 19, 2021

TIME: 3:00 PM

BID BOND REQUIRED: YES

BID SUMMARY SHEET

BID OPENING FOR:

2021 Sewer Collection System Cured-in-Place Pipe Rehabilitation Project

CITY OF ROSEVILLE CALIFORNIA

Bidders Name City, State	Bid Bond	Addendum 1	Addendum 2	Grand Total Price
Express Sewer & Drain, Inc. Rancho Cordova, CA	✓	✓	✓	$1,858,640.00
Insituform Technologies, Inc Chesterfield, MO	✓	✓	✓	$1,584,796.00

Please Sign-In

Staff	*Visitors (Name & Company)*	*Visitors (Name & Company)*
Joe Speaker		
Linda York		
Jonathan Cummings		

AGREEMENT

THIS AGREEMENT, is made and entered into this _____day of _____, 20_____, by and between the City of Roseville, a municipal corporation, ("CITY"), and Insituform Technologies, LLC, a Limited Liability Company, ("CONTRACTOR"); and

WITNESSETH:

WHEREAS, the City Council of the CITY, at a meeting held on the 17th day of March, 2021, approved plans and specifications for the 2021 Sewer Collection System Cured-In-Place Pipe Rehabilitation Project and directed the City Clerk to advertise for sealed proposals for doing said work and providing that bids be submitted on the 19th day of April, 2021; and

WHEREAS, the City Clerk, thereafter duly and regularly caused a notice to be published in the manner and for the time prescribed by law; and

WHEREAS, CONTRACTOR, pursuant to the provisions of said notice duly filed a bid with the City Clerk, a true copy of which bid is now on file in the office of the City Clerk, and is hereby referred to and by this reference made a part hereof as fully as if set forth at length herein; and

WHEREAS, all bids received pursuant to said notice were opened and examined and publicly declared at the time specified in said advertisement for bids and at a meeting of the City Council held on the _____ day of _____, 20_____, the Council found and

declared the bid of CONTRACTOR to be the lowest responsible bid and thereupon awarded a contract to CONTRACTOR to do the work referred to in the aforementioned specifications.

NOW, THEREFORE, the parties agree as follows:

1. THE WORK. CONTRACTOR agrees:

a. To do the work and furnish all the labor, materials, tools, supplies, equipment, superintendence, insurance, and bonds required for the 2021 Sewer Collection System Cured-In-Place Pipe Rehabilitation Project in accordance with the Contract Documents (the Work).

b. To do and perform the Work contemplated hereby in a good and workmanlike manner under the direction of and to the satisfaction of the Director of Public Works of the City of Roseville.

2. PAYMENT. CITY shall pay CONTRACTOR One Million, five hundred eighty-four thousand, seven hundred ninety-six dollars ($1,584,796.00) for the Work to be done under this Agreement in accordance with the Contract Documents.

3. CONTRACT DOCUMENTS. The complete Agreement between the parties hereto consists of the following documents:

a. The advertisement for bids (including the notice to bidders, instructions to bidders and proposals);

b. The accepted bid;

c. Plans and specifications (including standard construction specifications, special provisions and construction details);

d. Bonds and insurance required by the specifications; and

e. This contract.

All documents specified above are intended to operate so that any work called for in any one and not mentioned in the other, or vice versa, is to be executed the same as if mentioned in all said documents.

4. LIQUIDATED DAMAGES. In the event CONTRACTOR does not complete the Work within the time specified, CONTRACTOR agrees that CITY will suffer damages. Inasmuch as the actual damages which would result from such breach by CONTRACTOR under this Agreement are uncertain, and would be impractical or extremely difficult to fix, CONTRACTOR agrees that it shall pay, or CITY shall deduct from CONTRACTOR's fee, the amount of $ 1,000.00 per day as liquidated damages, in the event of such delay.

5. TIME OF COMPLETION. Time is of the essence of this Agreement. CONTRACTOR shall complete all Work under the Contract Documents within 186 Days of the date of this Contract. CONTRACTOR shall begin work by the date specified in the "Notice to Proceed" letter and shall diligently prosecute all of the Work under this Contract in all parts and requirements as defined in the Contract Documents.

6. SERVICE OF NOTICE. Any notice required or permitted to be given under this Agreement shall be deemed given when (a) personally delivered to the recipient identified below; (b) mailed by registered or certified mail, return receipt requested, postage pre-paid, to the address specified below; or (c) sent by facsimile, with confirmation of receipt, to the facsimile number identified below.

CITY OF ROSEVILLE	CONTRACTOR
Jonathan Cummings	Whittney Schulte
Environmental Utilities	17988 Edison Avenue
2005 Hilltop Circle, Suite 130	Chesterfield, MO 63005
Roseville, CA 95747	

CITY may also act through either its architect or construction manager if CITY expressly gives notice to CONTRACTOR, in writing, that CITY's designee has authority to act for CITY in a specific capacity.

7. DISPUTES. Disputes arising from this Agreement will be determined in accordance with the Contract Documents and Public Contract Code Sections 10240-10240.13.

8. GOVERNING LAW. This Agreement shall be governed by and construed in accordance with the laws of the State of California.

9. INDEPENDENT CONTRACTOR. CONTRACTOR shall act as an independent contractor, and covenants and agrees that it will conduct itself consistent with such status, that it will neither hold itself out as, nor claim to be, an officer or employee of CITY by reason of this Agreement.

10. SUCCESSORS IN INTEREST. This Agreement shall be binding upon the heirs, successors, executors, administrators and assigns of the respective parties hereto.

11. MODIFICATION. This Agreement and each provision contained herein may be waived, amended, supplemented or eliminated only by mutual written agreement of the parties.

12. SEVERABILITY. If any of the provisions contained in this Agreement are for any reason held invalid or unenforceable, such holding shall not affect the remaining provisions or the validity and enforceability of the Agreement as a whole.

13. INTEGRATED AGREEMENT. This is an integrated agreement and contains all of the terms, considerations, understanding and promises of the parties. It shall be read as a whole.

14. CONTRACTORS LICENSE LAW. CONTRACTORS ARE REQUIRED BY LAW TO BE LICENSED AND REGULATED BY THE CONTRACTORS' STATE LICENSE BOARD WHICH HAS JURISDICTION TO INVESTIGATE COMPLAINTS AGAINST CONTRACTORS IF A COMPLAINT REGARDING A PATENT ACT OR OMISSION IS FILED WITHIN FOUR (4) YEARS OF THE DATE OF THE ALLEGED VIOLATION. A COMPLAINT REGARDING A LATENT ACT OR OMISISON PERTAINING TO STRUCUTRAL DEFECTS MUST BE FILED WITHIN TEN (10) YEARS OF THE DATE OF THE ALLEGED VIOLATION. ANY QUESTIONS CONCERNING A CONTRACTOR MAY BE REFERRED TO THE REGISTRAR, CONTRACTORS' STATE LICENSE BOARD, P.O. BOX 26000, SACRAMENTO, CALIFORNIA 95826.

IN WITNESS WHEREOF, the City of Roseville, a municipal corporation, has authorized the execution of this Agreement in duplicate by its City Manager and attestation by its City Clerk under authority of Resolution No. _____, adopted by the Council of the City of Roseville on the ____day of _____, 20_____, and CONTRACTOR has caused this Agreement to be duly executed.

CITY OF ROSEVILLE, a municipal corporation

BY:_____
DOMINICK CASEY
City Manager

Insituform Technologies, LLC, a Limited Liability Company

BY: Whittney Schulte
its: Whittney Schulte, Contracting & Attesting Officer

and

ATTEST:

BY: Gina M. Gurrieri
its: Gina Gurrieri, Contracting & Attesting Office

BY: _____
SONIA OROZCO
City Clerk

APPROVED AS TO FORM:

BY: _____
ROBERT R. SCHMITT
City Attorney

APPROVED AS TO SUBSTANCE:

BY: Richard D. Plecker

Print Name: Richard Plecker

Title: Environmental Utilities Director

COUNCIL COMMUNICATION

CC #: 1556
File #: 0704

Title:	Parks, Recreation & Libraries Strategic Master Plan - Professional Services Agreement
Contact:	Tara Gee 916-774-5253 tgee@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 7.10.

RECOMMENDATION TO COUNCIL

Staff recommends Council adopt a resolution approving a professional services agreement with PROS Consulting, Inc., and authorizing the City Manager to execute it on behalf of the City of Roseville.

BACKGROUND

The project consists of a comprehensive strategic master plan that analyzes existing services provided, seeks input from the community through public outreach and statistically valid surveys, identifies gaps and needs of the community, outlines recreation and library program trends for the future, reviews access to public spaces as well as parks/facility needs and makes recommendations for future action based on findings over the next ten to fifteen years. The strategic master plan is intended to be a road map for future decisions.

On April 6, 2021, a Request for Proposals (RFP) was issued asking qualified consultants to submit a response and cost proposal to develop a strategic master plan for the Parks, Recreation & Libraries (PRL) Department. Responses to the RFP were due on May 3, 2021. Three submissions were received.

A five person panel made up of key staff within the Department reviewed and ranked the submissions. On May 17, 2021, virtual interviews were held with the top two ranked firms. Reference checks were conducted and after additional discussion, staff recommends a contract award to Pros Consulting, Inc. for $199,958.

FISCAL IMPACT

Funding for this project was allocated through the General Fund Contingency budget during FY2020-21.

ENVIRONMENTAL REVIEW

The California Environmental Quality Act (CEQA) only applies to projects which have the potential to cause a significant effect on the environment. Where it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment, the activity is not subject to CEQA. (CEQA Guidelines §15061(b)(3)).

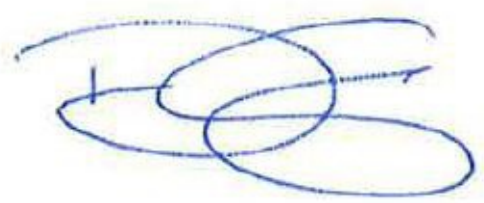
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Goal B - Support community engagement and advocacy
Goal C - Maintain a safe and healthy community
Goal D - Enhance economic vitality
Goal E - Deliver exceptional city services

Respectfully Submitted,

Tara Gee, Park Planning & Development Superintendent

Jill Geller, Parks, Recreation & Libraries Director



_____
Dominick Casey, City Manager

ATTACHMENTS:

Description

Resolution 21-284

Signed Agreement

RESOLUTION NO. 21-284

APPROVING A PROFESSIONAL SERVICES AGREEMENT, BY AND BETWEEN THE CITY OF ROSEVILLE AND PROS CONSULTING, INC., AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE

WHEREAS, a professional services agreement for Strategic Master Plan for the Parks Recreation & Libraries Department, between the City of Roseville and PROS Consulting, Inc., has been reviewed by the City Council; and

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Roseville that said agreement is hereby approved and that the City Manager is authorized to execute it on behalf of the City of Roseville.

PASSED AND ADOPTED by the Council of the City of Roseville this____day of _____, 20_, by the following vote on roll call:

AYES COUNCILMEMBERS:

NOES COUNCILMEMBERS:

ABSENT COUNCILMEMBERS:

_____
MAYOR

ATTEST:

_____
City Clerk

PROFESSIONAL SERVICES AGREEMENT

Project: Strategic Master Plan for the Parks Recreation & Libraries Department

THIS AGREEMENT is made and entered into this ___ day of _____, 20__, by and between the City of Roseville, a municipal corporation ("CITY"), and PROS Consulting, Inc., an Indiana corporation ("CONSULTANT"); and

W I T N E S S E T H:

WHEREAS, CITY desires professional services consisting of a strategic master plan for the Parks, Recreation & Libraries Department; and

WHEREAS, CONSULTANT has prepared a proposal in response to RFP #13-100 dated May 3, 2021, which describes the scope of work to be performed by CONSULTANT, the budget for the work, and the schedule for performance of the work; and

WHEREAS, CONSULTANT is qualified and experienced to provide such professional services.

NOW, THEREFORE, the parties agree as follows:

1. Services. CONSULTANT shall perform, at the direction of CITY, the scope of services as described in EXHIBIT "A," attached hereto and incorporated herein by this reference.

2. Compensation. For its services provided hereunder, CONSULTANT shall be compensated on a time and expense basis in accordance with the budget estimate as described in

EXHIBIT "A". Total compensation shall not exceed one hundred ninety-nine thousand, nine hundred fifty-eight dollars ($199,958).

CONSULTANT shall submit one monthly invoice for its services. Such invoices shall be delineated by task, the person performing the services, and the hourly rate, which shall be stated in time increments of not greater than one tenth (1/10) hours. CITY shall pay invoices within thirty (30) days after receipt, if the services specified in the invoice have been satisfactorily completed.

3. Indemnification. To the fullest extent allowed by law, CONSULTANT shall defend, indemnify, and save and hold harmless CITY, its officers, agents, employees and volunteers from any claims, suits or actions of every name, kind and description brought forth, or on account of, injuries to or death of any person (including but not limited to workers and the public), or damage to property, resulting from or arising out of CONSULTANT's willful misconduct or negligent act or omission while engaged in the performance of obligations or exercise of rights created by this Agreement, except those matters arising from CITY's sole negligence or willful misconduct. The parties intend that this provision shall be broadly construed.

CONSULTANT's responsibility for such defense and indemnity obligations shall survive the termination or completion of this Agreement for the full period of time allowed by law. The defense and indemnity obligations of this Agreement are undertaken in addition to, and shall not in any way be limited by, the insurance obligations contained in this Agreement.

4. Insurance. CONSULTANT agrees to continuously maintain, in full force and effect, the following minimum policies of insurance during the term of this Agreement.

COVERAGE	LIMITS OF LIABILITY
Workers' Compensation	Statutory
Commercial General Liability	$1,000,000 each occurrence $2,000,000 aggregate Personal Injury: $1,000,000 each occurrence $2,000,000 aggregate
Automobile Liability	$1,000,000 combined single limit
Professional Liability (errors and omissions)	$1,000,000 per claim $2,000,000 aggregate

a. Form. CONSULTANT shall submit a certificate evidencing such coverage for the period covered by this Agreement in a form satisfactory to Risk Management and the City Attorney, prior to undertaking any work hereunder. Any insurance written on a claims made basis is subject to the approval of Risk Management and the City Attorney.

b. Additional Insureds. CONSULTANT shall also provide a separate endorsement form or section of the policy showing CITY, its officers, agents, employees and volunteers as additional insureds for each type of coverage, except for Workers' Compensation and Professional Liability. Such insurance shall specifically cover the contractual liability of CONSULTANT. The additional insured coverage under the CONSULTANT's policy shall be primary and noncontributory, as evidenced by a separate endorsement or section of the policy, and shall not seek contribution from CITY's insurance or self-insurance. In addition, the additional insured coverage shall be at least as broad as the Insurance Services Office ("ISO") CG 20 01 Endorsement. Any available insurance proceeds in excess of the specified minimum insurance coverage requirements and limits shall be available to the additional insureds. Furthermore, the requirements for coverage and limits shall be: (1) the minimum coverage and

limits specified in this Agreement; or (2) the full coverage and maximum limits of any insurance proceeds available to the named insureds, whichever is greater.

c. Cancellation/Modification. CONSULTANT shall provide ten (10) days written notice to CITY prior to cancellation or modification of any insurance required by this Agreement.

d. Umbrella/Excess Insurance. The limits of insurance required in this Agreement may be satisfied by a combination of primary and excess insurance. Any excess insurance shall contain or be endorsed to contain a provision that such coverage shall also apply on a primary and noncontributory basis for the benefit of CITY (if agreed to in a written contract) before CITY's own insurance shall be called upon to protect it as a named insured.

e. Subcontractors. CONSULTANT agrees to include in its contracts with all subcontractors the same requirements and provisions of this Agreement, including the indemnity and insurance requirements, to the extent they apply to the scope of the subcontractor's work. Furthermore, CONSULTANT shall require its subcontractors to agree to be bound to CONSULTANT and CITY in the same manner and to the same extent as CONSULTANT is bound to CITY under this Agreement. Additionally, CONSULTANT shall obligate its subcontractors to comply with these same provisions with respect to any tertiary subcontractor, regardless of tier. A copy of CITY's indemnity and insurance provisions will be furnished to the subcontractor or tertiary subcontractor upon request.

f. Self-Insured Retentions. All self-insured retentions ("SIR") must be disclosed to Risk Management for approval and shall not reduce the limits of liability. Policies containing any SIR provision shall provide or be endorsed to provide that the SIR may be satisfied by either the named insured or CITY. CITY reserves the right to obtain a full

certified copy of any insurance policy and endorsements. The failure to exercise this right shall not constitute a waiver of such right.

g. Waiver of Subrogation. CONSULTANT hereby agrees to waive subrogation which any insurer of CONSULTANT may acquire from CONSULTANT by virtue of the payment of any loss under a Workers Compensation, Commercial General Liability or Automobile Liability policy. All Workers Compensation, Commercial General Liability and Automobile Liability policies shall be endorsed with a waiver of subrogation in favor of CITY, its officers, agents, employees and volunteers for all worked performed by CONSULTANT, its employees, agents and subcontractors.

h. Liability/Remedies. Insurance coverage in the minimum amounts set forth herein shall not be construed to relieve CONSULTANT of liability in excess of such coverage, nor shall it preclude CITY from taking such other actions as are available to it under any other provisions of this Agreement or law.

5. Records. CONSULTANT and its subcontractors shall maintain all files and records relating to the services performed hereunder during the term of this Agreement and for a period of not less than one (1) year after the date of termination or expiration. Provided, however, that in the event of litigation or settlement of claims arising from the performance of this Agreement, CONSULTANT and its subcontractors shall maintain all files and records until such litigation, appeals or claims are resolved. Duly authorized representatives of CITY shall have right of access during normal business hours and after reasonable notice to CONSULTANT's and subcontractors' files and records relating to the services performed hereunder, and may review and copy the files and records at appropriate stages during performance of the services and during the one (1) year period following termination or

expiration of this Agreement. CONSULTANT shall include this provisions in its contracts with all subcontractors.

6. Time is of the Essence. Time is of the essence of this Agreement.

7. Compliance with Laws. CONSULTANT shall comply with all federal, state and local laws, ordinances and policies as may be applicable to the performance of services under this Agreement.

8. Ability to Perform. CONSULTANT agrees and represents that it has the time, ability and professional expertise to perform the services required under this Agreement.

9. Governing Agreement. In the event of any conflict between this Agreement and its EXHIBITS, the provisions of this Agreement shall govern. In the event of any conflict between any of the EXHIBITS, the provisions of the first in order of attachment shall govern.

10. Assignment. CONSULTANT is employed to perform unique personal services. CONSULTANT shall not assign this Agreement without the prior written consent of CITY. CONSULTANT shall not employ or otherwise incur any obligation to pay other specialists or experts for services in connection with this Agreement, without prior written consent of CITY.

11. Independent Contractor. CONSULTANT, inclusive of its agents, officers, employees, volunteers, independent contractors, and subcontractors, shall act as an independent contractor, and covenants and agrees that it will conduct itself consistent with such status, that it will neither hold itself out as, nor claim to be, an officer or employee of CITY by reason of this Agreement.

12. Representations and Warranties. CONSULTANT warrants that it has not employed or retained any company or person, other than a bona fide employee working for CONSULTANT, to solicit or secure this Agreement, and that it has not paid or agreed to pay any

company or person, other than a bona fide employee, any fee, commission, percentage, brokerage fee, gift or any other consideration, contingent upon or resulting from the award or making of this Agreement. For breach or violation of this warranty, CITY shall have the right to terminate as void this Agreement, without liability, or, in its discretion, to deduct from the Agreement price or consideration, or otherwise recover, the full amount of such fee, commission, percentage, brokerage fee, gift or contingent fee.

13. Successors in Interest. This Agreement shall be binding upon the heirs, successors, executors, administrators and assigns of the respective parties hereto.

14. Copyright, Ownership and Use of Materials. All tangible material ("Material") created or delivered pursuant to this Agreement is considered a work made for hire under the Copyright Act. To the extent such Material does not qualify as a work made for hire, CONSULTANT hereby assigns to CITY all right, title, and interest, including but not limited to all copyrights, in all Material created by CONSULTANT in its performance under this Agreement. Material constitutes the scope of work outlined in Exhibit A and attached hereto, and all written and other tangible expressions, including but not limited to, drawings (including computer aided drawings), papers, documents, reports, surveys, renderings, exhibits, sketches, maps, models, prints, paintings or photographs, in any and all media or formats in which such materials have been created or are maintained. All Material furnished by CONSULTANT is, and shall remain, the property of CITY.

CONSULTANT shall execute any documents necessary to effectuate such assignment. In the event that CONSULTANT uses, employs, designates, or retains any person or entity who is not an employee of CONSULTANT, to perform any work required of it pursuant to this

Agreement, CONSULTANT shall require said person or entity to execute an agreement containing the preceding paragraph.

15. Termination of Agreement. The City may terminate this Agreement without cause by giving CONSULTANT ten (10) days advance written notice from the City Manager. CONSULTANT may terminate this Agreement without cause by giving CITY thirty (30) days advance written notice. In the event of termination through no fault of CONSULTANT, CITY shall compensate CONSULTANT for services performed as of the date of termination, upon the release to CITY of all Material hereunder, in any and all media or formats in which such materials have been created or are maintained. CITY retains the right to receive and use any Material, notwithstanding any termination or any dispute regarding the amount to be paid.

16. Attorney's Fees; Venue; Governing Law. If either party commences any legal action against the other party arising out of this Agreement or the performance hereof, the prevailing party in such action shall be entitled to recover its reasonable litigation expenses, including but not limited to, court costs, expert witness fees, discovery expenses, and attorney's fees. Any action arising out of this Agreement shall be brought in Placer County, California, regardless of where else venue may lie. This Agreement shall be governed by and construed in accordance with the laws of the State of California.

17. Modification. This Agreement and each provision contained herein may be waived, amended, supplemented or eliminated only by mutual written agreement of the parties.

18. Severability. If any of the provisions contained in this Agreement are for any reason held invalid or unenforceable, such holding shall not affect the remaining provisions or the validity and enforceability of the Agreement as a whole.

19. Notices. Any notices to parties required by this Agreement shall be delivered personally or mailed, U.S. first class postage prepaid, addressed as follows:

CITY OF ROSEVILLE	CONSULTANT
Jill Geller Parks, Recreation & Libraries Director 316 Vernon Street Roseville, CA 95678	Leon Younger PROS Consulting, Inc. 35 Whittington Dr., Suite 300 Brownsburg, Indiana 46112

Either party may amend its address for notice by giving notice to the other party in writing.

20. Integrated Agreement. This is an integrated agreement and contains all of the terms, considerations, understanding and promises of the parties. It shall be read as a whole.

IN WITNESS WHEREOF, the City of Roseville, a municipal corporation, has authorized the execution of this Agreement in duplicate by its City Manager and attested to by its City Clerk under the authority of Resolution No. _____, adopted by the Council of the City of Roseville on the ___ day of _____, 20__, and CONSULTANT has caused this Agreement to be executed.

CITY OF ROSEVILLE, a municipal corporation	PROS CONSULTING, INC., an Indiana corporation
BY: _____ DOMINICK CASEY City Manager	BY: Leon Younger its: President and Katherine Younger Chief Financial Officer

[SIGNATURES CONTINUED ON FOLLOWING PAGE]

ATTEST:

BY: _____
its: _____

BY: _____
SONIA OROZCO
City Clerk

APPROVED AS TO FORM:

BY: _____
MICHELLE SHEIDENBERGER
City Attorney

APPROVED AS TO SUBSTANCE:

BY: _____
JILL GELLER
Parks, Recreation & Libraries Director

EXHIBIT "A"

pros consulting INC.

Inspiring Communities to Action

May 3, 2021

Cover Letter

City of Roseville
Parks, Recreation & Libraries
Attn: Tara Gee
316 Vernon St., Suite 400
Roseville, CA 95678

RE: Request for Proposals – Strategic Master Plan for Parks, Recreation & Libraries Department
Dear Ms. Gee & Selection Committee:

PROS Consulting, Inc. is very excited about the opportunity to partner with the City of Roseville on the development of *Strategic Master Plan for the Parks, Recreation & Libraries Department*. We are a full-service management consulting and strategic master planning firm focusing on services to government agencies, with specialized experience in parks and recreation, national accreditation, open space planning, economic development, and marketing and branding.

Our national experience and our extensive work locally throughout the Sacramento Area and in California enables us to offer the ideal combination of national expertise and local insights, critical to a high performing agency such as Roseville. We believe our experience working with higher-performing and CAPRA Accredited agencies on similar master plans throughout the nation will have the least learning curve and our customized methodology is best suited to help you:

1. **Maximize community engagement in an extensive and innovative manner** to ensure the broad interests of the diverse community and stakeholders in Roseville is heard and can help shape the future of the City's parks and recreation system;
2. **Utilize a wide variety of data sources, including a statistically-valid survey,** and recreation and library best practices to predict trends and patterns of use and how to address unmet needs in Roseville;
3. **Determine unique Level of Service Standards** to develop appropriate actions regarding programs and facilities that reflects the City's strong commitment in providing high quality recreational activities for the community;
4. **Shape financial sustainability** through "next" practices for the City to achieve the strategic objectives, identify revenue opportunities and ensure future operational and maintenance needs are addressed; and
5. **Develop a dynamic and realistic strategic action plan** in order to establish, goals, policies, guidelines, and strategies for the City's parks, recreation, and library services to support the family-oriented community and many businesses that call Roseville home.

We are proud to say that California is in the top 3 states nationwide for the extent of work we have performed over the last several years and with this proposal we sincerely hope for an opportunity to continue our relationship. Also, since 2012, PROS has completed parks and recreation planning projects for over 55% of NRPA Gold Medal winners and nearly 40% of the CAPRA accredited agencies.

Our team includes **Wallace Roberts & Todd ("WRT")**, a local and nationally renowned planning design firm made up of city and regional planners, urban designers, landscape architects, and architects. PROS Consulting and WRT have worked together on many planning projects throughout California and large parks and recreation planning projects across the country. Also on the team is our longtime partner **ETC Institute**, a nationally renowned survey and market research firm to assist in the statistically-valid community survey development. Lastly we have included our team **Jennifer K. Sweeney & Associates, LLC** to assist in the evaluation and strategic planning for libraries.

PROS Consulting will perform the services and adhere to the requirements described in the RFP, including addenda dated 4/22/2021.

We welcome the opportunity to meet in person and present our approach and qualifications to perform this exciting project. If you have any questions or need additional information, please do not hesitate to me at 317.679.5615 or leon.younger@prosconsulting.com.

Sincerely,
PROS Consulting

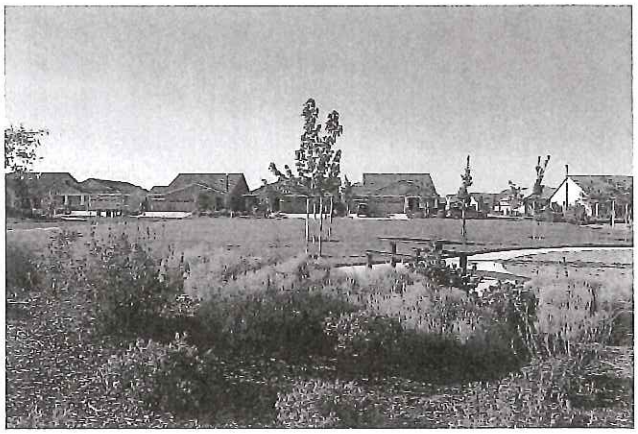
Leon Younger

Leon Younger, President

35 Whittington Dr.
Suite 300
Brownsburg, Indiana 46112
877.242.7760
877.242.7761
prosconsulting.com

Tab D – Project Understanding

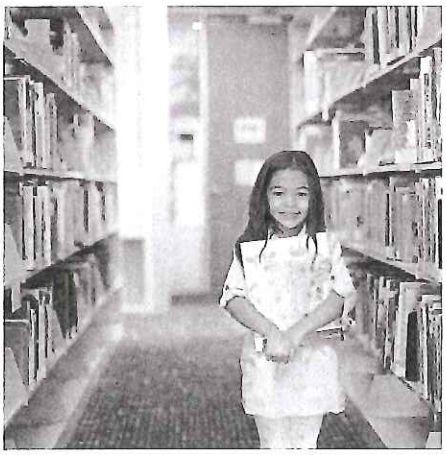
Project Understanding



The City of Roseville Parks, Recreation & Libraries Recreation Department ("Department") has a strong commitment to provide parks, trails, library, and recreational service programs for residents and visitors. The Department also partners with many community and state organizations to bring new, exciting ideas into its programming to enhance the community's quality of life. As such, the Department is seeking professional services to prepare a *Parks, Recreation, and Libraries Master Plan* ("Master Plan") to provide a vision for the future. Key components of the master planning process will be research, public involvement, and the development of recommendations for all aspects of Department recreation activities with a focus on facilities and capital improvements.

The Department desires a Master Plan that will align new investments with a strong community-driven mission and vision that integrates the City's strong pursuit of recreation activities to the community. The outcome will be a Master Plan that will be heavily used as a resource for future development and redevelopment of the Department's parks, recreation programs, and facilities. The Master Plan will:

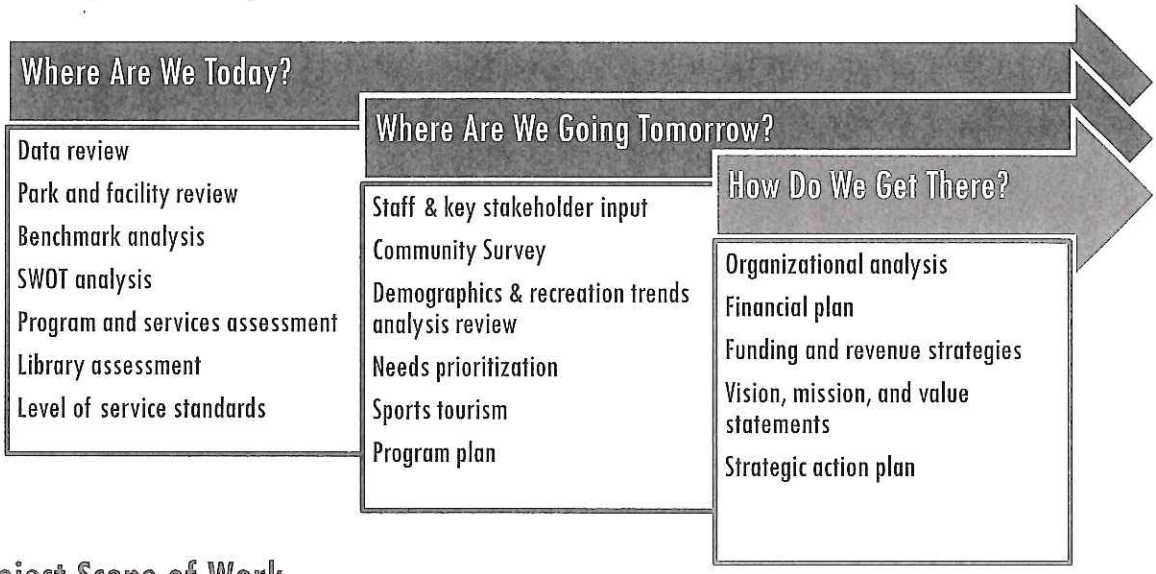
- **Maximize community engagement in an extensive and innovative manner** to ensure the broad interests of the diverse community and stakeholders in Roseville is heard and can help shape the future of the City's parks and recreation system;
- **Utilize a wide variety of data sources, including a statistically-valid survey,** and recreation and library best practices to predict trends and patterns of use and how to address unmet needs in Roseville;
- **Determine unique Level of Service Standards** to develop appropriate actions regarding programs and facilities that reflects the City's strong commitment in providing high quality recreational activities for the community;
- **Shape financial sustainability** through "next" practices for the City to achieve the strategic objectives, identify revenue opportunities and ensure future operational and maintenance needs are addressed; and
- **Develop a dynamic and realistic strategic action plan** in order to establish, goals, policies, guidelines, and strategies for the City's parks, recreation, and library services to support the family-oriented community and many businesses that call Roseville home.



The foundation of the Consulting Team's approach is a creative and comprehensive public participation process. It is very important to not only to engage those who typically participate in the planning process, but also those who do not. We will identify opportunities that engage people through a variety of community input processes. The information derived by the public's participation in key leadership meetings, focus group meetings, public forums, and surveys is important. However, it is equally important that the information received is applied to the overall planning process to accurately articulate the true unmet needs, address key issues and provide the greatest recommendations and strategies to move the City's parks and recreation services forward for optimum results.

Key Steps in the Process

The Master Plan will create a clear set of objectives that will provide direction to staff, elected officials, and the Parks and Recreation Commission for a short-term, mid-term and long-term range. There are numerous steps in the project, with the following key areas of focus being foundation components.



Project Scope of Work

Task 1 – Project Management, Progress Reporting & Existing Document Review

A. Kick-off Meeting, Data Collection & Project Management – A kick-off meeting should be attended by the key Department staff and Consulting Team members to confirm project goals, objectives, and expectations that will help guide actions and decisions of the Consulting Team. Detailed steps of this task include:

- Confirmation – The project goals, objectives, scope, and schedule will be confirmed.
- Outcome Expectations – Discuss expectations of the completed project.
- Communications – Confirmation on lines of communication, points of contact, level of involvement by Department and local leaders, and other related project management details. Also, protocols and procedures for scheduling meetings should be agreed to. We will coordinate and participate in routine progress meetings as often as necessary, no less than once a month and until the final plan is approved by the City Council. We will electronically provide the city's project manager with all completed or partially completed reports, forecasts, maps or plans at least three (3) working days prior to each progress meeting.
- Prepare database of stakeholders – The Consulting Team will work with the Department who will gather contact information from a variety of sources. This information will be used in the key leadership/focus group interview portion of the Master Plan.
- Site Tour – The Consulting Team will conduct a site tour of all existing assets located within the Department's boundaries.

B. Existing Document Review – We will review and analyze existing studies, plans, programs and other data to be provided by the city. This includes, but is not limited to:

- 2013 Needs Assessment
- Copy of Department NRPA Gold Medal application
- Department Business Plan
- Division Business Plans/Best Practices
- Asset inventory (latest version could be a few years old)
- Bikeway Map (bike trail are not a department responsibility, however, it relates to our park system)

- Maintenance Service Levels
- Maintenance Fee Schedule
- Urban Forestry Master Plan
- Department Policies
- Joint-Use Agreements with schools
- General Fund Park Rehabilitation Plan
- Visions 2010
- Ten Year General Fund/Lighting & Landscape Districts Rehabilitation Plan

Task 2 – Community Profile

A. Demographic & Trends Analysis – We will review the City's demographics and develop a comprehensive community profile including recreational trends that may impact the types of services provided by the department over the next ten to fifteen (10-15) years. This will include the needs of specific user groups, geographical areas, recommended re-envisioning of under-utilized public spaces or amenities, program/service needs, future development considerations and open space/urban forestry protection/enhancements. We will utilize the City of Roseville's projections and supplement with census tract demographic data obtained from Environmental Systems Research Institute, Inc. (ESRI), the largest research and development organization dedicated to Geographical Information Systems (GIS) and specializing in population projections and market trends; for comparison purposes data will also obtained from the U.S. Census Bureau. This analysis will provide an understanding of the demographic environment for the following reasons:

- To understand the market areas served by the City of Roseville and distinguish customer groups.
- To determine changes occurring in the City of Roseville and the region, and assist in making proactive decisions to accommodate those shifts.
- Provide the basis for Equity Mapping and Service Area Analysis

The demographic analysis will be based on US 2020 Census information, 2021 updated projections, and 5 (2026), 10 (2031), and 15 (2036) year projections. The following demographic characteristics will be included:

- Population density; Age Distribution ; Households; Gender; Ethnicity; Household Income

From the demographic base data, sports, recreation, and outdoor trends are applied to the local populace to assist in determining the potential participation base within the community. For the sports and recreation trends, the Consulting Team utilizes the Sports & Fitness Industry Association's (SFIA) 2021 Study of Sports, Fitness and Leisure Participation, ESRI local market potential, as well as participation trends from the Outdoor Foundation on outdoor recreation trends.

Task 3 – Comparisons and Benchmarking

A. Benchmark Analysis – We will complete a benchmark analysis of the City of Roseville's Parks, Recreation & Libraries Department that includes, at minimum, open spaces, urban forestry, facilities, programs, services, maintenance standards, revenue/expenses, community use and staffing levels of similar size, composition and demographics, including cities within the Sacramento region. The benchmark study will include the following metrics:

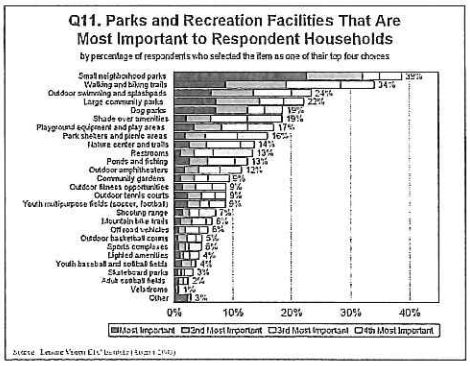
- Number of assets per population separated by asset type, open space acres per population, park acres per population, senior, youth and adult programs, maintenance levels and ADA compliance.
- Evaluation tools to be used are city standards, National Recreation & Parks Association (NRPA), American Library Association and International City/County Management Association (ICMA) guidelines.
- Identify opportunities to better address services.

Also, we will provide recommendations for minimizing duplication of effort either internally or externally (is services provided by the private sector).

Task 4 – Needs Assessment

A. SWOT Analysis - The Consulting Team will work with the staff to complete a SWOT analysis highlighting existing Strengths, Weaknesses, Opportunities and Threats faced by the Departments as it seeks to expand and grow its offerings over the next five to ten years.

B. Statistically-Valid Needs Assessment Survey – The Consulting Team will perform a random, scientifically valid community-wide household survey to quantify knowledge, need, unmet need, priorities, and support for system improvements including facility and programming needs of the Department. The Consulting Team will administer a statistically valid random sampling Needs Assessment Survey of household surveys in Roseville. The survey will be administered by a combination of a mail, online, and phone. Prior to the survey being administered, it will be reviewed and approved by staff. The survey will be mailed to all households in the Department, and ETC Institute will follow-up by e-mail and/or phone. The minimum sample size of 400 completed surveys at a 95% level of confidence will have a confidence interval of +/- 4.9%.



C. Parks and Facilities Inventory and Assessment – Roseville has evolved from a railroad town to a sleepy bedroom community to the fast-growing suburban city of over 140,000 that it is today. The city's park system has also evolved, starting with the small town parks from early days to the neighborhood and community parks created with outward growth. WRT will support the PROS team in understanding the park system today in the context of current demographic and recreation trends, and assessing how each of the city's parks is serving its community. Times have changed, and so must our parks. Drawing from our experience working with cities with similar trajectories—Fremont, Benicia, Tracy—we will be closely attuned to how typical suburban parks can be retrofitted and modernized as part of the lifecycle replacement process, so that they enliven and add value to a maturing community.

We will compile a comprehensive GIS inventory of existing parks using shape files provided by the City. This will include confirmation of the completeness of the data and comparison of the GIS recorded size to the acreage used in the LOS calculation. We will also confirm accuracy of location and review functionality, accessibility, general condition, comfort, and convenience. The analysis will note each location's major program amenities (i.e. fields, restrooms, playgrounds, picnic pavilions, basketball, aquatics, etc.), and its current general condition. Our team will provide qualitative evaluation of amenities per park report (e.g. equal balance of amenities in each park) and develop a set of prioritized recommendations for improvements needed within existing parks, open space, buildings, and other recreation facilities. The data will form the basis of materials prepared for the Park by Park workshop. We will confirm asset inventory separated by General Fund/Lighting & Landscaping District parks and parks within a Community Facilities District for Service.

An assessment form will be prepared to fit Roseville's needs. We will provide two samples for review and discussion. Based on City direction, we will prepare the final form.

A park and facility tour and working session will be performed with City staff to assess and confirm the inventory and existing conditions. The WRT team will then visit additional parks, using the assessment form and informed by the Staff-led tour (NOTE: Up to 25 Sites). In person assessment will be augmented with aerial photo review.

An aerial map and amenity inventory table will be provided for each park site. A comprehensive list of all parks and facilities citywide will be created. The City will review our draft condition assessment and provide additional information about the park and condition of facilities (i.e. irrigation system, buildings, fields, lighting systems). WRT, based on City input, will record all proposed improvements and renovations along with any identified facilities and amenities that should not be replaced. Information from this assessment will be used to inform public outreach, to update the Levels of Service standards, and influence the Capital Improvement Needs for the plan. The assessment will examine:

- Visual condition of major park amenities using good, fair, poor.
- Patterns of use and misuse will be noted as observed.
- Level of maintenance and maintainability (items in poor condition may not be maintainable)
- The surrounding open spaces and connectivity to those open spaces and to the City's parks.
- Building conditions and underground infrastructure will be noted at a high level for each site as provided by the City.

A comprehensive assessment form will be created for each park. A spreadsheet will summarize key attributes of Roseville parks and serve as the basis for the future Park by Park workshop.

D. Park/Facility Classifications and Level of Service Standards – The Consulting Team will work with the Department to review and confirm, modify or add to existing park classifications, and preferred facility standards for all park sites, trails, open space amenities including common areas and indoor and outdoor facilities. These classifications will consider size, population served, length of stay, and amenity types/services. Facility standards include level of service standards and the population served per recreational facilities and park amenities. Any new or modified classification or standard will be approved as required. These are based on regional, statewide or nationally accepted parks and recreation standards, as well as the Consulting Team's national experience and comparison with peer/survey agencies. These standards will be adapted based on the needs and expectations of the Department.

PARKS:	2015 Inventory - Developed Facilities												2015 Facility Standards			2020 Facility Standards		
Park Type	Valpo Parks	Schools	Valpo YMCA	Total Inventory	Current Service Level based upon population				Recommended Service Levels; Revised for Local Service Area				Meet Standard/ Need Exists	Additional Facilities/ Amenities Needed		Meet Standard/ Need Exists	Additional Facilities/ Amenities Needed	
Neighborhood Parks	15.50			15.50	0.48	acres per	1,000		2.00	acres per	1,000		Need Exists	49	Acre(s)	Need Exists	51	Acre(s)
Community Parks	147.50			147.50	4.55	acres per	1,000		5.00	acres per	1,000		Need Exists	15	Acre(s)	Need Exists	18	Acre(s)
Regional Parks	122.50			122.50	3.78	acres per	1,000		5.50	acres per	1,000		Need Exists	56	Acre(s)	Need Exists	60	Acre(s)
Special Use Park	270.10			270.10	8.33	acres per	1,000		8.00	acres per	1,000		Meets Standard	-	Acre(s)	Meets Standard	-	Acre(s)
Undeveloped Acres	153.00			153.00	4.72	acres per	1,000		0.00	acres per	1,000		Meets Standard	-	Acre(s)	Meets Standard	-	Acre(s)
Total Park Acres	**708.60**	**-**	**-**	**708.60**	**21.84**	**acres per**	**1,000**		**20.50**	**acres per**	**1,000**		**Meets Standard**	**-**	**Acre(s)**	**Meets Standard**	**-**	**Acre(s)**
OUTDOOR AMENITIES:																		
Picnic Shelters	23.00	-	1.00	24.00	1.00	site per	1,352		1.00	site per	2,500		Meets Standard	-	Sites(s)	Meets Standard	-	Sites(s)
Soccer Fields	9.00	0.30	-	9.30	1.00	field per	3,488		1.00	field per	4,000		Meets Standard	-	Field(s)	Meets Standard	-	Field(s)
Multi-Purpose Fields (Football, Cricket, Lacrosse, Rugby)	-	4.00	-	4.00	1.00	field per	8,111		1.00	field per	6,000		Need Exists	1	Field(s)	Need Exists	2	Field(s)
Adult Baseball Fields	2.00	-	-	2.00	1.00	field per	16,222		1.00	field per	6,000		Need Exists	3	Field(s)	Need Exists	4	Field(s)
Youth Baseball Fields	4.00	-	-	4.00	1.00	field per	8,111		1.00	field per	5,000		Need Exists	2	Field(s)	Need Exists	3	Field(s)
Softball Fields	6.00	-	-	6.00	1.00	field per	5,407		1.00	field per	6,000		Meets Standard	-	Field(s)	Meets Standard	-	Field(s)
Basketball Courts	5.00	-	-	5.00	1.00	court per	6,489		1.00	court per	4,000		Need Exists	3	Court(s)	Need Exists	3	Court(s)
Tennis Courts	1.00	7.00	-	8.00	1.00	court per	4,055		1.00	court per	5,000		Meets Standard	-	Court(s)	Meets Standard	-	Court(s)
Playgrounds	13.00	1.60	1.00	15.60	1.00	site per	2,080		1.00	site per	2,500		Meets Standard	-	Site(s)	Meets Standard	-	Site(s)
Dog Parks	-	-	-	-	1.00	site per	#DIV/0!		1.00	site per	40,000		Need Exists	1	Site(s)	Meets Standard	-	Site(s)
Skate Park	1.00	-	-	1.00	1.00	site per	32,443		1.00	site per	40,000		Meets Standard	-	Site(s)	Meets Standard	-	Site(s)
Sand Volleyball	-	-	-	-	1.00	site per	#DIV/0!		1.00	site per	15,000		Need Exists	2	Site(s)	Need Exists	2	Site(s)
Paved Multi-Use Trails	18.75	-	-	18.75	0.58	miles per	1,000		0.40	miles per	1,000		Meets Standard	-	Mile(s)	Meets Standard	-	Mile(s)
Unpaved Trails/ Hiking Trails	1.00	-	-	1.00	0.03	miles per	1,000		0.10	miles per	1,000		Need Exists	2	Mile(s)	Need Exists	2	Mile(s)
Spraygrounds	1.00	-	-	1.00	1.00	site per	32,443		1.00	site per	50,000		Meets Standard	-	Site(s)	Meets Standard	-	Site(s)
Outdoor Pools	-	-	-	-	1.00	site per	#DIV/0!		1.00	site per	50,000		Need Exists	1	Site(s)	Need Exists	1	Site(s)
INDOOR AMENITIES:																		
Recreation/Gymnasium (Square Feet)	-	12,000.00	7,800.00	19,800.00	0.61	SF per	person		2.00	SF per	person		Need Exists	45,086	Square Feet	Need Exists	46,532	Square Feet

2015 Estimated Population	32,443
2020 Estimated Population	33,166

Notes:
School inventory is reduced due to public access availability for several amenities.
Central Park Plaza acres is included under Special Use acres.

E. Geographical Analysis through Mapping – To begin, a comprehensive map of existing parks, facilities, and open space areas will be created. The City will provide accurate GIS data on the existing park system. The street network, topography, land use, and other relevant data will be added to aid analysis. We will review the Parks & Recreation and Open Space & Conservation Elements of the General Plan, determine consistency with current assets and locations and identify opportunities to address gaps. Mapping will address the following areas:

- The park system in its regional context.
- City parks by type.
- Residents' walkability and access to parks in pursuit of the Trust for Public Land's (TPL's) goal of a maximum of a 10-minute walk to a park for every resident.
- Location of major and special facilities (i.e. community centers, aquatic facilities, sports complexes, dog parks).
- Distribution of key park features (e.g. playgrounds, recreation amenities).
- Multiuse trails and the existing and planned bike network.
- Planned and future parks, trails, and open spaces, and future development areas.

F. **Recreation Program and Services Analysis and Plan**– Recreation programs and services are the backbone of park, recreation, and library departments. This assessment will review how well the system aligns itself with community needs. The goal of this process is to provide program enhancements that result in successful and innovative recreation program offerings. The Consulting Team will provide insight into program trends from agencies all around the country. The process includes analysis of:

- Age segment distribution
- Lifecycle analysis
- Core program analysis and development
- Similar provider analysis/duplication of service
- Market position and marketing analysis
- User fee analysis for facilities and programs/services
- Review of program development process
- Backstage support, or service systems and agency support needed to deliver excellent service

Ultimately, the outcome of the process will be the creation of a dynamic program plan that results in increased registration, drives customer retention and loyalty, improves customer satisfaction, and increases revenues. Additionally, it will help focus Department efforts in core program areas and create excellence in those programs deemed most important by program participants. Furthermore, the recreation assessment and programming plan for youth and adult and senior populations will be completed that meets CAPRA standards as outlined below:

- Program objectives
- Program and service statistics
- Program and service determinants
- Recreation and leisure service trends
- Community programming inventory

G. **Sports Tourism Strategy** – We will work with the Department to understand how current sports facilities are meeting the local/regional demand, and whether there is a market or opportunity for expanded or new venues. From this cursory review, we will look at other service providers in the region to quantify market share, as well as growth opportunities in the City. Recommendations will be built into the final Strategic Plan by facility type and size.

H. **Prioritized Park and Facility / Program Priority Rankings**– The Consulting Team will synthesize the findings from the community input, survey results, standards, demographics and trends analysis, park and facility assessment, program assessment, and the service area mapping into a quantified park and facility / program ranking. This priority listing will be compared against gaps or surplus in facilities and amenities, as well as programs. This will list and prioritize facility, infrastructure, amenities, and program needs for the recreation system and **provide guidance** for the Capital Improvement Plan. The analysis will include probable future recreation facilities, as well as program needs based on community input, as well as state and national user figures and trends. The Team will conduct a work session with the Department to review the findings and make revisions as necessary.

I. **Capital Improvement Plan** – The Consulting Team recommends the development of a three-tier capital improvement plan that will assist the City in the inevitable and continuous rebalancing of priorities and their associated expenditures. Each tier reflects different assumptions about available resources.

- The **Critical Alternative** has plans for prioritized spending within existing budget targets and focuses on deferred maintenance and lifecycle replacement of assets and amenities within the existing parks system. The intention of this alternative is to refocus and make the most of existing resources with the primary goal being for the City to maintain high quality services.

- The **Sustainable Alternative** describes the extra services or capital improvement that should be undertaken when additional funding is available. This includes strategically enhancing and renovating existing parks and facilities to better meet the park and recreational needs of Roseville residents that would require additional operational or capital funding. In coordination with the city's financial staff, the Department would evaluate and analyze potential sources of additional revenue, including but not limited to capital bond funding, partnerships, grants, and existing or new taxes.

- The **Visionary Alternative** represents the complete set of services and facilities desired by the community. It is fiscally unconstrained but can help provide policy guidance by illustrating the ultimate goals of the parks and recreation system and by providing a long-range look to address future needs and deficiencies. In the *Master Plan*, the Visionary Alternative addresses complete renovations of aging parks and facilities and the development of new parks and facilities. Funding for visionary projects would be derived from partnerships, private investments and new tax dollars.

Task 5 – Financial Analysis

A. Financial Plan and User Fee Analysis – We will review the Department's current Pricing Policy and will make recommendations regarding for potential updates over the next ten to fifteen (10-15) years. We will also will perform analysis to document the financial situation of the Department. The financial analysis will look at the budget, pricing policy, user fees, current and other revenue generating opportunities, grant opportunities, and the revenue forecast. This analysis will identify the financial situation of the Department with three primary goals:

- Understand the financial dynamics to further advance the understanding of operations gained through the work described above
- Review funding and accounting practices with an objective of accurate financial fund tracking and the ability of the Department to have more useful financial information for strategic decision-making
- Seek opportunities to improve the financial sustainability of the Department including evaluating expenditures and increasing current and new sources of revenue

This review will include comparison of current policies with national standards of best practice agencies. The Consulting Team will recommend policies and adjustments to current policies where enhancements may be needed or gaps are identified, as well as potential user fees for facilities, programs, and services.

B. Funding and Revenue Strategies – Funding strategies will be developed based in part to our review and analysis of the facilities as well as the national experience brought by the Consulting Team. The Consulting Team has identified numerous funding options that can be applied to the Master Plan based on the community values. The funding strategies to be evaluated for recommendations will include at a minimum:

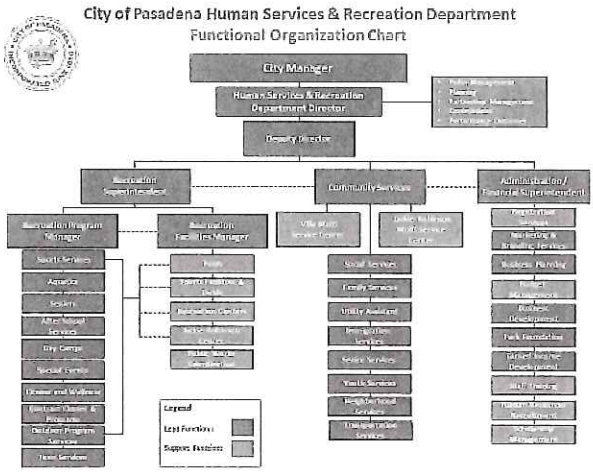
- Fees and charges options and recommendations
- Endowments/Non-profits opportunities for supporting operational and capital costs
- Sponsorships to support programs, events, and facilities
- Partnerships with public/public partners, public/not-for-profit partners and public/private partnerships
- Dedicated funding sources to support land acquisition and capital improvements
- Development agreements to support park acquisition, open space and park and facility development
- Earned Income options to support operational costs
- Land or facility leases to support operational and capital costs
- Identify grant opportunities and resources to construct facilities identified in the Master Plan including suggested timelines

Task 6 – Orgnizational Analysis

A. Organizational Analysis– It is understood that the Department has recently re-organized to better blend the Department, create cross-training opportunities and to provide efficient and effective services. We will work with Department leadership

to evaluate the current organizational structure and provide recommendations regarding staffing levels and the organizational structure to ensure efficiency and effectives in the delivery of services. This analysis will identify Department staffing needs, improved operational efficiencies, policy development, process improvements, system and technology improvements, and marketing/communication opportunities. This task will include recommendations in a comprehensive manner. This will include data collection, analysis and on-site observations of key organizational components in the following areas:

- Classification of services
- Administrative delivery
- Maintenance and operating standards
- Organizational design and staffing
- Customer service
- Staffing levels
- Field equipment/resources
- Service contracts
- Workload requirements
- Procedures manuals
- Existing policy and procedures management
- Performance measures and indicators
- Information systems and technology
- Marketing and communications
- Identify and expand partnerships/volunteer support for facilities and services
- Review and suggest new rules and regulations related to parks



This review will include comparison of current policies with national standards of best practice agencies. The Consulting Team will recommend policies and adjustments to current policies where enhancements may be needed or gaps are identified.

Task 7 – Public Outreach

The Consulting Team will utilize a **robust** public input process to solicit community input on how the recreation system and programs meet the needs of residents into the future. This task is an integral part of the planning process. A wide range of community/participation methods may be utilized with traditional public meetings. We will prepare a community outreach agenda to include the number and types of meetings which will be held. Working with the Department, we will develop and implement an innovative, strategic, and cost-effective public outreach program that incorporates a variety of outreach methods to attract and involve a wide-range of the community. Specific tasks include:

A. Public Engagement/Advocacy Strategy – The public engagement process will work hand-in-hand with the development of an advocacy strategy for the Master Plan. This will also need to account for the new realities in these Covid-19 times and help determine what's the best way to engage the community in person or virtually. This strategic process is a series of workshops at each milestone of the phase as shown:

- Workshop Series #1 – Overview of project and processes to achieve successful, sustainable implementation
- Workshop Series #2 – Present Key Public Needs Assessment Findings
- Workshop Series #3 – Present Key Technical findings
- Workshop Series #4 – Present Recommendations and Implementation Plan
- Workshop Series #5 – Present Final Plan for Adoption

B. Key Leadership/Focus Group Interviews – The Consulting Team will perform focus groups and key leadership interviews the community to evaluate their vision for recreation in the Roseville community. Up to eight (8) focus group meetings and key leadership interviews and other key leaders (up to 16) will be held over a two-day period. Also, during these interviews/focus groups, the Consulting Team will gain an understanding of the community values, as well as determine the priority for

recreation facilities and programming needs of the Department. The following list of potential interviewees will be used to select the final list in conjunction with the Department:

- Key city staff, including Executive Management
- City Council (1 meeting, 1 presentation)
- Parks & Recreation Commission (1 meeting, 1 presentation)
- Library Board
- Senior Commission
- Chamber of Commerce
- Placer Valley Tourism
- Public Safety
- Alternative Transportation
- Area School Districts
- Community-at-large
- Roseville Coalition of Neighborhood Association
- Other groups as may be identified in future discussions



C. **Public Forums/Workshops** – Public forums will serve to present information and gather feedback from citizens at large. It is important to have initial meetings early in the process and follow-up meetings during the final plan development process. It will be important to get maximum media exposure to inform citizens of the purpose and importance of the meetings and clearly note time and locations. We propose to conduct a total of two (2) public forums: one (1) initial public forum at the project midpoint to introduce the project and project goals, preliminary findings, gain input for the community's vision and core values for the recreation system, and one (1) as a final briefing and input opportunity on the draft plan. These meetings would be informal in nature offering the public an opportunity to participate in the planning process and to provide feedback on the proposed options. The purpose for these meetings will be to ensure opportunities for the general public to discuss their priorities and perceptions surrounding the recreation system.

D. **Needs Assessment Electronic Survey** – Also, the Consulting Team will create an online survey administered through www.surveymonkey.com that is open to anyone in the Roseville community. This survey will be promoted through the Department's website and promotional mediums to maximize outreach and response rates. These surveys would provide quantitative data (e.g., not statistically-valid) and guidance in addition to the stakeholder and focus groups in regards to the recommendations for park amenities, specific programs, facility components, usage, and pricing strategies.

E. **Crowd-Sourcing Project Website** – The Consulting Team will develop a customized project website that will provide on-going project updates and will serve as the avenue to crowd-source information throughout the project for the entire community. This could be combined with input through Social Media and could also host videos through a dedicated YouTube Channel and utilize the Town's website. (E.g. www.durangoparksplan.com or www.planindyparks.com.) It has proven to be a very effective tool in engaging the community on an on-going basis as well as maximize outreach to an audience that may not traditionally show up at public meetings or choose to respond to a phone or mail survey.

Task 8 – Implementation Plan & Master Plan Development

The Master Plan will be framed and prepared through a series of workshops with the Department. The overall vision and mission statements will be affirmed or modified, and direction for the Department will be established along with individual action strategies that were identified from all the research work completed. Specific tasks include:

A. **Develop Vision, Mission and Goals/Objectives** – The supporting vision and mission statements will be affirmed or developed with senior staff in a work session. Following this effort, goals/objectives and policies will be established and prioritized. A status briefing will be presented to gain input and consensus on direction.

B. **Strategic Action Plan** - Upon consensus of all technical work, the remaining action plan will be completed with supporting strategies, actions, responsibilities, and priorities/timelines. These strategies will be classified as short-term, mid-term or long-term strategies and priorities. This will be reviewed with the Department in a half-day workshop. The Consulting Team will propose a prioritization schedule and methodology used on successful master plans across the United States from their work. Action plans will be established in the following key areas:

- **Park Development and Improvements** – Recommendations that provide for short and long-term enhancement of park development, improvements, and land acquisition in the City.
- **Park and Facility Operational Management** – Recommendations that provide for short and long-term enhancement of park and facility operational management practices of the Department.
- **Programs and Services** – Recommendations that provide for short and long-term development of programs and services provided by the Department, including opportunities to improve meeting user needs.
- **Library Services** – Recommendations that provide for short and long-term enhancement of library operational management practices of the Department.
- **Financial and Budgetary Capacity Development** – Recommendations that provide for short and long-term enhancement of the financial and budgetary capacity of the Department related to facilities and lands.
- **Policies and Practices** – Specific policies and practices for the Department that will support the desired outcomes of this Master Plan will be detailed.

C. **Draft Report Preparation and Briefings**– The Consulting Team will prepare a draft Master Plan with strategies taking into account all analyses performed and. One electronic copy for public information. A presentation of the draft report will be completed to the City Council.

D. **Final Master Plan Presentations, Preparation, and Production** – Upon comment by City Council, as well as the community, the Consulting Team will revise the Draft Master Plan to reflect all input received. Once the draft Master Plan is approved by the City Council, the Consulting Team will prepare a final summary report and present to the Department for final approval and adoption. The final plan will be prepared with a Summary Report delivered along with associated appendices (technical reports).

Deliverables: Deliverables will be the following:

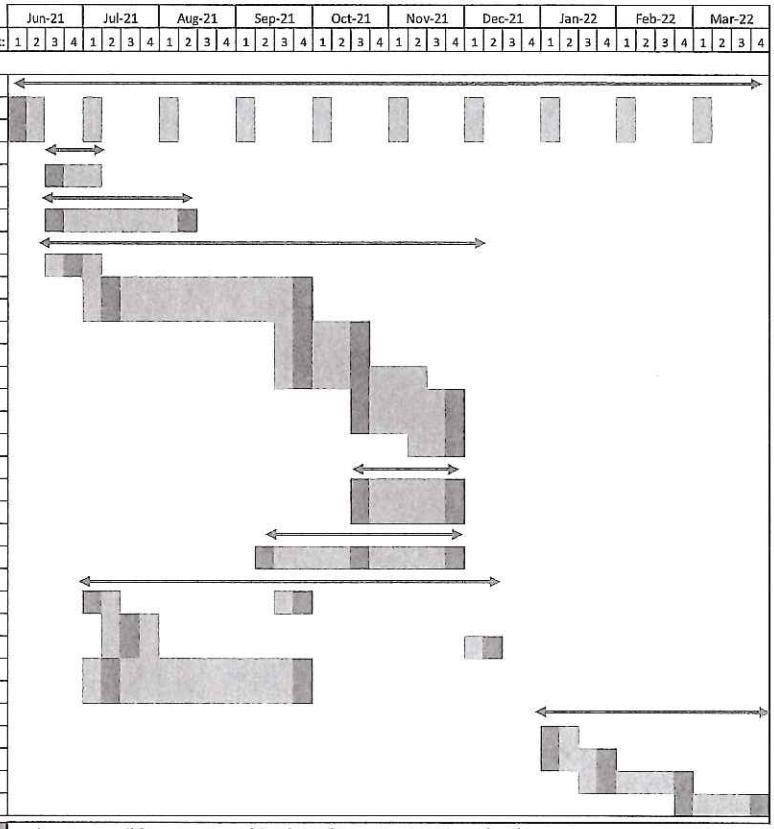
- A strategic ten to fifteen (10-15) year master plan that includes all of the above and:
- A strategic action plan with clear and measurable goals/objectives.
- A summary of existing conditions, asset inventories, staffing levels and level of service standards/analysis, including maintenance and operations.
- Specific and prioritized recommendations to enhance current and future programs, facilities, parks and public spaces to ensure the quality of life in Roseville.
- Identification of amenities that will either fill community gaps/needs or will contribute toward Roseville's economic vitality.
- Identification of recreational trends that will address identified gaps and needs now and into the future.
    - Identify core programs and services currently being offered and provide recommendations for the future based on identified gaps and needs.
- Recommendations for organizational efficiency and effectiveness related to staffing, structure, policies, best practices, expenses/revenues, and administration.
- Identification of new funding and revenue strategies. This should include recommendations to update the current Pricing Policy, if any.
- A ten to fifteen (10-15) year rehabilitation plan for parks and public spaces located within existing Community Facilities Districts for Service.

- A ten year plan for General Funded parks has been developed previously. This plan should be folded into this project and expanded to include new General Funded parks recently completed and extended to the ten to fifteen (10-15) year strategic plan timeframe.
- Charts, graphics or mapping that assists in clearly communicating findings and recommendations.
- A recreation assessment and programming plan for youth and adult and senior populations that meets CAPRA standards.
    - Program objectives
    - Program and service statistics
    - Program and service determinants
    - Recreation and leisure trends analysis
    - Community programming inventory
- A sports tourism plan based on review of City sports facilities (existing and proposed).

Tab E – Project Plan

PROS can begin the project immediately and has the capability and availability to meet the project timeline described below. Specific dates will be set during the kick-off meeting process and the PROS Team will consider any special requirements by the City in regards to scheduling. Each task / sub task lists the firm responsible for each deliverable.

Firm Responsible	Roseville Parks, Recreation & Libraries Strategic Master Plan
	Task 1 - Project Management, Progress Reporting & Existing Document Review
PROS, WRT, ETC, JKSA	A. Kick-off Meeting, Data Collection & Project Management
PROS, WRT, ETC, JKSA	B. Existing Document Review
	Task 2 - Community Profile
PROS, WRT	A. Demographic & Trends Analysis
	Task 3 - Comparisons and Benchmarking
PROS, JKSA	A. Comparative and Benchmark Analysis
	Task 4 - Needs Assessment
PROS, JKSA	A. SWOT Analysis
PROS, ETC	B. Statistically-Valid Needs Assessment Survey
WRT	C. Parks and Facilities Inventory and Assessment
PROS, WRT	D. Park/Facility Classifications and Level of Service Standards
WRT	E. Geographical Analysis through Mapping
PROS	F. Recreation Program and Services Analysis and Plan
PROS	G. Sports Tourism Strategy
PROS, WRT, JKSA	H. Prioritized Park and Facility/Program Priority Rankings
PROS, WRT	I. Capital Improvement Plan
	Task 5 - Financial Analysis
PROS	A. Financial Plan and User Fee Analysis
PROS	B. Funding and Revenue Strategies
	Task 6 - Organizational Analysis
PROS, JKSA	A. Organizational Analysis
	Task 7 - Public Outreach
PROS	A. Public Engagement/Advocacy Strategy
PROS, WRT, JKSA	B. Key Leadership/Focus Group Interviews
PROS, WRT, JKSA	C. Public Forums/Workshops
PROS	D. Needs Assessment Electronic Survey
PROS	E. Crowd-Sourcing Project Website
	Task 8 - Implementation Plan & Master Plan Development
PROS, WRT, JKSA	A. Develop Vision, Mission and Goals/Objectives
PROS, WRT, JKSA	B. Strategic Action Plan
PROS, WRT, JKSA	C. Draft Report Preparation and Briefings
PROS	D. Final Master Plan Preparation and Production



Key Meeting Dates
Length of Task
Task Technical Work

Firm Responsible: PROS Consulting (PROS), WRT, ETC Institute (ETC), Jennifer K. Sweeney & Associates (JKSA)

Tab F – Cost Proposal and Hourly Rates

The following fee breakdown is based on the project approach. We would appreciate the opportunity to meet and discuss the project approach and fees to ensure they are consistent with your expectations, as we are flexible in meeting your needs. This fee is a not-to-exceed amount and includes all costs, both direct and indirect, including any reimbursable expenses.

Hourly Rates:

Leon Younger, PROS Consulting President - $185
Michael Svetz, PROS Consulting Principal - $165
Philip Parnin, PROS Consulting Associate Principal - $145
John Gibbs, WRT Principal - $257
Jennifer K. Sweeney, Principal - $175
Neelay Bhatt, PROS Consulting Principal - $165
Mike Shellito, PROS Consulting Strategic Consultant - $150
Jason Morado, ETC Director of Research - $150
Peter Winch, WRT Senior Planner - $152

Cost Proposal

Review		
A. Kick-off Meeting, Data Collection & Project Management	$	11,561
B. Existing Document Review	$	3,756
Expenses	**$**	**2,000**
Subtotal Dollars	**$**	**17,317**
Task 2 - Community Profile		
A. Demographic & Trends Analysis	$	3,424
Expenses	**$**	**-**
Subtotal Dollars	**$**	**3,424**
Task 3 - Comparisons and Benchmarking		
A. Comparative and Benchmark Analysis	$	5,000
Expenses	**$**	-
Subtotal Dollars	**$**	**5,000**
Task 4 - Needs Assessment		
A. SWOT Analysis	$	4,200
B. Statistically-Valid Needs Assessment Survey	$	15,100
C. Parks and Facilities Inventory and Assessment	$	26,960
D. Park/Facility Classifications and Level of Service Standards	$	4,120
E. Geographical Analysis through Mapping	$	8,000
F. Recreation Program and Services Analysis and Plan	$	10,050
G. Sports Tourism Strategy	$	5,800
H. Prioritized Park and Facility/Program Priority Rankings	$	2,800
I. Capital Improvement Plan	$	4,456
Expenses	**$**	**1,000**
Subtotal Dollars	**$**	**82,486**
Task 5 - Financial Analysis		
A. Financial Plan and User Fee Analysis	$	6,100
B. Funding and Revenue Strategies	$	5,080
Expenses	**$**	**1,000**
Subtotal Dollars	**$**	**12,180**
Task 6 - Organizational Analysis		
A. Organizational Analysis	$	7,320
Expenses	**$**	**850**
Subtotal Dollars	**$**	**8,170**
Task 7 - Public Outreach		
A. Public Engagement/Advocacy Strategy	$	1,400
B. Key Leadership/Focus Group Interviews	$	8,986
C. Public Forums/Workshops	$	11,638
D. Needs Assessment Electronic Survey	$	1,740
E. Crowd-Sourcing Project Website	$	5,000
Expenses	**$**	**2,000**
Subtotal Dollars	**$**	**30,764**
Task 8 - Implementation Plan & Master Plan Development		
A. Develop Vision, Mission and Goals/Objectives	$	2,000
B. Strategic Action Plan	$	14,588
C. Draft Report Preparation and Briefings	$	11,594
D. Final Master Plan Preparation and Production	$	9,360
Expenses	**$**	**3,075**
Subtotal Dollars	**$**	**40,617**
TOTAL EXPENSES	**$**	**9,925**
TOTAL FEES	**$**	**190,033**
TOTAL DOLLARS	**$**	**199,958**

COUNCIL COMMUNICATION

CC #: 1537
File #: 0704

Title: Parks Design & Construction Standards - 2021 Update
Contact: Joel De Jong 916-774-5924 jdejong@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 7.11.

RECOMMENDATION TO COUNCIL

Staff recommends Council adopt a resolution approving the revisions of the Parks Design & Construction Standards for release starting July 1, 2021.

BACKGROUND

The Parks Design & Construction Standards is a guiding document that outlines design and construction standards applied to parks (neighborhood and citywide), and streetscapes. This document is updated every two years in order to ensure new codes, regulations and requirements are updated or added, address typographical errors, provide clarity in areas that may cause multiple interpretations or misinterpretations, and to ensure the latest technology in irrigation, lighting and other systems.

The revisions included in the July 2021 update include:
1. Correction of typographical errors and minor clarifications;
2. Clarifications to the establishment and close-out processes;
3. Updated site furnishings with new model numbers and updated supplier/manufacturer specifications on current products;
4. Updated lighting with updated supplier/manufacturer specifications on current products;
5. Updated irrigation, including new flow sensor and master valve models, pipe fittings, control wire connections and updated supplier/manufacturer specifications on current products;
6. Updated recommended tree list; and
7. Revised standard Parks Details to reflect updated standards, as needed, and update signature blocks to current Parks, Recreation and Libraries Director, Jill Geller.

Feedback from contractors and staff is collected over each two-year period which provides the basis for updates/revisions.

FISCAL IMPACT

The changes described above will have no fiscal impact to projects and could potentially reduce

costs by identifying equipment and materials that are less labor intensive to install and maintain. There is no general fund impact.

ENVIRONMENTAL REVIEW

The California Environmental Quality Act (CEQA) only applies to projects which have the potential to cause a significant effect on the environment. Where it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment, the activity is not subject to CEQA. (CEQA Guidelines §15061(b)(3)).

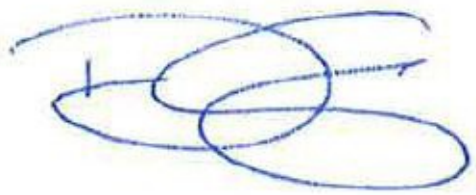
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Goal A - Remain fiscally responsible in a changing world
Goal C - Maintain a safe and healthy community
Goal F - Invest in well-planned infrastructure and growth

Respectfully Submitted,

Joel De Jong, Park Development Project Manager

Jill Geller, Parks, Recreation & Libraries Director



_____
Dominick Casey, City Manager

ATTACHMENTS:

Description

Resolution 21-269

2021 Parks Design & Construction Standards

RESOLUTION NO. 21-269

ADOPTING THE 2021 PARKS DESIGN & CONSTRUCTION STANDARDS

WHEREAS, in 1998, Council adopted the Parks Construction Standards to provide consistency in the construction of City parks; and

WHEREAS, these standards are updated every two years to ensure that the requirements remain up-to-date and applicable to the current construction environment; and

WHEREAS, the City Council has reviewed the proposed revisions of the Parks Design & Construction Standards, a copy of which is on file with the City Clerk,

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Roseville that the 2021 Parks Design & Construction Standards, effective July 1, 2021, is hereby adopted.

PASSED AND ADOPTED by the Council of the City of Roseville this____day of _____, 20_, by the following vote on roll call:

AYES COUNCILMEMBERS:

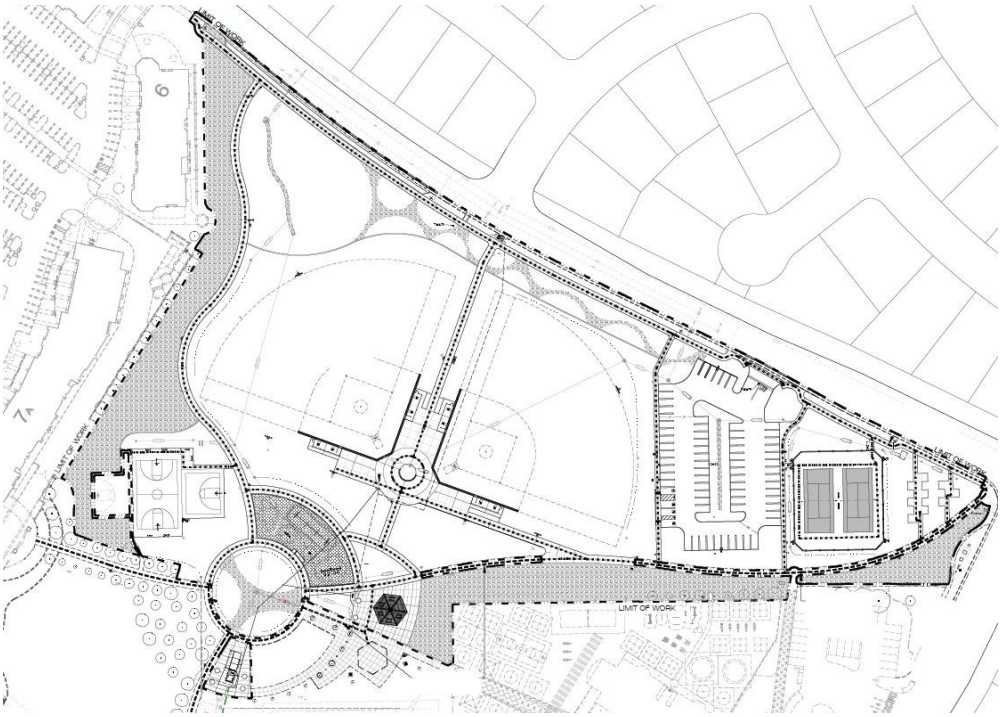
NOES COUNCILMEMBERS:

ABSENT COUNCILMEMBERS:

_____
MAYOR

ATTEST:

_____
City Clerk



Parks Design & Construction Standards

July 2021 Edition

REDLINE COPY
FOR COUNCIL APPROVAL ONLY

In order to ensure the most up-to-date version, hard copies of the Buildings & Grounds Section is provided as a supplemental. In all cases, the Buildings & Grounds Section is considered a part of these Parks Construction Standards.

316 Vernon Street, Suite 400
Roseville, California 95678
www.roseville.ca.us

CITY OF ROSEVILLE CALIFORNIA

CITY OF ROSEVILLE CALIFORNIA

PREFACE

The purpose of these construction standards is to set a minimum standard to be applied to the design and construction of park and streetscape projects within the City of Roseville. These standards are intended to apply to City-generated projects as well as Developer-generated ("Turn-Key") projects. To maintain a standard level of consistency, these requirements shall be applied by all Consultants, Developers, and Contractors.

Standard Construction Practice methodology has been applied to the creation of these standards. It is difficult to anticipate all situations, which may require the use of these standards, therefore, modifications, on a case-by-case basis, may be necessary. Proposed changes shall be reviewed by the Parks, Recreation & Libraries department prior to any modifications. These standards are not intended to replace federal, state, or local codes.

This document is organized into six sections:

- The first section discusses design guidelines and expectations.
- The second section outlines construction document preparation, Developer responsibilities for "Turn-Key" projects and inspection requirements.
- The third section references the City of Roseville's General Conditions for Buildings and Grounds. (See supplemental)
- The fourth section includes the Park's standard for technical specifications, section numbers, and formatting. These specification sections make up the "backbone" of the specification package. Additional information and specifications sections will and should be added by the Consultant to ensure that all project parameters are included in the final package. The City of Roseville Department of Public Works Design and Construction Standards is referenced as it applies to the type of work required to be performed.
- The fifth section contains the standard forms that would apply to each construction project.
- Lastly, the sixth section contains the standard details typically used in a park project. These details are those that can and should be standardized. Additional details specific to the project are to be prepared by the Consultant and included in the contract documents.

The next update to these standards will be in July 2023.

PARKS CONSTRUCTION STANDARDS

Table of Contents

Section 1: Design Guidelines
City Department Key Contacts
Roseville Parks & Recreation Values
Section 1A : Design Preliminaries
Section 1B : Design Development

Section 2: Construction Documents
Construction Documents for Parks
Construction Documents for Streetscapes

Section 3: General Conditions for Building and Grounds
Refer to Supplemental Publication

Section 4: Technical Specifications
i: Table of Contents
Section 00 31 46: Permits
Section 01 10 00: Summary of Work
Section 01 57 23: Storm Water Pollution Control
Section 03 30 00: Site Concrete
Section 04 20 00: Unit Masonry
Section 05 12 00: Structural and Misc. Steel
Section 09 91 00: Painting and Finishes
Section 12 93 00: Site Furnishings
Section 26 00 00: Site Electrical
Section 31 10 00: Clearing and Grubbing
Section 31 20 00: Earthwork
Section 32 12 16: Asphalt Concrete Paving
Section 32 15 40: Decomposed Granite Paving
Section 32 31 13: Chain Link Fencing
Section 32 32 19: Modular Concrete Retaining Walls
Section 32 84 00: Irrigation System
Section 32 90 00: Planting
Section 33 00 00: Utilities

Section 5: Forms & Quality Expectations
Application and Certificate for Payment
Continuation Sheet
Request for Field Instruction
Change Order
Project Schedule Sample
Submittal Summary
Park Improvement Inspection Card
Streetscape Inspection Card
Irrigation Color Schematic Requirements
Water Audit (Process and Checklist)
Cue Cards and Expectation Tri-folds

Section 6: Details

CITY OF ROSEVILLE CALIFORNIA

Parks, Recreation & Libraries Department

Section 1:
DESIGN GUIDELINES

CITY OF ROSEVILLE CALIFORNIA

Parks, Recreation & Libraries Department

Section 1A:
DESIGN PRELIMINARIES

City Departmental Key Contacts

Department	Phone Number (916)
Parks & Recreation, Park Development	772-PLAY (7529)
Development Services, Building Division (Structural)	774-5332
Electric	797-6937
Inspection Line (Structural, Plumbing & Electrical)	774-5332
Development Services, Engineering Division (Right-of-way Improvements & SWPPP)	746-1300
Environmental Utilities	774-5770
Planning	774-5276
Permit Center	Open to public: M-F 8 a.m. - 4 p.m. at 311 Vernon Street

The next update to these standards will be in July ~~2021~~ 2023.

Roseville Parks, Recreation & Libraries Values

Parks, Recreation & Libraries Mission
To enhance lives and the community by providing exceptional experiences.

Parks, Recreation & Libraries Vision
To be the leader in creating a healthy community through progressive, sustainable & memorable experiences.

Parks, Recreation & Libraries Values
- Fun & Celebration
- Innovation
- Learning
- Creativity
- Health & Wellness
- Community
- People
- Stewardship
- Safety
- Inclusion
- Diversity
- Collaboration

Values in Our Partners (Consultants, Contractors, Developers, Others)
- Responsiveness
- Creative and Innovative
- Team Work
- Fiscally Responsible
- Timeliness
- Human Design Bias
- Place-making orientation
- Learners-Teachers
- High Tech-High Touch
- Honesty and Ethics

The focus in all projects should be creating areas for social interaction for people oriented experiences/outcomes. Each space should offer, at minimum, an opportunity to learn and grow, interact and be social through a variety of positive active/programmed and passive/self-directed activities, which are aesthetically pleasing and are safe, clean and green.

The next update to these standards will be in July ~~2021~~ 2023.

CITY OF ROSEVILLE CALIFORNIA

Design Guidelines and Preferred Materials Checklist

These guidelines do not replace adopted Specific Plan Design Guidelines for landscape medians and street frontages. These Specific Plan Design Guidelines also contain conceptual guidance for improved park amenities. For all master plans, the proposed design shall include elements outlined in the adopted Specific Plan to the extent possible.

Grading

- Do not grade turfed slopes greater than 4:1 (25%) as it cannot be easily mowed. If possible, provide a 60" minimum flat bench at top of slope.
- Crown playing fields such as baseball, softball, and soccer, at a minimum of 1.5%, preferably 2%.
- Consider spectator areas when grading the play field sidelines. Provide adequate level areas for spectator seating.
- Provide for a not-to-exceed 2% cross slope on walkways consistent with ADA regulations~~,~~. ~~unless it can be demonstrated that compliance of the 2% cross slope negatively impacts the usability of the park.~~ Less than 2% is preferable to allow for construction tolerances.
- Longitudinal slopes on walks may vary when necessary given the site-specific terrain. Do not exceed 20:1 (5%) without providing handrails per the ADA regulations and the California Title 24 Building Code.
- Ensure compliance with Americans with Disabilities Act of 1990 (ADA), California Title 24 Building Code (Title 24) and minimize the need for handrails whenever possible.
- Hard court surfaces shall be graded at 1%.
- Obtain the current standard notes for grading from the ~~Public Works~~Development Services Engineering Division. These can be found online.
- Comply with the City of Roseville Oak Tree Ordinance.
- Slopes greater than 3:1 are not permitted. If unavoidable circumstances arise during construction, a solution for future erosion of bark and soils must be provided for all slopes greater than 3:1. A drainage plan showing a constructed drainage solution must be provided. An example is to place drain inlets at point discharges and a swale two feet from back of walk. Approval of the proposed drainage solution must be obtained from the Parks, ~~and~~ Recreation & Libraries Department prior to installation.

Drainage

- Confirm and indicate depth of storm drain stub.
- Locate all clean-outs **OUTSIDE** of the play area, within planting or turf.
- Provide a combination system using a main drain inlet and a perforated pipe (in a drain rock filled trench) drainage system to capture long runs or isolated areas within the play area. Slope subgrade to drain inlets.
- Do not locate drains within or immediately adjacent to a play field.
- Do not use drop inlets smaller than sixteen inches (16") square or diameter for landscape areas and twenty-four inches (24") minimum for all other areas. Drop inlets shall be concrete.
- Refer to Parks Standard Construction Details and Public Works Design and Construction Standards. Ensure the plan reference is to the most recent edition.
- For swales in planted or turf areas, ensure a minimum slope of 2%. Avoid swales in turf whenever possible.

The next update to these standards will be in July ~~2021~~2023.

- Do not sheet drain from planted or landscape areas across hardscape.
- Provide area drains ~~at tree wells~~in planter areas enclosed by concrete to prevent flooding.
- Manholes shall be ~~be 48" square (minimum) and~~ per the ~~Public Works~~Development Services Design and Construction Standards.
- For storm drain stubs to future phases of work, cap or install a riser above the silt line.
- Do not place drains within the Oak tree canopy.

Chain Link Fencing

- Where fencing is related to a specific facility, i.e. tennis courts, etc., install black vinyl coated fabric, posts and fittings, whenever budget allows.

Site Furniture

- Do not specify wood furniture.
- Use only in-ground mounted site furniture, except drinking fountains
- All site features, including planter and sound walls shall be sealed with two coats of anti-graffiti sealant in compliance with the ~~Public Works~~Development Services Design and Construction Standards. Site furniture, i.e. benches, picnic tables, etc. shall be coated with anti-graffiti finishes.
- Planters, seat walls and retaining walls shall be designed to prevent skateboarding. This shall be an integral part of the overall design. Third party "add-ons" shall be prohibited.
- Colors "to be selected by the City". Select furniture that provides compatible colors with the play components.
- Provide a two-foot (2') clearance between hardscape edges and site furnishings, or as otherwise required by ADA regulations.
- Provide a minimum four-foot (4') clearance between picnic tables or other obstructions on a minimum of one side for each table, or as otherwise required by ADA regulations.

The next update to these standards will be in July ~~2021~~2023.

Preferred Materials List

(While materials and equipment are listed as preferred, it shall be understood to include "or accepted equal" as stipulated in the standard specifications.)

Description	Model #	Manufacturer	Distributor	Comments
Backstops (Permanent)				Shall be per PK-45 or PK-46 and PK-50
Backstops (Portable)	1204-12	Patterson Williams	Miracle Play Group (916) 317-0545	or accepted equal.
Ball Field Mix	60/40 red lava and clay loam		~~Valley~~ Cascade Rock (916) 383-1300~~916-652-7209~~	or accepted equal.
Barbecue Pits	#200-X	Iron Mountain Forge	All About Play (800) 788-8855	Heavy duty, black or accepted equal.
Basketball Courts				Concrete with fiber mesh, except with prior approval.
Basketball Goals	1513-26-44 #29 backboard perimeter	Patterson Williams	Miracle Play Group (916) 317-0545	6' offset, dual post, #44 ~~net and~~ goal with #35 net, #26 ¼" rectangular heavy-duty solid steel, powder-coated backboard with #29 perimeter, lifetime warrantee. ~~Dual post~~
		Tomark Sports	(800) 959-1844	
	TF7174 (rim) PP10172 (net) TFS172 (backboard) TF7175 (stand)	Wausau Tile	(800) 231-4836	6' offset, heavy-duty chain net, aluminum rectangular powder-coated backboard. Single pre-cast concrete post.
				or accepted equal.
Benches	'SG' Series Signature Series	Wabash Valley	Miracle Play Group (916) 317-0545	Expanded metal, perforated pattern, PVC coated, in-ground mount or accepted equal.
Bike Racks	WBR-700	L.A. Steelcraft Products	Ross Recreation (916) 985-6349	7' loop (ribbon-style), 2-3/8" O.D Powder coated
	709	Miracle	Dale Green & Associates (916) 672-0112	Loop style, powder coated or accepted equal.

The next update to these standards will be in July ~~2021~~2023.

Bollard				shall be per detail PK-39.
Chain Link Fencing	Standard 9 gauge fabric	Per Standard detail PK-40		At play courts, all parts (i.e. posts, fabric, fittings) black vinyl coated, unless otherwise accepted.

Preferred Materials List

(While materials and equipment are listed as preferred, it shall be understood to include "or accepted equal" as stipulated in the standard specifications.)

Description	Model #	Manufacturer	Distributor	Comments
Booster Pump		~~Custom Pump~~V-Power		Sizes required by irrigation system or accepted equal.
Water Feature Controller		Water Odyssey		Sizes required by water play features or accepted equal.
Drinking Fountains	10145~~440~~ SM	Most Dependable Fountains	(800) 821-9838	Dual bowl with ~~jug~~ bottle filler & stainless steel carrier surface option and black powder coated finish. ~~Jug fillers to be added only at field complexes with 2 or more fields~~ Include recessed hose bib with locking cover. All drinking fountains to connect to sanitary sewer lines where feasible
Light Pole	RT34-~~14~~ 16 DE BLK TXT 30-30	Whatley		~~14'~~ 16' nominal mounting height, round tapered, direct burial pole. Finish: Black ~~(This item is available at Central Stores.)~~
Lights (Security/ Pathway)				Whenever possible, match existing streetlights and use an LED fixture
Lights (Parking lot)		Verify fixture style with Project Manager		150 W HPS. 20' straight steel pole. Finish: Black
Park	City	Quick Crete	(916) 447-8644	Concrete

The next update to these standards will be in July ~~2021~~2023.

Identification Sign	Standard PK-28	Products Norco, CA		
		Outdoor Creations Inc.	(530) 365-6106	
Park Namesake Bio Sign		KVO Industries, Inc.	(707) 573-6868	Information provided by City.
Playground Rules Sign	~~City Standard PK—24~~	Gopher Sign Company	(651) 698-5095	Or accepted equal

Preferred Materials List

(While materials and equipment are listed as preferred, it shall be understood to include "or accepted equal" as stipulated in the standard specifications.)

Description	Model #	Manufacturer	Distributor	Comments
Picnic Tables	'SG' series	Wabash Valley	Miracle Play Group (916) 317-0545	Expanded metal, perforated pattern, PVC-coated, in-ground mount. Select 6' long tables with double legs and cross braces. Specified tables shall not have umbrella holes.
Garbage Cans	Urbanscape "FG Style"	Wabash Valley	Miracle Play Group (916) 317-0545	Specify solid dome top, 32 gallon size with receptacle, surface mounted
Tennis Court Posts/Net	2205	Patterson Williams	Miracle Play Group (916) 317-0545	3" sq. posts, black vinyl coated, removable brass tension handle. Heavy duty net or accepted equal.
Volleyball Posts	2219-20	Patterson Williams	Miracle Play Group (916) 317-0545	4" O.D. posts, 11'-6" long w/fixed eyelets, self-securing rope clamp, 4" stainless steel cable option or accepted equal.
Volleyball Net	PBN4		Volleyballusa.com	
Volleyball Sand	~~Mortar Sand~~#1 White Masonry Sand	Hasties Capitol Sand & Gravel	(916) 989-4600	
Softball Bases	10355	Enduro	Tomark Sports	1/field

The next update to these standards will be in July ~~2021~~2023.

and Pitching Rubber		Bury-In Home Plate	(800) 959-1844	
	10390	Step-Down Pitching Rubber		2/field
	10053 and 10050	Saf-T-Slider Base with Double First Base		1 set/field
	10225	Anchor Ground Stakes		8 total/field

Play Areas

- Provide a minimum of three inches (3") between the finish surface of engineered wood fiber or sand and the top of curb/wall/or other. Ensure the 3" is at compaction/settling.
- Include as a part of the design "Age Appropriate" stickers visibly displayed on the equipment indicating the age range of the user in which the designed play structure is intended.
- Include as a part of the design the location of a "Playground Rules" sign indicating expectations for playground behavior and supervision. See standard details for sign design.
- Provide for an accessible path of travel to every major play component (the transfer deck of an active play structure and one belt swing), i.e. poured-in-place rubber surfacing per ASTM requirements. The path of travel must be constructed on non-friable materials.
- Orient the transfer deck to relate directly to the play area entry. Provide an access ramp in compliance with the latest ADA regulations, Consumer Product Safety
  - Commission (CPSC) Guidelines, and American Standards, Testing and Materials (ASTM). Comply with all applicable laws.
- Separate the swing area from the active play area to avoid conflicts in play circulation. Separation should be physical.
- Provide an eight foot (8') distance use zone between the play component and the play area containment edge.
- Do not overlap use zones, unless accepted in applicable regulations/codes. Use zones shall remain in compliance with accepted standards and requirements.
- Do not include "Super Scoops" or similar type sand scoop play components.
- Do not include rubber tile in the play design.
- Site play area for safe play and easy viewing from the street or parking lot.
- Sand for play areas shall be mortar sand as produced by Hasties Sand & Gravel, Roseville, California or equal.
- Colors of the play components "to be selected by the City".

Irrigation

- Confirm and indicate depth of water stubs.
- Recycled Water Systems: See City Environmental Utilities Department (EU).
- **Irrigation Pressure Calculations and Watering Schedules**
  - Pressure loss calculations must consider utilizing a minimum of two and up to 4 valves concurrently equaling the largest system demand.

The next update to these standards will be in July ~~2021~~2023.

- Pressure loss calculations must consider the longest run and the largest demand based on gallons per minute.
- Pressure loss calculations shall consider static water pressure at build-out.
- Watering schedules should consider a finite watering of nine hours per day. The maintenance watering schedule should ensure that the entire system associated with each controller shall meet the nine hour window per day. Watering various areas within a system for seven days a week does not meet the nine hour per watering day criteria.
- The goal of the irrigation system is to provide maximum flexibility to the system in cases where pressure losses are greater than originally estimated, new valves must be added to the system or other long term needs to ensure a healthy, thriving landscaped/turf area.

- Contact EU for selected/accepted backflow prevention device and/or refer to the Development Services Design and Construction Standards.
- Comply to extent reasonable with the City's water conservation ordinance.
- Meter
  - The meter shall be a part of the construction contract. Meters must be purchased through the City (EU).
  - The water connection (if not previously provided) shall be provided by EU. Fees for such connection shall be waived. The actual water tap shall be performed by the City (EU). Costs for installation shall be part of the contract.
- Backflow Preventers (BFP)
  - The BFP can be installed by the contractor OR by the City. All costs of installation (no matter method) is the responsibility of the contractor.
  - Size BFP the same size as the meter.
  - Type shall be accepted by EU.
  - Provide a lockable and removable insulation cover.
- Master Valve
  - For systems with one master valve, use a normally open master valve.
  - For systems with two master valves, the smaller master valve shall be normally open and the larger master valve shall be normally closed. However, bypass manifold assemblies can and should be avoided by using the FLOMEC flow sensor when needed.
  - Install master valve in valve box below grade.
- Flow Meters
  - Install flow meter that can capture maximum flow and minimum flow for the system. ~~If needed, install two flow meters – one flow meter to capture minimum flow and one meter to capture maximum flow.~~
  - Refer to Calsense design guidelines for proper sizing. Use Calsense "Recommend Range".
- Controller
  - Install one antenna for every controller.
  - Controllers for irrigation shall be Calsense and wired one (1) valve per output. Communications shall be via radio.
- Piping
  - Locate mainline as close to hardscape edges as possible.

The next update to these standards will be in July ~~2021~~2023.

- Do not pipe full and part or quarter turf rotor heads on the same valve unless MPR nozzles are specified.
- Sleeve all wiring and waterlines under paving and supply a spare sleeve, same size as largest, capped at both ends under roadways. Mark sleeves with ball markers.
- Pipe sprinkler heads following grade contours.

- Automatic Control Valves
  - The total number of turf heads per valve and GPM flow rate shall not exceed 75% maximum flow rate of the backflow as measured on the downstream side of the backflow.
  - All valves shall be Rainbird with ball valves on the inlet side or approved equal.
  - Zones (Valves) GPM should be matched so that when (the maximum number of) combined (largest valves) in a single program line they will operate close to or equal to the POC (mainline size) assigned maximum GPM. Combine 2 or more turf valves not to exceed MAX POC.
  - Reclaimed Valves to be PEB – no scrubber valves.
  - Water Window: 9 p.m. to 6 a.m. for reclaimed water. (9 hours)
  - Water Window: 9 p.m. to 6 a.m. for potable water. (9 hours)
  - Water Window: Sports Complex with Lights 11 p.m. to 6 a.m. (7 hours)
  - When using turf block or cells, design irrigation within these areas to be separate from adjacent areas for ease of operations.
- Sprinkler Heads
  - When recycled water is used, avoid direct spray onto picnic tables & drinking fountains.
  - Discuss head layout concepts with Project Manager prior to design. Multi-head (rotor) layouts in turf for long turf growth are discouraged.
  - Heads shall be spaced to achieve maximum Distribution Uniformity (DU) and designed to the middle nozzle or middle of nozzle range to allow for maximum adjustability.
  - For turf areas wider than 20 feet:
    - use Rainbird, 8000 or 5500 series
    - use stainless steel riser
    - use risers 5” or taller.
    - use pressure regulators in heads
  - For turf areas less than 20 feet wide:
    - use Rainbird R-VAN nozzles
    - use Rainbird 1800 P45 or Hunter PROS-PRS40 series body
    - use 6” pop-up height
    - use pressure regulators in heads
    - use built-in check valve where needed to prevent low head drainage.
- Spray heads and bubblers for planted areas:
  - In areas where width is 8' or greater:
    - use Rainbird R-VAN nozzles
    - use Rainbird 1800 P45 or Hunter PROS-PRS40 series body
    - use reclaimed body cap when needed (-R)
    - use matched precipitation rates

The next update to these standards will be in July ~~2021~~2023.

- use pressure regulators in heads
- use built-in check valve where needed to prevent low head drainage.
- use 12” minimum offset from hardscape where prevention of overspray and run-off is required.
- Do not use head spacing greater than 20’ in planted areas.

- In areas where width is < 8’:
  - use Rainbird R-VAN Side Strip Nozzles for linear applications or flood bubblers, stream bubblers, or other micro-emission devices
  - use Rainbird 1800 PRS series body
  - use check valve (SAM) when slopes are greater than 3%
  - use reclaimed body cap when needed
  - use pressure regulators in heads
  - use of drip may be considered on narrow, sloped planters where no other technology is feasible, and will be reviewed on a case-by-case basis.
- Design systems with deep water bubblers to trees in turf or planters for 24: boxed specimen or larger.
- Design irrigation zones large enough to see flow on controller independently. ~~This may require a by-pass manifold with two flow sensors.~~

- ~~Provide~~ Provide quick couplers at ~~100’~~ 300’ on center and at all end-of-line locations. ~~and at drinking fountain and picnic area locations.~~

- Sewer
  - Indicate sewer stub, depth of stub and proposed pipe routing.
  - For drinking fountain drain lines in small parks with no planned or future restrooms, SDR35 pipe may be used. All other applications require VCP sewer pipe.
  - If phased, indicate future manholes.
- Other
  - Comply with the City and State Water Conservation Ordinance.
  - Provide a complete water table outlining water needs per valve by month for a twelve-month period. The water table shall be included in the project manual as a part of the specifications (appendix) or on the plans.
  - Provide a complete watering schedule per valve. The watering schedule shall be included in the project manual as a part of the specifications (appendix) or on the plans with expected precipitation rates per valve. The schedule shall list the area (in sq ft) that is irrigated by that valve.
  - All Consultants shall utilize the attached irrigation legend shown in Section 1B for standardization of symbols for commonly used equipment.
  - Install a manual bypass for all quick coupler valves.
  - Do not irrigate within the tree canopy of existing Oak.
  - Points of connection, valves, gate valves, meters, and backflows shall be line size unless specifically approved by the Parks Department.
  - All swing joint components shall be the same size as the inlet of the sprinkler head to be connected.
  - Install a mow band to separate City maintained landscape areas from private maintained landscape areas for streetscapes.

Formatted: Bulleted + Level: 1 + Aligned at: 0.25" + Indent at: 0.5"

Formatted: Justified

The next update to these standards will be in July ~~2021~~2023.

- Install a mow band to separate irrigation systems that use potable water from irrigation systems that use recycled water for streetscapes.
- Install a mow band to delineate the end of a recycled mainline and the start of a different recycled mainline for streetscapes.
- Recycled water signs shall be at park entrances only.
- No planter area shall be less than 4' wide at its minimum width.

- Baseball/softball infield irrigation: (See PK-51 and PK-52)
  - Install a minimum of five (5) rotors on all infields; refer to PK-51 and PK-52. Use Rainbird 8000 heads. Set heads a minimum of four inches (4") and a maximum of six inches (6") into the turf from the infield edge.
  - Set infield rotors a minimum of four inches (4") and a maximum of six inches (6") away from backboards or hardscape.
  - Install a brass manual irrigation valve to turn on the infield line after the control valve.

Landscape Standards

- It should be noted that each specific plan area was carefully planned to create a unique aesthetic using plant material as a key component to achieve the aesthetic goals of the area. Selected plant material should consider the original goals outlined in the design guidelines specific to each plan area.
- Overall Landscape Concepts must:
  - Meet Water Efficient Landscape Ordinance (WELO) goals for water conservation,
  - Ensure diversity in trees, shrubs and groundcovers.
  - Include a mix of seasonal color/flowers (no annuals);
  - Consider location for height of plants at maturity
  - Against buildings/walls: taller plants against wall with layers of descending heights toward the front of planter with groundcover or sub shrubs in front 6" or lower at maturity;
  - In the open (planters with sidewalks on both sides, pathway one side/turf on other, streetscape medians, etc.): taller plants in the center with descending mature heights toward both edges and groundcover or sub shrubs at outer edges (6" or lower);
  - On berms taller than 2' from finish grade: sub shrubs or groundcover (6" or lower) only (total height with plantings at maturity to be 30" or less unless berm is existing);
  - Avoid use of woody stemmed shrubs;
  - Consider walk-on turf alternatives (low groundcover-types);
  - Use perennials to add color, but ensure evergreen are dominant in the planters.
  - Evergreens to provide mix of texture, leaf color and proven longevity;
  - Focus on water conserving plants and not natives, succulents or water thirsty plants;
  - Use multiple types of trees, shrubs and groundcovers (avoid designs that utilize only one tree, one shrub and one groundcover species);

The next update to these standards will be in July ~~2021~~2023.

- Review and contrast specific plan design guidelines with plant material noted in the Parks Construction Standards and current master gardeners/national nursery associations' plant cultivation advances

Landscaping for Parks

- Designs of parks and streetscapes shall maximize use of water-wise plants to the extent possible. Turf shall be designed for functional use for recreational purposes. Eliminate all non-functional turf.
- Where space allows, provide tree groupings in groves rather than in singles or rows in equal intervals, unless the design dictates the need.
- Provide a ten-foot (10') clearance between the tree trunk and the edge of hardscape, locate trees in center of planted areas and not in a straight row.
- Provide an eight-foot (8') minimum clearance between trees and other site improvements, including shrubs.
- Provide an entry planted (non turf) area to locate the park identification sign. Provide three to five (3-5) specialty roses to accent the sign. See City Project Manager for specific type.
- Refer to the list provided for preferred trees. Selected trees shall fulfill the following criteria:
  - For all areas with drains, do not plant trees within 12' of the drain, whenever possible.
  - Be appropriate to the site specific environment;
  - Tolerates heavy soil conditions;
  - Tolerates freeze;
  - Is considered disease and pest resistant;
  - Is known to have a deep rooting system (not shallow rooted) and
  - Tolerates heat (is not susceptible to sunburn).
  - Tree species, which are known for shallow root systems may be considered acceptable if located within a planted area and/or planted with root barrier panels.
  - When providing tree cut outs within hardscape, provide a five-foot (5') diameter round or square cut out. When budgets allow, include tree grates.
  - Planting sizes shall be:
    - 15 gallon for trees
    - 5 gallon for shrubs
    - 1 gallon for vines, selected shrubs and groundcovers
    - Flats for groundcovers.
    - *Size variations to be accepted by the City.*
  - Medium to large trees shall be spaced no closer than 25' on center.
  - Trees shall be planted no closer than 15' to any light fixture or structure.
  - Landscape plans shall draw all plantings, including trees at the mature widths.
  - Plants shall be located away from edge of pavement equal to the radius of the shrub at maturity, plus one foot. (E.g., a shrub that will grow to a 4' width at maturity shall be placed no closer than 3' from edge of pavement.)
- Berms shall not exceed 30" in height. This shall include plant material at maturity.

The next update to these standards will be in July ~~2021~~2023.

- Obtain a soils fertility test and report and include amendment recommendations as a part of improvement plans/construction documents.
- For trees located within open space or natural areas, install drain tiles within the plant basin.

Landscaping for Streetscape

- Grading & Drainage
  - Berms shall not exceed 30" in height. This shall include plant material at maturity.
  - Slopes greater than 3:1 are not permitted. If unavoidable circumstances arise during construction, a solution for future erosion of bark and soils must be provided for all slopes greater than 3:1. A drainage plan showing a constructed drainage solution must be provided. Approval of the proposed drainage solution must be obtained from the Parks and Recreation Department prior to installation.
  - Streetscapes shall not solely rely on surface drainage to address run-off issues. Hard pipe or other designed drainage systems shall be included in all design solutions.
  - Run-off shall be collected and satisfactorily addressed in order to avoid excessive water on sidewalks and/or bike trails.
- Landscaping
  - Tree and plant selection shall be consistent with the specific plan design guidelines AND these Parks Construction Standards.
  - In addition to the original goals of the specific plan, consideration related to major arterials and collector streets that cross specific plan areas or that stretches for long lengths should consider continuity of the plantings. This can be achieved in many ways:
    - Consistent street tree choices;
    - Groupings of a common tree species throughout the length of the road;
    - Use of a common shrubs and groundcover in groupings;
    - Specialty paving in the noses and crossings that convey continuity.
  - All landscape plans shall show sight distance triangles (to be confirmed by the project engineer), signs, streets lights, utility boxes, fire hydrants and any other appurtenances that will affect landscape and irrigation installation.
  - Plantings within the sight distance triangles shall be no taller than 12" at mature height.
  - For unsignalized left turn lanes, landscaping shall be no taller than 12" at mature height for a distance of 175' as measured from the ~~nose of the median~~turn pocket.
  - Trees in medians to be in two rows and offset to avoid a visual "picket fence" effect.
  - Obtain a soils fertility test and report and include as a part of improvement plans/construction documents.

The next update to these standards will be in July ~~2021~~2023.

- A soils fertility test shall be obtained by the contractor and submitted for review prior to adding soil amendments. The soils fertility test shall include recommendations for amendments.

- Irrigation
  - A master irrigation plan shall be developed, submitted and approved with the first phase of sub-phase of a development plan set.
    - The master irrigation plan shall show mainlines and sizes (gallons per minute and pressure), separate point of connections and sizes for each sub-phase, controller sizes, sleeves sizes and locations and valve sizes and locations.
    - Once approved, the master irrigation plan shall be included with each subsequent phase of sub-phased improvement plans.
    - Also, approved sleeve locations shall be reflected on the civil plans.
  - All plans must include a separation of City maintained irrigation and privately maintained irrigation for all irrigation areas shown on the plans. Separation of services includes but is not limited to the following: water meter, backflows, main line, lateral lines, valves, sprinkler layout, drip lines and all other irrigation related items.
  - City maintained irrigation lines, including the main line must not be constructed in privately maintained landscape areas or private property. The separation of City maintained irrigation and privately maintained irrigation must be easily identified on the plans to receive plan approval.
  - If the plans do not contain any City maintained irrigation a note stating this must be shown on each sheet containing irrigation plans.
  - Comply to extent reasonable with the City's water conservation ordinance.
  - All equipment and components of the irrigation system shall be consistent to these Parks Construction Standards. No substitutions are allowed, unless specifically approved.
  - Points of connection, valves, gate valves, meters, and backflows shall be line size unless specifically approved by the Parks Department.
  - For streetscapes, booster pumps are not considered a solution to address low pressure concerns and shall not be used.
  - All swing joint components shall be the same size as the inlet of the sprinkler head to be connected.
  - Master valve shall be Superior 3300.
  - Place mainline in parkway strip if planter is 10' or wider. Otherwise, place mainline in 2' bench at back of walk.
  - Parkway strips under 8' width may use Rainbird R-Van side strip and corner strip nozzles, as appropriate.
  - Areas where width is 4' – 6' (such as tapered noses of medians) should remain unirrigated and unplanted, mulched only. Under 4' should be paved.

- On-Site Amenities
  - Entry monuments and signs shall be designed to include monolithic signage or lettering that is connected as one component. Single lettering is prohibited. All signs and lettering shall be bolted in place and must be flush against surface. Use of epoxy only is prohibited.

The next update to these standards will be in July ~~2021~~2023.

- All plans must include a physical separation, such as a concrete mow band between City maintained landscape and privately maintained landscape. The separation of City maintained landscape and privately maintained landscape must be easily identified on the plans to receive plan approval. If the plans do not contain any City maintained landscape areas a note stating this must be shown on each sheet containing landscape plans.
- Selected stone veneer or stonework shall be available on a long-term basis to ensure future repair work will provide consistency in aesthetics. All veneer shall be grouted in place.
- Accent lighting shall be above-ground, up-light fixtures, or set in the entry walls. Use LED bulbs. All fixtures shall be readily available, with a realistic lead-time for replacement orders. No fixture shall be placed in turf areas.
- Planters and seat walls 4' high and lower with adjacent pavement or hardscape shall be designed to include skate deterrents as an integral part of the wall cap design. Third party add-on products such as "Skate Block" are prohibited.

Flatwork

- Concrete
  - Standard walkway finish shall be medium broom finish, unless identified as a special paving area.
  - Provide at least one path of travel to all major amenities within the park design where the concrete pathway is at least ten feet (10') wide for use by service vehicles. All curves within this route shall contain curves no smaller than ten feet (10') in radius.
  - Concrete mow bands, and concrete collars around light fixtures in turf areas shall be per details PK-27 and PK-29, unless otherwise accepted.
  - Concrete pads for light fixtures, benches, picnic tables or other site furnishings shall use 45-degree (or similar) angles rather than 90-degree angles.
  - Concrete pathways and other standard flatwork applications, shall be installed with fiber mesh at a (concrete section) depth of five inches (5"). Do not include welded wire mesh or rebar, unless otherwise accepted.
  - Install barbeques within decomposed granite. Barbeques shall not be installed within plantings areas or within the concrete picnic pad.
  - Color shall be integral.
- Asphalt Concrete Bike Paths and Miscellaneous Pads
  - Bike paths shall be a minimum of ten-feet (10') wide with a two-foot (2') wide AB shoulder on one side and a two-foot (2') wide decomposed granite shoulder on the other side of the path (for joggers/pedestrians) as shown in Parks Construction detail PK-43. See Public Works' Construction Standards for additional design criteria.
  - Bike path access shall be protected from private vehicle traffic through the use of collapsible bollards, stationary bollards, boulders and post and cable fencing.
  - Bike paths that serve as fire access lanes to wild land environments must have a minimum turning radius of twenty-two feet (22') inside diameter and thirty-two

The next update to these standards will be in July ~~2021~~2023.

feet (32') outside diameter. The bike path shall be capable of supporting a minimum GVW of 30,000 pounds.
  - Other AC paving (including parking lots) shall be per ~~Public Works~~Development Services' Construction Standards.
  - Include a redwood header on the outside edges of the DG shoulder when located within a developed park.
  - For additional bike trail construction requirements, see ~~Public Works~~Development Services Design and Construction Standards.
- Decomposed Granite (DG) Paving
  - Do not install DG in areas ~~which~~ exceed a longitudinal slope greater than 3%.
  - Provide a cross slope not-to-exceed 2%.
  - Install per detail PK-33.
- Header
  - Install per PK-25.
  - Install at both edges of AC or DG pathways within developed park boundaries. Required edging on open space trails shall be determined on a case-by-case basis.

Post & Cable Fencing

- Install per PK-41.
- Fire access points through the post and cable assembly shall be provided at a maximum interval of 750 feet. The cable crossing the fire access point shall be yellow, plastic coated cable in order to delineate the access points. The ends of the access point cable shall be secured to the posts in a similar fashion as the terminal post anchor, with the exception of adding a City of Roseville padlock connecting each end of the cable to the eyebolt.

Restrooms and Outdoor Sinks

- Do not specify porcelain fixtures.
- Use heavy-duty fixtures only, i.e. Chicago or accepted equal.
- Use polished concrete (flooring) sealed with two (2) coats of anti-graffiti stain.
- Do not use tile or brick (on outdoor sinks).
- Install at least one (1) outdoor GFI quadruple outlet with a heavy-duty, weather-resistant, vandal-proof, lockable cover.
- See the City Parks standard restroom plans. Contact the Project Manager to obtain information.
- Sewer connections shall be installed similarly to that described for the water connection and per EU approval. See page 6 of this Section under "Irrigation Meter".
- Do not use dead-bolt locks. Use a latch/lock handle.
- Use unisex signage.
- Lights shall be "LED high abuse security light similar to "Utilitech" 26-W model # 0208819 or approved equal. Timers shall be "Leviton" digital timer switch # VPT24-1P or approved equal.
- Restroom locks shall be "Schlage" dorm locks #ND73PD RHO626 or approved equal.

- Doors to be keyed to City Standard

Pre-Fabricated and/or Proprietary Structures

- Consult with the Building Department for requirements for structural calculations. Some items may be accepted as a deferred submittal. Determination shall be included in the Design Development submittal to the City.
- Include a note on the plans, if deferred items are a part of the project, "No additional time will be granted to the Contractor for Building review and approval of deferred item(s)."
- Bridges that serve as fire access lanes to wild land environments shall be constructed to allow for twelve feet (12') clear width, capable of supporting a minimum GVW of 30,000 pounds and shall allow a straight-line approach of a minimum of thirty-five feet (35').
- Submit structural calculations wet signed by a California licensed structural engineer.
- Submit shop drawings as a part of the construction submittal process.

Site Electrical

- Provide two separate circuits for pathway/security lighting throughout the park per the Parks Construction Standards.
- Security lighting shall be 25% of all fixtures, to be finalized upon design.
- Locate an outdoor GFI dual outlet, weatherproof, vandal-resistant cover in all group picnic areas mounting shall be mounted flush at top of post near roof.
- Metered service panels and service points shall be approved by the Electric Department. Where questions arise regarding acceptable standards, contact the Electric Department directly.
- Playing field lights shall be operated by a Musco control link system or accepted equal.
- Restrooms shall be on a separate circuit.
- Outlets flushed with wall.

Lighting for Security Purposes

- Coverage is for potential gathering places when the park is closed for ease of police surveillance.

Upon Approval of Master Plan

- Upon completion and prior to Parks & Recreation Commission hearing and City Council approval of the Master Plan, provide:
  - a full size rendering laminated and mounted on foam core board;
  - a digital file of the color rendering, jpg & pdf formats.
  - an 8-1/2"x11" color reduction (largest image possible),
  - an 8-1/2"x11" black and white reduction (largest image possible), and
  - an Estimate of Probable Costs.

Neighborhood and Pocket Park Design Criteria

The next update to these standards will be in July ~~2021~~2023.

Design

- Each park is to create a different look, theme or contain an element not already used in other City of Roseville parks.
- Comply with the current Parks Construction Standards.
- Elements to include, but not limited to:
  - Usable/turf for purposes of recreation
  - Maximize water-wise landscape areas where non-functional turf have traditionally been placed.
  - Design for one hour stay
  - One school-aged children's play area
  - One to two bay swings (2 – 4 actual swings)
  - Four and up picnic tables under a shaded shelter
  - Two – three picnic tables scattered within the park
  - Benches
  - Concrete pathways
  - Service access for maintenance to the picnic and play area
  - ADA accessibility through-out
  - One – two security lights
  - One drinking fountain
  - One park identification sign

Open Space Standards

- Provide a 10' clearance between toe of slopes and open space fencing/barriers for maintenance access
- Provide a master access plan for open space within a plan area to strategically identify access points for maintenance access into the open space
- All wetlands shall be flagged and fenced using orange construction fencing prior to start of any clearing and grading operations
- Slopes onto the open space shall be 3:1 maximum
- For landscapes adjacent to open space, use only native, non-invasive plantings
- Irrigation in landscaped areas adjacent to open space shall be designed to avoid all over-spray
- Over-grading onto Open Space shall be avoided
- Increased run-off due to new development on adjacent property shall be avoided or shall be collected into a piped storm drain system and conveyed to an acceptable receiving water. Daylighting onto Open Space is prohibited.

The next update to these standards will be in July ~~2021~~2023.

CITY OF ROSEVILLE CALIFORNIA

Parks, Recreation & Libraries Department

Section 1B:
DESIGN DEVELOPMENT

Preferred Tree List

The following list includes the Department's preferred tree species. Additional species may be suggested by the Consultant, which will be considered during the 75% construction document submittal phase of work.

Planting sizes to be 15 gallon. Variations in size shall be approved by the City.

Botanical Name	Common Name	Deciduous (D), Evergreen (E)	Turf (T), Non-Turf (N), Accent (A), Wet (W)
Large Trees	(Height/Spread: 35' and up)		
Acer rubrum	Red Maple	D	T, N, W
Acer macrophyllum	Big Leaf Maple	D	T, N, W
Acer negundo	Box Elder	D	W
Fraxinus ornus	Flowering Ash	D	T, N
Fraxinus raywoodii	Raywood Ash	D	T, N
Magnolia grandiflora	Southern Magnolia	E	N
Platanus acerfolia "Bloodgood'	London Plane Tree	D	T, N, W
Platanus racemosa	California Sycamore	D	T, N, W
Quercus castaneaefolia	Chestnut Leaf Oak	D	T, N
Quercus douglasii	Blue Oak	D	N
Quercus lobata	Valley Oak	D	N
Quercus phellos	Willow Oak	D	N
Quercus virginiana	Southern Live Oak	E	N
Quercus wislizenii	Interior Live Oak	E	N
Pistacia chinensis	Chinese Pistache	D	T, N
Sequoia sempervirens	Coast Live Redwood	E	T, N
Ulmus 'Accolade'	Accolade Elm	D	T, N
Ulmus 'Emerald Sunshine'	Emerald Sunshine Elm	D	T, N
Umbellularia californica	California Bay	E	T, N

The next update to these standards will be in July ~~2021~~2023.

Botanical Name	Common Name	Deciduous (D), Evergreen (E)	Turf (T), Non-Turf (N), Accent (A), Wet (W)
Medium Trees	(Height/Spread: 20'-35')		
Acer buergeranum	Trident Maple	D	T, N
Geijera parvifolia	Austrian Willow	E	N
Gleditsia triacanthos 'Sunburst'	Honey Locust	D	T, N, W
Koelreuteria paniculata	Golden Rain Tree	D	T, N, A
Laurus nobililis	Grecian Laurel	D	N
Malus floribunda	Japanese Flowering Crabapple	D	T, N, A
Nyssa sylvatica	Tupelo Tree	D	T, N
Schinus molle	California Pepper Tree	E	N
Sophora japonica	Japanese Pagoda	D	T, N
Small Trees	(Height/Spread: 15' - 20')		
Acer palmatum	Japanese Maple	D	N, A
Cercis canadensis	Eastern Redbud	D	N, A
Cercis occidentalis	Western Redbud	D	N, A
Lagerstroemia indica	Crepe Myrtle	D	N, A
Magnolia x soulangiana	Saucer Magnolia	D	N, A
Magnolia stellata	Star Magnolia	D	N, A
Melaleuca nesophila	Pink Melaleuca	E	N, A
Rhus lancea	African Sumac	E	N, A

See following pages for additional tree species options. To the extent possible, tree selections in Streetscapes shall be consistent with the design guidelines in the specific plan.

The next update to these standards will be in July ~~2021~~2023.

~~2019~~ 2021 City of Roseville RECOMMENDED TREE LIST

Common Name	Botanical Name	Water requirements	Distance Between Trees*	Mature Tree Shape	Av Mature Canopy Size (Diameter)	Mature Tree Height (max.)
Trees for 3' Wide Parkway / Planter or Larger *To calulate the planting distance between 2 different tree spacings, add the distances of the 2 species and divide by 2						
Amur Maple	*Acer tataricum ginnala*	*moist to dry*	15'	Rounded	15-20'	20'
Strawberry Tree	*Arbutus unedo*	*moist to dry*	12'	Oval to rounded	8-35'	8-35'
Western Redbud	*Cercis occidentalis*	*moist to dry drought tolerant*	10'	Rounded	10-18'	10-18'
Chinese Fringe Tree	*Chionanthus retusus*	*moist soil*	12'	Rounded	20-25'	20-25'
Chinese Fringe Tree 'Tokyo Tower'	*Chionanthus retusus*	*moist soil*	10'	Rounded	10'	20'
Purple Smoke Tree	*Cotinus coggygria*	*wet to moist*	10'	Rounded	10-15'	20'
English Hawthorn 'Paul's Scarlet'	*Crataegus laevigata 'Paul's Scarlet'*	*moist to dry*	15'	Vase-shape	20-25'	18-25'
Washington Hawthorn	*Crataegus phaenopyrum*	*moist to dry*	12'	Rounded, vase-shaped	15-20'	25'
Goldenchain Tree	*Laburnum anagyroides*	*moist soil*	8'	Oval to round-headed	15-20'	20-30'
Crape Myrtle	*Lagerstroemia hybrids*	*moist to dry*	12'	Broad-rounded	15-20'	6-30'
Crape Myrtle	*Lagerstroemia indica 'dynamite'*	*moist to dry*	12'	Broad-rounded	10-15"	25"
Amur Maackia	*Maackia amurensis*	*moist soil*	15'	Vase-shaped	15-20'	30-50'
Bechtel Crabapple	*Malus ioensis 'Plena'*	*moist soil*	12'	Broad-rounded	20'	25'
Rejoice Crabapple	*Malus 'Rejzam'*	*moist soil*	12'	Broad-rounded	10'	20'

The next update to these standards will be in July ~~2021~~2023.

Common Name	Botanical Name	Water requirements	Distance Between Trees*	Mature Tree Shape	Av Mature Canopy Size (Diameter)	Mature Tree Height (max.)
Crabapple 'Prariefire"	*Malus ioensis 'Prariefire'*	*moist soil*	12'	Broad-rounded	15-20'	25'
Golden Raindrops Crabapple	*Malus 'Schmidtcutleaf'*	*moist soil*	12'	upright vase	15'	20'
Firebird Crabapple	*Malus sargentii*	*well drained soil*	10'	rounded	10'	8'
Royal Raindrops Crabapple	*Malus 'JFS-KWS'*	*moist soil*	15'	upright spreading	15'	20'
Japanese Snowdrop	*Styrax japonicus*	*moist soil*	12'	Rounded	15-20'	25-30'
Fragrant Snowbell	*Styrax obassia*	*moist soil*	12'	Rounded	15-20'	20-30'
Chaste Tree	*Vitex agnus-castus*	*moist to dry*	15'	Rounded	15-20'	20-25'
Trees for 4' Parkway / Planter or Larger *To calculate the planting distance between 2 different tree spacings, add the distances of the 2 species and divide by 2						
Strawberry Tree	*Arbutus unedo 'Marina'*	*moist to dry*	20'	Oval to rounded	30'	40'
Trident Maple	*Acer buergerianum*	*moist soil*	18'	Oval	20-25'	20-25'
Urban Sunset Maple	*Acer truncatum x platanoides*	*moist and well drained soil*	25'	Oval	20'	35'
Hedge Maple	*Acer campestre*	*moist to dry but well drained soil*	18'	Rounded	30-35'	35'
Vine Maple	*Acer circinatum*	*moist soil*	18'	Rounded	25-35'	5-25'
Flame Maple	*Acer ginnala* 'Flame'	*moist soil*	18'	Rounded	20'	20'
Ruby Slipper Maple	*Acer ginnala 'Ruby Slippers*'	*moist soil*	18'	Rounded	20'	20'
Metro Gold Maple	*Acer campestre* 'Panacek'	*moist to dry but well drained soil*	18'	Oval	20'	35'
Red Sunset Maple	*Acer rubrum* 'Franksred'	*wet to moist soil*	18'	Oval	30'	45'
Fireburst Paperbark Maple	*Acer griseum 'JFS KW8AGRI'*	*moist soil*	15'	Upright-oval	15'	25'
Paperbark Maple	*Acer griseum 'JFS KW8AGRI'*	*moist soil*	10'	Oval to rounded	20'	25'

The next update to these standards will be in July ~~2021~~2023.

Common Name	Botanical Name	Water requirements	Distance Between Trees*	Mature Tree Shape	Av Mature Canopy Size (Diameter)	Mature Tree Height (max.)
Crismson Sentry Maple	*Acer Platanoides'Crimson Sentry'*	*moist and well drained soil*	10'	Pyramidal	15'	25'
European Hornbeam	*Carpinus betulus 'Fastigiata'*	*moist soil*	12'	Broad oval-vase shaped	20-30'	35'
American Hornbeam	*Carpinus caroliniana*	*wet to moist soil*	14'	Vase-shaped	20-30'	35'
Eastern Redbud	*Cercis canadensis*	*moist soil*	12'	Rounded	25-35'	20-30'
Golden Flame Tree	*Koelreuteria bipinnata*	*moist soil*	15'	Rounded	15-25'	35'
Goldenrain Tree	*Koelreuteria paniculata*	*moist to dry drought tolerant*	18'	Rounded	30-40'+	30-40'
Coral Sun Goldenrain Tree	*Koelreuteria paniculata 'Coral Sun'*	*moist to dry drought tolerant*	18'	Rounded	18'	20'
Katsura	*Cercidiphyllum japonicum*	*moist soil*	18'	Oval, Rounded or Umbrella	30-40'+	35'
Trees for 4' Wide Parkway / Planter or Larger (Continued) *To calulate the planting distance between 2 different tree spacings, add the distances of the 2 species and divide by 2						
Southern Magnolia 'St. Mary'	*Magnolia grandiflora* 'St. Mary'	*moist soil*	12'	Rounded	15-20'	25'
DD Blanchard Magnolia	*Magnolia grandiflora 'DD Blanchard'*	*moist soil*	12'	Rounded	15-20'	35'
Kobus Magnolia	*Magnolia kobus*	*well drained soil*	15'	Rounded	15-25'	50'
Saucer Magnolia	*Magnolia soulangiana*	*moist soil*	20'	Rounded	20-30'	25'
Mercury Magbnolia	*Magnolia soulangiana 'NCMX1'*	*moist soil*	15'	Upright pyramidal	10-15'	25'
Tupelo / Sour Gum	*Nyssa sylvatica*	*wet tor dry soil*	20'	Rounded pyramidal	20-30'	30-50'
Firestarter Tupelo	*Nyssa sylvatica 'JFS red'*	*wet tor dry soil*	18'	Upright Oval	15'	35'
Green Gable Tupelo	*Nyssa sylvatica' NSUHH'*	*wet tor dry soil*	20'	Pyramidal	20'	40'

The next update to these standards will be in July ~~2021~~2023.

Common Name	Botanical Name	Water requirements	Distance Between Trees*	Mature Tree Shape	Av Mature Canopy Size (Diameter)	Mature Tree Height (max.)
Chinese Pistache	*Pistacia chinensis*	*moist to dry drought tolerant*	24'	Broad-rounded	25-35'	30-35' (65')
Fern Pine	*Afrocarpus acilior*	*moist soil*	10'	Irregular oval	10-18'	65'
Carolina Laurel Cherry	*Prunus caroliniana*	*moist soil, drought tolerant*	15'	Irregular rounded	15-25'	20-30' (40')
Glenleven Littleleaf Linden	*Tilia cordata*	*well drained soil*	15'	Connical or oval	40-60'	65'
Purple Leaf Plum	*Prunus cerasifera* 'Krauter Vesuvius'	*moist soil*	15'	Rounded	15-25'	15-30'
Akebono Cherry	*Prunus x yedoensis*	*moist to dry*	15'	Upright spreading	25'	25'
Pink Flair Cherry	*Prunus sargentii 'JFS-KW58'*	*moist to dry*	15'	Upright narrow vase	10-15'	25'
Kwanzan Cherry	*Prunus serrulata'Kwanzan'*	*moist*	20'	vase	20'	30'
Royal Burgandy Cherry	*Prunus serrulata 'Royal Burgandy'*	*moist*	15'	Broad vase	15'	20'
Ornamental Pear 'Chanticleer'	*Pyrus calleryana* 'Chanticleer'	*moist soil*	18'	Narrow oval	15-20'	30-50'
Trees for 6' Parkway / Planter or Larger					***To calulate the planting distance between 2 different tree spacings, add the distances of the 2 species, divide by 2**	
Marshal Seedless Green Ash	*Fraxinus pennsyvanica 'Marshal'*	*wet to moist soil*	25'	Oval, errect, spreading	30-40'	50'
Bigleaf Maple	*Acer macrophyllum*	*moist soil, drought tolerant*	20'	Broad-rounded	30-75'	45-75'
Japanese Maple	*Acer palmatum 'Bloodgood'*	*moist and well drained soil*	15'	Broad-rounded	25'+	25'
Glowing Embers Japanese Maple	*Acer palmatum 'Glowing Embers'*	*moist and well drained soil*	15'	Broad-rounded	20'	22'

The next update to these standards will be in July ~~2021~~2023.

Common Name	Botanical Name	Water requirements	Distance Between Trees*	Mature Tree Shape	Av Mature Canopy Size (Diameter)	Mature Tree Height (max.)
Red Maple	*Acer rubrum*	*wet to moist soil*	25'	Oval to rounded	to 60'	40-60'
Fall Fiesta Maple	*Acer saccharum 'Bailsta'*	*moist soil*	25'	Broad-rounded	35-50'	50'
Armstrong Gold	*Acer rubrum*	*wet to moist soil*	25'	Columnar	12'	40'
October Glory Maple	*Acer rubrum 'October Glory'*	*wet to moist soil*	25'	Oval to rounded	35'	40'-50'
Columnar Norway Maple	*Acer Platanoides 'columnar'*	*moist and well drained soil*	15'	Narrow upright	15'	35'
Norway Maple	*Acer Platanoides*	*moist and well drained soil*	25'	Rounded	50-60'	65'
Crismson King Maple	*Acer Platanoides 'Crimson King'*	*moist and well drained soil*	25'	Oval to rounded	35'	40'
Armstrong Maple	*Acer rubrum*	*wet to moist soil*	25'	Narrow, fastigiate	12'	45'
Sebsation Box Elder	*Acer neguno 'sensation'*	*wet to dry soil*	25'	Rounded to umbrella	25'	30'
Common Horsechestnut	*Aesculus hippocastanum*	*moist soil*	25'	Rounded	40-70'	60-75'
European Hackberry	*Celtis australis*	*moist to dry drought tolerant*	30'	Rounded	50-60'	40-70'
Common Hackberry	*Celtis occidentalis*	*moist to dry drought tolerant*	25'	Rounded	50-60'	40-70'
Kentucky Coffee Tree	*Gymnocladus dioica*	*moist to dry drought tolerant*	25'	Oval with coarse branching	40-50'	60-75'
Princeton Sentry Ginkgo (Male Only)	*Ginkgo biloba 'Princeton sentry'*	*moist to dry*	15'	narrowly pyrimoidal	15'	40'
Sweet Bay	*Laurus nobilis*	*moist to dry*	20'	Irregular rounded	20-25'	25-35'
Trees for 6' Parkway / Planter or Larger (Continued) *To calulate the planting distance between 2 different tree spacings, add the distances of the 2 species, divide by 2						
Douglas Fir	*Pseudotsuga menziesii*	*moist to dry*	30'	Conical	30-40'	60-80'

The next update to these standards will be in July ~~2021~~2023.

Common Name	Botanical Name	Water requirements	Distance Between Trees*	Mature Tree Shape	Av Mature Canopy Size (Diameter)	Mature Tree Height (max.)
Blue Oak	*Quercus douglasii*	*moist to dry*	30'	Rounded umbrella	50-80'	50-60'
English Oak	*Quercus robur*	*moist to dry*	30'	Oval, round, or umbrella	35-60'	65'
Holly Oak	*Quercus ilex*	*moist to dry*	25'	Rounded umbrella	40-50'	40-65'
Burr Oak	*Quercus macrocarpa*	*wet to dry*	30'	Rounded or umbrella	75-85'	>65'
Turkey Oak	*Quercus cerris*	*well drained soil*	30'	Rounded	50'	50'
Willow Oak	*Quercus phellos*	*moist to dry*	25'	Rounded or umbrella	30-40'	40-60'
Southern Live Oak	*Quercus virginiana*	*wet to moist soil*	25'	Oval, round, or umbrella	30-50'	50'
Cork Oak	*Quercus suber*	*moist to dry drought tolerant*	30'	Rounded or umbrella	35-45'	>65'
Trees for 6' Parkway / Planter or Larger						
Japanese Pagoda Tree	*Sophora japonica*	*moist soil*	25'	Rounded to broad-spreading	50-75'	50'
Accolade® Elm	*Ulmus japonica x wilsoniana 'Morton'*	*moist soil*	25'	Vase shaped with arching limbs	60'	70'
Emerald Sunshine Elm	*Ulmus propinqua 'Emerald Sunshine'*	*moist soil*	25'	Vase shaped	30'	30'
Trees for 8' Parkway / Planter or Larger *To calulate the planting distance between 2 different tree spacings, add the distances of the 2 species and divide by 2						
Sycamore Maple	*Acer pseudoplatanus*	*moist soil*	25'	Oval or Rounded	40-50'	50'
Incense Cedar	*Calocedrus decurrens*	*moist to dry drought*	25'	Conical	25-30'	>65'

The next update to these standards will be in July ~~2021~~2023.

Common Name	Botanical Name	Water requirements	Distance Between Trees*	Mature Tree Shape	Av Mature Canopy Size (Diameter)	Mature Tree Height (max.)
Atlas (Blue) Cedar	*Cedrus atlantica*	*moist to dry drought tolerant*	30'	Conical, spreading	30-40'	>65'
Deodar Cedar	*Cedrus deodara*	*moist to dry drought tolerant*	35'	Conical	30-60'	>65'
Carob	*Ceratonia siliqua*	*moist to dry*	25'	Broad to wide-rounded or umbrella	30-45'	30-40'
Arizona Cypress	*Cupressus arizonica*	*well drained soil*	20'	Conical to columnar	25-30'	40-50'
Maidenhair tree (Male Only)	*Ginkgo biloba*	*moist to dry*	30'	Conical, spreading	30-40'+	40-65'
Autumn Gold Ginkgo (Male Only)	*Ginkgo biloba 'Autumn Gold'*	*moist to dry*	30'	Broadly pyrimoidal	35'	45'
Honey Locust (thornless)	*Gleditsia triacanthos*	*wet to dry soil, drought tolerant*	25'	Oval or umbrella	30-70'	40-65'
Rubylace Honey Locust (thornless)	*Gleditsia triacanthos 'Rubylace'*	*wet to dry soil, drought tolerant*	25'	Oval or umbrella	25'	30'
Sunburst Honey Locust (thornless)	*Gleditsia triacanthos 'Suncole'*	*wet to dry soil, drought tolerant*	25'	Irregular	35'	40'
Toyon	*Heteromeles arbutifolia*	*moist to dry*	25'	Rounded	15-25'	35'
Japanese Lilac	*Syringa reticulata*	*moist to dry drought tolerant*	25'	Oval or Rounded	25-40'	35'
Empress Tree	*Paulownia tomentosa*	*moist soil*	20'	Oval or rounded	30-40'	40-60'
London Plane Tree	*Platanus x hispanica*	*wet to dry soil*	30'	Oval, rounded or umbrella	30-50'	40-70'
American Sycamore	*Platanus occidentalis*	*wet to dry soil*	30'	Oval, rounded or umbrella	30-50'	>70'

The next update to these standards will be in July ~~2021~~2023.

Common Name	Botanical Name	Water requirements	Distance Between Trees*	Mature Tree Shape	Av Mature Canopy Size (Diameter)	Mature Tree Height (max.)
California Sycamore	*Platanus racemosa*	*moist to dry*	30'	Oval, rounded or umbrella	30-50'	40-70'
California Black Oak	*Quercus kelloggii*	*moist to dry*	30'	Oval, rounded or umbrella	30-60'	40-70'
Valley Oak	*Quercus lobata*	*moist to dry*	30'	Broad-rounded	50-80'	>65'
Swamp White Oak	Quercus *bicolor*	*wet to moist soil*	30'	Oval, rounded or umbrella	30-60'	65'
Interior Live Oak	*Quercus wislizenii*	*moist to dry*	30'	Oval, rounded, umbrella or vase	30-60'	30-65'
Western Red Cedar	*Thuja plicata*	*moist soil*	25'	Conical to wide conical	50-80'	50-70'
Sawleaf Zelkova	*Zelkova serrata*	*moist soil*	30'	Rounded or umbrella	30-60'	40-70'
Village Green Zelkova	*Zelkova serrata'Village Green'*	*moist soil*	30'	vase - rounded	40'	40'
Wireless Zelkova	*Zelkova serrata* 'Schmidtlow'	*moist soil*	30'	Broad-vase	15'	24'
Trees for 12'+ Parkway / Planter					***To calulate the planting distance between 2 different tree spacings, add the distances of the 2 species and divide by 2**	
American Chestnut	*Castanea dentata*	*moist soil*	30'	Oval to rounded or wide spreading	40-60'	>65'
Southern Magnolia	*Magnolia grandiflora*	*moist soil*	30'	Broad pyramidal, rounded pyramidal and rounded	30-50'	60-80'

The next update to these standards will be in July ~~2021~~2023.

Common Name	Botanical Name	Water requirements	Distance Between Trees*	Mature Tree Shape	Av Mature Canopy Size (Diameter)	Mature Tree Height (max.)
Chestnut-Leafed Oak	*Quercus castaneafolia*	*well drained soil*	30'	Broad and rounded	50-60'	60-80'
Red Oak	*Quercus rubra*	*moist soil*	30'	Rounded	60-75'	60-75'
Willow Oak	*Quercus phellos*	*moist to dry*	30'	Rounded	30-50'	90'
Scarlet Oak	*Quercus coccinea*	*moist to dry*	30'	Broad oval	40'	50'-60'
Coast Redwood	*Sequoia sempervirens*	*moist soil*	25'	Narrow pyramidal to wide conical	50-60'	60-80'
Giant Sequoia	*Sequoiadendron giganteum*	*moist to dry*	30'	Narrow pyramidal	50-60'	60-80'
Bald Cypress	*Taxodium distichum*	*wet to dry soil*	25'	Oval at maturity, uniform	20-30'	50-70'
Drought Tolerant Species						
Red Push Pistache	*Pistacia atlantica x Pistacia integerrima*	*Moist to dry soil*	25'	Oval at maturity, uniform	20-30'	50-70'
Mulga	*Acacia aneura*	*Moist to dry soil*	10'	Rounded	10-18'	
Palo Verde	*Parkinsonia x desert museum*	*Moist to dry soil*	24'	Broad-rounded	25-35'	30-35' (65')
California Buckeye	*Aesculus californica*	*Moist to dry soil*	24'	Broad-rounded	25'	25'
Loquat	*Eriobotrya japonica*	*Moist to dry soil*	24'	Broad-rounded	25-35'	30-35' (65')
Pineapple guava	*Feijoa sellowiana*	*Moist to dry soil*	10'	Rounded	15-25'	25'
Silk oak	*Grevillea robusta*	*Moist to dry soil*	35'	Oval or Rounded	30-60'	>65
Western Redbud	*Cercis occidentalis*	*moist to dry drought tolerant*	10'	Rounded	10-18'	10-18'
Crape Myrtle	*Lagerstroemia hybrids*		12'	Broad-rounded	15-20'	6-30'
Goldenrain Tree	*Koelreuteria paniculata*	*moist to dry drought tolerant*	18'	Rounded	30-40'+	30-40'

The next update to these standards will be in July ~~2021~~2023.

Common Name	Botanical Name	Water requirements	Distance Between Trees*	Mature Tree Shape	Av Mature Canopy Size (Diameter)	Mature Tree Height (max.)
Chinese Pistache	*Pistacia chinensis*	*moist to dry drought tolerant*	24'	Broad-rounded	25-35'	30-35' (65')
Kentucky Coffee Tree	*Gymnocladus dioica*	*moist to dry drought tolerant*	25'	Oval	40-50'	60-75'
Cork Oak	*Quercus suber*	*moist to dry drought tolerant*	30'	Rounded or umbrella	35-45'	>65'
Honey Locust (thornless)	*Gleditsia triacanthos*	*wet to dry soil, drought tolerant*	25'	Oval or umbrella	30-70'	40-65'
Japanese Lilac	Syringa *reticulata*	*moist to dry drought tolerant*	25'	Oval or Rounded	25-40'	35'
Atlas (Blue) Cedar	*Cedrus atlantica*	*moist to dry drought tolerant*	30'	Conical, spreading	30-40'	>65'
Incense Cedar	*Calocedrus decurrens*	*moist to dry drought tolerant*	25'	Conical	25-30'	>65'
Deodar Cedar	*Cedrus deodara*	*Moist to dry soil*	35'	Conical	30-60'	>65'
Arizona Sycamore	*Platanus wrightii*	*Moist*	35'	Oval or Rounded	30-60'	>65
Trees Tolerant of High-Salinity Irrigation						
Hedge Maple	*Acer campestre*	*moist to dry but well drained soil*	18'	Rounded	30-35'	35'
Golden Flame Tree	*Koelreuteria bipinnata*	*moist soil*	15'	Rounded	15-25'	35'
Deodar Cedar	*Cedrus deodara*	*Moist to dry soil*	35'	Conical	30-60'	>65'
Italian Cypress	*Cupressus sempervirens*	*moist to dry*	10'	Columnar	8-12'	50-60'
Leyland Cypress	*Cupressocyparis × leylandii*	*Moist to dry soil*	18'	Columnar	30'-50'	50-60'
Oleander	*Nerium oleander*	*Moist to dry soil*	18'	Rounded	15-25'	25'
Southern live oak	*Quercus virginiana*	*wet to moist soil*	30'	Rounded	35-45'	>65'

The next update to these standards will be in July ~~2021~~2023.

Common Name	Botanical Name	Water requirements	Distance Between Trees*	Mature Tree Shape	Av Mature Canopy Size (Diameter)	Mature Tree Height (max.)
Cork Oak	*Quercus suber*	*moist to dry drought tolerant*	30'	Rounded or umbrella	35-45'	>65'
Silk oak	*Grevillea robusta*	*Moist to dry soil*	35'	Columnar	40-60'	>65'
Strawberry Tree	*Arbutus unedo*	*moist to dry*	12'	Oval to rounded	8-35'	8-35'
Trident Maple	*Acer buergerianum*	*moist soil*	18'	Oval	20-25'	20-25'
Western Redbud	*Cercis occidentalis*	*moist to dry drought tolerant*	10'	Rounded	10-18'	10-18'
Toyon	*Heteromeles arbutifolia*	*moist to dry*	15'	Rounded	15-25'	35'
California Sycamore	*Platanus racemosa*	*moist to dry*	35'	Oval	34-60'	>65'

The next update to these standards will be in July ~~2021~~2023.

Not To Be Planted Within 20' of Any Infrastructure and Not to be Planted on Roseville City Property - Species have invasive root systems and create major hardscape damages	
Silver Maple	***Acer saccharinum***
Tree-of-Heaven	***Ailanthus altissima***
Mimosa / Silk Tree	***Albizia julibrissin***
White Alder	***Alnus rhombifolia***
Modesto Ash	***Fraxinus velutina 'Modesto'***
Glossy Privet	***Ligustrum lucidum***
American Sweet Gum	***Liquidambar styraciflua***
Mulberry family	***Morus species***
Grey Pine/Foothill Pine	***Pinus sabiniana***
Locust family	***Robinia species***
Willow family	***Salix species***
Cottonwood family	***Populus species***
Chinese Hackberry	***Celtis sinensis***
Chinese Tallow Tree	***Sapium sebiferum***

The next update to these standards will be in July ~~2021~~2023.

Suggested Water – Conserving Plantings

Trees			
Latin Name	*Common Name*	*Native*	*Non-Native*
Aesculus californica	California Buckeye	X	
Ceratonia siliqua	Carob		X
Cercis occidentailis	Western Redbud	X	
Cotinus coggygria	Smoke Tree		X
Juglans californica	California Black Walnut		
Quercus spp.	Oak- Valley, Interior Live, Blue	X	
Quercus spp.	Oak- Virginia, Cork		X
Platanus racemosa	California Sycamore	X	
Rhus lacea	African Sumac		X
Robinia spp	Locust		X
Schinus Molle	California Pepper Tree		X
Umbellularia californica	California Bay	X	
Shrubs			
Latin Name	*Common Name*	*Native*	*Non-Native*
Abelia spp	NCN		X
Arbutus unedo	Strawberry Tree		X
Artemesia californica	California Sagebush, Dusty Miller*	X	
Berberis thunbergia	Barberry	X	
Callistemon spp	Bottlebrush		X
Calluna vulgaris	Scotch Heather		X
Carex firma ‘Variegata’	Carex		X
Carpenteria californica	Bush Anemone	X	
Ceanothus spp	Wild Lilac		X
Cistus spp	Rock Rose*	X	
Cistus mickie	Yellow Rock Rose	X	
Dietes vegata	Fortnight Lily		X
Dodonaea viscosa	Hop bush		X
Erica spp	Heath		X
Eriogonum	Wild Buckwheat	X	
Euryops spp	NCN		X
Grevillea ‘Noelii’	Noel’s Grevillea		X
Hermerocallis spp	Daylily*		X
Heteromeles arbutifolia	Toyon	X	
Kniphofia sp.	Red Hot Poker	X	
Lamium maculatum ‘Aureum’	Spotted Dead Nettle		X

The next update to these standards will be in July ~~2021~~2023.

Shrubs continued			
Latin Name	*Common Name*	*Native*	*Non-Native*
Lavatera maritima	Tree Mallow		X
Liriope spp	Lilly Turf*		X
Loropelatum chinense	Chinese Fringe Flower		X
Mahonia spp	Mahonia	X	X
Mimulus spp	Monkey Flower		
Nerium oleander	Oleander		X
Osmanthus fragrans	Sweet Olive		X
Penstemon spp	Beard Tongue, Penstemon*		X
Photinia x fraseri	Photinia		X
Physocarpus opulfolius	Donna May		X
Rhamnus californica	Coffeeberry	X	
Ribes spp	Gooseberry		X
Rosa banksiae	Lady Banks Rose		X
Rosmarinus officinalis	Rosemary		X
Salvia spp	Sage*		X
Santolina chamaecyparissus	Lavender Cotton		X
Spirea japonica 'Dakota Gold Charm' or 'Gould Mound'	Spirea		X
Viburnum davidii	Sweet Viburnum		X
Xylosma congestum	Shiny Xylosma		X
Zauschneria californica	California Fuschsia	X	

Groundcover, Grasses, Perennials			
Latin Name	*Common Name*	*Native*	*Non-Native*
Actostphylos spp	Manzanita	X	
Arctotis	African Daisy*		X
Aster	Aster*		X
Baccharis spp	Coyote Bush	X	
Carex firma 'Variegata'	Variegated Carex		
Chamaemulum nobile	Chamomile		X
Ceratostigma plumbagiodes	Cape Plumbago		X
Chrysianthemum maximum	Shasta Daisy*		X
Coprosma repens	Mirror Plant		X
Coreopsis	Tick Seed*		X
Festuca ovina var. 'Glauca'	Blue Fescue		X
Gazania 'Fiesta Red'	Red-Orange Gazania		X
Heliamthemum nummularium	Sunrose		
Iberis sempervirens	Candytuft*		X
Iris douglasiana	Iris*	X	
Kniphofia spp	Red Hot Poker*		X

The next update to these standards will be in July ~~2021~~2023.

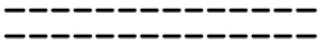
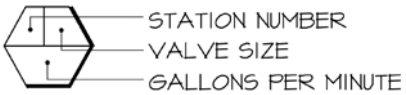
Groundcover, Grasses, Perennials continued			
Latin Name	*Common Name*	*Native*	*Non-Native*
Lavendula angustifolia	Lavendar*		X
Limonium	Statice*		X
Lobularia maritima	Sweet Allysum		X
Muhlenbergia rigens	Deer Grass	X	
Myoporum parvifolium	NCN*		X
Nierembergia spp	Cup Flower		
Pennisetum spp	Fountain Grass		X
Phlox stolonifera	Creeping Phlox*		X
Thymus pseudolinosus	WoolyThyme*		X
Thymus serpyllum 'Coccineus'	Red Thyme		X
Verbena spp	Verbena*		
Vines			
Clematis spp	Clematis*		X
Clytostoma callistegioides	Lavender Trumpet Vine		X
Lonicera japonica	Honeysuckle*		X
Macfadyena unguis-cati	Yellow Trumpet Vine, Cat's Claw		X
Rosa californica	California Rose	X	
Tecoma capensis	Cape Honeysuckle		X
Vitus californica	California Grape	X	

*denotes fire-resistant plants
Native denotes California native
Non-Native denotes ornamental plant species prone to utilize minimal water

While all plants listed require little water at maturity, all plants require initial watering over a three +/- year period in order to properly establish. California natives planted in urban surroundings will require periodic watering during the summer.

The next update to these standards will be in July ~~2021~~2023.

Standard Symbols for the Irrigation Legend

	Pressure Mainline, Schedule 40 PVC, size as noted on the plans. *(Bold and distinctly different from other graphic lines).*
	Non-pressurized Lateral Lines, Schedule 40 PVC, size as noted on the plans. *(Do not use pipe smaller than ¾").*
	Schedule 40 PVC Sleeve under pavement per Parks Standard detail PK-4.
	Point of Connection *(Label static water pressure and gallons per minute available at POC).*
	Meter *(Note size, type and for which line type it applies).*
	Backflow Prevention Device *(Note size, type and City standard detail).*
	Flow Sensor per Parks Standard detail PK-2 *(Note size, and model #).*
	Calsense (V.2) *(Note # of stations).* Install inside enclosure. See Specifications.
	Gate/Ball Valves per Parks Standard detail PK-11 or PK-12. *(Note size, model #, manufacturer).*
	Quick Coupler Valve, Rainbird 44RC per Parks Standard detail PK-14. *(Note size).*
	Electric Remote Control Valve, size as noted on plans. *(Note type, model # and precipitation rate).*
	Pop-Up Rotor *(Note nozzle size, radius, gpm and psi).*
	Other sprinkler heads *(Note type, model, radius, gpm and psi. Use triangular, circular and square shapes, in that order).*
	RCV Valve Labeling Symbol *(Include Station number, gpm and valve size).*

The next update to these standards will be in July ~~2021~~2023.

Standard Irrigation Schedule – Sample

IRRIGATION SCHEDULE: PLANT ESTABLISHMENT

HYDROZONE (CIRCUIT MINUTES PER DAY/WATERING DAYS PER WEEK)
STREAM BUBBLER - .3 PLANT FACTOR - 1 GPM

	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JLY.	AUG.	SEP.	OCT.	NOV.	DEC.
A-7 250 SF	5/1	5/1	4/2	4/2	5/2	5/3	5/3	6/3	5/2	5/2	4/2	5/1

HYDROZONE
SPRAY SHRUBS- .5 PLANT FACTOR - PERCIP. RATE = .45" PER HOUR

	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JLY.	AUG.	SEP.	OCT.	NOV.	DEC.
A-2 - 804 SF	10/2	11/3	19/3	29/3	29/4	35/4	40/4	34/4	26/4	18/4	11/3	6/3
A-4 - 1,130 SF	10/2	11/3	19/3	29/3	29/4	35/4	40/4	34/4	26/4	18/4	11/3	6/3
A-5 1,948 SF	10/2	11/3	19/3	29/3	29/4	35/4	40/4	34/4	26/4	18/4	11/3	6/3
A-6 995 SF	10/2	11/3	19/3	29/3	29/4	35/4	40/4	34/4	26/4	18/4	11/3	6/3
A-11 1,187 SF	10/2	11/3	19/3	29/3	29/4	35/4	40/4	34/4	26/4	18/4	11/3	6/3
A-12 1,909 SF	10/2	11/3	19/3	29/3	29/4	35/4	40/4	34/4	26/4	18/4	11/3	6/3
A-13 1,208 SF	10/2	11/3	19/3	29/3	29/4	35/4	40/4	34/4	26/4	18/4	11/3	6/3
A-15 1,183 SF	10/2	11/3	19/3	29/3	29/4	35/4	40/4	34/4	26/4	18/4	11/3	6/3
A-16 1,054 SF	10/2	11/3	19/3	29/3	29/4	35/4	40/4	34/4	26/4	18/4	11/3	6/3
A-18 2,106 SF	10/2	11/3	19/3	29/3	29/4	35/4	40/4	34/4	26/4	18/4	11/3	6/3

HYDROZONE
SPRAY SHRUBS- .3 PLANT FACTOR - PERCIP. RATE = .45" PER HOUR

	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JLY.	AUG.	SEP.	OCT.	NOV.	DEC.
A-1 1,211 SF	9/2	9/3	16/3	18/4	24/4	29/4	25/5	21/4	17/3	11/3	8/2	7/2
A-3 1,127 SF	9/2	9/3	16/3	18/4	24/4	29/4	25/5	21/4	17/3	11/3	8/2	7/2
A-8 1,530 SF	9/2	9/3	16/3	18/4	24/4	29/4	25/5	21/4	17/3	11/3	8/2	7/2
A-9 1,431 SF	9/2	9/3	16/3	18/4	24/4	29/4	25/5	21/4	17/3	11/3	8/2	7/2
A-10 1,934 SF	9/2	9/3	16/3	18/4	24/4	29/4	25/5	21/4	17/3	11/3	8/2	7/2
A-14 1,907 SF	9/2	9/3	16/3	18/4	24/4	29/4	25/5	21/4	17/3	11/3	8/2	7/2
A-17 1,998 SF	9/2	9/3	16/3	18/4	24/4	29/4	25/5	21/4	17/3	11/3	8/2	7/2

IRRIGATION SCHEDULE: ESTABLISHED LANDSCAPE

HYDROZONE (CIRCUIT MINUTES PER DAY/WATERING DAYS PER WEEK)
STREAM BUBBLER - .5 MEDIUM WATER USE - 15 GPM

	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JLY.	AUG.	SEP.	OCT.	NOV.	DEC.
A-7 250 SF	2/1	3/1	3/1	3/2	3/2	5/3	5/3	5/3	5/3	4/2	3/1	2/1

HYDROZONE
SPRAY SHRUBS- .5 PLANT FACTOR - PERCIP. RATE = .45" PER HOUR

	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JLY.	AUG.	SEP.	OCT.	NOV.	DEC.
A-2 - 804 SF	7/2	14/2	22/2	21/3	31/3	38/3	43/3	29/3	26/4	18/3	13/2	7/2
A-4 - 1130 SF	7/2	14/2	22/2	21/3	31/3	38/3	43/3	29/3	26/4	18/3	13/2	7/2
A-5 1,948 SF	7/2	14/2	22/2	21/3	31/3	38/3	43/3	29/3	26/4	18/3	13/2	7/2
A-6 995 SF	7/2	14/2	22/2	21/3	31/3	38/3	43/3	29/3	26/4	18/3	13/2	7/2
A-11 1,187 SF	7/2	14/2	22/2	21/3	31/3	38/3	43/3	29/3	26/4	18/3	13/2	7/2
A-12 1,909 SF	7/2	14/2	22/2	21/3	31/3	38/3	43/3	29/3	26/4	18/3	13/2	7/2
A-13 1,208 SF	7/2	14/2	22/2	21/3	31/3	38/3	43/3	29/3	26/4	18/3	13/2	7/2
A-15 1,183 SF	7/2	14/2	22/2	21/3	31/3	38/3	43/3	29/3	26/4	18/3	13/2	7/2
A-16 1,054 SF	7/2	14/2	22/2	21/3	31/3	38/3	43/3	29/3	26/4	18/3	13/2	7/2
A-18 2,106 SF	7/2	14/2	22/2	21/3	31/3	38/3	43/3	29/3	26/4	18/3	13/2	7/2

HYDROZONE
SPRAY SHRUBS- .3 PLANT FACTOR - PERCIP. RATE = .45" PER HOUR

	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JLY.	AUG.	SEP.	OCT.	NOV.	DEC.
A-1 1,211 SF	7/1	8/2	9/2	15/2	22/2	25/2	29/2	26/2	19/2	7/2	6/2	7/1
A-3 1,127 SF	7/1	8/2	9/2	15/2	22/2	25/2	29/2	26/2	19/2	7/2	6/2	7/1
A-8 1,330 SF	7/1	8/2	9/2	15/2	22/2	25/2	29/2	26/2	19/2	7/2	6/2	7/1
A-9 1,331 SF	7/1	8/2	9/2	15/2	22/2	25/2	29/2	26/2	19/2	7/2	6/2	7/1
A-10 1,934 SF	7/1	8/2	9/2	15/2	22/2	25/2	29/2	26/2	19/2	7/2	6/2	7/1
A-14 1,907 SF	7/1	8/2	9/2	15/2	22/2	25/2	29/2	26/2	19/2	7/2	6/2	7/1
A-17 1,998 SF	7/1	8/2	9/2	15/2	22/2	25/2	29/2	26/2	19/2	7/2	6/2	7/1

IRRIGATION SCHEDULE - COMMERCIAL

CONTROLLER: A

VALVE	GPM	Landscape Area (S.F.)	PLANT TYPE	WATER USE	IRRIGATION METHOD	WATERING DAYS/WK	MAX RUN TIME CYCLE	ESTABLISHMENT PERIOD												MAINTENANCE PERIOD												PER VALVE		
								JAN	FEB	MAR	APR	MAY	JUN	JULY	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JULY	AUG	SEP	OCT	NOV	DEC			
								MONTHLY ETO												MONTHLY ETO														
								1.1	1.7	3.1	4.7	6.2	7.7	8.5	7.3	5.6	3.7	1.7	1	1.1	1.7	3.1	4.7	6.2	7.7	8.5	7.3	5.6	3.7	1.7	1			
								RUN TIME IN MINUTES/DAY												RUN TIME IN MINUTES/DAY												PR (in/Yr)	MAWA (Gal/Yr)	ETWU (Gal/Yr)
A1	14.0	140	Tree	Med	Bubblers/Drip	3	0:62	0	1	1	2	2	3	3	3	2	1	1	0	0	0	1	1	2	2	2	2	2	1	0	0	28.56	4531	4531
A2	18.8	4,230	Shrub/GC	Low	Bubblers/Drip	3	14.03	6	9	16	24	32	39	43	37	28	19	9	5	4	7	12	18	24	30	33	29	22	14	7	4	17.14	136900	136900
A3	15.4	3,460	Shrub/GC	Low	Bubblers/Drip	3	14.01	6	9	16	24	31	39	43	37	28	19	9	5	4	7	12	18	24	30	33	29	22	14	7	4	17.14	111979	111979
A4	7.0	70	Tree	Med	Bubblers/Drip	3	0:62	0	1	1	2	2	3	3	3	2	1	1	0	0	0	1	1	2	2	2	2	2	1	0	0	28.56	2265	2265
A5	12.9	3,715	WS Turf	High	Stream Spray/Rotor	5	17.95	12	19	35	53	70	87	96	82	63	42	19	11	10	15	27	41	54	67	74	63	48	32	15	9	30.31	120232	120232
A6	8.1	2,300	WS Turf	High	Stream Spray/Rotor	5	17.70	12	19	34	52	69	86	94	81	62	41	19	11	9	14	26	40	53	66	72	62	48	32	14	9	30.31	74437	74437
A7	13.4	3,015	Shrub/GC	Low	Bubblers/Drip	3	14.03	6	9	16	24	32	39	43	37	28	19	9	5	4	7	12	18	24	30	33	29	22	14	7	4	17.14	97577	97577
A8	19.7	3,545	Shrub/GC	Low	Bubblers/Drip	3	14.08	6	9	16	24	32	39	43	37	29	19	9	5	4	7	12	18	24	30	33	29	22	15	7	4	17.14	114730	114730
A9	8.0	80	Tree	Med	Bubblers/Drip	3	0:62	0	1	1	2	2	3	3	3	2	1	1	0	0	0	1	1	2	2	2	2	2	1	0	0	28.56	2589	2589
A10	17.0	4,860	WS Turf	High	Stream Spray/Rotor	5	17.82	12	19	35	52	69	86	95	81	62	41	19	11	9	15	27	40	53	66	73	63	48	32	15	9	30.31	157289	157289
A11	14.0	5,325	WS Turf	High	Stream Spray/Rotor	5	23.71	16	25	46	70	92	114	126	108	83	55	25	15	13	19	35	54	71	88	97	83	64	42	19	11	30.31	172338	172338
A12	14.0	5,325	WS Turf	High	Stream Spray/Rotor	5	23.71	16	25	46	70	92	114	126	108	83	55	25	15	13	19	35	54	71	88	97	83	64	42	19	11	30.31	172338	172338
A13	18.0	4,860	WS Turf	High	Stream Spray/Rotor	5	16.83	12	18	33	50	65	81	90	77	59	39	18	11	9	14	25	38	50	62	69	59	45	30	14	8	30.31	157289	157289
A14	6.0	60	Tree	Med	Bubblers/Drip	3	0:62	0	1	1	2	2	3	3	3	2	1	1	0	0	0	1	1	2	2	2	2	2	1	0	0	28.56	1942	1942
A15	12.3	2,270	Shrub/GC	Low	Bubblers/Drip	3	11.50	5	7	13	20	26	32	35	30	23	15	7	4	4	5	10	16	20	25	27	23	18	12	5	3	17.14	73466	73466
																				ESTIMATED PLANTED AREA AVERAGE PRECIPITATION IN INCHES/YEAR												25.45		
																													TOTAL # OF VALVES			15		

LANDSCAPE AREA		
SHRUB	0	S.F.
ANNUALS	0	S.F.
TURF	0	S.F.
TREE	0	S.F.
TEMP	0	S.F.
HA	0	S.F.

SPECIAL LA		
SHRUB	16,520	S.F.
TURF	26,385	S.F.
TREE	350	S.F.
EDIBLE	0	S.F.
ACTIVE	0	S.F.
WATER	0	S.F.
SLA	43,255	S.F.

OTHER		
BARK MULCH		S.F.
D.G.		S.F.
HARDSCAPE		S.F.
SLA	0	S.F.

TOTAL AREA	
	S.F.

WATER DEMAND		
Maximum Flow Demand	25	Gpm/Day
Watering Window of	8	Hours
# of Watering Days/Wk - Turf	5	Days
# of Watering Days/Wk - Shrub	3	Days

SOILS	YEARLY ETO	
Texture	Clay and Clay Loam	Roseville 52.2

MAWA = (YEARLY ETO) (0.62) [(0.45 x LA) + (0.55 x SLA)]

ETWU = (YEARLY ETO)(0.62)((HA x Ka/IE)+SLA)

ETWU 1,399,905 > MAWA 1,399,905

MAWA	1,399,905
ETWU	1,399,905

The next update to these standards will be in July ~~2021~~2023.

Design Development

Upon Approval of Master Plan, Prepare Design Development Documents

- Use 22" x 34" size sheets is preferred. Plan information shall be contained within a 21" x 33" framework for eventual reduction to 11" x 17" size.
- The first sheet shall be the Title Sheet and shall include only the following items:
  - Vicinity Map
  - Sheet Index
  - Project Title
  - Consultant/Sub-consultant Names, Addresses and Phone Numbers
  - Professional Stamp with Name, License Number and Expiration Date clearly marked.
  - Signature Block for the Development Services Department, City Engineer, Date.
  - 2" x 2" box for Development Services (Engineering and Building) stamp plans upon approval.
  - ***Do not place general plan notes on this sheet. If space is available, these general notes shall be placed on the appropriate sheet to which the notes apply.***
- The second plan sheet shall be a Scope of Work Sheet. This sheet shall be an overall base plan identifying all types of construction including in project using textures and labels all add alternates and any deferred submittals and, if the project is to be phased, a sheet which clearly delineates the various park elements to be constructed under this contract by use of textures and labels.
- Provide the following individual plan sheets, as required for a complete set of working drawings:
  - Demolition (Use topographic survey, existing trees, wetlands, water courses, other natural features, existing utilities and stubs and other pertinent information as a part of the base map).
  - Grading & Drainage (These two sheets can be combined or separated depending on the amount of information which needs to be conveyed. Also include existing topographic information overlaid in a 35% halftone or CAD equivalent).
  - Erosion Control sheet is for reference only and to facilitate preparation of the Storm Water Pollution Prevention Plan (SWPPP). Include the following note "The SWPPP shall be implemented and monitored by the contractor and shall be a "living document" reflecting the status of construction work as it progresses."
  - Staking & Reference (Include roadway stationing, if applicable; and existing street improvements, including street lights, transformers, fire hydrants, and water storm drain and sewer stubs.)
  - Irrigation

- Planting (show proposed trees and shrubs/groundcover on one plan sheet. Include tree permit conditions and notes, if applicable.)
- Landscape Details
- Other trades' sheets

- The plan scale shall be no smaller than 1" = 30', preferably 1" = 20', unless otherwise approved. All plan sheets shall be drawn at the same scale and the north arrows shall be oriented in the same direction from sheet to sheet.

Specifications

- Revise Table of Contents as needed.
- Cover sheet shall be provided by the City, unless it is a turn-key project.
- Review basic sections provided, edit to reflect project needs.
- (First draft submittal shall show strikeouts and redlines. Do not delete shaded paragraphs until final version.) Non shaded paragraphs can not be modified only paragraphs that are shaded should contain revisions.
- Insert additional sections to reflect project needs consistent with format provided. (Modifications shall be Microsoft Word 2010 compatible, Arial font, 12 pt. Indicate all new sections.)
- Specifications shall be prepared and provided in 8-1/2" x 11" booklet form.
- ***The provision of these specifications does not relieve the Consultant of his/her responsibility to provide detailed and complete contract documents.***

Design Development 75% Completion

The purpose of this submittal is to refine design, select materials and address site issues.

(Note: Design Refinement and Materials Selection can occur before 75% submittal. A submittal is required for Parks internal review and comment. Provide electronic pdf plans which includes, at minimum):

- 100% complete Grading Plan with cut and fill calculations and drainage calculations (per City of Roseville Public Works Construction Standards, latest edition). Indicating number import, export or a balanced project.
- 100% complete Drainage Plan. (See #1 comment above and confirm underground stubs/utilities.)
- Partial Construction/Staking and Reference Plan indicating materials and detail references.
- Electrical Plan showing light location, POC and size of transformer.
- Irrigation Plan showing complete mainline layout with gate valves shown, head layout, controller type and location, sprinkler head type (e.g. model number, manufacturer name, gpm, psi and radius in feet), point of connection location and the static water pressure at the point of connection. For projects where the subdivision has not yet been built, indicate the projected static water pressure at build-out.

- Planting Plan, including a plant list, soils analysis report (report to be consistent with test recommendations per Section 32 90 00- Planting, 1.06), a delineation of turf and groundcover areas, and tree locations.
- 75% of the construction details, including references to the City Standards by detail number.
- Determination of any deferred items have been identified and discussed with Building Department and noted on the plans.
- Updated estimate of probable costs.
- Checklist requirements

The next update to these standards will be in July ~~2021~~2023.

Design Development Completion Checklist

Project Name _____ Reviewed By: _____ Date: __/___/___

Grading

- ☐ Cut and fill calculations provided and addressed on plans.
- ☐ Playfield and courts sloped per Design Guidelines.
- ☐ Adequate level space provided at play fields for spectators.
- ☐ Walkways comply with ADA.
- ☐ Berms do not exceed 30" in height.

Drainage

- ☐ Design complies with Design Guidelines, including drainage calculations.

Site Improvements

- ☐ Layout of all site improvements are clearly shown on base map, including:
  - Fencing
  - Drinking Fountains
  - Site Furniture (benches, picnic tables, etc.)
  - Pavement by type
  - Poured-in-place items, i.e. seat wall, retaining walls, concrete curbs, mowstrips, etc.
  - Hard Court Surfaces
  - Overhead Structures
  - buildings
- ☐ Layout of improvements does not create unsafe conditions or conflict with adjacent uses.
- ☐ Layout complies with Design Guidelines.
- ☐ Proposal of unique construction materials and deferred submittal items are clearly shown. (Further discussion may be necessary).

Play Area

- ☐ Drainage and layout complies with Design Guidelines.
- ☐ Use zones are clearly marked and do not overlap, except between spring toys.
- ☐ A clear path of travel from the play area entrance to the transfer deck is shown in the most direct route.
- ☐ The swing area is visually and/or physically separated.
- ☐ At least one belt swing has an accessible non-friable play surface beneath connected to an accessible pathway.

Irrigation

- ☐ Sprinkler head layout is shown.
- ☐ Controller type and location is shown.
- ☐ Sprinkler types and models are listed.
- ☐ Point of connection and static water pressure (current and projected) is listed.

Planting

- ☐ A preliminary plant list is provided.
- ☐ Species shown on the list comply with Design Guidelines.
- ☐ Trees are shown and turf/groundcover areas are delineated.

The next update to these standards will be in July ~~2021~~2023.

CITY OF ROSEVILLE CALIFORNIA

Parks, Recreation & Libraries Department

Section 2:
CONSTRUCTION DOCUMENTS

Standard Construction Document Preparation Checklist for Parks

Construction Documents Review and Approval Process 99% Completion

(City – wide plan review)

- City-wide plan review of 99% complete Plans occurs through the Online Permitting Services (OPS) Portal and Electronic Plan Review system. Plans and other technical documents must comply with the document submittal requirements outlined by the City of Roseville Development Services Department.

- Upon completion of the documents for submittal, provide the Project Manager with the electronic files for upload to the OPS Portal.

- An Appendix should include the, soils fertility, chemistry, and structure testing lab report, permits (other than City permits), geotechnical report (if necessary), and the environmental document (if necessary) shall be incorporated within the appendix. City shall provide permits, geotechnical report, and environmental documents, as needed for the specific project.

- Include an Estimate of Probable Costs with the 99% submittal.

Construction Documents 100% Completion

- Upon receipt of City comments, revise the plans and specifications and provide written responses to each Department's comments indicating where the changes have been made within the contract documents.

- Resubmit plans and specifications (100%) (quantity of resubmittal shall be as necessary to respond to City comments) to the Project Manager for redistribution. Include written responses to the plan check comments.

- Utility Composite (CAD) drawing required by Environmental Utilities at this stage.

Approved Plans and Specifications

- After all departments have approved the construction documents, submit to the project manager the complete set of plans in AutoCAD 2014 or higher format.

Park Plan Requirement *Checklist (For Use by Consultant prior to submitting plans to the City)*

Date: _____

To: _____

CC: _____

Project: _____

CWJ#: _____ **EN#** _____ **BD#** _____

Plans submitted to the City for review and approval must contain the following components. Provide checklist with plan submittals:

COVER SHEET

- ☐ Project Name and Address
- ☐ CWJ# is noted on the top right-hand corner of the plan sheet
- ☐ Landscape Architect Seal
- ☐ Vicinity Map
- ☐ Signature Block
- ☐ Sheet Index
- ☐ Codes Reference
- ☐ Reference to date specific Parks Construction Standards
- ☐ Cut and fill calculations are provided
- ☐ Deferred submittals and add alternates are listed
- ☐ Each sheet is clearly labeled

SCOPE OF WORK PLAN

- ☐ Street lights and roadways are shown.
- ☐ Limit of work line is shown
- ☐ Match lines are shown
- ☐ ADA routes are indicated
- ☐ City of Roseville Public Improvement and Tree Preservation Notes are clearly labeled.
- ☐ Proposed driveways, sidewalks, access points/ramps and right-of-way improvements shown

EROSION CONTROL PLAN

- ☐ Plan is provided

GRADING & DRAINAGE PLAN

- ☐ Storm drain tie-ins are shown
- ☐ Drainage systems are shown.
- ☐ Contour lines are shown, both existing and future
- ☐ Percentage of slope is shown on all sidewalks, concrete, planter areas, etc.
- ☐ Height of walls, curbs and finish grade elevations are shown.
- ☐ Legend is shown.

LAYOUT & REFERENCE (CONSTRUCTION) PLAN

- ☐ Plan is provided.

The next update to these standards will be in July ~~2021~~ 2023.

CONSTRUCTION DETAILS

- ☐ Play structure components are labeled and safety zones are shown.
- ☐ Construction details are provided.
- ☐ Standards Construction details are shown with Department Head signature or referenced.

IRRIGATION PLAN & DETAILS

- ☐ Potable water connection, irrigation point of connection (POC), meters, backflows and types of waterlines are clearly labeled.
- ☐ Sewer and water tie-ins are shown
- ☐ Irrigation main line layout and the size are clearly labeled
- ☐ Sprinkler head and valve layout is shown.
- ☐ Gallons per minute (GPM) is _____ and is shown.
- ☐ Pounds per square inch (PSI) is _____ and is shown.
- ☐ Irrigation legend is provided.
- ☐ Watering schedule is provided.
- ☐ Controller type is _____ and the location is shown.
- ☐ Standard Irrigation details are shown with Department Head signature or referenced.
- ☐ Backflow/connection details comply with Public Works Standards.

LANDSCAPE PLAN & DETAILS

- ☐ Plant list is provided.
- ☐ Tree and shrub locations are shown and turf/groundcover areas are delineated.
- ☐ Standard Planting details are shown with Department Head signature or referenced.

ELECTRICAL PLAN

- ☐ Electrical point of connection is shown.
- ☐ Available amperage is _____ and is shown.
- ☐ Light locations and types are located and labeled.
- ☐ One-line diagram is provided.
- ☐ Load calculations, voltage, phase, size of main service and location of metered pedestal are shown.

STRUCTURAL COMPONENTS (Building, lights, fences over 6' high, walls over 4' high)

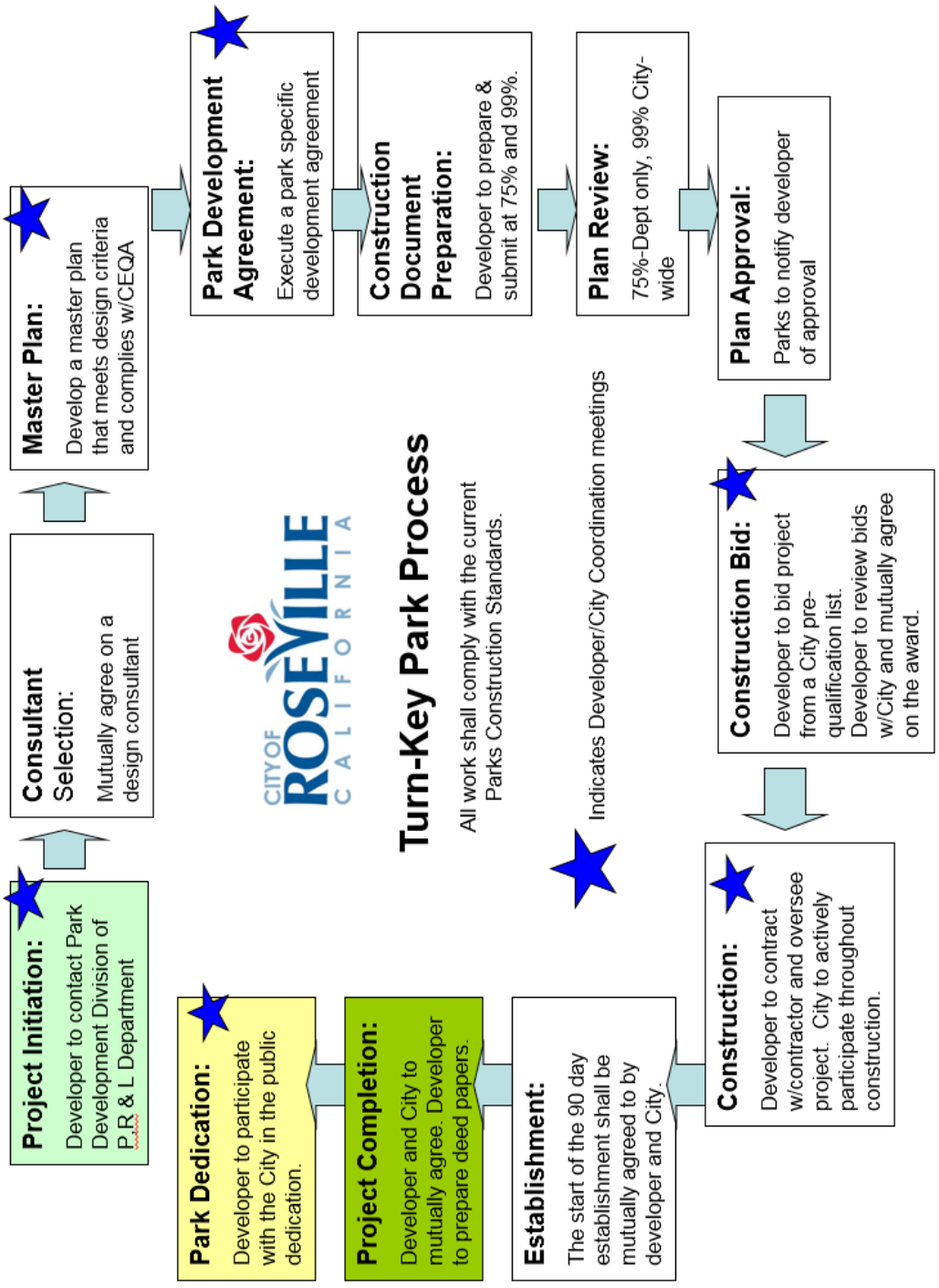
- ☐ Construction details are shown.

As an authorized representative of _____ (firm/company), I have reviewed and verified that the submitted plans contain all of the required items listed above.

Signature _____ Date _____

Print Name _____ Print Firm/Company _____

The next update to these standards will be in July ~~2021~~ 2023.



The next update to these standards will be in July ~~2021~~ 2023.

Process for Developer Generated “Turn-Key” Park Projects

Step	The Developer shall…..	The City shall….
1	Contact Parks, Recreation & Libraries, Park Development Division (774-5505) to set up a meeting to review project and process. Include the proposed construction budget and schedule for design, construction document preparation, and construction.	Meet with the Developer to review the project including: process, design criteria, construction budget and schedule.
2	Execute Park Development Agreement between the City and the Developer(s). (Template available upon request.)	Provide input and assistance toward the creation of the Park Development Agreement. Staff to take agreement to City Council for approval.
3	Provide a list of Landscape Architects under consideration to design the park and to provide construction documents for the project on CAD. Landscape Architect must have had previous park design experience, a valid Calif. Landscape Architect license, and have local experience. Submit a statement of qualifications, and an example of full-scale construction drawings to the City for review and approval.	Review submitted materials and provide input. Make recommendations towards the selection of the Landscape Architects and related Consultants based on their qualifications, references and experience.
4	Notify the City of who the recommended Landscape Architect is, prior to award of their contract and start of their work.	Approve selection of Landscape Architect and related Consultants.
5	Download a copy or provide a link of the Parks Construction Standards, which include park design guidelines for use by the Consultant and City Improvement Construction Standards through Development Services.	Provide a link to the Park Construction Standards.
6	Submit to the City a Conceptual Park Plan and an estimate of probable costs, based on the approved specific plan concept, for review and input.	Review and provide input on the submitted plan.
7	Revise the submitted plan, based on City input, for completion of the Final Master Plan. Submit a colored, laminated rendering and an 8-1/2”x 11” black and	Upon receipt of the final master plan, take proposed plan to Parks and Recreation Commission.

The next update to these standards will be in July ~~2021~~ 2023.

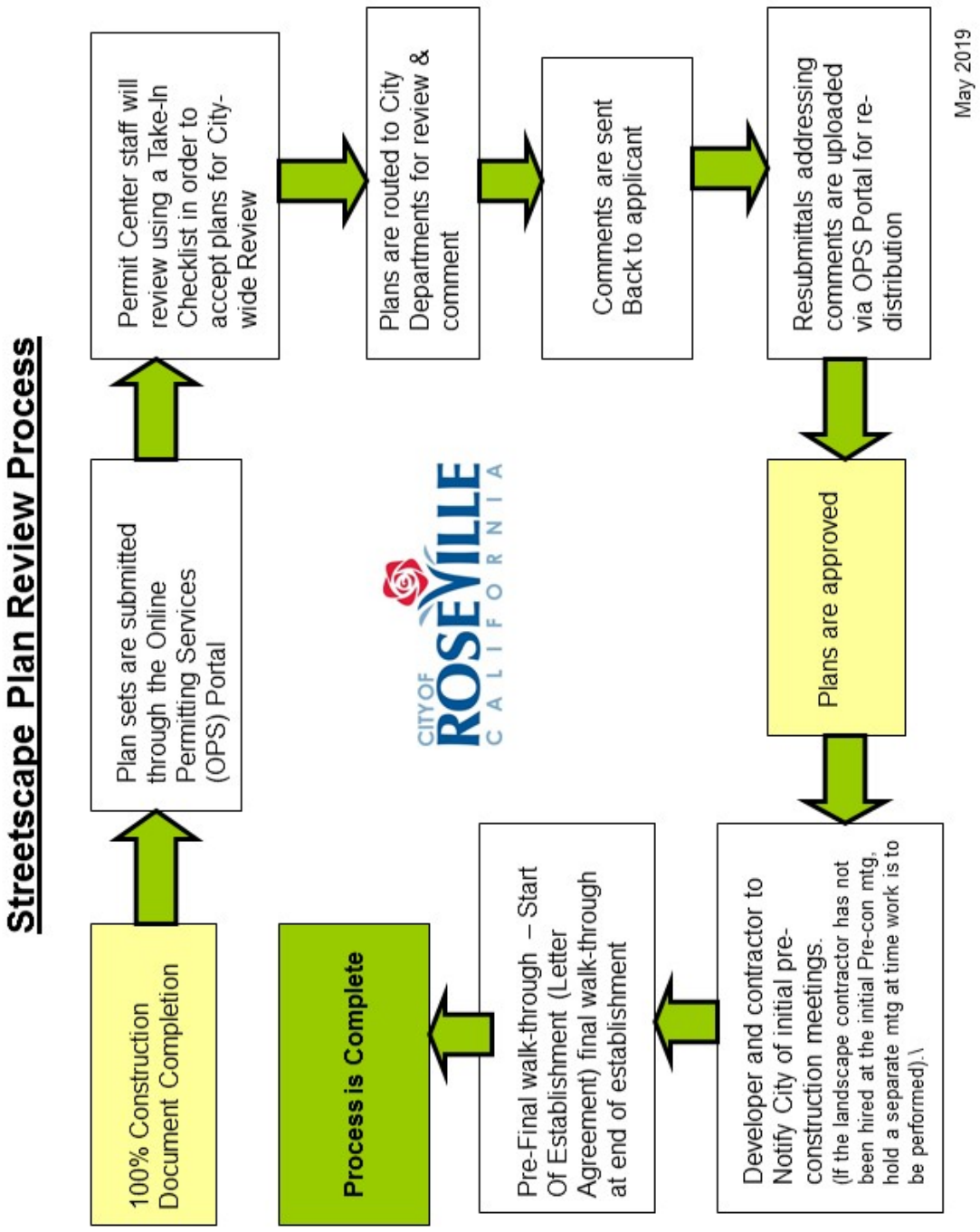
Step	The Developer shall…..	The City shall….
7 (Cont'd)	white reduction of the master plan, a digital file of the color rendering and a revised estimate of probable costs.	
8	Developer is responsible for any required permits, and environmental clearances for project. Based on the completed master plan design, contact the City's Environmental Coordinator for environmental review and determination of requirements and/or clearances. (Generally an initial study is required and possibly a negative declaration.)	
9	Submit final master plan with approved environmental documentation and final cost estimate to City for final approval by City Council.	Take the final master plan with environmental determination to the City Council for approval.
10	Provide construction documents based on the Parks Construction Standards, and applicable City Improvement Standards, at Design Development (75%) and 99% completion. At Design Development completion, provide electronic plan files as outlined in the Design Development Section of these Standards. At 99% completion and prior to citywide review, submit complete sets of plans, permit applications, draft specifications consistent with the Construction Document Section of these Standards to the Project Manager for submittal to the Online Portal Services system. An estimate of fees will be calculated by Development Services and will need to be paid by the Developer in order to cover City plan review, GIS/mapping and inspection costs. Unspent balances of the deposit will be returned to the Developer upon completion of the warrantee period.	Review the construction documents at Design Development and 99% completion. At 99% completion, coordinate plan review with other City departments through the city-wide review process.
11	Revise and resubmit to the Parks, Recreation & Libraries Department contact the construction documents to	Assist in obtaining City approvals of the bid package.

Step	The Developer shall…..	The City shall….
11 (cont.)	reflect City comments. At 100% provide written responses to each City comment indicating where in the documents the response to the comment is located. After all Departments have approved the construction documents, submit the bid package (see next page)	
12	Upon receipt of approved plans, obtain list of pre-qualified contractors from City. Certain subcontractor trades are included in pre-qualifications.	Provide pre-qualified contractors/subcontractors' list.
13	Solicit bids for the construction of the project utilizing the pre-qualified contractors list.	
14	Upon receipt of bids, provide the City with the results of the bid. Make recommendations for selection of the contractor and value engineering items, if necessary.	Review and approve bid recommendation. (Value engineering may be necessary if bids are over budget.)
15	If required, hire a park construction inspector, as approved by the City.	Approve or provide a park construction inspector.
16	Upon City approval, register selected contractor with the Department of Industrial Relations, outlining scope of work included in the contract, and proceed with the construction of the project. Notify the City's liaison of the Pre-construction meeting and submit a construction schedule at that time.	All applicable City Dept's to participate in the Pre-construction meeting and ongoing inspections as required.
17	Obtain all applicable City permits, including, but not limited to, grading, drainage, encroachment, building and tree permits. Maintain all inspection cards including Parks inspection card on site to be signed off by inspectors at the time of each inspection.	Provide Parks inspection card.
18	Submit electronic versions of project submittals for review and approval by the City.	Review and stamp submittals. Distribute to applicable City staff and return electronic copy to developer.

The next update to these standards will be in July ~~2021~~ 2023.

Step	The Developer shall…..	The City shall….
19	Developer to provide a professional liaison (i.e. landscape architect or construction manager) to monitor and communicate with the City during the progress of construction and any changes which may need to be considered due to site conditions or other. This shall include the review of any submittals and other shop drawings.	Participate in the on-site review, submittal reviews, and inspections of construction progress. Attend routine construction meetings as needed.
20	Conduct on-site reviews on a weekly basis. Complete establishment period. Conduct a Pre-final and Final site review. Submit certification by landscape architect that park is built according to plans and specifications.	Participate in the Pre-final and Final site review.
21	If a reimbursement is due, submit a detailed cost summary with receipts or approval forms to the City for review, including approved change orders.	Meet with Developer to review final cost summary. Based on agreed cost, process reimbursement to the Developer.
22	Coordinate a meeting with the City to provide turn-over documents as outlined in the Parks Standards.	Facilitate a meeting and collect all turn-in items, including meter numbers for transfer to City.
22	Submit the appropriate documentation for the deeding of the improved park property to the City for recordation. Coordinate with the City Manager's Office. Also switch utility bills from developer to City of Roseville.	Accept the project upon completion of all of the following: formal dedication by the developer, upon satisfactory completion of the project including the maintenance period, and upon receipt of asbuilts.
23	Celebrate with a dedication - Work with City to plan.	Work with Developer to plan dedication of park.
24	Respond on a timely basis to any repairs under the one-year warrantee.	Monitor warranty period and request any repairs.
25		At end of warranty period, provide balance remaining of deposit to Developer.

The next update to these standards will be in July ~~2021~~ 2023.



The next update to these standards will be in July ~~2021~~ 2023.

Streetscape Construction Documents and Plan Processing

Streetscape Construction Document

Streetscapes General

- List the square footages of turf areas and landscape areas individually (by valve number) within the irrigation sheets.
- Redwood header boards are not permitted. Utilize the 12" wide concrete mow bands per Parks Construction Standards.
- Include required notes on all plan sets:
  - "All improvements shall comply with City of Roseville Parks Construction Standards, latest edition".
  - "Contact USA Alert (800) 642-2444 at least 48 hours prior to start of work."
  - "A preconstruction meeting must be scheduled prior to construction commencement of any irrigation and/or landscaping."
- Show accent lighting including model # and type on the plans. In-ground fixtures are not permitted. Lighting located within a turf area is not permitted. Use LED fixtures where possible.
- Subdivision names on entry monuments shall be cast in place or monolithic and bolted. Epoxy placed lettering or logos are not permitted.
- Seat/Planter walls and handrails shall be designed with skate deterrents as an integral part of the design. Third party add-on products such as "Skate Block" are prohibited.

Grading

- All plans shall include grading contours and drainage systems to show how site water is being surface and subsurface drained.
- All berms shall not exceed 30 inches in height; this shall include the height of plant material on the berm at maturity.
- Slopes of any landscaped areas greater than 2% shall locate the toe of slope two feet away from back of walk. The remaining two feet shall be a bench sloped at 2% away from the back of walk.

Irrigation

- Provide water/irrigation schedule on each irrigation plan consistent with requirements outlined in the City's Water Efficient Landscape Ordinance.
- The gallons per minute shall be included for all irrigation nozzles on the irrigation legend.
- Location and size of back flow preventer shall be shown. Provide a detail enlargement of the point of connection.
- Size of the meter, backflow and all valves shall be consistent with the size of the irrigation main line.
- #12 copper tracing wire is required along entire length of irrigation main line.

- Reclaimed water notes shall state compliance with City of Roseville Department of Public Works Design and Construction Standards. If utilizing an existing controller, specify its location and how many stations are available for use. Landscape architect shall verify existing controller conditions.
- All irrigation designs must comply with the City of Roseville Water Efficient Landscape Ordinance.
- Sub-surface irrigation shall be minimally used and only as approved by the Parks, Recreation & Libraries Department. Areas for consideration in allowed used of sub-surface irrigation are corners around monuments and narrow areas less than 3 feet wide. Additional review of drip will be required for changing legislation.
- Do not design streetscapes using booster pumps.

Planting

- Planting and irrigation must be integrated so that like-water use plants are placed together in the same irrigation zone.
- Do not use “No Mow” fescue.
- Large trees shall not be used where planter or median strip widths are less than ten feet wide. Either remove the tree or replace with smaller variety. See Design Guidelines Section for trees specific to planter widths.
- All plans shall include vehicle site distance triangles at all intersections and turn pockets. Site distance triangles shall be verified by the project engineer. No plantings which will grow taller than 12” in height at maturity shall be planted within the site distance triangles.
- All plan sets shall show fire hydrants, streets signs, street lights and underground utility easements. Planting shall avoid conflicts with these improvements.
- Do not plant trees or shrubs in front of irrigation heads.

The next update to these standards will be in July ~~2021~~ 2023.

Streetscapes Plant Species Concern

Botanical Name	Common Name	Concerns	Alternate Suggestion
Agapanthus	African Lily	Limit use, heat and frost sensitive	dwarf variety
Aquilegia formosa	Western Columbine	Short lived species, sun and heat sensitive	Phygelius x rectus 'Winchester Fanfare' or 'Pink Elf' or 'African Queen' or 'Trewidden Pink'
Artemesia californica 'Canyon Gray'	Trailing Sagebrush	Prohibited in the specific plan	Artemisia stellerana 'Silver Brocade' or Lessingia filaginifolia 'Silver Carpet'
Crataegus laevigata	English Hawthorn	Disease prone, do not use	Acer buergeranum 'Streetwise'
Hypericum calycinum	Creeping St. Johnswort	Do not use, this species is invasive	Teucrium chamaedrys 'Prostratum' or Gazania or Erigeron 'Wayne Roderick'
Imperata cylindrical 'Rubra'	Japanese Blood Grass	Winter dormancy, with high water requirements	Pennisetum setaceum 'rubrum'
Lupinus albifrons	Silver Bush Lupine	Short lived	Teucrium fruticans 'Compactum'
Mimulus aurantiacus	Sticky Monkey Flower	Brittle stems and summer dormant	Agastache 'Apricot Sunrise' or 'Tangerine Dreams' or 'Tutti-frutti' (These require good drainage)
Platanus x acerifolia	London Plane Tree	Limit use, do not use in planters less than 10' wide	
Pinus spp	Pines	Structurally unsound	
Rosmarinus officinalis	Rosemary	Collects trash too rangy	

The next update to these standards will be in July ~~2021~~ 2023.

Plan Approvals and Construction

- Plans approved more than two years prior to the start of construction shall comply with the current Parks Construction Standards and may require a new review at the time of construction.
- Contractor shall include Parks, Recreation & Libraries Department in the initial pre-construction meeting.
- Due to the delay in time between the initial pre-construction meeting and landscape work, the Contractor shall call for a second pre-construction meeting with Parks, Recreation & Libraries prior to start of irrigation work. This includes any proposed impacts to existing irrigation systems already under City operations. The landscape subcontractor shall be in attendance.
- All streetscapes are required to be inspected by the City of Roseville Park Inspector at key milestones of the project. A construction inspection card specific to streetscapes will be presented at the preconstruction meeting and must be kept at the construction site at all times. The Inspector must approve and sign each construction milestone listed on the inspection card at the time of inspection. Signing off of all phases/milestones at the end of the project is not permitted.

The next update to these standards will be in July ~~2021~~ 2023.

CITY OF ROSEVILLE CALIFORNIA

Street Landscape Plan Requirement *Checklist (For use by the Consultant prior to submitting plans)*

Date: _____

To: _____

CC: _____

Project: _____

CWJ#: _____ **EN#** _____ **BD#** _____

Plans submitted to the City for review and approval must contain the following components:

COVER SHEET

- ☐ Project Name and Address
- ☐ CWJ# is noted on the top right-hand corner of the plan sheet
- ☐ Architect or Engineer Seal
- ☐ Vicinity Map (Context of the property is shown with adjacent land uses labeled.)
- ☐ Signature Block
- ☐ Sheet Index
- ☐ Reference to date specific Parks Construction Standards
- ☐ Individual square footage of turf areas and landscape areas are listed.
- ☐ Each sheet is clearly labeled

GRADING & DRAINAGE PLAN

- ☐ Storm drain tie-ins are shown
- ☐ Drainage systems are shown.
- ☐ Contour lines are shown, both existing and future
- ☐ Percentage of slope is shown on all sidewalks, concrete, planter areas, etc.
- ☐ Height of walls, curbs and finish grade elevations are shown.
- ☐ Legend is shown.

LAYOUT & REFERENCE (CONSTRUCTION) PLAN

- ☐ Plan is provided.
- ☐ Street lights and roadways are shown.
- ☐ Limit of work line is shown
- ☐ Match lines are shown
- ☐ Proposed driveways, sidewalks, access points/ramps and right-of-way improvements are shown
- ☐ Major sewer, water and storm drain lines are shown.
- ☐ Fire hydrants are shown

IRRIGATION PLAN & DETAILS

- ☐ A master irrigation plan showing points of connections/sizes, sleeves/sizes, valbes/sizes, mainline/sizes and controller locations shall be included in all phased plans sets.
- ☐ Areas that are to be City maintained and privately maintained are clearly labeled.
- ☐ Irrigation water point of connection (POC), meters, backflows and types of waterlines are clearly labeled.
- ☐ Irrigation main line layout and the size are clearly labeled
- ☐ Sprinkler head and valve layout is shown.
- ☐ Gallons per minute (GPM) is _____ and is shown.

The next update to these standards will be in July ~~2021~~ 2023.

☐ Pounds per square inch (PSI) is _____ and is shown.
☐ Irrigation legend is provided.
☐ Watering schedule is provided.
☐ Controller type is _____ and the location is shown.
☐ Standard Irrigation details are shown with Department Head signature or referenced.
☐ Backflow/connection details comply with Public Works Standards.

LANDSCAPE PLAN & DETAILS

☐ Areas that are to be City maintained and privately maintained are clearly labeled.
☐ Plant list/legend is provided and is consistent with the specific plan design guidelines and Parks Construction Standards.
☐ Tree and shrub locations are shown and turf/groundcover areas are delineated.
☐ Site distance triangles are shown.
☐ Standard Planting details are shown with Department Head signature or referenced.

ELECTRICAL PLAN

☐ Electrical point of connection is shown.
☐ Available amperage is _____ and is shown.
☐ Light locations and types are located and labeled.
☐ Load calculations, voltage, phase, size of main service and location of metered pedestal are shown.

STRUCTURAL COMPONENTS (Building, lights, fences over 6' high, walls over 4' high)

☐ Construction details are shown.

As an authorized representative of _____ (firm/company), I have reviewed and verified that the submitted plans contain all of the required items listed above.

Signature _____ Date _____

Print Name _____ Print Firm/Company _____

The next update to these standards will be in July ~~2021~~ 2023.

CITY OF ROSEVILLE CALIFORNIA

Parks, Recreation & Libraries Department

In order to ensure the most up-to-date version, hard copies of the Buildings & Grounds Section is provided as a supplemental. In all cases, the Buildings & Grounds Section is considered a part of these Parks Construction Standards.

Section 3:
CITY OF ROSEVILLE GENERAL CONDITIONS FOR BUILDING AND GROUNDS

CITY OF ROSEVILLE CALIFORNIA

Parks, Recreation & Libraries Department

Section 4:
TECHNICAL SPECIFICATIONS

TABLE OF CONTENTS

SECTION 00 31 46: PERMITS
SECTION 01 10 00: SUMMARY OF WORK
SECTION 01 57 23: STORM WATER POLLUTION CONTROL
SECTION 03 30 00: SITE CONCRETE
SECTION 04 20 00: UNIT MASONRY (GENERAL)
SECTION 05 12 00: STRUCTURAL AND MISCELLANEOUS STEEL (GENERAL)
SECTION 09 91 00: PAINTING AND FINISHES (GENERAL)
SECTION 12 93 00: SITE FURNISHINGS
SECTION 26 00 00: SITE ELECTRICAL
SECTION 31 20 00: EARTHWORK
SECTION 32 12 16: ASPHALT CONCRETE PAVING
SECTION 32 15 40: DECOMPOSED GRANITE PAVING
SECTION 32 31 13: CHAIN LINK FENCING
SECTION 32 32 19: MODULAR CONCRETE RETAINING WALLS
SECTION 32 84 00: IRRIGATION SYSTEM
SECTION 32 90 00: PLANTING
SECTION 33 00 00: UTILITIES

Consultants to add new sections and/or edit existing sections as needed to reflect specific project needs. New sections shall be formatted to match those included in these standards.

APPENDICES

A: Irrigation Schedules # pages
B: Soils Fertility Report # pages
C: Permits (provided by the City/Project Owner) # pages
D: Environmental Document (provided by the City/Project Owner) # pages
E: Geotechnical Report (provided by the City/Project Owner) # pages

Consultant to add or delete sections/appendices as they apply to specific project needs. Items noted to be provided by the City shall be identified on a project by project basis.

SECTION 00 31 46
PERMITS

PART 1 - GENERAL

1.01 General Requirements

A. The requirements set forth in the General Conditions shall be in addition to the standards provided herein.

B. The requirements set forth in the Supplemental Conditions shall be in addition to the standards provided herein.

C. The intent of this Section is to furnish bidders with the known list of required permits for the Work under the Contract Documents. Bidders should note that the list is not necessarily complete and that additional requirements may exist or arise.

1.02 Permits

A. The Contractor shall obtain copies of the following permits from the Project Manager. Copies of these shall be obtained prior to start of work and shall be kept on the jobsite.

1. State Water Resources Control Board General Permit for Discharges of Storm Water Associated with Construction Activity:

   The City has prepared and submitted the SWPPP and Notice of Intent (NOI) to the State Water Resources Control Board. Prior to starting construction, Contractor shall obtain coverage under and comply with the General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit Order 2009-0009-DWQ). The City will prepare and submit the NOT when permanent BMP's have been installed.
2. City of Roseville Department of Development Services, Encroachment Permit for all Work related to this project.
3. City of Roseville Department of Development Services, Grading Permit for all Work related to this project.
4. City of Roseville Department of Development Services, Building Permit for all structural items associated with this project, including, but not limited to, lighting, backstops, restrooms, shade structures, drinking fountain (plumbing code), and miscellaneous electrical.
5. California Department of Fish & Game, Section 1601 Streambed Alteration Agreement: Owner has applied for and obtained the Section 1601

Agreements to allow work within streambeds and banks. A copy of the permit is included in the Appendix of the Project Manual.

6. City of Roseville Planning Department, Tree Permit: Owner has applied for and obtained a tree permit to allow removal or encroachment under Heritage Oaks.

B. Contractor shall comply with the conditions of these permits, and will be solely responsible for all costs associated with meeting permit conditions unless specifically specified otherwise in these Contract Documents.

C. A copy of the permit is included in the Appendix of the Project Manual. A trench/excavation permit must be on file with the City. Submit a copy of the notification letter to CAL OSHA, which outlines the project, and contracted scope of work.

PART 2 - PRODUCTS

Intentionally left blank.

PART 3 - EXECUTION

Intentionally left blank.

END OF SECTION

SECTION 01 10 00
SUMMARY OF WORK

PART 1 - GENERAL

1.01 General

A. The requirements set forth in the General Conditions shall be in addition to the standards provided herein.

B. The requirements set forth in the Special Conditions shall be in addition to the standards provided herein.

1.02 Project Description

A. Project Name and address:

Sample Project Name
123 Main Street Roseville

B. Project description/scope of work:

The scope of this project includes …

C. The Contractor, prior to submission of his bid, shall visit the site and become familiar with the physical site conditions, the plans and specifications. All existing site conditions, apparent in a detailed, on-site inspection, shall be a part of the project. Submission of a bid shall represent the Contractor's acknowledgment of the existing site conditions and its effect on the implementation of the contract documents.

1.03 Engineering

A. Field Engineering, as a part of this contract, shall include:

1. Layout of the work and establishment of lines and grades.
2. Said work to be performed by a California Registered Civil Engineer or a California licensed Land Surveyor.
3. When discrepancies between the drawings and actual site conditions are discovered, notify the Inspector for instruction on how to proceed.
4. All work shall:
   a) Establish indicated layout in relation to the property survey and existing reference points.
   b) Establish and preserve permanent reference points during the course of construction.
   c) Set locations and elevations of all site elements as required for proper completion of the work.

1.04 Permits, Fees and Notices

A. The Contractor and/or his assigned Subcontractors shall obtain any and all required permits (beyond those provided in the Appendix) from all governing authorities, including other City Departments, prior to start of construction.

1.05 Construction Plans

A. Any discrepancies or omissions found in the Contract Documents shall be reported to the City's project manager immediately. The City's project manager will clarify discrepancies or omissions, in writing, within a reasonable time.

B. In resolving inconsistencies among two or more sections of the Contract Documents, precedence shall be given in the following order:

1. Notice to Contractors
2. Special Provisions
3. City of Roseville Parks Construction Standards
4. City of Roseville Design and Construction Standards
5. Drawings

Addenda shall take precedence over all sections referenced therein. Figure dimensions on Drawings shall take precedence over scale dimensions. Detailed Drawings shall take precedence over general Drawings.

1.06 Definitions

A. The term "accepted" where used within, shall mean accepted in writing by the City of Roseville's Project Manager.

B. The term "Inspector", where noted, shall mean the project representative, appointed by the City of Roseville, who will oversee the project on a day-to-day basis.

C. The term "Project Manager", where noted, shall mean the project representative appointed by the Parks Department.

D. The term "Consultant", where noted, shall mean the prime Consultant listed on the cover sheet of these Specifications.

E. The term "accepted equal", where used herein, shall mean the equal in the opinion of the Project Manager, in consultation with the Consultant, when necessary, and as accepted in writing by the Project Manager.

F. The term "Project Owner", where used herein, shall mean the landowner or developer.

G. The term "provide", where used herein, shall mean furnish and install complete.

H. The term "as selected", where used herein, shall mean as selected by the Consultant and as accepted by the Project Manager.

I. The term "substantially complete", where used herein, shall mean the state of which the project can be used in the manner of which it is intended with the exception of minor items as determined by the Project Manager.

J. See Section 1 of the General Conditions for additional definitions and terms.

1.07 Standards

A. Numerous standards are referenced in these contract documents. The referenced standards shall be the current edition as of the date of these contract documents. Also, see Section 4 - 1.02 of the General Conditions.

B. The codes adopted by the City, County, State and federal agencies shall govern minimum requirements for this project. Where codes conflict with these Specifications, the more stringent shall apply, and such conflicts shall be brought to the attention of the Project Manager. Caltrans Standards shall be applied where specifically referenced. In the absence of specific reference requirements in the contract documents, the applicable codes shall govern.

C. In addition to the standards noted in individual sections of these Specifications, standards of the following organizations shall be noted by initials only.
   1. ANSI: American National Standards Institute.
   2. ASTM: American Society for Testing and Materials.

1.08 Submittals

A. All submittals shall be submitted at one time within ten (10) working days from issuance of Notice to Proceed. The review time for submittals shall be as noted in Section 2 - 1.04 of the Special Conditions. Items returned for re- submittal shall be returned to the City within two weeks

B. The Contractor shall include a cover sheet indicating the following (A sample is provided in Section 5: Forms):
   1. Drawing sheet or specification section reference (by section, paragraph and sub-paragraph numbers);
   2. Item description;
   3. Indication whether this item is “as specified” or “proposed substitution” and
   4. A space for itemized response summary, e.g. “reviewed” or “resubmit”.

C. Contractor shall provide submittals electronically in PDF file format and physical product samples as required in specifications.~~submit a minimum of two copies/samples of each submittal.~~ It shall be the Contractor’s responsibility to ensure that the summary sheet ~~and the appropriate number of copies are~~is included in the submittal package. Incomplete submittal packages (i.e., the lack of a summary sheet or lack of ~~the~~an appropriate ~~number of copies~~product sample) will not be reviewed.

D. Proposed substitution requests must include a comparison between the originally specified item and the proposed substitute. The burden of proof of compliance for proposed substitutions with project requirements rests with the Contractor. Coordination of the installation of accepted substitutions, including

incidental changes/modifications to accommodate proposed products shall be at no additional cost to the Owner.

E. Where required in specified Section of these Specifications, submittals shall include proof of order of site furnishings, play equipment or other materials within two weeks (ten working days) ~~from issuance of Notice to Proceed~~of receipt of the returned, approved submittal. Submittals of orders shall be made at one time. Exceptions will be considered, with justification.

1.09 Tests

A. In addition to Section 4 - 1.03 of the General Conditions, testing and inspections may be performed by a private testing laboratory. The testing laboratory, provided by the City, shall be under the direction of a California registered civil engineer. All work shall conform to requirements set forth by ASTM B329, and shall be acceptable to the City.

B. Copies of the laboratory reports/results of each test or inspection shall be provided to the Project Manager, Inspector and Contractor.

1.10 Temporary Facilities

A. Sanitary provisions shall be the responsibility of the Contractor. Existing restroom facilities shall be not utilized by the Contractor, his Sub-contractors, or employees thereof, unless specifically accepted by the Project Manager. Provide chemical toilets or water closets and urinals connected to the sewer in a location accepted by the Project Manager.

B. Barricades shall be the responsibility of the Contractor and shall be erected as necessary to protect the property, the construction and the public from hazards due to construction.

C. Signs, other than those identified in these Specifications, shall be prohibited. Notices, required by law, shall be posted and maintained.

1.11 Utilities

A. All utility fees, including, but not limited to, connection fees, installation fees, meters, monthly service fees and cost of utilities used during the course of construction and establishment are considered a direct cost and are the responsibility of the Contractor until project acceptance by City Council.

1.12 Dust/Noise Control Requirements

A. Dust and other air pollution nuisances on or adjacent to the site shall be abated, per Section 2 - 1.07 of the General Conditions. Dirt shall not be allowed to accumulate on streets or sidewalks nor be washed into sewer. ~~The Contractor shall install silt basin, silt fences or other physical means to prevent winter run-off or dry season flow passing through the site.~~

B. Noise from construction operations shall be kept to a minimum. Allowable hours of operations shall be from 7 a.m. to 7 p.m. Monday through Friday. Work on weekends and holidays must be approved by the project manager. Work on weekends and holidays shall not begin before 8 a.m. and must be completed by 8 p.m.

1.13 Tree Replacement Schedule

A. Trees damaged or removed without prior approval shall be replaced at an inch per inch basis on-site, except otherwise accepted. New stock shall follow the table provided:

Plant Size	Inch Value
3 Five Gallon Stock	One Inch
1 Fifteen Gallon Stock	One Inch
1 24” Box Stock	Two Inches
1 36” Box Stock	Three Inches

1.14 Inspection of Construction

A. In addition to the routine inspections performed by the Parks Inspector, portions of work may be inspected by the other city departments. Notify the Parks Inspector and Project Manager a minimum of 48 hours prior to date of inspection.

B. The Parks Inspector shall be the main line of communication between the site superintendent, the project manager and other City department inspectors. Changes in scope of work or standards shall be approved by the project manager.

C. Refer to the parks inspection record. This shall be issued at the Pre-Construction meeting and shall be utilized by the Contractor throughout the course of construction. A completed “hard card” shall be submitted to the Project Manager along with required turn in items (See 1.~~15~~ 19 this Section) upon final acceptance of the project. The Notice of Completion shall not be filed until all record documents have been received and accepted.

1.15 Adverse Impacts to Site Conditions Due to Construction

A. Impacts that affect the site conditions to the detriment of the park or streetscape Impacts that affect the site conditions to the detriment of the park or streetscape construction or long term viability of the site shall be mitigated by the contractor prior to acceptance of the project. Such impacts shall include, but are not limited to:

1. Soil compaction in non-structural areas;
2. Diesel or gas fuel leaks/spillage;
3. Buried concrete or other construction debris;
4. Hazardous material contamination;

5. Lime treatment in planting areas;
6. and more.

1.16 Pre-final (Punch List) Review

A. Notify, in writing, to the Parks Construction Inspector, that the work is substantially complete. Substantially complete is defined as "the state of work where it may be used in a suitable and intended manner with exception of minor corrections". Partial acceptances will not be granted. Items to be reviewed as a part of substantial completion include:
   1. All construction items
   2. Installation of all site furnishings, including lights and signs
   3. Seeding or sodding of all turf areas
   4. All planting, including weeding of planted areas
   5. The irrigation system is fully functioning as designed and as confirmed by the landscape irrigation audit.

B. Within five workings days of receipt of notification, the Parks Construction Inspector will confirm substantial completion. The Parks Construction Inspector will schedule the punch list walk (pre-final review) within five working days after the project has been determined as substantially complete. A formal punch list will be developed at the punch list walk. The Parks Construction Inspector will provide a copy of the formal punch list to the Contractor within five working days of punch list walk. Performance of the punch list walk does not automatically trigger the start of establishment.

~~B. Upon field confirmation by the Parks Construction Inspector regarding substantial completion, a pre-final (punch list) walk-through will be conducted within seven (7) calendar days of receipt of notification. A formal punch list will be developed at that time. Performance of the pre-final (punch list) review shall not automatically trigger the start of establishment.~~

   1. If at any point during this review that it becomes apparent that the Contractor has not properly prepared for the site review, the inspection shall immediately be terminated and re-scheduled at such a time as the site has been readied for a review. Any costs for the re-scheduling of the review shall be the responsibility of the Contractor. Lack of site preparation could delay start of the establishment period.

C. ~~The pre-final (punch list) review shall occur within one (1) business week after the project has been determined as "substantially complete".~~ Concurrent to the pre-final review~~y~~, the City will make a formal request for all required turn-in items to be submitted to the City. All turn-in items shall be submitted to the City (single point of contact), at one time and only by appointment. Do not drop off the turn-in items at the front counter and without an appointment.

Formatted: Indent: Left: 0.75", No bullets or numbering

D. Once all turn-in items have been confirmed to be complete and accurate, the establishment period may be considered to begin. The City shall have sole discretion in determining the appropriateness of the commencement of the establishment period and shall notify the developer/contractor in writing of the start and end dates. Portions of the project will not be accepted for establishment prior to the substantial completion of the entire project.

1.17 Establishment Period

A. The duration of the establishment period shall be:
   1. For seeded turf in parks: Ninety (90) calendar days, minimum, and until the Notice of Completion (NOC) for City-built parks has been approved by the City Council, or the deed transferring property ownership, has been recorded at the County for Developer-built parks.
   2. For sodded turf in parks: Forty-five (45) calendar days commencing between March 1st and October 31st and sixty (60) calendar days commencing between November 1st and February 28th, and until the Notice of Completion (NOC) for City-built parks has been approved by the City Council, or the deed transferring property ownership, has been recorded at the County for Developer-built parks.
   3. For streetscapes: Thirty (30) calendar days, minimum, and until final acceptance of all related street improvements subject to approval of a ~~Certificate~~ Notice of Completion by the City Council.

B. Active maintenance is required throughout the entire establishment period. Active maintenance is defined as:
   1. All areas within the project site shall be protected against damage including vandalism, erosion, trespass, rodents and other acts. Immediately repair all damaged areas.
   2. All walkways and paved areas shall be kept clean and all debris within planting and turf areas shall be immediately removed.
   3. Automatic irrigation controller shall be fully utilized and irrigation system monitored and adjusted as described in Section 32 84 00 4.03.
   4. All plant and turf maintenance as described in Section 32 90 00 3.11

C. Prior to the start of the final thirty (30) days of establishment:
   1. All punch list items shall be completed.
   2. All certifications and testing shall be completed.
   3. All plantings and turf shall be thriving and in a healthy condition.
   4. The lack of active maintenance prior to the final thirty (30) days may constitute a delay in the start of the final thirty (30) days of the establishment period.

1.18 Final Review

A. One (1) week prior to the end of the establishment period, a final on-site review shall be conducted to review project readiness for final turn-over. All punch list items must be satisfactorily addressed prior to the final review.

B. The project shall be prepared and cleaned per Section 2 - 1.12 of the General Conditions; the turf shall be mowed; and the irrigation heads shall be adjusted appropriately one day prior to the scheduled final review.

C. Acceptance of the project shall be considered "field accepted" and a recommendation will be forwarded to the City Council for "final acceptance" per Section 7 - 1.01 of the General Conditions.

D. An unaccepted project shall extend the establishment period until such time as the unaccepted portions of the project have been reviewed and field accepted by the Inspector and Project Manager.

E. Turn over for City maintenance shall occur only after:

1. The specified duration of the establishment period has been successfully completed.
2. If required, the deed transferring property ownership, has been recorded at the County.
3. A ~~Certificate of Compliance (COC) for streetscapes or~~ Notice of Completion (NOC) for city~~-~~-built parks and for streetscapes has been approved by the City Council.

F. Contractor shall provide a written guarantee covering all improvements associated with this project. See 1.19 – Warrantees and Guarantees.

1.19 Record Documents

A. Record documents or as-built plans shall be maintained on-site and updated routinely as specified in Section 2 - 1.13 of the General Conditions. Record documents shall include **all items under the contracted scope of work**.

B. Record documents shall be submitted:

1. one full size set of final as-built drawings (verified/initialed by the Parks Inspector during the establishment period)
2. one set of 11 x 17 reductions of the complete as-built package; and
3. two sets 11 x 17 laminated reductions of the irrigation plan illustrating with colors the individual controller stations; and
4. one USB storage device containing PDF scanned images (in color) of the verified/initialed ~~-~~as-built drawings.
5. For City of Roseville CIP projects, SWPPP binder.

1.20 Warranties and Guarantees

A. Warranties are required under various Sections of these Specifications. Prior to final acceptance, the Contractor shall assemble all warranties into a single,

bound or stapled package. All ~~warrantees~~ warranties shall be clearly labeled and the number of years highlighted. Also, see Sections 7 - 1.10 and 7 - 1.11 of the General Conditions.

1. Warranties for equipment shall be submitted in the manufacturer's standard form and shall be countersigned by the subcontractor or supplier and the Contractor.
2. All other warranties shall be provided in the following format, written on subcontractor's or supplier's letterhead, signed by the subcontractor or supplier and countersigned by the Contractor:

WARRANTY FOR _____ YEARS

"We hereby warrant that the ***product*** which we have installed at ***project name*** has been done in accordance with the contract documents, and that the work, as installed will fulfill the warranty requirements included in the Specifications.

We agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced by so doing, that may prove to be defective in its workmanship or material within the warranty period stated above commencing from the date of final acceptance of the above named project by the City of Roseville's City Council, without additional expense to the City, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of failure to comply with the above conditions within thirty (30) days of notification by the City, we collectively or separately do hereby authorize the City to proceed with the repairs or replacement of such defects at our expense. Payment of said costs and charges will be forwarded to the City upon demand.

Signed: _____ _____
Subcontractor or Supplier Date

Countersigned:_____ _____
Contractor Date

B. Guarantees shall be a minimum of one (1) year for all plant material, including trees and shrubs. The guarantee shall state that plant materials (trees & shrubs) to be free of all defects or disease and all plants are in a healthy and thriving condition at the completion of the contract. Deciduous plant material shall be warranted beyond the time of contract completion until such time as growth becomes evident.

PART 2 - PRODUCTS

Intentionally left blank.

PART 3 - EXECUTION

Intentionally left blank.

END OF SECTION

SECTION 01 57 23
STORM WATER POLLUTION CONTROL

PART 1 - GENERAL

1.01 General

A. The requirements set forth in the General Conditions shall be in addition to the standards provided herein.
B. The requirements set forth in the Special Conditions shall be in addition to the standards provided herein.

1.02 References

A. State Water Resources Control Board Order No. 2009-0009-DWQ National Pollutant Discharge Elimination System General Permit No. CAS0000002, for Storm Water Discharges Associated with Construction and Land Disturbance Activities.
B. CASQA California Stormwater BMP Handbook – Construction, November 2009

1.03 Definitions

A. NOI: Notice of Intent
B. NOT: Notice of Termination
C. QSP: Qualified SWPPP Practitioner
D. QSD: Qualified SWPPP Developer
E. SWPPP: Storm Water Pollution Prevention Plan
F. SWRCB: State Water Resources Control Board
G. NPDES: National Pollutant Discharge Elimination System General
H. WDID: Waste Discharger Identification number
I. BMP: Best Management Practices

PART 2 - PRODUCTS

Intentionally left blank.

PART 3 - EXECUTION

3.01 SWPPP

A. Comply with State Water Resources Control Board Order No. 2009-0009-DWQ National Pollutant Discharge Elimination System General Permit No.

CAS0000002, for Storm Water Discharges Associated with Construction and Land Disturbance Activities.

B. A SWPPP has been developed for this project. The SWPPP is a dynamic document and will change as conditions (weather or construction phases) warrant.
C. Implementation of the SWPPP is the responsibility of the Contractor and a part of this project. Costs associated with implementation and maintenance of the BMPs per the SWPPP shall be included in the lump sum base bid.
D. Major changes to the SWPPP shall be reviewed by the City's QSD prior to implementation. Cost associated with the major changes will be paid for using the unit cost listed in the Additions or Deletions Sheet of the Proposal
E. The City's QSP will perform weekly inspections of the jobsite. Implementation of and minor changes to the SWPPP as directed by the City's QSP shall be incidental to the Work. Contractor shall start all inspection corrective actions within 72 hours of observation, and complete as soon as possible.
F. All BMPs installed will be inspected by the City's QSD/QSP for compliance with the SWPPP and BMP Fact Sheets. BMPs that are not in compliance shall be brought into compliance by the Contractor at no cost to the City.
G. Keep one copy of the SWPPP and amendments at the project site.
H. The SWPPP shall be readily available throughout the course of construction and until the NOT has been accepted by SWRCB. The SWPPP shall be made available upon request by a representative of the Regional Water Quality Control Board, State Water Resources Control Board, United States Environmental Protection Agency, or City' storm water staff.
I. At the end of the establishment period, the Contractor shall submit the project site copy of the SWPPP including copies of all inspections, Rain Event Action Plans (REAPs), reports, and sampling and analysis results to the City's Project Manager.

3.02 Schedule

A. Contractor shall develop a Water Pollution Control Schedule that describes the timing of grading or other work activities that could affect water pollution. The schedule shall be updated by the Contractor to reflect changes in the Contractor's operations that would affect the necessary implementation of water pollution control practices. The typical sequence of work shall be adjusted by the Contractor based on weather conditions and forecasted rain events. The schedule is considered an appropriate and applicable BMP.

3.03 Penalties and fines

A. Contractor is responsible for all penalties and fines assessed to or levied on the project related to the implementation of the SWPPP.

B. In an effort to maintain compliance with the General Permit, the Contractor may be asked to make changes to the BMPs. If the Contractor is unable to perform these services in a timely manner the City reserves the right to address any areas of concern and deduct the cost from the contract.

3.04 ~~Inlet Filters~~BMP's

A. ~~Drain inlet filters may be employed in lieu of straw bales. Horizontal mesh filters attached to the top of or below the drain inlet grate shall not be allowed. Only high flow volume, bag type filters or others as accepted by the Public Works Inspector shall be used~~Construction BMP's shall be installed per the Erosion / Sediment Control Plan and project SWPPP, and in accordance with the CASQA California Stormwater BMP Handbook. Use of alternative BMP's will be reviewed and accepted at the discretion of the City's QSD..

~~3.05 Silt Fence and Straw Wattles~~

~~A. Silt fences and straw wattles may be employed in lieu of, and are preferred to straw bales.~~

~~3.06 Slope Protection/Erosion Control~~

~~A. All slopes greater than 10:1 shall be covered with broadcast straw at a rate of 50 bales or 4,000 pounds per acre. Slopes exceeding 4:1 shall have straw pressed in place or a tackifier shall be applied.~~

~~B. All slopes along building frontages (from the building setback line to the City right-of-way) exceeding 4:1 shall have erosion netting installed (jute or as accepted by the Public Works Inspector).~~

~~C. Slopes steeper than 4:1 and adjacent to City of Roseville right-of-way, flood plains, natural drainages, park land or designated open space shall require broadcast seeding and shall be covered with straw matting.~~

~~D. Hydroseed shall not be used on slopes where broadcast straw, erosion netting or straw matting are specified above, except as an additional measure to them. Within a site, protection of bare and/or disturbed slopes which are isolated from areas requiring erosion protection shall be addressed on the plans. Hydroseeding may be an acceptable alternative in isolated expanses, regardless of slope.~~

~~E. From the back of City sidewalk to 25 feet back, all disturbed, bare slopes of less than 10:1 shall be hydroseeded. Broadcast straw as specified above for 10:1 or steeper slopes is an acceptable option.~~

~~3.07 Straw Bales~~

~~A. Straw bales shall be stockpiled on the site at a rate of 1.5 bales per acre by October 1. Measures shall be provided to keep straw dry.~~

~~**3.08 Silt Controlling Devices**~~

~~A. Use of alternative silt controlling devices will be review and accepted at the discretion of the City's QSD.~~

~~**3.09**~~**3.05 Cleaning**

A. Thoroughly clean all areas where work has occurred. Remove from the site excess material, debris and rubbish.
B. Take all precautions to protect completed work. Immediately repair or replace all damaged areas due to tire ruts, erosion, compaction failure, etc. Keep all erosion control measures intact.

Delete this article if winter suspension is not required

~~**3.10**~~**3.06 Winter Construction Suspension**

A. Contractor shall include a winter construction suspension as part of the construction schedule. The counting of working days will be suspended during the winter suspension period. It is at the City's sole and complete discretion to determine the start and end dates of the winter construction suspension. The City will notify the Contractor 10 working days before the start of the winter construction suspension. The City will notify the Contractor 10 working days before the end of the winter construction suspension. The Contractor shall begin work within 15 calendar days after receiving the notice of the end of the winter construction suspension.
B. Contractor shall include an allowance of *($15,000)* for the winter construction suspension. Costs associated with preparing the site for the winter construction suspension and costs associated with corrective actions required during the winter construction suspension will be paid for using the allowance on a Time & Materials Basis according to the allowable mark-ups in the project's General Conditions. Costs to implement and maintain the BMPs per the Erosion and Sediment Control Plan are excluded from the winter suspension allowance and shall be included in the lump sum base bid.
C. Prior to the winter construction suspension, stabilize all exposed soils ~~with hydroseed and straw. Hydroseed shall consist of annual rye grass seed at 20 lbs/acre and mulch at 1 ton/acre. Straw shall be placed at 2 tons/acre and tackifier shall be placed over the straw to prevent dislocation by wind~~at the direction of the City's QSD/QSP. In addition, all adjacent drainage inlets shall be protected and perimeter control shall be installed and in good repair.
D. Traffic on the construction site shall be kept to minimum. All traffic entering or exiting the site must use the stabilized construction entrance.
E. Where there are areas of concentrated runoff flows, Contractor shall protect the soil from erosion.

F. Per the Construction General Permit Requirements, inspections by the City's QSD/QSP will continue into and through the winter suspension period. Inspections will occur before, during, and after each qualifying storm event (0.5" or more precipitation) and at least once per week. Contractor shall start all inspection corrective actions within 72 hours of observation, and complete as soon as possible.
G. Should rain be forecast at 50% or better by NOAA, the City's QSD/QSP will prepare a Rain Event Action Plan (REAP) and email such document to the Contractor. Contractor shall complete all corrective actions within the REAP prior to the start of precipitation.
H. The City's QSD/QSP will be sampling all discharge to ensure compliance with runoff standards for pH and turbidity. If the water sampling indicates compliance issues, Contractor shall make repairs or adjustments to BMPs immediately, and respond to any such requests within 24 hours.

END OF SECTION

SECTION 03 30 00
SITE CONCRETE

PART 1 - GENERAL

1.01 General Requirements

A. The requirements set forth in the General Conditions shall be in addition to the standards provided herein.
B. The requirements set forth in the Supplemental Conditions shall be in addition to the standards provided herein.
C. The standards set forth in the City of Roseville Design and Construction Standards and the City of Roseville Parks Construction Standards, latest editions, shall be in addition to the standards provided herein.

1.02 Description

A. Furnish all labor, materials and equipment for the complete installation of all concrete work, flatwork and poured-in-place as shown in the Plans and as specified herein.

1.03 References

A. Caltrans Standard Specifications, latest edition.
B. California Building Code (CBC) and California Administrative Code (Title 24), latest editions.

1.04 Quality Assurance

A. For all flatwork, the Contractor shall pour a six-foot by six-foot (6" x 6") sample of each type of finish specified for review and acceptance by the Project Manager prior to pouring any concrete. The accepted samples shall remain on-site and intact until all concrete work has been completed. The quality of the concrete work shall be measured by the accepted samples.
B. During the course of construction, a qualified testing laboratory shall obtain samples as determined by the Inspector and conforming to federal and state codes and standards. Such costs shall be paid for by the City. Re-tests and removal of below acceptable strength concrete shall be borne by the Contractor. The Contractor shall cooperate with the testing during the course of obtaining such samples.
C. Variances in surface grades of more than 1/8", as measured by a straight edge ten feet (10") long, shall be corrected to the satisfaction of the Inspector. Remove all areas where standing water occurs, including any surface irregularities.

1.05 Handling and Storage

A. Comply with ATSM C-94, “Specifications for Ready Mix Concrete” for the batch, mix and transport of concrete.
B. Mix and deliver only the amount that will be poured immediately.

1.06 Record Drawings

A. The Contractor shall keep an accurate record of the as-built conditions of the site concrete. These records shall be updated daily and kept at the construction site. At any time, the Inspector may examine the conditions of the “as-builts” to ensure compliance of the above.

PART 2 - PRODUCTS

2.01 Concrete

A. Concrete for play area curbs, sidewalks, and accessible ramps shall conform to the provisions of Section 90-2 “Minor Concrete” of the Caltrans Standard Specifications. Cementitious material shall be „Type II Modified” and shall contain no less than 505 pounds of cementitious material per cubic yard. Aggregate shall be not greater than one-inch or smaller than 3/8-inch. Submit concrete analysis for review and acceptance prior to placement of concrete.

2.02 Fiberglass Reinforcement

A. Fibers for concrete shall be Fibermesh 150, as manufactured by Propex Operating Company; or accepted equal. Fibers shall contain 100 percent virgin polypropylene multifilament fibers, e3 patented technology, containing no reprocessed olefin materials. The fibers shall conform to ASTM C1116 Type III and manufactured specifically for the secondary reinforcement of concrete.

2.03 Expansion Joint Material

A. Fiber expansion joint shall conform to ASTM-1751 and shall be a non-extruding resilient filler. Filler shall have preserve attributes and high quality bituminous materials.
B. Apply Sikaflex elastomeric sealant, or accepted equal, over all expansion joints.

2.04 Concrete Forms

A. All forms shall be new at the start of the project and shall be construction grade Douglas Fir. Minimum size lumber shall be 2 x 6.
B. Radius bends shall be formed by spring steel forms or laminated boards, as required.
C. Plywood shall be 5/8”, Class I, exterior grade as outlined in APA “Guide to Plywood Grades”. Omit mill oiling treatment.

2.05 Coloring Agents

A. (Insert amount and color)

B. All colored concrete admixtures shall be integral.

2.06 Seeded Aggregate

A. Aggregate shall be clean, washed aggregate as selected. Provide samples of rock mixture.

PART 3 - EXECUTION

3.01 Poured-In-Place Concrete Forms

A. Concrete for hardscape or flatwork shall be placed on subgrade compacted to 95% relative compaction. Prior to placement of concrete, a soils compaction test must be performed by an accepted soils testing professional on a representative number of locations along the flatwork area. The City or project owner shall provide the initial test. The results of these tests must be available and meet acceptable levels prior to pouring. Re-tests and re-work of any area, as directed by the soils professional, shall be the responsibility of the Contractor.

B. Construct forms to conform to the shapes, dimensions and details shown on the Plans. All forms shall be true to lines, plumb, level and square.

C. Forms shall not leak, spread, shift or settle when concrete is placed.

D. All forms shall carry dead and live loads and shall not deflect more than 1/8" between supports after placement of concrete.

E. All forms shall be thoroughly soaked a minimum of twelve (12) hours prior to pouring of concrete. Forms shall be treated per manufacturer's recommendations.

F. Reuse of forms may be allowed at the discretion of the Inspector. Reused forms shall be cleaned and free of defects that would affect the final concrete finish.

G. Concrete footings shall be formed only when excavations slump or cave in. Over-excavate the trench or footing diameter to accommodate the forms' installation and removal. Apply water to moisten soil. Do not allow water to create mud or ponding.

3.02 Fiberglass Reinforcement

A. Install per manufacturer's instructions. Apply at the batch plant prior to delivery. Thoroughly mix fiber material to avoid "clumping".

3.03 Expansion Joints

A. Expansion joints shall be placed where vertical elements meet horizontal paving unless otherwise noted on the Plans. This shall include vertical expansion joints on play area curb walls, buildings, shade structures, walls and/or planters. The corners of the paving shall be tooled at the expansion

joints. Trim exposed fibers which protrude above or beyond the finish surface of paving or the finish surface of the wall.

3.04 Control Joints for Concrete Sidewalks

A. Control joints shall be per detail PK-32 with deep, straight and finished with rounded edges. Control joints shall be placed (on-center) a distance equal to the width of the concrete walkway, unless otherwise shown on the Plans. For example a ten-foot wide walkway shall have control joint placed ten feet on center.

3.05 Admixtures

A. (Insert, if used)

3.06 Coloring Agent

A. (Insert, if used)

3.07 Placement of Concrete

A. Do not pour concrete in weather below 40 degrees F. or when temperatures are predicted to fall below freezing within 24 hours, except with prior authorization.
B. Concrete shall be transit mixed according to ASTM C-94. Limit the quantity of water to the required strength. Concrete shall be of a consistency that it flows slowly into the forms.
C. Mixing of concrete shall be continuous commencing from the time water is added to the mix until such time that the concrete is poured. All concrete shall be placed within an hour of the time when water is first added.
D. Concrete shall be deposited up to the finished height of the forms and up to the adjacent joint. No partial pours will be allowed. Excess material shall be dumped on-site and later removed by the Contractor.
E. Thoroughly compact the concrete manually spading and tamping concrete into all corners of the forms and by utilizing a high-speed mechanical vibrator. Retain a standby vibrator on-site during the course of concrete work. When utilizing the vibrator, take precautions to avoid impact on the forms.
F. After obtaining uniform compaction, screen tamper all flatwork surfaces, screed and bull float to ensure that large aggregates are pushed below the surface. When it is practical to work on the surface, wood float, steel trowel paving to a uniform surface.
G. Concrete elements shall not exceed the following tolerances:
    1. Linear: 1/8”
    2. Slab deviation: 1/8” in 10"

3.08 Finishes

A. Finishes shall be as shown on the Plans and shall be consistent in quality throughout the project. Medium broom finished concrete shall have clean, deep control joints spaced appropriately. No visible cracks or discoloration will be accepted. Finishes on vertical surfaces shall be consistent throughout. Vertical expansion joints are spaced as identified on the plans and are smooth with the finish surfaces. All edges for flatwork and vertical surfaces shall be eased at a consistent radius.

B. Upon completion of float finishing, provide the final finish as follows:
   1. Medium Broom Finish: shall be accomplished by pulling a stiff bristle broom across a floated surface. The direction of the broom shall be perpendicular to the path of travel, unless otherwise shown on the Plans.
   2. Seeded Aggregate Finish: shall be accomplished by evenly distributing selected aggregate over the floated surface. Surface voids shall be minimum. Thoroughly embed aggregates just beneath the finished surface using a hand float. When the concrete has firmly set, brush and hose the surface with water to expose the aggregate to a uniform surface. Aggregate shall not be exposed more than 1/16", shall not be dislodged and shall not be unevenly exposed. Use of a pressurized nozzle for this work shall be prohibited.
   3. Acid Washed Finish: shall be accomplished after the slab has cured and no sooner than two (2) weeks after the concrete had been placed. Remove the cement film from the surface of the aggregate by an acid wash. Delaying the acid wash additional time is permissible. The slab shall be saturated with water, brushed free of standing water and washed with 5% to 10% solution muriatic acid. Several flushings with clear water should follow until the surface matches the accepted sample panel.
   4. Rock Salt Finish: shall be accomplished by (Insert, if used).
   5. Medium Sandblast Finish: shall be accomplished by (Insert, if used)
   6. Other (Insert, if used)

3.09 Removal of Forms

A. Forms shall remain in place as follows:
   1. For mass concrete work: 5 days.
   2. For other flatwork and other concrete work: 3 days.

B. Remove all bolts, nails, ties, wires, etc. a minimum of one inch (1") below the surface of the concrete. Remove imprints, irregularities or other such defects and patch as directed by the Inspector.

3.10 Curing and Protection

A. Allow adequate time for the concrete to cure. In temperatures above 75 degrees F., ensure that the concrete surface remains wet for a period of seven (7) days minimum.

B. Protect all concrete from damage during the curing period. This shall include damage from sun, rain, flowing water, frost, mechanical injury, tire tracks, footprints, oil stains, etc. Should such damage occur, Contractor shall take immediate action to repair damage to the satisfaction of the City.

3.11 Clean-Up

A. During the course of this work, the area shall be kept clear and free of debris as realistically possible. Upon completion of concrete work, completely remove from the site all used forms, hardware, spillage, rejected work and other materials.

B. Remove from site furnishing posts all concrete “slobber”. Re-touch posts as necessary for a clean finish.

END OF SECTION

SECTION 04 20 00
UNIT MASONRY (GENERAL)

PART 1 - GENERAL

1.01 Conditions

A. The general provisions of the Contract, including General and Supplementary Conditions and General Requirements apply to the work specified in this section.

1.02 Scope of Work

A. Provide all labor, materials, and equipment required to complete the unit masonry work as indicated on the Drawings and/or specified herein.
B. Work includes, but not limited to the following:
   1. Concrete masonry units.
   2. Face brick units.
   3. Pre-cast Elements.
   4. Installation of all required reinforcements, fasteners, anchors and accessories.
   5. Cleaning of unit masonry.
C. Related work specified in other sections:
   1. Section 03 30 00: Concrete

1.03 Quality Assurance

A. Material and installation standards: Comply with recommendations of the Brick Institute of America (BIA) standards; National Concrete Masonry Association standards; and ASTM standards.
B. Verify all measurements indicated on Drawings by taking field measurements; proper fit and attachment of all units is required.
C. Accurately fit, cut, and securely mortar together all units to produce a plumb, level and rigid installation.
D. All work and materials shall comply with Uniform National Building Codes (latest edition), and all other applicable codes and ordinances that govern the work of this Section.

1.04 Qualification of Installers

A. Installers shall be trained and experienced in the skills required and shall be completely familiar with the materials and their installation. Qualified installers shall be present at all time during the progress of work.

1.05 Coordination

A. Coordinate with all other trades whose work relates to unit masonry installation for placing all required reinforcements, fasteners, anchor, accessories, etc.

1.06 Submittals

A. Submit for Landscape Architect's written approval two (2) representative samples of each unit specified.
B. Submit manufacturer's certificate that units meet or exceed material specifications.

PART 2 - PRODUCTS

2.01 Concrete Masonry Units

A. ASTM C-652, concrete masonry hollow units, wire cut. Standard and bond beam units. Size and color as indicated on the Drawings. Color shall be standard grey.

2.02 Stone Veneer

A. As shown on Drawings.

2.03 Precast Concrete Molding and Baseboard

A. As shown on Drawings.

2.04 Masonry Mortar

A. ASTM C-270, Type M, consisting of one (1) part cement and three (3) parts sand with quarter (1/4) part lime.
B. LATICRETE 3701 grout and Mortar Admix
C. Mortar compressive strength at 28 days shall be 3000 PSI

2.05 Grout

A. Grout mix ratio by volumes: one part Portland Cement (ASTM C-150, Type 1); two parts minimum to three parts maximum damp loose sand, two (2) parts coarse aggregate (ASTM C-404).
B. LATICRETE 3701 Grout and Mortar Admix.
C. Grout compressive strength at 28 days shall be 3000 PSI.

2.06 Unit Masonry Reinforcement

A. Horizontal Joint Reinforcement: Truss type, hot-dipped galvanized zinc coated steel construction; 3/16 inch side rods with No. 9 cross ties.
B. Horizontal and vertical rebar reinforcements: ASTM A-615, Grade 40, size as indicated on the Drawings.

2.07 Concrete

A. As per Section 03 30 00: Concrete

PART 3 - EXECUTION

3.01 General

A. Supply anchor devices as indicated on the Drawings and as required to install materials as specified in other sections of work.
B. Cut units where required with a power saw or order units pre-cut from manufacturer.
C. Construct walls and other masonry construction to the full thickness indicated on the Drawings, using unit sizes as indicated.
D. Establish lines, levels, and coursing. Protect from disturbances.

3.02 Coursing

A. Install units straight and plumb with all courses true to line and level.
B. Install units in pattern as indicated on the Drawings.
C. Maintain unit courses to uniform width. Make vertical and horizontal joints equal and of uniform thickness.

3.03 Placing and Bonding

A. Lay units in full bed of mortar properly jointed with other work.
B. Install full mortar coverage of vertical and horizontal face of joints. Maintain uniform joint width of 3/8" – 1/2", depending on nominal unit sizes. Cut joints flush and tool slightly concave.
C. Fully bond intersections and external and internal corners.
D. Do not shift or tap units after mortar has taken initial set. Where adjustment must be made remove mortar and replace.
E. Remove excess mortar.
F. Fill hollows at concrete masonry units solid with grout or as indicated on the Drawings. Fill hollows of structural brick block units where reinforcement occurs solid with grout or as indicated on the Drawings.
G. Wall caps shall be epoxied and anchored in place.

3.04 Reinforcement

A. Horizontal joint reinforcement: Place masonry joint reinforcement sixteen (16) inches on center or as indicated on the Drawings.
B. Place joint reinforcement continuous and lap reinforcement according to the recommendations of the Manual of Standard Practice of the Concrete Reinforcing Steel Institute.
C. Horizontal and vertical rebar reinforcement: Install with bond and beam spacing and rebar spacing as indicted on Drawings.

D. Place and consolidate grout fill without disturbing reinforcing. Cells containing reinforcement shall be grouted solid.

3.05 Curing and Protection

A. Provide thorough curing of joints and grout pours.
B. Protect newly laid masonry from exposure to precipitation, excessive drying, freezing, soiling, backfill and other harmful elements.

3.06 Waterproofing & Graffiti Seal

A. All walls below grade shall be waterproofed on the backside extending from the foundation to the brick cap.
B. Install in conformance with manufacturer's specifications.
C. Apply 2 clear coats of graffiti sealant on exposed exterior and interior surfaces. Submit proposed sealant type and conform to manufacturer specifications.

3.07 Cleaning

A. Brush off excess mortar as work progresses. Dry-brush masonry at end of each day's work.
B. Clean masonry with cleaners and methods as recommended by the manufacturer of the masonry units.
C. Rinse walls by washing off cleaning solution, dirt and mortar using clean, pressurized water.
D. Repair damage to adjacent materials that occurs during cleaning operation at no additional cost to the Owner.

END OF SECTION

SECTION 05 12 00
STRUCTURAL AND MISCELLANEOUS STEEL (GENERAL)

PART 1 - GENERAL

1.01 Conditions

A. The general provisions of the Contract, including General and Special Provisions apply to the work specified in this Section.

1.02 Scope of Work

A. Furnish all labor, materials, and equipment as required to fabricate and install all structural and miscellaneous steel work as indicated on Drawings and specified herein.
B. Although such work or materials are not specifically indicated, furnish and install all supplementary or miscellaneous items, appurtenances and devices incidental to or necessary for a secure and complete installation.
C. Provide shop drawings for all work.
D. Completely coordinate with work of all other trades.

1.03 References (Latest Edition)

A. AISC: Standard Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings by the American Institute of Steel Construction (AISC).
B. AISC – Code of Standard Practice – Manual of Steel Construction – Allowable Stress Design (ASD).
C. AISC – Code of Standard Practice of Steel Buildings and Bridges.
D. ASTM A36 – Structural Steel.
E. ASTM A-53: Black and Hot Dipped Zinc – Coated Welded and Seamless Steel Pipe.
F. ASTM A-120: Black and Hot Dipped Zinc – Coated Welded and Seamless Steel Pipe.
G. ASTM A307 – Carbon Steel Externally Threaded Standard Fasteners.
H. ASTM A500 – Cold Formed Welded and Seamless Carbon Steel Structural Tubing in Round and Shapes.
I. ASTM A501 – Hot Formed Welded and Seamless Carbon Steel Structural Tubing.
J. AWS A2.4 – Symbols of Welding, Brazing, and Nondestructive Examination.
K. AWS D1.1 – Structural Welding Code.
L. SSPC (Steel Structures Painting Council) – Painting Manual.

M. California Building Code (CBC), latest edition.

1.04 Regulatory Requirements

A. Safety Requirements: Work shall comply with all Federal, State and municipal regulations regarding safety, including the requirements of the following:
   1. William-Steiger Occupational Safety & Health Act of 1970
   2. State of California, California Administrative Code, Title 8 Industrial Relations, Chapter 4, Subchapter 4, “Construction Safety Orders” and other State and local agencies having jurisdiction.

B. California Building Code (CBC), latest edition.

1.05 Submittals

A. Shop Drawings: General
   1. Before any structural steel is fabricated or delivered to jobsite, submit Shop Drawings in accordance with the General Conditions of these specifications.
   2. Shop Drawings shall clearly show all pieces with all pertinent dimensions, data, layout, sizes and weights, connections, and all controlled dimensions and elevations. Drawings shall clearly distinguish between shop and field bolts and welds. Errors in dimensions shown on shop drawings shall be responsibility of Contractor.
   3. Show details, including cuts, copes, connections, holes, threaded fasteners, and welds in accordance with AWS.
   4. Indicate which structural units, members or brackets require field cuts or welds due to construction techniques.
   5. Indicated metal fabricator’s method for radius form bents of pipe or tubing.
   6. All shop and field welds shall be indicated by AWS Welding Symbols.
      a) Indicate size, length and type of each weld.
      b) Special Inspection required by CBC and Building Department.

B. Welding:
   1. Certification of Welder’s Qualifications.
   2. Welding Procedure: Submit descriptive data to illustrate welding procedures to be performed.

1.06 Quality Assurance

A. Fabricated structural steel members in accordance with AISC Code of Standard Practice.
B. Perform Work in accordance with AISC Section 10.
C. Perform Work in accordance California Building Code (CBC), latest edition.
D. All welding procedures, welders, welding operation, and tackers shall be qualified in accordance with AWS Standard Code D1.1.
E. Maintain one copy of each document on site.

F. Fabricator: Company specializing in performing the work of this section.
G. Erector: Company specializing in performing the work of this section.
H. All construction shall conform to applicable building codes, project specifications and applicable regulations. Where the provisions of applicable codes, material manufacturer's requirements, and project specifications conflict, the more stringent provision shall govern.
I. Certification: Furnish, before fabrication, a mill certified report (in duplicate) of the tests for ach heat of steel or iron from which the material is to be fabricated, containing the results of chemical and physical tests required by the ASTM specifications for the materials.
J. Qualify welding processes and welding operators in accordance with AWS "Standard Qualifications Procedure". Provide certification that welders to be employed in work have satisfactorily passed AWS qualification test within the previous twelve (12) months. If recertification of welders is required, retesting will be Contractor's responsibility.
K. Work shall comply with the Drawings, Specifications and accepted Shop Drawings in every aspect. All errors of fabrication and connections, defective materials, fasteners, and workmanship shall be replaced at the expense of the Contractor.

1.07 Delivery, Storage and Handling

A. Deliver anchor bolts and anchorage devices which are to be embedded in cast-in-place concrete or masonry in ample time so as not to delay that Work.
B. Store materials to permit easy access for inspection and identifications. Keep steel members off the ground using pallets, platforms, or other supports. Protect steel members and packaged materials from corrosion and deterioration. Remove any damaged items from the site and replace at no cost to the Owner.
C. Use all means necessary to protect structural steel before, during and after installation.

1.08 Coordination

A. Coordinate and furnish all required anchorages, templates, and patterns, setting drawings, and installation directions for all built-in items. Supervise the proper location and the installation of all built-in items. Deliver all items required to be embedded in concrete, masonry or built into other material to their respective Contractor. Provide holes and connections for Work of others Contractors.

1.09 Field Measurements

A. Take field measurements prior to preparation of Shop Drawings and metal fabrication. Proper fit and attachments of all items is required; allow for trimming and fitting when taking field measurements before metal fabrication.

1.10 Shop Assembly

A. Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

PART 2 - PRODUCTS

2.01 General

A. Use materials of size and thickness indicated or, if not indicated, as required to produce strength and durability in finished product for use intended.
B. Metal surfaces used for fabrications of miscellaneous metal items which will be exposed to view shall be smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness.
C. All other materials not specifically described, but required for a complete and proper installation, shall be new, free from rust, best quality of their respective kind, and subject to the approval of the Project Inspector.

2.02 Steel Plates, Shapes and Bars

A. All miscellaneous steel shall be standard cold-rolled sections, new, free from rust, and conforming to ASTM A-36.

2.03 Steel Pipe

A. All steel pipe shall be black steel pipe, except where indicated to be galvanized, complying with provisions of:
    1. ASTM A-120, Schedule 40 for pipe less than four (4) inch diameter.
    2. ASTM A-53 ERW for pipe greater than four (4) inch diameter.

2.04 Steel Tubing

A. All steel tubing shall be cold-formed steel tubing conforming to ASTM A-500, Grade B.

2.05 Fasteners

A. General: Provide electro-zinc plated fasteners for exterior use or where built into exterior walls or slabs. Select fasteners for the type, grade and class specified.
B. Bolts and Nuts: Regular hexagon-head carbon steel type conforming to ASTM A-307, Grade A with electro-zinc plating.

C. Flat Washers: U.S.S. standard round carbon steel type conforming to FS FF-W-92 with electro-zinc plating.
D. Lock Washers: Helical spring carbon steel type conforming to FS FF-W-84 with electro-zinc plating.
E. Anchor Bolts: Nonheaded "J" bolt type, unless otherwise indicated on Drawings, conforming to ASTM A-307, Grade A with electro-zinc plating.

2.06 Shop Paint

A. Primer shall be Red Oxide Primer, conforming to Federal Specification TT-P-31 for steel surfaces and Federal Specifications TT-P-64b for galvanized surfaces.

2.07 Grout

A. Pre-mixed, factory packaged, non-shrinking, non-metallic, non-staining, non-corrosive and non-gaseous group complying with CE CRD-C588. Provide grout specifically manufactured for exterior applications.

PART 3 - EXECUTION

3.01 General

A. Comply with AISC Code and Specifications and maintain Work in safe and stable conditions during erection. Provide temporary bracing and shoring as required; remove when final connections are in-place.
B. Execute all Work using skilled metal workers only. Do all welding as per AWS Specifications with certified welders.
C. When possible, fit and shop assemble all metal Work, ready for installation, with shop and field connections welded or attached with fasteners as indicated on Drawings.
D. Prior to all work of this Section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where fabrication and installation of the work of this section may properly commence.
E. Make all required measurements in the field to ensure proper and adequate fit of miscellaneous metal items.
F. It is the intent of the Drawings to indicate detail connections. Where connection detail is not shown, detail shall be patterned after a connection similar condition, or an AISC standard type.

3.02 Fabrication

A. General
   1. Use materials of size and thickness indicated on Drawings or on accepted Shop Drawings to produce strength and durability in finished product for use

intended. Work to dimensions are indicated on drawings or on accepted Shop Drawings, using proven details of fabrication and support.

2. All fabrication shall be in accordance with AISC Specifications for fabrication of structural steel, California Building Codes, and requirements of regulatory agencies.
3. Do not field cut or alter structural metal units, members or brackets without accepted Shop Drawings.
4. Fabricate and pre-assemble work in shop to greatest extent possible.
5. Fabricate exposed work true to line, shape and level with accurate angles and radiuses. Ease exposed metal edges to a radius of approximately 1/32 inch.
6. Make cuts, bends, punching and drilling accurate, neat and properly located. Grind and file smooth all parts exposed to view; leave exposed surfaces free of fabrication marks. Mark and match-mark units requiring field assembly.
7. All welds shall be continuous, unless otherwise indicated, complying with AWS Specifications. Form exposed connections with tight, flush and smooth hairline joints. Grind exposed welds smooth and flush to match and blend with adjoining surfaces.
8. Cut, reinforce, drill and tap fabricated metal work as indicated on Drawings to receive finish hardware, fasteners and similar items.

B. Bolted Connections:
   1. Punch or drill holes 1/16 inch larger than bolt size and spear-ream before inserting bolts.
   2. Ream unfair holes, but only up to next larger bolt size. Where unfairness exceeds maximum, weld hole in base material solid and drill hole of proper size.
   3. As erection progresses, bolt up work to take care of dead load, lateral forces, and erection stresses. Provide any additional bracing necessary to resist all possible forces during erection. Contractor is entirely responsible for the stability of the structural steel work until the job is complete.

C. Assembly with Standard Threaded Fasteners:
   1. Beveled Washers: Provide under bolt heads or nuts resting on surfaces exceeding 5 percent slope with respect to head or nut.
   2. Draw up tight, check threads with chisel, or provide approved lock washers or self-tightening nuts.

D. Welded Connections:
   1. Perform welding using shielded metal arc, submerged arc, gas metal arc, or flux cored arc methods in accordance with appropriate sections of AWS D1.1 and CBC Chapter 27.

2. In addition to specific requirements of Drawings, details of welded joints shall comply with all requirements for joints which are accepted without qualification tests under the AWS Code. If sizes of fillet welds are not shown on Drawings, use AWS minimum weld size, but not less than thinnest part thickness minus 1/16 inch.
3. Plan welding operations to eliminate stress build-up.
4. Field Welding:
   a) Perform field welding in accordance AWS D1.1.
   b) Where field welding is applied to existing flexural members involving application of significant amounts of heat to member, provide temporary shoring to prevent deflections.
   c) Provide Special Inspection per the CBC, latest edition.

E. Column Bases:
1. Finish in accordance with AISC. Lack of contact bearing with column shall not exceed 1/16 inch.

F. Bearing Plates:
1. Finish in accordance with AISC. Provide for attachment as shown on Drawings.
2. Cut, drill (tap where indicated or required), or punch holes perpendicular to metal surfaces. Do not flame cut holes or enlarge holes by burning. Drill holes in bearing plates.

3.03 Shop Painting

A. Shop paint all metal Work, except members or portions of members to be embedded in concrete or masonry, surfaces and edges to be field welded, stainless steel, and galvanized surfaces, unless otherwise indicated.
B. Clean all metal work to be primed and painted in accordance with Section 09 91 00 – Painting and Finishes.
C. Immediately after surface preparation brush or spray on primer in accordance with manufacturer's instruction at a rate to provide uniform dry film thickness of 20 mils for each coat. Use painting methods which will result in full coverage of joints, corners, edges and exposed surfaces.
D. Apply one (1) shop coat to fabricated metal items, except apply two () coats of primer to surfaces inaccessible after assembly or installation.
E. Give any painted built-in portions one (1) field coat of primer on all abraded areas after installation.

3.04 Galvanizing

A. All metal fabrications intended for exteriors use or for use in high moisture areas are to be hot-dip galvanized, unless otherwise noted.

B. Hot dip galvanizing or zinc coatings, applied on products fabricated from rolled, pressed and forged steel shapes, plates, bars and strips shall comply with ASTM Specification A123-73.
C. Hot dip galvanizing or zinc coatings on assembled steel products shall comply with ASTM Specifications A386.
D. The weight of coatings shall be as designated in Table 1 for the class and thickness of material to be coated. Galvanized surfaces for which a shop coat of paint is specified shall be chemically treated to provide a bond for the paint.
E. Except for bolts and nuts, all galvanizing shall be done after fabrication.

3.05 Installation

A. General:
   1. Compliance: Erect and install all miscellaneous metal in strict accordance with the Drawings, the reviewed shop drawings, and the referenced standards, aligning straight, plumb, and level within a tolerance of one in 200. Accurately assemble structural steel to lines and elevations indicated, within specified AISC tolerances.
   2. Splice metal work only where indicated and approved on shop Drawings.
   3. Install anchorage devices and fasteners where required for securing miscellaneous metal fabrications to in-place construction; including anchorage devices and fasteners that require to be cast into concrete or masonry. Provide temporary bracing or anchors in formwork for items cast into concrete or similar construction.
   4. Perform cutting, drilling, and fitting required for installation of miscellaneous metal fabrications. Set Work accurately in location, alignment and elevation. Install items plumb, level, true and free of rack; measured from established lines and levels.
   5. Fit exposed connections accurately together to form tight hairline joints. Weld connections which are not to be left as exposed joints, but cannot be shop welded due to shipping size limitations. Grind exposed joints smooth and touch-up shop paint coat.
   6. Do not weld, cut or abrade the surfaces of exterior units which have been hot-dip galvanized after fabrication, and are intended for bolted or screwed field connections.
   7. All field welds shall conform to AWS Specifications. Grind all exposed welds smooth and flush to match and blend with adjoining surfaces.
   8. Clean and touch-up all field welds and scratches with shop paint as specified.

3.06 Finishes

A. Finish all fabricated metal Work as per Section 09 91 00: Painting and Finishes

END OF SECTION

SECTION 09 91 00
PAINTING AND FINISHES (GENERAL)

PART 1 - GENERAL

1.01 Conditions

A. The general provisions of the Contract, including General Conditions and Special Provisions apply to the work specified in this Section.

1.02 Description

A. Work includes, but is not limited to the following:
   1. Provide all materials, tools, equipment, appliances, labor and supervision required to paint and finish all surfaces and/or components as specified herein and as indicated on the Drawings, including all miscellaneous items and labor required to complete the Work of this Section.
   2. Surface preparation, priming and painting of all metal surfaces as indicated on Drawings or as follows:
      a) Miscellaneous surfaces.
   3. All surfaces that are left unfinished by the requirements of other sections shall be painted or finished as part of this contract.

B. Related Work described elsewhere.
   1. Section 05 12 00: Structural and Miscellaneous Steel

C. Definition: The term “paint”, as used herein, shall mean all coating systems materials, including primers, emulsions, enamels, stains, sealers and fillers, and other applied materials whether used as prime intermediate or finish coats.

1.03 Work Not Included

A. Pre-Finished Items: Unless otherwise specified or indicated on the Drawings, do not include the painting of items that are specified to receive manufacturer’s factory finish, i.e. such items as site furnishings, irrigation equipment, electrical equipment, etc. See applicable Sections.

B. Finished Metal Surfaces: Unless otherwise specified, all metal surfaces or anodized aluminum, stainless steel, chromium plate, copper, bronze or similar finished materials do not require painting.

1.04 Submittals

A. Provide in accordance with the General Conditions prior to ordering material, a complete, detailed list of materials proposed for use on work. Include affidavit from manufacturer stating that proposed materials are the best of their

respective kinds and suitable for intended purpose. Submit in ample time to avoid delays in work if the list, or portions thereof, are rejected.

B. Painter shall prepare and submit color samples to match color chips in 12- inch square size and must receive approval from Project Inspector before applying final paint coats to finish surfaces. Approved samples shall be retained at the Project Inspector's office for record.

1.05 Paint Coordination

A. Provide prime coats which are compatible with finish paints used. Review other Sections of these specifications in which prime paints are to be provided to ensure compatibility of total painting system for various surfaces. Upon request from other trades, furnish information and specifications for finish materials proposed for use, to ensure compatible prime coats are used. Provide barrier coats over incompatible primers or remove and reprime as required. Notify Project Inspector in writing of any anticipated problems using specified painting systems with surfaces primed by others.

1.06 Job Conditions

A. Applicator shall examine areas, surfaces and conditions under which painting Work is to be applied and notify the Project Inspector in writing of conditions detrimental to proper and timely completion of Work. Do not proceed with Work until unsatisfactory conditions have been corrected in a manner acceptable to Project Inspector and Applicator, or Applicator shall assume responsibility for and rectify any unsatisfactory finish resulting.

B. Starting of painting Work shall be construed as Applicator's acceptance of surfaces and conditions.

1.07 Weather Conditions

A. Apply water base paints only when temperature of surfaces to be painted and surrounding air temperature are between fifty (50) degrees F (10 degrees C) and ninety (90) degrees F (32 degrees C), unless otherwise permitted by paint manufacturer's printed specifications.

B. Apply solvent-thinned paints only when temperature of surfaces to be painted and surrounding air temperatures are between forty-five (45) degrees F (7 degrees C) and ninety-five (95) degrees F (35 degrees C), unless otherwise permitted by paint manufacturer's printed specifications.

C. Do not apply paint in rain, fog or mist; or when relative humidity exceeds eighty-five (85) percent; or to damp or wet surfaces.

1.08 Delivery and Storage

A. Deliver materials to job site in original, new and unopened packages or containers bearing manufacturer's name and label, and the following information:
   1. Manufacturer's Name
   2. Manufacturer's stock number and date of manufacture
   3. Special color mix: name and number
   4. Contents by volume for major pigment and vehicle constituents
   5. Thinning instructions
   6. Application instructions

B. Store materials and equipment as approved by applicable codes and enforce good housekeeping practices. Any soiled or used rags waste, etc., shall be removed from the site every night and every precaution shall be taken to avoid the danger of fire. No paint materials shall be washed or emptied on the site or into any sewer drains, storm drains or street gutters.

1.09 Protections

A. Protection Work of other trades, whether to be painted or not, against damage by painting and finishing Work. Provide suitable covering or other methods of protection during progress of this Work. Correct any damage by cleaning, repairing or replacing, and repainting, as acceptable to the Project Inspector.

B. Provide "Wet Paint" signs as required to protect newly painted surfaces. Remove all protective materials upon completion of the Work and touch-up and restore all damaged or defaced surfaces, including the removal of paint spots from other surfaces.

1.10 Guarantee

A. Adhesion: All materials applied shall be guaranteed for a period of two (2) years against failure due to surface conditions, materials, or application. There shall be no evidence of fingerprints blisters, running, peeling, scaling, chalking, streaks or stains.

PART 2 - PRODUCTS

2.01 Color Schedule

A. Project Inspector shall furnish to the Contractor a color schedule of paints to be used based on one of the approved manufacturer's color charts or requirements for specially mixed colors. Use of one of the other approved manufacturer's requires the Contractor to match the color schedule provided by the Project Inspector.

B. Manufacturers names used to designate colors of color schedule is not intended to imply that products names are required to the exclusion of equivalent products of other manufacturers.
C. All colors and manufacturers shall be approved and authorized by the Project Inspector before commencing work.

2.02 Materials Quality

A. Provide best quality grade of various types of paints as regularly manufactured by acceptable paint materials manufacturer. Materials not displaying manufacturer's identification as a standard, best-grade product will not be acceptable. Acceptable paint manufacturers include:
   1. Kelley-Moore
   2. Benjamin Moore Company
   3. The Glidden Company
   4. Pratt and Lambert, Inc.
   5. Dunn and Edwards
   6. Sherwin-Williams
   7. W.P. Fuller Company
   8. Tiger Drylac

B. Provide primer and undercoat paint produced by the same manufacturer as finish paint. Use only thinners approved by paint manufacturer, and use only within recommended limits.

~~C.~~ Epoxy paints and wood stains for use in standard comfort stations shall be as specified on plans.

2.03 Metal Primer

A. Primer for metal surfaces shall be Red Oxide Primer, conforming to Federal Specification TT-P-31 for metal surfaces and Federal Specification TT-P-64b for galvanized surfaces.

PART 3 - EXECUTION

3.01 Surface Preparation

A. General: Perform preparation and cleaning procedures in accordance with paint manufacturer's instructions, and as herein specified, for each particular surface condition.
B. Paint no items fitted with finish hardware or other similar items until hardware has been removed or provided with surface-applied protection prior to surface preparation and painting operations. Install hardware or remove surface-applied protection after paint has dried.

C. Metal Surfaces: Clean all metal surfaces, which are not galvanized or shop-painted, of scale, dirt, rust and other deleterious materials before priming. Clean metal in accordance with Steel Structures Painting Council (SSPC) Specifications.
   1. SP-2: Hand Tool Cleaning
   2. SP-3: Power Tool Cleaning
   3. SP-7: Brush-off Blasting Cleaning

   Remove oil, grease, and similar contaminants in accordance with:
   1. SP-1: Solvent Cleaning

D. Galvanized Surface: Clean all galvanized surfaces of oil and other surface contaminants with a crystalline zinc phosphate pretreatment (phosphoric acid etch). Remove pretreatment solution by thoroughly washing with clean water and wipe dry.

3.02 Materials Preparation

A. Mix and prepare painting materials in accordance with manufacturer's specifications.
B. Stir materials before application to produce a mixture of uniform density, and stir as required during application. Do not stir surface film into materials. Remove film and if necessary, strain materials before using.

3.03 Application of Primer Coat

A. Apply primer coast to all surfaces which are required to be painted or finished, and which have not been prime coated or shop-painted by others. For metal surfaces, tough up shop-painted coats as required.
B. Immediately after surface preparation brush or spray on primer in accordance with manufacturer's instructions at a rate to provide uniform dry film thickness of two (2.0) mils for each coat. Use painting methods which shall result in full coverage of joints, corners, edges and exposed surfaces.
C. All primer coats shall be free from runs, sags, and other defects. All coats shall be thoroughly dry before applying succeeding coats.
D. Apply one (1) coat of metal primer for metal surfaces, as specified and/or as recommended by manufacturer's instructions.

3.04 Application of Paint

A. Apply paint in accordance with manufacturer's instructions. Use applicators and techniques best suited for each surface and type of materials being painted.
B. All painting Work shall be done by skilled workman in a professional manner. All coats shall be evenly spread and shall be free from run, sags and other defects. All coats shall be thoroughly dry before applying succeeding coats.

C. All individual coats of paint shall be inspected and approved by the Project Inspector before application of the succeeding specified coat; otherwise no credit for the coat applied shall be given, and the Applicator shall automatically assume responsibility to recoat the Work. The applicator shall provide the Project Inspector a report of each coat applied when completed for inspection and approval to comply with the above.
D. Where coverage is incomplete, not uniform, or not to the required dry film thickness, provide an additional coat at no extra cost to the Developer.
E. Apply finish coats of paint to all exposed surfaces as follows:
   1. For primed metal surfaces, apply two (2) coats of 100% acrylic latex base paint, per manufacturer's recommendations. Apply first coat of paint within 72 hours of primer application. If first coat of finish paint cannot be applied within the specified application time, the contractor shall re-clean and re-primer all exposed metal surfaces prior to start of metal paining operations.
F. Give special attention to ensure that surfaces, including edges, corners, crevices, welds, and exposed fasteners, receive a dry film thickness equivalent to that of flat surfaces.
G. Apply first-coat material to surfaces that have been cleaned, pretreated or otherwise prepared for painting as soon as practical after preparation and before subsequent surface deterioration's.
H. Allow sufficient time between successive coatings to permit proper drying. Do not recoat until pain has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure and application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.
I. Apply all coating without reduction, except as specifically required by label directions, or required by this Section.
J. Sand carefully between all coats on smooth surfaces for good adhesion of subsequent coats.
K. Paint all exposed surfaces and anything inaccessible after installation prior to installation, if required to be painted.

3.05 Application of Epoxy Paint

A. Use epoxy paint for floor and wall in restrooms up to ADA height.

END OF SECTION

SECTION 12 93 00
SITE FURNISHINGS

PART 1 - GENERAL

1.01 General Requirements

A. The requirements set forth in the General Conditions shall be in addition to the standards provided herein.

B. The requirements set forth in the Supplemental Conditions shall be in addition to the standards provided herein.

1.02 Description

A. Furnish all labor, materials and equipment for the complete installation of all site furniture, including play equipment and play surfacing, as shown on the Plans and as specified herein.

1.03 References

A. All play equipment shall meet or exceed the standards set forth by the Consumer Product Safety Commission (CPSC), comply with the Americans with Disabilities Act (ADA), meet all current ASTM standards and be consistent with State and local codes.

B. The play area surfacing shall meet or exceed the fall absorption/impact rates set forth by the CPSC guidelines and ASTM standards. The surfacing shall be an accessible surface and manufactured specifically for play areas.

C. Nothing in the Plans or Specifications is to be construed to permit work not conforming to regulating codes and standards. The Contractor shall furnish without extra charge any material and labor, when required, by the compliance with these rules and regulations, even though the work was not mentioned in these particular Specifications or shown on the Plans.

D. The product manufacturer shall supply complete Specifications for the installation of all site furnishings, including play equipment and play surfacing.

1.04 Submittals

A. Submittals for specified items are required. The Contractor shall submit a materials summary sheet indicating which items will be installed as specified and which items are proposed for substitutions. The Contractor shall submit proof of order within ten (10) working days of the Notice to Proceed, indicating all specified materials have been ordered, noting “as specified” or “substitution proposed”. For the following items, also provide:

1. Resilient Play Surfacing (i.e. rubber surfacing material) Submittal shall include IPEMA certification of materials and the most recent impact absorption test results.
2. Play Equipment and Swings submittals shall include color samples, manufacturer's materials and parts list, and installation instructions.
3. All items with "color as selected by City" shall include color samples.
4.

B. On the date of the Notice to Proceed, the Contractor shall immediately place the order to purchase all site furnishings, including the play equipment and play surfacing as specified on the Plans and as outlined herein. **Proof of all orders shall be submitted to the Project Manager within ten (10) working days of the Notice to Proceed.**

C. The Contractor shall submit a Certificate of Compliance from a third party certified playground inspector which verifies that the entire playground, including individual components, and surfacing meets or exceeds regulated requirements as described in Section 1.03 above.

1.05 Record Drawings

A. The Contractor shall keep an accurate record of the as-built conditions of the miscellaneous site amenities. These records shall be updated daily and kept at the construction site. At any time, the Inspector may examine the conditions of the "as-builts" to ensure compliance of the above.

PART 2 - PRODUCTS

2.01 Materials

A. Play Equipment shall be custom configuration as shown on the Plans and as specified herein. The equipment shall be as distributed by *(contact name and phone number)*, and as manufactured by *(contact name and phone number)* or accepted equal. Color as selected by the City.

B. Swings shall be the custom configuration as shown on the Plans as distributed by *(contact name and phone number)*, and as manufactured by *(contact name and phone number)*, or accepted equal. Color as selected by the City.

C. Poured-in-place resilient surfacing shall be as shown on the Plans and as specified herein. The play surfacing shall be Tot Turf TPV Poured Surfacing as manufactured by Robertson Industries, contact Frank Horwath, (510) 433-0655 or accepted equal. Color as selected by the City.
   1. Thickness of surfacing shall meet or exceed ASTM F 1292-93 Thickness vs. Fall Height requirements. The topcoat shall be ½ inch thick.
   2. Color shall be 50/50 black and brown mix, unless custom colors are shown on plans. For yellow, gold, red, and green colors use an aromatic binder.

For blue, gray, purple, teal and tan colors use an aliphatic binder to preserve the color.

3. Poured-in place resilient surfacing shall have a five (5) year warranty.

D. Engineered wood fiber shall be clean, engineered wood fiber, manufactured specifically for play areas.
   1. Engineered wood fiber manufacturer shall provide testing certification by an independent testing agency that the results comply with CPSC guidelines and ASTM standards.
   2. Engineered wood fiber shall meet the following requirements: ASTM F1951-99 (ADA Compliance Test) and ASTM F 1292-96 (Shock Absorbency).
   3. Manufacturer shall provide a Certificate of Insurance that shall provide coverage for products liability with the limit of liability not less than $1,000,000.
   4. The manufacturer shall also provide written guarantee for three (3) years from the date of installation against decay and biochemical degradation calling for replacement of defective materials during the guarantee period.
   5. Manufacturer certifies that the engineered wood fiber has been installed in not less than three (3) sites for periods of not less than three (3) years demonstrating the claims made with regard to these Specifications.

E. Picnic Tables shall be as shown on the Plans and as specified herein. The tables shall be as distributed by *(contact name and phone number)*, and as manufactured by *(contact name and phone number)* or accepted equal. Color as selected by the City.

F. Benches shall be as shown on the Plans and as specified herein. The benches shall be as distributed by *(contact name and phone number)*, and as manufactured by *(contact name and phone number)* or accepted equal. Color as selected by the City.

G. Drinking Fountain shall be MDF #~~440~~ 10145 SM (bottle filler dual bowl and accessible) and stainless steel surface carrier as distributed by Husbands and Associates (800) 821-9838 and as manufactured by Most Dependable Fountains or accepted equal. Color to be stainless powder coated black or as approved. Include recessed hose bib with locking cover. Install with a sand strainer when sand amenities are included in the park design. ~~For drain inlet at drinking fountain, see Section 33 00 00: Utilities.~~

H. Infield Mix shall be 60/40 red lava/ screened clay mix as distributed by ~~Valley~~ Cascade Rock, 916-~~652~~383·~~7209~~ 1300 or accepted equal.

I. Park Identification Sign shall be fabricated by Quick Crete Products Corp., Norco, CA, (916) 447-8644, or by Outdoor Creations, Inc., Anderson, CA, (530) 365-6106, or accepted equal.

J. Age-Appropriate Signage shall contain the following language:

"This play area has been designed for the use of children aged *(fill in the appropriate age range)* years of age."

K. Park Namesake Plaque shall be a 24" by 18" digital high pressure laminate graphic panel fabricated or accepted equal. Plaque shall be mounted on a SlimLine single pedestal sign system or accepted equal. Manufacturer for the plaque and sign system (model # 2418 SL-SLP-AL) is KVO Industries (Chris Howell, (707) 573-6868). Installation location shall be verified in the field with the Project Manager.

L. Playground rules sign shall be as fabricated by Gopher Sign Company, (651) 698- 5095, or accepted equal.

M. BBQ Grill shall be Iron Mountain Forge or accepted equal. Installation location shall be verified in the field with the Project Manager.

N. Line Paint (for basketball courts): Hawker - Laykold; Koch Materials - Decocolor; Extol - Color; L&M - Nova acrylic; California Products Corp - Plexicolor Laykold; or accepted equal.

O. Trash Receptacle shall be 32 gallon receptacle with liner, dome top (model # TG3D33S) as fabricated by Wabash Valley, (260) 352-2102, or accepted equal.

P. Other (See Design Guidelines for additional information) shall be as shown on the Plans and as specified herein. The *(site amenity)* shall be as distributed by *(contact name and phone number)*, and as manufactured by *(contact name and phone number)* or accepted equal. Color as selected by the City.

PART 3 - EXECUTION

3.01 Installation

A. Contractor to provide experienced workers or subcontractors to install all site furnishings, including the play equipment and play surfacing described in these Specifications. The workers or subcontractor must demonstrate that at least five (5) similar play structures and five (5) play surface applications similar to that specified for this project have been installed in the last three (3) years.

B. All site furnishing, including play equipment shall be installed per manufacturer's instructions.

C. Engineered wood fiber shall be blown in place to avoid damage to adjacent improvements unless specifically approved by City.

D. Poured-in-place rubber play surfacing and access ramps shall be installed as shown on the plans. Install poured-in-place rubber over a 4" thick concrete base. The rubber base coat shall be _____" and the rubber topcoat shall be 1/2", unless otherwise noted on the plans. Apply the appropriate binder with all finished poured-in-place rubber surfaces based on color as outlined in Section 2.01 J and per manufacturer's instructions. Installation of poured-in-place rubber surfacing shall be performed by an International Playground Equipment

Manufacturer Association (IPEMA) certified and experienced installer. Submit a copy of the installer's certification prior to installation. "Experience" is as defined in 3.01 A above.

For Aggregate sub base: Grading to be +/- .375 (3/8") inside the play area 4" minimum thickness. Applied as follows:

Step 1 Install 2", compact
Step 2 Apply by hand Portland cement to entire surface
Step 3 Apply ¼" water to entire surface
Step 4 Repeat Steps 1, 2, & 3 to attain required thickness

Sub base to be installed before play equipment in order to utilize large compaction equipment. Jumper compactor equipment to be utilized along outside perimeter of play area curb. Compaction test shall be performed to verify that the aggregate is compacted to 95%. Sub base (aggregate) must be sloped per ADA requirements.

E. Heights of tables and benches shall be as follows, unless otherwise required by ADA; California Title 24 or other code requirements:

Description	**Height Above Finish Grade**
Table Surface Height	34" Maximum
Knee Space Height	27" Minimum Clear Space
Knee Space Depth	17" Minimum from edge of table to nearest obstruction under table top
Width of Knee Space	30" Minimum clear width beneath table
Bench Surface Height	16" Minimum, 18" Maximum

F. Heights for play equipment, including ramps and transfer decks shall comply with the approved recommendations by the U.S. Architectural and Transportation Barriers Compliance Board: Play Facilities Regulatory Negotiation Committee.

G. For play equipment, locate all footings prior to installation of drain lines. Adjust drain lines to accommodate play structure footings. Provide appropriate fall zones as shown on the Plans and per applicable codes and guidelines.

H. All footings shall be Class A concrete with 3/4" maximum size aggregate, unless otherwise noted. Footings shall be in accordance with Caltrans Standard Specifications, Section 90. Install all footings below finish surface. In paved areas, install paved surface over footing for a clean finished surface as shown on the Plans.

I. Carefully install all furnishings and equipment without disturbance to adjacent finishes. Contractor shall be responsible for the damage and subsequent repairs of damaged finished product.

J. Install park namesake plaque. Installation location shall be verified in the field with the Project Manager.

K. Install age-appropriate stickers on all play structures.

L. Install playground rules sign. Installation location shall be verified in the field with the Project Manager.

3.02 Cleaning

A. Thoroughly clean all areas where work has occurred. Remove from the site excess material, debris and rubbish.
B. Take all precautions to protect completed work. Immediately repair or replace all damaged areas due to tire ruts, erosion, compaction failure, etc. Keep all erosion control measures intact.

PART 4 - WARRANTY

4.01 General

A. Contractor shall warranty all site amenities included under this Section.
B. Contractor shall also provide a written warranty covering all materials, equipment and workmanship furnished by him to be free of all defects after installation is accepted, including all defective parts that may have been found.
C. Submit written warranty on company letterhead addressed to the City when providing As-built drawings.
D. Contractor shall submit to the City, upon completion of work, a Certificate of Compliance by a third party certified playground inspector for the installation of the play structure and safety surfacing. Certification shall include testing for compliance of ASTM 1292 (Impact Attenuation of Surfacing Systems under and around Play Equipment). All tests, including re-tests, shall be the responsibility of the Contractor. Submit all test results to the City.
E. Submit maintenance manual for poured-in-place resilient surfacing.
F. Contractor shall submit to the City, upon completion of work, a Certificate of Compliance from the manufacturer of the play structure for the installation of the play structure.
G. Contractor shall submit to the City, upon completion of work, critical fall criterion used to certify all play surfacing material.
H. Attach cut sheets of installed items to the warranty.

END OF SECTION

SECTION 26 00 00
SITE ELECTRICAL

(This Section is only partially complete. Consultant shall provide all applicable 260000 series Sections specific to the project scope.)

PART 1 - GENERAL

1.01 General Requirements

A. The requirements set forth in the General Conditions shall be in addition to the standards provided herein.
B. The requirements set forth in the Special Conditions shall be in addition to the standards provided herein.
C. The standards set forth in the City of Roseville Design and Construction Standards, latest edition and requirements outlined by the City of Roseville Electric Department shall be in addition to the standards provided herein.
D. The standards set forth in the latest edition of the California Electrical Code (CEC), incorporating the latest edition of the NEC with City of Roseville amendments shall be in addition to the standards provided herein.

1.02 Description

A. Furnish all labor, materials and equipment for the complete installation of site electrical as shown in the Plans and as specified herein.
B. Submittals shall be required for requested substitutions or plan deviations ONLY. The Contractor shall install all specified electrical fixtures, poles and equipment, unless otherwise accepted and determined as an equivalent.

1.03 References

A. Conform to requirements outlined in the latest editions of the California Electrical Code (CEC), California Administrative Code (Title 24), California Building Code (CBC), California Administrative Code (Title 22) and other applicable codes.
B. Conform to requirements outlined in the latest edition of the Roseville Electric Specifications for Commercial Construction.

1.04 Record Drawings

A. Record drawings are required as a part of this work. At all times, the Contractor shall maintain accurate information of the work in progress. Deviation in layout of conduit or other materials shall be recorded to the satisfaction of the Inspector. Upon completion of the project, as-builts shall be submitted to the

City on reproducible plan sheets and shall depict all changes in a neat and legible manner.

PART 2 - PRODUCTS

2.01 Service Panels

A. Service panels shall meet the Roseville Electric approved sections of the EUSERC requirements. The list of acceptable panels can be found at https://the.euserc.org/s/Roseville-City-of-Acceptability-Pages.pdf
B. Service panel shall be:
   1. Built to UL508A standards
   2. Metered
   3. Single phase or three phase application
   4. Rated for 120 to 480 volts
   5. Color: Hunter Green

2.02 Electronic Astronomic Time Switch

A. Electronic Astronomic Time Switch shall be model ET-2815C, as manufactured by Intermatic, or accepted equal.

2.03 Conduit and Fittings

A. For primaries (12,000 volts), conform to Roseville Electric's Specifications for Commercial Construction, latest edition.
B. All other conduit and fittings shall conform to the California Electric Code, latest edition.

2.04 Wires and Cables

A. Conform to the California Electric Code, latest edition.
B. All wires shall be copper only, 90-degree-C THHN/THWN insulation.

2.05 Wire Connections and Devices

A. Conform to the California Electric Code, latest edition.
B. Splices and joints for #10 AWG or smaller wiring shall be twisted together electrically and mechanically strong and insulated with approved type insulated electrical spring connectors, Scotchlok or Ideal. Joints and connections for #8 AWG or larger shall be made with Burndy, T & B, or approved equal, solderless tool applied pressure lugs and connectors. Uninsulated lugs and wire ends shall be insulated with layers of plastic tape equal to insulation of wire and with all irregular surfaces properly padded with "Scotchfil" putty prior to application of tape. Tape shall be equal to Scotch #33, General Electric #AW-1, or approved equal. Feeder splicing is not permitted.

C. Receptacles: 15 & 20 Amp 125 Volt receptacles shall be "Specification" grade, duplex, UL Listed, rated Weatherproof where installed outdoors or in damp or wet locations. Where only one receptacle is connected to a 20 ampere circuit, a 20 ampere receptacle shall be used. Receptacles to be Hubbell 5262 series, 5362 series, or equal. Provide an equipment grounding jumper (pigtail) connecting the grounding terminal of the receptacle to the grounded box.

2.06 Outlet Boxes

A. Cast Metal boxes shall be cadmium plated, cast iron alloy by Crouse-Hinds Form 8 condulets, Appleton Form 35 Unilets or accepted equal.

B. Cast Metal Outlet boxes shall be four inch (4") round, galvanized cast iron alloy with threaded hubs and mounting lugs as required. Boxes shall be furnished with cast cover plates of the same material as the box and neoprene gaskets by Crouse-Hinds VXF series, Appleton JBX series or accepted equal.

2.07 Pull and Junction Boxes

A. Per City of Roseville Electric Department's Specifications for Commercial Construction, latest edition.

2.08 Parts Identification

A. Consistent with the City of Roseville Electric Department's Specifications for Commercial Construction, latest edition.

2.09 Electrical Support Equipment

A. Concrete Fasteners shall be Philips "Red-Head" or accepted equal. Powder driven concrete pin fasteners, low velocity type shall be Remington, Ramset or accepted equal.

B. Conduit Straps shall be hot dipped galvanized, cast malleable iron, one hole type strap with cast clamp-backs and spacers (as required) by O-Z/Gedney No. 15-50G strap and #14G spacer, Efcor No. 231 strap and No.131 spacer or accepted equal.

C. Concrete Inserts shall be pressed galvanized steel, spot insert with oval slot capable of accepting support nuts of ¼ inch to ½ inch diameter thread by Unistrut No. M2506 series, Globestrut CSI series or accepted equal.

D. Construction Channel shall be 1-1/2 inch by 1-1/2 inch 12 gauge galvanized steel channel with 17/32 inch diameter bolt holes, 1-1/2 inch on center, in the base of the channel by Kindorf 905 series, Unistrut P-1000-HS or accepted equal.

E. Cable Ties and Clamps shall be one piece, nylon, reusable type lashing tiesby Thomas and Betts Co "Ty-Raps", Panduit "Pan-Ty" or accepted equal.

F. General Fasteners shall be wood screws for fastening to work; machine screws for fastening to steel; toggle bolts for fastening to gypsum board or plaster walls; expansion anchors for attachments to pre-poured concrete.
G. GFI Outlet Cover shall be metal, lockable, and flush with the surface it is installed in. Cover must conform to the California Electric Code, latest edition.

2.10 Fixtures and Poles

A. Parking Lot lights shall be:
B. Pathway/Security lights shall be:
   1. LED: Hadco: RL54 B B N N 1 A W N N N A 2 N N N N SP1~~RL54 B B N N 1 A N N 80 A N~~
   2. Pod: die-cast aluminum housing with tool-less access
   3. Globe: clear prismatic injection molded U.V. stabilized acrylic
   4. Symmetric photometric distribution
   5. Rated 120 volts
C. Poles shall be:
   1. Whatley: TR34 ~~20~~ 16 DE BLK ~~SMS~~ TXT 30-30 or accepted equal
   2. Fiberglass, direct burial
   3. ~~Smooth~~ Textured round, tapered
   4. ~~20'~~ 16' mounting height
   4.~~5.~~ Include –RC receptacle as shown on plans

2.11 Tracer Wire

A. Insulated solid copper wire, minimum #12 gauge.

PART 3 - EXECUTION

3.01 Installation

A. Install (luminaire and poles) in accordance to manufacturer's instructions.
B. Ensure proper handling and installation of fixtures including hardware necessary for a complete installation. Fixtures (luminaire and poles) shall be clean, plumb and level.
C. All lamps shall be new and in operating condition. New lamps shall have less than 100 hours of operation on-site.
D. All splices in exterior fixtures or fixture outlet boxes shall be made watertight, using specified epoxy resin splicing kits.
E. Operate the entire system, once complete, in the presence of the Inspector. Immediately correct any improper connections or other items.
F. Install concrete collars around light poles. Concrete collars shall be per the Parks Construction Standards, latest edition.
G. Install tracer wire on top of conduit for all up-lighting and sports field lighting.

3.02 Clean Up

A. At all times, maintain a safe and clean work site, free of debris and rubbish.
B. All electrical parts shall be clean of conductive and deleterious materials.
C. All enclosures shall be free of dirt and debris.
D. Clean all finishes and touch up damaged areas prior to pre-final inspection.

3.03 Excavation & Backfill

A. Refer to Section 33 00 00 Utilities.

3.04 Equipment Pads

A. Concrete reinforced pads for mounting of equipment (i.e. switchboard, transformers, freestanding panels, etc.) shall be minimum 3000psi, 6" thick with #4 rebars at 12" on center each way. Rebars shall be centered in pad. Pad shall extend 2" beyond equipment and 1.5" above surrounding area. Backfill and compact to 95% maximum dry density at optimum moisture content in layers not to exceed 6" when compacted.

3.05 Grounding

A. Grounding and ground bonding of the electrical installation shall be in accordance with CEC Article 250, and any applicable codes. Ground fittings shall be approved manufactured type, installed and connected to conform with Code requirements.
B. Neutral conductors and noncurrent-carrying parts of equipment at each installation shall be grounded in accordance with applicable code. Ground conductor shall be copper having a current capacity sized in accordance with CEC.
C. All equipment cases, motor frames, etc., shall be completely grounded to satisfy requirements of CEC. Install bond wire in flexible conduit. Install copper bond wire, sized in accordance with CEC, in all nonmetallic raceways and bond to all metallic parts using approved fittings.
D. Service ground conductor shall be connected to a "Ufer" encased ground and bonded to the metallic cold water pipe system and to the metallic natural gas line. 5/8” x 10 ft copper clad ground rods may be used in lieu of the Ufer ground where no footing is available.
E. All connections shall be made with solderless connectors or molded fusion-welding process.
F. Equipment grounding conductors shall be insulated with a continuous green outer finish along its entire length. Conductors size #4 AWG and larger may be identified (with green electrical tape applied half-lapped) at each end and at every point where the conductor is accessible. Tape shall be applied from its point of entry to point of exit or termination.

G. Insulated grounded (neutral) conductors shall be identified with a continuous white outer finish along its entire length. Neutral conductors #4 AWG or larger can be identified by a distinctive white marking (applied half-lapped with white electrical tape) for the last 12 inches at each end.

3.06 Field Testing

A. Perform Insulation Resistance (IR) "Megger" Testing per NETA Standards. Submit test results. Provide testing for:
   1. All feeders 100 Amps and higher.
   2. Branch circuits 100 Amps and higher.

B. Each ground rod shall be tested. A ground rod which does not have a resistance to ground of 25 ohms or less shall be augmented by one additional ground rod at no less than 8 feet from each other.

3.07 Consultant to complete.

END OF SECTION

SECTION 31 10 00
CLEARING AND GRUBBING

PART 1 - GENERAL

1.01 General Requirements

A. The requirements set forth in the General Conditions shall be in addition to the standards provided herein.

B. The requirements set forth in the Supplemental Conditions shall be in addition to the standards provided herein.

1.02 Description

A. Preserve and protect existing site amenities to remain, including, but not limited to, trees, shrubs, underground utilities and other improvements as shown on the Plans. Protection of work shall include affected improvements on adjoining properties.

B. Scope of work includes: site preparation, removal of debris, staging of equipment and materials and securing the site for construction.

1.03 Related Work

A. Section 31 20 00: Earthwork

B. Section 01 57 23: Storm Water Pollution Control

1.04 Protection/Replacement

A. Prior to demolition, erect protective fencing a minimum of one foot (1') beyond the canopy of all trees to remain. The radius of the canopy shall be measured from the longest branch furthest from the trunk. Refer to the environmental document for additional requirements for protective fencing on other existing natural features. For work within or near protected trees, a tree permit may be required.

B. If public use is to be maintained on unaffected portions of the project site, the Contractor shall be responsible for directing pedestrian and vehicular traffic safely around the construction zone. Utilization of temporary fencing, barricades, signage, etc. shall be the responsibility of the Contractor. Safe detours shall be available to the general public at all times during the course of construction.

C. Protection of existing site improvements shown to remain, including, but not limited to, fencing, signs, benches, picnic tables, play structures, shade structures, drinking fountains, concrete paving, concrete wall and curbs,

decomposed granite paving, asphalt concrete paving, recreational site improvements, etc. are to be protected and preserved.

D. The Contractor shall be responsible for any damage to and maintenance of all existing street improvements, drainage facilities and irrigation systems and to re-establish these improvements to their original condition as soon as possible after completion of the work in the area, to the complete satisfaction of the Project Manager and Inspector. Realignments or modifications to the existing facilities as shown on the plans are accepted.
E. Survey monuments and markers either shown on the Plans or encountered during the course of construction shall be protected and preserved. The Contractor shall notify the Inspector upon discovery of an unmarked monument, at which time, arrangements for the relocation or adjustment of the monument will be determined. All costs associated with the relocation or adjustment of these monuments shall be the Contractor's responsibility.
F. Burning or burying removed material on-site is prohibited.
G. Where the removal of specific material creates an open hole, pit, trench or other depression, the Contractor shall immediately backfill and compact the areas consistent with requirements outlined in Section 31 20 00 of these Specifications.
H. All items identified in the Plans to remain or identified in the field to remain, removed in error by the Contractor, shall be repaired or replaced to match in equal or better construction, at no cost to the City. The quality of the repair or replacement shall be measured as that existing at contract award.

PART 2 - PRODUCTS

Intentionally left blank.

PART 3 - EXECUTION

3.01 Pre-Construction Site Review

A. Contractor shall review existing site conditions with the Inspector prior to start of construction and document any conditions which adversely affect the satisfactory execution of the work and final acceptance of the project.
B. Commencement of work constitutes acceptance of existing conditions. The Contractor shall, at his expense, be responsible for correcting all unsatisfactory and defective work.

3.02 Clearing

A. Completely remove trees, shrubs, stumps, vines, rubbish/debris, undergrowth, deadwood, structures, and other elements identified to be removed and/or which interfere with the construction as shown on the Plans and as specified.

B. Obtain verification from the Project Manager for non-identified items scheduled to be removed prior to actual removal.

3.03 Grubbing

A. Remove all stumps, roots, grasses and weeds in its entirety. Apply systemic weed killer. Confirm weed kill prior to removal.
B. Once surface material is removed, the Contractor shall stockpile the top twelve inches (12") of topsoil for use during the final grading phase of work. This soil shall be free of rocks, debris, roots and other undesirable material.

3.04 Utilities

A. Contact USA Alert (800) 642-2444 prior to commencement of any demolition or excavation work. Provide a minimum of 48 hours' notice. Verify all utilities entering into and their locations within the project site.
B. Where utilities lie within the project site, but are not a part of the project, the Contractor shall cooperate with the agency or utility company having jurisdiction to maintain its use and the integrity of the structure.
C. Where utilities enter into the project site and taps, connections to or extensions of the utility are identified in the Plans, the Contractor shall coordinate all work with the agency or utility company having jurisdiction to minimize or eliminate disruption of use by the adjacent properties.
D. Verify that all utilities, shown to be removed on the Plans, are inactive and turned off prior to disconnection and/or re-routing, prior to demolition.

3.05 Debris Removal

A. All materials removed as a part of this contract shall become the property of the Contractor and shall be legally disposed of off-site, unless otherwise noted on the Plans.
B. Where a portion of a concrete slab, curb or wall and asphalt concrete paving or curb is to be removed, the concrete shall be cut with a concrete saw at a 90 degree angle so that the edge of the remaining concrete shall form a neat, straight line. Conform to the City of Roseville Design and Construction Standards, latest edition.

END OF SECTION

SECTION 31 20 00
EARTHWORK

PART 1 - GENERAL

1.01 General Requirements

A. The requirements set forth in the General Conditions shall be in addition to the standards provided herein.
B. The requirements set forth in the Supplemental Conditions shall be in addition to the standards provided herein.
C. The standards set forth in the Caltrans Standard Specifications, latest edition, shall be in addition to the standards provided herein.
D. The requirements set forth by CAL OSHA shall be in addition to the standards provided herein.

1.02 Description

A. Provide all labor, operations and materials necessary for earthwork, including, but not limited to, staking and surveying, grading; excavating; installation of facilities necessary to perform excavation and subsequent removal of such facilities upon completion of work; subgrade preparation; backfilling; and other incidental items necessary for a complete project.
B. This project (is a balanced cut and fill project) (requires export of material) or (requires import of material) – select one. The (import) or (export) of material shall be a part of the Contractor's bid price.
C. The intent of the grading plan is to provide positive drainage and to maintain slopes on walkways as required by the Americans with Disabilities Act and California Title 24 throughout the project site. The Project Manager shall be notified immediately of any discrepancies between the Plans and actual field conditions and/or conflicts between the design and code requirements.

1.03 Related Work

A. Section 31 10 00: Clearing and Grubbing
B. Section 33 00 00: Utilities
C. Section 32 84 00: Irrigation System
D. Section 32 90 00: Planting
E. Section 26 00 00: Site Electrical
F. Section 01 57 23 Storm Water Pollution Control

1.04 Quality Assurance

A. All work shall conform to local codes and regulations, including standards set forth in the Standard Specifications of the State of California, Business and Transportation Agency, Department of Transportation (Caltrans), Chapter 70 of the Uniform Building Code and ASTM.
B. Relative compaction shall be the in-place dry density of soil denoted as a percentage of the maximum dry density of the same material. This shall be as determined by ASTM 1557. The optimum moisture is measured by the water content which corresponds to the maximum dry density.
C. Upon discovery of unforeseen subsurface site conditions, the Contractor shall notify the Inspector immediately.
D. Upon discovery of hazardous materials, cease all activity and immediately contact the Fire Department.

1.05 Protection

A. Provide and install all supports, shoring, bracing, underpinning, sheet piling and other methods for the sides of excavations necessary for ensuring safe working conditions for the workmen and to protect adjacent improvements to remain.
B. Provide any and all protection measures necessary to ensure the protection of the workmen, the general public, including children and the project site. These protection requirements remain the Contractor's sole responsibility throughout the duration of the project, including non-working hours.
C. Do not obstruct vehicular, bicycle or pedestrian thoroughfares, unless previously accepted by the City. Provide safe and adequate detours around the construction as required by City and State regulations.
D. Trenches shall be covered at all times when work directly associated with the trenches is not occurring, including non-work hours.
E. During the course of construction, the Contractor shall ensure that surface drainage does not create a nuisance onto adjacent properties.

1.06 Erosion Control Measures

A. Construction sites shall have required erosion and sediment control measures in place as required by the SWPPP. If construction is in progress, the Contractor shall ensure that the construction site is prepared prior to the onset of any storm. At a minimum, erosion control measures shall include:
    1. Broadcast seed
    2. Drainage area protection
    3. Dust/mud control
    4. Drain inlet filters
    5. Silt fence and straw wattles
    6. Slope protection

7. Straw bales
8. Silt controlling devices

PART 2 - PRODUCTS

2.01 Base Rock

A. Class 2 aggregate base per Caltrans Standard Specifications, latest edition.

2.02 Drain Rock

A. Drain rock shall be Class 2 permeable, washed, unbroken stone or gravel. Material gradation shall conform to the following:

Sieve Size	Percent Passing
1 inch	100
No. 4	20-50
No. 50	0-10
No. 200	0-5

2.03 Pea Gravel

A. Pea gravel shall be natural stone, free of clay, shale or organic matter, and shall conform to the following:

Sieve Size	Percent Passing
3/8 inch	100
No. 4	47
No. 8	2
No. 16	1

2.04 Fill

A. Structural Fill shall conform to Caltrans Standard Specifications or the accepted site-specific geotechnical report generated for the project.
B. Fill for non-structural areas shall conform to the following standards:
   1. Plasticity: ASTM D4318-84
   2. Expansion Index: No greater than twenty (20)
   3. Testing: UBC 29-9 and ASTM D422-72
   4. Particle Size: No greater than one inch (1”)

2.05 Topsoil

A. The top eight to ten inches (8” – 10”) of native soil containing more than three percent (3%) organic material. Topsoil shall be free of rocks no larger than one inch (1”) in diameter, free from subsoil, roots, heavy or stiff clay, course sand, destructive seeds, noxious chemicals, brush, debris, litter and other undesirable materials.
B. For any import soil to be used in turf/planting areas, submit a soils analysis with soil amendment recommendations (for plant growth) for review and acceptance

prior to placement on-site. Soils test information shall be as outlined in Section 32 90 00: Planting – 1.06.

2.06 Soil Sterilant

A. Sterilizer shall be standard, quick-acting, short-lived and non-selective weed and grass killer, commonly used under roadway/transportation projects. Application of the sterilant shall pose no short or long term health threats to the installer or the general public. Submit analysis for approval prior to applying.

2.07 Sand

A. Granular, fine, free of organic matter, mica, loam or clay material.

PART 3 - EXECUTION

3.01 Construction Staking

A. The layout of all work shall be performed by a California State licensed land surveyor provided by the Contractor.
B. Notify the Inspector immediately of any discrepancies between actual field conditions and the Plans. Minor field adjustments may be necessary in order to fulfill the intent of the Plans.
C. Non-notification of discrepancies between actual field conditions and the Plans by the Contractor, in writing, shall indicate his acceptance of such field conditions. Adjustments/modifications to the construction to accommodate the inconsistencies (without notification) shall be at no additional cost to the City.

3.02 Excavation

A. All excavations shall be as noted on the Plans. Excavations shall include accommodation of base material.
B. Do not over-excavate. Excavations shall provide appropriate space to install shoring, bracing, formwork, etc, as needed to ensure the safe and proper construction of the work.
C. Take every precaution to prevent water from entering, softening, and undercutting excavated areas, including, pits, footings, trenches, etc.
D. Notify the Inspector immediately upon discovery of unsatisfactory soils materials or unforeseen site conditions. Excavation shall include the complete removal of the unsatisfactory material and its legal disposal thereof.

3.03 Site Grading

A. A grading permit is required to be obtained by the Contractor prior to commencing any earthwork.
B. Grading shall include adjacent transition areas, new elevations/contours as shown on the Plans. All subgrade areas shall be graded parallel to the finish

grades and contours and shall be uniform in slope. Transition areas shall provide a smooth connection between new and existing grades and shall not create additional drainage or ponding onto adjoining properties.

C. Surface grades shall provide for positive drainage away from structures and footings, and shall be uniformly smooth throughout.
D. Rough grading shall:
   1. Be graded to a tolerance of 0.10 feet, plus or minus for planted and turf areas.
   2. Be graded with a tolerance less than .04' from specified grade and cross section for subgrade in which pavement, curbs and other structural elements are to be placed immediately above.
   3. Provide a subgrade surface free of exposed rocks, stones and boulders.
   4. Provide a subgrade surface free of depressions, pits, etc., with proper backfill and compaction. See paragraph 3.04 below.

3.04 Placement of Fill Material

A. Prior to placement of fill material, the Contractor shall:
   1. Obtain approval of the subgrade surface from the Inspector.
   2. Scarify, dry and compact soft and/or wet areas.
   3. Remove and replace unsuitable subgrade material to the satisfaction of the Inspector.
   4. Take all necessary corrective action.
B. Do not use topsoil as fill or backfill material, unless otherwise accepted in writing.
C. Fill shall be placed in the following manner:
   1. Accepted engineered fill material for structural slabs and areas to be paved shall be placed in six-inch (6") loose thickness, uniform layers over the entire area.
   2. Fill material in planted areas shall be placed in twenty-four inch (24") maximum loose thickness throughout the areas to receive fill.
D. Aerate or water each lift to obtain the required compaction rate indicated on the Plans. Thoroughly mix material to ensure proper moisture content for compaction. Repeat the operations until grades, as shown on the Plans, are obtained. Jetting of trenches shall be reviewed and accepted by the Inspector prior to performance of work.
E. Do not place fill when the subgrade is frozen, muddy or wet. Allow conditions to thaw and dry out before resuming operations.
F. Use hand tampers or vibrating compactors around foundations walls, retaining walls and other structural elements. Do not use large equipment in these areas and do not begin compaction operations until the bearing surfaces have reached its design strength.

G. Fill around existing trees to remain shall not exceed twelve inches (12”).
   1. Minor fill (6” or less) shall utilize topsoil and shall be placed by hand. Do not cover crown of trunk. Feather grades to the extent possible.
   2. Fills between 6” and 12” shall utilize 3/4” pea gravel on grade, placed up to three inches (3”) below finish grade. Apply topsoil, by hand, to meet finish grade elevations. Feather grades to the extent possible.
H. Construct mounds from on-site material. The core of the mound (1’ below finish elevations) shall be compacted to 90%. The top twelve inches (12”) shall be compacted to 85%. Place topsoil in the top twelve inches (12”).
I. Place topsoil in all turf and planting areas a minimum of twelve (12) inches deep. See Section 31 10 00, 3.03-B: Clearing and Grubbing.

3.05 Trenching, Backfilling and Compacting

A. For trenches greater than five feet (5’) in depth, submit an OSHA permit related to the work.
B. All trenches shall be straight, true and cut vertical at 90 degrees to the surface plane.
C. For trenches through existing paved surfaces, use a concrete saw or other tool to achieve straight, clean lines. Replace paved surface to the same or better condition as existing prior to cut.
D. Do not over-excavate. Maintain bearing surfaces true, level and undisturbed to the extent possible.
E. Trenches shall be kept dry and frost-free. Do not allow standing water to collect.
F. Do not allow trenches to remain exposed at any time when work directly related is not occurring. Cover all trenches during non-work hours.
G. Bedding for all trenches to receive pipes shall be as follows:
   1. Bedding material shall be consistent with the City of Roseville Design and Construction Standards, latest edition.
   2. Pipe shall lie completely on bedding. Pipe fittings or joints shall not bear weight.
   3. Bedding shall be uniform throughout the length of pipe.
H. Initial backfill for storm drains, sewer lines and electrical conduit shall conform the applicable City standard set forth by the Department having jurisdiction.
I. Backfill beyond the initial operations shall be native soil, placed in twelve-inch (12”) lifts. Compaction for trenched areas shall be 95% for parking lot, driveway and roadway areas; 90% for hardscape (i.e. walkways, picnic pads basketball and tennis courts); and 85% in areas to be planted. Place topsoil over trenches in planted areas. Upon completion, all trenches shall be filled flush with adjacent finish grades.
J. Compaction tests shall be required for trenched areas, hardscape areas and areas where fill over two feet in depth will be placed. The Inspector shall

determine the number of tests and the locations. Re-tests shall be the Contractor's responsibility.

K. Potholing shall be required in areas where existing utilities are indicated. Hand digging may be required.

3.06 Soil Sterilant

A. Soil sterilant shall be applied to areas where paving is to be installed. The worker applying the sterilant shall take every precaution to avoid overspray of sterilant onto areas to be planted. The sterilant shall be placed no further than six inches (6") beyond the edge of pavement.

B. Soil sterilant shall not be applied in inclement weather and windy days.

3.07 Drainage Areas

A. All bare areas, regardless of slope, within 50 feet of natural drainages shall be covered with straw and pressed in place.

B. No grading or trenching, except as required for erosion or sediment control, shall occur within 35 feet from the centerline of perennial and intermittent drainage swales between October 5 and April 1 unless approved by the Engineering Division, as well as any other governmental agency which may have additional jurisdiction and/or requirements.

3.08 Dust/Mud Control

A. Adjacent Streets: Adjacent street frontages shall be swept at least once a day to remove silt and other dirt which is evident from construction activities.

B. Construction Vehicles: The Contractor is responsible for cleaning construction vehicles leaving the site on a daily basis to prevent dust, silt, mud and dirt from being released or tracked offsite. Adjacent streets shall be swept clean daily.

C. Grading Spoils: Dry stockpiles of soil shall be watered to prevent the generation of airborne dust. Trucks transporting dry soil shall be covered with tarpaulins.

D. Water: Water shall be sprayed on all exposed earth surfaces during clearing, grading, earth moving and other site preparation activities. The exposed earth shall be watered throughout the day to minimize dust. The Contractor shall obtain a hydrant permit from the Environmental Utilities Department.

E. Wind Allowances: Grading activities shall be restricted or halted when winds exceed 15 miles per hour as deemed necessary by the Public Works Inspector.

END OF SECTION

SECTION 32 12 16
ASPHALT CONCRETE PAVING

PART 1 - GENERAL

1.01 General Requirements

A. The requirements set forth in the General Conditions shall be in addition to the standards provided herein.

B. The requirements set forth in the Supplemental Conditions shall be in addition to the standards provided herein.

C. The standards set forth in the City of Roseville Design and Construction Standards and the City of Roseville Parks Construction Standards, latest editions, shall be in addition to the standards provided herein.

D. The standards set forth in the State of California, Title 24, Americans with Disabilities Act, latest edition, shall be in addition to the standards provided herein.

1.02 Description

A. Furnish all labor, materials and equipment for the complete installation of asphalt concrete paving, including international disabled signs as shown in the City Standard, as shown on the Plans and as specified herein.

1.03 References

A. Caltrans Standard Specifications for asphaltic concrete, latest edition.

1.04 Tolerances

A. All surface areas shall drain. Ponding, puddling or birdbaths are not acceptable.

B. Surface grades shall conform to the following:

Description	**shall not exceed, ... from indicated line, grade or thickness**
Base Course	0.1 foot +/-
Finish Surface	0.05 foot +/-
Thickness of finished pavement	0.01 foot less

C. Flatness: maximum variance of 1/8” as measured with a ten (10) foot straight edge.

1.05 Testing

A. Testing shall occur during the installation of pavement. The number and frequency of tests shall be as determined by the Inspector.

PART 2 - PRODUCTS

2.01 Aggregate Base

A. Conform to Caltrans Standard Specification, Section 26 paragraph 1.02B, Class 2.

2.02 Asphalt Concrete

A. Conform to Caltrans Standard Specification, Section 39 and the City of Roseville Design and Construction Standards, latest edition.

2.03 Soil Sterilant

A. Sterilizer shall be standard, quick-acting, short-lived and non-selective weed and grass killer, commonly used under roadway/transportation projects. Application of the sterilant shall pose no short or long term health threats to the installer or the general public. Submit analysis for approval prior to applying.

2.04 Striping

A. Traffic marker paint, in accordance with Caltrans Standard Specifications, Section 83-3.02.
B. Thermoplastic marking tape in accordance with Caltrans Standard Specifications, Section 84-2.02. (Required for bike trails)

2.05 Header

A. Per City of Roseville Parks Construction Standards, latest edition.

2.06 Accessible Parking Signs

A. Signs for parking stalls shall conform to the California Manual on Uniform Traffic Control Devices (CMUTCD), the Standard Highway Signs manual with the Caltrans California Sign Specifications.
B. Notification sign: Notification sign shall read: “Unauthorized vehicles parked in designated handicapped spaces not displaying distinguishing placards or license plates issued for physically disabled persons may be towed at owner’s expense. Towed vehicles may be reclaimed at Roseville PD, 1051 Junction Blvd or by telephoning (916) 774-5000. CVC 22511.8”.
C. Sign posts: shall conform to Section 56 Signs in the City of Roseville Design and Construction Standards.

PART 3 - EXECUTION

3.01 Preparation

A. Upon completion of grading operations, compact the subgrade at the required elevation to a relative compaction density of 95%, unless otherwise noted on

the Plans. A load or performance test shall be conducted in the presence of the Inspector prior to the placement of AC.

B. Apply soil sterilant per manufacturer's directions. Limit the work zone of the sterilant application to the area to receive paving plus three feet (3') on each side.
C. Completely install redwood header as shown in the City of Roseville Parks Construction Standards, latest edition, if shown on the Plans.
D. No material shall be placed in muddy conditions, nor shall any material be placed during or immediately after inclement weather, i.e. rain storms, temperatures below 35 degrees F, etc.
E. In areas where soil conditions are less than optimal, geotechnical tests shall be performed to verify compaction rates. The Inspector shall determine the number of tests necessary in order to verify conditions. Initial tests will be provided by the City. Re-tests shall be the Contractor's responsibility.

3.02 Installation

A. Spread aggregate base material in six-inch (6") lifts.
B. Compact base surface to a relative compaction of 95% and in accordance to the Caltrans Standard Specifications, Section 26.
C. Spread asphalt concrete material in accordance to the Caltrans Standard Specifications, Section 39.
D. Upon completion, apply water to the finished surface and allow water to run-off. All areas of ponding, puddling or birdbaths shall be filled with asphalt and fine aggregate. Conform fill surface with adjacent surface to the point edges are not visible.
E. Take every precaution to protect adjacent amenities or structures from material spillage or damage. In case of spillage or damage, the Contractor shall immediately repair or replace the damaged area to the satisfaction of the City.
F. Clean and oil all manhole covers, grates and other surface structures within the pavement area.
G. All new asphalt concrete paving shall receive a fog seal at a rate of 1/12 to 1/10 gallon of undiluted emulsion per square yard. All work shall conform to Caltrans Standard Specifications, Section 37. **Once sealed, parking of vehicles and/or equipment or stockpiling of material on the finished surface is prohibited.**
H. Clean all surface structures that lie within the asphalt concrete area.

3.03 Striping

A. Conform to the City of Roseville Design and Construction Standards, latest edition.

B. Ensure that all pavement to receive striping is completely cured. Clean all pavement surfaces.
C. Accurately lay out all pavement markings, including, parking stripes, centerline stripes, international disabled parking logo, striping for disabled access ramp, directional arrows, game court lines and other pavement markings as shown on the Plans or as required by code.
D. All pavement lines, striping and lettering shall be four inches (4") in width, unless otherwise indicated on the Plans.
E. Lines painted with traffic paint shall receive two coats of paint. Allow each coat to dry completely prior to applying the second coat.
F. Apply all pavement markings on clean, dry surfaces, during weather conditions where temperatures are higher than 35 degrees F, no rain is occurring or predicted within the next twenty-four (24) hours, and the humidity is less than 80.
G. Remove all excess adhesives and tracking onto unmarked areas.
H. All pavement striping applications shall conform to Caltrans Standard Specifications, Sections 84 and 85.

3.04 Accessible Parking Signs (For parking lots only)

A. Verify that the language on the signs meets with current laws and regulations prior to installation. Immediately notify project manager of discrepancies.
B. For signs at parking stalls: install one per space designated for disabled parking. Locate sign as shown on the Plans. Verify location in the field prior to installation. Sign bottom shall be set at seven feet (7') above finished grade.
C. For notification signs: install one per driveway entrance. Verify location in the field prior to installation. Sign bottom shall be set at two feet (2') above finished grade unless otherwise directed.
D. Sign post installation shall conform to TS-17A of the City of Roseville Development Services Design and Construction Standards.

3.05 Protection and Cleaning

A. Do not allow equipment or vehicles to park on new asphalt surfaces upon completion of fog seal operations. At his discretion, the Contractor may allow the parking of equipment and vehicles on the asphalt concrete **AFTER** the asphalt concrete material has been laid, passing applicable compaction tests and **PRIOR TO** applications of fog seal and striping.

END OF SECTION

SECTION 32 15 40
DECOMPOSED GRANITE PAVING

PART 1 - GENERAL

1.01 General Requirements

A. The requirements set forth in the General Conditions shall be in addition to the standards provided herein.

B. The requirements set forth in the Supplemental Conditions shall be in addition to the standards provided herein.

C. The standards set forth in the City of Roseville Design and Construction Standards and the City of Roseville Parks Construction Standards, latest editions, shall be in addition to the standards provided herein.

1.02 Description

A. Furnish all labor, materials and equipment for the complete installation of decomposed granite paving, including redwood headers as shown in the Plans and as specified herein.

1.03 References

A. Caltrans Standard Specifications, latest edition.

1.04 Submittals

A. Submittals for specified items are not required; however, submittals are required for any proposed substitutions or deviations from the Plans or Specifications. Additionally, submittals are required for the specific items listed below. The Contractor shall submit a materials summary sheet indicating which items will be installed as specified and which items are proposed for substitutions. The Contractor shall submit proof of order within ten (10) working days of the Notice to Proceed, indicating all specified materials have been ordered, noting “as specified” or “substitution proposed”. Submittals are required on the following items:

1. Decomposed granite material and binding material: provide a sample “brick” for review and approval.

PART 2 - PRODUCTS

2.01 Crushed Quarry Rock

A. Crushed rock, graded between #4 and #200. Rock shall be high quality and well-graded.

B. Hastie's Capitol Sand and Gravel, Roseville, CA (916) 989-4600 or accepted equal.

2.02 Header

A. 1"x6"or2"x6" Redwood header board.

2.03 Binding Material

A. PolyPavement, Los Angeles, CA (323) 954-2240 or accepted equal.

PART 3 - EXECUTION

3.01 Preparation

A. Upon completion of grading operations, compact the subgrade at the required elevation to a relative compaction density of 95%, unless otherwise noted on the Plans.
B. Completely install redwood header as shown in the City of Roseville Parks Construction Standards.
C. No material shall be placed in muddy conditions, nor shall any material be placed during or immediately after inclement weather, i.e. rain storms, etc.
D. Submit samples of crushed rock to a PolyPavement Certified Lab to prepare a laboratory "brick" to confirm that the quarry material has sufficient fines for good binding.

3.02 Installation

A. Provide a 10' by specified width test sample, to be approved prior to installation. This sample shall be the basis of overall approval.
B. Thoroughly combine binder per manufacturer recommendations.
C. Spread crushed granite fine/binder material in two (2) one and one half inch (1-1/2") lifts (thickness after compaction).
D. Wet and roll each lift to form a uniform, smooth surface with a cross slope of 2%. Compact each lift to a 95% relative compaction density.
E. Upon completion of the final lift, fill any depressions, holes or divots and re- roll using the above process.
F. Provide a Certificate of Compliance verifying that the binder/stabilizer has been mixed per manufacturer's recommendations.

3.03 Clean Up and Protection

A. Thoroughly clean all areas where work has occurred. Remove from site excess material, debris and rubbish.
B. Take all precautions to protect completed work. Immediately repair or replace all damaged areas due to tire ruts, erosion, compaction failure, etc.

END OF SECTION

SECTION 32 31 13
CHAIN LINK FENCING

PART 1 - GENERAL

1.01 General Requirements

A. The requirements set forth in the General Conditions shall be in addition to the standards provided herein.

B. The requirements set forth in the Special Conditions shall be in addition to the standards provided herein.

1.02 Description

A. Furnish all labor, materials and equipment for the complete installation of the chain link fence system, including gates as shown on the Plans and as specified herein.

1.03 References

A. Caltrans Standard Specifications, latest edition.

PART 2 - PRODUCTS

2.01 General

A. Wire used in the fabric shall be galvanized and shall have a tensile strength of 80,000 lbs. Per square inch based on cross sectional areas of the wire. One sample shall be tested without removing bends caused by weaving of the wire with the mesh. A second test shall be conducted on a wire strand carefully straightened. The tensile strength is finally determined as the average reading between the two tests. Wire to match fabric selection.

B. Fabric shall be 1-3/4" 9-gauge nominal wire mesh, *hot-dipped galvanized or black vinyl coated* after weaving as shown on the plans. Conform to ASTM A392, with tensile strength as described in 2.01A above. Fabric shall be knuckled top and bottom with single width to full height of fence.

C. Ties/Fasteners shall be 9-gauge aluminum or black powder coated wire.

D. Fittings, clips, bolts, bands, bars, post tops/covers and other hardware necessary for a complete fence system shall be *galvanized or black powder coated*.

E. Where fencing is shown on the Plans to be black vinyl or powder coated, all appurtenances, including fabric, posts, rails, clips, bands, fittings, etc., necessary for a complete fence system shall be black vinyl or powder coated. Vinyl or powder coating shall be the industry standard for this type of finish.

2.02 Posts and Rails

A. Posts and rails shall be *hot-dipped galvanized per ASTM ~~A120~~ ~~A53~~ or black powder coated*, to match fabric and as shown on the Plans. All posts shall be installed with moisture-proofed caps on the top.
B. Size and lengths of posts shall be as shown in the City of Roseville Design and Construction Standards PK-40, latest edition.

2.03 Gates

A. Fabric and finish to match fence.
B. Hinges and latches shall be industrial strength, heavy duty and shall fit snugly around post. Latches shall be lockable.
C. Size and lengths of posts shall be as shown in the City of Roseville Design and Construction Standards PK-40, latest edition.

PART 3 - EXECUTION

3.01 Post Installation

A. Posts are to be spaced evenly as shown on the City Standard and set plumb and true to lines with the top line uniform as shown in the City of Roseville Design and Construction Standards PK-40, latest edition.
B. All posts shall be set in concrete as shown in the City of Roseville Design and Construction Standards PK-40, latest edition.
C. Where nicks on vinyl or powder coated finished occurs due to installation, the Contractor shall re-finish and patch damaged areas immediately.

3.02 Fabric

A. Attach fabric using fabric bands or clips spaced approximately 14” apart. Connections to top rails and tension wires shall utilize wire ties placed 24” on center.
B. For corner and vertical end connections, install stretcher bars banded to posts and gate frames at 24” apart (maximum).
C. All fabric to be stretched tight, free from sags and bulges.

3.03 Rails

A. For splices along the top rail, provide couplings every 20’. The coupling shall produce a continuous brace from end to end of each stretch of fence. Install a heavy spring at every fifth coupling to allow for expansion or contraction.
B. Utilize the appropriate fittings to ensure that all rails are rigidly clamped to end and corner posts.
C. Clamp mid and bottom rails at each post.

3.04 Gates

A. Gates shall be installed consistent with the City Standard detail. Verify grade conditions along the fence bottom to ensure proper use of the gate(s).
B. Gate openings shall be face-to-face dimensions and shall swing according to the Plans.

3.05 Cleaning

A. Thoroughly clean all areas where work has occurred. Remove from the site excess material, debris and rubbish.
B. Take all precautions to protect completed work. Immediately repair or replace all damaged areas due to tire ruts, erosion, compaction failure, etc. Keep all erosion control measures intact.

END OF SECTION

SECTION 32 32 19
MODULAR CONCRETE RETAINING WALLS

PART 1 - GENERAL

1.01 General Requirements

A. The requirements set forth in the General Conditions shall be in addition to the standards provided herein.
B. The requirements set forth in the Supplemental Conditions shall be in addition to the standards provided herein.

1.02 Description

A. Work includes furnishing and installing concrete modular block retaining wall units to the lines and grades shown on the construction drawings and as specified herein.
B. Work includes preparing foundation soil, furnishing and installing leveling pad, unit fill and backfill to the lines and grades shown on the construction drawings.
C. Keystone retaining walls of low height may be constructed without reinforcement using simple techniques, while high walls and walls with surcharge may be constructed with geogrid reinforcement and compacted backfill to suit a wide range of engineering requirements.

Delete the following paragraph if all retaining walls are unreinforced.

D. Work includes furnishing and installing geogrid reinforcement and backfill to the lines and grades designated on the construction drawings.

1.03 Related Sections

A. Section 31 20 00: Earthwork
B. Section 03 30 00: Site Concrete

1.04 References

A. ASTM C 33 - Standard Specification for Concrete Aggregates.
B. ASTM C 150 - Standard Specification for Portland Cement.
C. ASTM C 331 - Standard Specification for Lightweight Aggregates for Concrete Masonry Units.
D. ASTM C 618 - Standard Specification for Fly Ash and Raw Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete.
E. ASTM C 989 - Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars.
F. ASTM D 698 - Standard Method of Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3) 600kN-m/m3)).

G. ASTM D 1557 - Standard Specification for Laboratory Compaction Characteristics of Soils Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN- m/m3).

1.05 Definitions

A. Structural Geogrid: A structural element formed by a regular network of integrally connected tensile elements with apertures of sufficient size to allow interlocking with surrounding soil, rock, or earth and to function primarily as reinforcement.
B. Modular Unit: A concrete retaining wall element machine made from Portland cement, water, and aggregates.
C. Unit Fill: A drainage aggregate which is placed within and immediately behind the modular concrete units.
D. Reinforced Backfill: A compacted soil which is placed within the reinforced soil volume as outlined on the plans.

1.06 Submittals

A. Submit under provisions of Section 01 10 00: Summary of Work.
B. Product Data: Submit manufacturer's product data for proposed materials and method of installation.
C. Samples: Submit samples of each product used in the work of this section.
D. Certifications: Submit a manufacturer's certification, prior to start of work, that the retaining wall system components meet the requirements of this specification.
    1. Contractor's submittal package shall include but not be limited to actual test results for tension/creep, durability/aging, construction damage, geogrid/facing connection, pullout, and quality control.
    2. Contractor shall submit certification, prior to start of work, that the retaining wall system (modular concrete units and specific geogrid):
        a) has been successfully utilized on a minimum of five (5) similar projects, i.e., height, soil fill types, erection tolerances, etc.; and
        b) has been successfully installed on a minimum of 1 million (1,000,000) square feet (92,000 sq m) of retaining walls.
E. Test Reports: Submit test reports documenting strength of specific modular concrete unit and geogrid reinforcement connection. The maximum design tensile load of the geogrid shall be equal to the laboratory tested ultimate strength of geogrid/concrete retaining wall unit connection at a maximum normal force limited by the "Hinge Height" of the structure divided by a safety factor of 1.5. The connection strength evaluation shall be performed in accordance with NCMA test method SRWU-1.
F. Contractor shall submit engineering plans prepared by a professional engineer experienced with Mechanically Stabilized Earth retaining wall systems and

registered in the state of the project location. The engineering designs, techniques, and material evaluations shall be in accordance with the KEYSTONE Design Manual, 1995, NCMA Design Guidelines for Segmental Retaining Walls, 1997, or the AASHTO Standard Specifications for Highway Bridges, Section 5.8, 1993 Interim, whichever is applicable.

G. Submit a list of previous projects totaling of 500,000 square feet (46,000 sq m) or more where the specific retaining wall system has been used successfully. Contact names and telephone numbers shall be listed for each project.

1.07 Quality Assurance

A. Owner will engage and pay for independent soil testing services during earthwork operations.

1.08 Delivery, Storage and Handling

A. Contractor shall check the materials upon delivery to assure that proper materials have been received.

B. Contractor shall prevent excessive mud, wet cement, epoxy, and similar materials (which may affix themselves) from coming in contact with the materials.

C. Contractor shall protect the materials from damage. Damaged materials shall not be incorporated into the retaining wall structure.

Delete the following two paragraphs if all retaining walls are unreinforced.

D. Geogrids shall be stored above minus 20 degrees F.

E. Rolled geogrid material may be laid flat or stood on end for storage.

1.09 Record Drawings

A. The Contractor shall keep an accurate record of the as-built conditions of the modular concrete retaining walls. These records shall be updated daily and kept at the construction site. At any time, the Inspector may examine the conditions of the “as-builts” to ensure compliance of the above.

PART 2 - PRODUCTS

2.01 Manufacturer

A. Provide modular concrete retaining wall units and accessory materials fabricated by authorized licensed manufacturers of Keystone Retaining Wall Systems, 4444 West 78th Street, Minneapolis, MN 55435. Telephone 612-897-1040. ASD. FAX 612-897-3858, or accepted equal.

2.02 Modular Concrete Retaining Wall Units

A. Modular concrete units shall conform to the following architectural requirements:

1. Modular concrete unit color: Manufacturer's standard color.
2. Face finish: Sculptured rock face in angular multiplanar configuration. Other face finishes will not be allowed without written approval.
3. Bond configuration - running with bonds nominally located at midpoint vertically adjacent units, in both straight and curved alignments.
4. Exposed surfaces of units shall be free of chips, cracks or other imperfections when viewed from a distance of 20 feet (6.1 m) under diffused lighting.
5. Corners: Provide 90 degree corners, finished two sides, where indicated.
6. Cap units: Provide solid cap units with parallel sides for straight walls and convex walls, angular sides for concave walls.

B. Modular concrete units shall conform to the following material requirements:
   1. Cement: Materials shall conform to the following applicable specifications.
      a) Portland Cement: ASTM C 150.
      b) Modified Portland Cement: Portland cement conforming to ASTM C 150, modified as follows:
         1) Limestone - calcium carbonate, with a minimum 85 percent content, may be added to the cement, provided these requirements of ASTM C 150 as modified are met:
            a. Limitation on insoluble residue 1.5 percent.
            b. Limitation on air content of mortar by volume: 22 percent maximum.
            c. Limitations of loss of ignition: 7 percent.
      c) Blended Cements: ASTM C 618.
      d) Pozzolans: ASTM C 618.
      e) Blast Furnace Slag Cement: ASTM C 989.
   2. Aggregates: Conform to the following specifications:
      a) Normal Weight Aggregates - ASTM C 33.
      b) Lightweight Aggregates - ASTM C 331.
   3. Other Constituents: Air entraining agents, coloring pigments, integral water repellents, finely ground silica, and other constituents shall be previously established as suitable for use in modular concrete retaining wall units and shall conform to applicable ASTM standards or, shall be shown by test or experience to be not detrimental to the durability of the modular concrete units or any material customarily used in retaining wall construction.

C. Modular concrete units shall conform to the following structural and geometric requirements:
   1. Compressive strength: 3000 pounds per square inch (20MPa) minimum.
   2. Absorption: 8 percent maximum for standard weight aggregates.
   3. Unit width to height ratio: 2.25 to 1.

In the next four paragraphs concerning unit depth, weight, shear strength, and connection strength, delete the requirement for Standard or Compact units, respectively, if only one type is required. If both types are required, retain both.

4. Unit depth:
   a) Standard units: 20 inches (508 mm) minimum.
   b) Compact units: 12 inches (305 mm) minimum.
5. Unit weight:
   a) Standard units: 90 pounds (40 kg) per unit minimum for standard weight aggregates.
   b) Compact units: 75 pounds (34 kg) per unit minimum for standard weight aggregates.
6. Inter-unit shear strength:
   a) Standard units: 1500 pounds per linear foot (21,000 N/m), minimum, at 2 pounds per square inch (13 kPa) normal pressure.
   b) Compact units: 400 pounds per linear foot (5800 N/m), minimum, at 2 pounds per square inch (13 kPa) normal pressure.
7. Geogrid/unit peak connection strength:
   a) Standard units: 1000 pounds per linear foot (14600 N/m), minimum, at 2 pounds per square inch (13 kPa) normal force.
   b) Compact units: 600 plf minimum at 2 psi normal force. 600 pounds per linear foot (8700 N/m), minimum, at 2 pounds per square inch (13 kPa) normal force.
8. Maximum horizontal gap between erected units: 1/2 inch (13 mm).

D. Modular concrete units shall conform to the following constructability requirements:
   1. Vertical setback: 1/8 inch (3 mm) plus/minus per course (near vertical) or 1-1/4 inch (31.3 mm) plus/minus per course per the design drawings.
   2. Alignment and grid positioning mechanism: Fiberglass pins, two per unit minimum.

2.03 Shear Connectors

A. Strength of shear connectors between vertical adjacent units shall be applicable over a design temperature range of minus 10 degrees F (minus 23 degrees C) to plus 100 degrees F (plus 38 degrees C). Shear connectors shall be ½-inch (13 mm) diameter thermoset isopthalic polyester resin- pultruded fiberglass reinforcement rods. Connectors shall have a minimum flexural strength of 128,000 pounds per square inch (882 MPa) and short beam shear of 6,400 pounds per square inch (44 MPa).

B. Shear connectors shall be capable of holding the geogrid in the proper design position during grid pre-tensioning and backfilling.

2.04 Adhesive

A. Construction Adhesive: Keystone Kapseal as supplied by manufacturer of modular concrete units.

2.05 Base Leveling Pad Material

A. Material shall consist of a compacted crushed stone base or non-reinforced concrete as shown on the drawings.

2.06 Unit Fill

A. Unit fill shall consist of clean 1-inch minus crushed stone or crushed gravel meeting the gradation listed below.
   1. 1-inch (25 mm) sieve, 100 percent passing.
   2. ¾-inch (19 mm) sieve, 75-100 percent passing.
   3. No. 4 (4.75 mm) sieve, 0 - 10 percent passing.
   4. No. 50 (300 micro-m) sieve, 0 - 5 percent passing.

B. Pea gravel (3/8-inch to ½-inch (9.5 mm to 13 mm) round stone) is not acceptable.

2.07 Reinforced Backfill

A. Reinforced backfill shall be free of debris and meet the following gradation requirements:
   1. 2-inch (50 mm) sieve, 100-75 percent passing.
   2. 3/4-inch (19 mm) sieve, 100-75 percent passing.
   3. No. 4 (4.75 mm) sieve, 100-20 percent passing.
   4. No. 40 (425 micro-m) sieve, 0-60 percent passing.
   5. No. 200 (75 micro-m) sieve, 0-35 percent passing.
   6. Plasticity Index (PI) less than 10 and liquid limit less than 40.

B. The maximum aggregate size shall be limited to 3/4 inch (19 mm) unless field tests have been or will be performed to evaluate potential strength reductions to the geogrid design due to damage during construction.

C. Material can be sit-excavated soils where the above requirements can be met. Unsuitable soils for backfill (high plastic clays or organic soils) shall not be used in the backfill or in the reinforced soil mass.

D. Contractor shall submit reinforced fill sample and laboratory test results to the Architect/Engineer for approval prior to the use of any proposed reinforced fill material.

Delete the following article if all retaining walls are unreinforced.

2.08 Geogrid

A. Material: Geogrid products shall be high-density polyethylene or polypropylene expanded sheet or polyester woven fiber materials, specifically fabricated for use as soil reinforcement.
B. Tal, Allowable Tensile Design Load, shall be determined as follows:
   1. Tal = Tult/(Rfd x Rfcr x Rfcd x FS)
   2. Tal shall be evaluated based on a 75 year design life.
C. Rfcr, Reduction Factor for Creep Limited Tensile Load: Rfcr shall be determined from 10,000 hour creep testing performed in accordance with ASTM D 5262.
D. Rfd, Reduction Factor for Durability/Aging: Rfd shall be determined from polymer specific durability testing covering the range of expected soil environments.
E. Rfcd, Reduction Factor for Construction Damage: Rfcd shall be determined from product specific construction damage testing performed in accordance with GRI-GG4. Test results shall be provided for each product to be used with project specific or more severe soil type.
F. FS, Overall Factor of Safety: FS shall be 1.5 unless otherwise noted.
G. The maximum design tensile load of the geogrid shall not exceed the laboratory tested ultimate strength of the geogrid/facing unit connection as limited by the "Hinge Height" divided by a factor of safety of 1.5. The connection strength testing and computation procedures shall be in accordance with NCMA test methods.
H. Soil Interaction Coefficient, Ci: Ci values shall be determined per GRI:GG5 at a maximum 0.75 inch (19 mm) displacement.
I. Manufacturing Quality Control: The geogrid manufacturer shall have a manufacturing quality control program that includes QC testing for each 40,000 square feet (3700 sq m) of production, each lot, or each production day. The QC testing shall include:
   1. Tensile Modulus
   2. Specific Gravity
   3. Melt Flow Index (PP & HDPE)
   4. Molecular Weight (PETP)

PART 3 - EXECUTION

3.01 Examination

A. Verify that layout dimensions are correct and substrate is in proper condition for installation. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 Excavation

A. Contractor shall excavate to the lines and grades shown on the construction drawings. Obtain the Architect/Engineer's approval of excavation prior to placement of leveling material or fill soils.
B. Over-excavation of deleterious soils and replacement with suitable fill, when approved in advance by the Architect/Engineer, will be paid at unit cost rates.
C. Contractor shall be careful not to disturb embankment and foundation materials beyond lines shown.

3.03 Base Leveling Pad

A. Leveling pad material shall be placed to the lines and grades shown on the construction drawings.

Select one of the following three paragraphs for desired base leveling pad, or leave more than one if contractor may choose. Note that Proctor testing is not possible for crushed stone option.

B. Granular leveling pad material shall be compacted to a minimum of 95 percent Standard or 90 percent Modified Proctor.
C. Crushed stone leveling pad shall be compacted to yield (Proctor testing does not apply).
D. Concrete leveling pad shall be minimum inches of unreinforced concrete.

E. Leveling pad shall be prepared to ensure full contact to the base surface of the concrete units.

3.04 Modular Unit Installation

A. First course of units shall be placed on the leveling pad, and alignment and level checked. Pins or molded surfaces of modular concrete units shall be used for alignment control; do not attempt alignment from split-face surface.
B. Ensure that all units are in full contact with base and properly seated.
C. Install fiberglass-connecting pins and fill all voids in and around the modular units with unit fill material. Tamp or rod unit fill to ensure that all voids are completely filled.
D. Sweep excess material from top of units and install the next course. Ensure that each course is completely unit filled, backfilled and compacted prior to proceeding to next course.

E. Place each subsequent course ensuring that pins protrude into adjoining courses a minimum of 1 inch (25 mm). Two pins are required per unit. Push next course unit forward, away from the fill zone, locking against the pins in the previous course and backfill as the course is completed. Repeat procedure to the extent of wall height.
F. Follow wall erection and unit fill placement closely with any other backfilling required.
G. Position vertically adjacent modular concrete units as recommended by the manufacturer (in running bond pattern).
H. Maximum, stacked, vertical height of wall units, prior to wall unit fill, backfill placement and compaction, shall not exceed two courses.
I. One cubic foot, minimum, of unit fill shall be used for each square foot (0.30 cu m/sq m) of wall face. Unit fill shall be placed within cores of, between, and behind units to meet this requirement.
J. Whole, or cut, units on curves and corners to shall be erected with running bond approximately centered on units above and below.
K. Cap Installation: Apply adhesive to top surface of unit below and place cap unit into position over projecting pins from units below.

Delete the following article if all retaining walls are reinforced with geogrid reinforcement.

3.05 Unreinforced Backfill Placement

A. Place and compact backfill in lifts not to exceed 8 inches (200 mm).
B. Backfill shall be compacted to 95 percent of the maximum density as determined by ASTM D 698.
C. Place the top 8 inches (200 mm) of the structure fill using low permeability soil.
D. Only lightweight hand-operated equipment shall be allowed within 3 feet (900 mm) from the tail of the modular concrete units.
E. At the end of each day's operation, the Contractor shall slope the last lift of reinforced backfill away from the wall units to direct runoff away from wall face. The Contractor shall not allow surface runoff from adjacent areas to enter the wall construction site.

Delete the following article if all retaining walls are unreinforced.

3.06 Structural Geogrid Installation

A. Geogrid shall be oriented with the highest strength axis perpendicular to the wall alignment.
B. Geogrid reinforcement shall be placed at the elevations and to the extent shown on the construction drawings or as directed by the Engineer.
C. The geogrid shall be laid over the fiberglass pins of the modular wall units and extended horizontally on compacted backfill. Place the next course of modular

concrete units over geogrid. The geogrid shall be pulled taut, and anchored prior to backfill placement on the geogrid.

D. Follow manufacturer's guidelines relative to overlap requirements of uniaxial and biaxial geogrids.
E. Geogrid reinforcements shall be continuous throughout their embedment lengths. Spliced connections between shorter pieces of geogrid is not allowed unless pre-approved by the Architect/Engineer prior to construction.

Delete the following article if all retaining walls are unreinforced.

3.07 Reinforced Backfill Placement

A. Reinforced backfill shall be placed, spread, and compacted in such a manner that minimizes the development of slack in the geogrid.
B. Backfill shall be placed from the wall back towards the embankment to ensure that the geogrid remains taut.
C. Reinforced backfill shall be placed and compacted in lifts not to exceed 8 inches (200 mm) where hand compaction is used, or 12 inches (300 mm) where heavy compaction equipment is used.
D. Reinforced backfill shall be compacted to 95 percent of the maximum density as determined by ASTM D 698. The moisture content of the backfill material prior to and during compaction shall be uniformly distributed throughout each layer and shall be within +1/-3 percentage points dry of optimum.
E. Place the top 8 inches (200 mm) of the structure fill using low permeability soil.
F. Only lightweight hand-operated equipment shall be allowed within 3 feet (900 mm) from the tail of the modular concrete unit.
G. Tracked construction equipment shall not be operated directly upon the geogrid reinforcement. A minimum fill thickness of 6 inches (152 mm) is required prior to operation of tracked vehicles over the geogrid. Tracked vehicle turning should be kept to a minimum to prevent tracks from displacing the fill and damaging the geogrid.
H. Rubber tired equipment may pass over geogrid reinforcement at slow speeds, less than 10 miles per hour (16 kph). Sudden braking and sharp turning shall be avoided.
I. At the end of each day's operation, the Contractor shall slope the last lift of reinforced backfill away from the wall units to direct runoff away from wall face. The Contractor shall not allow surface runoff from adjacent areas to enter the wall construction site.

END OF SECTION

SECTION 32 84 00
IRRIGATION SYSTEM

PART 1 - GENERAL

1.01 General Requirements

A. The requirements set forth in the General Conditions shall be in addition to the standards provided herein.
B. The requirements set forth in the Supplemental Conditions shall be in addition to the standards provided herein.

1.02 Description

A. Furnish all labor, materials and equipment for the complete installation of an automated irrigation system, including all necessary appurtenances for proper operation, noted or implied, as shown on the Plans and as specified herein.
B. Water usage, meter costs, connection fees, testing and other associated utility costs are considered direct costs and is the responsibility of the Contractor until the project is accepted.
C. Installation of the water meter shall be by the City.

1.03 Related Work

A. Section 32 90 00: Planting
B. Section 26 00 00: Site Electrical

1.04 Quality Assurance

A. All work shall comply with local and state laws, codes, regulations and requirements which govern any portion or all of the work contained in this Section. These include, but are not limited to, the latest editions of:
   1. City of Roseville Park Construction Standards,
   2. City of Roseville Design and Construction Standards,
   3. City of Roseville Electric Department Standard Specifications,
   4. Local, state and federal electrical codes, manuals and guidelines, and
   5. Local, state and federal plumbing codes, manuals and guidelines.

1.05 Submittals

A. Submittals for specified items are not required for Parks or Streetscape projects, unless specifically listed below. However, submittals are required for any proposed substitutions or deviations from the parks Plans or Specifications. For Streetscapes, no substitutions will be accepted. The Contractor shall submit a materials summary sheet indicating which items will be installed as specified

and which items are proposed for substitutions. The Contractor shall submit proof of order within ten (10) working days of the Notice to Proceed, indicating all specified materials have been ordered, noting “as specified” or “substitution proposed”. Submittals are required on the following items:

1. Controller, Flow Sensor(s), and Master Valve(s).
2. Filter (Recycled water)
3.

1.06 Explanation of Drawings

A. The drawings are diagrammatic and do not reflect all offsets, fittings and other miscellaneous items required for a complete and operable irrigation system. It shall be the Contractor’s responsibility to investigate all existing site conditions, become thoroughly familiar with the site, and provide all labor, materials and equipment required for the installation of the irrigation system.
B. Avoid conflicts between other trades and the installation of the irrigation system. Minor adjustments to avoid such conflicts shall be made in the field. Major discrepancies between actual field conditions and the Plans shall be brought to the attention of the Project Manager. The lack of notification shall indicate that the Contractor assumes full responsibility for any revision deemed necessary to ensure proper installation.

1.07 Product Delivery, Handling and Storage

A. All materials shall be delivered bearing manufacturer’s label with size, type and model number (if applicable) clearly marked.
B. All pipe shall be delivered in a vehicle which allows the material to lie flat without concentrated weight or stress at any point.
C. Unload all materials with care so as to avoid damage. Store materials in a covered area and do not expose PVC pipe to extreme sun or heat. Store pipe lying flat.
D. Do not install any material that has been damaged. Replace all material found to be damaged.

1.08 Record Drawings

A. The Contractor shall keep an accurate record of the as-built conditions of the irrigation system. These records shall be updated daily and kept at the construction site. At any time, the Inspector may examine the conditions of the “as-builts” to ensure compliance of the above.
B. Dimensions shall be recorded from two (2) permanent points of reference.
C. The City may at its discretion withhold progress payments to the Contractor if the as-built records are not updated to the satisfaction of the City.

PART 2 - PRODUCTS

2.01 General

A. All materials specified shall be new, bearing the brand name, type, serial numbers and model number as shown on the Plans and as specified herein, unless otherwise accepted in writing.

2.02 Backfill Material

A. Backfill shall be clean, screened, on-site material, free from organic material, large clods of earth and/or rock larger than one (1) inch in diameter, trash, debris, rubbish, tree trunks, broken concrete or asphalt and other unacceptable material.

B. Material larger than one (1) inch shall be removed from site and legally disposed. All removal shall be the responsibility of the Contractor.

2.03 Meter

A. Meter shall be as shown on the Plans and as required by the City of Roseville Environmental Utilities Department.

2.04 Backflow Prevention Device

A. Backflow Prevention Device shall be as shown on the Plans.

B. Cover shall be insulated, freeze-proof, removable and lockable, manufacturer and model per the City of Roseville Design and Construction Standards or accepted equal.

2.05 Filter (Recycled Water Only)

A. Amiad Filtration Systems, Manual Steel Filter, Disc Type-Red 130 micron filter element, match line size of recycled water meter.

2.06 Flow Sensor and Master Valve

A. Calsense Controllers:

1. Flow sensor shall be a Calsense Flow Meter (FM-B) featuring a proprietary, non-magnetic sensing mechanism and a six-bladed design. Flow sensor shall be accurate to +/- 1% of full scale. Flow sensor body shall be constructed of bronze. Applications with high and low flows requiring a bypass manifold flow meter shall instead utilize Flomec QS200 Ultrasonic Flow Sensor.

2. Master valve(s) shall be Superior, ~~3000~~ 3300 series, normally open, electric globe valve, constructed of brass with dirty water protection and No Minimum Flow feature. For ~~installations with a single master valve, the valve shall be normally open. For installations with two master valves, the larger valve shall be normally closed and the smaller valve shall be normally~~

~~open~~recycled water systems, include -RW Recycled Water designation with purple handle for identification.

3. Flow meters to be constructed consistent with the Calsense specifications.
4. Valve boxes for master valve and flow sensor shall be 18" (jumbo) green rectangular rigid plastic valve boxes with lockable lids and extensions by Carson Industries, LLC or accepted equal. Valve box lid shall be colored green in turf areas, tan in natural planter areas, and purple for recycled water applications.

2.07 Booster Pump

A. Customflow Quality Booster Pump by ~~Custom Pump & Power~~V-Power Equipment, Inc. (888) 830-8025.
B. Provide technical startup support, pump certification and 30 month following delivery warranty by V-Power Equipment~~Custom Pump & Power,~~ Inc.
C. Variable Frequency Drive Control Panel with Fuji Eco Drive, NEMA 12 enclosure, main disconnect, DC choke, panel cooling fan, HOA switch on panel door, 110 volt transformer for controls and external fan, Terminals for wire connections, (2) Pump start relays for irrigation controller controls, ET/U.L. 508A Listed and proprietary programmed for City of Roseville standard operation by Custom Pump & Power, Inc.
D. IFM Efector PA3224 transducer is rated for 0-145PSI and adjustable through the VFD.
E. Enclosures to be sized to fit pump, VFD, valves, bypass, transducer, and pump inserted Hot Stop temperature protection to be activated at 120 degree with manual reset mounted on the VFD panel door. Flange connection for inlet and outlet outside the enclosure. Standard enclosure to be fitted for padlock and have a shock assisted opening on the front. Larger enclosures with removable doors with built in lock with the 402 key. All enclosures to be steel and powder coated dark green.
F. Installation by licensed contractor as shown on plans and connect power wires from meter pedestal and 24-volt control wire from the controller to the VFD line connectors inside the enclosure.

2.08 Pipe

A. PVC Pressurized Mainline
   1. For lines three inch (3") or larger: polyvinyl chloride (PVC) 1120-1220, SDR 21, Class 200 rubber gasketed pipe, and NSF accepted per Standard No. 14, Type I, Grade I. Conform to:

Material	ASTM
Pipe	D1784, D2241
Rubber Gasket	F477

2. For lines two and one half inches (2-1/2") or smaller: Schedule 40 polyvinyl chloride (PVC) 1120-1220, and NSF accepted per Standard No. 14, Type I, Grade I. Conform to:

Material	ASTM
Pipe	D1784, D1785

B. PVC Non-Pressurized Lateral Lines
1. Schedule 40 polyvinyl chloride (PVC) 1120-1220, SDR 21.0, NSF accepted per Standard No. 14, Type 1, Grade II.

C. Recycled Water
1. Pipes shall meet the standards outlined in Sections 2.08, A and B above, unless otherwise noted in the City of Roseville Design and Construction Standards for recycled water, latest edition.
2. All pipes containing recycled water shall be purple, NSF accepted and conform to the City of Roseville Design and Construction Standards, latest edition.

2.09 Fittings and Nipples

A. Fittings for ~~Potable~~ Mainline Pipe:
1. For all control valves on mainlines three inches (3") and larger, use painted, ductile iron saddle taps with double stainless steel straps and nuts Model #202 by Romac Industries, Inc. or accepted equal.
2. For all other connections on mainlines three inches (3") and larger mainline pipe, use glued schedule 80 fittings.
3. For all connections on mainlines two and one half inches (2-1/2") or smaller, use glued schedule 40 fittings.

B. Fittings for ~~Potable~~ Solvent Weld Pipe:
1. Schedule 40 for 2 ½" pipes or smaller and Schedule 80 for 3" pipe and larger polyvinyl chloride (PVC), standard weight, conforming to ASTM D2466-73. Use Schedule 80 for all recycled water systems.
2. Weld-on #P-70 primer and Weld-on #711 gray glue or accepted equal.
3. Teflon tape for all threaded PVC fittings.

C. Plastic Nipples shall be Schedule 80, Type 1, Grade 1, polyvinyl chloride (PVC), threaded at both ends, and conforming to ASTM D1784 -85. Nipples shall be uniformly gray.

D. Fittings for Recycled Pipe:
1. ~~See Section 141 Recycled Water in the City of Roseville Design and Construction Standards, latest edition~~Fittings shall meet the standards outlined in Sections 2.09, A, B and C above, unless otherwise noted in the City of Roseville Design and Construction Standards for recycled water, latest edition.~~.~~

2.10 Swing Joints

A. Swings joints shall be as shown in the City Parks Construction Standard detail. Schedule 40 threaded PVC triple swing joints or an accepted equal.

2.11 Electric Remote Control Valve

A. Sizes as shown on the Plans. All valves shall be Rainbird PEB series or accepted equal and shall contain the following:
   1. a globe-type electric remote control, normally closed diaphragm type with slow opening and closing action,
   2. encapsulated solenoid type actuation,
   3. a minimum rating of twenty-four (24) volts,
   4. sixty (60) cycle,
   5. two to five (2-5) watts,
   6. a manual flow adjustment with shut-off provisions,
   7. provisions for an external “bleed” of the diaphragm chamber for manual operation.
   8. a ball valve on the inlet.
   9. Schedule 80 PVC threaded fittings from saddle tap to POC to valve.

B. Valve boxes shall be rectangular, rigid plastic valve boxes with lockable lids and extensions by Carson Industries, LLC or accepted equal. Valve box shall be sized appropriately to house entire valve assembly with space to accommodate maintenance access.
   1. Boxes shall be colored green in potable applications, and purple for recycled water applications.
   2. Valve boxes used on recycled water systems shall be permanently colored purple through the manufacturer. Boxes painted purple will be rejected.
   3. Label lids using heat branded identification, T:Turf, S:Shrubs, B:Bubblers

C. Controller station identification number shall be standard yellow tags with permanent numbers by Christy or accepted equal.

2.12 Root Watering System

A. Provide pre-manufactured root watering system.
   1. Pressure compensating bubbler. See irrigation sheets for flow rates.
   2. Check valve where applicable to prevent low head drainage.
   3. Swing joint assembly
   4. Locking grate top on semi-rigid mesh tube
   5. Filter fabric sleeve

2.13 Irrigation Heads

A. All irrigation heads shall conform to type, size, precipitation rate, gallons per minute discharge, pressure and throw radius as shown on the Plans, unless otherwise accepted in writing.
B. In all available models, all irrigation heads shall have stainless steel risers, unless otherwise approved in writing.
C. For recycled water applications, irrigation heads shall be colored purple, have debris pocket, and wiper seals with 3 touch points.
D. Irrigation heads shall have built-in pressure regulation for pop up sprays and/or water-efficient heads.
E. Include built-in check valve where applicable to prevent low head drainage.

2.14 Drip Irrigation

A. Sub-surface dripline.
    1. Flexible polyethylene tubing shall have factory-installed pressure-compensating, inline emitters spaced evenly per listed spacing.
    2. Emitter shall incorporate elemental or ionic copper root intrusion prevention technology, and shall be warranted by the manufacturer to be free of emitter plugging due to root intrusion for a period of fifteen (15) years minimum.
    3. Emitter shall have a built-in check valve that will hold back, at minimum, an 8.5' column of water.
    4. Dripline for use with recycled water systems shall be properly and permanently marked for non-potable use.
B. All fittings shall be constructed of injection molded, brown plastic having a nominal outside dimension of 17mm (0.56”). Female and male threaded ends shall be capable of mating to standard PVC pipe with tapered threads.
C. Line flushing valve
    1. Valve shall be schedule 40 PVC ball valve with brass hose thread adapter.
    2. Valve box shall be rigid plastic, with lockable cover by Carson Industries, LLC or accepted equal. Boxes shall be colored green in potable applications, and purple for recycled water applications.
    3. Drip system operation indicator shall be Rainbird 1812 Pop-up spray body with 4-VAN nozzle set to 0-degree pattern, with Rainbird SA-125050 swing assembly and XFF-TFA barbed bt ½” FIPT fitting, or accepted equal.
D. Pressure Regulating Filters shall be Rainbird PRB Pressure Regulating Basket Filter, or approved equal, and shall include: Basket style body and jar-top cap constructed of heavy-duty glass-filled, UV-resistant polypropylene, with 150 PSI (10,3 bar) operating pressure rating. Standard 200 mesh (75 micron) filter screen constructed of stainless steel attached to propylene frame. Normally-open in-line pressure regulating device, constructed of durable, UV resistant non-corrosive material able to accommodate an inlet pressure rating of not less

than 150 PSI (10,3 bar), with preset outlet pressure of approximately 40 PSI (2,8 bar).

2.15 Thrust Blocks

A. All thrust blocks shall be concrete. The size of the blocks shall be determined by the average safe soil-bearing load of 700 lbs. per square foot.
B. Polyethylene sheeting at thrust blocks shall be 6mil.

2.16 Quick Coupler Valves

A. For potable water, quick coupling valves shall be Rainbird #44LRC or accepted equal. For recycled water, quick coupling valves shall be Rainbird #44NP lockable or accepted equal. All quick coupling valves shall be:
   1. brass or bronze with one (1) IPS female pipe connection,
   2. two piece body with a removable upper portion (for replacement), and
   3. durable yellow covers for potable and purple for recycled.
B. Valve keys shall be brass or bronze and shall be of the same manufacturer and size as the valve.
C. Valve box shall be rigid plastic, a minimum of ten inches (10") in diameter with lockable cover by Carson Industries, LLC or accepted equal. Boxes shall be colored green in potable applications, and purple for recycled water applications.
D. Where recycled water is used, conform to the City of Roseville Design and Construction Standards.

2.17 Manual Valves

A. For pipe four inches (4") and larger gate valves shall be:
   1. located where shown on the Plans,
   2. flanged with Class 125 cast iron body,
   3. bronze trimmed with a non-rising stem,
   4. square operating nut,
   5. able to withstand a cold water pressure of 150 pounds per square inch, and
   6. sized to match the pipeline which the valves serve, unless otherwise shown on the Plans.
B. For pipe three inches (3") or smaller and on pipes which feed directly into a remote control valve, ball valves shall be installed and shall:
   1. allow for manual operations,
   2. rapid on/off , drip-tight shut-off control,
   3. be constructed of bronze or brass with heavy-duty handle,
   4. operate up to 22 gallons per minute,
   5. operate between 15 and 150 pounds per square inch, and

6. be sized to match the pipeline which the valves serve, unless otherwise shown on the Plans.

C. Valve box shall be rigid plastic, a minimum of ten inches (10") in diameter with extensions and lockable cover by Carson Industries, LLC, as shown on the Plans or accepted equal. Boxes shall be colored green in potable applications, and purple for recycled water applications.

2.18 Automatic Irrigation Controller

A. Automatic controllers shall be Calsense CS3000 or accepted equal, ~~as distributed by Ewing Irrigation, 500 Berry St # B, Roseville, CA, 95678, Attn: Tom Noonan, (916) 812-5034~~. Each controller shall include:

1. CS3-LR – Calsense Local Radio,
2. FM-B – Flow Meter (Brass),
3. CS3-~~SSE~~SS1 or CS3-~~SSE~~SS1-D – Stainless Steel Enclosure with:
   a) CS3000 Transient Protection
   b) TP-110 – AC Line Protection,
   c) LR-STUBBY – Antennae w/2ft cable
   d) On/Off Switch
   e) GFI electrical outlet inside enclosure.

When multiple controllers are used, include:

4. CS3-FL – Flowsense software (for multiple controllers sharing POC and/or communications)
5. CS3-MSSE-KIT or CS3-SR-KIT – Hardwire or SR radio,

When multiple flow sensors are used, include:

6. CS3-2WIRE-OPT & CS-2W-POC (one per POC) – Additional Flow Meter interface.

B. Communication wire between controllers shall be Paige Cable P7171D or accepted equal.

2.19 Control Wires

A. Direct burial solid copper wire AWG-U.F. 600 volt.

B. Common wire and two spare wires shall be minimum #12-gauge.

C. Pilot wires shall be red, minimum #14-gauge. Wire gauge shall be, at minimum:

Wire Gauge	#14	#12	#10	#8
Max. Distance (ft.)	2,500	3,250	4,000	4,800

D. Splices:

1. Wire connections at remote control valves only shall utilize 3M direct bury splice kit model #DBY (yellow) or model #DBR (red).
2. All other splices, including line splices, connections to flow meters and other sensors, shall

utilize 3M Scotchcast 3570G Connector Sealing Packs~~Spears DS-100 Connectors with Spears DS300 sealant, or accepted~~no known equal.

E. Wiring colors shall be:

USE	COLOR
Flow	Yellow
Master	Blue
Pump	Black
Valves	Red
Common	White
Spare	Orange
Tracer	Green

2.20 Sleeves

A. Schedule 40 PVC 1120-1220 and two times the diameter of the pipe to be accommodated by the sleeve, one (1) for control wires and one (1) for main line, and one (1) for lateral lines.
B. Maximum one (1) line per sleeve.
C. Add one (1) spare, same size as largest.

2.21 Tracer Wire

A. Insulated solid copper wire, minimum #12 gauge. Color shall be green.

PART 3 - EXECUTION

3.01 Site Conditions

A. Prior to start of irrigation work, review the site conditions to verify that stub- outs, points of connections, sizes of the points of connections, water pressure and other essential items necessary for irrigation work to commence are as shown on the Plans and as indicated in the Specifications.
B. Notify the Inspector immediately of any existing conditions which are unacceptable for the commencement of irrigation work.

3.02 Coordination of Work

A. Coordinate all work with other trades.
B. The irrigation plan is diagrammatic. Whenever possible, locate all pipes in planted or turf areas. Do not scale off of the Plans. Where field conditions have changed, notify the Inspector immediately.

3.03 Excavation and Trenching

A. Trenches shall be dug straight and in such a manner as to completely support the pipe continuously along the bottom of the trench. In rocky conditions, over-excavation and placement of clean bedding material may be required to ensure

protruding rocks do not place undue stress on pipes. Trench layout shall follow that shown on the Plans, except where accepted by the City.

B. The following minimum cover shall be provided for pipe:

Pipe Type	Minimum Cover
Pressurized Mainlines	24”
Non- Pressurized Lateral Lines	18”
Domestic Water Lines	24”
Control wires	24”
PVC Sleeves under Paving	18”
PVC Sleeves under Auto X-ings	24”

C. Install detection wire, looped in and out of valve boxes and attached to all irrigation mainlines.

D. High voltage wires shall not be installed in the same irrigation water line trench.

3.04 Testing and Flushing

A. Pressure Testing shall occur only when the following conditions can be fulfilled:

Item Description	Condition
Quick coupler valves	Installed and capped
Electric remote control valves	Installed
Flow valve	Installed and open
Ball/Gate valves	Installed and open
Lateral lines	Disconnected
Welded PVC joints	Cured at least 24 hours
Pipe	Center loaded with backfill
Concrete Thrust Blocks	Installed and cured at least 48 hours
Couplings and fittings	Exposed
Detection wire	Installed

~~A.~~B. A pressure gauge shall be installed at the lowest point of the line. Continuous pressure shall be applied at a rate of 125 psi for all mainlines. The pressure shall remain stable for a minimum of two hours with no detectable leakage. Upon completion of the test, a complete examination of the line shall be conducted by the City. Leaks resulting from the test shall be repaired and the line shall be re-tested. This process shall be repeated until the line passes the leakage test.

~~B.~~C. All lines and risers shall be flushed prior to final installation of irrigation heads. All control valves shall be left open during the flushing process.

3.05 Backfilling and Compacting

A. Backfilling of trenches shall not occur until all tests and reviews have been performed. See inspection record contained in the Parks Construction Standards, latest edition. Any trench that is prematurely backfilled may be required to be re-dug for review.

B. Compaction of the trenched areas shall meet the following compaction rates of 95% in areas to receive paving and 85% in areas to be planted.
C. Do not flood trenches unless otherwise accepted by the City.
D. Sunken trenches shall be re-finished flush with the adjacent grades.

3.06 Backflow Prevention Device and Enclosure

A. Install per local codes and manufacturer's instructions.
B. When the flow meter is installed above grade, install a backflow prevention device enclosure with lockable gate.

3.07 Flow Meter Installation

A. Install per local codes and manufacturer's instructions.
B. All flow meters shall be installed in ground.
C. Install 3/4" conduit from irrigation controller to flow meter valve box. Install a pull box every 100'.
D. Valve box lids shall be permanently marked identifying FM for flow meter and MV for master valve and GR for grounding rod with heat branding using stencils in a uniform location on all boxes throughout.

3.08 Booster Pump Installation

A. Install per local codes and per manufacture's instruction.
B. Furnish wires and conduits to connect electrical power, and 24-volt pump start controls to the VFD panel located inside the VFD panel
C. Ductile iron plumbing from the flanges above ground to the mainline.
D. Install level concrete housekeeping pad for the pump enclosure per plans, 4" thick, 1"above ground, with 1/2" tool edges
E. Trust blocks to be installed per pump manufacturer's and landscape architect's requirements.

3.09 Pipe Installation

A. Install irrigation pipe in planted areas whenever possible.
B. All pipe and fittings shall be cleaned and free from dirt, dust and moisture.
C. Pipe may be assembled along the trench at grade to avoid undue strain on the pipe or the fittings. All solvent weld connections shall be primed before applying glue. Snake the pipe within the trench to compensate for expansion and contraction.
D. All PVC pipe and metal valve connections shall be made with threaded fittings consistent with drawings PK-15 and PK-16 of the City of Roseville Parks Construction Standards.
E. All PVC-to-PVC threaded connections shall be made with Teflon tape.

F. Install concrete thrust blocks in locations where rubber gasketed irrigation mainlines change directions, e.g. ells, tees; as required on other lines and fittings; and at the termination point of the mainline. Do not conduct a pressure test within 48 hours of the thrust block pours. The size of the thrust blocks shall be per manufacturer's instructions and shall be adequate in size to absorb thrusts up to the maximum internal water pressure. Refer to 3.18 Thrust Blocks.
G. Use glued fittings for all connections inside of a sleeve and within 20' of a sleeve.

3.10 Electric Remote Control Valves

A. Install per local codes, manufacturer's instructions, City of Roseville Design and Construction Standards and as shown on the Plans.
B. Install one (1) electric remote control valve per box and whenever possible, group valve boxes together. Align boxes in a straight and neat row and flush to finish grade. Provide a minimum of six (6) inches between boxes.
C. All valves shall be tagged for easy identification of valve number. Valve box lids shall be permanently marked identifying valve number and controller letter with heat branding using stencils in a uniform location on all boxes throughout.
D. Each valve shall be separately saddle tapped. Manifolded valves shall be rejected.
E. Locate valve boxes outside of turf areas, adjacent to paving, i.e. sidewalks, hardscape, etc. except where shown on the Plans.
F. Provide a minimum of eighteen (18) inches of a complete set of spare control wires, looped, within all control valve boxes.

3.11 Irrigation Heads

A. Install all heads where shown on the Plans and as specified herein.
B. Turf rotary pop-up heads shall be placed two (2) inches from any edge of adjacent walkway, concrete mow band, concrete curb, header board or other hardscape edging, or as required by current WELO regulations.
C. Rotary pop-up heads shall be installed flush with the top of finish grades of turf or planting areas.
D. Sprinkler head riser nipples sizes shall match or be the same as the riser opening of the sprinkler body.
E. Install sprinkler heads with internal check valves where heads are located in low drainage areas, i.e. bottom of berms, bottom of drainage swales, toe of slopes, etc.
F. Install all heads perpendicular to ground surface with an offset from the edge of pavement as indicated in the details.

3.12 Drip Irrigation

A. Drip irrigation is to be installed in a grid pattern layout of equal spacing between rows, unless otherwise noted on approved plans.
B. All drip irrigation shall be installed sub-surface, per manufacturer's specifications. Staple all tubing to soil at 5 feet on-center spacing prior to backfilling.
C. Drip line shall be installed prior to plant installation, with the exception of 15-gallon and larger plant container sizes, which may be installed first at the discretion of the contractor.
D. Line Flushing Valves are to be installed below grade, as detailed, in a valve box with bolt-down lid to allow for periodic inspection and flushing.
    1. Minimum of One (1) Line Flushing Valve shall be installed for every fifteen (15) GPM of zone flow, and at every termination point within a zone, and shall be installed at a point farthest away from the source (typically on an exhaust header) as possible.
E. Pop-up drip system operation indicators shall be placed within eighteen inches (18") of each Flush Valve and shall not be placed such that it will be obstructed by vegetation. Place minimum twelve (12) inches from adjacent hardscapes.
F. If required, Air/Vacuum Relief Valves shall be installed below grade in valve boxes to allow for periodic inspection.
G. Valve box lids shall be permanently marked identifying LF for Line Flush valve and AR for Air/vacuum Relief with heat branding using stencils in a uniform location on all boxes throughout.

3.13 Quick Coupler and Gate Valves

A. Install per local codes and manufacturer's instructions.
B. Locate valve boxes flush with finish grade, twelve (12) inches from walkways, curbs, header boards, etc., and within planted area whenever possible.
C. Install one (1) valve per box.
D. For quick coupler valves, install at 100 feet on center to the extent possible. Provide a 24" steel support staked adjacent to the riser using two (2) stainless steel clamps.
E. For gate valves, install at locations indicated on the Plans.
F. For valve boxes installed below grade, provide 3M ball markers.
G. Valve box lids shall be permanently marked identifying GV for gate valve and QC for quick couplers, and SB for splice boxes with heat branding using stencils in a uniform location on all boxes throughout.

3.14 Automatic Controller

A. Install per local codes and manufacturer's instructions within the specified enclosure.

B. Provide single Paige Cable P-7171D installed in conduit between all controllers.
C. Provide all necessary wiring for a complete installation between the controller and the valves.
D. Above grade wiring shall be installed in metal conduit, unless otherwise accepted. Securely mount conduit onto enclosure or wall and paint to match the adjacent surface.
E. Provide a grounding rod and bonding for each enclosure as required for lightning protection. Grounding rod shall be consistent with drawing PK-1 of the City of Roseville Parks Construction Standards. Install separate grounding rods for each enclosure where bonding is impractical.
F. Label each controller, using permanent markings, with the letter identification indicated on the Plans. Affix label on the inside of the controller cabinet door.
G. Install 110V outlet (GFIC) inside controller enclosure.
H. Provide two (2) reduced as-built irrigation diagrams, laminated and color-coded indicating controller letter, valve/station numbers, valve size, operating pressure, gallons per minute and type of planting for each valve. See Section 01 10 00: Summary of Work 1.15B.
I. Ground test to be conducted after installation. Test results shall not exceed 25 ohms.

3.15 Control Wires

A. Wherever possible, install control wires in common trenches with mainline. The wires shall be taped in bundles at ten (10) feet on center and laid to the side of the pipe. Provide slack between ties to allow for contraction.
B. Wire valve to controller as shown on the plans.
C. Where runs are long, provide an extra three (3) feet of extra ground and control wires looped at 200’ intervals. Snake wires within trenches to allow for contraction.
D. Line splices shall occur in valve boxes at grade, label and allowed only on lengths greater than 2500’. Show locations on as-built plans.
E. Do not wrap wire around pipe or allow any wiring to be placed in concrete or concrete thrust blocks.
F. Install two (2) spare wires starting from the controller, looped to each valve box to the furthest valve box, without splices.

3.16 Tracer Wire

A. Install tracer wire on top of the mainline.
B. Provide a twelve-inch (12”) loop in and out of each valve box. Solder all splices.
C. Where potable water lines are placed in a separate trench, install a tracer wire on top of the potable water line.
D. Tracer wire shall be tested during review and pressure test of the mainline.

3.17 Sleeves

A. Install sleeves under all pavement and as shown on the Plans.
B. Install sleeves at the depths indicated in Section 3.03B above.
C. Extend sleeves a minimum of twelve (12) inches beyond the edge of pavement.
D. At every sleeve location installed in roadways, provide a spare PVC sleeve capped at each end and marked with a 3M ball marker.

3.18 Thrust Blocks

A. Install polyethylene sheeting between mainline and concrete.
B. Thrust blocks shall be formed against a solid trench wall. The thrust block cavity shall be in undisturbed soil or previously placed compacted backfill that yields an acceptable allowable bearing pressure.
C. Concrete thrust blocks shall not be poured on valve wires.

3.19 Cross Connection Testing for Recycled Water Systems

A. The Recycled Water System shall be tested for cross connection in accordance with Uniform Plumbing Code Appendix J prior to use.
B. All testing of Recycled Water Systems must be performed utilizing a potable water source via a construction water connection per City of Roseville Construction Standards. No Recycled Water may enter a Recycled Water System until all testing is successfully completed.
C. At the time a cross connection test is to be performed, construction on both the Potable and Recycled Water Systems being tested must be complete and both systems fully operational and functioning as designed.
D. Cross connection testing shall be performed in the system by City forces with the assistance of the contractor. The test must be coordinated through the Parks Department Inspector. Forty-eight (48) hours' notice is required before the test. Depending on complexity of the site, a preliminary field meet may be required.

3.20 Coverage Test

A. Prior to planting, the Contractor shall perform a coverage test to confirm that water coverage is complete and adequate, and produces no overspray onto hardscapes. Irrigation pressure readings at the head or emission device may also be taken as part of the coverage test to confirm adequate system hydraulics.
B. The coverage test shall be performed on the entire irrigation system and shall be performed in the presence of the Parks Inspector. The irrigation system must be connected to the City water system through the water meter. Temporary connections are not allowed. On recycled water systems, the

coverage test shall take place only after successful completion of the cross-connection test, with the recycled water meter in place.

C. On Park projects containing turf, a comprehensive survey of the Distribution Uniformity (Low Quarter) of each irrigation zone containing turf shall be performed by a third-party, certified irrigation auditor prior to planting of turf. The irrigation system must be 100% complete, including functionality of the irrigation controller and booster pump, if present. The irrigation auditor shall prepare and submit a report listing each zone's Distribution Uniformity, including actual mapping data of catch cans, and noting any potential deficiencies in the system leading to any inadequate findings. Reported deficiencies in Distribution Uniformity will be evaluated by the Project Manager and may require corrective measures prior to approval of turf planting. Deficiencies caused by improper installation shall be corrected at no additional cost to City.

3.21 Irrigation Audit

A. A landscape irrigation audit shall be performed after all landscape and irrigation is installed. The irrigation system must be 100% complete, including functionality of the irrigation controller and booster pump, if present.

B. All landscape irrigation audits shall be conducted by a third party certified landscape irrigation auditor. Landscape audits shall not be conducted by the person who designed the landscape or installed the landscape.

C. The water audit shall conform to the specific water audit requirements of the City of Roseville Environmental Utilities Department, and any supplemental requirements from the City of Roseville Parks, Recreation & Libraries Department. The contractor shall submit a comprehensive landscape irrigation audit. This shall include, but is not limited to:
   1. A completed Irrigation Audit Report-(City of Roseville provided forms only)
   2. Complete system evaluation, including site conditions, system and flow data.
   3. Scheduling parameters used to set the irrigation controller.
   4. An Irrigation schedule for the landscape provided to the owner.

D. A minimum of 25% of all zones shall be audited. The 25% minimum shall be a representative sample of each irrigation method present (i.e. Rotors, bubblers, rotary nozzles, drip, etc.), and is in addition to any turf zones audited during the coverage test.

E. Any deficiencies noted in the audit report such as, but not limited to, run-off, overspray, obstruction of spray patterns, etc., shall be corrected and signed off as such by the original irrigation auditor prior to submission of the report. Do not submit audit reports with uncorrected deficiencies.

3.22 Clean Up

A. Each phase of work shall be immediately cleaned up. Excess equipment, material, etc., shall be legally disposed of and removed from site. All concrete, asphalt and/or decomposed granite paving shall be kept free of soil. Damage to such surfaces shall be immediately repaired to the satisfaction of the City.

PART 4 - GUARANTEE

4.01 General

A. Contractor shall provide a written guarantee covering all materials, equipment and workmanship furnished by him to be free of all defects after installation is accepted, including all defective parts that may have been found.
B. All paved areas shall be swept clean and planted areas shall be weed-free.
C. All irrigation heads shall be properly adjusted. Debris and refuse shall be removed from site prior to inspection.

4.02 Pre-Final (Punch List) Review

A. See Section 01 10 00 1.16 - Summary of Work for notification process.

4.03 Establishment

A. Full automated utilization of the irrigation system shall be included as part of the maintenance of the project. See Section 329000: Planting for additional information.
B. Program and utilize the establishment schedule as submitted with the turn-in items.
C. Contractor to run the system in “quantity” mode or “time plus flow” for a minimum of one (1) week.
D. Check the irrigation system weekly to ensure proper operations. Make all necessary adjustments, including watering schedule to ensure proper and healthy plant growth. At no time shall pools of water be present within any part of the project. Conversely, at no point shall dry or under-watered spots be visible upon inspection. Improper irrigation management resulting in flooding or dry conditions to the detriment of plant material may constitute an extension of the establishment period, at no additional cost to the City.

4.04 Final Review

A. The Contractor shall demonstrate to the City, valve by valve, the entire irrigation system to be operable. All heads shall be adjusted/flushed and all drip zones shall be flushed prior to the on-site review. Any item requiring adjustments shall be completed immediately and to the satisfaction of the City.
B. Provide necessary training to City staff in the proper operations and maintenance of the booster pump.

C. The date of final acceptance by the City Council or the recordation of the property transfer shall signify the start date of the warranty period. Final acceptance shall include the project in total and will not segregate any specific item or trade included in the construction of the project.

END OF SECTION

SECTION 32 90 00
PLANTING

PART 1 - GENERAL

1.01 General Requirements

A. The requirements set forth in the General Conditions shall be in addition to the standards provided herein.

B. The requirements set forth in the Supplemental Conditions shall be in addition to the standards provided herein.

1.02 Description

A. Furnish all labor, materials and equipment for the complete installation of landscape items, including all trees, shrubs, groundcovers and turf; maintenance for the establishment of new plant materials; and all necessary appurtenances for proper planting, noted or implied, as shown on the Plans and as specified herein.

1.03 Related Work

A. Section 31 20 00: Earthwork

B. Section 32 84 00: Irrigation System

1.04 Quality Assurance

A. Provide an experienced foreman who shall directly supervise the work force during all work to be performed under this contract. The foreman shall be present during the time when work is to be performed.

B. Plant material shall conform to current “American Standards for Nursery Stock” and the State of California Grading Code of Nursery Stock, No. 1 grade. Use only nursery-grown stock.

C. All plant material shall be certified free of plant diseases and insect infestations from the County Agricultural Commissioner as required by law. Each shipment of plant material shall be required to have clearance certificates.

D. Prior to planting, a soils fertility test/analysis shall be conducted by an accepted and qualified testing laboratory. Test results shall contain existing nutrient levels, soil texture, cation exchange capacity, soluble salts, pH levels, infiltration rates and recommended soil amendments/fertilizers to ensure proper growth of the specified plantings.

1.05 Submittals

A. Submittals for specified items are not required; however, submittals are required for any proposed substitutions or deviations from the Plans or Specifications. Additionally, submittals are required for the specific items listed below. The Contractor shall submit a materials summary sheet indicating which items will be installed as specified and which items are proposed for substitutions. The Contractor shall submit proof of order within ten (10) working days of the Notice to Proceed, indicating all specified materials have been ordered, noting “as specified” or “substitution proposed”. Submittals are required on the following items:
   1. Bark mulch material,
   2. Certificates of compliance for turf seed mix, soil amendments, fertilizers and hydroseed mix,
   3. Sod-grown turf,
   4. Soils test with soil amendment recommendations.
   5. Trees
      a) Submit for approval, plant sources including the names of nurseries proposed as sources of acceptable trees, and a list of the trees they will provide. The plant list shall include the botanical and common name and the size at the time of selection, including basal caliper and height.
      b) Submit all requests for substitutions of plant species or size for approval. Request for substitution shall be accompanied with a list of nurseries contacted in the search for the required plant and a record of other attempts to locate the required material. Requests shall also include sources of plants found that may be of a smaller or larger size, or a different shape or habit than specified, or plants of the same genus and species but different cultivar origin, or which may otherwise not meet the requirements of the specifications, but which may be available for substitution.

1.06 Soil Testing

A. Native soil and in-place topsoil shall be tested for amendment determination. Soil Tests shall include soil texture, macro nutrients, micro nutrients, lime, base saturation, pH, sodium, boron, salinity, Cation Exchange Capacity (CEC), and Organic content.

B. Submit soils report for review and approval after completion of grading operations. Soil Testing shall be performed by an agriculture-based lab, with detailed, written recommendations for soil amendments and fertilizers specific to ornamental landscape plants and turf.

1.07 Product Delivery, Handling and Storage

A. All materials shall be delivered bearing nursery label with botanical, common names, including cultivars.
B. Carefully handle plant material to ensure that limbs are not broken during the planting or storage of the material.
C. Store plant material in a covered area on-site, protected from inclement or hot weather on-site. Keep root balls moist by frequent watering (during hot weather) of all accepted stock until such time as planting occurs.

1.08 Inspection of Plant Material

A. Notify the Project Manager a minimum of 48 hours prior to date of delivery. All plant material is subject to inspection at the time of delivery. A sample number of plants will be inspected for the following items:

If the sample....	**then the plant shall be...**
is healthy, shapely and well rooted	accepted.
bears a strong central leader	accepted.
is wilted, wind-blown or sunburned	rejected.
is root-bound, restricted or deformed	rejected.
does not bear a strong central leader or has been severely pruned back	rejected.

B. Stock to be consistent with CALFIRE Nursery/Tree Quality Cue card and Root Management Cue Card. Inspector may require contractor to remove tree or plant stock from plant containers to examine roots.
C. 15 gal tree needs to have at least 1" in basal caliper, a 24" box tree needs to have at least 2" in basal caliper, a 36" box tree needs to have at least 3" in basal caliper. Basal caliper is measured as 6" above the ground.
D. Based on the sample inspection, the Project Manager or Inspector reserves the right to reject any or all of the plant material delivered. All rejected plant material shall be immediately disposed of off-site.

1.09 Record Drawings

A. The Contractor shall keep an accurate record of the as-built conditions of the landscaping. These records shall be updated daily and kept at the construction site. At any time, the Inspector may examine the conditions of the "as-builts" to ensure compliance of the above.

PART 2 - PRODUCTS

2.01 Plants

A. The material to be planted shall conform to that indicated on the plans, unless otherwise accepted. The quantity shown on the Plans is approximate and is

furnished for convenience only. Verify all quantities prior to ordering plant material.

2.02 Turf

A. Turf shall be *seed or sod*.
B. Seed –
   1. 98% pure, weed-free mixture with a minimum of 95% germination. Deliver on-site unopened and in the original containers.
   2. 100% Turf Saver RTF (Rhizomatous Tall Fescue) by Barenbrug or accepted equal.
   3. Rhyzome – Active Tall Fescue Blend by Pacific Coast Seed or accepted equal:
      34% Traverse Turf-type Tall Fescue
      33% 3rd Millennium Turf-type Tall Fescue
      33% Rhambler Turf-type Tall Fescue
   4. Turf seed mix shall be Blue tag certified.
C. Sod – Tall fescue blend with named, improved turf-type varieties only. Blend shall contain a minimum 25% Lateral Spread, Rhizomatous, or Self-Repair type tall fescue. Sod shall be non-netted, and contain no more than 10% Bluegrass.
D. Seed / Sod must be submitted and accepted by the Project Manager prior to ordering.

2.03 Soil Amendment

A. As recommended by soils test report.

2.04 Mulch

A. Regular "Walk-on" fir bark as manufactured by Redi-Gro Corporation, Sacramento, CA (916) 381-6063, Mallard Creek, Inc, Rocklin, CA (916) 645-1681, My Bark Company, Inc., Linden, CA (209) 649-4250 or accepted equal.
B. Decorative bark, shredded lumber or saw dust, and construction debris are not permitted. The mulch must be free of needles.

2.05 Topsoil

A. Stockpiled, on-site material.
B. Imported topsoil shall be natural, friable, well-draining, free from admixture of subsoil and foreign objects larger than one inch (1") in diameter, free from toxins or any other harmful substance which may deter healthy plant growth.
C. Perform a soils test for all imported soil. Soil test shall comply with Section 1.06. Submit soils report for review and approval prior to import activities.

2.06 Pre- and Post- Emergent Herbicide

A. Clean, and non-staining. Consult with a pesticide specialist.

2.07 Tree Stakes and Ties

A. Trees furnished in #15 nursery containers require 2" diameter stakes. Trees less than 8' in height require an 8' stake; trees 8' or greater in height require a 10' stake. ~~Two (two) inch diameter by eight (8) feet long minimum,~~ Stakes shall be pine or douglas fir (pressure or non-pressure treated).

B. Trees furnished in 24" boxes or larger require 3" diameter by 10' long stakes. Stakes shall be ~~Three (3) inch diameter by ten (10) feet long minimum,~~ pine or douglas fir (pressure or non-pressure treated).

C. Tree ties should be cut in length out of flat woven polypropylene material, 3/4 inch wide, and 900 lb. break strength. Color to be Green. Product to be ArborTie manufactured by Deep Root Partners, L.P. or approved equal.

D. Tree guying to be flat woven polypropylene material, 3/4 inch wide, and 900 lb. break strength. Color to be Green. Product to be ArborTie manufactured by Deep Root Partners, L.P. or approved equal.

2.08 Native Broadcast Seed

A. Where required, broadcast seed shall be applied as follows:

1. Upland areas ~~(to 3' above swale bottom)~~

Elymus glaucus (Blue Wildrye)	10.0 lbs/acre
Nassella pulchra (Purple Needlegrass)	9.0 lbs/acre
Nassella cernua (Nodding Needlegrass)	6.0 lbs/acre
Melica caljfornica (Californiameljc)	3.0 lbs/acre
Vulpia microstachys (Small Fescue)	3.0 lbs/acre
Poa secunda (Native Pine Bluegrass)	3.0 lbs/acre
Bromus carinaws (California Brome)	2.0 lbs/acre

2. Channel / Wetland Edges (bottom to 3' ~~upslope~~ above high water ~~surface~~ level)

Elymus trachycaulus (Slender Wheetgrass)	12.0 lbs/acre
Hordeum brachyantherum (Meadow Barley)	10.0 lbs/acre
Leymus triticoides 'Yolo' (Creeping Wildrye)	8.0 lbs/acre
Agrostis exarata (Bentgrass)	3.0 lbs/acre
Elymus glaucus (Blue Wildrye)	5.0 lbs/acre

3. Wildflowers (addition to seed mix(es) above, if specified)

Clarkia amoena (Farewell to Spring)	0.5 lbs/acre
Eschscholzia caljfornica (California Poppy)	2.0 lbs/acre
Lupinus nanus {Sky Lupine)	3.5 lbs/acre
Nemophila menziesii (Baby Blue Eyes)	1.5 lbs/acre
Lasthenia californica (Common Goldfields)	1.5 lbs/acre

Formatted: Font: Not Italic

Formatted: Font: Not Italic

Formatted: Font: Not Italic

B. Areas with sandy, dry soil shall receive: Zorro Annual Fescue 6 lbs/acre, Rose Clover 9 lbs/acre
C. A fertilizer consisting of 15-15-15 shall be applied at a rate of one half pound per 1,000 square feet. Fertilizer shall be Natural-based, slow release, and balanced in N, P, & K.
D. Seed for creek banks shall conform to the latest requirements of the California Department of Fish and Game.

PART 3 - EXECUTION

3.01 Site Preparations

A. Prior to start of landscaping work, review the site conditions to verify that final grades have been established, plant/turf beds are weed free, and the irrigation system is operational as shown on the Plans and as indicated in the Specifications.
B. For landscaping within all street right-of-ways, conduct a soils analysis test of the existing soils and remove all lime-treated soils, aggregate base or other non-organic material to a minimum depth of two feet before planting or irrigation installation. Import topsoil to bring the finish grade to specified grades. Submit the soils analysis test results of the imported material prior to import.
C. Notify the Inspector immediately of any existing conditions which are unacceptable for the commencement of landscaping work.

3.02 Coordination of Work

A. Coordinate all work with other trades.

3.03 Preparation of Planting and Turf Areas

A. Upon completion of grading and underground activity, Contractor shall obtain a soils test as outlined in 1.06.
B. Place stockpiled topsoil in all areas to receive planting or turf to a minimum depth of twelve inches (12”).
C. Rip topsoil surface in two directions to a minimum depth of twelve inches (12”).
D. Spread soil amendments at the rates indicated in the soils report.
E. Rototill amendments to recommended depths. Till amendments to a depth of 6” or as recommended by soils report.
F. Remove all rock and debris which are greater than ½ inch in areas to be turfed and one inch (1”) in areas to be planted.
G. All planted and turf areas to be smooth and uniform in grade as shown on the Plans.
H. Planting areas to be sloped to drain as shown on the Plans.

3.04 Storage of Plants and Trees

A. Protect materials from deterioration during delivery and storage. Adequately protect plants from drying out, exposure of roots to sun, wind or extremes of heat and cold temperatures. If planting is delayed more than 24 hours after delivery, set plants in a location protected from sun and wind. Provide adequate water to the root ball package during the shipping and storage period, including weekends and Holidays.

B. Soil moisture shall be maintained above wilting point and below field capacity for the root ball substrate or soil.

C. All plant materials must be available for observation prior to planting. Any plants determined to damaged or distressed due to improper watering may be rejected by inspector and shall be replaced at no cost to City.

3.05 Plant Installation

A. Tree and Shrub Planting

1. Remove only those plants which will be planted the same day. Place such plants in the proposed locations for review and accepted by the City prior to actual planting. Notify the Inspector a minimum of 48 hours prior to day of planting.
2. Dig planting pits as shown on the Plans and as shown in the Parks Construction Standards. Scarify the sides and bottom of pit to prevent glazing. Fill pit completely with water and allow the water to completely drain from the pit prior to actual planting.
3. Relocate any plantings taller than 6” in height that fall in front of any irrigation head in order to ensure proper coverage of the irrigation system.
4. For pits that retain water, completely penetrate the hardpan layer at the bottom of the pit and backfill with topsoil. Fill pit with water to test and ensure proper drainage.
5. Prior to tree planting a central leader needs to be established by structural pruning, as necessary. Codominant leaders need to be removed or suppressed by structural pruning. Refer to the CALFIRE "Tree Training", "Tree Planting", and "Tree Quality" cue cards and "Tree and Plant Root Management Standard and Quality Expectations" contained in Section 5 of these Standards.
6. Plants shall be removed from their containers only at the time of placement within the plant pit. Perform root pruning on all four sides of the root ball by shaving and cutting away the root ball periphery to reduce the amount of circling roots. Starting from the top and then cutting/slicing down to the bottom of the root ball. On a 15 gal container at least 1-1.5 inches of the root ball periphery needs to be removed by slicing or shaving. On a 24” and 36”box tree at least 2 inches of the root ball periphery needs to be removed

by slicing or shaving. A sharp hand pruning saw needs to be used for the slicing or shaving of the root ball. Refer to the CALFIRE "Root Management" cue card contained in Section 5 of these Standards. This process will remove many girdling and circling roots deflected by the container wall and allows for root penetration within the planting basin. Spread all roots to the side to allow proper root development. Add native backfill and amendments as shown in the Parks Construction Standards and as recommended by the soils testing laboratory.

7. Plant tree at least three inches (2") above grade on mount to prevent bowl effect. The tree's beginning root flare must be located at top of grade with installed sod.
8. Carefully place plant into the plant pit without damaging the root ball. Water the backfill until saturated. For trees, water in by hand after planting using at least ten (10) gallons of water, minimum.
9. Construct berm and place tree stakes and install mulch per the Parks Construction Standards. Mulch is required for trees within the turf area.
10. Where mowing will occur, provide an eight-foot (8') minimum horizontal clearance between trees and other site improvements, including shrubs.
11. Tree ties should be installed via a figure eight loop and each tie shall be secured with a nail on the tree stake. Install two (2) Arbor Ties at 2/3 of tree height and two (2) Arbor Ties at ½ of tree height.
12. ~~Trees less than 8' in height require an 8' stake. Trees 8' or greater in height require a 10' stake.~~
13. ~~13.~~12. Tree stakes should be inserted into the ground to a minimum depth of 18".

B. Groundcover Planting
   1. Place groundcover plants in neat, straight, and parallel rows, triangularly spaced as shown on the Plans and as indicated herein.
   2. Start the first row of planting at a distance equal to the on-center spacing required per plan, minimum, from the edge of the adjacent hardscape, mow band or header board.
   3. Groundcover shall be installed to the outside edge of the water basins of trees or shrubs.

3.06 ~~Turf Planting~~Seeding- Turf and Native

(Hydroseeding for turf or natural areas)

A. Lightly scarify areas to be hydroseeded.
B. Tank, hose and associated apparatus must be thoroughly clean and free of debris or other material prior to placement/spraying of seed.
C. Hydroseed turf mix shall contain the following:

Material	Application Rate
Turf Seed	Per Manufacturer's Recommendations
Wood Cellulose Fiber Mulch	60 lbs. per 1,000 SF
Binder	Per Manufacturer's Recommendation
Fungicide turf only	1/3 lb. per 1,000 SF
Fertilizer	Per soils lab recommendation and as approved by Parks, Recreation & Libraries Department
Soil Conditioner	Per Soil Conditioner soils lab recommendation and as approved by Parks, Recreation & Libraries Department

D. Blend mix in a hydraulic mixer until all material is consistently blended.
E. Apply mix at a rate of 125 pounds per 1,000 square feet unless otherwise recommended by the manufacturer.
F. Spray mixture consistently over the area to be hydroseeded. Protect adjacent areas such as paving, walls, play areas and other from overspray.
G. At the end of each day of spraying operations, clean up all areas where overspray has occurred.
H. Once seed is placed, it should not be allowed to dry out.

3.07 Sod- Turf

~~H.~~

~~(Sod)~~

A. Remove all "humps" and depressions prior to sodding.
B. Keep all sod rolls shaded and moist prior to installation.
C. Do not store sod rolls more than one (1) day. Sod shall be laid upon delivery.
D. Unroll sod one at a time for immediate installation.
E. Provide tight seam between rolls of sod (less than 1/8" gaps).
F. Stagger rows so that the ends of sod rolls are stepped.
G. For turf areas where sod is partially provided, add topsoil at all transition edges to same as finish grade.

~~3.07~~3.08 Mulch

A. Prior to placing mulch, apply post-emergent herbicide to any weeds present, per label directions.
B. Prior to placing mulch, apply pre-emergent herbicide in all planting areas, per label directions.
C. Apply three inches (3") of mulch in all landscape planter areas.

Formatted: Heading 3

Formatted: Heading 3, Pattern: Clear (Background 1)

Formatted: Heading 3, Indent: Left: 0"

D. Keep mulch a minimum of three inches (3") away from the trunks of all woody shrubs and ~~six~~ four inches (~~6~~4") away from all trees. Taper mulch profile away from this point to prevent subsequent collection of mulch against trunks.

~~3.08~~3.09 Watering

A. Upon completion of each planting or turf area, irrigate appropriately to ensure proper health and growth.
B. Continually adjust the irrigation for plant needs regardless of air temperature.

~~3.09~~3.10 Clean-up

A. Upon completion of planting operations, collect and remove from site all empty plant containers, debris, rubbish and other trash.
B. Sweep clean and wash all hardscape areas.
C. Clean up shall occur, at minimum of once a week, at the end of the work week.
D. Maintain the entire site in a clean condition to the satisfaction of the City.

~~3.10~~3.11 Pre-Final (Punch List) Review

A. See Section 011000 1.16 of the Summary of Work for notification process.
B. The following conditions must be met in order for planting to be considered towards substantial completion, as required to enter into the establishment period described in Section 011000, 1.16:
    1. For seeded turf:
        a. Upon completion of the second mowing of completely germinated turf. Second mowing is defined as full coverage of turfed area 90% weed free.
        b. Root depth – Turf grass roots shall be healthy, creamy-white in color and be 4" or greater in length/depth as measured from the soil surface to root tip. This shall be consistent throughout turfed area.
        c. Turf shall be of uniform green color with no visible signs of stress due to soil fertility, moisture, disease or pests.
    2. For sodded turf:
        a. Accepted installation of the sod.
        b. Turf shall be of uniform green color with no visible signs of stress due to soil fertility, moisture, disease or pests.
    3. For trees and shrubs:
        a. Trees and shrubs shall be properly installed, and with no visible signs of stress due to soil fertility, moisture, disease or pests.

~~3.11~~3.12 Establishment Period

A. Active maintenance is required throughout the entire establishment period:
    1. Maintain turf to a height of two and one half inches (2-1/2") for cool season turf varieties and one and one half inches (1-1/2") for warm season turf

varieties. Maintained height shall be measured from the surface of finish grade to the top of the leaf blade throughout the establishment period, and mowed as frequently as required to maintain said height. At no time shall the leaf blade be mowed or cut more than 1/3 of the length of the blade. Root mass/depth must remain consistent as measured at the start of establishment or greater.

2. Edge all turf areas along hardscape edges.
3. Re-seed all bare areas within the turf as soon as evident.
4. Immediately replace all dead plants.
5. As necessary, raise all trees and shrubs which have sunk within the plant pit beyond the levels indicated in the Standard details.
6. Keep all areas free of weeds, pests and disease.
7. For trees located in turf areas, maintain a circle free of turf at a distance described in the Standard details

B. Prior to the start of the final thirty (30) days of establishment:
   1. All plant replacements shall be completed.
   2. All plantings and turf shall be thriving and in a healthy condition.
   3. The lack of active maintenance prior to the final thirty (30) days may constitute a delay in the start of the final thirty (30) days of the establishment period.

~~3.12~~3.13 Final Review

A. The Inspector shall review the site for completion of items noted, but not limited to, “B” below. All corrective action is required to enter into the final thirty (30) days of establishment.
B. The site shall be prepared for review, by ensuring that:
   1. All spray heads have been properly adjusted,
   2. Dead plants have been replaced,
   3. Planting areas have been weeded,
   4. Turf areas have full germination, are consistent in green color and are weed-free,
   5. Walkways and paved areas have been swept and washed, and
   6. Turf roots meet standards outlined in 3.10
C. Failure to complete any one or all of the above items may constitute non-performance of the final review and will require re-scheduling. In this case, the cost of the extended establishment period shall be at no additional cost to the City.

PART 4 - GUARANTEE

4.01 General

A. Contractor shall provide a written guarantee covering all plant materials (trees & shrubs) furnished by him to be free of all defects or disease and that all plants are in a healthy and thriving condition at the completion of the contract. Deciduous plant material shall be warranted beyond the time of contract completion until such time as growth becomes evident.

(For all park construction projects)

B. All plants, except those provided by the City, shall be warrantied for a period of one (1) year, commencing on the date of final acceptance. The ~~warrantee~~ warranty shall be as outlined in Section 011000: Summary of Work, paragraph 1.19.

(For all streetscapes, street landscape frontage, street medians and Lighting & Landscape District projects.)

C. All plants, except those provided by the City, shall be warrantied for a period of nine (9) months, minimum, commencing on the date of final acceptance. Warrantee responsibilities expire upon acceptance and approval of the "~~Certificate~~ Notice of Completion" for the overall development project. The warrantee shall be as outlined in Section 011000: Summary of Work, paragraph 1.19.

END OF SECTION

SECTION 33 00 00
UTILITIES

PART 1 - GENERAL

1.01 General Requirements

A. The requirements set forth in the General Conditions shall be in addition to the standards provided herein.
B. The requirements set forth in the Supplemental Conditions shall be in addition to the standards provided herein.
C. The standards set forth in the City of Roseville Design and Construction Standards, latest edition, for storm drainage throughout the project and for sanitary sewer installations within the public rights-of-ways, easements, or as shown on the improvement plans shall be in addition to the standards provided herein.
D. The standards set forth in the latest edition of the California Building Code (CBC) for sanitary sewer installation within the project site, outside of the public right-of-way or easement shall be in addition to the standards provided herein.

1.02 Description

A. Furnish all labor, materials and equipment for the complete installation of the storm drain system and sanitary sewer pipe, and necessary appurtenances as shown on the Plans and as specified herein.
B. Submit a materials listing for review and approval prior to commencement of specified work.

1.03 Related Work

A. Section 31 10 00: Clearing and Grubbing
B. Section 31 20 00: Earthwork

1.04 Safety Requirements

A. Furnish, install and maintain required sheeting, shoring, bracing, and other methods to ensure complete and safe work environment for all workers. Upon completion of work, remove all bracing, shoring, etc. in its entirely, unless otherwise directed by the Inspector.
B. Prior to excavation or trenching, the Contractor shall contact USA Alert (800)
C. 227-2600 to locate all known utilities a minimum of 48 hours prior to start of work. During the course of construction, the Contractor shall take every precaution to maintain and protect utilities noted to remain. Said utilities shall remain operational at all times, unless otherwise noted on the plans.

D. The existing utilities are shown on the Plans based on the information available at the time of contract document development. The City shall not assume responsibility for any inaccuracies or incompleteness of the Plans based on such information. The Contractor shall immediately notify, upon damage of any pipeline or facility, the Owner and/or its agents and take every action necessary to repair or replace damaged facilities to the satisfaction of the Inspector, and at no additional cost to the City.
E. Trenches, excavations and repair of pavement shall be consistent with Section 31 20 00: Earthwork.

1.05 Coordination

A. The piping system as shown on the Plans is diagrammatic. The Contractor shall make reasonable adjustments to the layout to avoid conflicts, based on actual field conditions. Said changes shall not interfere with the design intent of the system.

1.06 Tolerance

A. The allowable tolerance for the installation of pipe is 0.05 feet within grades or spot elevations indicated on the Plans.

1.07 Product Storage

A. Take every precaution to protect the materials and pipes from damage during the delivery, storage and installation of the pipe system. Store in a cool, contained area, protected from direct sunlight and per manufacturer's recommendations. Pipe shall be supported on firm level ground at the site.

1.08 Record Drawings

A. The Contractor shall keep an accurate record of the as-built conditions of the storm drain and sanitary sewer system. These records shall be updated daily and kept at the construction site. At any time, the Inspector may examine the conditions of the "as-builts" to ensure compliance of the above.

PART 2 - PRODUCTS

2.01 General

A. All products shall conform to City of Roseville Design and Construction Standards, latest edition, except as noted below.

2.02 Drain Pipe

A. Solid drainpipe shall be PVC SDR 35 and shall conform to ASTM D1784, or accepted equal. Gasketed connections shall conform to ASTM F477.

B. Perforated drainpipe shall be smooth walled PVC, open per Caltrans Section 68-1.02K, or accepted equal.

2.03 Drain Rock

A. Drain rock shall be Class 2 washed, ¾" diameter.

2.04 Filter Fabric

A. Filter fabric shall be MiraDRAIN 5000, or accepted equal.

2.05 Drains

A. Drain Inlets shall be pre-cast and a minimum size of twenty-four inches (24") square or round by Jensen Precast, or accepted equal.
   1. Grate shall be heavy duty, cast iron, walk-on, and bolt down.
   2. Box extensions shall be Jensen Precast, or accepted equal.
   3. The base shall be six inches (6") thick.
   4. Walls shall be six inches (6") thick.
   5. A "No Dumping" Metal Storm Drain Marker shall be affixed to the concrete color of each drain inlet (See Detail DR-20)
   6. Contractor may install cast-in-place drain inlets in lieu of pre-cast drain inlets. Submit shop drawings and concrete mix design for review and approval.

B. Channel Drains for baseball/softball backstop areas shall be Polycast 600 series pre-sloped trench drains with galvanized steel slotted grates or accepted equal.

~~C. Drinking fountain drain inlet shall be eight inch (8") round cast iron drain with cast iron grate, #Z-742-VP by Zurn or accepted equal.~~

~~D.~~C. Sanitary sewer clean outs shall be as specified in the City of Roseville, Design and Construction Standards, latest edition.

2.06 Manholes

A. Manholes shall have tongue and groove joints, be forty-eight inches (48") minimum in diameter, meeting ASTM C-478.

B. Covers shall be cast iron.

C. All components shall conform to the City of Roseville Design and Construction Standards, latest edition.

2.07 Tracer Wire

A. Insulated solid copper wire, minimum #12 gauge. Color shall be green.

2.08 Sanitary Sewer~~Vitrified Clay~~ Pipe

A. Vitrified clay pipe (VCP) shall be as specified in Section 91 Sanitary Sewer in the City of Roseville, Design and Construction Standards, latest edition.

~~A.~~B. PVC SDR 35 may be used for drinking fountain drain applications only, with prior approval, and shall conform to ASTM D3034.

2.09 Potable Water Warning Tape

A. On sites with both Recycled water and potable water lines. Blue plastic tape, 3 inches wide, with the words "CAUTION: POTABLE WATERLINE" imprinted in minimum 1-inch high, black letters. Imprinting shall be continuous and permanent.

2.10 Other (Specify)

A. Additional products not listed in City Standard.

PART 3 - EXECUTION

3.01 General

A. All pipes shall slope uniformly from given elevations shown on the Plans.
B. All pipes shall be accurately laid true to line and grade, utilizing accepted construction methods.
C. Damaged or cracked pipe and fittings shall not be installed and shall be removed from site.
D. Install all pipe in locations shown on the Plans, except where existing conditions necessitate minor changes.
E. All pipe and fittings shall be kept clean and closed throughout the course of construction.
F. Connections to existing sanitary sewer stubs shall be "TV-ed" and air tested prior to the start of construction per the City of Roseville Design and Construction Standards, latest edition.

3.02 Installation

A. Installation of the specified pipe lines shall conform to the City of Roseville Design and Construction Standards, latest edition.
B. Notify the Inspector a minimum of 48 hours prior to covering of work to ensure timely inspections.
C. Cutting of AC or concrete paving shall be clean, vertical and straight, using a saw, or other tool specific to this application. Replace paving to existing or better condition prior to work.
D. Trench and backfill shall be per City of Roseville Design and Construction Standards, latest edition.
E. Catch basins and drain inlets shall be installed with a concrete collar with "No Dumping" message and fish symbol depressed into the concrete or bolted in

place, consistent with Drawing DR-20 the City of Roseville Design and Construction Standards, latest edition.

F. Drain inlets installed in mulched planter areas shall have a 12-inch wide collar of 2- to 6-inch river cobble placed over filter fabric.

G. Channel drains shall be set per manufacturer's instructions. Place slotted grates along the entire length of the backstop, including wing fencing, wherever concrete is placed adjacent to the backstop system. Provide a below grade piped connection at all gate openings into the infield area. Do not install grated drain sections at these entry/exit points.

~~H. Drain inlets at drinking fountains shall be located under jug filler and connected to storm drain per local codes.~~

~~I.~~H. Manholes shall be per City of Roseville Design and Construction Standards, latest edition. Install grate flush with finish grade.

~~J.~~I. Sanitary Sewer Clean-outs shall be installed with 3M ball markers and shall be located within planted or turf areas, whenever possible. Place clean-outs at 100' intervals throughout the project. Clean-outs shall not be located within play areas. Install per City of Roseville Design and Construction Standards, latest edition.

~~K.~~J. Upon completion, thoroughly flush storm drain system in the presence of the Parks Inspector.

~~L.~~K. Installation of additional products not listed in the City Standards.

3.03 Tracer Wire

A. Install tracer wire on top of the potable water lines

B. Tracer wire shall be continuous with no splices.

3.04 Potable Water Warning Tape

A. To be used on all potable water piping installed within the same project limits as on-site recycled water piping.

B. Install plastic warning tape in pipe backfill, six inches above pipe, for the entire length of the pipe.

3.05 Cleaning

A. Keep site clean at all times. Remove from the site all debris and rubbish and legally dispose.

END OF SECTION

CITY OF ROSEVILLE CALIFORNIA

Parks, Recreation & Libraries Department

Section 5:
FORMS & QUALITY EXPECTATIONS

APPLICATION AND CERTIFICATE FOR PAYMENT

AIA DOCUMENT G702 PAGE 1 OF PAGES

TO (OWNER):

APPLICATION NO.:

PERIOD TO:

FROM (CONTRACTOR):

KA#

Distribution to:
___ OWNER
___ ARCHITECT
___ CONTRACTOR
___ INSPECTOR
___

CONTRACT FOR:

CONTRACT DATE:

CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for Payment, as shown, in connection with the Contract. Continuation Sheet, AIA Document G702, is attached.

1. ORIGINAL CONTRACT SUM ..... $ _____
2. Net change by Change Orders ..... $ _____
3. CONTRACT SUM TO DATE (Line 1±2)..... $ _____
4. TOTAL COMPLETED & STORED TO DATE..... $ _____
   (Column G on G702)
5. RETAINAGE:
   a. ____% of Completed Work $ _____
      (Column D+E)
   b. ____% of Stored Material $ _____
      (Column F on G703)
   Total Retainage (Line 5a + 5b or
   Total in Column 1 of G702..... $ _____
6. TOTAL EARNED LESS RETAINAGE..... $ _____
   (Line 4 less Line 5 Total)
7. LESS PREVIOUS CERTIFICATES FOR
   PAYMENT (Line 6 from prior Certificate) ..... $ _____
8. CURRENT PAYMENT DUE..... $ _____
9. BALANCE TO FINISH, PLUS RETAINAGE..... $ _____
   (Line 3 less Line 6)

CHANGE ORDER SUMMARY

Change Orders approved in previous months by Owner TOTAL		ADDITIONS	DEDUCTIONS
Approved this Month			
Number	Date Approved		
TOTALS			

Net change by Change Orders	

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief, the Work covered by this Application for payment has been completed in accordance with the Contract Documents, that all previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

CONTRACTOR:

By:_____ Date: _____

State of: County of:
Subscribed and sworn to before me this day of ,20
Notary Public:
My Commission expires:

CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on on-site observations and the data comprising the above application, the Architect/Inspector certifies to the Owner that to the best of the his/her knowledge, information and belief, the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

Inspector: _____ Date: _____

Project Manager_____ Date: _____

This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.

AMOUNT CERTIFIED ..... $ _____

(Attach explanation if amount certified differs from the amount applied for.)

CONTINUATION SHEET

AIA DOCUMENT G703 PAGE OF PAGES

AIA Document G702, APPLICATION AND CERTIFICATE FOR PAYMENT, containing Contractor's signed Certification is attached.
In Tabulations below, amounts are stated to the nearest dollar.
Use Column 1 on Contracts where variable retainage for line items may apply.

APPLICATION NUMBER:
APPLICATION DATE:
PERIOD TO:

			WORK COMPLETED						
A	B	C	D	E	F	G		H	I
ITEM NO.	DESCRIPTION OF WORK	SCHEDULED VALUE	FROM PREVIOUS APPLICATION (D + E)	THIS PERIOD	MATERIALS PRESENTLY STORED (NOT IN D OR E)	TOTAL COMPLETED AND STORED TO DATE (D + E + F)	% (G + C)	BALANCE TO FINISH (C - G)	RETAINAGE

REQUEST FOR FIELD INSTRUCTION

Distribution to:
___ OWNER
___ ARCHITECT
___ CONTRACTOR
___ INSPECTOR
___ FIELD
___ OTHER

CONTRACT FOR (project name, address):

RFI NUMBER:

TO: **City of Roseville**
Parks, Recreation & Libraries
Park Development Division
311 Vernon Street
Roseville CA 95678

INITIATION DATE:

CONTRACT DATE:

Category:
_____ Direction not given in Contract Documents
_____ Interpretation of contract requirements
_____ Conflict in contract requirements

Reference:
Contract Drawings _____
Shop Drawings _____
Specifications _____

Subject:

Submitted By:_____ Possible Cost Impact: yes/no Possible Time Impact: yes/no

REPLY:

Answered By: _____ Date: _____ Page ____ of _____

CHANGE ORDER

AIA DOCUMENT G701

Distribution to:
___ OWNER
___ ARCHITECT
___ CONTRACTOR
___ INSPECTOR
___ FIELD
___ OTHER

CONTRACT FOR (project name, address):

CHANGE ORDER NUMBER:

TO (Contractor):

INITIATION DATE:

CONTRACT DATE:

You are directed to make the following changes in this Contract:

Not valid until signed by both the Owner and Architect/Inspector.
Signature of the Contractor indicates his agreement herewith, including any adjustments in the Contract Sum or Contract Time.

The original (Contract Sum) (Guaranteed Maximum Cost) was .....$ _____
Net change by previously authorized Change Orders .....$ _____
The (Contract Sum) (Guaranteed Maximum Cost) prior to this Change Order was .....$ _____
The (Contract Sum) (Guaranteed Maximum Cost) will be (increased) (decreased) (unchanged) by this Change Order.
The new (Contract Sum) (Guaranteed Maximum Cost) including this Change Order will be .....$ _____
The Contract Time will be (increased) (decreased) (unchanged) by _____ ( ) Days.
The Final Contract Working date of this Change Order therefore is _____.

		Authorized:
_____	_____	City of Roseville, Parks & Recreation Department
Architect/Inspector	*Contractor*	*Owner*
_____	_____	311 Vernon Street
Address	*Address*	
_____	_____	Roseville, CA 95678
By: _____	By: _____	By: _____
Date: _____	Date: _____	Date: _____

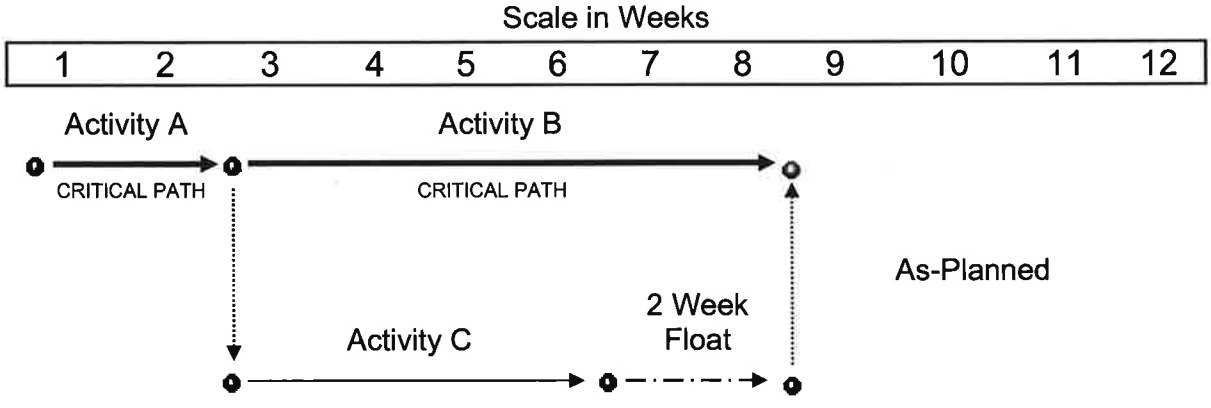
CITY OF ROSEVILLE CALIFORNIA

Project Schedule Sample

Checklist of Preparation of CPM Schedules

1. The structural breakdown of the project.
2. The types of work to be performed and the labor trades involved.
3. Permit requirements.
4. Procurement, fabrication, delivery, installation and test activities for major materials and equipment.
5. Submittal and approval of shop and working drawings and material samples.
6. Availability and access to work areas.
7. Procurement and delivery of owner-furnished equipment.
8. Interfaces and dependencies with preceding, concurrent and follow-up contractors (and their subcontractors, if any).
9. Availability of workforce and special skills required.
10. Material and equipment restrictions and availability.
11. Distance to and from the jobsite for the labor force, the delivery of materials and the company's personnel.
12. Potential utility interruptions.
13. Temporary construction utility storage space.
14. Laydown space and storage space.
15. Environmental controls.
16. Special regulations.
17. Climate considerations.
18. Special construction equipment and techniques.
19. Interim milestone dates.
20. Contingency plans for critical events.
21. Any other significant elements peculiar to the project in question.

Sample Contemporaneous Time Frame Analysis



CITY OF ROSEVILLE CALIFORNIA

Submittal Summary

Project: _____

Contractor: _____

Reviewed By: _____

To be completed by the City of Roseville Project Manager

#	Item Description	Drawing Sheet / Spec. Reference	(select one)	Date Received	Status *	Date Returned
			as specified substitution			
			as specified substitution			
			as specified substitution			
			as specified substitution			
			as specified substitution			
			as specified substitution			
			as specified substitution			
			as specified substitution			
			as specified substitution			
			as specified substitution			
			as specified substitution			
			as specified substitution			
			as specified substitution			

*Status: 1) No Exceptions Taken, 2) Make Corrections Noted, 3) Revise & Resubmit, 4) Submit Specified Item, 5) Rejected

CITY OF ROSEVILLE
PARK IMPROVEMENT INSPECTION RECORD

Park Name: _____

Address
Contractor

***Building, Public Works (PW) and Environmental Utilities (EU) must sign this card in addition to the Building Inspection Card.**

For Building Construction Contact Building Department	Date	Inspector
Ground Plumbing		
Service Grounding		
Foundation/Forms		
Wire/Membrane		
Joist or Girders		
Floor Insulation		
Ground Mechanical		
Roof Shear		
Wall Shear		
Rough Mechanical		
Rough Plumbing		
DWV		
Rough Electrical (Walls)		
Rough Framing (Walls)		
Roof Framing/Trusses		
Insulation		
Lath		
Scratch Coat		
Sheet Rock Nail		
Roof Sheathing		
Exterior Shear Nail		
Handicap Access		
DO NOT COVER UNTIL ABOVE HAVE BEEN ACCEPTED.		

For Utilities Construction	Contact	Date	Inspector
Water (Street to R/W) (R/W to Building) *	EU		
Sewer, incl. TV test (Street to R/W) (R/W to Building) *	EU		
Recycled Water	EU		
Water (Building)	Bldg		
Sewer (Building)	Bldg		
Domestic Water (R/W to DF)	EU		
Domestic Water (DF)	Bldg		
Electrical (Street to transformer)	Electric		
Electrical (Transformer to building/lights)	Bldg		
Irrigation Mainline	Parks		
DO NOT COVER UNTIL ABOVE HAVE BEEN ACCEPTED.			
PRESSURE TEST AND APPROVAL REQUIRED UPON COMPLETION OF COMPACTION *Confirm Inspecting Department at Pre-Construction Meeting			

ACCEPTED PLANS MUST BE ON THE JOBSITE OR INSPECTIONS WILL NOT BE MADE.

THIS INSPECTION CARD MUST BE POSTED IN A CONSPICUOUS PLACE VISIBLE FROM THE STREET.

CONTRACTORS WILL BE RESPONSIBLE FOR ALL UTILITY BILLS INCURRED PRIOR TO FINAL APPROVAL/ACCEPTANCE.

City Department List

Department	Phone Number	Fax Number
Parks	(916) 774-5748	(916) 746-1759
Engineering	(916) 774-5339	(916) 774-5379
Electric	(916) 774-5600	(916) 784-3797
Environ. Utilities	(916) 774-5770	(916) 774-5690
Building*	(916) 774-5333	(916) 774-5394
Fire	(916) 774-5800	(916) 774-5810
Police	(916) 774-5000	(916) 781-2344

*Request for inspection must be called prior to 3:30pm, Monday through Friday, in order to be scheduled for the next business day.

For Park Improvements	Contact	Date	Inspector
Rough Grading	Parks		
Storm Drain	Parks		
Drain & Manhole locations	Parks		
Electrical Box location	Parks		
Depth of trenches i.e. SD, SS Irrigation Mainline	Parks		
Compaction of trenches, i.e. SD, SS, Irrigation Mainline	Parks		
Play Area Drainage	Parks		
Irrigation Mainline, incl. Pressure test, Trace wire test & Thrust blocks	Parks		
Swing Joints (sample)	Parks		
Flow Meter	Parks		
Shade Shelters	Bldg		
Structural Footings for fencing taller than 6' (backstops, netting, etc.)	Bldg		
DO NOT COVER UNTIL ABOVE HAVE BEEN ACCEPTED			
Compaction tests for hardscape	Parks		
Hardscape layout	Parks		
Preliminary finish grading	Parks		
Overall ADA compliance	Parks		
ADA Compliance to Structure/Bldg	Bldg		
Concrete Forms (prior to pouring)	Parks		
Concrete Finish (sample)	Parks		
Concrete	Parks		
Electrical (Struct. Footings)	Bldg		
Grout Pack (for walls)	Parks		
Asphalt Paving	PW or Parks		

For Park Improvements	Contact	Date	Inspector
SWPPP	PW		
Plant Material (upon delivery)	Parks		
Plant Placement (prior to planting)	Parks		
Irrig. Head Coverage (prior to seeding)	Parks		
Site Furniture Locations (prior to installation)	Parks		
Sign Locations (prior to installation)	Parks		
Controller Installation & Programming (prior to final acceptance)	Parks		
DF- Plumbing	Bldg		
Bacteria Test	EU		

Other

For Park Improvements	Contact	Date	Inspector

Comments

This completed inspection record shall be submitted to the Parks Department Project Manager prior to final acceptance of the project.

Final Sign Off

Parks Inspector _____ Date _____

CITY OF ROSEVILLE
STREETSCAPE INSPECTION RECORD

PROJECT NAME:

PROJECT ADDRESS:

CITYWIDE JOB #: EN #:

CONTRACTOR (NAME & PHONE #):

FOREMAN (NAME & PHONE #):

APPROVED PLANS AND PARKS CONSTRUCTION STANDARDS (CURRENT EDITION) MUST BE PRESENT ON THE JOBSITE OR INSPECTIONS WILL NOT BE MADE. THIS INSPECTION CARD MUST BE AVAILABLE AT THE PROJECT SITE AT ALL TIMES. CONTRACTOR IS RESPONSIBLE FOR ALL UTILITY BILLS INCURRED PRIOR TO FINAL APPROVAL/ACCEPTANCE.

CITY INSPECTOR TO DATE AND INITIAL EACH BOX BELOW AS EACH ITEM IS APPROVED FOR EACH SHEET/PAGE#

Irrigation Main Line	Sheet/Page #	Sheet/Page #	Sheet/Page #	Sheet/Page #	Sheet/Page #
24" Coverage (24" distance between top of pipe and finish grade)					
Trace Wire					
Control Valve Wires (2 extra)					
Saddle Taps					
Control Valves (gate/ball valve & union)					
Quick Coupler					
Gate Valves					
Reclaimed Water Tape					
Thrust Blocks (48 hrs. before MPT)					
Sleeves					
Mainline Pressure Test (MPT)					
Backfill & Compaction					
DO NOT COVER UNTIL ALL OF THE ABOVE IS ACCEPTED					
Irrigation Laterals	Sheet/Page #	Sheet/Page #	Sheet/Page #	Sheet/Page #	Sheet/Page #
18" Coverage (18" distance between top of pipe and finish grade)					
Swing Arms					
Spray Heads					
Sleeves					
Backfill & Compaction					
DO NOT COVER UNTIL ALL OF THE ABOVE IS ACCEPTED					
Valve Boxes	Sheet/Page #	Sheet/Page #	Sheet/Page #	Sheet/Page #	Sheet/Page #
Valve Boxes					
Permanently Branded & Tags					

Soil / Site Preparation	Sheet/Page #	Sheet/Page #	Sheet/Page #	Sheet/Page #	Sheet/Page #
Soil Analysis					
Soil Amendments					
Rototilling					
Finish Grade					
Pre-emergent					
Plant Material Quality	Sheet/Page #	Sheet/Page #	Sheet/Page #	Sheet/Page #	Sheet/Page #
Trees					
Shrubs					
Turf					
Plant Material Installation	Sheet/Page #	Sheet/Page #	Sheet/Page #	Sheet/Page #	Sheet/Page #
Trees					
Shrubs					
Turf					
Mulch					
Irrigation POC & Controller	Sheet/Page #	Sheet/Page #	Sheet/Page #	Sheet/Page #	Sheet/Page #
Master Valve Flow Sensor					
Automatic Controller					
Irrigation Final Items	Sheet/Page #	Sheet/Page #	Sheet/Page #	Sheet/Page #	Sheet/Page #
Coverage Test					
Cross Connection Survey					
Construction Reviews	Sheet/Page #	Sheet/Page #	Sheet/Page #	Sheet/Page #	Sheet/Page #
Pre-final Review					
Maintenance Period					
Final Review					
Turn-In Requirements	Sheet/Page #	Sheet/Page #	Sheet/Page #	Sheet/Page #	Sheet/Page #
As-Built Plans					
Controller Chart					
Other Misc. Inspections	Sheet/Page #	Sheet/Page #	Sheet/Page #	Sheet/Page #	Sheet/Page #

INSPECTIONS MUST BE CALLED-IN 48 HOURS PRIOR TO DESIRED INSPECTION TIME.
A CITY INSPECTOR WILL RESPOND WITHIN 48 HOURS.

PRIMARY CITY INSPECTOR: **PHONE#**

SECONDARY CITY INSPECTOR: **PHONE#**

Irrigation Color Laminate Schematic Example

1. A minimum of 5 colors should be used, and separated so no adjoining laterals are the same color.
2. Laterals shall be traced in a manner that reflects the actual pipe installation, and to include all heads. In cases where Nettafim is used, the <u>area</u> covered by the valve should be outlined. ***(see illustration A)***
3. Valve descriptions shall be outlined with the same color as the lateral it runs. DO NOT color in or cover the valve description with color. The valve number shall also be printed at/on the actual lateral. ***(see illustration B)***
4. Valve descriptions should be of a size and quality that is easily legible (More than one sheet may be required for larger areas).
5. Valve descriptions shall <u>accurately</u> reflect the valve number, size and flow rate as it is installed.

Illustration A

Coloring and numbering laterals

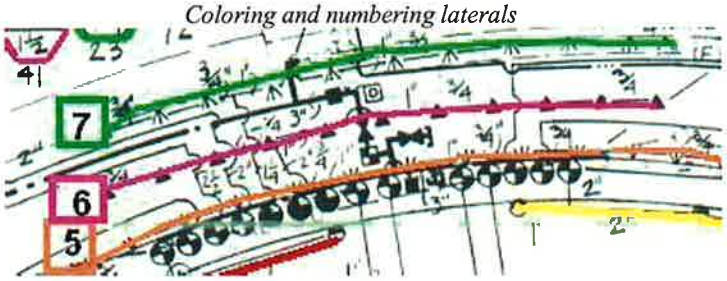
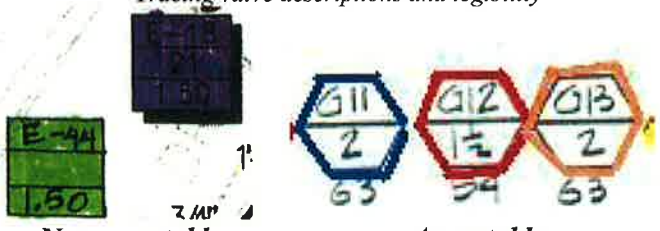


Illustration B

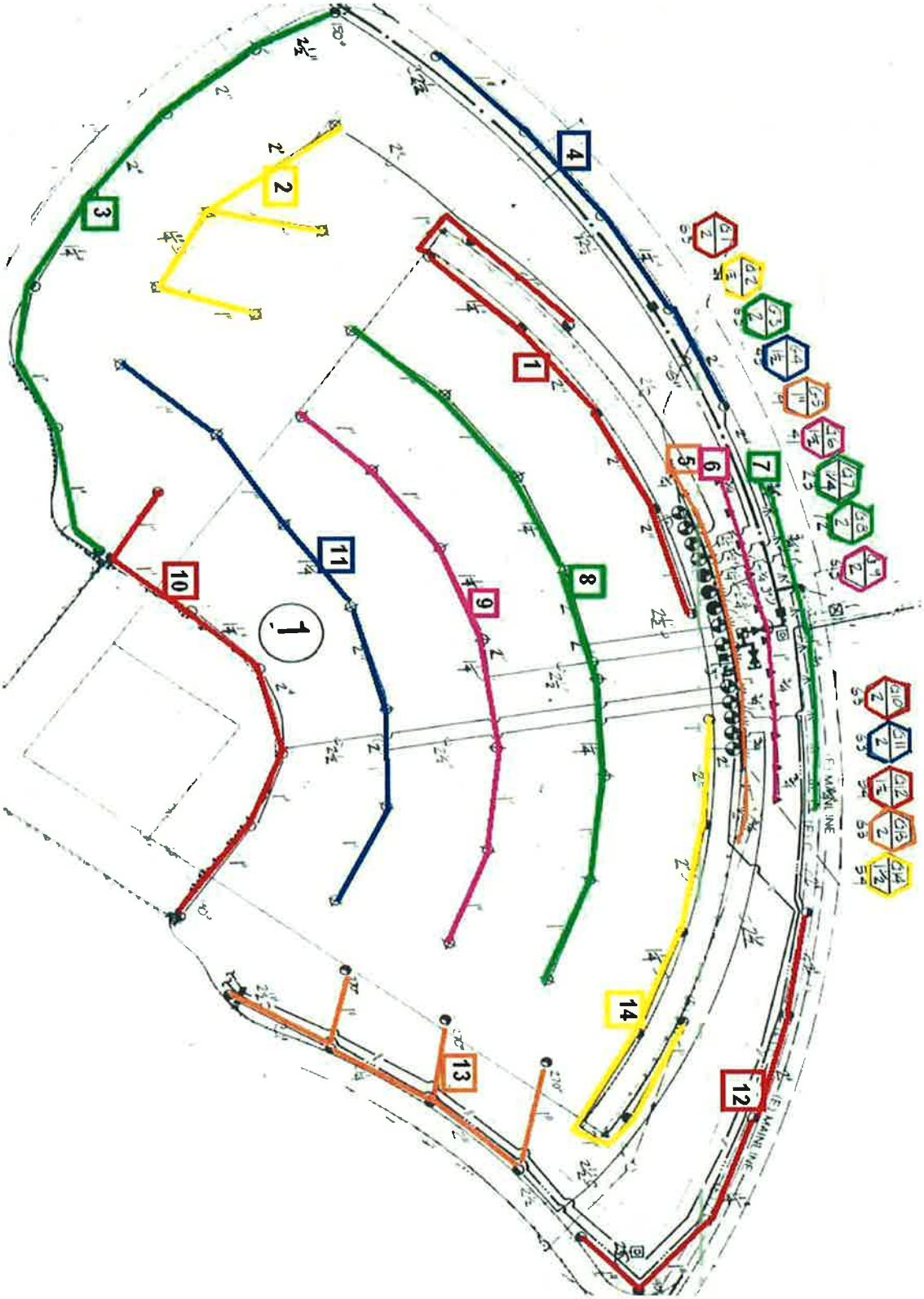
Tracing valve descriptions and legibility



<u>Not</u> acceptable ***Acceptable***

**See complete example on next page*

Irrigation Color Laminate Schematic Example



****Not to scale*

CALSENSE

Controller Name

Station	In Use	Flow Rate (gpm)			Size (sq. ft.)	Precipt Rate (in/hr)	Description
1	☑	1					
2	☑	1					
3	☑	1					
4	☑	1					
5	☑	1					
6	☑	1					
7	☑	1					
8	☑	1					
9	☑	1					
10	☑	1					
11	☑	1					
12	☑	1					
13	☑	1					
14	☑	1					
15	☑	1					
16	☑	1					
17	☑	1					
18	☑	1					
19	☑	1					
20	☑	1					
21	☑	1					
22	☑	1					
23	☑	1					
24	☑	1					
25	☑	1					
26	☑	1					

CALSENSE®

Controller Name

Station	In Use	Flow Rate (gpm)			Size (sq. ft.)	Precipt Rate (in/hr)	Description
27	☑	1					
28	☑	1					
29	☑	1					
30	☑	1					
31	☑	1					
32	☑	1					
33	☑	1					
34	☑	1					
35	☑	1					
36	☑	1					
37	☑	1					
38	☑	1					
39	☑	1					
40	☑	1					
41	☑	1					
42	☑	1					
43	☑	1					
44	☑	1					
45	☑	1					
46	☑	1					
47	☑	1					
48	☑	1					

Coverage Tests and Irrigation Audits for City of Roseville Parks and Streetscapes

Purpose:

- Maximize irrigation water efficiency by ensuring proper installation and functioning of irrigation system as designed.
- Analyze water requirements and irrigation use in the context of each site's unique conditions.
- Develop irrigation schedules based on water requirements, quality and availability.
- Make maintenance recommendations to keep the irrigation system working reliably and cost effectively.

Coverage Tests:

- Prior to planting, the Contractor shall perform a coverage test to confirm that water coverage is complete and adequate, and produces no overspray onto hardscapes.
- Performed on the entire irrigation system and in the presence of the Parks Inspector.
- The irrigation system must be connected to the City water system through the water meter. Temporary connections are not allowed.
- For park projects with turf:
    - Survey of the Distribution Uniformity (Low Quarter) of each irrigation zone containing turf to be performed prior to planting of turf.
    - The irrigation system must be 100% complete, including functionality of the irrigation controller and booster pump, if present.
    - Reported deficiencies in Distribution Uniformity may require corrective measures prior to approval of turf planting.

Irrigation Audits:

- A landscape irrigation audit shall be performed after all landscape and irrigation is installed and 100% complete.
- All landscape irrigation audits shall be conducted by a third party certified landscape irrigation auditor. Landscape audits shall not be conducted by the person who designed the landscape or installed the landscape.
- The water audit shall conform to the specific water audit requirements of the City of Roseville Environmental Utilities Department, and any supplemental requirements from the City of Roseville Parks, Recreation & Libraries

Department. The contractor shall submit a comprehensive landscape irrigation audit. This shall include, but is not limited to:

  - A completed Field Audit Submission Package **(City of Roseville provided forms only)**
  - Complete system evaluation, including site conditions, system and flow data.
  - Scheduling parameters used to set the irrigation controller.
  - An Irrigation schedule for the landscape provided to the owner.

- A minimum of 25% of all zones shall be audited. The 25% minimum shall be a representative sample of each irrigation method present (i.e. Rotors, bubblers, rotary nozzles, drip, etc.), and is in addition to any turf zones audited during the coverage test.
- Any deficiencies noted in the audit report such as, but not limited to, run-off, overspray, obstruction of spray patterns, etc., shall be corrected and signed off as such by the original irrigation auditor prior to submission of the report. Do not submit audit reports with uncorrected deficiencies.

Best Management Practices for Preparing for a Water Audit

System tune-up	• Level and adjust sprinkler heads flush with finish grades or as outlined in the Parks Construction Standards. • Flush all nozzles, unplug any plugs. • Adjust spray patterns to eliminate overspray over hardscapes, fences and walls. • Double check all heads are matched precipitation rates per station.
Calculate correct run times. Develop water schedules based on weather and/or fine tune the water schedules	• Recognize that each station's performance will vary. Adjust schedules outlined in the approved plans accordingly. • Reflect changes in actual site conditions and microclimates. • Make notations of schedule adjustments on the as-built plans.
Test operating pressures	• Test pressure at the point of connection (after the backflow), middle of the system and at the end of the system. • Consider pressure changes at build-out.

**excerpted from "Certified Landscape Irrigation Auditor" book by the Irrigation Association.*

Water Audit Checklist: A Guide to Preparing For and Conducting an Audit

Site Name:_____ Date: _____

Auditor: _____

Controller ID #: _____ Total # of Stations: _____

Station #:						
Plant Material Type (T= Turf; L= Landscaping)						
Sprinkler Type (R=Rotor, S = Pop-Up Spray, W = water efficient –drip, sub surface, micro, mp rotator, etc.)						
Observed Problems:						
Valve Malfunctions						
Low Pressure						
High Pressure						
Tilted Sprinkler Heads						
Spray Deflection						
Sunken Sprinkler Heads						
Worn or Broken Sprinkler Heads						
Missing Sprinkler Heads						
Unmatched Precipitation Nozzles						
Plugged Equipment						
Arc Management						
Low Sprinkler Drainage						
Leaky Seals or Fittings						
Lateral or Drip Line Leaks						
Slow Drainage or Ponding						
Thatch or Roots of Mature Plantings impacting water Infiltration						
Compaction/Run-Off						
Improper Zoning/Microclimate						
Lack of Adequate Flows						
Run Time Length						
Run Time Cycles						
Run Time Days/Week						
Flow Sensors Installed/Functioning						
Pressure After Backflow						
Pressure at Middle of System						
Pressure at Last Sprinkler in System						
Comments:						

Root Management Cue Card

Consistent root management in the nursery promotes structurally stable and healthy trees in the landscape. Improperly managed root balls can form permanent defects, such as circles and bends on the periphery. Follow these guidelines for managing roots to reduce defects on young trees.

The root ball should be inspected at each shift to a larger container starting with the liner (the young tree in its original container, Fig. 1A). Root pruning on the periphery and bottom of liner root ball removes most defects (Fig. 1B).

Cut a root back to the point just behind the bend (Fig. 2A) to remove the bend. Cutting the root at a point after the bend (Fig. 2B) is less effective because the bend remains. Roots that grow down and around the sides of the liner root ball become woody as they enlarge in diameter (Fig. 3, right). These woody roots retain their original deflected orientation, which can cause health and stability problems for the tree.

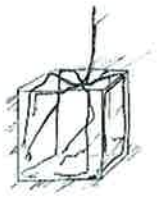


Figure 1A. Roots growing on the periphery of the liner.



Figure 1B. Pruning the liner to remove roots growing on the periphery.

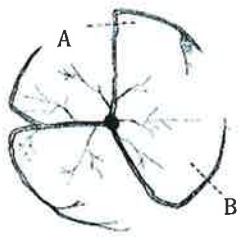


Figure 2. Cut roots at (A) to form new roots that grow away from the trunk (see Fig. 5). Do not cut roots at (B), since the defects can regrow.

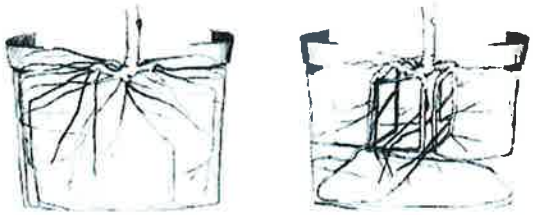


Figure 3. A quality root system develops if the roots of liners (see Fig. 1) are properly pruned when the tree is shifted to a larger container (left). A poor root system develops when deformed roots are not pruned during shifting (right).

Pruning a tree's roots when shifting it to a larger container or before planting it in the landscape improves the root system because it cuts roots back to straight, radial root segments attached to the trunk (Fig. 4). A pruned root ball will be smaller than it was before pruning. Certain types of containers reduce root growth on the periphery of the root ball, so less root pruning may be needed. In some instances, root defects develop further inside the root ball. In these cases, prune root balls deep enough to remove defects.

In the weeks and months following root pruning, new roots grow away from the cut ends in a fanlike manner (Fig. 5). These new roots provide greater stability and should not girdle the tree.

Whether root defects can be corrected depends on their location in the root ball, severity, tree species, water management, size of roots, and time of year. It is easier to cut defective roots when a tree is younger than when it is older (Fig. 6).
Ideally, roots should be inspected and defective roots pruned at each shift to a larger container, reducing the need to heavily prune larger roots.

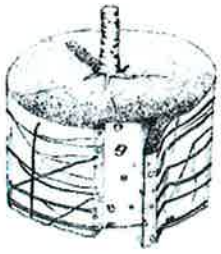


Figure 4. Pruning the roots on the periphery of a container root ball.

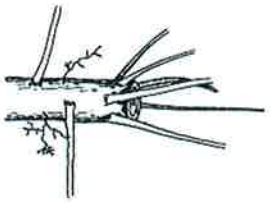


Figure 5. Roots growing from a cut root.

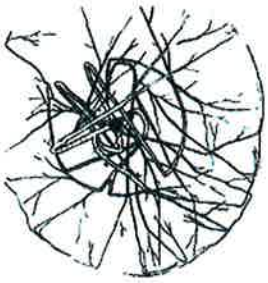


Figure 6. The liner, 5-gallon, and 15-gallon containers left an imprint on this root system. These root defects would be difficult to correct at this stage.

Copyright © 2010 Edward F. Gilman and Brian Kempf www.urbantree.org

Urban Tree Foundation

CAL FIRE

ReLEAF

Tree Training Cue Card

Trees that grow to be large are more structurally sound and cost-effective to maintain when trained with a central dominant leader that extends 30 feet or more into the crown (Fig. 1, left). Vigorous, upright branches and stems that compete with the central leader can become weakly attached (Fig. 1, right).

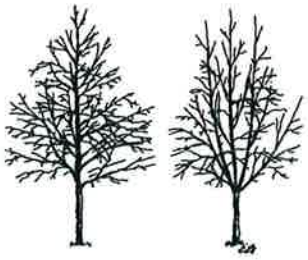


Figure 1. Good tree structure (left); poor structure (right).

Trees with branches spaced along the central leader, or trunk, (Fig. 1, left) are stronger than trees with branches clustered together (Fig. 1, right). Prune newly planted trees to one central leader by shortening competing stems (Fig. 2). All branches and stems should be shorter than the central leader after pruning is completed (Fig. 2, right).

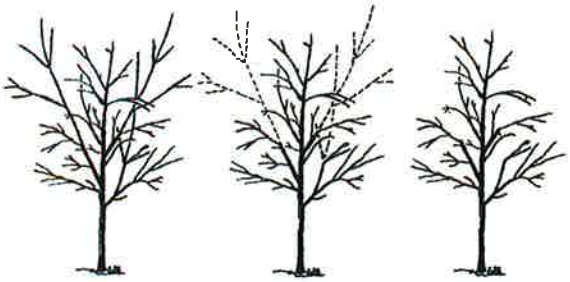


Figure 2. Shorten competing stems to improve structure.

Shorten or remove branches that are larger than half the trunk diameter at planting and every few years thereafter. Shorten them by cutting back to a live lateral branch (Fig 3, top drawing). This lateral branch should be pointed away from the trunk and it should not be growing upright. The central leader should be more visible in the crown center after pruning. Only large-diameter branches need to be pruned because they compete with the leader and could be weakly attached (Fig 3, L). Small branches (Fig. 3, S) do not need pruning because they will not compete with the leader.

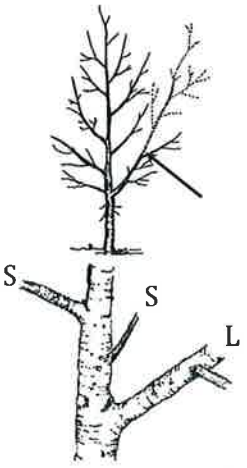


Figure 3. Only large branches need pruning (L). Small branches (S) do not need to be pruned.

Shorten the largest low branches when the tree is young to keep them small (Fig. 4). These shortened branches may be removed later for clearance; removing small branches creates smaller wounds with less likelihood of decay.

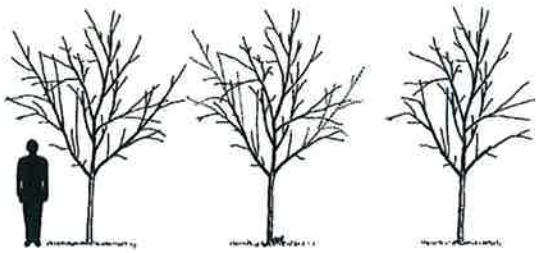


Figure 4. Shorten larger low branches to encourage growth in the leader and improve tree structure.

The best way to shorten large or long stems and branches is to cut them back to a live lateral branch (Fig 5). This slows growth on the pruned parts and encourages growth in the dominant leader creating sound structure.



Figure 5. Reduce a stem back to a live lateral branch to slow its growth.

Remove larger branches by making three cuts (Fig. 6). This prevents the bark from peeling or splitting off the trunk below the cut. Make the final cut back to the branch collar (enlarged area around union of branch and trunk).

Structural Pruning Checklist

1. Develop and maintain a central leader.
2. Identify the lowest branch in what will become the permanent crown.
3. Prevent branches below the permanent crown from growing larger than half the trunk diameter.
4. Space main branches along the central leader.
5. Reduce vigorous upright stems back to lateral branches.

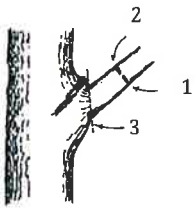


Figure 6. Remove large branches using three cuts.

Pruning Safety

Prune from the ground using proper tools and safety equipment. Do not prune near power lines.

Copyright © 2010 Edward F. Gilman and Brian Kempf www.urbantree.org

Tree Planting Cue Card

Selecting quality trees: Planting quality trees begins by choosing vigorous, structurally sound trees from the nursery. Strong trees have straight roots, a thick trunk with taper, and a good branch structure appropriate for the species (Fig. 1). The root collar (the uppermost roots) should be in the top 2 inches of the root ball.



Figure 1. Quality tree ready for planting.

Digging the hole: A firm, flat-bottomed hole will prevent trees from sinking. Dig the hole only deep enough to position the root collar even with the landscape soil surface (Fig. 2). Use a rototiller or shovel to loosen soil in an area three times the size of the root ball. This loose soil promotes rapid root growth and quick establishment.

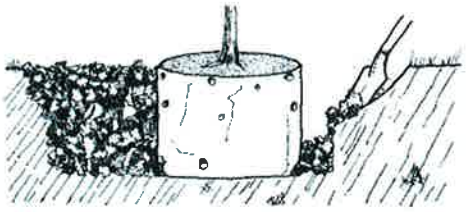


Figure 2. Loosening soil in a large area around the root ball allows for rapid root growth and quick establishment.

Installing the tree: Remove soil and roots from the top of the root ball to expose the root collar; cut away any roots that grow over the collar (Fig. 3). Also cut any roots that circle or mat along the sides and bottom of the root ball (Fig. 4). The root collar should be even with the landscape soil after planting (see Fig. 3). Backfill with soil removed from the hole. Minimize air pockets by packing gently and applying water. Build a berm 4 inches tall around the rootball to help force water through the root ball. Enlarge the berm as the tree establishes.

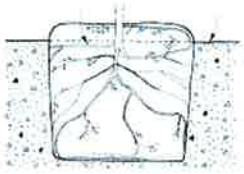


Figure 3. Remove soil and roots growing over the root collar (A) and place collar level with soil surface (B).

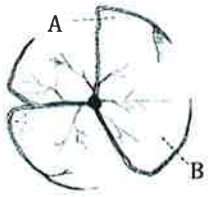
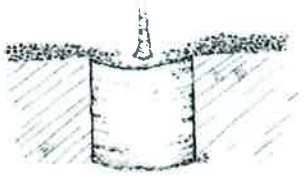


Figure 4. Cut roots at (A) to form new roots that grow away from the trunk. Do not cut roots at (B), since the root defects will regrow.

Staking: Staking holds trees erect and allows the root ball to anchor. Secure the trunk at the point where the tree stands straight. A second stake tied directly to the trunk made of bamboo may be required to straighten the upper trunk.

Mulching: A layer of organic mulch, such as leaf litter, shredded bark, or wood chips, helps protect tree roots from temperature extremes and conserves soil moisture. Mulch also helps prevent grass from competing with the tree for water and nutrients. The mulched area makes it easier to operate mowers and weed eaters without hitting the trunk and compacting soil. Apply mulch to a depth of 3 to 4 inches (slightly thinner on top of the root ball).



Irrigating: Consistent irrigation is critical for establishment.
1. Apply about 3 gallons irrigation per inch of trunk diameter to the root ball 2 or 3 times a week for the first growing season.
2. Increase volume and decrease frequency as the tree becomes established.
3. Weekly irrigation the second year and bimonthly irrigation the third year should be sufficient for establishment.
4. Once established irrigation requirements depend on species, climate and soil conditions.
5. Irrigation devices should be regularly checked for breaks and leaks.

Pruning: Training young trees promotes structurally sound growth and overall tree health. Cut back or remove codominant stems (stems that compete with the central leader) to encourage growth in the central leader (below).

Before Pruning

After Pruning



Urban Tree Foundation

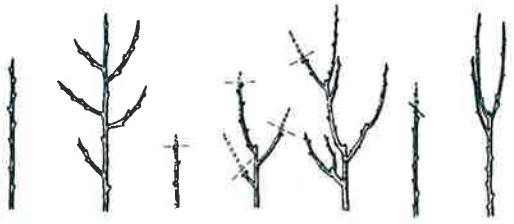
CAL FIRE

ReLEAF

Tree Quality Cue Card

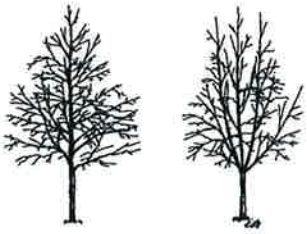
Shade trees that grow to be large should have one relatively straight central leader. Heading the tree is acceptable provided the central leader is retrained.

Desirable Desirable Not desirable



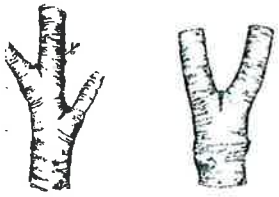
Main branches should be well distributed along the central leader, not clustered together. They should form a balanced crown appropriate for the cultivar or species.

Desirable Not desirable



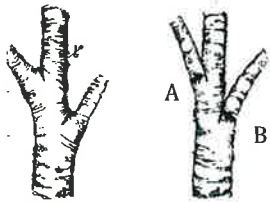
The diameter of branches that grow from the central leader, or trunk, should be no larger than two-thirds (one-half is preferred) the diameter of the trunk measured just above the branch.

Desirable Not desirable



The largest branches should be free of bark that extends into the branch union, known as included bark (see A and B).

Desirable Not desirable



Temporary branches particularly on trees less than 1 inch caliper should be present along the lower trunk below the lowest main branch. These branches should be no larger than 3/8 inch in diameter.

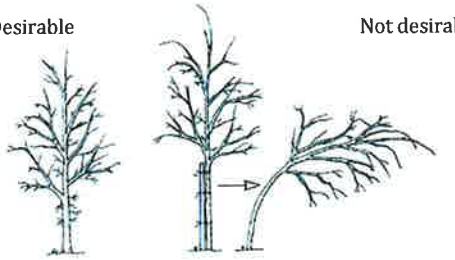
Desirable Not desirable



The trunk should be free of wounds, sunburned areas, conks (fungal fruiting bodies), wood cracks, bleeding areas, signs of boring insects, cankers, or lesions. Properly made recent pruning cuts are acceptable.

The trunk caliper (thickness) and taper should be sufficient so that the tree remains vertical without a stake.

Desirable Not desirable



The root collar (the uppermost roots) should be within the upper 2 inches of the soil media (substrate). The root collar and the inside portion of the root ball should be free of defects, including circling, kinked, and stem girdling roots. You may need to remove soil near the root collar to inspect for root defects.

Desirable Not desirable



The tree should be well rooted in the soil media. Roots should be uniformly distributed throughout the container. The tree's structure and growth should be appropriate for the species or cultivar. When the container is removed, the root ball should remain intact. When the trunk is lifted, both the trunk and root system should move as one.

The root ball should be moist throughout at the time of inspection and delivery. The roots should show no signs of excess soil moisture as indicated by poor root growth, root discoloration, distortion, death, or foul odor. The crown should show no signs of moisture stress as indicated by wilted, shriveled, or dead leaves or branch dieback.

Copyright © 2010 Edward F. Gilman and Brian Kempf www.urbantree.org

Urban Tree Foundation CAL FIRE California ReLEAF Western Chapter International Society of Arboriculture

STRUCTURAL PRUNING GUIDELINES OF NEW TREES

- Structural prune tree before you plant it.
- Develop and/or maintain a central leader.
- Remove dead branches at the point of attachment.
- Remove diseased, decayed, broken, weakly attached, and/or crossing branches.
- Reduce or remove co-dominant leaders and branches.
- Space main branches along one central leader.

BEFORE



OPTION A:
REDUCTION CUT



OPTION B:
REMOVAL CUT



CITY OF ROSEVILLE CALIFORNIA

The City of Roseville's Mission Statement

"To create and maintain a vibrant community environment and enhance the quality of life for our residents, businesses, customers and partners."

We accomplish this by...

Providing exceptional facilities, programs and services in a fiscally responsible manner.

Parks, Recreation & Libraries Mission

To enhance lives and the community by providing exceptional experiences.

For additional information, contact the
Parks, Recreation & Libraries Department
Tel: 916 772-PLAY (7529)
Fax: 916 774-5251
www.roseville.ca.us/parks

UPDATED JUNE 2015

Tree and Plant Root Management Standards & Quality Expectations

Parks, Recreation & Libraries



This brochure is provided to you to ensure that the City's expectations are conveyed to you in a practical and understandable format. These standards and quality expectations are outlined in greater detail in the Parks Construction Standards.

CITY OF ROSEVILLE CALIFORNIA

GIRDLING / CIRCLING ROOTS

If trees are held too long in containers / boxes roots are not able to spread out to the sides anymore and will be deflected by the sidewalls of the container. Roots will then start to girdle or circle around the container walls. If a tree is planted with a circling or girdling roots, the roots will continue to circle and girdle; the roots will not be able to extend to the sides. Trees planted with a girdled or circled root system will also create a structural instability in the future and the trees will fall over within 5 years of planting. Proper root pruning will assure safe, sound and healthy trees.

EXAMPLES





ROOT PRUNING GUIDELINES PRIOR TO PLANTING

Root prune root ball on all four sides by shaving/cutting by using a sharp hand pruning saw.

Start at the top of the root ball and slice down to the bottom like a cake; slice/shave all 4 sides.



On a 15 gal tree cut/shave at least 1-1.5 inches off the root ball on all 4 sides.



On a 24" or 36" box tree cut/ shave at least 2 inches of root ball on all 4 sides.



Cut and remove all remaining/ girdling roots with a sharp pruning shear.



This process will remove any girdling and circling roots deflected by the container wall.

Spread all roots of the sliced root ball to the side to allow proper root development.

ROOT COLLAR INSPECTION

Most often the root collar is buried with soil by the nursery. The root collar (uppermost roots) should be within the upper two inches of soil media and should be free of defects such as circling or girdling roots. You may need to remove some soil in order to find and inspect the root collar. The root collar must be visible before the tree can get planted. Do not bury root collar when planting the tree.



TREE PLANTING & MULCHING

1. Spread out roots to the side of the planting hole.
2. Plant tree at least 3 inches above grade on mount to prevent bowl effect.
3. The tree's beginning root flare must be located at top of grade with installed sod.
4. Water tree when planted.
5. Stake tree.
6. Place mulch around tree, 4 ft. in diameter, with a thickness of 4 inches. Stay 6 inches away from tree trunk to prevent stem decay.

EXPECTATIONS

The City of Roseville's Parks, Recreation & Libraries Department joins you in your efforts in designing parks that are creative, innovative and functional. Following is a list of expectations, which assist us in accomplishing these goals:

QUALITY

Quality is a priority for Roseville parks. We define quality by:

1. Designs include a signature element that separates the park from others. These help our residents to identify with our parks without having to know the park name.
2. Designs that are functional, addresses long term maintenance concerns and are aesthetically pleasing.
3. Designs that meet federal, state and local codes and ordinances.
4. Construction documents that are complete, thorough and easily read with particular attention to grading and irrigation.

ON TIME

Deadlines and milestones are mutually set and met. Communication to anything contrary is provided.

ON BUDGET

Accurate cost estimating is provided and reflective of the most current industry costs. Designs meet the stipulated budget.

INNOVATIVE

To be innovative does not automatically equal high cost. Innovation and creativity can be found in all aspects of the project and can be found in paying attention to the details. Innovation can simply be in the form of finding new ways to accomplish a traditional outcome more effectively and more efficiently.

The expectations shown are only a small collection of samples of what the City of Roseville considers quality finish work. Please consult the Parks Construction Standards for a more detailed outline of design guidelines.

CITY OF ROSEVILLE CALIFORNIA

The City of Roseville's Mission Statement

"To create and maintain a vibrant community environment and enhance the quality of life for our residents, businesses, customers and partners."

We accomplish this by...

Providing exceptional facilities, programs and services in a fiscally responsible manner.

Parks, Recreation & Libraries Mission

To enhance lives and the community by providing exceptional experiences.

For additional information, contact the
Parks, Recreation & Libraries Department
Tel: 916 772-PLAY (7529)
Fax: 916 774-5251
www.roseville.ca.us/parks

UPDATED JUNE 2015

Design Standards & Quality Expectations

Parks, Recreation & Libraries



This brochure is provided to you to ensure that the City's expectations are conveyed to you in a practical and understandable format. These standards and quality expectations are outlined in greater detail in the Parks Construction Standards.

CITY OF ROSEVILLE CALIFORNIA

OUR EXPECTATIONS



Ensure ADA access and path of travel and other code requirements.



Ensure grading considers mowers and on-going maintenance needs.



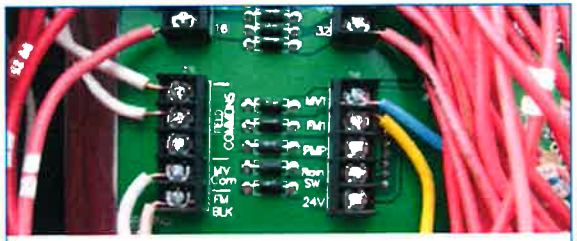
Ensure drains are appropriately located and slopes into the drains are not overly exaggerated nor too gradual.



Site features consider heavy use, potential vandalism and misuse such as skate boards.



Play areas are attractive and contain interest.



Irrigation designs adhere to the standards outlined in the Parks Construction Standards.



Irrigation designs consider site specific constraints and compensate for these challenges.



Irrigation designs consider the most water efficient approach, takes full advantage of available technology and takes steps beyond meeting minimal requirements.



Landscaping offers good variety of sizes, textures and shapes as well as seasonal change.



Trees are selected specific for the space provided, eg, small tree species for a narrow planter, etc.



The City seeks knowledgeable, experienced and creative partners as our design consultants. We search for partners who are flexible, open to ideas and who are willing to push innovation forward by providing suggestions, ideas and solutions.

EXPECTATIONS

The City of Roseville's Parks & Recreation Department joins you in your efforts in building a successful park project. Following is a list of expectations, which pertain to this project:

PROJECT APPROACH

This project is a City project. Professional courtesy is to be displayed at all times. Professional courtesy can be defined as being a team member, displaying an interest in obtaining and performing quality work, a willingness to listen to other team member's opinions, accepting responsibility where the responsibility lies, and acknowledging that we all are pursuing the same goal, that is, to build the best park/project we can.

CORRESPONDENCE

All correspondence shall contain a cover sheet, transmittal or memorandum indicating the name of the recipient, the date and a summary of what is either being transmitted or requested. Typical forms are provided in the Parks Standards book, which shall be used during the course of construction.

DISCREPANCIES

Discrepancies between the plans/specifications and the Parks Construction Standards shall be immediately brought to the attention of the Project Manager. In most cases, the Parks Standards shall prevail over the project plans and specifications. Lack of notification shall place sole responsibility on the contractor without guarantee of City approval.

PRIOR NOTICE

Lack of prior notice for any item of work requiring inspection or review will result in a delay of work. Notice shall be given to the Project Manager a minimum of 48 hours in advance. Same day notices will not be accepted.

The expectations shown are only a small collection of samples of what the City of Roseville considers quality finish work. Please consult the Parks Construction Standards for a more detailed outline of design guidelines.

CITY OF ROSEVILLE CALIFORNIA

The City of Roseville's Mission Statement

"To create and maintain a vibrant community environment and enhance the quality of life for our residents, businesses, customers and partners."

We accomplish this by...

Providing exceptional facilities, programs and services in a fiscally responsible manner.

Parks, Recreation & Libraries Mission

To enhance lives and the community by providing exceptional experiences.

For additional information, contact the Parks, Recreation & Libraries Department
Tel: 916 772-PLAY (7529)
Fax: 916 774-5251
www.roseville.ca.us/parks

UPDATED JUNE 2015

Irrigation Construction Standards & Quality Expectations

Parks, Recreation & Libraries



This brochure is provided to you to ensure that the City's expectations are conveyed to you in a practical and understandable format. These standards and quality expectations are outlined in greater detail in the Parks Construction Standards.

CITY OF ROSEVILLE CALIFORNIA

OUR EXPECTATIONS



Valve boxes aligned and square with hardscape. Boxes are set at 2-1/2" above finish grade in planting areas and 1-1/2" above finish grade in turf areas.



Valves placed centered in valve box, aligned square within the box, tagged and filled with drain rock.



Quick coupler valves set 2-1/2" above finish grade in planting areas, placed centered within the valve box and anchored with an angle iron, 36" long.



Backflow prevention device, meter and flow sensor are aligned.



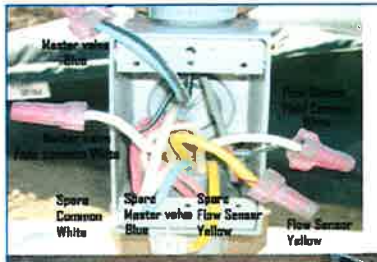
Irrigation heads at grade in planters and in turf areas.



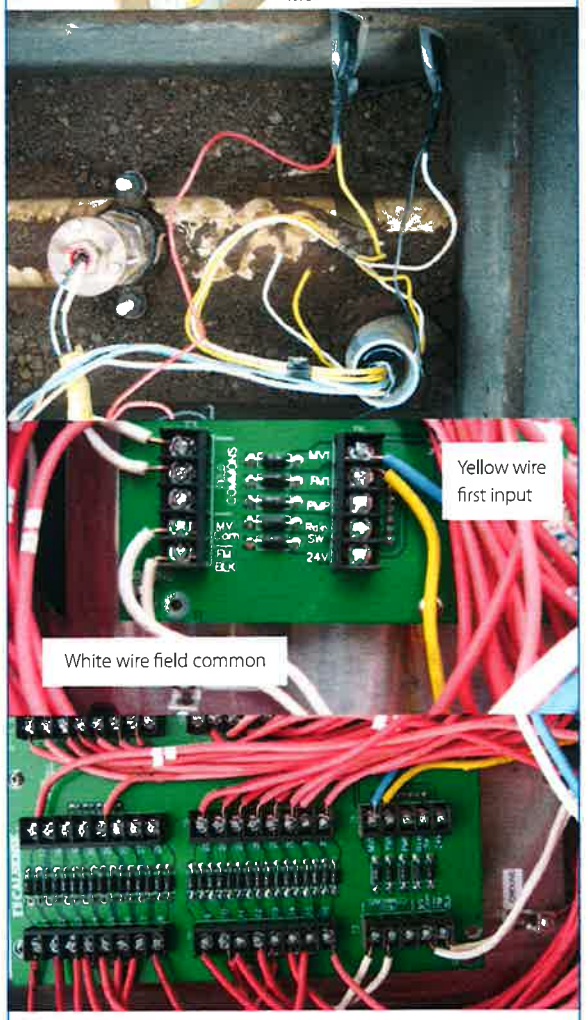
Irrigation enclosure contains equipment, neatly aligned. Manuals and irrigation station layouts are contained inside.



Ground rod 8' from control panel in irrigated areas.



Master valve wiring installed correctly.



Irrigation control wiring installed neatly and correctly.

EXPECTATIONS

The City of Roseville's Parks & Recreation Department joins you in your efforts in building a successful park project. Following is a list of expectations, which pertain to this project:

PROJECT APPROACH

This project is a City project. Professional courtesy is to be displayed at all times. Professional courtesy can be defined as being a team member, displaying an interest in obtaining and performing quality work, a willingness to listen to other team member's opinions, accepting responsibility where the responsibility lies, and acknowledging that we all are pursuing the same goal, that is, to build the best park/project we can.

CORRESPONDENCE

All correspondence shall contain a cover sheet, transmittal or memorandum indicating the name of the recipient, the date and a summary of what is either being transmitted or requested. Typical forms are provided in the Parks Standards book, which shall be used during the course of construction.

DISCREPANCIES

Discrepancies between the plans/specifications and the Parks Construction Standards shall be immediately brought to the attention of the Project Manager. In most cases, the Parks Standards shall prevail over the project plans and specifications. Lack of notification shall place sole responsibility on the contractor without guarantee of City approval.

PRIOR NOTICE

Lack of prior notice for any item of work requiring inspection or review will result in a delay of work. Notice shall be given to the Project Manager a minimum of 48 hours in advance. Same day notices will not be accepted.

The expectations shown are only a small collection of samples of what the City of Roseville considers quality finish work. Please consult the Parks Construction Standards for a more detailed outline of design guidelines.

CITY OF ROSEVILLE CALIFORNIA

The City of Roseville's Mission Statement

"To create and maintain a vibrant community environment and enhance the quality of life for our residents, businesses, customers and partners."

We accomplish this by...

Providing exceptional facilities, programs and services in a fiscally responsible manner.

Parks, Recreation & Libraries Mission

To enhance lives and the community by providing exceptional experiences.

For additional information, contact the Parks, Recreation & Libraries Department
Tel: 916 772-PLAY (7529)
Fax: 916 774-5251
www.roseville.ca.us/parks

UPDATED JUNE 2015

Landscaping Construction Standards & Quality Expectations

Parks, Recreation & Libraries



This brochure is provided to you to ensure that the City's expectations are conveyed to you in a practical and understandable format. These standards and quality expectations are outlined in greater detail in the Parks Construction Standards.

CITY OF ROSEVILLE CALIFORNIA

OUR EXPECTATIONS



Scarify root ball on sides and bottom.



Space plants per plan.



Plant shrubs 2 inches higher with soil over root ball.



Trees staked per the City standards.



Plant shrubs in a basin and place 2" mulch in basin.



Apply two inches of mulch in shrub/groundcover areas.



Plant trees in a basin and place 2" of mulch in basin.

EXPECTATIONS

The City of Roseville's Parks & Recreation Department joins you in your efforts in building a successful park project. Following is a list of expectations, which pertain to this project:

PROJECT APPROACH

This project is a City project. Professional courtesy is to be displayed at all times. Professional courtesy can be defined as being a team member, displaying an interest in obtaining and performing quality work, a willingness to listen to other team member's opinions, accepting responsibility where the responsibility lies, and acknowledging that we all are pursuing the same goal, that is, to build the best park/project we can.

CORRESPONDENCE

All correspondence shall contain a cover sheet, transmittal or memorandum indicating the name of the recipient, the date and a summary of what is either being transmitted or requested. Typical forms are provided in the Parks Standards book, which shall be used during the course of construction.

DISCREPANCIES

Discrepancies between the plans/specifications and the Parks Construction Standards shall be immediately brought to the attention of the Project Manager. In most cases, the Parks Standards shall prevail over the project plans and specifications. Lack of notification shall place sole responsibility on the contractor without guarantee of City approval.

PRIOR NOTICE

Lack of prior notice for any item of work requiring inspection or review will result in a delay of work. Notice shall be given to the Project Manager a minimum of 48 hours in advance. Same day notices will not be accepted.

The expectations shown are only a small collection of samples of what the City of Roseville considers quality finish work. Please consult the Parks Construction Standards for a more detailed outline of design guidelines.

CITY OF ROSEVILLE CALIFORNIA

The City of Roseville's Mission Statement

"To create and maintain a vibrant community environment and enhance the quality of life for our residents, businesses, customers and partners."

We accomplish this by...

Providing exceptional facilities, programs and services in a fiscally responsible manner.

Parks, Recreation & Libraries Mission

To enhance lives and the community by providing exceptional experiences.

For additional information, contact the Parks, Recreation & Libraries Department
Tel: 916 772-PLAY (7529)
Fax: 916 774-5251
www.roseville.ca.us/parks

UPDATED JUNE 2015

Park Construction Standards & Quality Expectations

Parks, Recreation & Libraries



This brochure is provided to you to ensure that the City's expectations are conveyed to you in a practical and understandable format. These standards and quality expectations are outlined in greater detail in the Parks Construction Standards.

CITY OF ROSEVILLE CALIFORNIA

OUR EXPECTATIONS



Valve boxes aligned and square with hardscape. Boxes are set at 2-1/2" above finish grade in planting areas and 1-1/2" above finish grade in turf areas.



Valves placed centered in valve box, aligned square within the box, tagged and filled with drain rock.



Quick coupler valves set 2-1/2" above finish grade in planting areas, placed centered within the valve box and anchored with an angle iron, 36" long.



Backflow prevention device, meter and flow sensor are aligned.



All posts are plumb, and fall zones are maintained at 8'. Age appropriate signs are installed.



Picnic table and benches are horizontal and all bolts are tight. Seat heights are as specified. Concrete slobber is removed.



Irrigation enclosure contains equipment, neatly aligned. Manuals and irrigation station layouts are contained inside.



Electrical transformer and irrigation controller enclosure are aligned.



"Playground Rules" sign is located near all play areas and in plain view. The sign is durable and constructed of aluminum with vinyl lettering. The frame/posts are tubular steel powder coated to match play structure colors.



Vertical surfaces are consistent throughout. Vertical expansion joints are provided and are smooth with the finish surfaces. All edges have been eased at a consistent radius.



Medium broom finished concrete with clean, deep score joints spaced appropriately. No visible cracks or discoloration.

TREE SELECTION

The types of trees selected for planting is dependent on the space available, the urban forest inventory, and the specific plan. A specific plan has been developed with design guidelines outlining the types of preferred trees that help define the aesthetics of the area. Tree selections may be changed over time based on long tern maintenance and safety concerns.



PLANT SELECTION

The types of shrubs and groundcovers are selected for aesthetics. Taller shrubs and hedges are planted to hide fences and walls. Smaller shrubs are selected to minimize the need for pruning. Perennials are selected for annual accent color, but without the need for annual replacement. Groundcovers are selected to provide green space while being cautious to not create trash collectors. Harsh routine pruning shortens the life span of shrubs, thus increasing long term costs.



CITY OF ROSEVILLE CALIFORNIA

The City of Roseville's Mission Statement

"To create and maintain a vibrant community environment and enhance the quality of life for our residents, businesses, customers and partners."

We accomplish this by...

Providing exceptional facilities, programs and services in a fiscally responsible manner.

Parks, Recreation & Libraries Mission

To enhance lives and the community by providing exceptional experiences.

For additional information, contact the Parks, Recreation & Libraries Department
Tel: 916 772-PLAY (7529)
Fax: 916 774-5251
www.roseville.ca.us/parks

UPDATED JUNE 2015

Street Landscape Standards & Quality Expectations

Parks, Recreation & Libraries



This brochure is provided to you to ensure that the City's expectations are conveyed to you in a practical and understandable format. These standards and quality expectations are outlined in greater detail in the Parks Construction Standards.

CITY OF ROSEVILLE CALIFORNIA

PREFERRED PRUNING APPROACHES



"Boxed" pruning along fences, sound walls and parking lot edges to create a continuous hedge.



Plants in medians retain natural shapes, but clipped away from street pavement.



Strapped leafed plants cut back in Fall only and only if they are deciduous species.



Use the shrub's natural shape in the landscapes.

STREET TREE STANDARDS

Street Trees are to be:

- Pruned to ensure an overhead clearance over the street of 15'.
- Pruned to ensure an overhead clearance of 10' over sidewalks.
- Limbs might be pruned when branches overhang adjacent property and pose impending property damage.

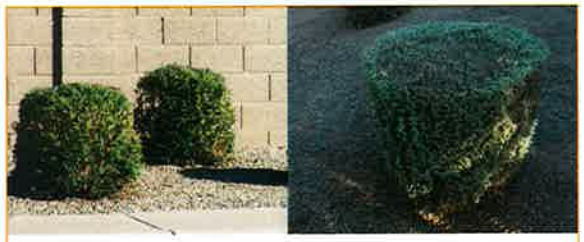
Trees will be removed:

- if the roots are or will be causing pavement damage;
- if the structural integrity of the tree is compromised;
- if the health of the tree is declining; or
- if the tree is dead.





PLEASE **DO NOT**



Prune shrubs in balls or squares if not next to fences, walls or parking lots.



Prune trees without appropriate arboricultural practices.



Prune evergreen plants.



Leave dead plants in place.

CITY OF ROSEVILLE CALIFORNIA

Parks, Recreation & Libraries Department

Section 6:
PARKS STANDARD DETAILS

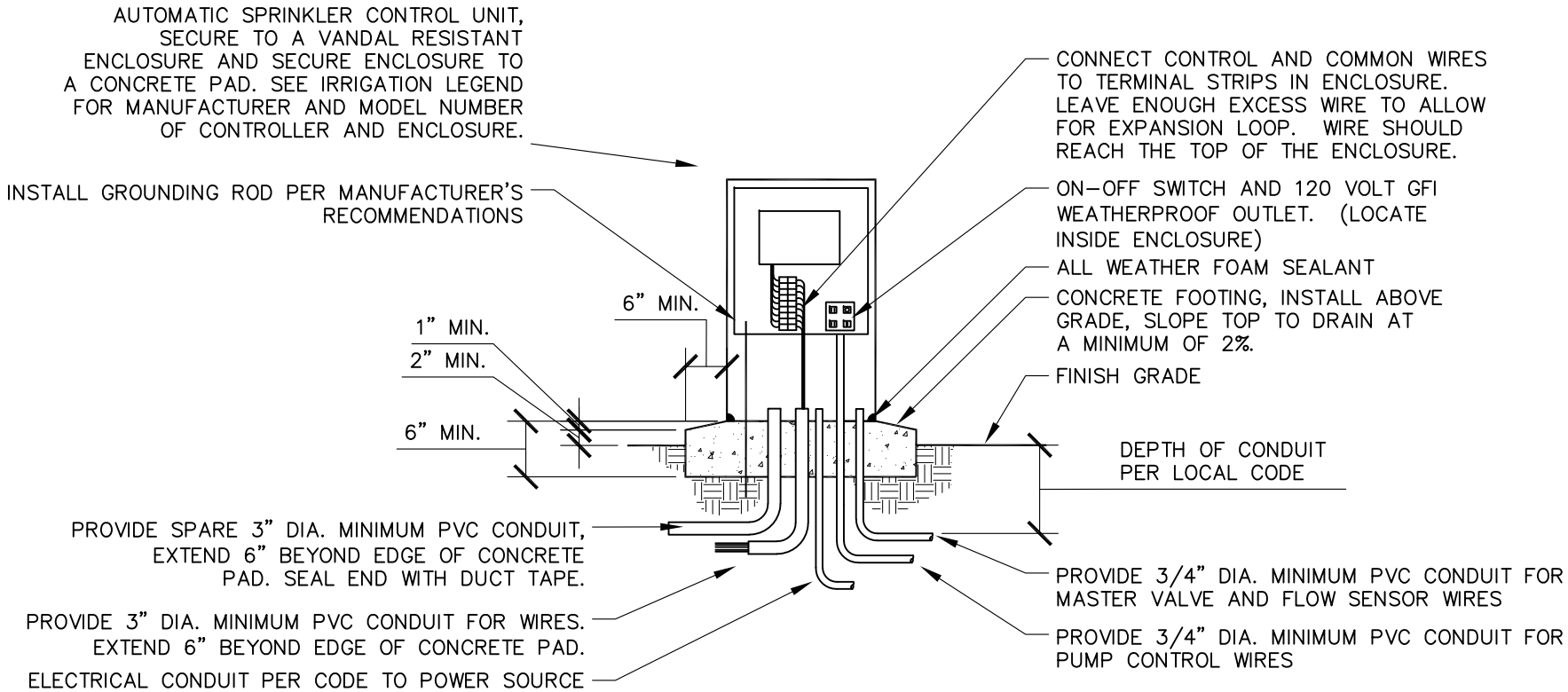
PARKS CONSTRUCTION STANDARDS

INDEX	~~2019~~ 2021 PARKS STANDARDS
IRRIGATION	
CONTROLLER	PK-1
MASTER VALVE - CALSENSE	PK-2
NOT IN USE	PK-3
RECYCLED WATER FILTER	PK-4
PIPE AT PAVEMENT	PK-5
PIPE TRENCH	PK-6
POP-UP ROTOR	PK-7
POP-UP SPRAY	PK-8
ROOT WATERING SYSTEM	PK-9
THRUST BLOCK	PK-10
VALVE - 3" AND SMALLER	PK-11
VALVE - 4" AND LARGER	PK-12
VALVE - DRIP CONTROL	PK-13
VALVE - QUICK COUPLING	PK-14
VALVE - REMOTE CONTROL AT GRADE	PK-15
DRIP FLUSH VALVE AND OPERATION INDICATOR	PK-16
LANDSCAPE	
GROUNDCOVER PLANTING	PK-17
SHRUB PLANTING	PK-18
SHRUBS ON SLOPES	PK-19
TREE PLANTING	PK-20
TREES ON SLOPES	PK-21
MISCELLANEOUS	
BARBEQUE	PK-22
DRINKING FOUNTAIN	PK-23
PICNIC TABLE AND BENCH INSTALLATION HEIGHTS	PK-24
HEADER	PK-25
KEYSTONE SEAT WALL/ RETAINING WALL	PK-26
MOWBAND	PK-27
PARK IDENTIFICATION SIGN	PK-28
SECURITY LIGHT WITH CONCRETE COLLAR	PK-29
PAVING	
ASPHALT CONCRETE PAVING	PK-30
CONCRETE PAVING	PK-31
CONTROL JOINTS	PK-32
DECOMPOSED GRANITE PAVING	PK-33
PLAY AREAS	
PLAY AREA - ACCESS RAMP “A”	PK-34
PLAY AREA - ACCESS RAMP “B”	PK-35
PLAY AREA - CONCRETE CURB	PK-36
PLAY AREA - DRAIN	PK-37
PLAY AREA - PERFORATED PIPE DRAIN	PK-38

Formatted: Indent: Hanging: 0.19"

PARKS CONSTRUCTION STANDARDS

INDEX	~~2019~~ 2021 PARKS STANDARDS
BOLLARDS & FENCES (ACCESS RESTRICTIONS)	
STATIONARY BOLLARD	PK-39
CHAIN LINK FENCE	PK-40
POST AND CABLE FENCE	PK-41
NOT IN USE~~SPLIT RAIL FENCE~~	PK-42
BIKE TRAILS	
BIKE TRAIL - SECTION	PK-43
BIKE TRAIL - STRIPING	PK-44
SPORTS FIELDS	
NOT IN USE	PK-45
NOT IN USE	PK-46
BALL FIELD LAYOUT	PK-47
DUGOUT LAYOUT	PK-48
INFIELD EDGE DRAIN & WARNING TRACK	PK-49
SIDELINE FENCE	PK-50
SKINNED INFIELD IRRIGATION LAYOUT	PK-51
NOT IN USE	PK-52
HORSESHOE COURT LAYOUT	PK-53
VOLLEYBALL COURT LAYOUT	PK-54
BASKETBALL HALF-COURT LAYOUT	PK-55



JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

NOTES

1. COMMON WIRE TO BE WHITE & CONTROL WIRE TO BE RED IN COLOR. BUNDLE AND TAPE AT INTERVALS OF 10 FT. O. C.
2. NO SPLICES SHALL BE MADE BETWEEN CONTROLLER AND REMOTE CONTROL VALVES UNDER 500 LINEAL FEET.
3. ORDER WITH MANUFACTURER'S FACTORY FINISH STAINLESS STEEL.
4. INSULATE AROUND INSIDE BASE OF BOX WITH ALL WEATHER FOAM SEALANT.
5. GROUNDING ROD SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS..
6. GROUND TEST TO BE CONDUCTED AFTER INSTALLATION, NOT TO EXCEED 25 OHMS.
7. MASTER VALVE WIRE SHALL BE BLUE.
8. PROVIDE COLOR CODED MAP OF VALVE LOCATIONS.

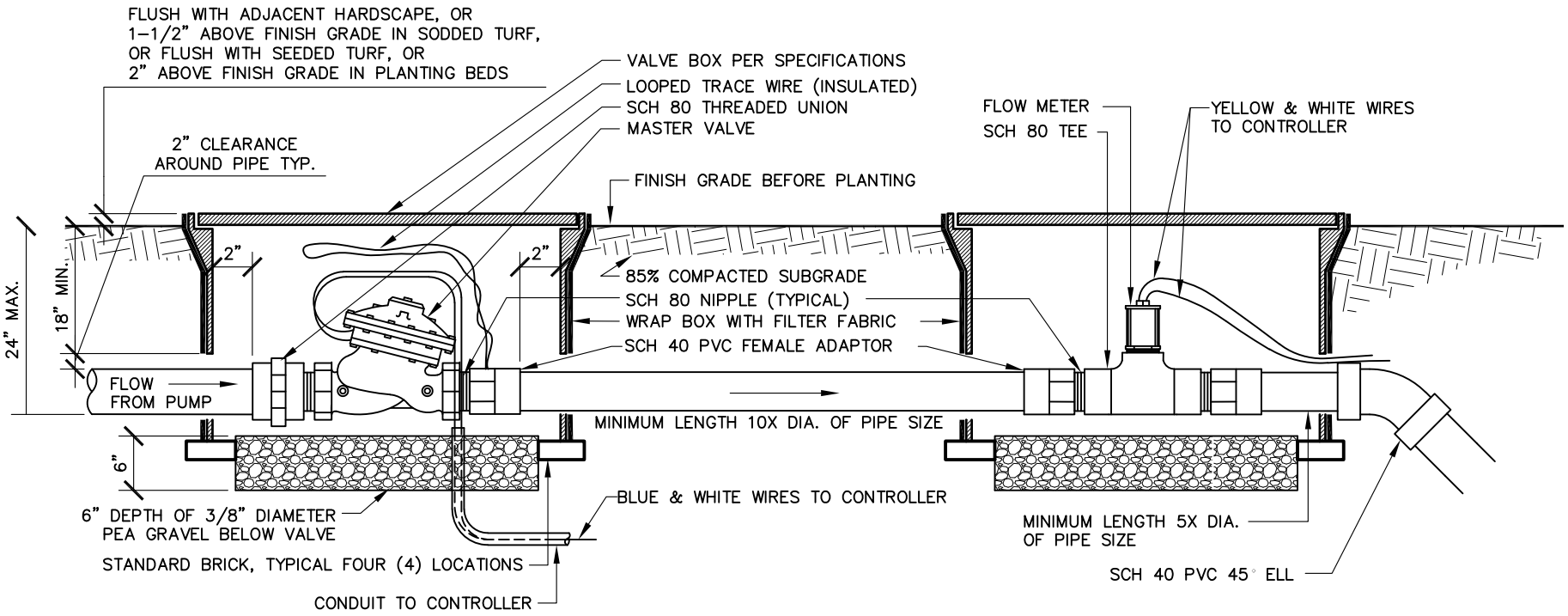
CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

CONTROLLER

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK-1



JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

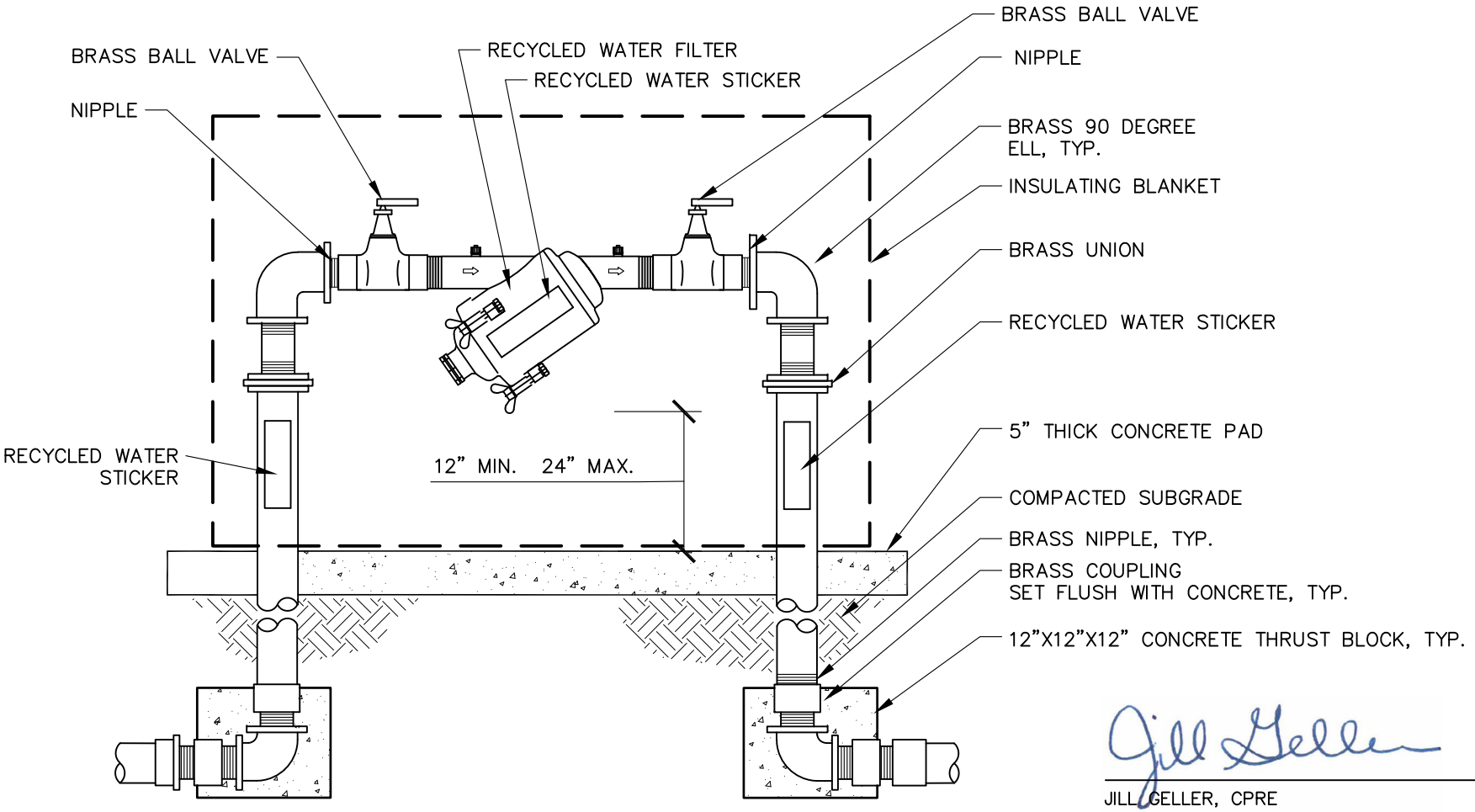
MASTER VALVE CALSENSE

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK-2

NOTES

1. INSTALL VALVES A MINIMUM OF 12" FROM STRUCTURES OR HARDSCAPING.
2. INSTALL VALVES IN PLANTER BEDS WHEREVER POSSIBLE.
3. PLACE VALVE BOX AT RIGHT ANGLES TO STRUCTURES OR HARDSCAPING.
4. INSTALL VALVE BOX SO THAT TOP OF BOX IS FLUSH WITH ADJACENT HARDSCAPING.
5. USE TEFLON TAPE ON ALL MALE THREADS.
6. INSULATE AROUND PIPE AT BOX OPENINGS WITH PLASTIC SHEETING TO PREVENT SOIL FROM ENTERING BOX.
7. REFER TO SPECIFICATIONS FOR REQUIREMENTS FOR TAPING, EXPANSION COILS, WIRE CONNECTIONS, ETC.
8. FOR USE WITH CALSENSE CONTROLLERS ONLY.



JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

NOTES

1. USE TEFLON TAPE ON ALL THREADED FITTINGS.
2. LOCATE IN SHRUB/GROUNDCOVER AREA WHENEVER POSSIBLE.
3. PROVIDE INSULATING BLANKET OVER RECYCLED WATER FILTER.
4. PIPE AND FITTINGS 3" OR SMALLER SHALL BE BRASS; 4" OR LARGER SHALL BE DUCTILE IRON.
5. RECYCLED WATER STICKERS SHALL BE PURPLE AND SHALL READ "RECYCLED WATER – DO NOT DRINK"

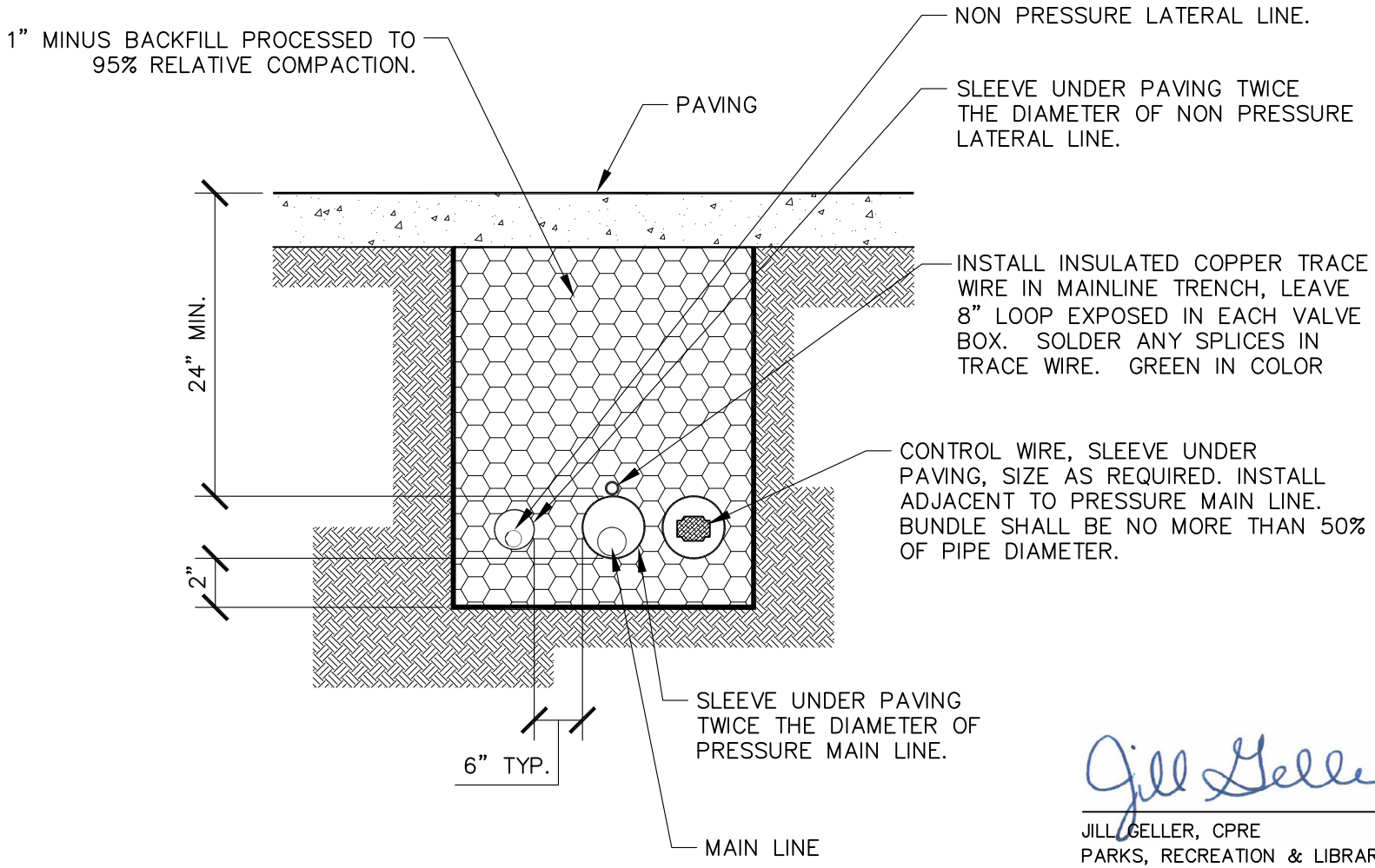
CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

RECYCLED WATER FILTER

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK–4



JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

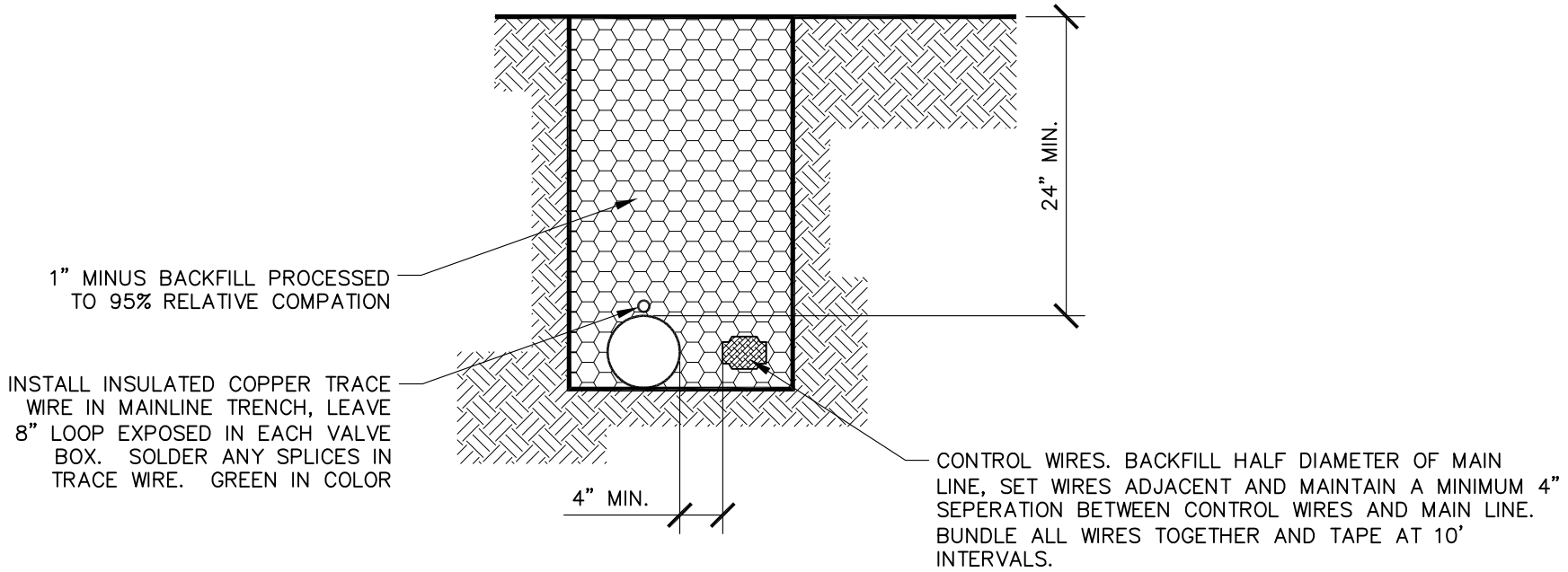
PIPE AT PAVEMENT

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

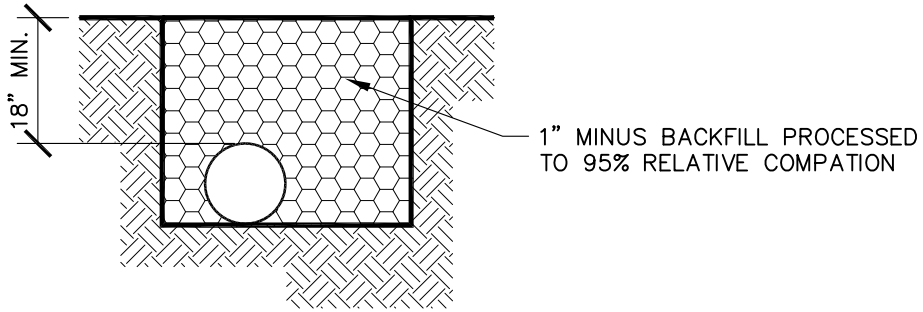
PK-5

NOTES

1. ALL SLEEVES TO BE SCHEDULE 40 PVC.
2. EXTEND ALL SLEEVES 12" BEYOND EDGE OF HARDSCAPING.
3. CAP BOTH ENDS OF ALL SPARE SLEEVES AND MARK BOTH ENDS WITH 3M LOCATOR BALLS.
4. INSTALL SPARE SLEEVE UNDER ROADWAYS



PRESSURE MAIN LINE



NON PRESSURE LATERAL

JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

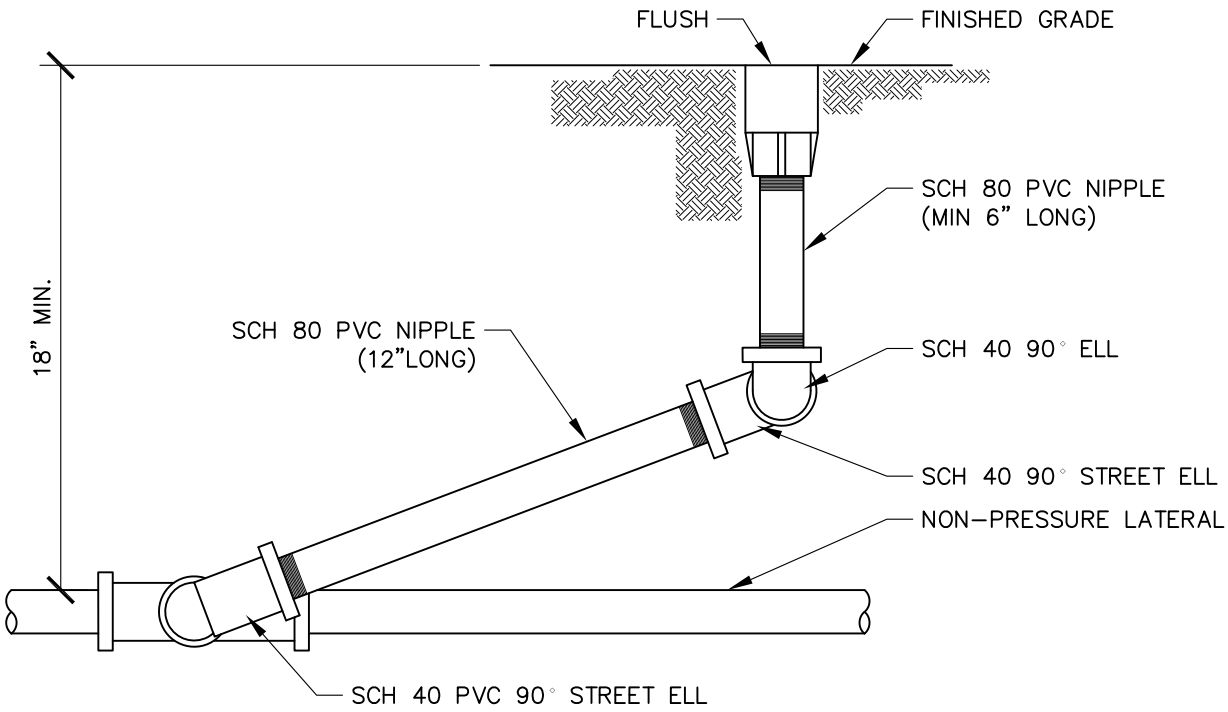
PIPE TRENCH

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK–6

NOTES

1. RECLAIMED WATER REQUIRES BURIED TAPE LINE PER PUBLIC WORKS CONSTRUCTION STANDARDS.



JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

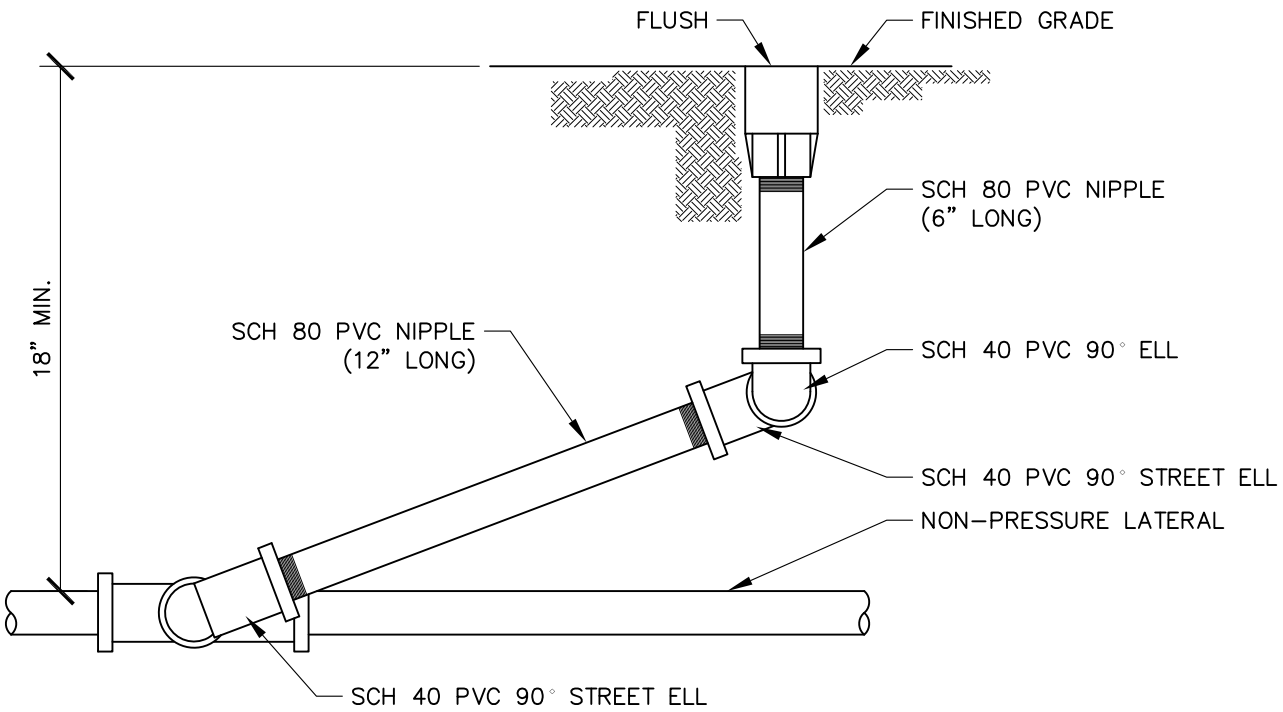
POP-UP ROTOR

NOTES

1. LOCATE HEAD 2" FROM WALKS, CURBS, HARDSCAPING, MOW STRIPS, AND HEADER BOARDS, OR AS REQUIRED BY CURRENT WELO REGULATIONS.
2. LOCATE HEAD 12" FROM ALL STRUCTURES.
3. USE TEFLON TAPE ON ALL THREADED FITTINGS. DO NOT USE MARLEX FITTINGS.
4. SWING JOINT ASSEMBLY PIPE SIZE MUST MATCH INLET SIZE OF SPRINKLER.
5. PREFABRICATED SWING JOINTS ARE ALLOWED, UPON APPROVAL.

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK-7



JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

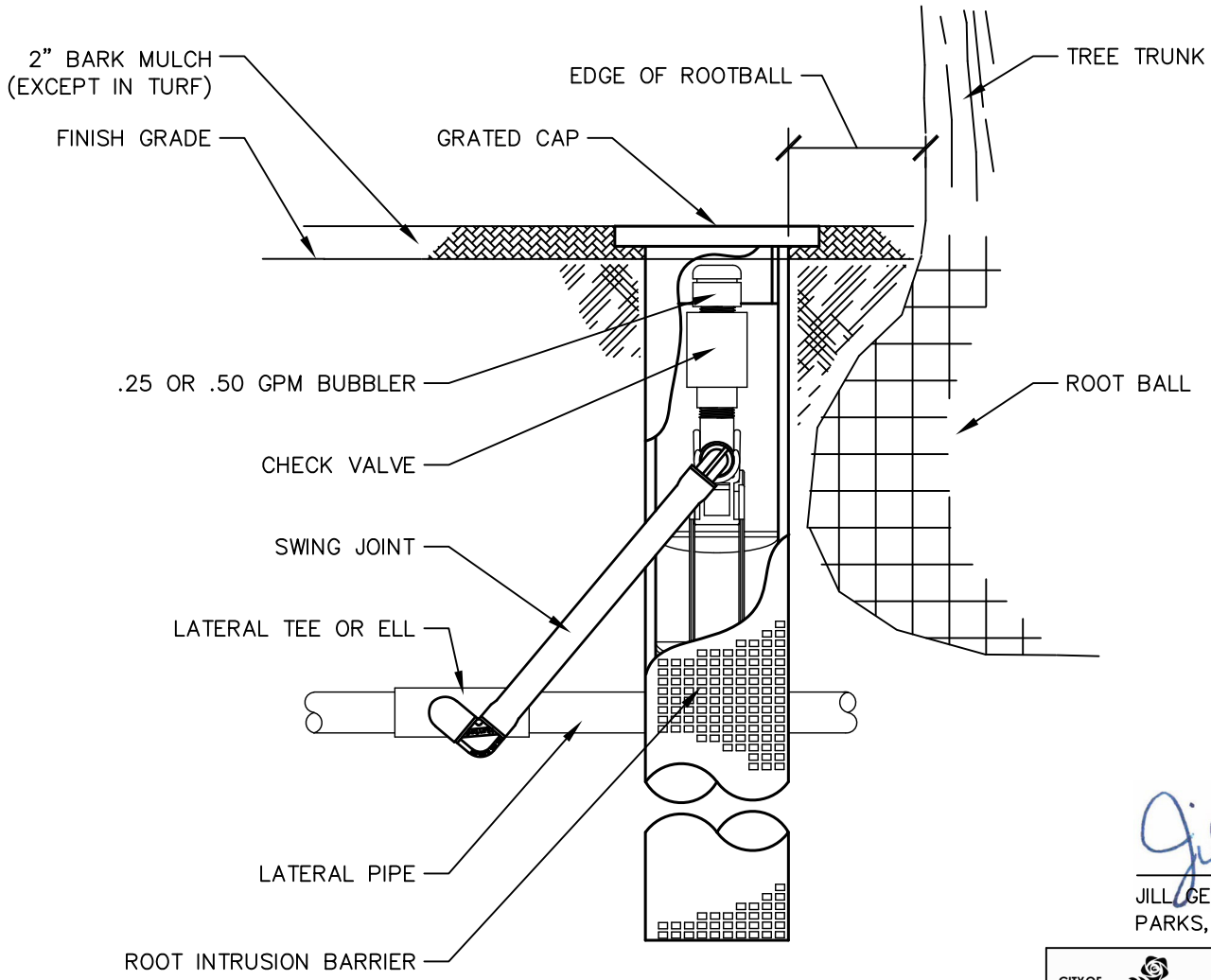
POP-UP SPRAY

NOTES

1. LOCATE HEAD 2" FROM WALKS, CURBS, HARDSCAPING, MOW STRIPS, AND HEADER BOARDS, OR AS REQUIRED BY CURRENT WELO REGULATIONS.
2. LOCATE SPRAY HEADS 12" FROM ALL STRUCTURES IN TURF AREAS AND 6" FROM ALL STRUCTURES IN GROUND-COVER AREAS.
3. USE TEFLON TAPE ON ALL THREADED FITTINGS. DO NOT USE MARLEX FITTINGS.
4. PREFABRICATED SWING JOINT ARE ALLOWED, UPON APPROVAL.
5. 6" LONG SCH 80 PVC RISER NIPPLE NOT REQUIRED FOR 12" POPUP HEADS.

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK-8



JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

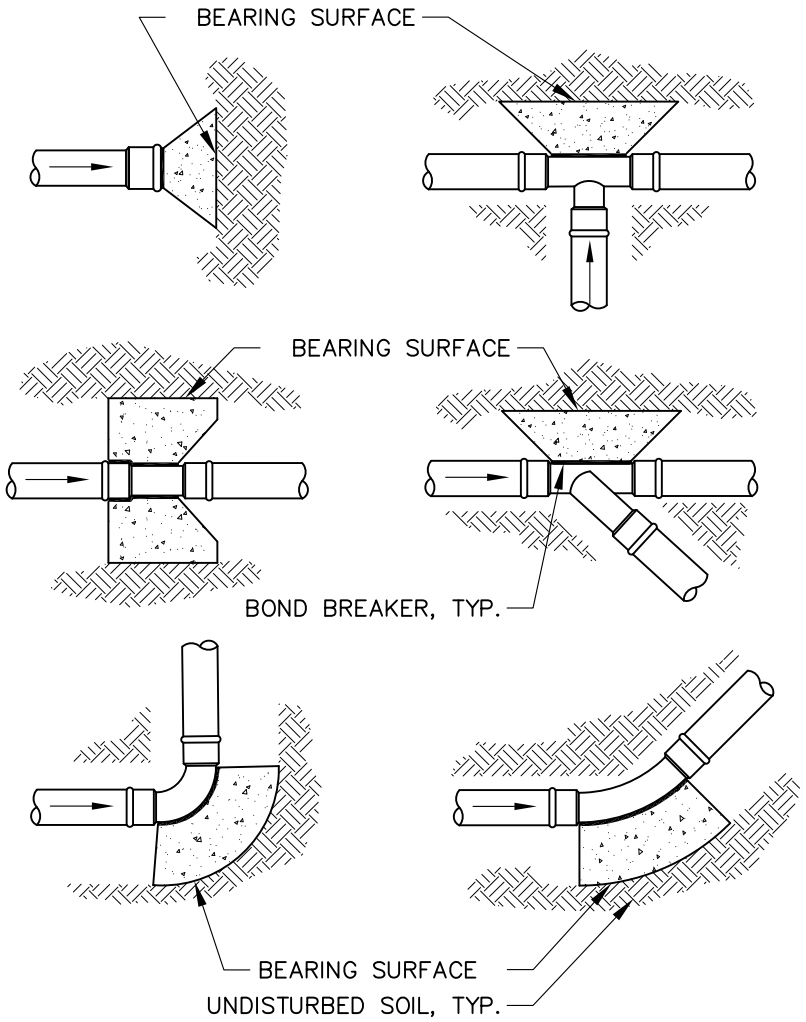
ROOT WATERING SYSTEM

NOTE

1. INSTALL FILTER FABRIC SLEEVE
2. SEE PLANS AND SPECS FOR APPROVED MANUFACTURERS AND MODEL NUMBERS

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK–9



MINIMUM BEARING SURFACE AREA

PIPE SIZE	TEE AND PLUG	90 DEGREE BEND	45 DEGREE BEND
1–1/2"	0.45 SQ. FT.	0.63 SQ. FT.	0.34 SQ. FT.
2"	0.69 SQ. FT.	0.97 SQ. FT.	0.53 SQ. FT.
2–1/2"	1.0 SQ. FT.	1.41 SQ. FT.	0.77 SQ. FT.
3"	1.48 SQ. FT.	2.10 SQ. FT.	1.14 SQ. FT.
4"	2.43 SQ. FT.	3.45 SQ. FT.	1.87 SQ. FT.
6"	5.25 SQ. FT.	7.41 SQ. FT.	4.02 SQ. FT.
8"	9.08 SQ. FT.	12.83 SQ. FT.	6.96 SQ. FT.
10"	14.93 SQ. FT.	21.07 SQ. FT.	11.44 SQ. FT.

JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

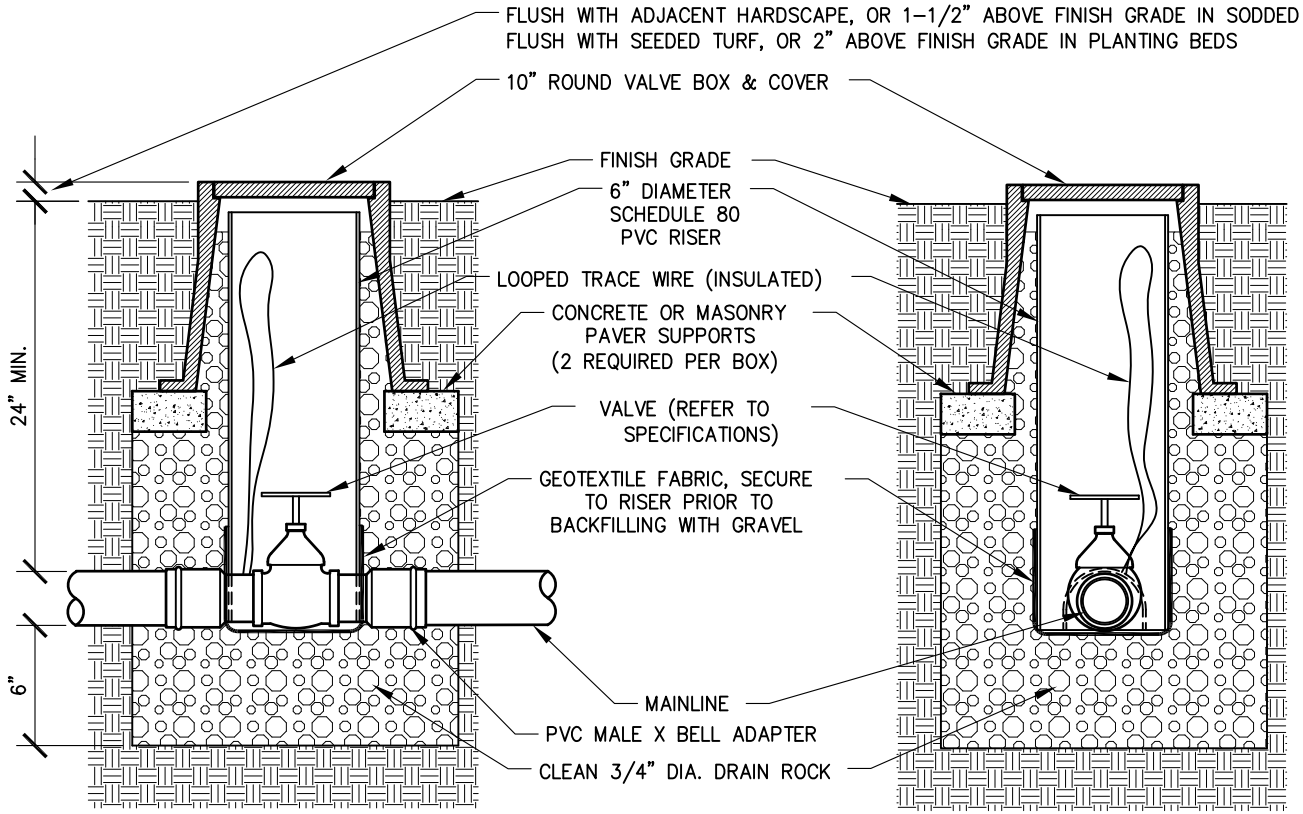
THRUST BLOCKS

NOTES

1. SIZE THRUST BLOCKS AS SPECIFIED ABOVE.
2. DO NOT ENCASE CONTROL WIRES IN THE CONCRETE.
3. ALL FITTINGS MUST BE WRAPPED WITH POLYETHYLENE TO PREVENT CONCRETE FROM ADHERING TO BOLTS OR PIPES.
4. JOINTS AND BOLTS SHALL BE ACCESSIBLE FOR REPAIRS.

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK–10



JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

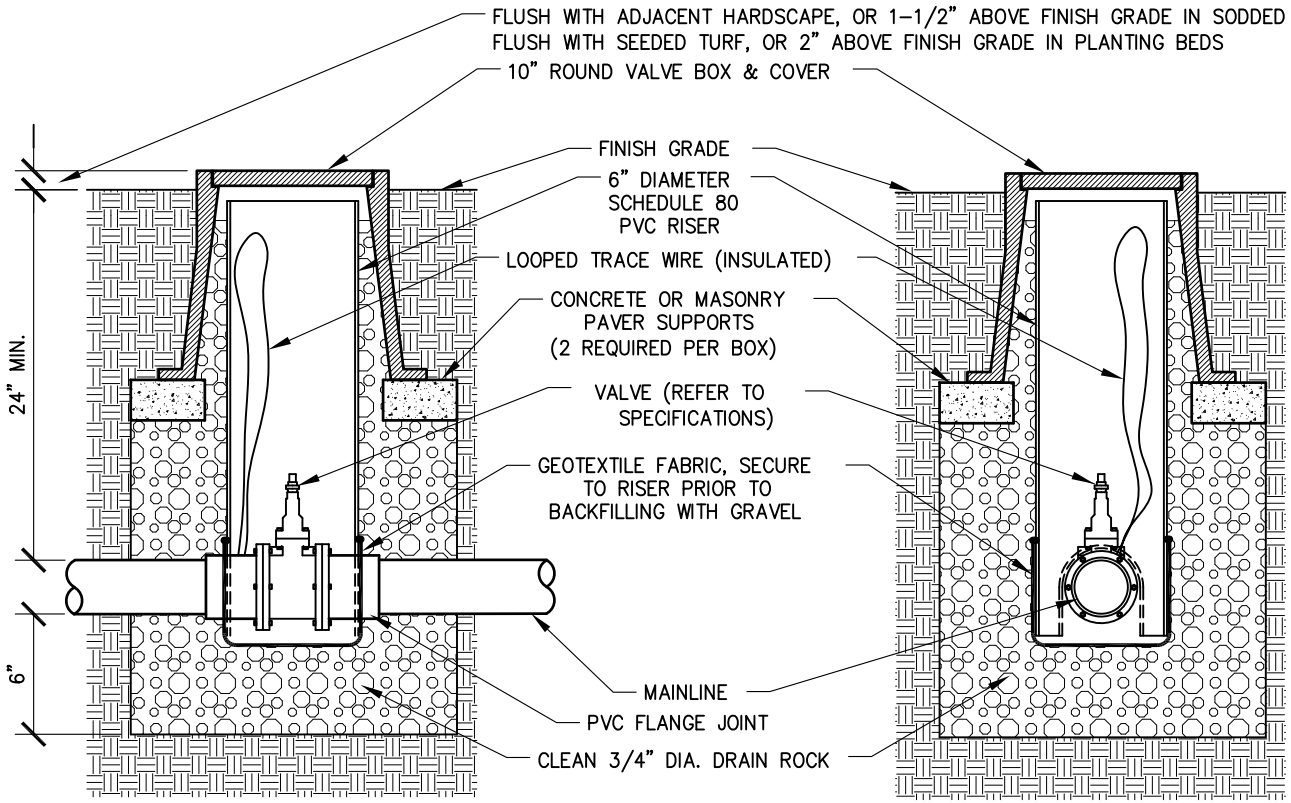
VALVE
3" AND SMALLER

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK–11

NOTES

1. COMPACT SOIL AROUND BOX TO 90% MINIMUM COMPACTION.
2. PLACE DRAIN ROCK PRIOR TO INSTALLING VALVE BOX.
3. GATE VALVE AND FITTINGS SHALL BE LINE SIZE UNLESS OTHERWISE NOTED.
4. USE TEFLON TAPE ON ALL THREADED FITTINGS.
5. LOCATE VALVES IN SHRUB/GROUNDCOVER AREAS WHENEVER POSSIBLE.
6. LOOP EXTRA TRACER WIRE UP TO TOP OF BOX.



JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

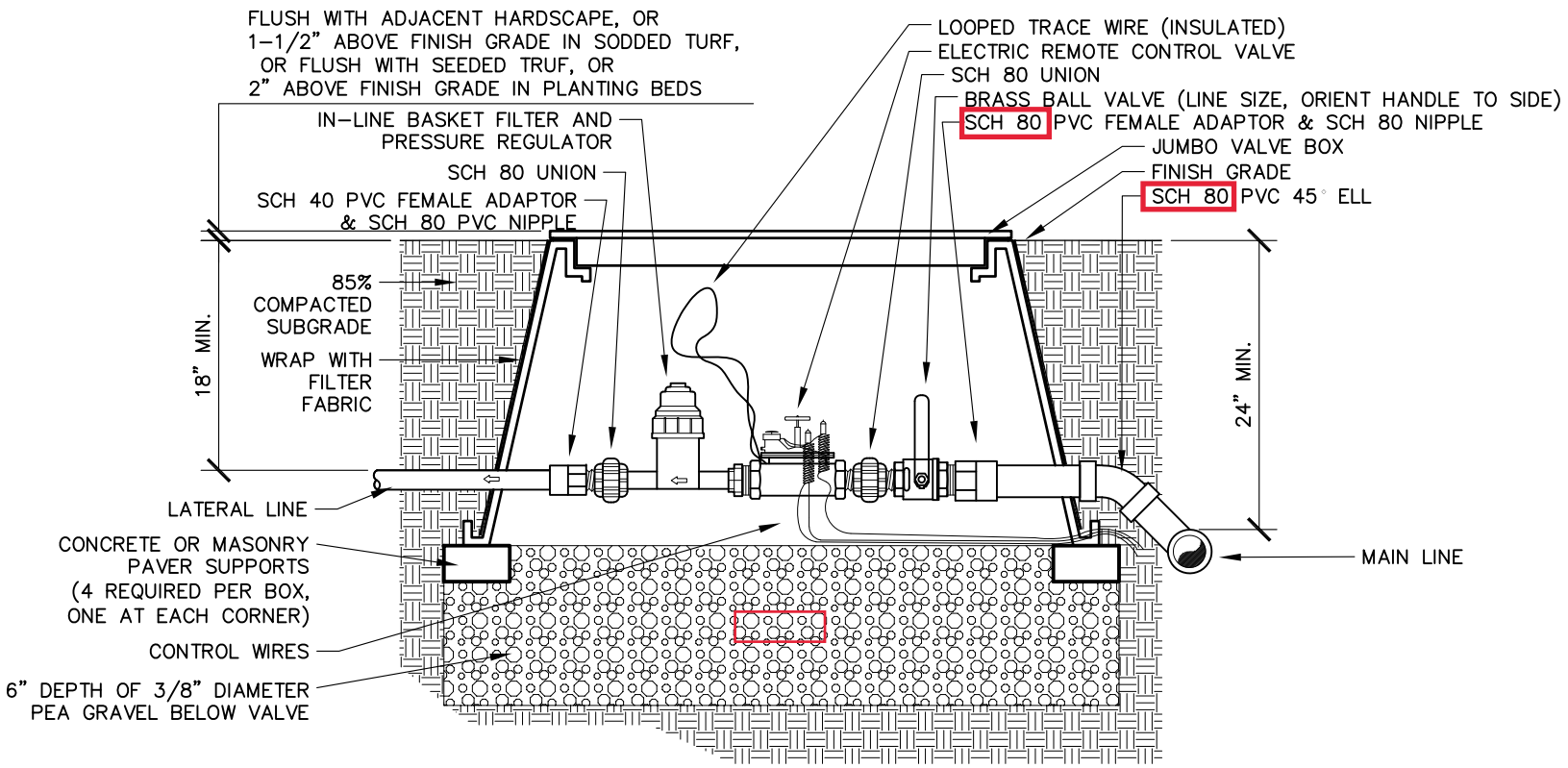
VALVE
4" AND LARGER

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK–12

NOTES

1. COMPACT SOIL AROUND BOX TO 90% MINIMUM COMPACTION.
2. PLACE DRAIN ROCK PRIOR TO INSTALLING VALVE BOX.
3. GATE VALVE AND FITTINGS SHALL BE LINE SIZE UNLESS OTHERWISE NOTED.
4. USE TEFLON TAPE ON ALL THREADED FITTINGS.
5. LOCATE VALVES IN SHRUB/GROUNDCOVER AREAS WHENEVER POSSIBLE.
6. LOOP EXTRA TRACER WIRE UP TO TOP OF BOX.



JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

NOTES

1. INSTALL VALVES A MINIMUM OF 12" FROM STRUCTURES OR HARDSCAPING.
2. INSTALL VALVES IN PLANTER BEDS WHEREVER POSSIBLE.
3. PLACE VALVE BOX AT RIGHT ANGLES TO STRUCTURES OR HARDSCAPING.
4. INSTALL VALVE BOX SO THAT TOP OF BOX IS FLUSH WITH ADJACENT HARDSCAPING.
5. USE TEFLON TAPE ON ALL MALE THREADS.
6. PROVIDE SCHEDULE 80 THREADED UNION ON DOWNSTREAM SIDE.
7. INSULATE AROUND PIPE AT BOX OPENINGS WITH PLASTIC SHEETING TO PREVENT SOIL FROM ENTERING BOX.
8. REFER TO SPECIFICATIONS FOR REQUIREMENTS FOR TAPING, EXPANSION COILS, WIRE CONNECTIONS, ETC.
9. ALL RCV'S SHALL BE TAGGED INDICATING STATION #'S.
10. ALL VALVE BOXES SHALL HAVE STATION #'S PERMANENTLY BURNED ON VALVE BOX LIDS. MARKINGS SHALL BE AS FOLLOWS:
    TURF VALVES: T#
    LANDSCAPE AREA VALVES: L#
    BUBBLER VALVES: B#

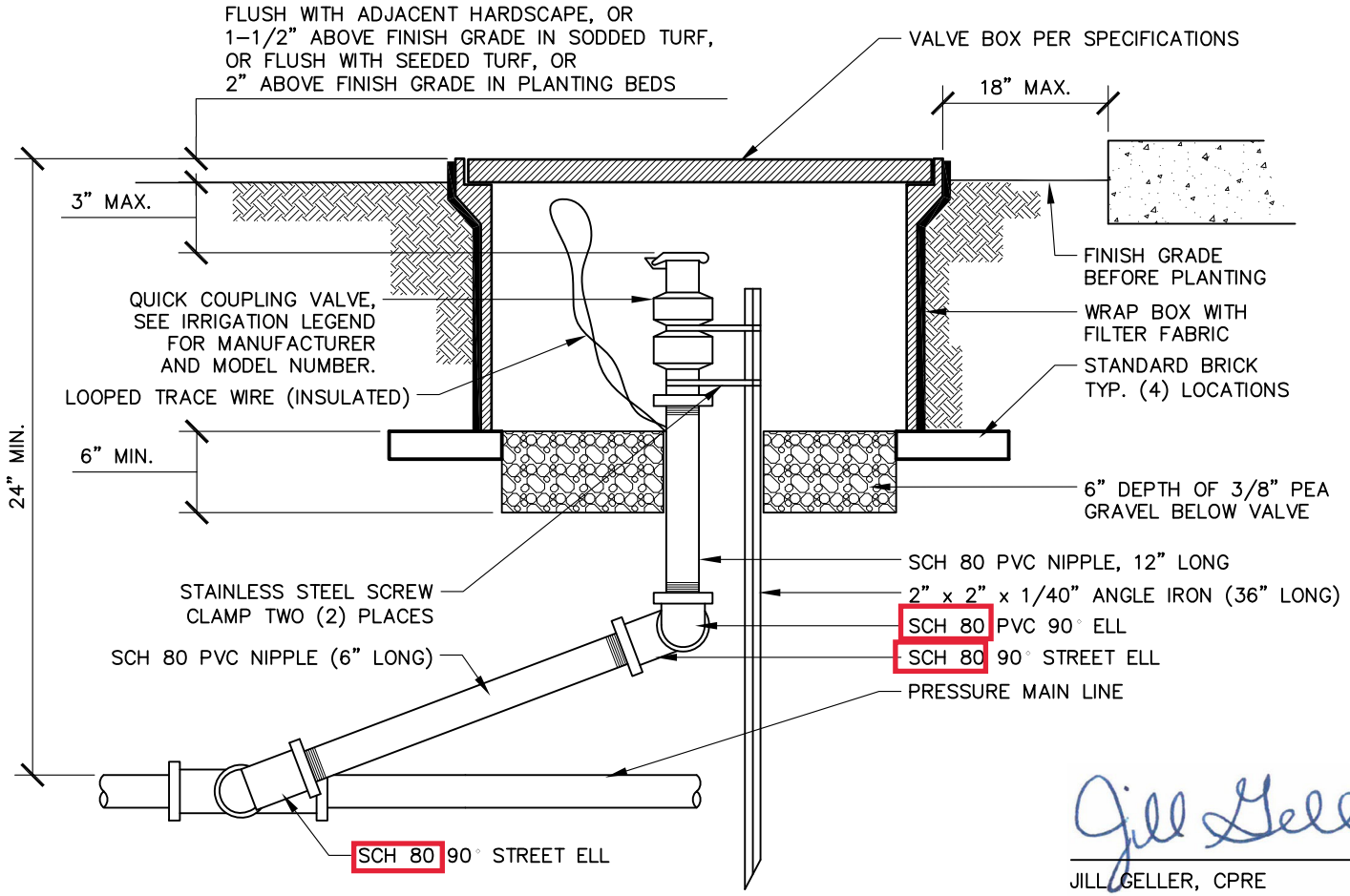
CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

VALVE
DRIP CONTROL

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK-13



JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

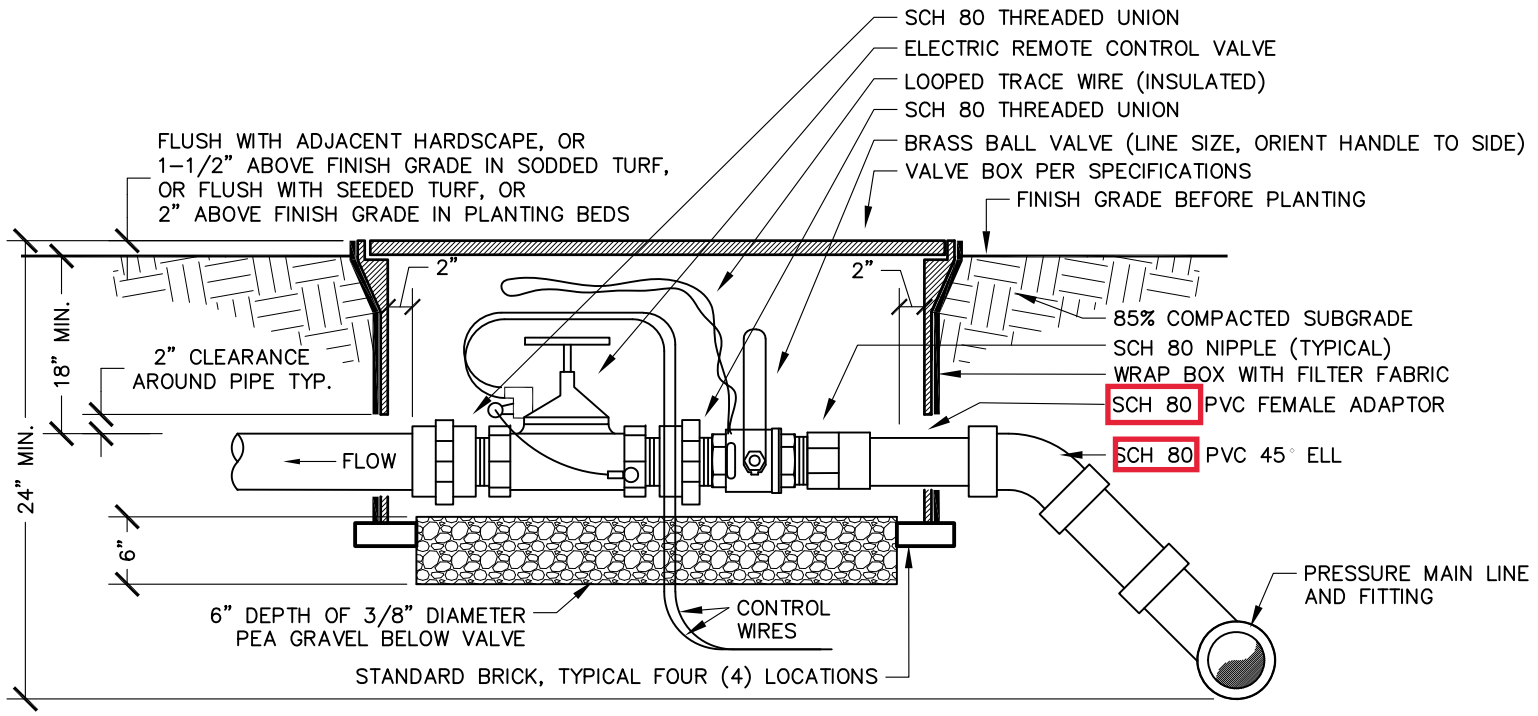
VALVE
QUICK COUPLING

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK–14

NOTES

1. INSTALL VALVE BOXES SO THAT THE TOP OF THE BOX IS FLUSH WITH THE TOP OF THE ADJACENT HARDSCAPE.
2. USE TEFLON TAPE ON ALL THREADED CONNECTIONS.



NOTES

1. INSTALL VALVES A MINIMUM OF 12" FROM STRUCTURES OR HARDSCAPING.
2. INSTALL VALVES IN PLANTER BEDS WHEREVER POSSIBLE.
3. PLACE VALVE BOX AT RIGHT ANGLES TO STRUCTURES OR HARDSCAPING.
4. INSTALL VALVE BOX SO THAT TOP OF BOX IS FLUSH WITH ADJACENT HARDSCAPING.
5. USE TEFLON TAPE ON ALL MALE THREADS.
6. PROVIDE SCHEDULE 80 THREADED UNION ON DOWNSTREAM SIDE.
7. INSULATE AROUND PIPE AT BOX OPENINGS WITH PLASTIC SHEETING TO PREVENT SOIL FROM ENTERING BOX.
8. REFER TO SPECIFICATIONS FOR REQUIREMENTS FOR TAPING, EXPANSION COILS, WIRE CONNECTIONS, ETC.
9. ALL RCV'S SHALL BE TAGGED INDICATING STATION #'S.
10. ALL VALVE BOXES SHALL HAVE STATION #'S PERMANENTLY BURNED ON VALVE BOX LIDS. MARKINGS SHALL BE AS FOLLOWS:
    TURF VALVES: T#
    LANDSCAPE AREA VALVES: L#
    BUBBLER VALVES: B#

Jill Geller

JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

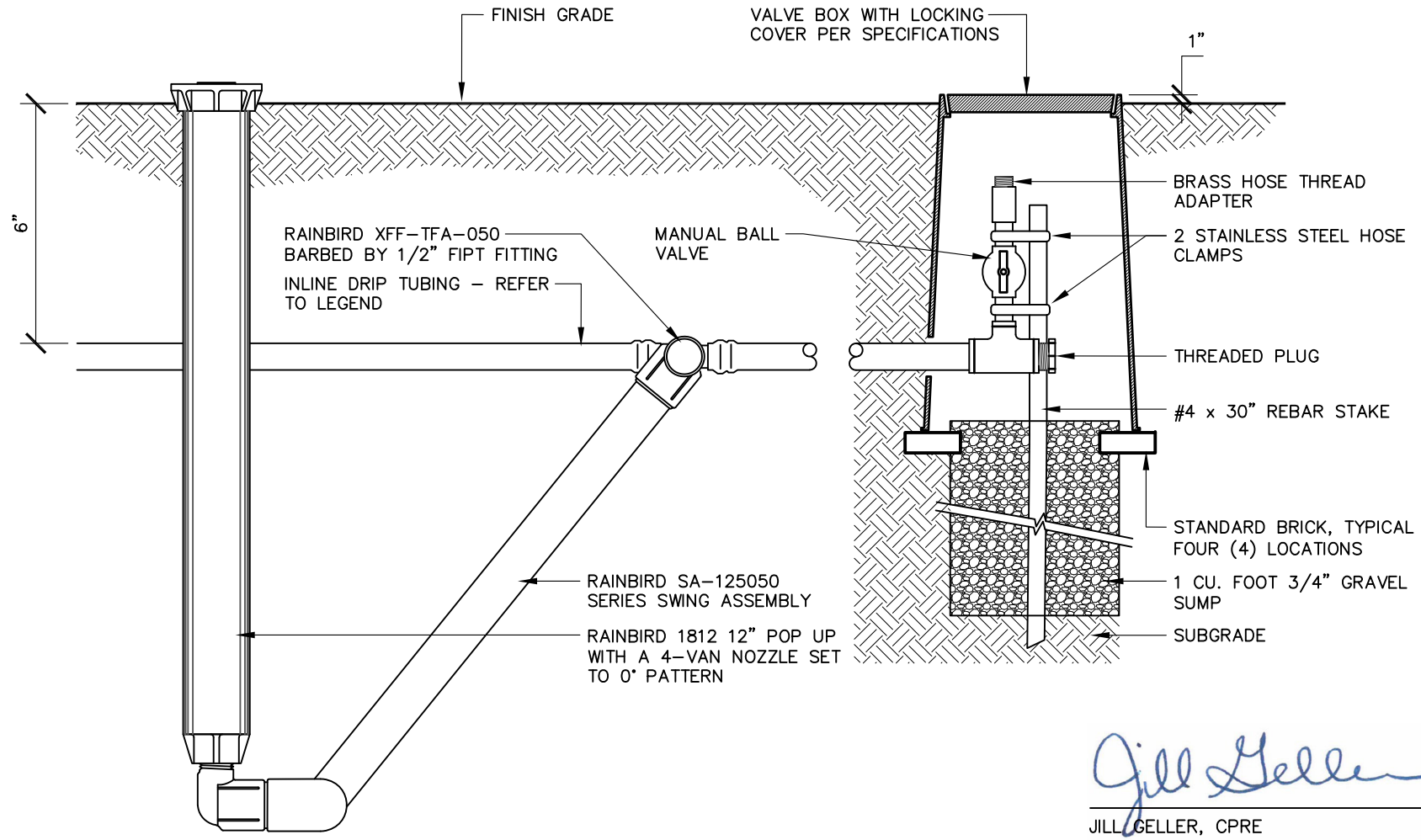
CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

VALVE
REMOTE CONTROL AT GRADE

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK-15



JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

NOTES

1. CENTER BALL VALVE IN VALVE BOX OPENING TO ALLOW EASY ACCESS.
2. INSTALL OPERATION INDICATOR WITHIN 18" OF FLUSH VALVE.
3. PLACE VALVE BOX AT RIGHT ANGLES TO STRUCTURES OR HARDSCAPING.
4. USE TEFLON TAPE ON ALL MALE THREADS.
5. INSTALL 3M LOCATOR BALLS AT ALL BOXES.
6. REFER TO SPECIFICATIONS FOR REQUIREMENTS FOR TAPING, EXPANSION COILS, WIRE CONNECTIONS, ETC.

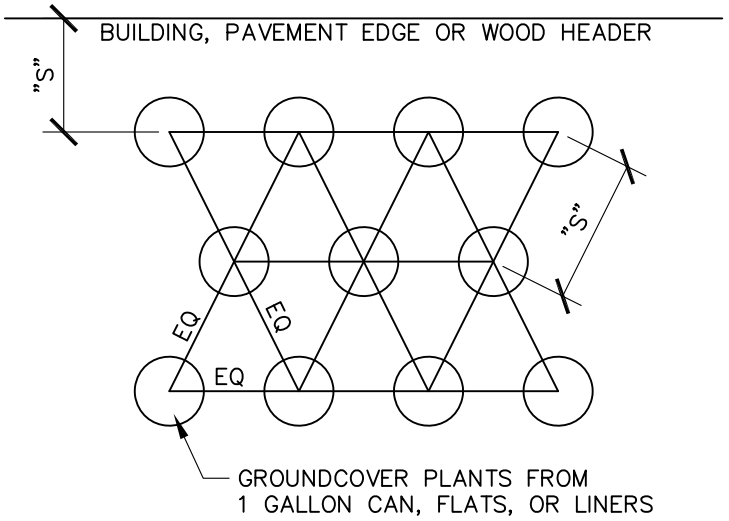
CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

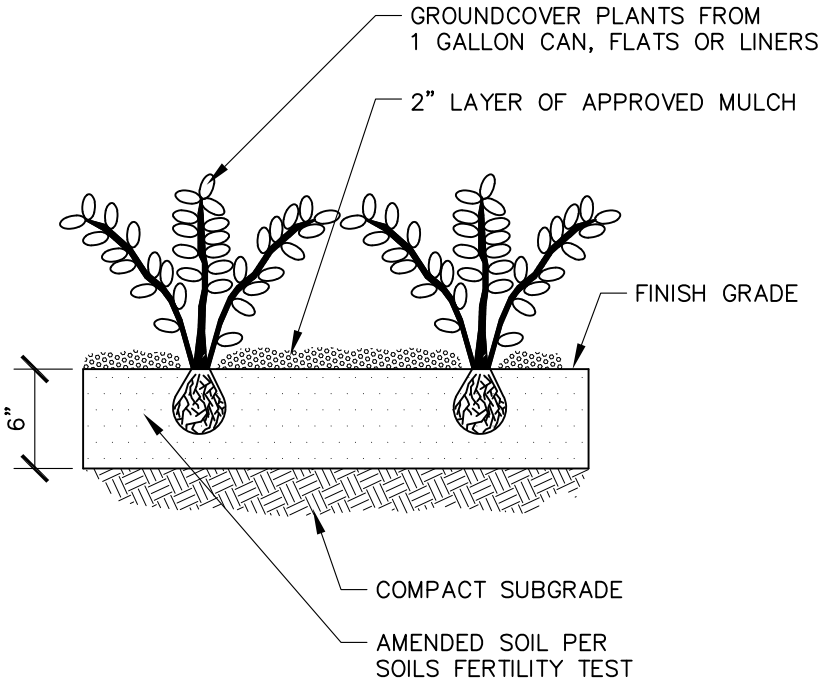
DRIP FLUSH VALVE AND OPERATION INDICATOR

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK-16



PLAN



SECTION

JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

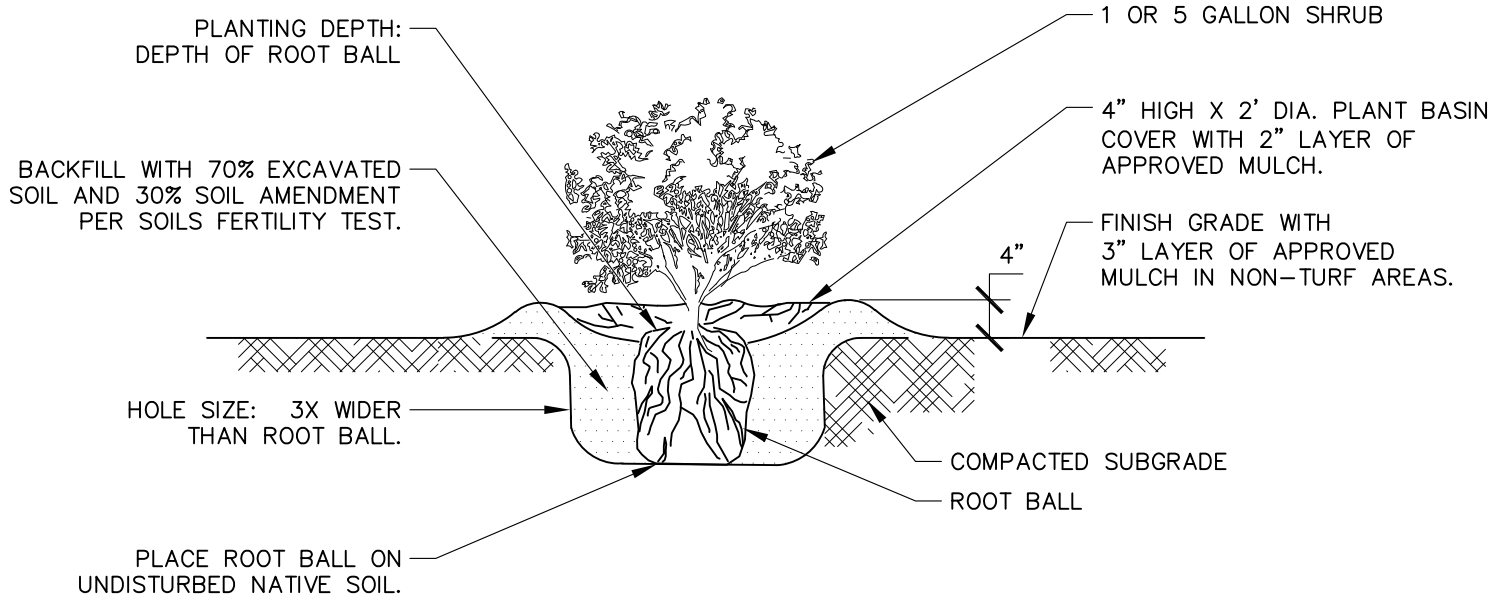
GROUNDCOVER PLANTING

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK–17

NOTES

1. "S" REFERS TO PLANT SPACING, SEE PLANT TABLE ON CONSTRUCTION DOCUMENTS.



JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

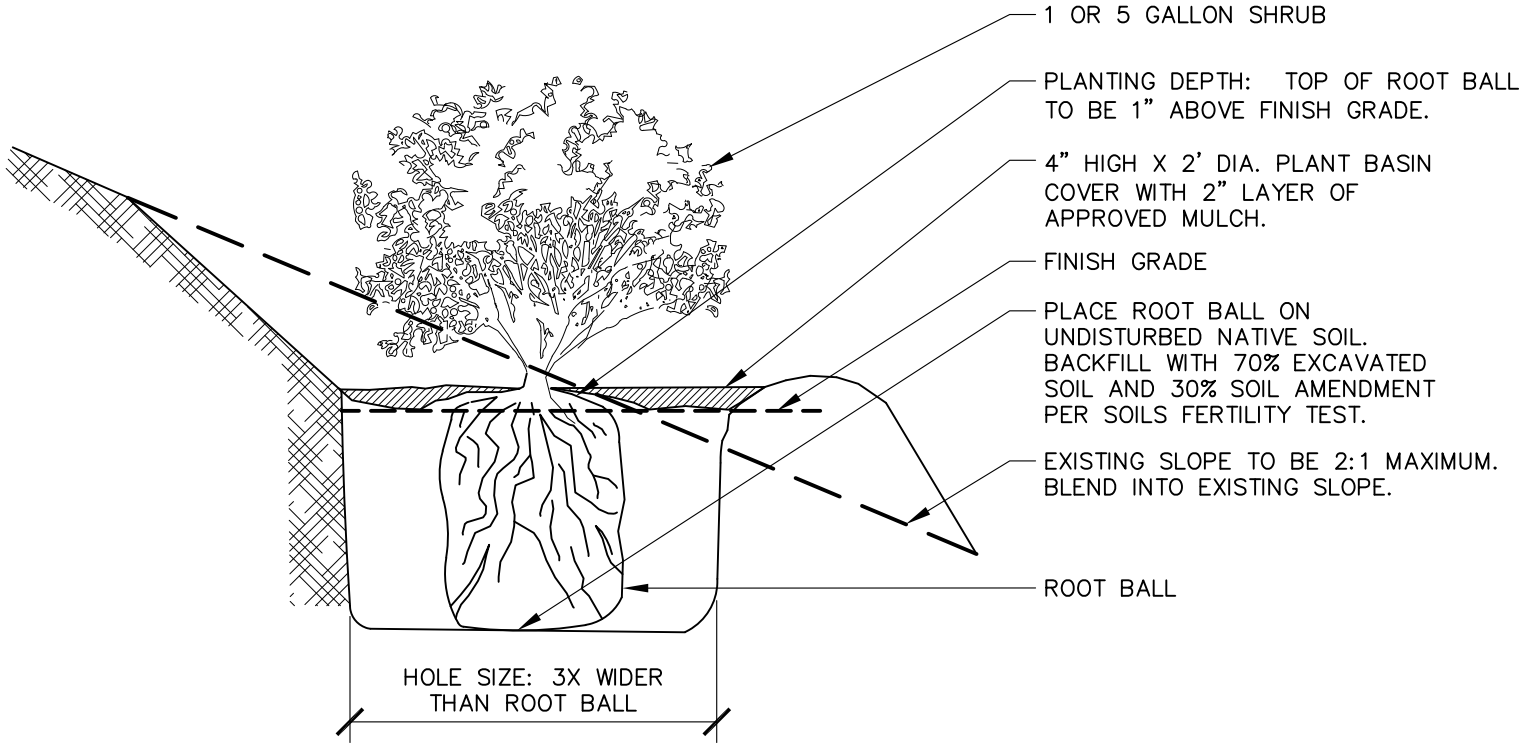
SHRUB PLANTING

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK-18

NOTES

1. AMENDMENT SHALL BE CONSISTENT WITH SOILS FERTILITY TEST.
2. PLANTING AREAS SHALL BE TREATED WITH PRE-EMERGENT PRIOR TO PLANTING TO PREVENT GERMINATION OF WEED SEEDS.
3. SCORE ROOT BALL IN VARIOUS LOCATIONS.



JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

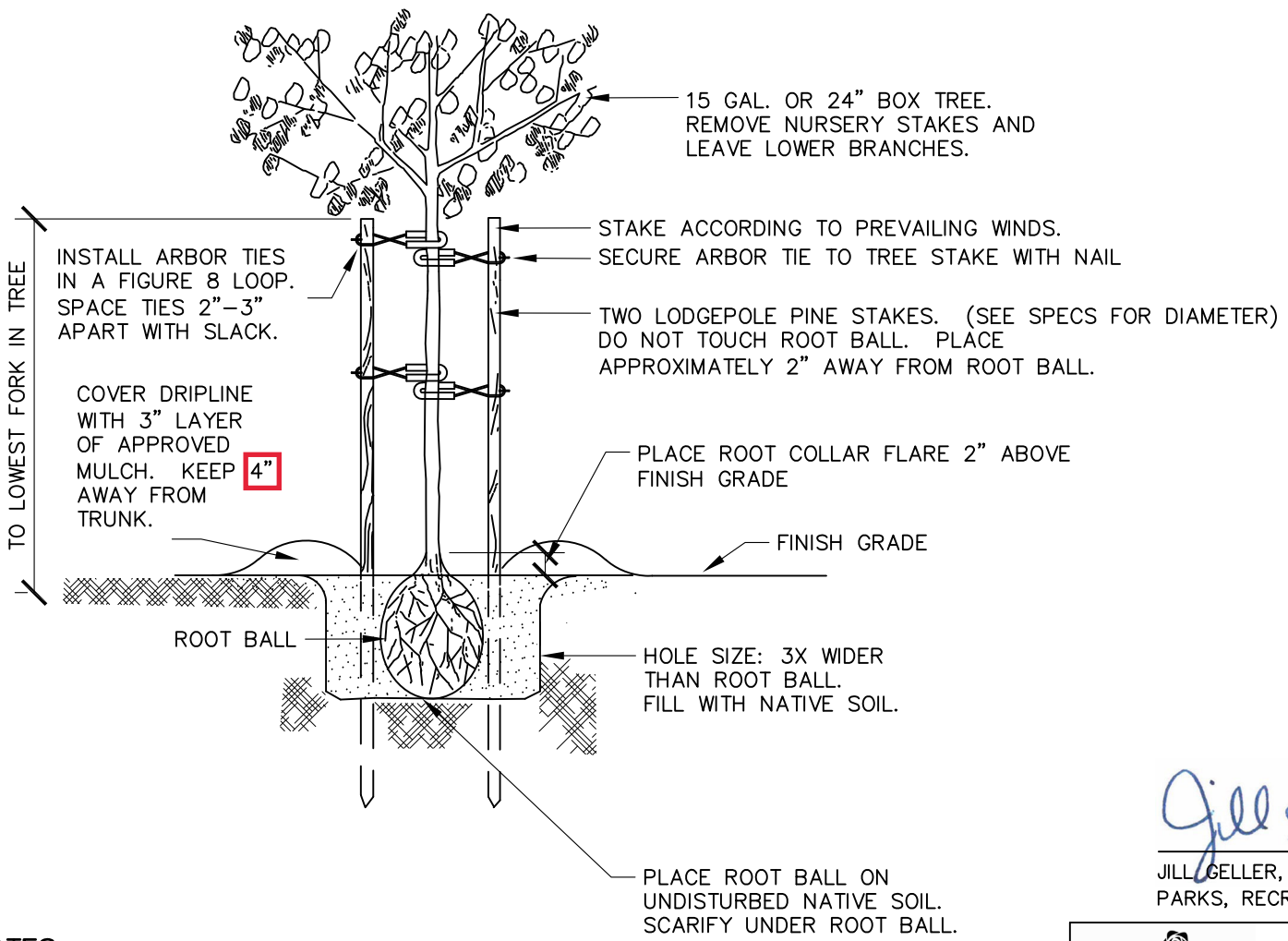
SHRUBS ON SLOPES

NOTES

1. PLANTER AREAS SHALL HAVE PRE-EMERGENT HERBICIDE APPLIED BEFORE PLANTING TO PREVENT GERMINATION OF WEED SEEDS.
2. BUBBLERS TO BE PLACED ON UPHILL SIDE OF SHRUB.
3. SCORE ROOT BALL IN VARIOUS LOCATIONS.

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK-19



NOTES

1. SCORE ROOT BALL AND CUT GIRDLING ROOTS ON ALL FOUR SIDES OF ROOT BALL.
2. FOR LAWN AREAS: PROVIDE A 3' DIA. AREA FREE OF TURF.
3. TREES FURNISHED IN #15 NURSERY CONTAINERS REQUIRE 2" DIA. STAKES. TREES LESS THAN 8' IN HEIGHT REQUIRE AN 8' STAKE. TREES 8' OR GREATER IN HEIGHT REQUIRE A 10' STAKE. TREES FURNISHED IN 24" BOXES REQUIRE 3" DIA. BY 10' LONG STAKES.
4. INSTALL 2 ARBOR TIES, AT 2/3 OF TREE HEIGHT AND 2 ARBOR TIES AT 1/2 OF TREE HEIGHT.
5. TREE STAKES SHOULD BE INSERTED INTO THE GROUND TO A MINIMUM DEPTH OF 18".
6. TREES TO BE STRUCTURALLY PRUNED BEFORE PLANTING. ESTABLISH A CENTRAL LEADER AND REDUCE OR REMOVE CODOMINANT LEADERS.

Jill Geller

JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

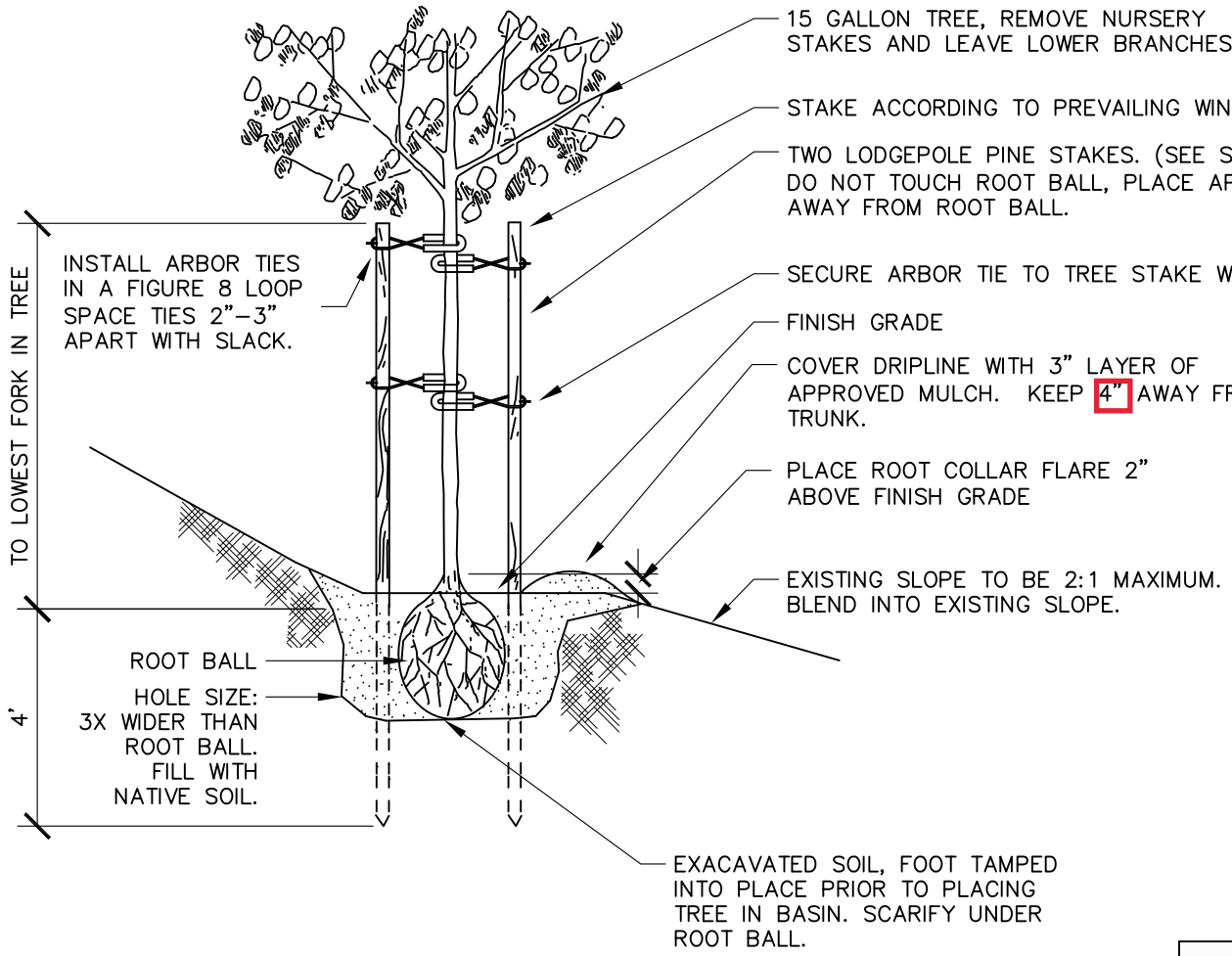
CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

TREE PLANTING

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK–20



NOTES

1. SCORE ROOT BALL AND CUT GIRDLING ROOTS ON ALL FOUR SIDES OF ROOT BALL.
2. TREES FURNISHED IN #15 NURSERY CONTAINERS REQUIRE 2" DIA. STAKES. TREES LESS THAN 8' IN HEIGHT REQUIRE AN 8' STAKE. TREES 8' OR GREATER IN HEIGHT REQUIRE A 10' STAKE. TREES FURNISHED IN 24" BOXES REQUIRE 3" DIA. BY 10' LONG STAKES.
3. INSTALL 2 ARBOR TIES, AT 2/3 OF TREE HEIGHT AND 2 ARBOR TIES AT 1/2 OF TREE HEIGHT.
4. TREE STAKES SHOULD BE INSERTED INTO THE GROUND TO A MINIMUM DEPTH OF 18".
5. TREES TO BE STRUCTURALLY PRUNED BEFORE PLANTING. ESTABLISH CENTRAL LEADER AND REDUCE OR REMOVE CODOMINANT LEADERS.

JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

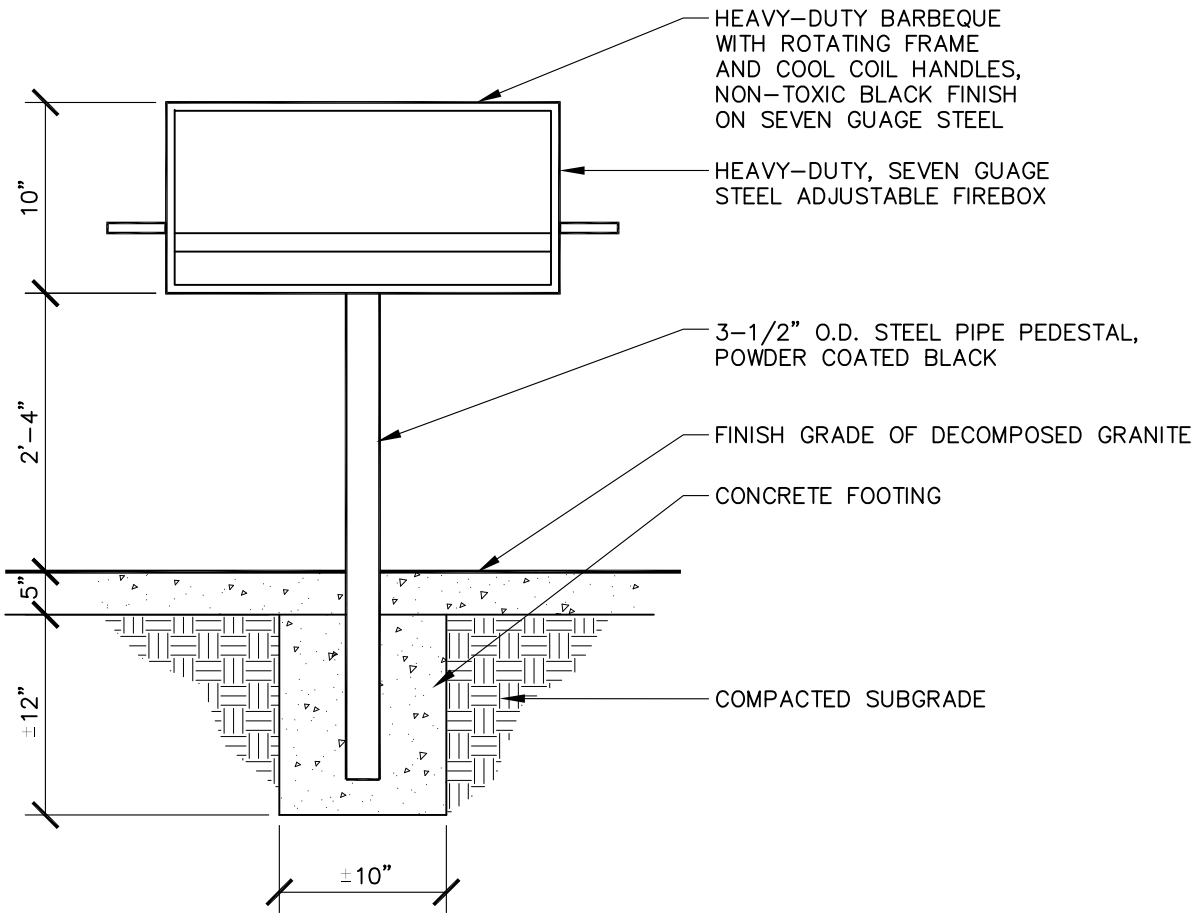
CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

TREES ON SLOPES

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK–21



NOTES

1. INSTALL FOOTING PER MANUFACTURER'S SPECIFICATIONS AND DETAILS.
2. SEE PROJECT SPECIFICATIONS FOR MODEL NUMBER AND TYPE.
3. LOCATE ADEQUATE DISTANCE FROM STRUCTURES AND TREES IN ORDER TO PREVENT THE POTENTIAL FOR CLIMBING.

Jill Geller

JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

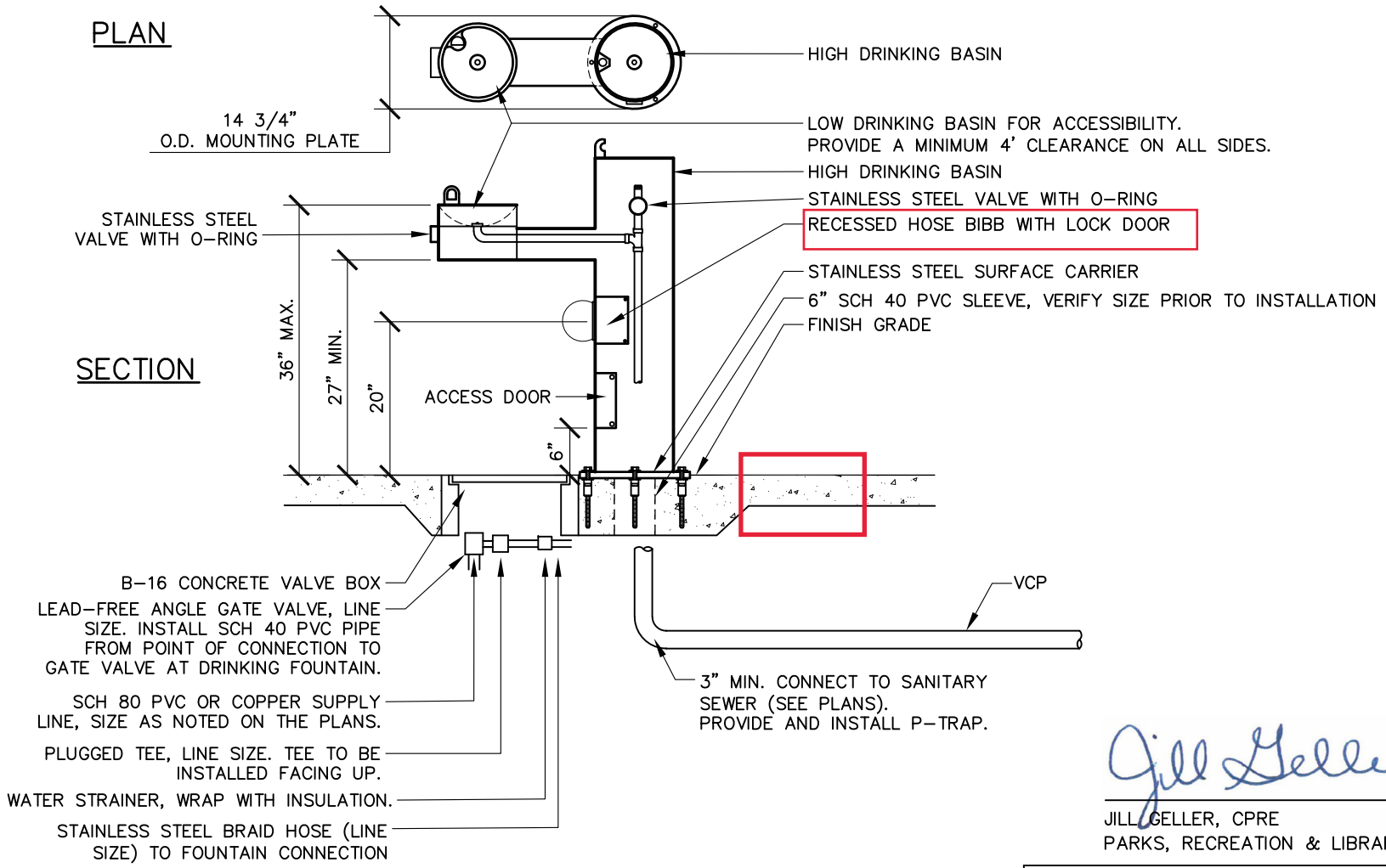
CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

BARBEQUE

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK–22



JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

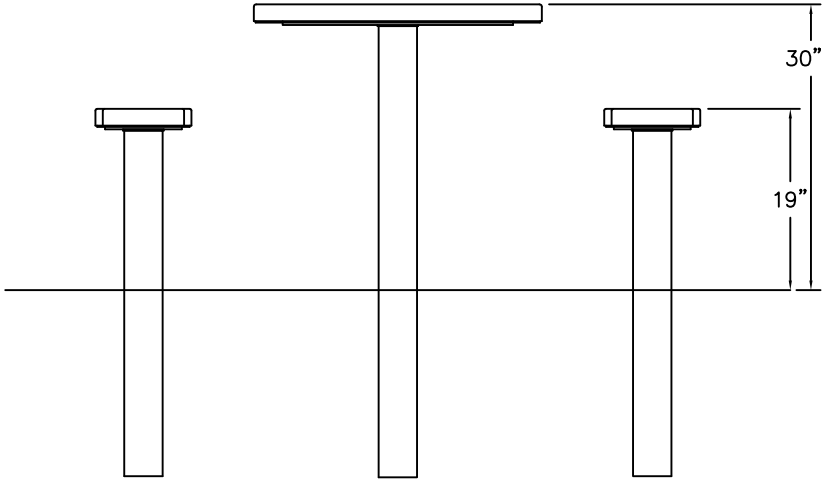
DRINKING FOUNTAIN

NOTES

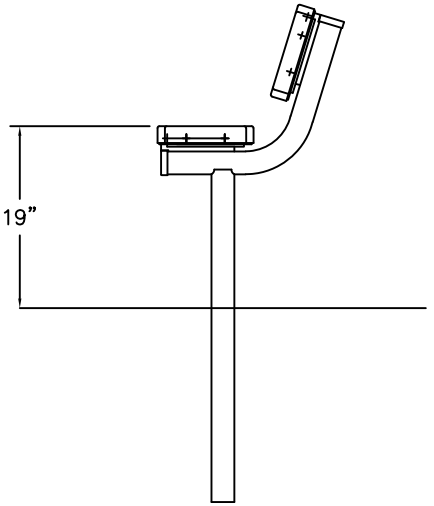
1. PROVIDE LINE SIZE TWO WAY CLEAN OUT EVERY 100' ON SANITARY SEWER LINE UPSTREAM OF Y.
2. 10" STAINLESS STEEL SURFACE CARRIER REQUIRED.
3. FOUNTAIN BASE PER MANUFACTURER'S SPECIFICATIONS.
4. LOCATION OF DRINKING FOUNTAIN "ON" BUTTON AND LOCATION OF BOTTLE FILLER SPOUT (IF APPLICABLE) SHALL BE DETERMINED VIA THE SUBMITTAL PROCESS.

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK-23



TABLE



BENCH

NOTES

1. INSTALL FOOTINGS PER MANUFACTURERS RECOMMENDATIONS.
2. INSTALL PLUMB AND LEVEL.

JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

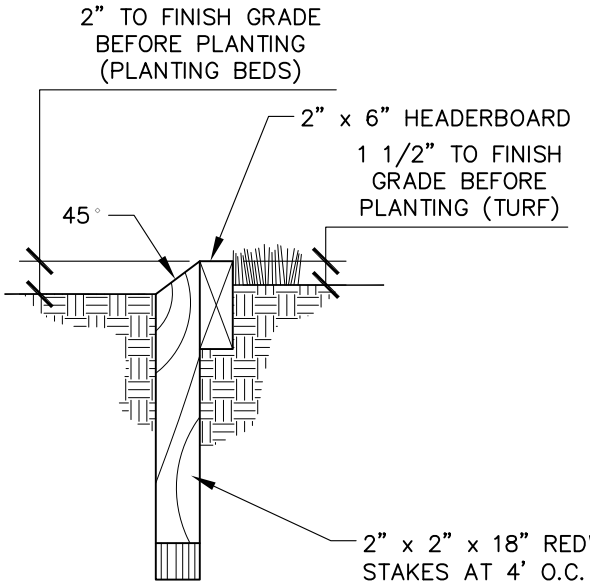
CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

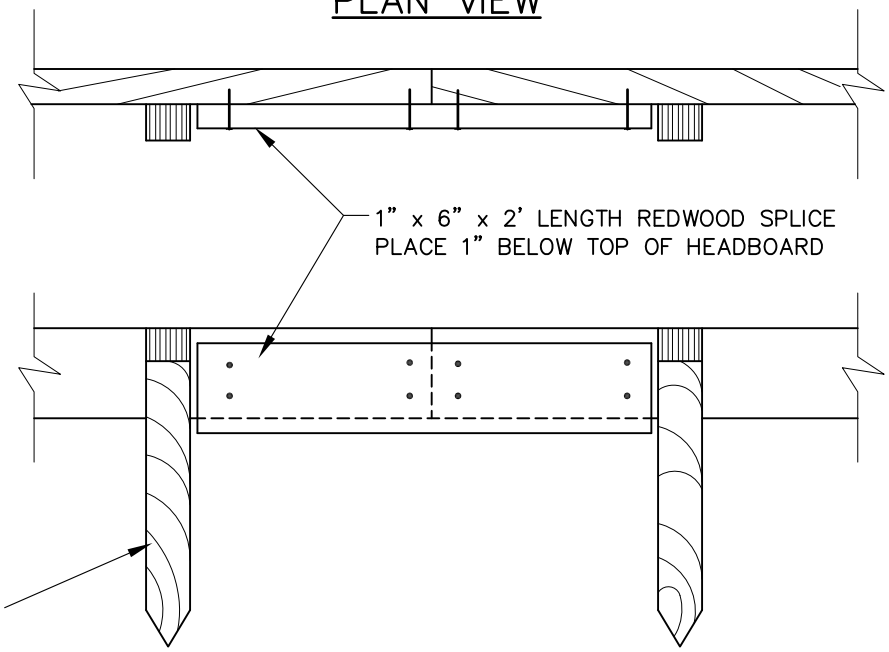
PICNIC TABLE AND BENCH INSTALLATION HEIGHTS

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK–24



SECTION



PLAN VIEW

SPLICE DETAIL

JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

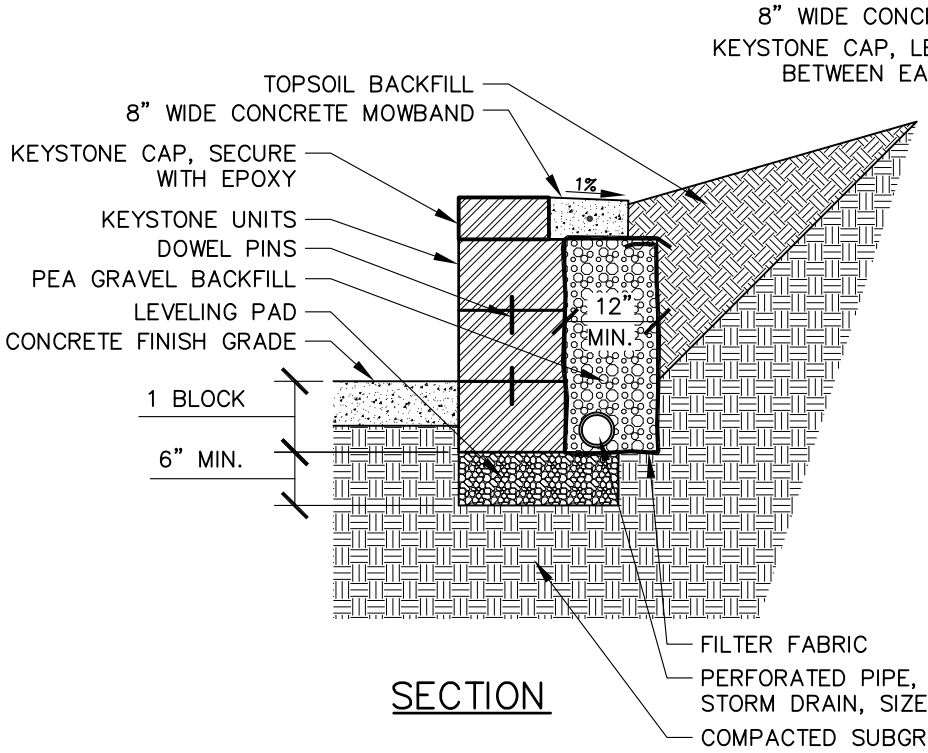
NOTES

1. USE TWO 1" x 6" REDWOOD ON ALL CURVES (WHERE NECESSARY).
2. INSTALL ALL STAKES AND SPLICES ON PLANTING SIDE OF HEADER BOARD.
3. ALL NAILS SHALL BE GALVANIZED.
4. ALL LUMBER SHALL BE REDWOOD, ROUGH CONSTRUCTION HEART GRADE IN ACCORDANCE TO CALIFORNIA REDWOOD ASSOCIATION GRADING RULES.
5. UTILIZE ONLY AS APPROVED BY CITY. DO NOT USE IN TURF OR PLANTED AREAS.

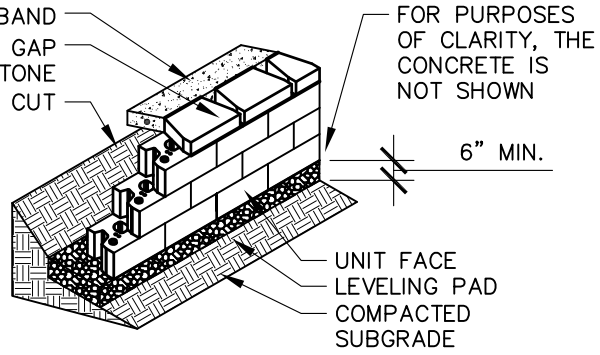
HEADER

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

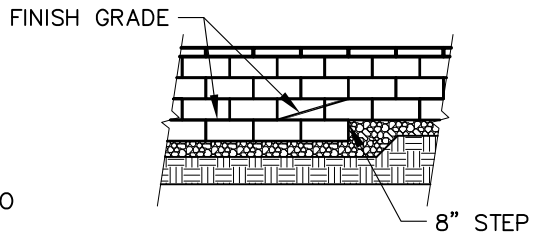
PK–25



SECTION



ISOMETRIC VIEW



FRONT ELEVATION

JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

NOTES

1. KEYSTONE UNITS FOR THIS PROJECT SHALL BE COMPACT STRAIGHT FACE UNITS (18"W x 8"H x 12"D) AND MINICAP UNITS (18"W x 4"H x 10"D).
2. THE LEVELING PAD IS TO BE CONSTRUCTED OF COMPACTED CLASS II AGGREGATE BASE OR 2,000 PSI CONCRETE.
3. SUBGRADE COMPACTED TO A MINIMUM OF 95% RELATIVE DENSITY.
4. LEAVE NON-GROUTED GAP BETWEEN CAP STONES AT FRONT, GROUT AT BACK TO HOLD.
5. APPLY ANTI-GRAFFITI SEALANT TO ALL SURFACES. WALL NOT TO BE USED IN A PUBLIC RIGHT-OF-WAY.

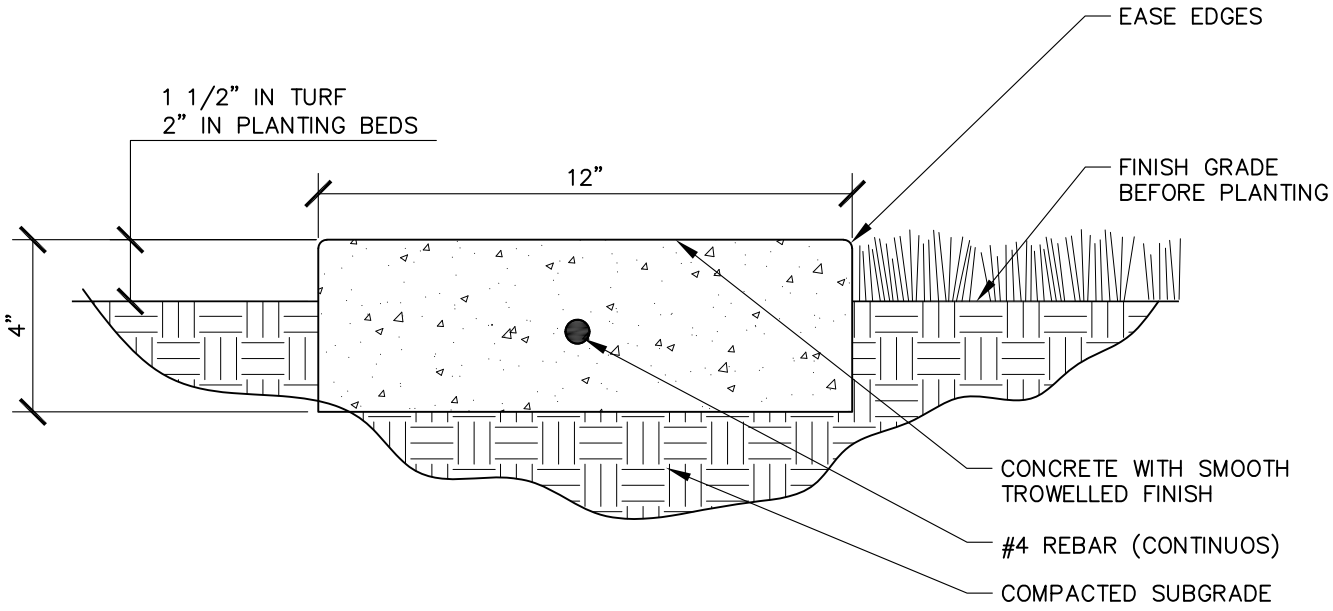
CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

KEYSTONE SEAT WALL RETAINING WALL

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK-26



JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

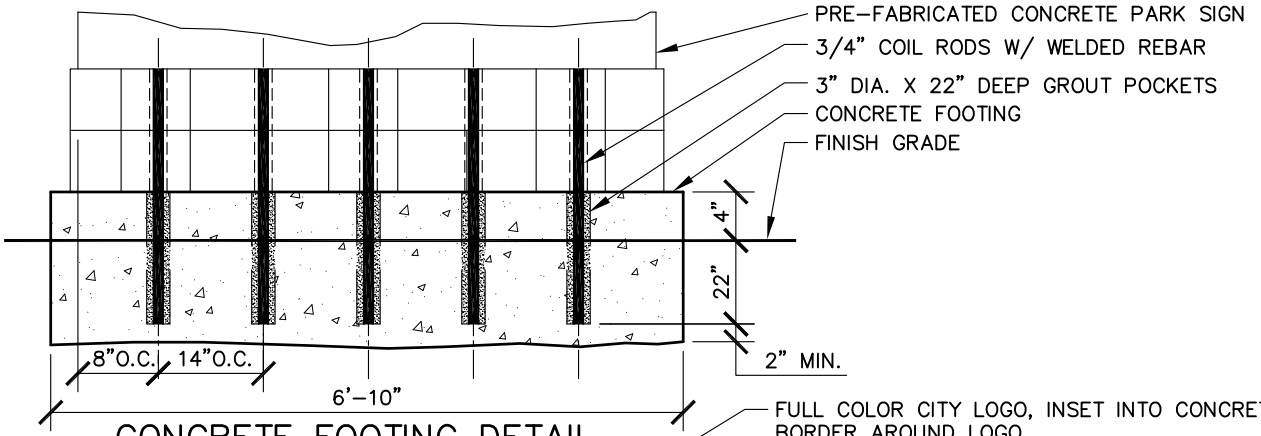
MOWBAND

NOTES

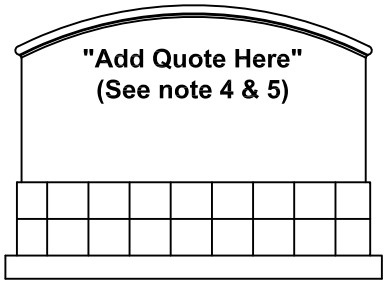
1. WHERE VEHICULAR SERVICE/MAINTENANCE TRAFFIC WILL CROSS MOWBANDS, CONCRETE SECTIONS SHALL BE THICKENED TO 6" (SELECT AREAS ONLY).
2. PROVIDE 1/2" SCORE JOINTS AT 20' O.C.

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

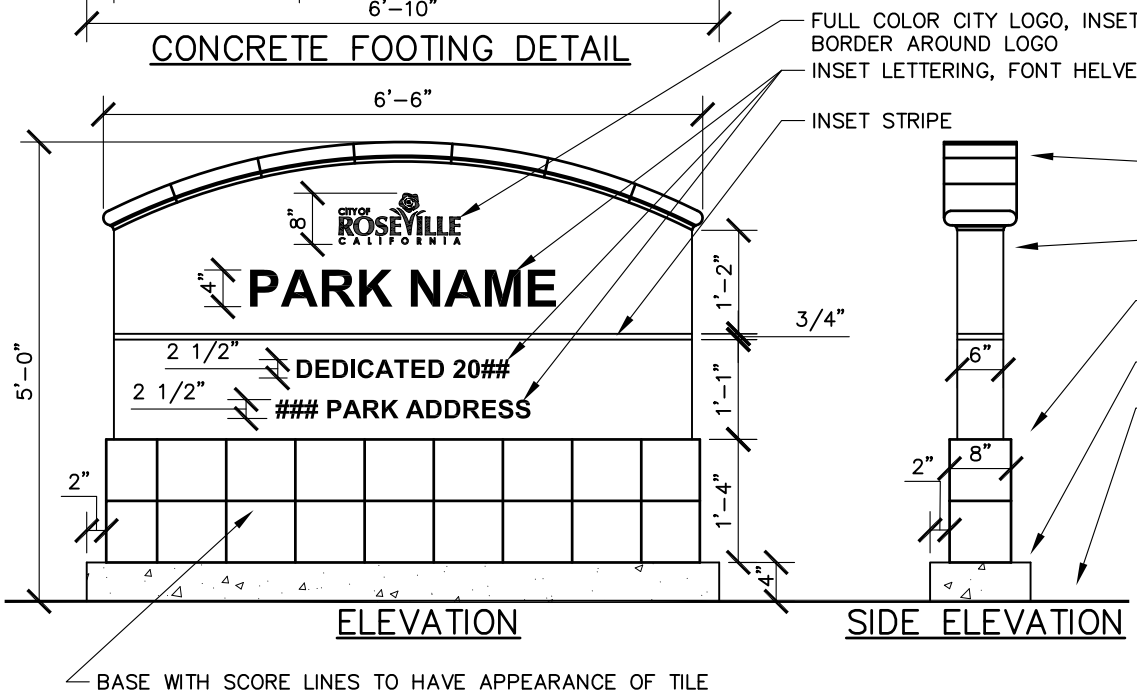
PK–27



CONCRETE FOOTING DETAIL



BACK



ELEVATION

SIDE ELEVATION

JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

NOTES

1. CONSULT PROJECT MANAGER FOR CITY OF ROSEVILLE LOGO SPECIFICATIONS.
2. SUBMIT SHOP DRAWINGS FOR APPROVAL PRIOR TO SIGN CONSTRUCTION.
3. CONSTRUCT CONCRETE FOOTING PER MANUFACTURER'S SPECIFICATIONS.
4. COORDINATE PARK NAME, DEDICATION YEAR, ADDRESS AND QUOTE ON BACK OF SIGN WITH PROJECT MANAGER PRIOR TO PLACING ORDER.
5. QUOTE ON BACK OF SIGN: INSET LETTERING, 2-1/2" TALL, FONT HELVETICA, DARK BLUE.

CITY OF ROSEVILLE CALIFORNIA

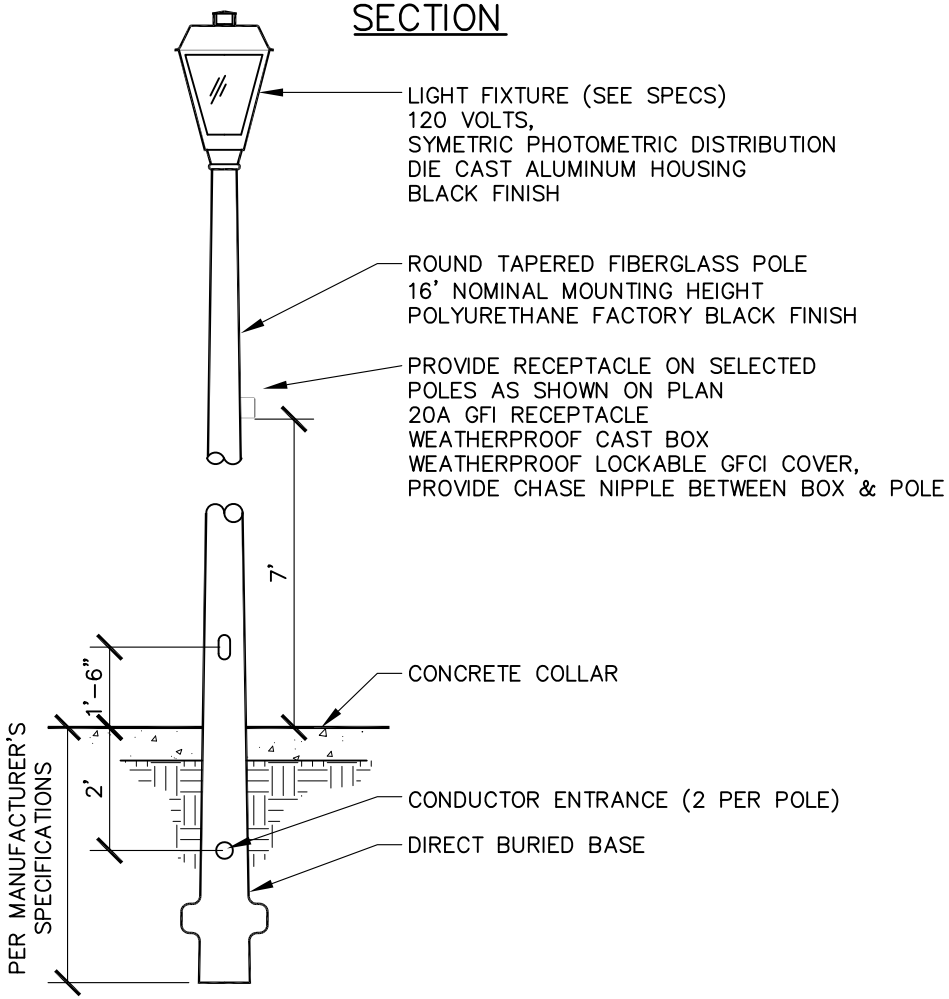
PARKS, RECREATION, & LIBRARIES DEPARTMENT

PARK IDENTIFICATION SIGN

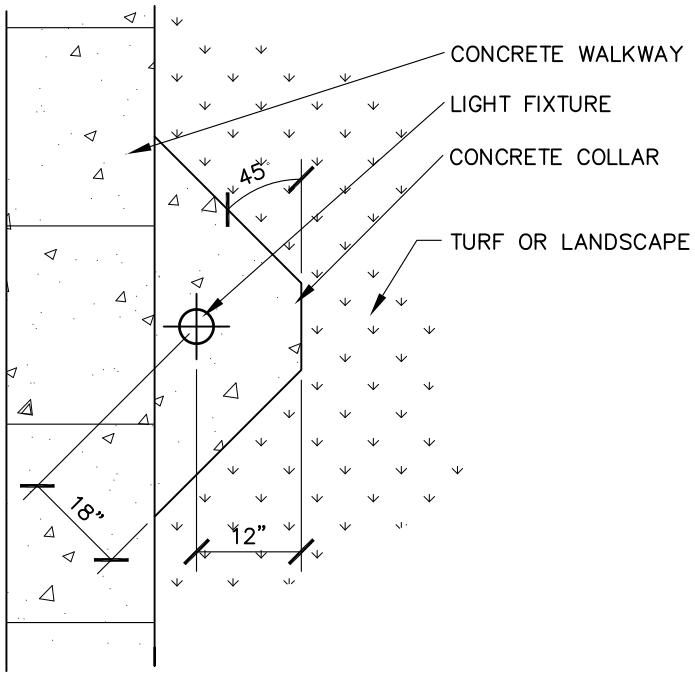
SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK-28

SECTION



PLAN



JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

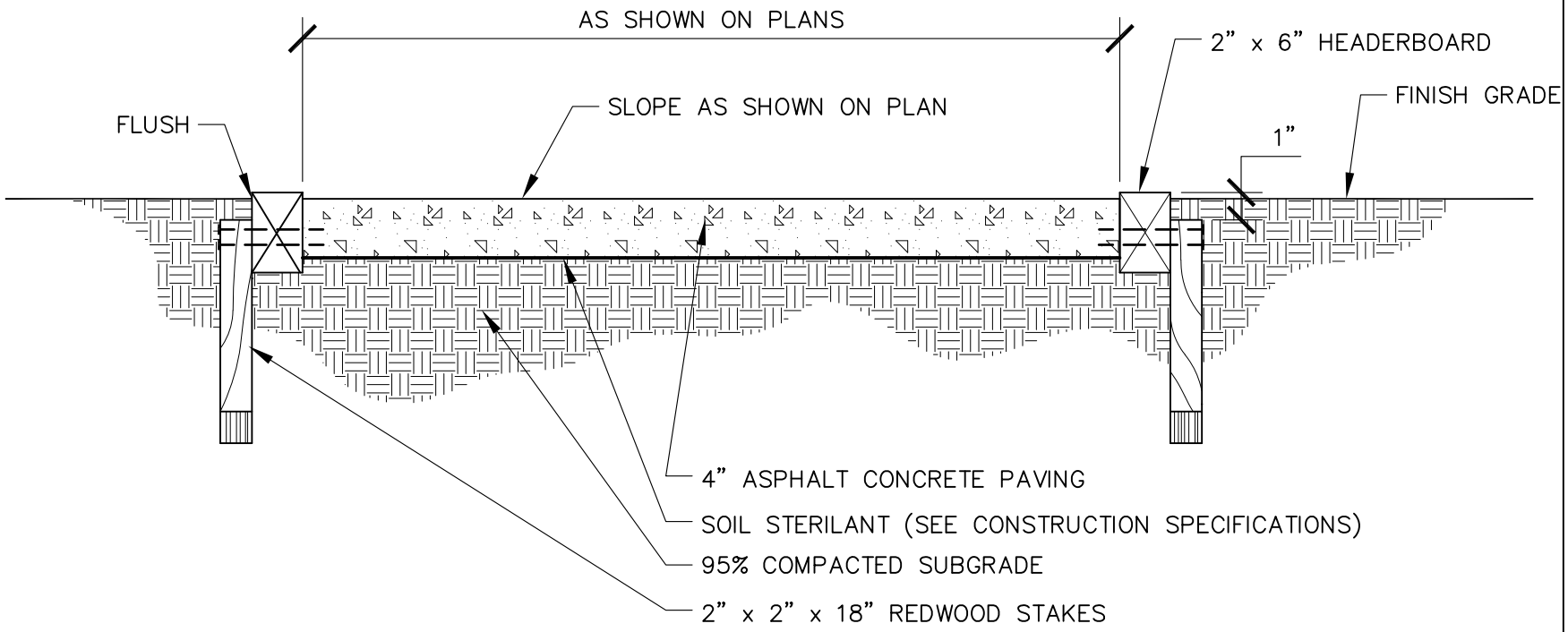
SECURITY LIGHT WITH CONCRETE COLLAR

NOTES

1. INCLUDE MANUAL BYPASS IN POWER PEDESTAL FOR MANUAL OVERRIDE.
2. ALL LIGHTS TO BE LOCATED ADJACENT TO WALKWAYS.

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK–29



JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

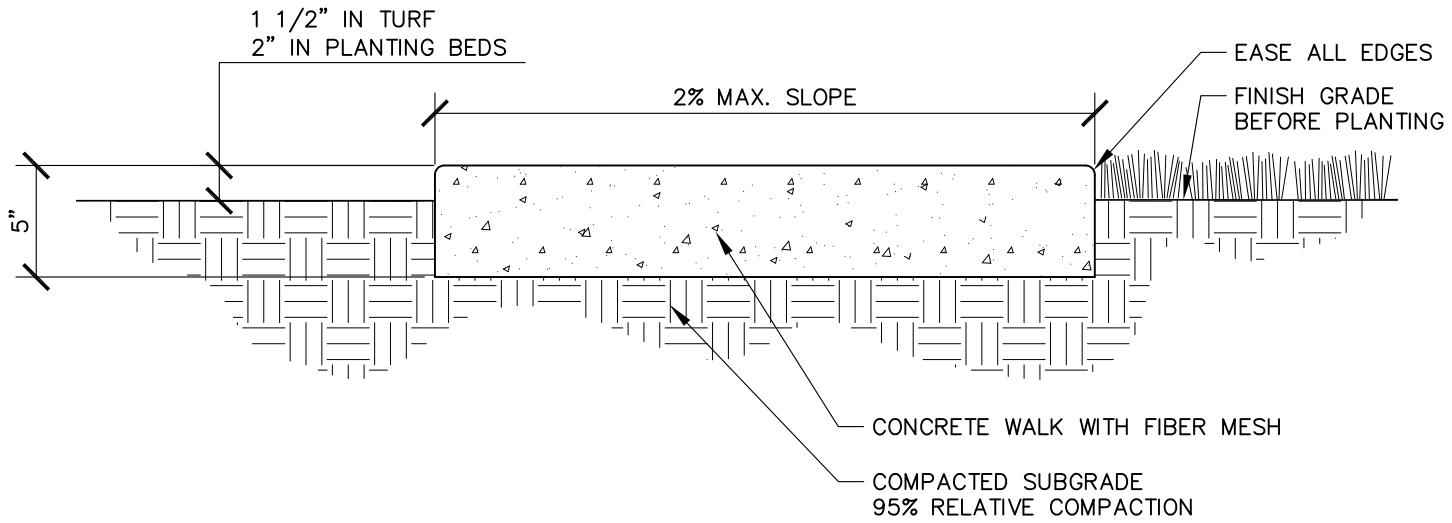
ASPHALT CONCRETE PAVING

NOTES

1. HEADER BOARD SHALL BE REDWOOD, ROUGH, CONSTRUCTION HEART GRADE, IN ACCORDANCE TO CALIFORNIA REDWOOD ASSOCIATION GRADING RULES.
2. ALL NAILS SHALL BE GALVANIZED 16 PENNY.
3. TYPE A ASPHALT CONCRETE REQUIRED.

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK–30



JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

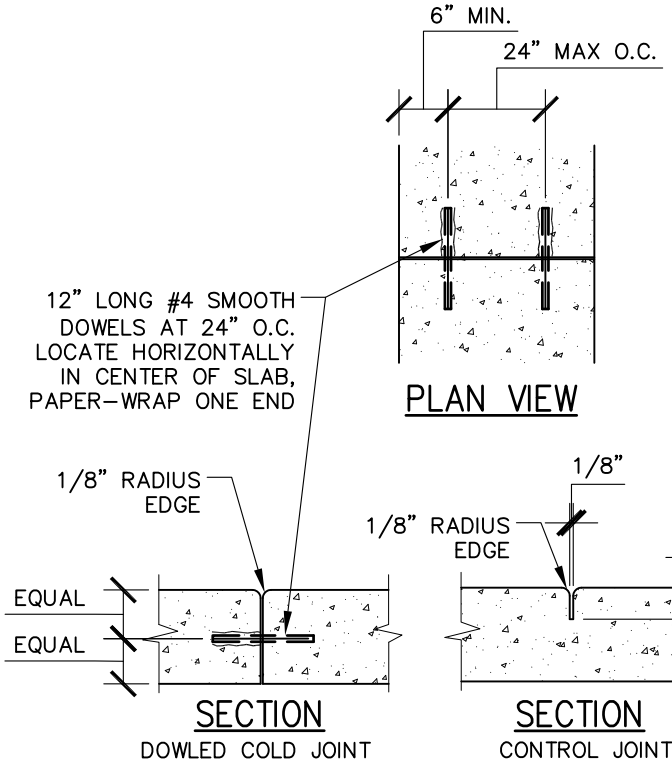
CONCRETE PAVING

NOTES

1. PROVIDE CONROL JOINTS 2" DEEP AT INTERVALS THE WIDTH OF THE WALK.
2. CLASS "A" SIX SACK CONCRETE.
3. MEDIUM BROOM FINISH PERPENDICULAR TO PATH OF TRAVEL UNLESS OTHERWISE SPECIFIED.

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

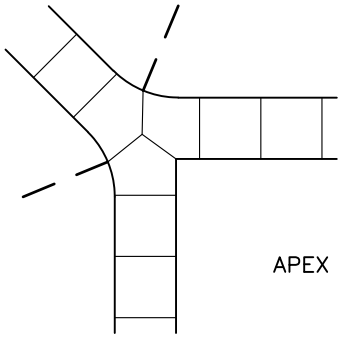
PK–31



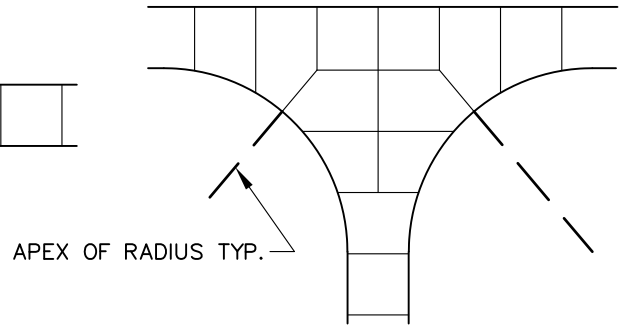
PLAN VIEW

SECTION
DOWLED COLD JOINT

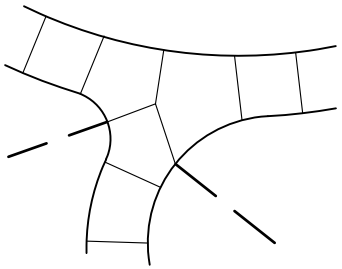
SECTION
CONTROL JOINT



Y INTERSECTION



LARGE T INTERSECTION



T AND Y INTERSECTION

JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

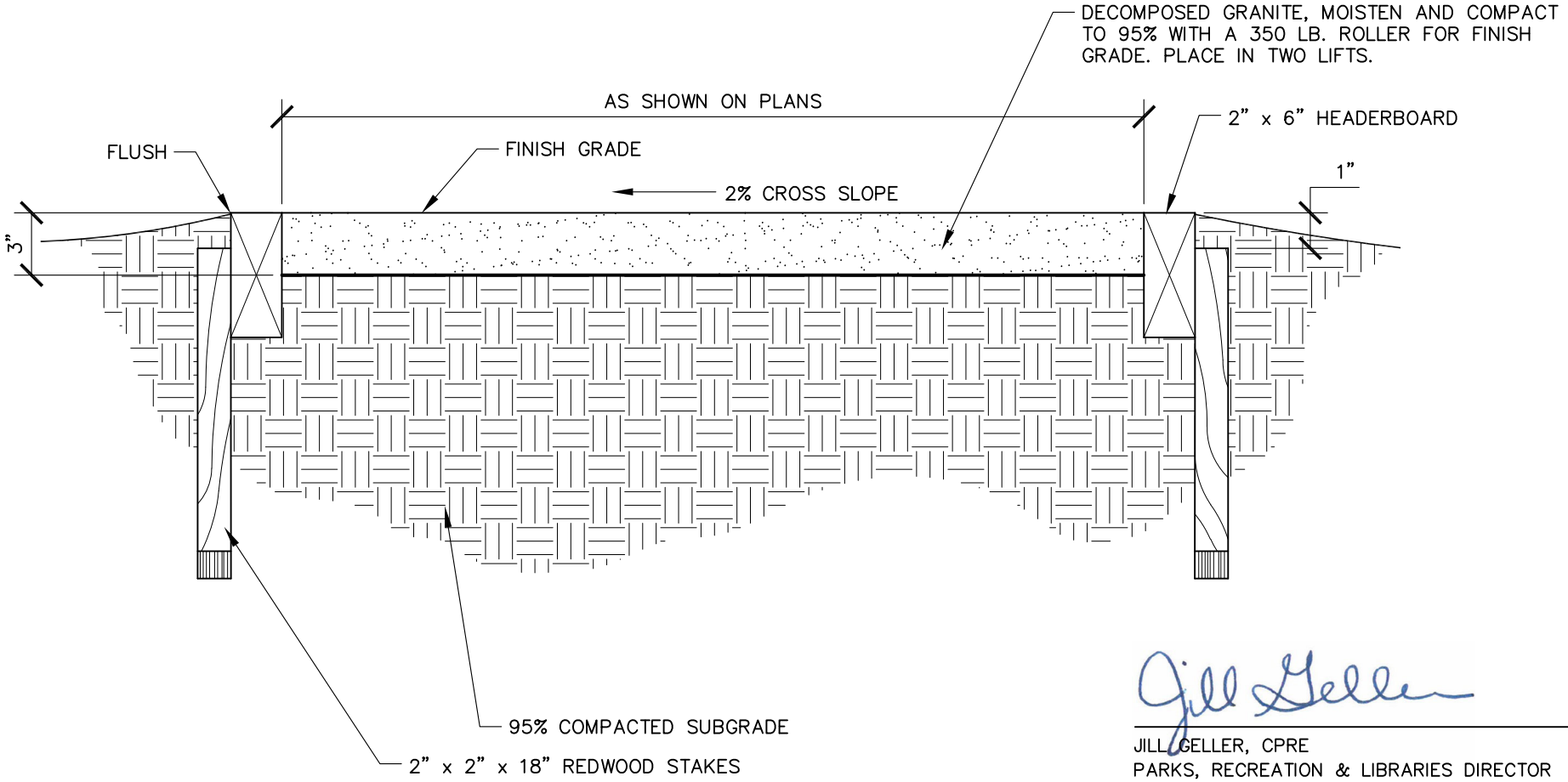
CONTROL JOINTS

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK-32

NOTES

1. CONTROL JOINTS SHALL NOT DIVIDE CONCRETE INTO SHAPES CONTAINING AN INTERIOR ANGLE OF 45 DEGREES OR LESS.
2. JOINTS SHALL BE SPACED EQUAL TO THE WIDTH OF THE PATH. EXAMPLE: A 10 FT. WIDE PATH SHALL HAVE JOINTS SPACED AT 10 FT. O.C.



JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

DECOMPOSED GRANITE PAVING

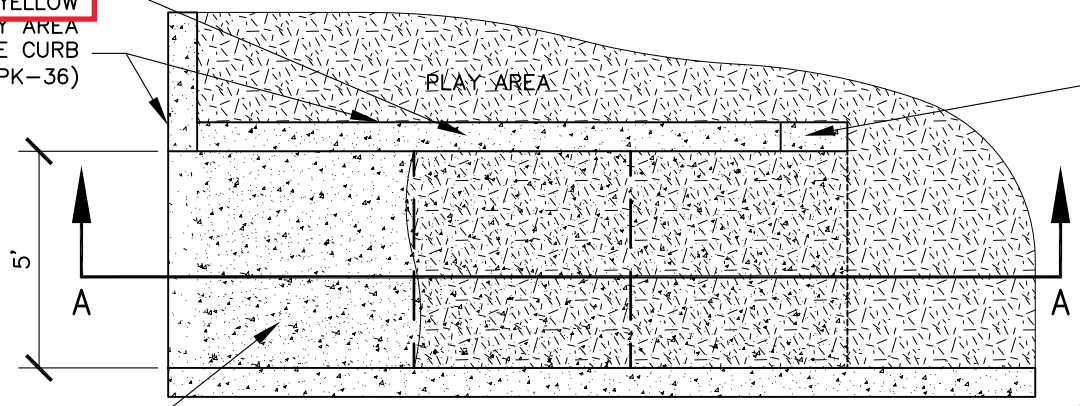
SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK–33

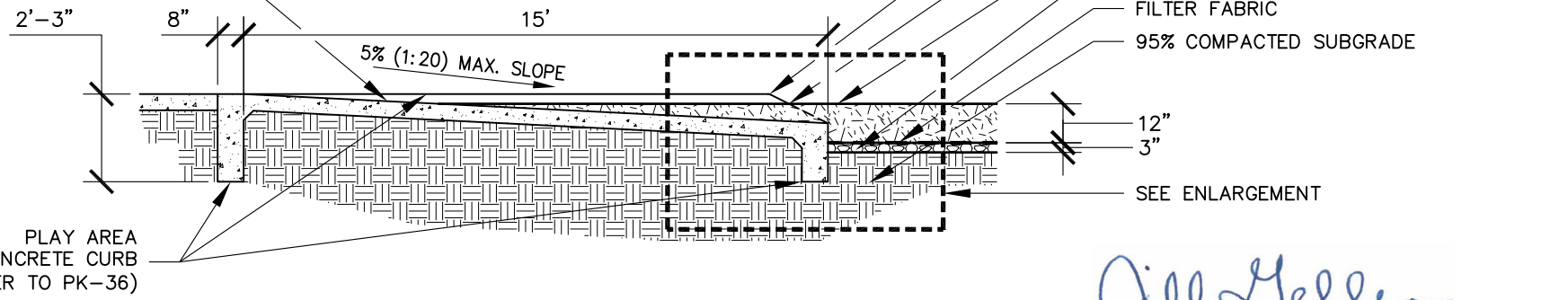
NOTES

1. CONTRACTOR TO SUBMIT SAMPLE OF LIGHT TAN OR CALIFORNIA GOLD DECOMPOSED GRANITE FOR APPROVAL BY CITY.

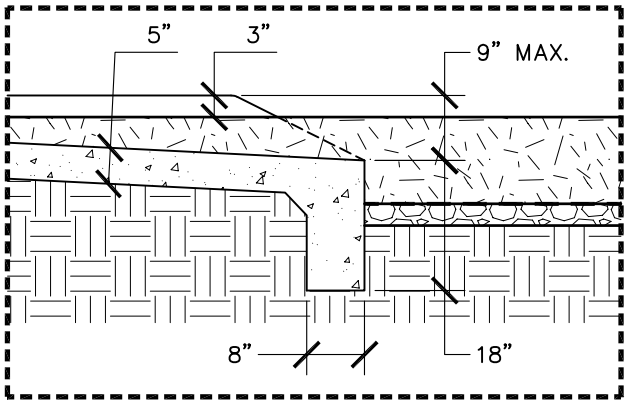
PLAN VIEW



SECTION A-A



ENLARGEMENT



JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

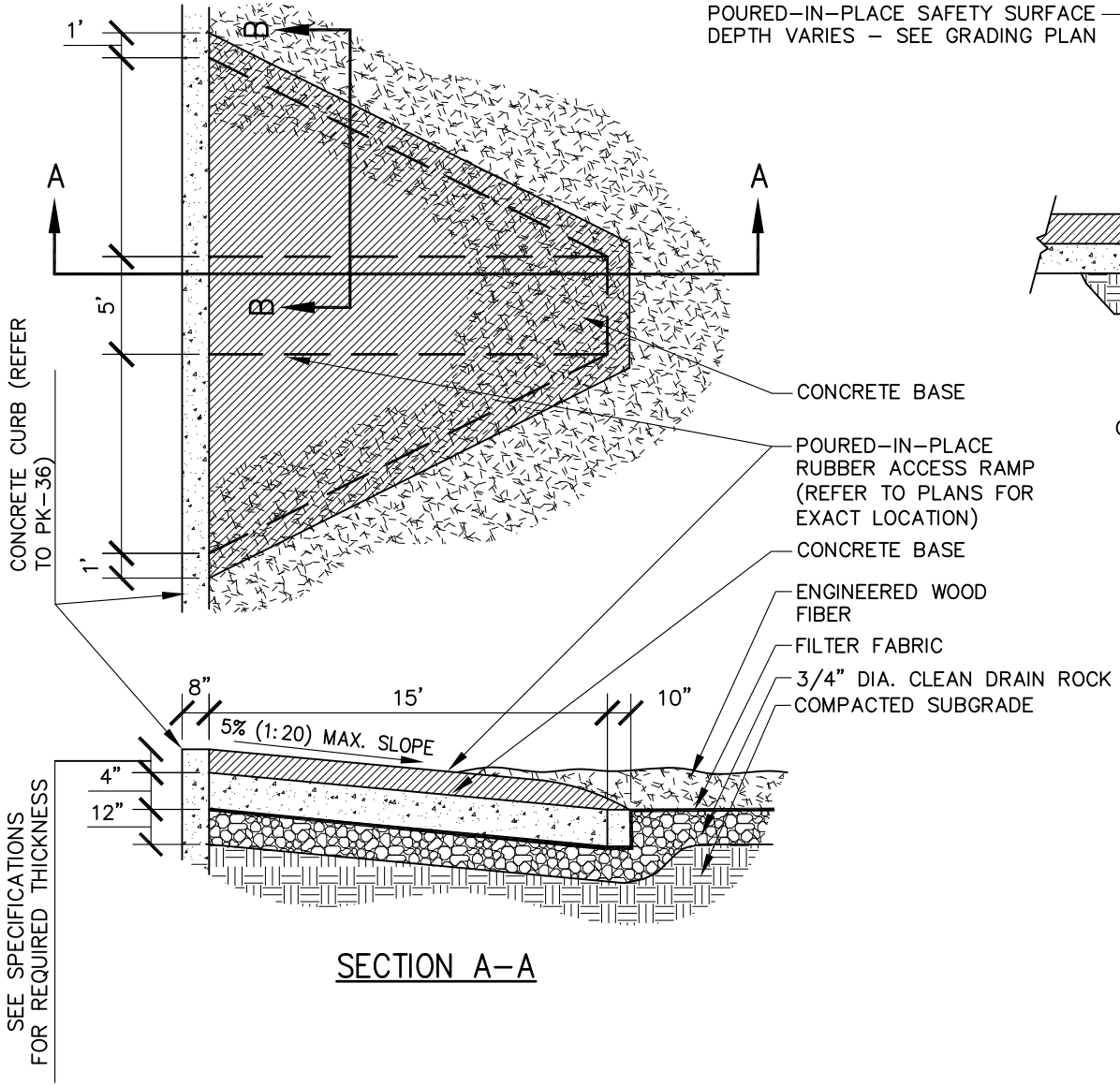
CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

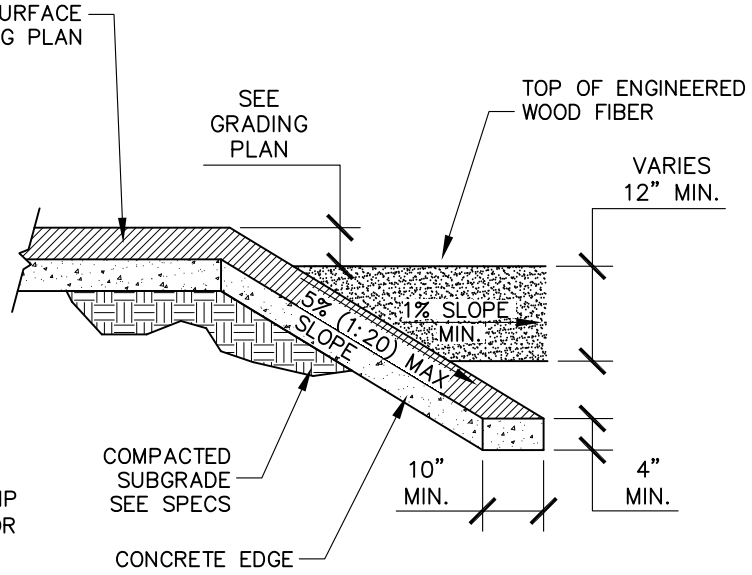
PLAY AREA ACCESS RAMP "A"

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK-34



SECTION A-A



SECTION B-B

JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

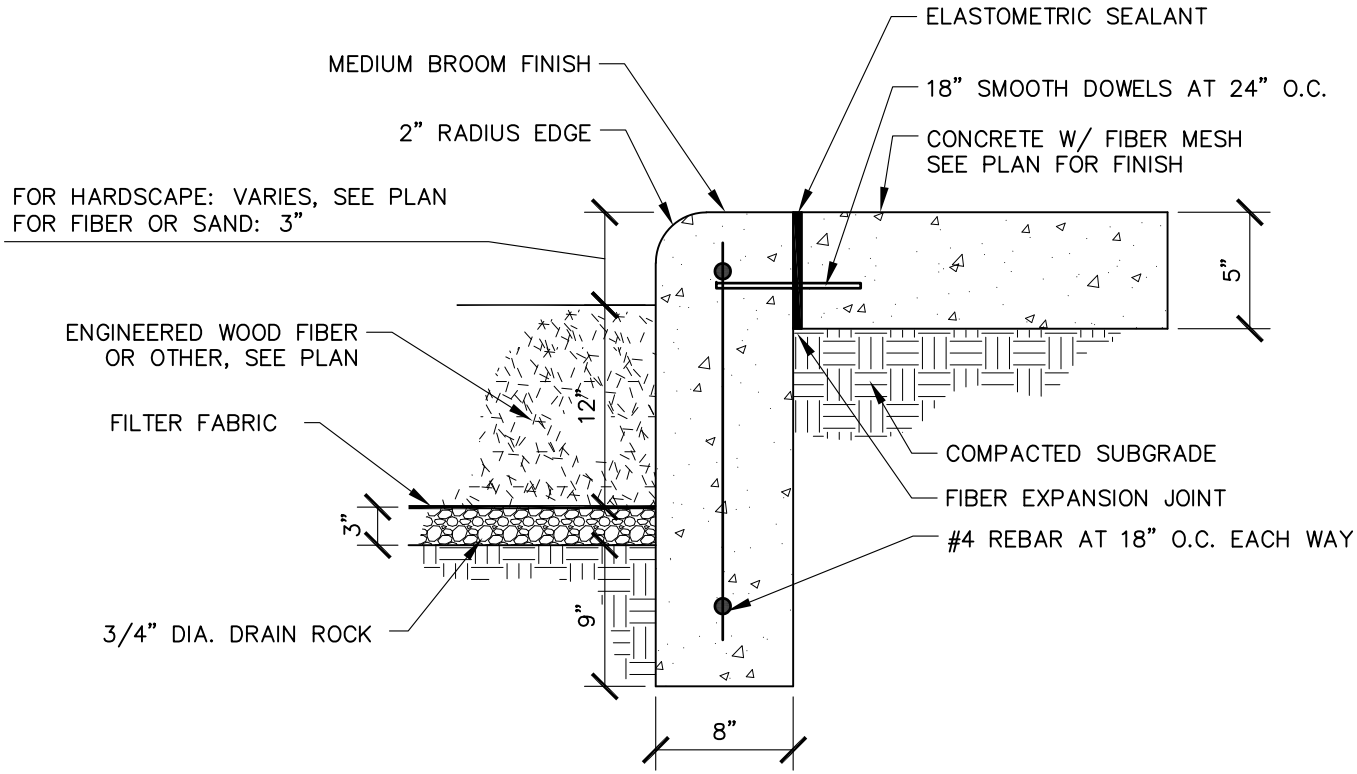
PLAY AREA ACCESS RAMP "B"

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK-35

NOTES

1. INSTALL POURED-IN-PLACE SURFACING PER MANUFACTURER'S SPECIFICATIONS.



JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

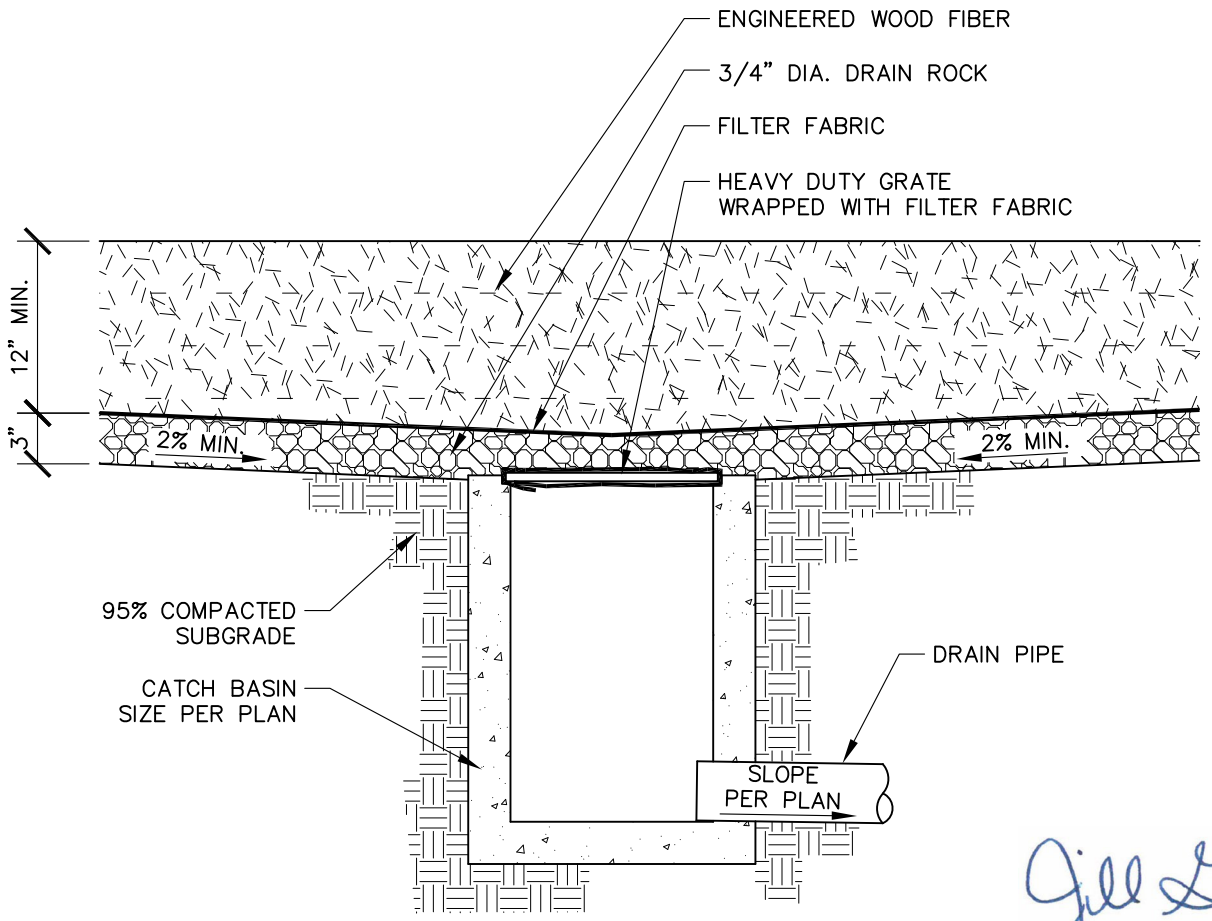
PLAY AREA CONCRETE CURB

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK–36

NOTES

1. INSTALL TYPE 3 CONCRETE CURB AND CONCRETE PAVING. PROVIDE 18" SMOOTH DOWELS AT 24" O.C.
2. PROVIDE VERTICAL SCORE JOINTS (1" DEEP) AT HORIZONTAL SCORE LINES. ALIGN WITH SIDEWALK.



JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

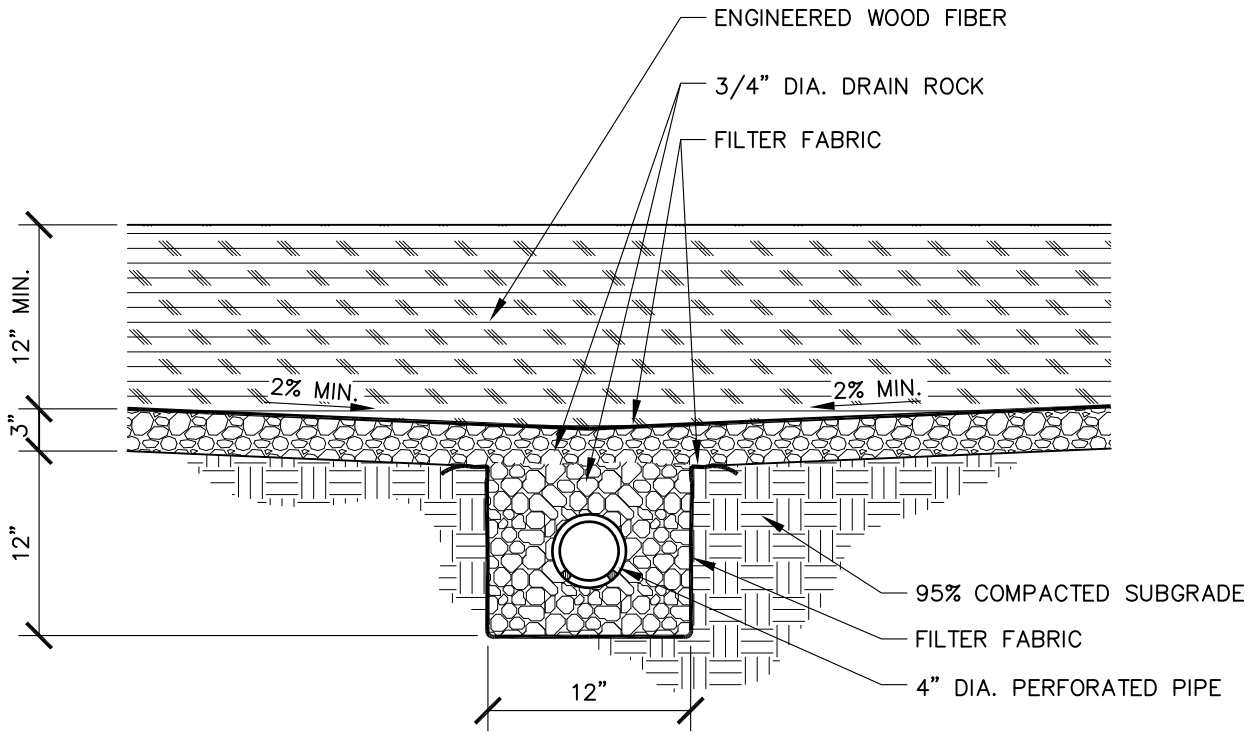
CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

PLAY AREA DRAIN

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK–37



JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

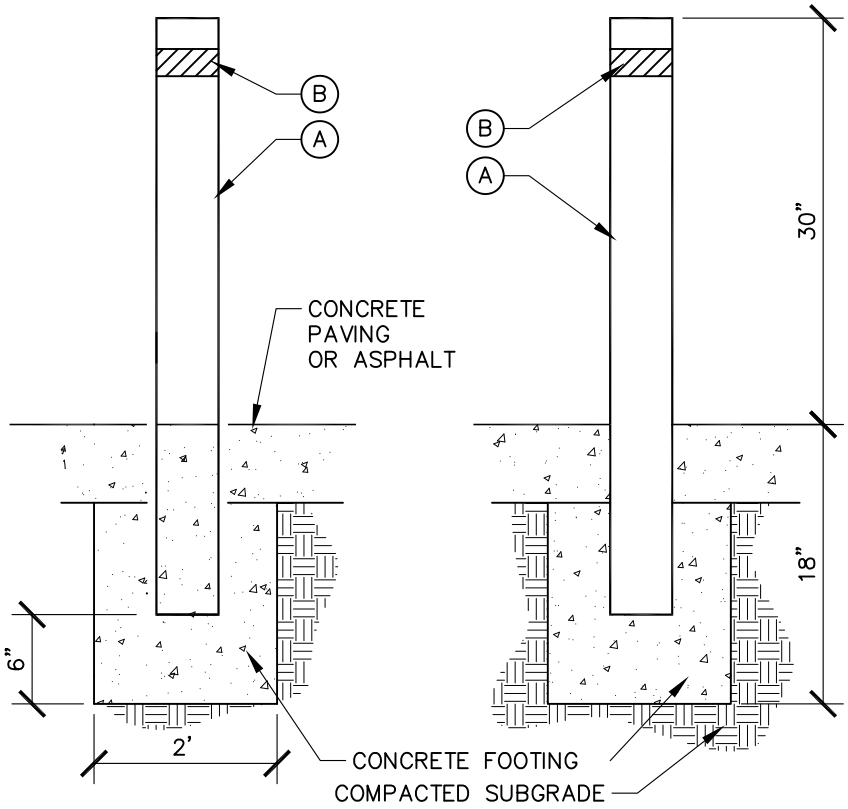
PLAY AREA
PERFORATED PIPE DRAIN

NOTES

1. PERFORATED PIPE SHALL BE LAID IN A HERRINGBONE PATTERN AND CONNECTED TO A DRAIN INLET.
2. LOCATE ALL CLEAN OUTS OUTSIDE PLAY AREA WITHIN PLANTING/TURF AREAS.

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK–38



FRONT SECTION

SIDE SECTION

LEGEND

A. 3 1/2" O.D. 1/4" WALL STEEL TUBE WITH CAP WELDED ON TOP. EASE ALL EDGES OF STEEL TUBE.

B. PLACE 2" WHITE REFLECTIVE TAPE.

NOTES

1. ALL TUBING SHALL BE BLACK STEEL PIPE.
2. ALL JOINTS SHALL BE WELDED IN ACCORDANCE WITH CA STATE STANDARD SPECIFICATIONS FOR WELDING STRUCTURAL STEEL AND GROUND SMOOTH.
3. ALL PARTS SHALL BE PAINTED WITH TWO COATS ZINC CHROMATE PRIMER AND TWO COATS EXTERIOR ENAMEL. COLOR: YELLOW

Jill Geller

JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

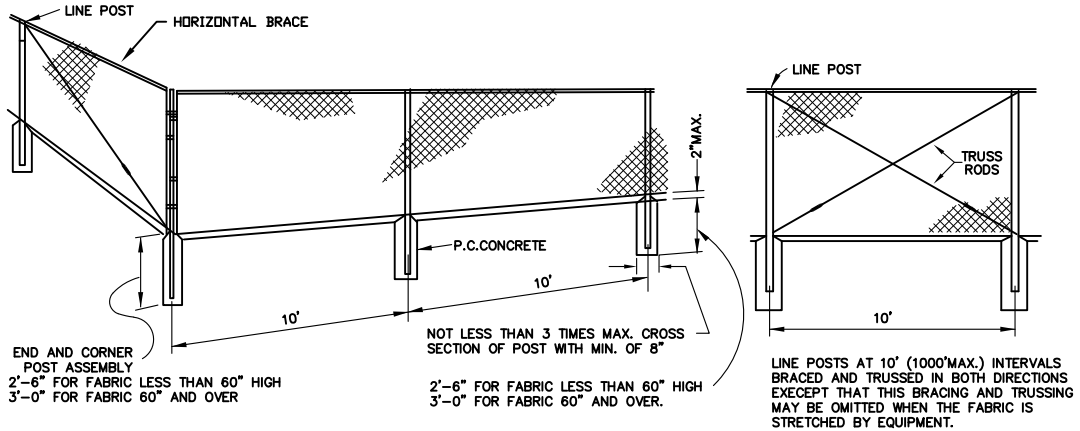
CITY OF ROSEVILLE CALIFORNIA

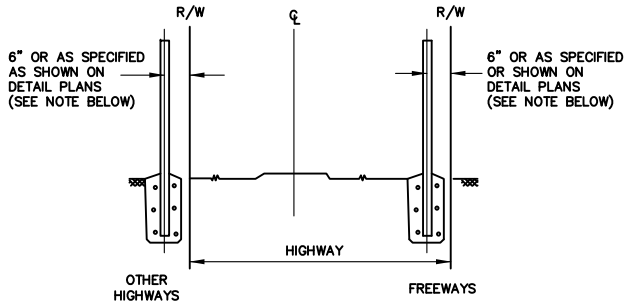
PARKS, RECREATION, & LIBRARIES DEPARTMENT

STATIONARY BOLLARD

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK–39

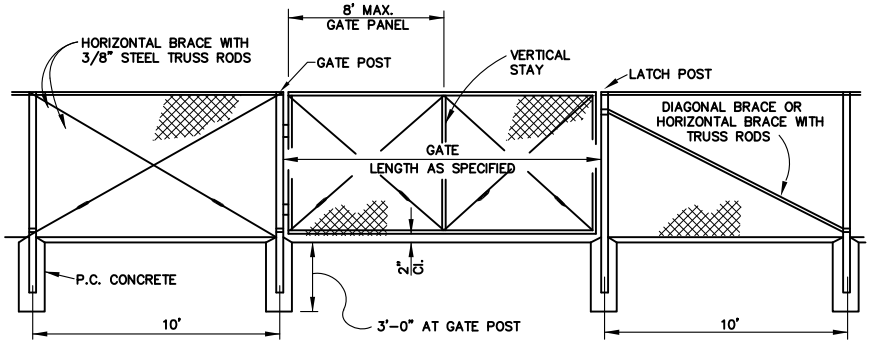




NOTES

1. OFFSET TO BE 2'-0" AT MONUMENT LOCATIONS, MEASURED AT RIGHT ANGLES TO R/W LINES. TAPER TO ACHIEVE OFFSET TO BE AT LEAST 20' LONG.

FENCE LOCATION



TYPE CL-4=48" FABRIC (11 GAUGE)
TYPE CL-6=72" FABRIC (9 GAUGE)

TYPICAL MEMBER DIMENSIONS										
FENCE HEIGHT	LINE POSTS			END, LATCH & CORNER POSTS			BRACES			
	ROUND (I.D.)	H	ROLL FORMED	ROUND (I.D.)	ROLL FORMED		ROUND (I.D.)	H	ROLL FORMED	
6' AND LESS	1-1/2"	1-7/8" X 1-5/8"	1-3/4" X 1-3/4"	2"	3-1/2" X 3-1/2"	2" X 1-3/4"	1-1/4"	1-1/2" X 1-5/16"	1-5/8" X 1-1/4"	1-3/4" X 1-1/4"
OVER 6'	2"	2-1/4" X 2"	2" X 1-3/4"	2-1/2"	3-1/2" X 3-1/2"	2" X 1-3/4"	1-1/4"	1-1/2" X 1-5/16"	1-5/8" X 1-1/4"	1-3/4" X 1-1/4"

NOTES

1. THE ABOVE TABLE SHOWS EXAMPLES OF POST AND BRACE SECTIONS WHICH MAY COMPLY WITH THE SPECIFICATIONS.
2. SECTIONS SHOWN IN THE TABLES MUST ALSO COMPLY WITH THE STRENGTH REQUIREMENTS AND OTHER PROVISIONS OF THE SPECIFICATIONS.
3. OTHER SECTIONS WHICH COMPLY WITH THE STRENGTH REQUIREMENTS AND OTHER PROVISIONS OF THE SPECIFICATIONS MAY BE USED ON APPROVAL OF THE ENGINEER.
4. OPTIONS EXERCISED SHALL BE UNIFORM ON ANY ONE PROJECT.
5. DIMENSIONS SHOWN ARE NOMINAL.

GATE POST							
FENCE HEIGHT	GATE WIDTHS	NOMINAL I.D.	WEIGHT PER FOOT	FENCE HEIGHT	GATE WIDTHS	NOMINAL I.D.	WEIGHT PER FOOT
6'-0" AND LESS	UP THRU 6'	2-1/2"	4.95	OVER 6'	UP THRU 6'	3"	7.58
	OVER 6' THRU 12'	4"	10.79		OVER 6' THRU 12'	5"	14.62
	OVER 12' THRU 18'	5"	14.62		OVER 12' THRU 18'	6"	18.97
	OVER 18' TO 24' MAX.	6"	18.97		OVER 18' TO 24' MAX.	8"	28.55

NOTES

1. ABOVE POST DIMENSIONS AND WEIGHTS ARE MINIMUMS. LARGER SIZES MAY BE USED ON APPROVAL OF ENGINEER.

Jill Geller

JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

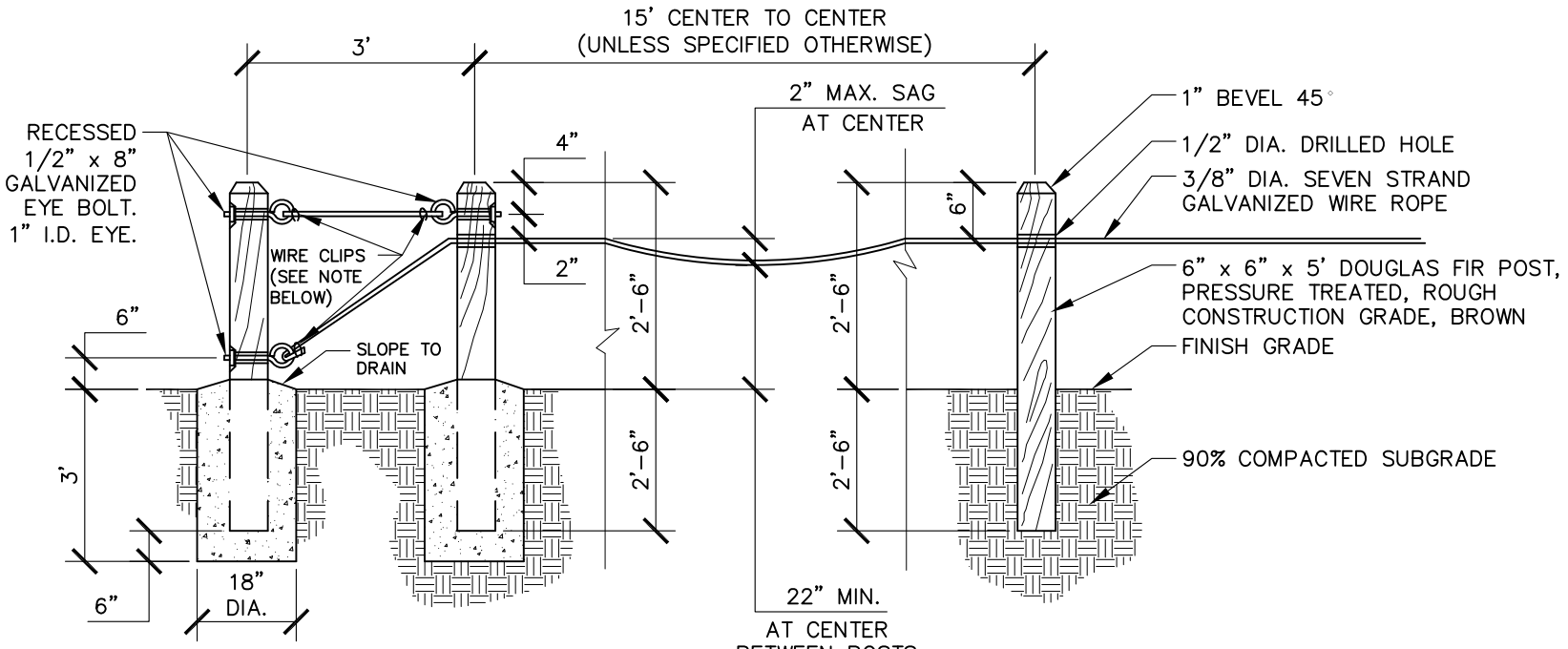
CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

CHAIN LINK FENCE

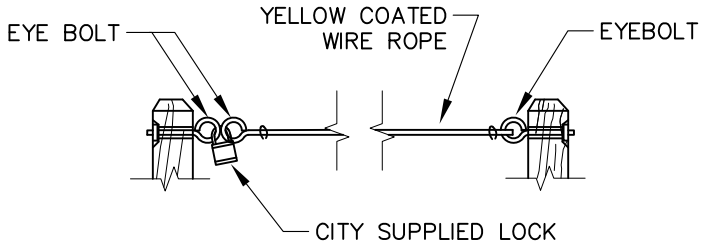
SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK-40



TERMINAL POST ANCHOR

LINE POST



FIRE ACCESS

NOTES

1. PROVIDE CONCRETE FOOTINGS AT ALL END POSTS, AT ALL BENDS AND AS SPECIFIED ON APPROVED PLANS.
2. USE 3/8" x 2" GALVANIZED WIRE ROPE CLIPS FOR CONNECTIONS AND SPLICES. ALL CLIPS SHALL BE PLACED WITH NUTS FACING DOWNWARD.
3. FOR FIRE ACCESS POINTS, USE YELLOW PVC COATED CABLE.
4. WHERE REQUIRED, USE WHITE PVC COATED CABLE IN LIEU OF GALVANIZED CABLE EXCEPT IN FIRE ACCESS LOCATIONS.
5. DO NOT INSTALL IN TURF AREAS.

JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

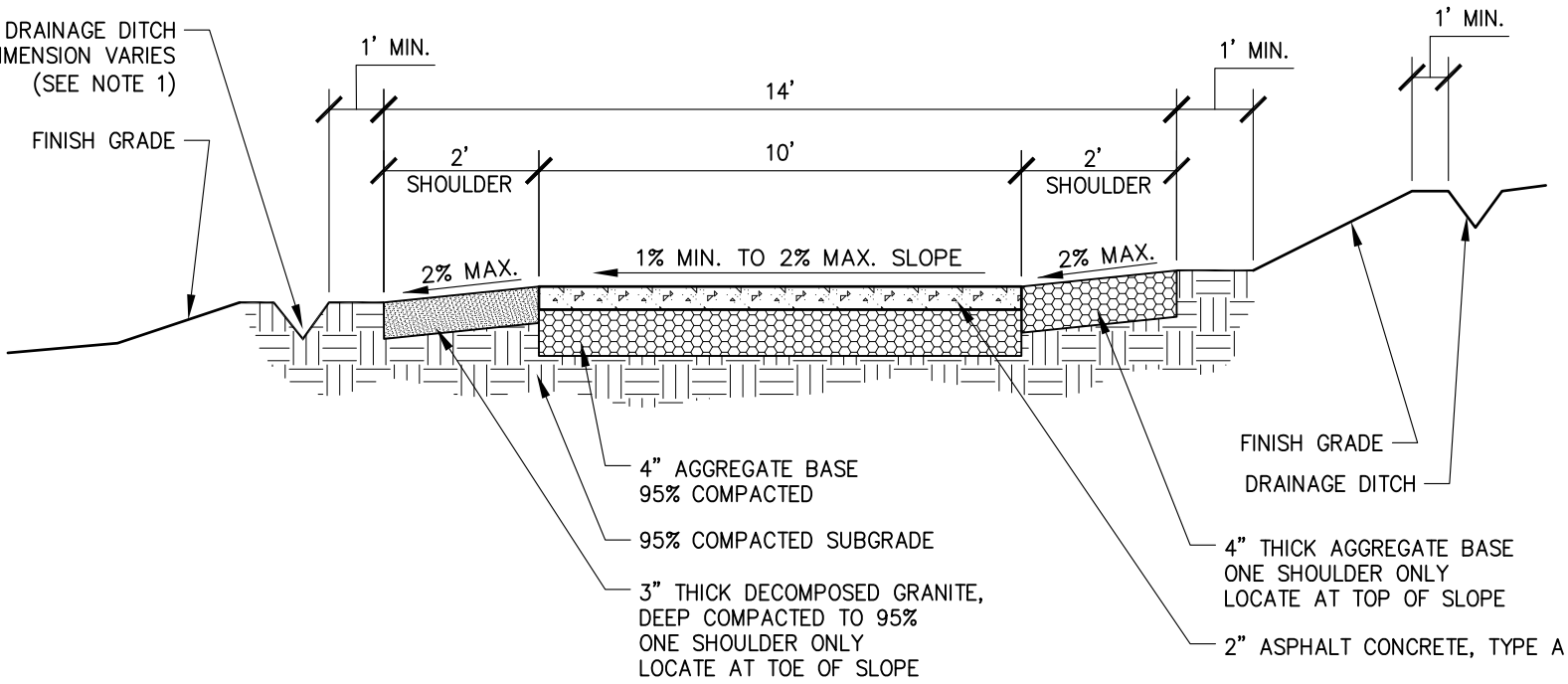
CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

POST AND CABLE FENCE

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK–41



JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

NOTES

1. BIKE PATHS CONSTRUCTED WITHIN CUT–SLOPES SHALL HAVE A DRAINAGE DITCH OF SUITABLE DIMENSIONS ALONG THE UPHILL SIDE TO INTERCEPT THE HILLSIDE DRAINAGE. BIKE PATHS CONSTRUCTED ON TOP OF FILL SLOPES SHALL HAVE A DRAINAGE DITCH OF SUITABLE DIMENSIONS ALONG THE DOWNHILL SIDE TO INTERCEPT THE TRAIL'S DRAINAGE.
2. MAXIMUM SLOPE RATE FOR CUT AND FILL SLOPES SHALL BE PER THE RECOMMENDATIONS OF A LICENSED GEOTECHNICAL ENGINEER. IN LOCATIONS ADJACENT TO CREEKS, DITCHES, OR DOWN–SLOPES GREATER THAN 3 FEET HORIZONTAL TO 1 FOOT VERTICAL, A MINIMUM SHOULDER WIDTH OF 5 FEET FROM THE EDGE OF PAVEMENT TO THE TOP OF SLOPE IS REQUIRED.
3. STRUCTURAL SECTION SHALL BE CAPABLE OF SUPPORTING A MINIMUM GROSS VEHICULAR WEIGHT OF 30,000 POUNDS. IF SOILS ANALYSIS IDENTIFIES AN R–VALUE LESS THAN 20, THE STRUCTURAL SECTION SHALL BE MODIFIED AS NECESSARY TO SUPPORT 30,000 POUNDS.

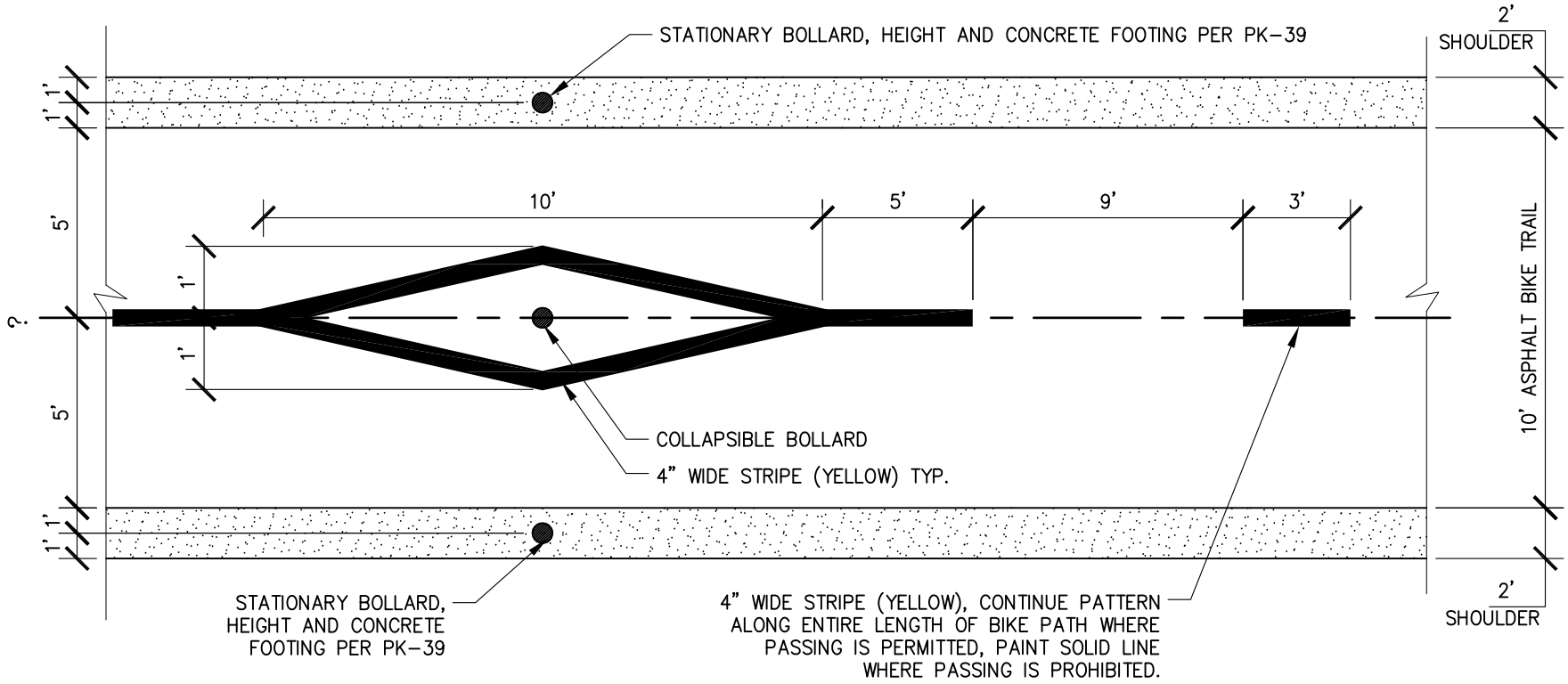
CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

BIKE TRAIL SECTION

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK–43



JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

NOTES

1. ALL STRIPING AND PAVEMENT MARKINGS SHALL BE CONSTRUCTED WITH PAINT PER CALTRANS STANDARD SPECIFICATIONS SECTION 84-3.
2. BOLLARD STRIPING SHALL CONFORM WITH CALTRANS HIGHWAY DESIGN MANUAL, SECTION 1003.1.15 AND THE CALIFORNIA MUTCD SECTION 9C.101.
3. INSTALL RETROREFLECTIVE MARKERS ON ALL BOLLARDS PER CALIFORNIA MUTCD SECTION 9C.101.
4. LOCATE BOLLARDS 20 FEET FROM FACE OF CURB/EDGE OF TRAVEL WAY OR AS APPROVED.
5. A SITE SPECIFIC REVIEW IS REQUIRED TO DETERMINE IF PHYSICAL BARRIERS ARE REQUIRED ADJACENT TO THE STATIONARY BOLLARDS TO FURTHER DETER VEHICLE ACCESS.

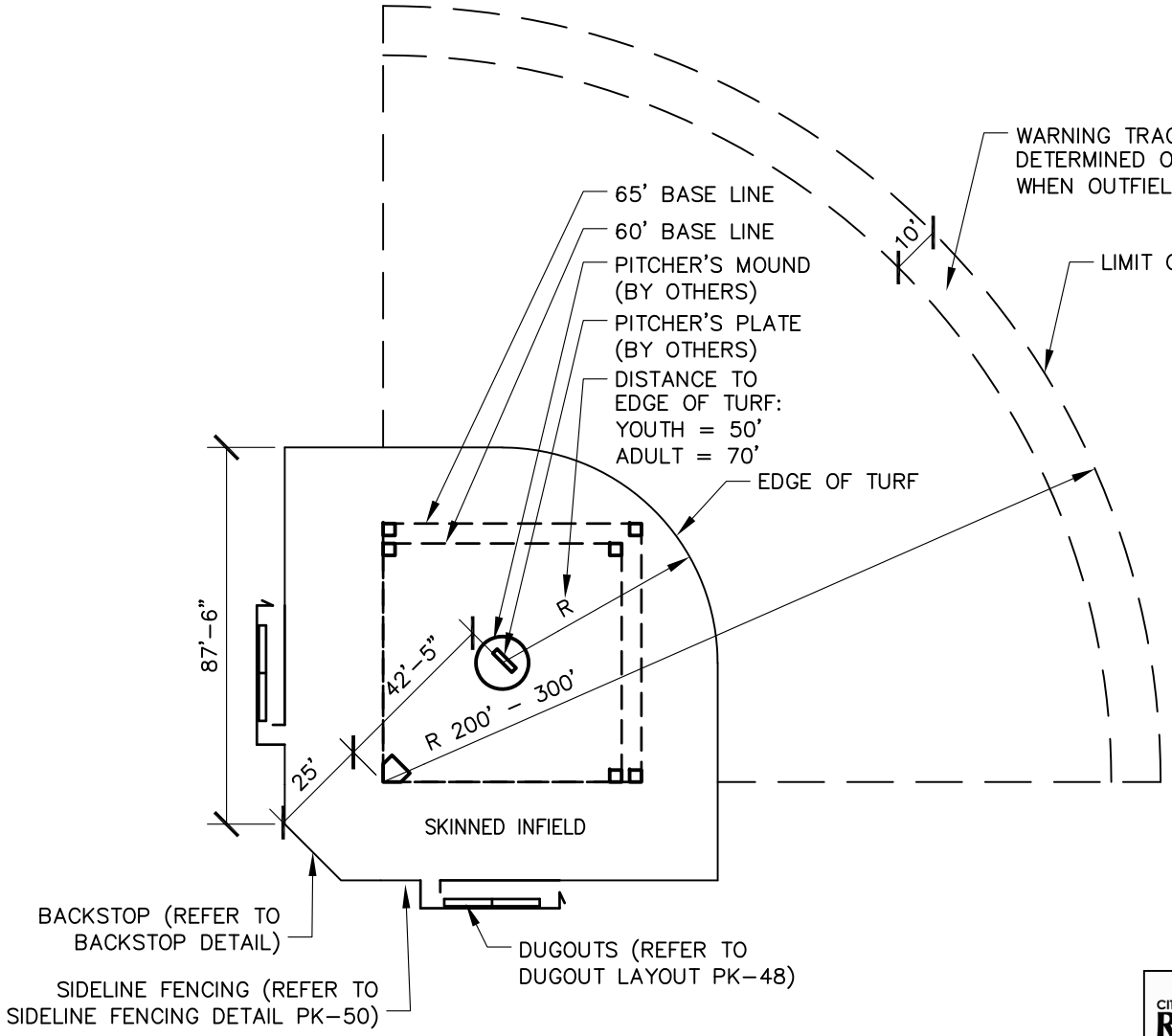
CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

BIKE TRAIL STRIPING

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK-44



JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

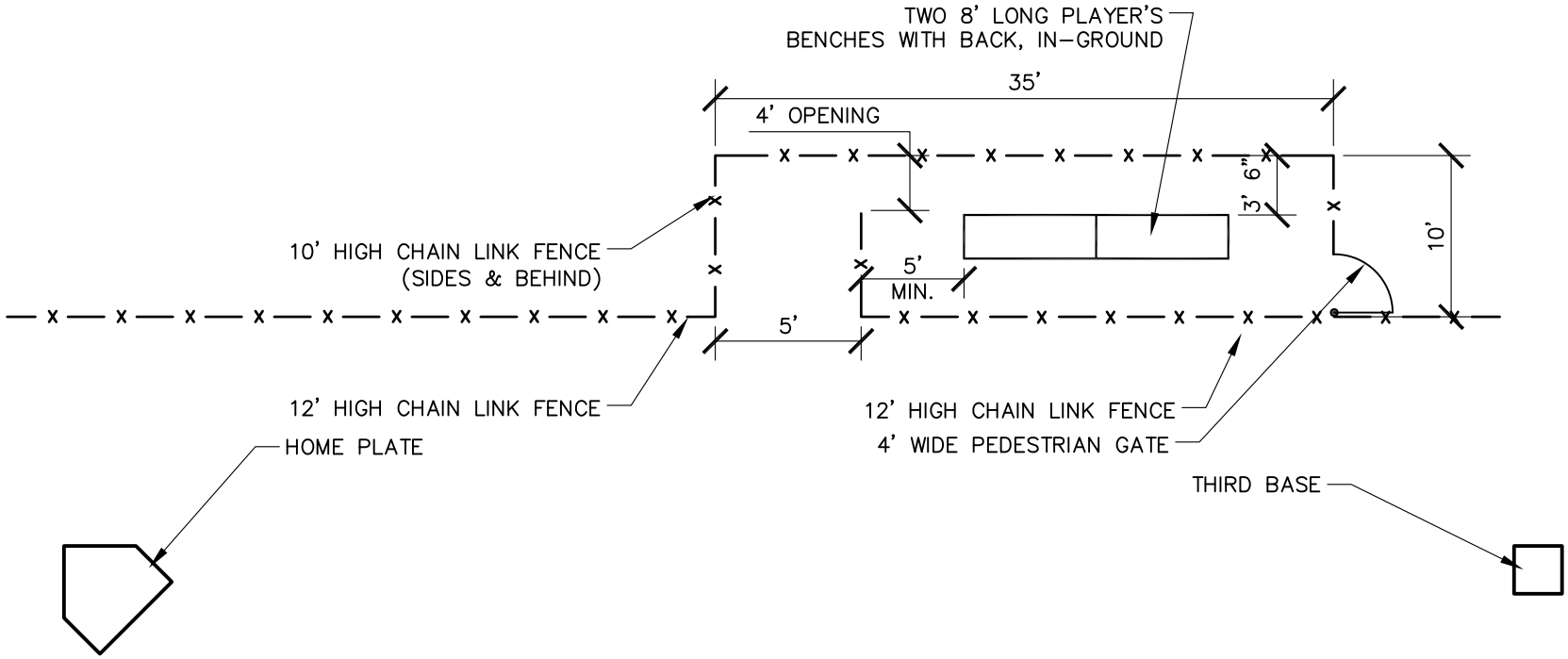
BALL FIELD LAYOUT

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK-47

NOTES

1. ALL AREAS MUST DRAIN AWAY FROM INFIELD.
2. LENGTH OF SIDELINE FENCING SHALL BE DETERMINED ON A PROJECT-BY-PROJECT BASIS.
3. PITCHER'S MOUND, PITCHER'S PLATE, AND BASES TO BE SUPPLIED BY OTHERS.
4. 6" MINIMUM DEPTH OF INFIELD MIX.



JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

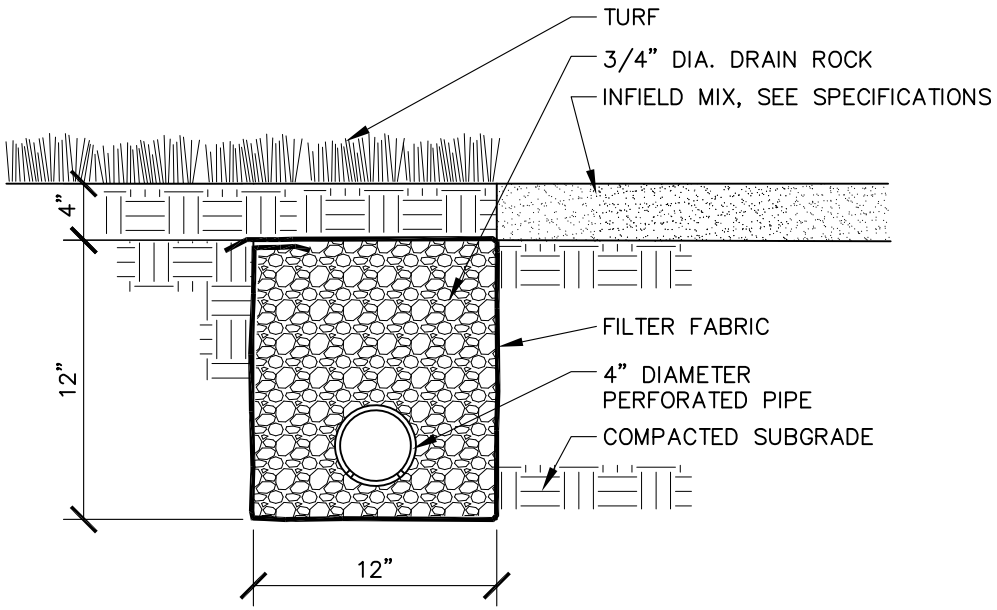
CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

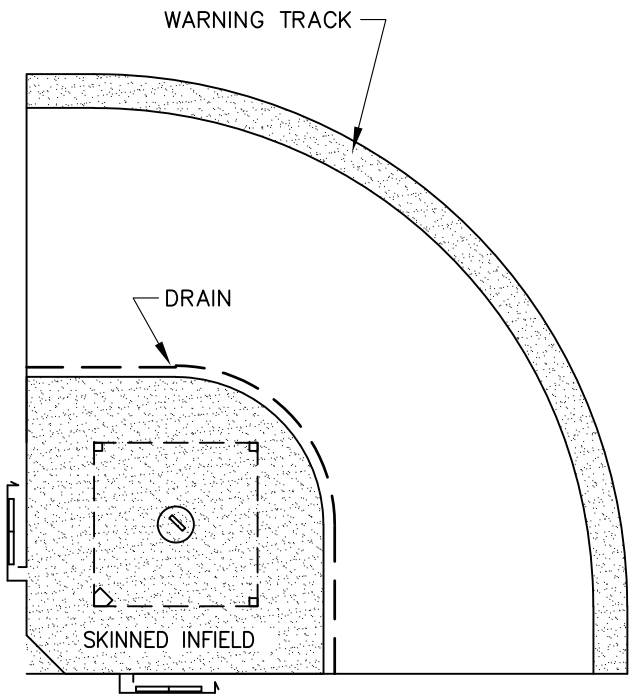
DUGOUT LAYOUT

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK-48



SECTION



PLAN

JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

INFIELD EDGE DRAIN AND WARNING TRACK

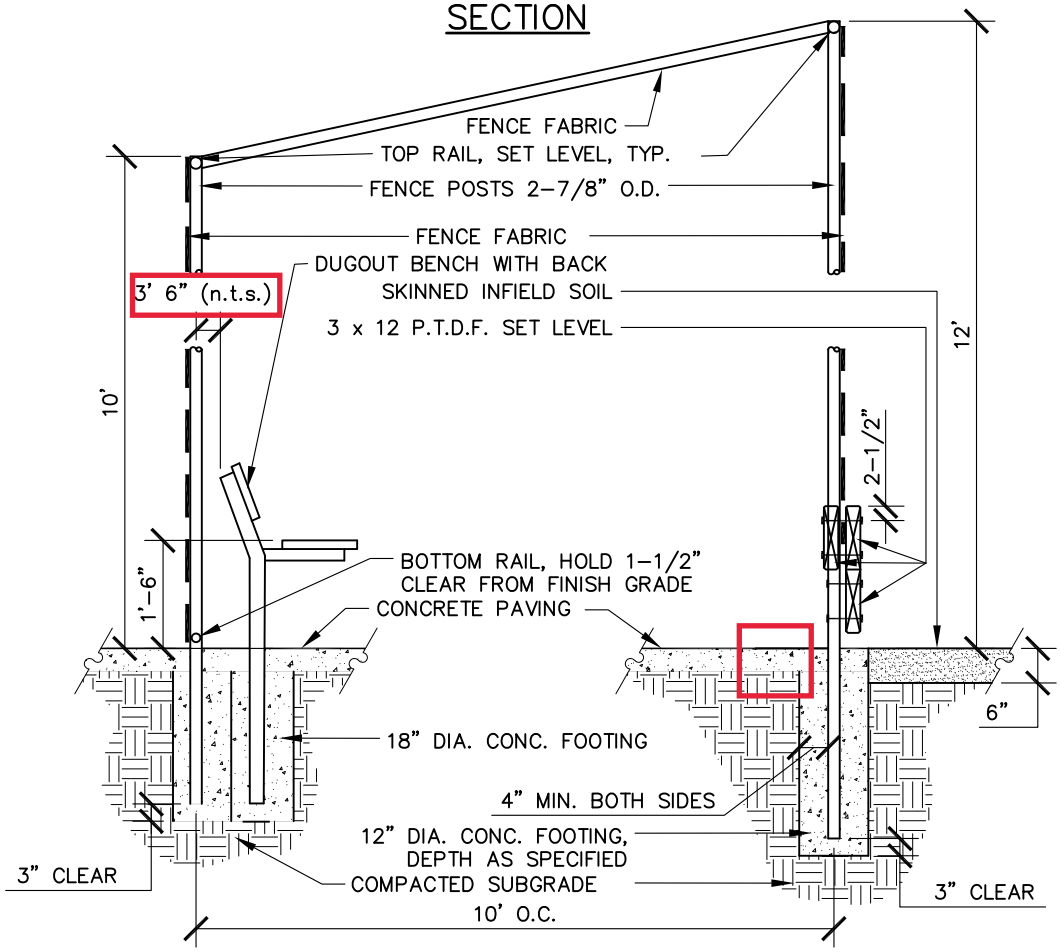
NOTES

1. INSTALL FILTER FABRIC TO LINE THE ENTIRE TRENCH, INCLUDING THE TOP.
2. CONNECT DRAIN TO STORM DRAIN SYSTEM.

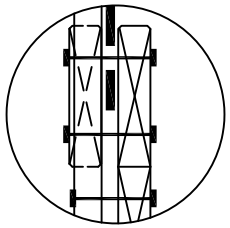
SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK–49

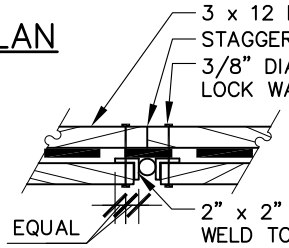
SECTION



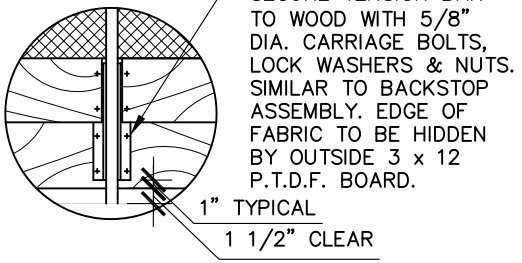
ENLARGEMENT



PLAN



ELEVATION



Jill Geller

JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

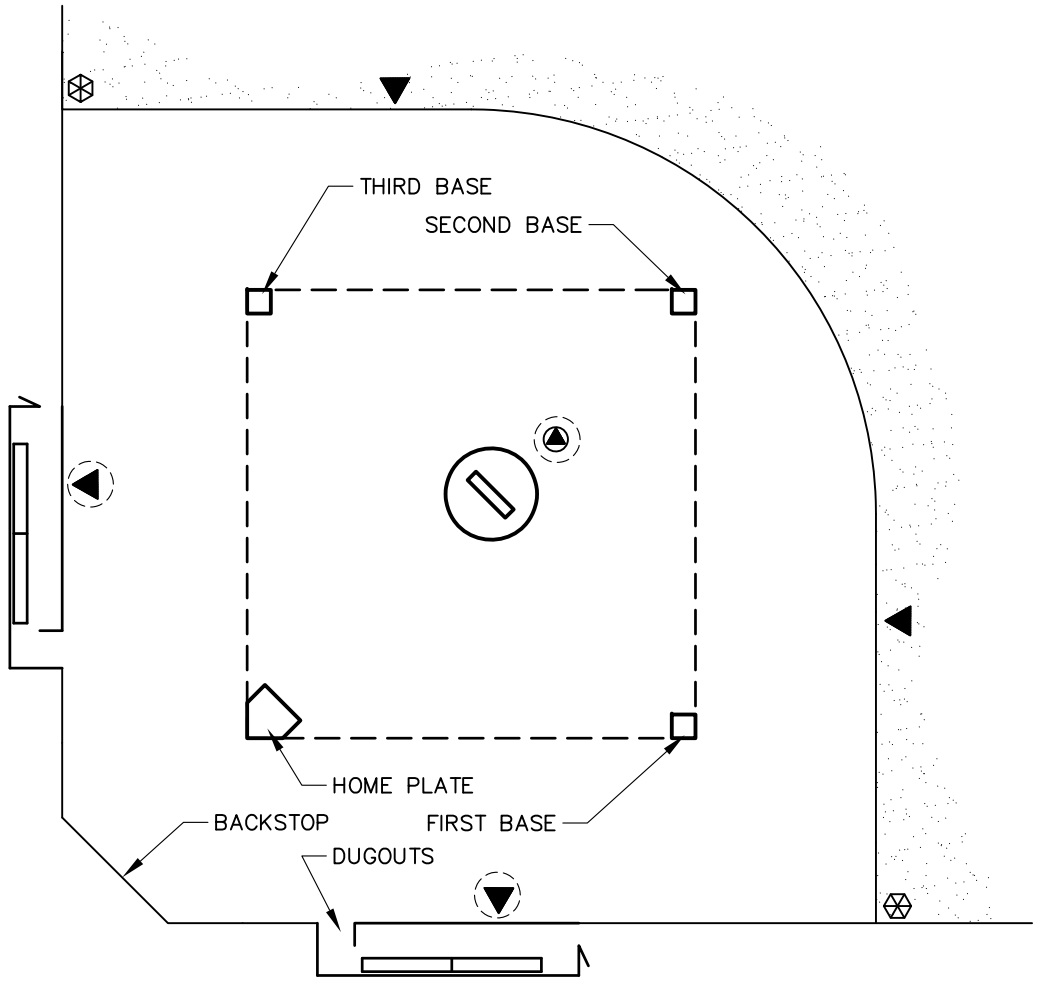
SIDELINE FENCE

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK–50

NOTES

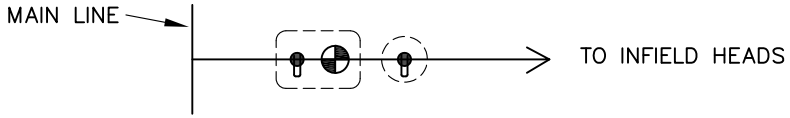
1. ALL STEEL AND HARDWARE SHALL BE HOT–DIPPED GALVANIZED.
2. PRIME AND PAINT WOOD WITH KELLY–MOORE PAINT. COLOR TO BE OXFORD BROWN OR WOODLAND FERN.
3. WOOD TO BE PRESSURE TREATED S4S SELECT DOUGLAS FIR (P.T.D.F.)
4. 6" MINIMUM DEPTH OF INFIELD MIX



LEGEND

- QUICK COUPLER
- 180° POP–UP TURF SPRINKLER – RAINBIRD FALCON 6504 SERIES STAINLESS STEEL HEAD, OR APPROVED EQUAL
- 360° POP–UP TURF SPRINKLER FALCON 6504 SERIES STAINLESS STEEL HEAD
- 4" ROUND VALVE BOX & COVER
- REMOTE CONTROL VALVE
- 2" MAXIMUM BRASS BALL VALVE, AT GRADE

CONNECTION ENLARGEMENT



NOTES

1. PROVIDE A BRASS MANUAL IRRIGATION ISOLATION VALVE FOR EACH QUICK COUPLER.
2. BACKFILL BOXES CONTAINING SPRINKLER HEADS WITH PEA GRAVEL TO A LEVEL 3" FROM BOTTOM OF LID.

JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

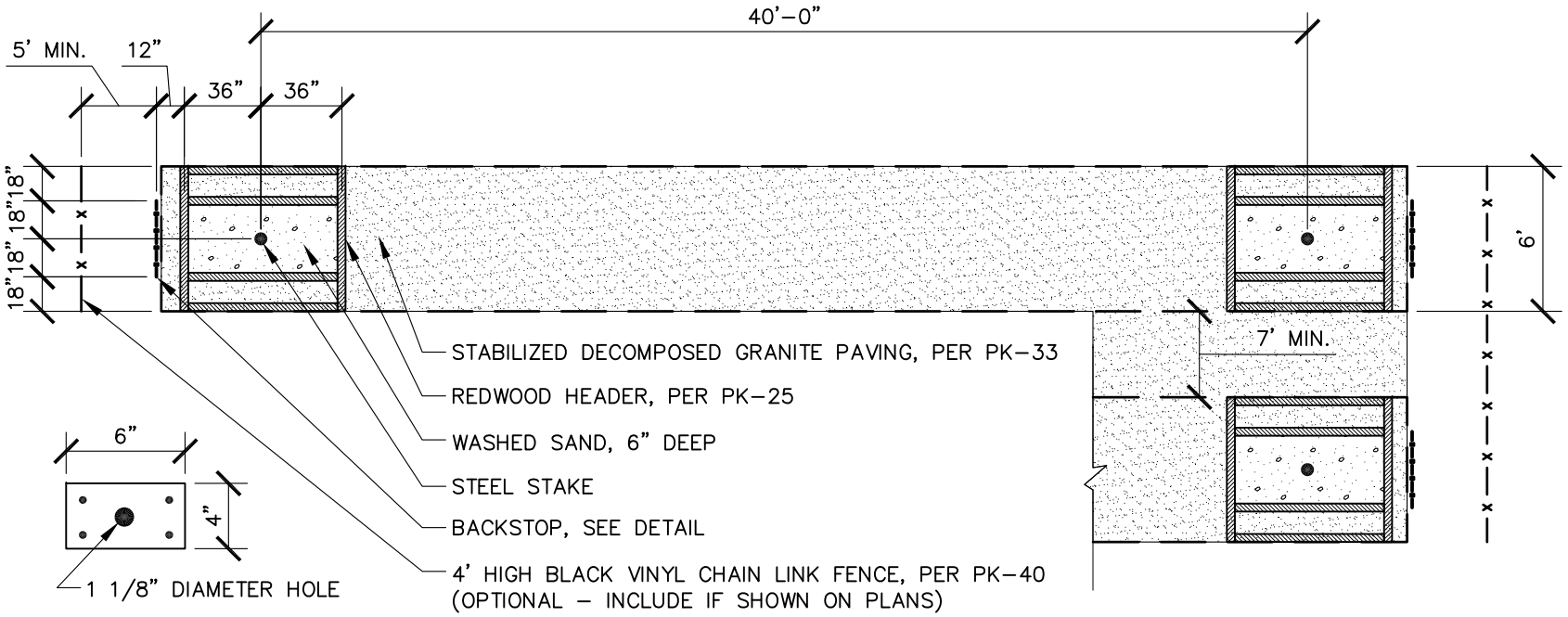
CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

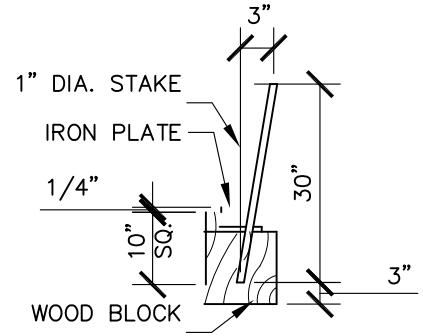
SKINNED INFIELD IRRIGATION LAYOUT

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

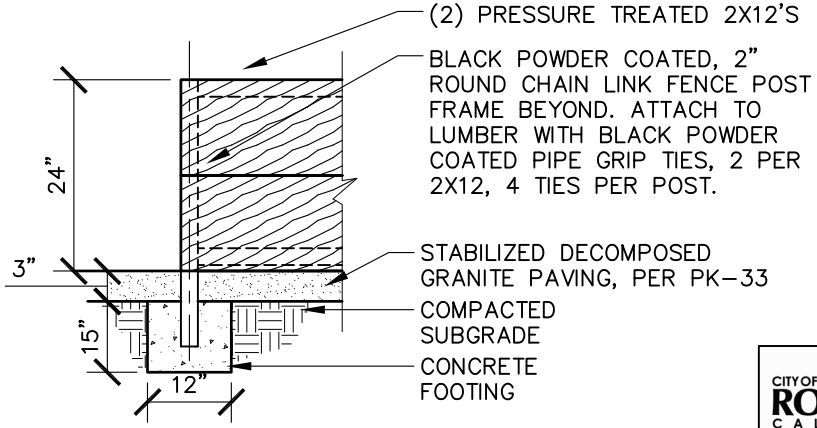
PK–51



IRON PLATE PLAN



STAKE SECTION



BACKSTOP DETAIL

NOTES

1. STAKES SHOULD BE MADE OF 1" DIAMETER COLD ROLLED STEEL 30" LONG.
2. BLOCK SHOULD BE PRESSURE TREATED DOUGLAS FIR OR APPROVED EQUAL.
3. DRILL 1" DIAMETER BY 7" DEEP HOLE INTO BLOCK AND DRIVE PEG INTO BLOCK.
4. SLIP IRON PLATE OVER PEG AND ATTACH WITH FOUR LAG SCREWS.

JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

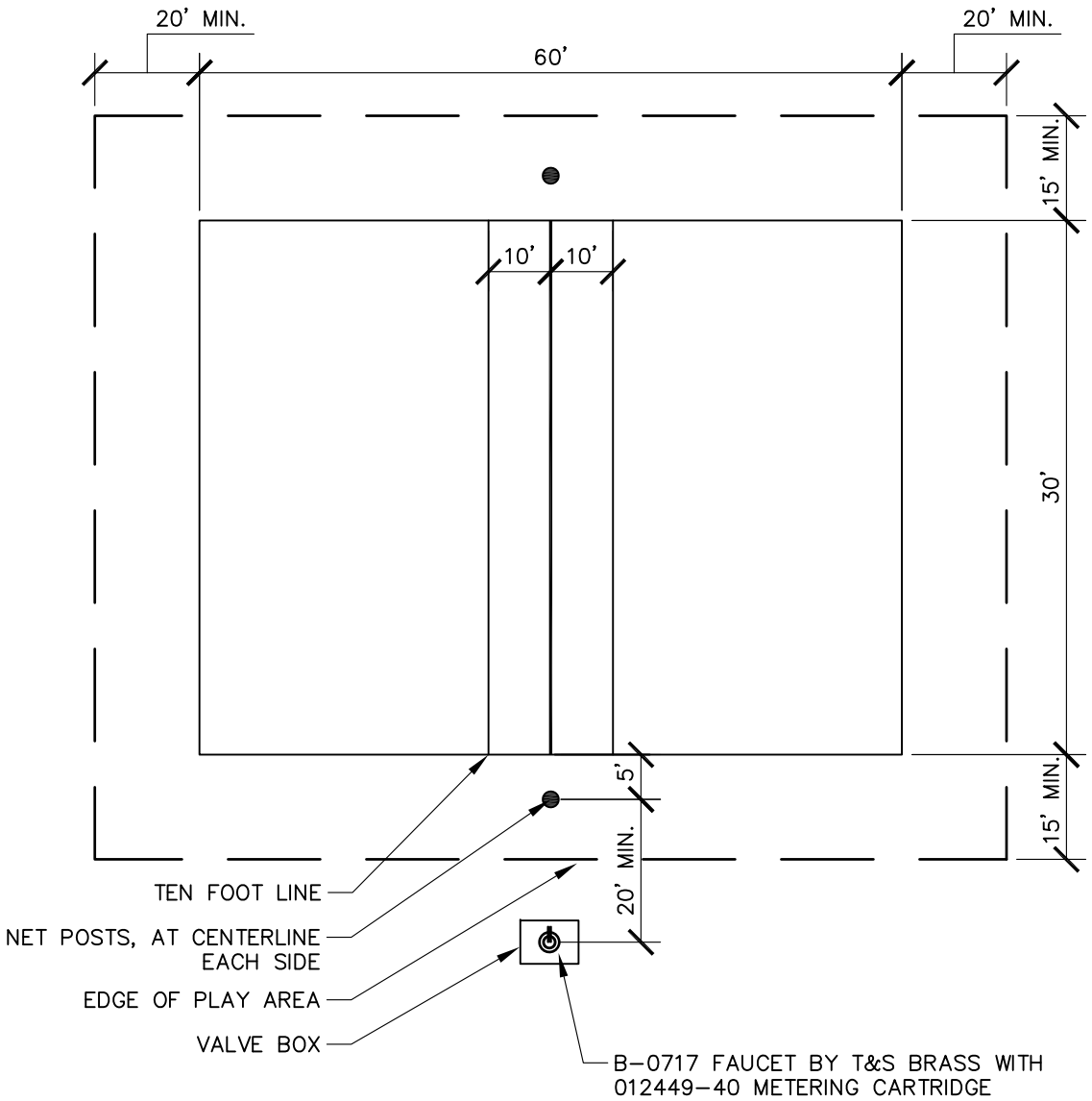
CITY OF ROSEVILLE CALIFORNIA

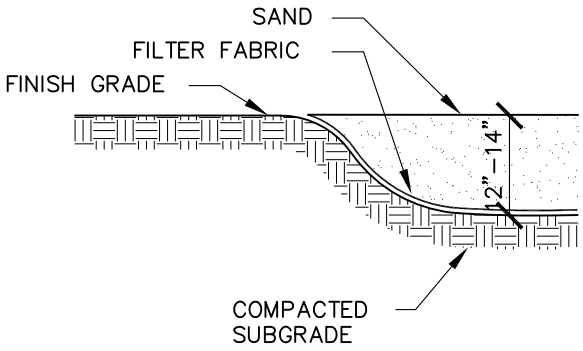
PARKS, RECREATION, & LIBRARIES DEPARTMENT

HORSEHOE COURT LAYOUT

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK–53





SECTION

JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

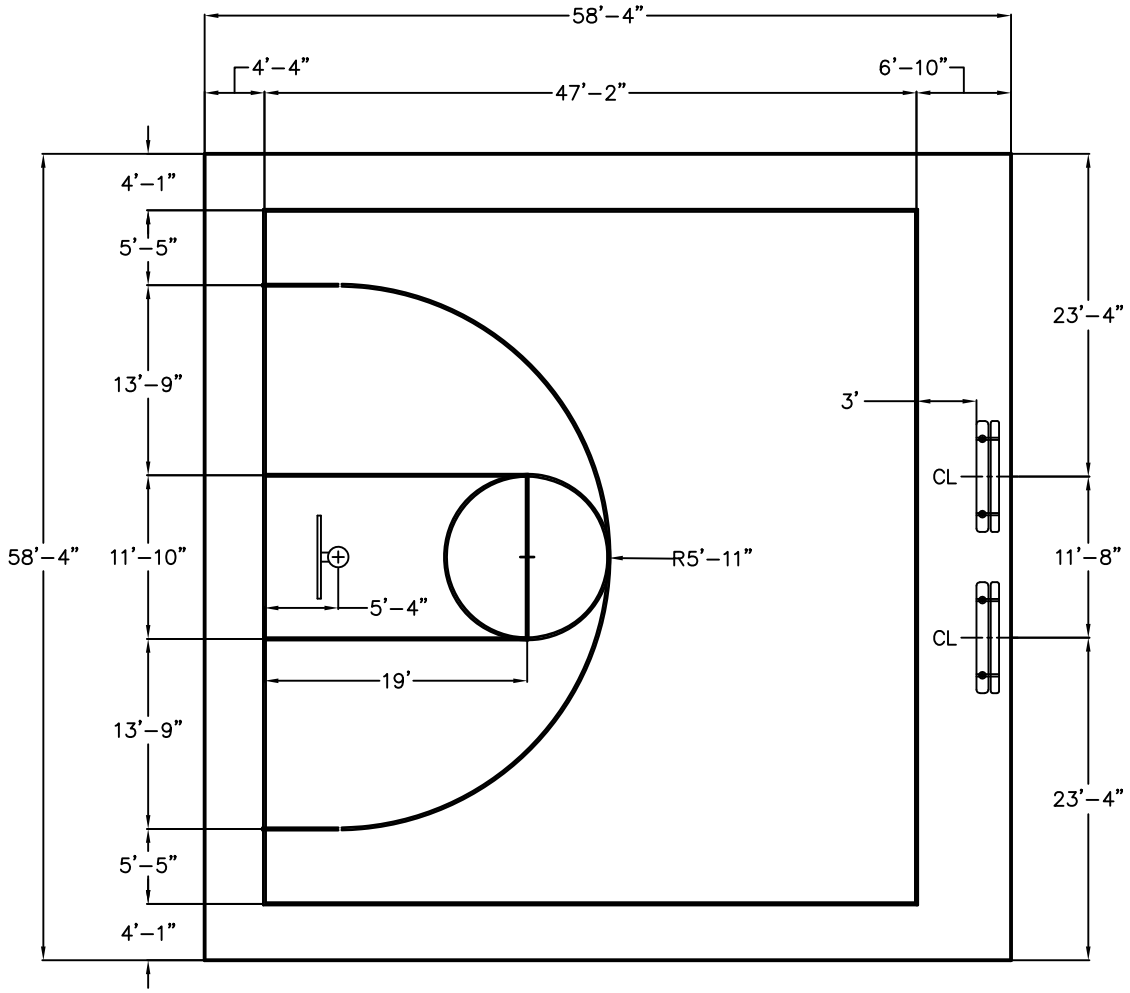
VOLLEYBALL COURT LAYOUT

NOTES

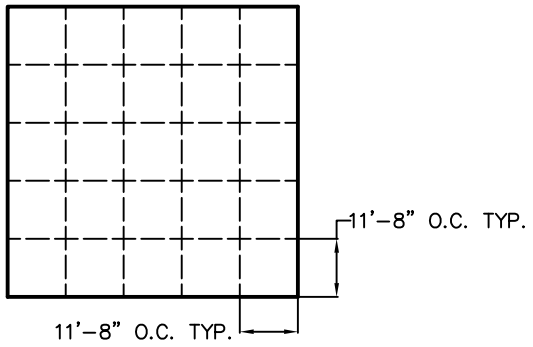
1. FINISH GRADE OF SAND SHALL BE FLUSH WITH FINISH GRADE OF ADJACENT AREA.
2. DO NOT INSTALL IRRIGATIONS HEADS IN SAND AREA.

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK-54



LAYOUT



CONTROL JOINT LAYOUT

JILL GELLER, CPRE
PARKS, RECREATION & LIBRARIES DIRECTOR

CITY OF ROSEVILLE CALIFORNIA

PARKS, RECREATION, & LIBRARIES DEPARTMENT

BASKETBALL HALF–COURT LAYOUT

SCALE: NONE
REVISED: JULY 2021
REVIEWED BY: T. GEE
APPROVED BY: J. GELLER

PK–55

NOTES

1. STRIPING WIDTH – 2"
2. STRIPING DIMENSIONS MEASURED FROM CENTER OF STRIPE.

COUNCIL COMMUNICATION

CC #: 1529
File #: 0704

Title: Park Naming Policy Revisions
Contact: Tara Gee 916-774-5253 tgee@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 7.12.

RECOMMENDATION TO COUNCIL

Adopt a resolution approving the proposed May 2021 revisions to the Park Naming Policy.

BACKGROUND

The park naming process has been in place for more than twenty years. This public process solicits name suggestions every July for new parks that will be under construction that fiscal year. The Park Naming Subcommittee has been made up of two City Council members and three officers of the Parks & Recreation Commission. The three officers included Chair, Vice-Chair and Secretary.

Recent Changes
Two recent changes have occurred that caused staff to re-evaluate the process. These are:
• The Parks & Recreation Commission no longer appoints a Secretary position.
• Attorney review of the Subcommittee has determined that the Subcommittee is subject to the Brown Act.

Impacts
These changes create a need to change the process. The most critical aspect of the change is compliance with the Brown Act. To address this, options were considered. These included:
• Create a Subcommittee made up of staff who will present up to three recommendations per park to be named to the Parks & Recreation Commission who, in turn, will recommend up to three names per park to the City Council for their final approval.
• Keep the Subcommittee as is (with makeup to consist of three “members” of the Parks & Recreation Commission rather than three “officers”) and conduct the review and selection of submitted names in a public forum.

Recommendation
The recommendation is to create a Subcommittee made up of staff to present up to three recommendations per park to be named to the Parks & Recreation Commission, who, in turn shall forward up to three names to the City Council for their final approval. This allows for both the Commission and Council to remain actively involved in the process while also complying with the Brown Act when suggested names are brought forward to the Commission and Council. The

proposed revised park naming process is attached.

Parks and Recreation Commission
The Parks and Recreation Commission reviewed the policy revisions at the June 7, 2021 meeting. The Commission approved the proposed policy revisions and is forwarding the recommendation to Council for approval.

FISCAL IMPACT

The changes to the park naming process have no fiscal impact.

ENVIRONMENTAL REVIEW

The California Environmental Quality Act (CEQA) does not apply to activities that will not result in a direct or reasonably foreseeable indirect physical change in the environment, or is otherwise not considered a project as defined by CEQA Statute §21065 and CEQA State Guidelines §15060(c)(3) and §15378. Approval of the Park Naming Policy revisions meet the above criteria and are not subject to CEQA. No additional environmental review is required.

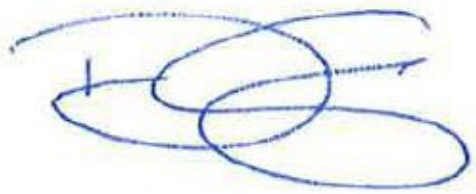
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Goal B - Support community engagement and advocacy

Respectfully Submitted,

Tara Gee, Park Planning & Development Superintendent

Jill Geller, Parks, Recreation & Libraries Director



_____
Dominick Casey, City Manager

ATTACHMENTS:

Description

Resolution 21-264

Park Naming Process - Redlined

Park Naming Process - Revised

RESOLUTION NO. 21-264

APPROVING REVISIONS TO THE PARK NAMING POLICY PROGRAM FOR THE CITY OF ROSEVILLE

WHEREAS, due to recent changes, staff recommends revisions to the Park Naming Policy; and

WHEREAS, those revisions were submitted to the Parks and Recreation Commission for review and recommendation on June 7, 2021; and

WHERAS, the Parks and Recreation Commission supports the proposed May 2021 revisions to the Park Naming Policy.

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Roseville that said May 2021 revisions to the Park Naming Policy are hereby adopted by the City of Roseville.

PASSED AND ADOPTED by the Council of the City of Roseville this____day of _____, 20_, by the following vote on roll call:

AYES COUNCILMEMBERS:

NOES COUNCILMEMBERS:

ABSENT COUNCILMEMBERS:

_____
MAYOR

ATTEST:

_____
City Clerk

Park Naming Process

Parks, Recreation & Libraries

Revised May 2021

On ~~January 18~~, 2021~~17~~, City Council approved changes to the park naming process. ~~These changes apply to parks and facilities within parks only. The naming process for City buildings and other City facilities remains unchanged.~~ This process applies to parks and Parks, Recreation & Libraries (PRL) facilities only. "PRL facilities" are defined as recreation facilities, rooms within PRL buildings, and amenities within parks including, but not limited to, sports fields, groves of trees, walkways and trails. There is a separate naming process for City buildings and other City facilities.

Annual Advertisement Period

~~On the first working day i~~In July, ~~a press release would be sent out~~ notification is made to~~ying~~ the public and interested individuals that name suggestions are being sought for new parks and new facilities within parks that will be under construction during that fiscal year period (July 1 to June 30). This suggestion period is open for three weeks. Names should be submitted to the City Clerk and forwarded to appropriate staff.

At the conclusion of the suggestion period, the names received will be considered as follows:

1. The Park Naming Subcommittee shall review the list and make recommendations for park and/or facility names, using the criteria outlined below, to the Parks & Recreation Commission. The Park Naming Subcommittee shall consist of the following staff:
   a. Parks, Recreation & Libraries Director
   b. Park Planning and Development Superintendent
   c. Park Development Project Manager (one representative serving a two-year term, to be rotated among Park Development Project Managers)
   d. PRL Superintendent from the Parks Division (one representative serving a two-year term, to be rotated among PRL Superintendents from the Parks Division)
   e. PRL staff member chosen "at-large", who shall serve a two-year term
   f. Staff member from the Development Services Department (one representative serving a two-year term, to be rotated among Development Services staff)

   Two-year terms shall be staggered to provide continuity in the rotational representation.
2. Names received shall be considered "active" for both the current and following fiscal years, and will be considered for those parks and facilities scheduled for construction during those same fiscal years.
3. A name suggestion cannot be submitted more than three consecutive years.
4. The Park Naming Subcommittee maintains the right to select a name not included on the "active" list, due to special circumstances such as historical significance, the passing of an active contributor(s) to the community, or other considerations.

~~Annual List~~

~~The names received during this open advertisement period would be compiled into a list with the following provisions:~~

~~4. The list will be maintained as "active" for a one (1) year period and will be reviewed for name considerations for park projects and facilities within parks scheduled for construction during the same time period of the advertisement;~~
~~5. The Park Naming Subcommittee maintains the right to select a name appropriate for the park based on geographical location, such as street names, subdivision name, or adjacent school name;~~
~~6. A name suggestion cannot be submitted more than three consecutive years;~~
~~7.~~1. ~~The Park Naming Subcommittee maintains the right to select a name not on the "active" list due to special circumstances, such as historical significance; the passing of an active contributor(s) to the community; or other.~~

Criteria for Naming a Park Facility

~~Names must:~~

~~1. reflect geographical location;~~

~~2. reflect significant natural features;~~
~~3. honor a significant individual (See below)~~

~~Individuals must have made a significant contribution to the Roseville community, including, but not limited to:~~

~~A - Donation of land or large financial contribution to a specific facility;~~
~~B - Contributed substantially and improved the quality of life in Roseville. This could relate to involvement with Parks and Recreation or other volunteer community involvement activities towards the betterment of life in Roseville.~~
~~C - Died or disabled in the line of duty as part of City service.~~

The act of naming is significant and meaningful. A name can invoke powerful emotions, create images and help to recall history. The naming of a park or facility is intended to be a permanent act, and therefore should be approached in a thoughtful manner. The name of a park or facility may take into consideration the past, present and future history of the land, its use, and our relationship to it. The following criteria and factors shall be considered when naming or renaming a park or facility:

- Recognition of nearby prominent geographical locations (e.g., street names, subdivision names, or adjacent school names)
- Recognition of significant natural and geological features of the area
- Recognition of outstanding features of the park or facility
- Recognition of historical or cultural significance in the area
- Recognition of significant individuals within the community, as follows:
  - The person contributed a significant amount of land or funding for the park or facility (typically amounting to 50% or more of development costs).
  - The person has made significant volunteer contributions to the Roseville community and its residents' quality of life.
  - The person is deceased and is being recognized for substantial volunteer contributions to the quality of life in Roseville.
  - The person died in the line of duty as part of City service.

Naming of new parks or recreation facilities should also consider:

- Including "Roseville" for regional or city-wide parks and recreation facilities;
- Avoidance of duplication of surnames in order to ease confusion of sites and locations for the general public;

The Subcommittee reserves the right to consider exceptions due to extraordinary circumstances which inspire vision and civic engagement. Exceptions can be made when the actions or contributions of an individual not normally meeting the established criteria are so significant and profound that this person deserves consideration.

~~Each park or facility within a park, such as ball-playing fields, groves of trees, walkways, trails and buildings, or special rooms in a building could be named after selected individuals in their honor as desired and as appropriate.~~

It is noted that the City of Roseville is grateful for the sacrifices of our fallen soldiers and veterans who served our country. With limited parks and recreation facilities available, it is difficult to place a higher value or honor of one life over another. Therefore, honoring our fallen soldiers and veterans shall be directed to existing veteran-related programs within the City.

R~~Additionally, r~~e-naming of an existing park due to costs, potential loss of neighborhood identity and other considerations shall be discouraged. The City Council reserves the right to add to the name of an existing park not named after a person or family, ~~consider park sites, not associated with a specific individual(s), to add onto an existing established park name~~ due to special circumstances. In such cases, the original park name shall not be replaced. Under these special circumstances, community contributions towards the offset of costs incurred to change signage shall be a component of the approval process. ~~To ensure geographically named parks remain a part of the process, an effort shall be made to balance the naming of parks in the range of 20% of the parks within the park system inventory shall be geographically based at any given time.~~

Name Selection Process
~~The Park Naming subcommittee is made up of the three officers of the Parks and Recreation Commission; the Mayor and one City Council member.~~

~~1. The Subcommittee shall review all names and recommend a short list of up to three name for each new park or recreation facility scheduled for construction during the same fiscal year;~~

~~2. he short list of selected names shall be reviewed by the Parks and Recreation Commission for consideration at a formal meeting;~~
~~3. Thereafter, the Parks and Recreation Commission shall forward the short list of recommendations to the City Council for formal approval. The Commission may elect to recommend a name per park or facility for Council consideration along with the short list; All l names submitted during the submission period shall be forwarded to the City Council with the recommendations. This shall include the "active list" of names from the previous year;~~
~~4. Potential namesakes will be contacted by Staff prior to the Parks & Recreation Commission meeting~~

1. The Subcommittee shall review all names and recommend up to three names for each new park or facility to the Parks & Recreation Commission.
2. The recommended names, along with the full list of submissions (including the "active" names from the previous year), shall be reviewed by the Parks and Recreation Commission for consideration at a formal meeting. The Parks and Recreation Commission shall recommend up to three names for each new park or facility to the City Council.
3. The recommended names, along with the full list of submissions (including the "active" names from the previous year), shall be reviewed by the City Council for approval at a formal meeting.
4. Family members of any potential namesakes shall be contacted by PRL staff prior to final approval by City Council, to ensure their support of the recommendation.
5. The Annual Park Naming Process shall conclude upon City Council's final approval of the park or facility name.

Suggested Name For a Park or Facility Within a Park

Suggested Name _____
*(Print or type the suggested name **exactly** how you would like it to read)*

Park Preference: ☐ Any park site ☐ _____ *(Specify park)*

# of years as a Roseville Resident _____

Reason for Suggestion *(Must be completed for further consideration)*:

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Attach a second sheet if necessary. ☐ *Attachment included*

Name _____
(of individual submitting request)

Address _____

Phone Number/Email Address_____

Please submit this form to the City Clerk's office for name consideration. All names must be in accordance with the established City criteria. Submit one name per form.

FOR CITY USE ONLY:

For FY _____ Has this name been submitted before? ☐ Yes ☐ No
If yes, when? _____

Subcommittee Review Comments:

_____
_____
_____

Park Naming Process

Parks, Recreation & Libraries

Revised May 2021

On _____, 2021, the City Council approved revisions to the Park Naming Process. This process applies to parks and Parks, Recreation & Libraries (PRL) facilities only. "PRL facilities" are defined as recreation facilities, rooms within PRL buildings, and amenities within parks including, but not limited to, sports fields, groves of trees, walkways and trails. There is a separate naming process for City buildings and other City facilities.

Process

In July of each year, notification is made to the public and interested individuals that name suggestions are being sought for new parks and facilities that will be under construction during that fiscal year period (July 1 to June 30). This suggestion period is open for the month of July. Names should be submitted to the City Clerk and forwarded to the Park Planning and Development Superintendent.

At the conclusion of the suggestion period, the names received will be considered as follows:

1. The Park Naming Subcommittee shall review the list and make recommendations for park and/or facility names, using the criteria outlined below, to the Parks & Recreation Commission. The Park Naming Subcommittee shall consist of the following staff:
    a. Parks, Recreation & Libraries Director
    b. Park Planning and Development Superintendent
    c. Park Development Project Manager (one representative serving a two-year term, to be rotated among Park Development Project Managers)
    d. PRL Superintendent from the Parks Division (one representative serving a two-year term, to be rotated among PRL Superintendents from the Parks Division)
    e. PRL staff member chosen "at-large", who shall serve a two-year term
    f. Staff member from the Development Services Department (one representative serving a two-year term, to be rotated among Development Services staff)

    Two-year terms shall be staggered to provide continuity in the rotational representation.
2. Names received shall be considered "active" for both the current and following fiscal years, and will be considered for those parks and facilities scheduled for construction during those same fiscal years.
3. A name suggestion cannot be submitted more than three consecutive years.
4. The Park Naming Subcommittee maintains the right to select a name not included on the "active" list, due to special circumstances such as historical significance, the passing of an active contributor(s) to the community, or other considerations.

Criteria for Naming a Park Facility

The act of naming is significant and meaningful. A name can invoke powerful emotions, create images and help to recall history. The naming of a park or facility is intended to be a permanent act, and therefore should be approached in a thoughtful manner. The name of a park or facility may take into consideration the past, present and future history of the land, its use, and our relationship to it. The following criteria and factors shall be considered when naming or renaming a park or facility:

- Recognition of nearby prominent geographical locations (e.g., street names, subdivision names, or adjacent school names)
- Recognition of significant natural and geological features of the area
- Recognition of outstanding features of the park or facility
- Recognition of historical or cultural significance in the area
- Recognition of significant individuals within the community, as follows:
    - The person contributed a significant amount of land or funding for the park or facility (typically amounting to 50% or more of development costs).
    - The person has made significant volunteer contributions to the Roseville community and its residents' quality of life.
    - The person is deceased and is being recognized for substantial volunteer contributions to the quality of life in Roseville.

- The person died in the line of duty as part of City service.

Naming of new parks or facilities should also consider:

- Including “Roseville” for regional or city-wide parks and facilities
- Avoiding duplication of names in order to ease confusion of sites and locations for the general public

The Subcommittee reserves the right to consider exceptions due to extraordinary circumstances, which inspire vision and civic engagement. Exceptions can be made when the actions or contributions of an individual not normally meeting the established criteria are so significant and profound that this person deserves consideration.

It is noted that the City of Roseville is grateful for the sacrifices of our fallen soldiers and veterans who served our country. With limited parks and facilities available, it is difficult to place a higher value or honor of one life over another. Therefore, honoring our fallen soldiers and veterans shall be directed to existing veteran-related programs within the City.

Re-naming of an existing park or facility, due to costs, potential loss of neighborhood identity and other considerations, shall be discouraged. The City Council reserves the right to add to the name of an existing park not named after a person or family, due to special circumstances. In such cases, the original park name shall not be replaced. Under these special circumstances, community contributions towards the offset of costs incurred to change signage shall be considered in the approval process.

Name Selection Process

1. The Subcommittee shall review all names and recommend up to three names for each new park or facility to the Parks & Recreation Commission.
2. The recommended names, along with the full list of submissions (including the “active” names from the previous year), shall be reviewed by the Parks and Recreation Commission for consideration at a formal meeting. The Parks and Recreation Commission shall recommend up to three names for each new park or facility to the City Council.
3. The recommended names, along with the full list of submissions (including the “active” names from the previous year), shall be reviewed by the City Council for approval at a formal meeting.
4. Family members of any potential namesakes shall be contacted by PRL staff prior to final approval by City Council, to ensure their support of the recommendation.
5. The Annual Park Naming Process shall conclude upon City Council’s final approval of the park or facility name.

Suggested Name For a Park or Facility Within a Park

Suggested Name _____
*(Print or type the suggested name **exactly** how you would like it to read)*

Park Preference: ☐ Any park site ☐ _____ *(Specify park)*

If a name of an individual or family, number of years residing in Roseville _____

Reason for Suggestion *(Must be completed for consideration. If suggesting the name of a person, please include their number of years as a Roseville resident, their year of death, and explain the individual's substantial contributions to the quality of life in Roseville through volunteer service.):*

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Attach a second sheet if necessary. ☐ *Attachment included*

Name _____
(of individual submitting request)

Address _____

Phone Number/Email Address_____

Please submit this form to the City Clerk's office for name consideration. All names must be in accordance with the established City criteria. Submit one name per form.

FOR CITY USE ONLY:

For FY _____ Has this name been submitted before? ☐ Yes ☐ No
If yes, when? _____

Subcommittee Review Comments:

_____
_____
_____

COUNCIL COMMUNICATION

CC #: 1545
File #: 0800-03

Title: Roseville Electric Utility Security Plan
Contact: Petra Wallace 916-774-5510 pwallace@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 7.13.

RECOMMENDATION TO COUNCIL

Roseville Electric Utility staff recommends City Council adopt a resolution to adopt the Roseville Electric Utility Security Plan report.

BACKGROUND

The purpose of the Roseville Electric Utility Security Plan, or "Plan" is to meet the physical security plan requirements as defined by the California Public Utilities Commission (CPUC) Phase I Decision on Order Instituting Rulemaking Regarding the Physical Security of Electrical Corporations D.19-01-018.

The Plan describes Roseville Electric Utility's conformance with the industry standard set by D.19-01-018 and describes the approach that Roseville is taking to identify and protect our critical infrastructure (Covered Distribution Facilities) from physical security threats.

The Plan was reviewed by AESI-US, Inc. a qualified independent third party, and validated by the Roseville Police Department in accordance with the CPUC's requirements. Roseville Electric Utility is required to review this plan every 5 years.

FISCAL IMPACT

There is no fiscal impact associated with the approval of the Physical Security Plan. Security improvements recommended by the plan will be addressed in future budgets.

ENVIRONMENTAL REVIEW

The California Environmental Quality Act (CEQA) only applies to projects which have the potential to cause a significant effect on the environment. Where it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment, the activity is not subject to CEQA. (CEQA Guidelines §15061(b)(3)).

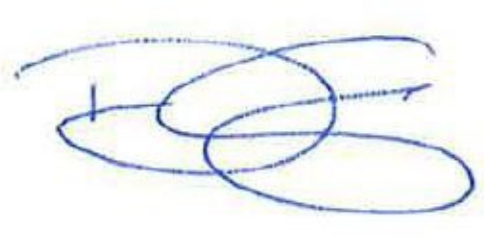
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Goal A - Remain fiscally responsible in a changing world
Goal C - Maintain a safe and healthy community

Respectfully Submitted,

Petra Wallace, Electric Risk and Compliance Supervisor

Michelle Bertolino, Electric Utility Director



_____
Dominick Casey, City Manager

ATTACHMENTS:

Description

Resolution 21-277

Roseville Electric Utility Security Plan 2021

RESOLUTION NO. 21-277

APPROVING THE ROSEVILLE ELECTRIC UTILITY SECURITY PLAN

WHEREAS, the purpose of the Roseville Electric Utility Security Plan ("Plan") is to meet the physical security plan requirements as defined by the California Public Utilities Commission (CPUC) Phase I Decision on Order Instituting Rulemaking Regarding the Physical Security of Electrical Corporations D.19-01-018; and

WHEREAS, the Plan describes Roseville Electric Utility's conformance with the industry standard set by D.19-01-018 and describes the approach that Roseville is taking to identify and protect our critical infrastructure (Covered Distribution Facilities) from physical security threats; and

WHEREAS, the Plan was reviewed by AESI-US, Inc. a qualified independent third party, and validated by the Roseville Police Department in accordance with the CPUC's requirements; and

WHEREAS, Roseville Electric Utility is required to review this plan every 5 years; and

WHEREAS, the Roseville Electric Utility Security Plan has been reviewed by the City Council; and

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Roseville that said Roseville Electric Utility Security Plan is hereby approved and may be submitted to the California Public Utilities Commission.

PASSED AND ADOPTED by the Council of the City of Roseville this____day of _____, 2021, by the following vote on roll call:

AYES COUNCILMEMBERS:

NOES COUNCILMEMBERS:

ABSENT COUNCILMEMBERS:

_____
MAYOR

ATTEST:

_____
City Clerk

ROSEVILLE ELECTRIC UTILITY SECURITY PLAN

PUBLIC REPORT ON ROSEVILLE ELECTRIC UTILITY'S PHYSICAL SECURITY PROGRAM FOR DISTRIBUTION-LEVEL FACILITIES

July 1, 2021

TABLE OF CONTENTS

I. Overview 4

A. Goal of Utility Security Plan 4

B. Description of Roseville Electric Utility 4

C. Results of Utility Security Plan Assessement 4

II. Background 5

III. Plan Development Process 6

A. Physical Security Principles 6

B. Utility Security Plan Development Process 7

STEP 1: Assessment/Plan Development 7

STEP 1A: Identify Covered Distribution Facilities 7

STEP 1B: Perform Risk Assessment 7

STEP 1C: Develop Mitigation Plan 7

STEP 2: Independent Review 8

STEP 3: Validation 8

STEP 4: Adoption 8

STEP 5: Maintenance 8

STEP 6: Repeat Process 8

IV. Identification of Covered Distribution Facility (Step 1A) 9

A. Identification Factors 9

B. Identification Analysis 10

V. Risk Assessment (Step 1B) 11

A. Methodology 11

B. Mitigation Measures 11

C. Risk Assessment 13

VI. Covered Distribution Facility Mitigation Plans (Step 1C) 14
A. Covered Distribution Facility Mitigation Plan 15
VII. Independent Evaluation and Response (Step 2) 17
A. Requirements for Qualified Third Party Review 17
B. Identification of Third Party Reviewer 18
C. Public Results of Third Party Evaluation 18
D. Roseville Electric Utility Response 18
VIII. Validation (Step 3) 18
A. Selection of Qualified Authority 18
B. Results of Qualified Authority Review 18
C. Roseville Electric Utility Response to Qualified Authority Review 19
IX. Narrative Descriptions for Utility Security Plan 19
A. Asset Management Program 19
B. Workforce Training and Retention 19
C. Preventative Maintenance Plan 19
D. Physical Security Event Training 20

I. OVERVIEW

A. GOAL OF UTILITY SECURITY PLAN

Ensuring the safety of its facilities is a top priority for Roseville Electric Utility (Roseville). Roseville prioritizes safety in all aspects of its design, operation, and maintenance practices. The overarching goal of this Utility Security Plan is to describe Roseville's risk management approach concerning "Covered Distribution Facilities" physical security as defined by the Joint IOU/POU Straw Proposal and D.19-01-018. Appropriate consideration of resiliency, impact, and cost factors were also considered.

B. DESCRIPTION OF ROSEVILLE ELECTRIC UTILITY

Roseville Electric Utility, as the City of Roseville's community-owned electric service, has provided reliable and affordable electric service for more than 100 years. The City of Roseville is located in Placer County, northeast of Sacramento, California along Interstate 80 and State Route 65 (38°45'9"N, 121°17'22" W), and has a population of nearly 140,000. In 2020, Roseville Electric Utility employed 153 people and served 63,507 customers, including 56,467 residential and 7,040 business customers. Roseville owns its distribution system, fifteen distribution substations (including two Receiving Substations). Roseville's system serves an area of 43 square miles, and maintains 145 miles of overhead lines and more than 704 miles of underground lines.

C. RESULTS OF UTILITY SECURITY PLAN ASSESSEMENT

Roseville has fifteen Distribution Facilities located within its service territory meeting the definition of Distribution Facility per D.19-01-018. A Distribution Facility is defined as an electric power substation associated with the distribution system and the primary feeders for supply to residential, commercial and/or industrial loads.

All fifteen Distribution Facilities were considered and evaluated in Roseville's Physical Security Program for Distribution Level Facilities. In order to identify which of the fifteen Distribution Substations within Roseville's service territory provide electricity to critical loads, a thorough risk assessment was completed in Section VI. The assessment identified four "Covered Distribution Facilities" as defined by the Joint IOU/POU Straw Proposal and D.19-01-018.

After an extensive review of Roseville's existing methodology, it was determined that the risk level for the four Covered Distribution Facilities was medium, with existing and planned mitigating measures sufficient to effectively mitigate the identified risks of a physical attack to a low/very low probability. Roseville continues to identify and assess potential risks associated with Covered Distribution Facilities and continues to apply the methodologies described in this document.

II. BACKGROUND

On April 16, 2013, one or more individuals attacked equipment located within Pacific Gas and Electric Company's (PG&E) Metcalf Transmission Substation, ultimately damaging 17 transformers. These individuals also cut nearby fiber-optic telecommunication cables owned by AT&T. In response to the attack, the Federal Energy Regulatory Commission (FERC) directed the North American Electric Reliability Corporation (NERC) to develop new physical security requirements, resulting in the creation of CIP-014.

At the state level, Senator Jerry Hill authored SB 699 (2014), directing the California Public Utilities Commission (CPUC) to "consider adopting rules to address the physical security risks to the distribution systems of electrical corporations." In response to SB 699, the CPUC's Safety and Enforcement Division (SED) prepared a white paper proposing a new requirement for investor owned utilities (IOUs) and publicly owned utilities (POUs) to develop security plans that would identify security risks to their distribution and transmission systems, and propose methods to mitigate those risks. The CPUC hosted a series of workshops to better understand the state of utility physical security protections and to seek input on refining their proposal.

In order to support the CPUC's development of reasonable industry standards for state-level regulations of physical security, the California Municipal Utilities Association (CMUA), which is the statewide trade association for POUs, coordinated with the state's IOUs to develop a comprehensive Straw Proposal[1] (Joint IOU/POU Straw Proposal) for a process to identify at-risk facilities and, if necessary, develop physical security mitigation plans. As a member of CMUA, Roseville staff participated in the development of the Joint IOU/POU Straw Proposal through a CMUA working group as well as through direct meetings with the IOUs. The Joint POU/IOU Straw Proposal set out a guideline for the following: (1) identifying if the utility has any high priority distribution facilities; (2) evaluating the potential risks to those high priority distribution facilities; (3) for determining the distribution facilities where the identified risks are not effectively mitigated through existing resilience/security measures and a process for developing a mitigation plan; (4) a process where a third party reviews the mitigation plans; (5) a document retention policy; (6) a verification process established by the POU governing board; and (7) for information sharing protocols.

SED filed a response[2] to the Joint IOU/POU Straw Proposal that recommended various modifications and clarifications, including a six step process. Additionally, SED recommended that the utility mitigation plans include: (1) an assessment of supply chain vulnerabilities; (2) training programs for law enforcement and utility staff to improve communication during physical security events; and (3) an assessment of any near-by communication utility infrastructure that supports a distribution substation.

[1] Straw Proposal available at: https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/Safety/Risk_Assessment/physicalsecurity/R1506009-Updated%20Joint%20Straw%20Proposal%20and%20Cover%20083117%20Filing.pdf.

[2] SED Response available at: https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/Safety/Risk_Assessment/physicalsecurity/Final%20Staff%20Recommendation%20for%20Commission%20Consideration%20010318.pdf.

In early 2019, the CPUC approved Decision (D.) 19-01-018, which adopted the Joint IOU/POU Straw Proposal as modified by the SED proposal, with additional clarifications and guidance. D.19-01-018 clarified that where there is a conflict between the Straw Proposal and the SED Proposal, then it is the rule in the SED Proposal that controls.[3]

The POUs generally treat CPUC safety rules for electric utility supply systems as key industry standards. This Utility Security Plan describes Roseville Electric Utility's conformance with the industry standard set by D.19-01-018.

III. PLAN DEVELOPMENT PROCESS

A. PHYSICAL SECURITY PRINCIPLES

The Joint IOU/POU Straw Proposal seeks to support the creation of a risk management approach toward distribution system physical security, with appropriate considerations of resiliency, impact, and cost. In order to accomplish this risk-based approach, the Joint IOU/POU Straw Proposal identifies several principles to guide the development of each individual utility's program. These principles are the following:

1. Distribution systems are not subject to the same physical security risks and associated consequences, including threats of physical attack by terrorists, as the transmission system.

2. Distribution utilities will not be able to eliminate the risk of a physical attack occurring, but certain actions can be taken to reduce the risk or consequences, or both, of a significant attack.

3. A one-size-fits-all standard or rule will not work. Distribution utilities should have the flexibility to address physical security risks in a manner that works best for their systems and unique situations, consistent with a risk management approach.

4. Protecting the distribution system should consider both physical security protection and operational resiliency or redundancy.

5. The focus should not be on all Distribution Substations, but only those that risk dictates would require additional measures.

6. Planning and coordination with the appropriate federal and state regulatory and law enforcement authorities will help prepare for attacks on the electrical distribution system and thereby help reduce or mitigate the potential consequences of such attacks.

[3] D.19-01-018 at 43, footnote 58 ("Should there be any question of which shall predominate should there be any incongruity or conflict between a utility or SED RASA recommended rule, the SED RASA rule shall apply.").

B. UTILITY SECURITY PLAN DEVELOPMENT PROCESS

Roseville utilized a multi-step process to develop this Utility Security Plan that is consistent with the Joint IOU/POU Straw Proposal and D.19-01-018. The intent of the proposal is to implement a risk management approach toward distribution system physical security, with appropriate consideration of resiliency, impact, and cost. In order to accomplish this risk-based approach, general principles were derived from information described and evaluated during meetings to guide the utility's overall evaluation of Distribution Facilities. The relevant six steps of that process are the following:

STEP 1: ASSESSMENT/PLAN DEVELOPMENT

Roseville's staff prepared a Draft Utility Security Plan through the process set forth in Steps 1A, 1B, and 1C. Please note the following principles:

- Distribution Facilities will not be able to eliminate the risk of a physical attack occurring, but certain actions can be taken to reduce the risk or consequences of a significant attack.
- Distribution Facilities should have the flexibility to address physical security risks in a manner that works best for their systems and unique situations, consistent with a risk management approach.
- The focus of this assessment is both physical security protection and operational resiliency on the identified critical load facilities (Covered Distribution Facilities) in which additional risk mitigation measures are required.

STEP 1A: IDENTIFY COVERED DISTRIBUTION FACILITIES

Roseville evaluated all distribution-level facilities in its service territory that are subject to its control to determine if any facility met the definition of a "Covered Distribution Facility" pursuant to the factors identified in the Joint IOU/POU Straw Proposal as modified by D.19-01-018.

STEP 1B: PERFORM RISK ASSESSMENT

For every individual "Covered Distribution Facility" identified in the Joint IOU/POU Straw Proposal as modified by D.19-01-018 pursuant to Step 1A, Roseville performed an evaluation of the potential risks associated with a successful physical attack that Covered Distribution Facilities, and whether existing grid resiliency, back-up generation, and/or physical security measures appropriately mitigate identified risks.

STEP 1C: DEVELOP MITIGATION PLAN

If there are any individual Covered Distribution Facilities where the Risk Assessment performed pursuant to Step 1B finds that the existing mitigation and/or resiliency measures do not effectively mitigate the identified risks, then Roseville will develop a Mitigation Plan for that

Covered Distribution Facilities. The Mitigation Plan will use a risk-based approach to select reasonable and cost-effective measures that can either be security focused (*e.g.*, walls or alarms) or resiliency focused (*e.g.*, adequate spare parts).

STEP 2: INDEPENDENT REVIEW

Roseville's Utility Security Plan cycle will contain the identification process, risk assessment, and Mitigation Plan development performed pursuant to Steps 1A, 1B, and 1C. This documentation in combination with the narrative description in Sections IV-VI below will constitute Roseville Electric Utility's Draft Utility Security Plan. Each Draft Utility Security Plan is submitted to a Qualified Third Party for Independent Review. The Qualified Third Party will then issue an evaluation that identifies any potential deficiencies in the Draft Utility Security Plan as well as recommendations for improvements. Roseville will then modify its plan to address any identified deficiencies or recommendations. The combination of the Draft Utility Security Plan, the non-confidential conclusions of the Qualified Third Party, and Roseville's responses to the Qualified Third Party Review will constitute Roseville Electric Utility's Utility Security Plan.

STEP 3: VALIDATION

Roseville will submit its Utility Security Plan to a qualified authority for review. Such entity will provide additional feedback and evaluation of Roseville Electric Utility's Utility Security Plan and, to the extent that this entity is authorized, such entity deems the Utility Security Plan as adequate.

STEP 4: ADOPTION

Roseville's Utility Security Plan will be presented to and adopted by City of Roseville's Council at a public meeting.

STEP 5: MAINTENANCE

Roseville will refine and update the Utility Security on an ongoing basis as appropriate and necessary to preserve plan integrity.

STEP 6: REPEAT PROCESS

Roseville will repeat this six step process at least once every five years or sooner if circumstances dictate.

IV. IDENTIFICATION OF COVERED DISTRIBUTION FACILITY (STEP 1A)

As described in Section III, Step 1A of the Utility Security Plan process involves assessing all distribution-level facilities that are subject to the control of Roseville to determine which facilities are "Covered Distribution Facilities" subject to the need for a risk assessment. This Section describes the factors that Roseville used to evaluate its distribution facilities and the results of its evaluation.

A. IDENTIFICATION FACTORS

The Joint IOU/POU Straw Proposal defines seven screening factors to determine if a facility is a "Covered Distribution Facility." Some factors require additional definitions and/or clarifications in order to be applied to Roseville's facilities. The following Table provides the Joint IOU/POU Straw Proposals Factors as modified/clarified by Roseville.

Factor	Joint IOU/POU Straw Proposal Description	Roseville's Specific Approach*
1	Distribution Facility necessary for crank path, black start or capability essential to the restoration of regional electricity service that are not subject to the California Independent System Operator's (CAISO) operational control and/or subject to North American Electric Reliability Corporation (NERC) Reliability Standard CIP-014-2 or its successors	Roseville reviewed system operations, grid operations, and area planning to identify any crank path or black start essential facilities within Roseville Electric Utility's service territory. As Roseville does not have any black start facilities in the state of California, no loads or facilities meet this criteria.
2	Distribution Facility that is the primary source of electrical service to a military installation essential to national security and/or emergency response services (may include certain airfields, command centers, weapons stations, emergency supply depots)	Roseville reviewed customer and load attributes to identify those specifically critical to national security and/or emergency response services. Roseville potentially identified and included 1 primary source of electrical service.
3	Distribution Facility that serves installations necessary for the provision of regional drinking water supplies and wastewater services (may include certain aqueducts, well fields, groundwater pumps, and treatment plants)	Roseville defines "regional drinking water supplies and wastewater services" to mean a facility providing the primary source of these services to over 40,000 customer accounts or to an area with a population of over 100,000. Based on the approach described above, Roseville identified and included 2 Distribution Facilities with the potential to impact a significant portion of the Roseville community.
4	Distribution Facility that serves a regional public safety establishment (may include County Emergency Operations Centers; county sheriff's department and major city police department headquarters; major state and county fire service headquarters; county jails and state and federal prisons; and 911 dispatch centers)	Roseville defines "regional public safety establishment" as any of the following: (1) a major police or fire department serving 1.5 million population with an least 1000 sworn officers; (2) County Sheriff's Department Headquarters; (3) County Emergency Operations Center; (4) County/State Fire

		headquarters; (5) a California State Prison; (5) a United States Penitentiary; or (6) a Federal Correctional Institute. Roseville identified 1 Distribution Facility that met this requirement.
5	Distribution Facility that serves a major transportation facility (may include International Airport, Mega Seaport, other air traffic control center, and international border crossing)	In addition to the facilities listed in the Joint IOU/POU Straw Proposal, Roseville defines a "major transportation facility" as any transportation facility that has (1) an average of 600 or more flights per day; or (2) 50,000 passengers per day. Roseville identified 1 Distribution Facility that met this requirement.
6	Distribution Facility that serves as a Level 1 Trauma Center as designated by the Office of Statewide Health Planning and Development	Roseville reviewed current listings of Level 1 Trauma Centers and cross referenced with the company's service territory and customer information. No Level 1 Trauma Centers are found to be located within Roseville Electric Utility's service territory.
7	Distribution Facility that serves over 60,000 meters	Roseville identified a Distribution Facility providing electrical service to over 60,000 customers.

Note: The "Roseville's Specific Approach" in the table above was defined by Electric Staff.

B. IDENTIFICATION ANALYSIS

In performing this identification analysis, Roseville is assessing all distribution level facilities that are subject to its exclusive control, or if the facility is jointly owned, the joint ownership agreement identifies Roseville as the entity responsible for operation and maintenance. These specific types of facilities include Distribution Facilities.

Based on this scope, Roseville has identified fifteen Distribution Facilities that are subject to this identification analysis. Of the fifteen Distribution Substations, four fell within one of the covered categories listed above. The Covered Distribution Facility Category Matrix below summarizes this analysis.

Facility ID	1. Crank Path, Black Start	2. Military Installation	3. Regional Drinking Water/ Wastewater Services	4. Regional Public Safety	5. Major Transportation Facility	6. Level 1 Trauma Center	7. Over 60,000 Meters
Facility 1			X		X		
Facility 2			X				
Facility 3				X			
Facility 4							X

Covered Distribution Facility Category Matrix

V. RISK ASSESSMENT (STEP 1B)

A. METHODOLOGY

Pursuant to the process identified in the Joint IOU/POU Straw Proposal and D.19-01-018, Roseville will assess the potential risks associated with a successful physical attack on each of the Covered Distribution Facilities identified in Section IV above. For purpose of this analysis, a physical attack is limited to the following: (1) theft; (2) vandalism; (3) discharge of a firearm; and (4) sabotage. A "successful physical attack" is limited to circumstances where a theft, vandalism, discharge of a firearm, and/or sabotage has directly led to the failure of any elements of the Covered Distribution Facility that are necessary to provide uninterrupted service to the specific load identified in Section IV. While no sabotage related incident has occurred at the facilities in the past, Roseville continues to monitor for sabotage related threats.

In order to perform this risk analysis, Roseville evaluated the relative risk that (1) a physical attack on a Covered Distribution Facility will be successful considering the protective measures in place; or (2) that the impacts of a successful attack will be mitigated due to resiliency and other measures in place.

B. MITIGATION MEASURES

D.19-01-018 identifies the specific mitigation measures that a utility should consider when performing this risk analysis. The following table lists these mitigation measures and provides additional clarifications that are necessary to apply these measures to Roseville's territory.

Measure	D.19-01-018 Description	Additional Clarification
1	The existing system resiliency and/or redundancy solutions (e.g., switching the load to another distribution substation or circuit capable of serving the load, temporary circuit ties, mobile generation and/or storage solutions).	No additional clarification.
2	The availability of spare assets to restore a particular load.	No additional clarification.
3	The existing physical security protections to reasonably address the risk.	No additional clarification.
4	The potential for emergency responders to identify and respond to an attack in a timely manner.	Each facility is evaluated based on a law enforcement officer arriving at the Covered Distribution Facility within 15 minutes of a report from the public of a break in or attack, or of Roseville notifying the law enforcement agency of the triggering of an alarm at the facility.
5	Location and physical surroundings, including proximity to gas pipelines and geographical challenges, and impacts of weather.	Roseville evaluated this element based on the proximity of the Covered Distribution Facility to populated areas and the extent to which the interior of the facility is

		shielded from view due to walls, vegetation, or other visual obstructions.
6	History of criminal activity at the Distribution Facility and in the area.	Roseville evaluated the property crime rates in the immediate vicinity of the Covered Distribution Facility from Roseville Police Department and compared those crimes rates to property crime rates for the county and the state to determine if the area is subject to a higher than average incidence of property related crimes.
7	The availability of other sources of energy to serve the load (e.g., customer owned back-up generation or storage solutions).	No additional clarification.
8	The availability of alternative ways to meet the health, safety, or security.	No additional clarification.
9	Requirements served by the load (e.g., back up command center or water storage facility).	No additional clarification.

Figure 1 below illustrates the causes of a successful physical security attack (Top Event) and Covered Distribution Facility consequences, as well as prevention measures to prevent a physical security attack and control measures that can be employed to mitigate the outcome.

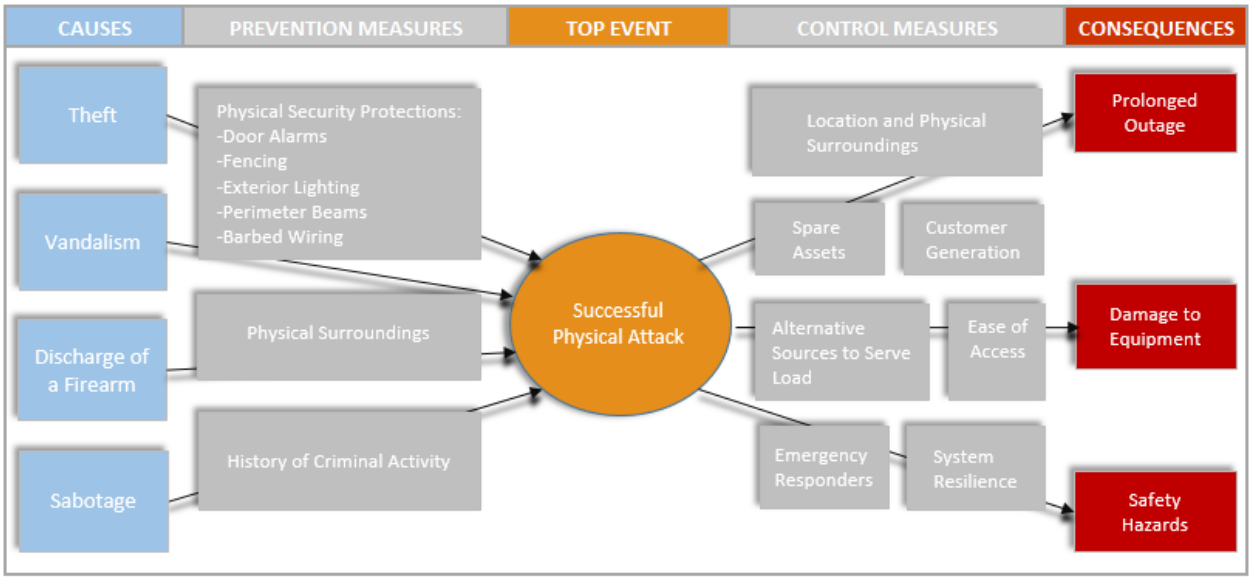


Figure 1: Roseville Bow-Tie Assessment of Covered Distribution Facilities

C. RISK ASSESSMENT

Based on the process described in the Joint IOU/POU Straw Proposal and the direction provided in D.19-01-018, Roseville has determined that of the four Covered Distribution Facilities identified in Section IV, the existing programs and measures in effect at each Covered Distribution Facility effectively mitigate the risks of a physical attack.

All Covered Distribution Facilities are initially designated as high risk given the nature of the proceeding and the assessment of impact through the identification of critical loads. The assessed risk level of each Covered Distribution Facility is then a result of both the presence and the effectiveness of existing prevention and control mitigation measures in place. A greater number of more effective measures reduce the risk level at a greater rate than fewer or less effective measures.

The following section includes the results of applying this methodology to the four Covered Distribution Facilities along with the resulting assessment of each mitigation measure for each Covered Distribution Facility and the assessed risk level.

The following table provides the results of applying this methodology to the four Covered Distribution Facilities and a summary of Roseville's assessment of each mitigation measure for each Covered Distribution Facility.

Mitigation	Facility 1	Facility 2	Facility 3	Facility 4
1. The existing system resiliency and/or redundancy solutions (e.g., switching the load to another substation or circuit capable of serving the load, temporary circuit ties, mobile generation and/or storage solutions).	Fully Effective	Fully Effective	Fully Effective	Fully Effective
2. The availability of spare assets to restore a particular load.	Partly Effective	Partly Effective	Partly Effective	Partly Effective
3. The existing physical security protections to reasonably address the risk.	Partly Effective	Partly Effective	Fully Effective	Partly Effective
4. The potential for emergency responders to identify and respond to an attack in a timely manner.	Fully Effective	Fully Effective	Fully Effective	Fully Effective
5. Location and physical surroundings, including proximity to gas pipelines and geographical challenges, and impacts of weather.	Fully Effective	Fully Effective	Fully Effective	Fully Effective
6. History of criminal activity at the Distribution Facility and in the area.	Fully Effective	Fully Effective	Fully Effective	Fully Effective
7. The availability of other sources of energy to serve the load (e.g., customer owned back-up generation or storage solutions).	Fully Effective	Fully Effective	Fully Effective	Fully Effective
8. The availability of alternative ways to meet the health, safety, or security.	Fully Effective	Fully Effective	Fully Effective	Fully Effective
9. Requirements served by the load (e.g., back up command center or water storage facility).	Fully Effective	Fully Effective	Fully Effective	Fully Effective

As identified above, the four identified Covered Distribution Facilities have existing mitigating measures sufficient to effectively mitigate the identified risks of a physical attack. These facilities are discussed in Section VI.

VI. COVERED DISTRIBUTION FACILITY MITIGATION PLANS (STEP 1C)

Pursuant to the process identified in the Joint IOU/POU Straw Proposal and D.19-01-018, Roseville has determined that for the four Covered Distribution Facilities that are subject to Roseville's control, the existing and planned mitigation measures effectively reduce the risk of a physical security attack to a from medium to low/very low risk. This section describes the existing Mitigation Plan that Roseville utilizes for the four Covered Distribution Facilities.

In order to perform this risk analysis, Roseville evaluated the relative risk that (1) a physical attack on a Covered Distribution Facility would be successful considering the protective measures in place; or (2) that the impacts of a successful attack would be mitigated due to resiliency and other measures in place. Throughout the below analysis Roseville determined that the physical security risks for the identified Covered Distribution Facilities are low with Roseville's existing resiliency, security measures, and planned mitigation efforts.

1. *System resilience:* The vast majority of Roseville's system has been designed to handle the anticipated loss of service to a major component (transformer, 60kv line, 12kv feeder etc.). Once Roseville reaches the individual customer level, loss of a pad mount transformer or service drop would require the repair/replacement prior to having the power restored.

2. *Spare assets:* Roseville's system has been designed to accommodate the loss of any one of the identified Covered Distribution Facilities (via switching on Roseville's distribution system). Other components such as wire, cable, distribution switches, pad mount transformers, and wood pole replacements are readily available in stock, with the exception of metal switchgear.

   Roseville performs detailed contingency analysis on the loss of a substation transformer biennially. This analysis is performed using distribution load flow software and takes into account updated load forecasts. Detailed switching schedules have been prepared for the loss of every substation transformer. While Roseville operates a radial distribution system, all circuits are looped (with normal open points) and mitigation of the loss of a transformer can be accommodated by using the excess capacity on other substation transformers and 12kV circuits.

3. *Existing physical security protections:* Includes door alarms, brick and wire fencing, exterior lighting, barbed wire, and perimeter beams. Note that door alarms, perimeter beams, and exterior gate contacts are monitored through the Roseville SCADA system.

4. *Emergency responders to respond to occurrence:* The Covered Distribution Facilities were not built with the express purpose of emergency responder access however, all are

within the City limits, and most are adjacent to roadways and have reasonable access for the Roseville Police Department and Roseville Fire Department emergency response crews. Important to note that City of Roseville is a full service city with its own fire and police departments.

5. *Location and physical surroundings, including proximity to gas pipelines and geographical challenges, and impacts of weather:* The above mentioned Covered Distribution Facilities are located in an urban area and all are within the City of Roseville limits. No major gas transportation pipelines are close to the Covered Distribution Facilities.

6. *History of criminal activity at the Covered Distribution Facilities and in the area:* Graffiti happens infrequently (not typical) and addressed during monthly routine inspections as needed (if graffiti is detected it is addressed within two days). Roseville has had one theft at Facility 2 (loss of a portable propane tank) in 2018.

7. *The availability of other sources of energy to serve the load (e.g., customer owned back-up generation or storage solutions):* Roseville has evaluated the potential for customer owned generation at each critical load as a part of this assessment. All identified critical load entities maintain backup generation in the event that a successful physical attack occurs on the Covered Distribution Facilities and in the highly unlikely event that secondary sources are not available. The backups are tested on a yearly basis to ensure they are working if they are called upon. City owned critical facilities are evaluated on an annual basis to ensure backup generation is reliable and available.

8. *The availability of alternative ways to meet the health, safety, or security:* Roseville's existing resilience, backup generation, and availability of secondary sources to feed the load provide multiple options to meet health, safety, and security. At this time, Roseville is not formally considering providing alternate ways to meet the needs served by the critical loads as these needs are fully covered currently.

9. *Requirements served by the load:* The critical loads have backup generation available and are able to be fed by secondary sources. As a result it was determined that the load requirements would be met through alternative means as discussed in this section.

A. COVERED DISTRIBUTION FACILITY MITIGATION PLAN

Roseville operates the electric grid with the lowest level of risk reasonably attainable. After an extensive review of Roseville's existing methodology, it was determined that the risk level for the four Covered Distribution Facilities was slightly below medium. The Facility Mitigation Plan will increase the physical security measures by December 31, 2022. Roseville will also develop a utility-wide physical security plan that will create a more holistic approach to Facility security. Roseville takes an active approach to both physical security and system resilience, thus proactively reducing potential risks, as shown in Figure 2 & 3 below.

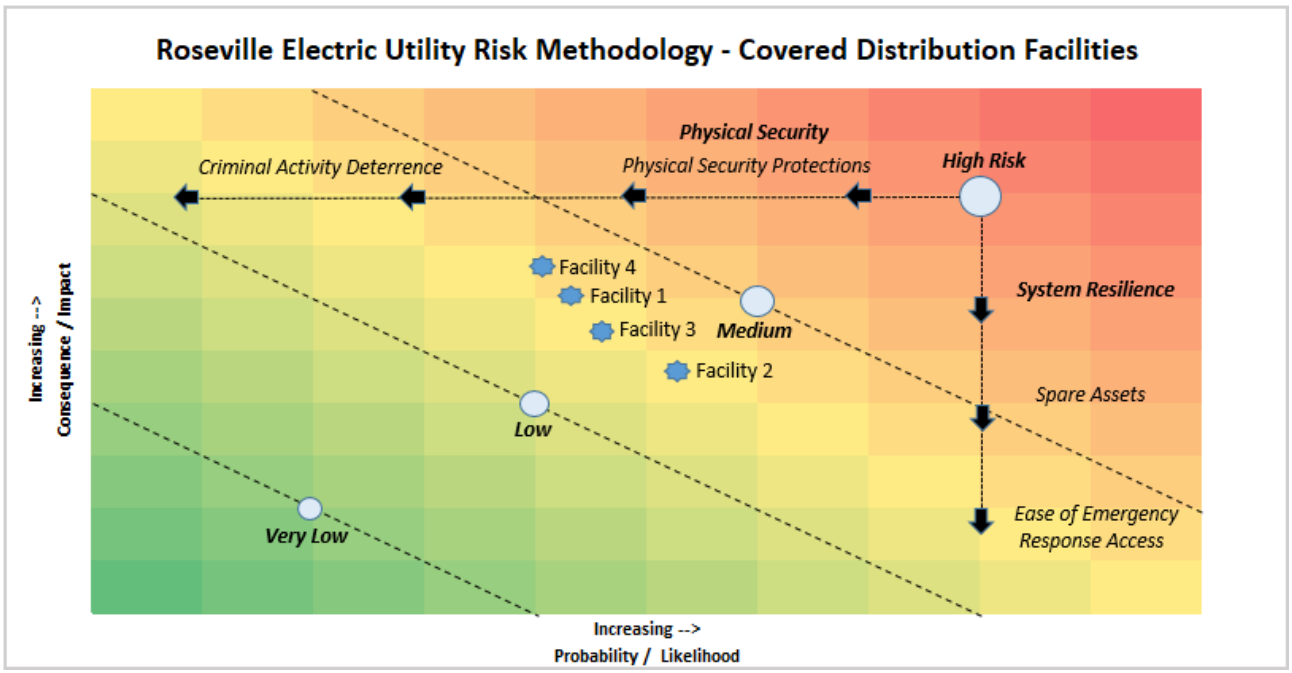


Figure 2: Roseville Risk Methodology Baseline Prior to Assessment

The heat map above indicates the baseline risk prior to existing physical and resilience measures that Roseville has in place or is in the active process of implementing based on the analysis performed during the assessment.

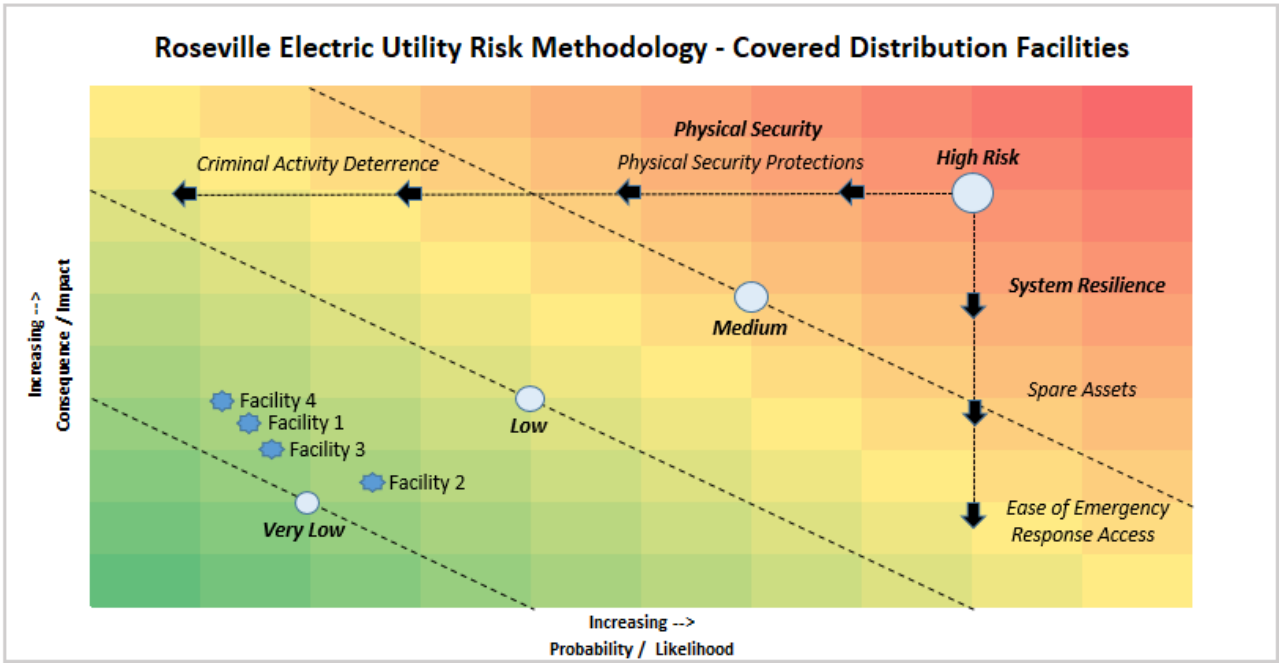


Figure 3: Roseville Risk Methodology Post Mitigation Measures

The post mitigation heat map above illustrates Roseville's four Covered Distribution Facilities risk exposure moving to the low/very low quadrant due to existing and planned physical and resilience measures. Roseville will continue to identify and assess potential risks associated with Covered Distribution Facilities and apply the methodologies described in this document consistent with D.19-01-018.

Roseville also considered the emerging threats below that after current evaluation considered them to be low risk:

- Insider threats: Roseville has a documented process that includes performing Personal Risk Assessments (PRA) during the hiring process to identify any potential past issues with the perspective employee being considered for employment. Roseville also has a documented process to remove the employee's physical and network access when they are no longer employed by Roseville.
- Unmanned aerial vehicles (UAVs): Roseville monitors and evaluates these emerging industry trends. UAV activity near the Covered Distribution Facilities was determined to be very low at this time.
- Supply chain risk: Should the Roseville supply chain become unavailable, Roseville would address this through spare assets on hand or request needed materials through the use of existing mutual aid agreements with neighboring utilities.

VII. INDEPENDENT EVALUATION AND RESPONSE (STEP 2)

A. REQUIREMENTS FOR QUALIFIED THIRD PARTY REVIEW

D.19-01-018 specifies the following criteria for a Qualified Third Party:

Independence: A Qualified Third Party cannot be a division of the POU. A governmental entity can select as the third-party reviewer another governmental entity within the same political subdivision, so long as the entity has the appropriate expertise, and is not a division of the POU that operates as a functional unit, i.e., a municipality could use its police department as its third-party reviewer if it has the appropriate expertise.

Adequate Qualifications: A Qualified Third Party must be an entity or organization with electric industry physical security experience and whose review staff has appropriate physical security expertise, which means that it meets one of the following: (1) an entity with at least one member who holds either an ASIS International Certified Protection Professional (CPP) or Physical Security Professional (PSP) certification; (2) an entity or organization with demonstrated law enforcement, government, or military physical security expertise; or (3) an entity or organization approved to do physical security assessments by the CPUC, Electric Reliability Organization, or similar electrical industry regulatory body.

B. IDENTIFICATION OF THIRD PARTY REVIEWER

Roseville has selected as its Third Party Reviewer AESI-US, Inc. (AESI). AESI is an independent third party and not a part of the City of Roseville. AESI meets the second qualification criterion above, "an entity or organization with demonstrated law enforcement, government, or military physical security expertise."

C. PUBLIC RESULTS OF THIRD PARTY EVALUATION

AESI has reviewed the Roseville's Physical Security Plan pursuant to the California Public Utilities Commission's ("CPUC") Phase 1 Decision on Order Instituting Rulemaking Regarding the Physical Security of Electrical Corporations, dated January 10, 2019, which requires electric utilities to identify electric distribution assets that may merit special protection and measures to lessen identified risks and threats.

AESI made several recommendations to improve current physical security measures. The recommended changes are not a requirement but best industry practices.

D. ROSEVILLE ELECTRIC UTILITY RESPONSE

Roseville will implement the recommended physical security enhancements at the identified Covered Distribution Facilities by December 31, 2022. Currently Roseville has separate physical security plans for different sections of the organization. Roseville will work towards completing a holistic department wide physical security plan that would combine existing measures.

VIII. VALIDATION (STEP 3)

A. SELECTION OF QUALIFIED AUTHORITY

Roseville selected the Roseville Police Department as its Qualified Authority to conduct the validation step of the physical security as required. Roseville's Police Department is a separate department from the utility, therefore they are independent in their validation review. Employees from the Roseville Police Department have been through extensive training focusing on physical security of electric substations in the last five years. Roseville feels that the Roseville Police Department is the perfect entity to validate Roseville's Physical Security Plan and measures.

B. RESULTS OF QUALIFIED AUTHORITY REVIEW

The Roseville Police Department reviewed and determined that current measures are adequate based on the mitigation plan and the fact that local crimes are not targeting the Covered Distribution Facilities.

C. ROSEVILLE ELECTRIC UTILITY RESPONSE TO QUALIFIED AUTHORITY REVIEW

Roseville continues to work with the Roseville Police Department to improve and enhance physical security measures.

IX. NARRATIVE DESCRIPTIONS FOR UTILITY SECURITY PLAN

A. ASSET MANAGEMENT PROGRAM

Roseville utilizes a Computer Maintenance Management System (CMMS) for asset and inventory management. This software is an enterprise asset management solution (equipment, installations, buildings, etc.) and includes services such as purchasing, inventory, location management, service desk, and work planning.

This CMMS software tracks the majority of items in Roseville's warehouses. The software is used to:

- track when inventory falls below "safety-stock" reorder points
- perform cycle counts and make appropriate adjustments
- create purchase requisitions and purchase orders to restock needed items
- capture transactions such as receipts, issues, transfers and returns

The utilization of an inventory management program optimizes service levels by tracking each item's location, number in stock and how many are available. CMMS manages Roseville's field assets as well. Roseville uses time based scheduling for maintenance planning and inspections. Workforce mapping and asset visualization is accomplished through the CMMS's geospatial connection to Roseville's Geographic Information System (GIS). Work orders are created and closed in the field on mobile devices which help to streamline the process.

B. WORKFORCE TRAINING AND RETENTION

Roseville staff are highly trained in all aspects of infrastructure operations at all four Covered Distribution Facilities. Personnel are available via call back in the event of an emergency and/or to initiate repairs utilizing Roseville's spare part inventory. Finally, Roseville is aware that retention of employees with these skill sets are a necessity and continues to work on maintaining a positive work environment.

C. PREVENTATIVE MAINTENANCE PLAN

Roseville has a Standard Operating Procedure as a documented preventative maintenance plan for identified equipment (PRC-005-6) to ensure that mitigation measures are functional and performing adequately. It establishes procedures for analyzing, mitigating, and providing documentation regarding failures and corrective action plans internally. It also establishes standard procedures for reporting protection system failures and misoperation.

Roseville performs preventative maintenance on a scheduled basis on all distribution facility assets, such as: breakers, switch gear, substation transformers, and physical security systems.

Roseville utilizes a maintenance program for substation inspections. The objective of this program is to establish a standard for utility operations use pertaining to type, frequency and grading of the City's electric utility substation activities.

Additionally, the Covered Distribution Facilities use a Computer Maintenance Management System (CMMS) to track and schedule maintenance activities. CMMS is a software package that maintains a computer database of information about Roseville's maintenance operations.

D. PHYSICAL SECURITY EVENT TRAINING

The City of Roseville has an Emergency Management Team (EMT) that meets regularly and has representatives from each City department as part of the team. The EMT works to ensure that the City of Roseville is prepared to respond to disasters that may occur within the City. The City Manager acts as the Emergency Services Director. The Director works closely with city staff during a disaster; while the day-to-day operation of disaster preparedness and readiness lies with the Emergency Preparedness Manager, a Roseville Fire Department Battalion Chief.

The City of Roseville is a member of the California Utility Emergency Association (CUEA), which plays a key role in ensuring communications between utilities during emergencies. CUEA serves as a point-of-contact for critical infrastructure utilities, CalOES and other governmental agencies before, during and after an event.

Roseville has worked with local law enforcement on the four Covered Distribution Facilities to educate them on physical hazards, points of entry and protection. Roseville and local law enforcement participate semiannually with the City's EMT on Emergency Operations Center scenarios, further increasing communication between agencies. Roseville also belongs to the Electricity Information Sharing and Analysis Center (E-ISAC) which is a trusted source of quality analysis and rapid sharing of security information for the electric industry.

COUNCIL COMMUNICATION

CC #: 1528
File #: 0704-01

Title: Maidu Soccer Arena Improvement Project - Notice of Completion
Contact: Heather Buck 916-774-5254 hcbuck@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 7.14.

RECOMMENDATION TO COUNCIL

Staff recommends City Council accept the Maidu Soccer Arena Improvement Project as complete and adopt a resolution authorizing the Parks, Recreation & Libraries Director to execute the Notice of Completion.

BACKGROUND

The Parks, Recreation & Libraries Department has made a final inspection of the Maidu Covered Soccer Arena Improvements Project and has found that all contract work has been completed in accordance with the improvement plans and specifications. The project is now ready for acceptance. The Maidu Covered Soccer Arena is located on the 152-acre regional park site located off of Rocky Ridge Drive and south of Douglas Boulevard. The project included minor alterations to the existing covered soccer arena to improve access, cleanliness, and spectator comfort. It included replacement of the existing fencing with new fencing, and added shade for bleachers, additional concrete walks for access within the facility, and an electrically operated gate for improved management of facility rentals. In accordance with City specifications, the contractor shall guarantee the installation of these improvements for a period of twelve (12) months from the date of this Notice of Completion.

The project originally included replacement of the existing net system. This component of the original contract has been deducted from the contract and will be implemented under a separate contract. This deduction of the contract has been mutually agreed upon between the City and contractor.

FISCAL IMPACT

Funding for the park improvements was provided through the Parks, Recreation & Library Capital Projects Fund in FY2019-20. Maintenance of the existing citywide park is paid from the General Fund and remains unchanged.

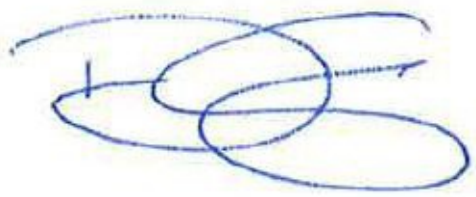
ENVIRONMENTAL REVIEW

The California Environmental Quality Act (CEQA) does not apply to activities that will not result in a direct or reasonably foreseeable indirect physical change in the environment, or is otherwise not considered a project as defined by CEQA Statute §21065 and CEQA State Guidelines §15060(c)(3) and §15378. Approval of a Notice of Completion meets the above criteria and is not subject to CEQA. No additional environmental review is required.

Respectfully Submitted,

Heather Buck, Park Development Project Manager

Jill Geller, Director, Parks, Recreation & Libraries



_____

Dominick Casey, City Manager

ATTACHMENTS:

Description

Resolution 21-263

Notice of Completion

RESOLUTION NO. 21-263

ACCEPTING THE PUBLIC WORK KNOWN AS THE MAIDU SOCCER ARENA IMPROVEMENT PROJECT, APPROVING THE "NOTICE OF COMPLETION", AND AUTHORIZING THE PARKS, RECREATION AND LIBRARIES DIRECTOR TO EXECUTE SAID NOTICE ON BEHALF OF THE CITY OF ROSEVILLE

BE IT RESOLVED by the City Council of the City of Roseville as follows:

1. The "Notice of Completion" on file in the City Clerk's Department relative to that public work known as the Maidu Soccer Arena Improvement Project, has been approved and the public work accepted.

2. The Parks, Recreation and Libraries Director is hereby authorized and directed to execute said Notice on behalf of the City of Roseville.

PASSED AND ADOPTED by the Council of the City of Roseville this_____day of _____, 20_____, by the following vote on roll call:

AYES COUNCILMEMBERS:

NOES COUNCILMEMBERS:

ABSENT COUNCILMEMBERS:

_____
MAYOR

ATTEST:

_____
City Clerk

RECORDING REQUESTED BY AND WHEN
RECORDED MAIL TO:

CITY CLERK
CITY OF ROSEVILLE
311 VERNON STREET
ROSEVILLE, CA 95678

Exempt from recording fees
Pursuant to Gov't Code §27383

NOTICE OF COMPLETION

NOTICE IS HEREBY GIVEN that the public work of improvement known as the _____ Project was completed and accepted by the City of Roseville on _____. The location is situated in the City of Roseville, County of Placer, State of California and is indicated on the attached map, marked as Exhibit "A" and incorporated herein by this reference. The real property herein described is owned by the City of Roseville, 311 Vernon Street, Roseville CA 95678.

The direct/general contractor on said project was _____.

The surety on said project was _____

_____.

_____

City of Roseville
Owner

ATTEST:

_____
Sonia Orozco, City Clerk

State of California)
County of Placer)

I,_____, being first duly sworn, depose and say: I am the _____ of the City of Roseville, a municipal corporation in the State of California, owner of the property described in the above Notice. I am duly authorized to make this verification for and on behalf of the City of Roseville. I have read the Notice of Completion and know its contents and the facts stated therein are true.

_____

City of Roseville

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California)
County of Placer)

Subscribed and sworn to (or affirmed) before me on this _____ day of _____,

20___, _____

proved to me on the basis of satisfactory evidence to be the person(s) who appeared before me.

_____

Place Notary Seal and/or Stamp Above

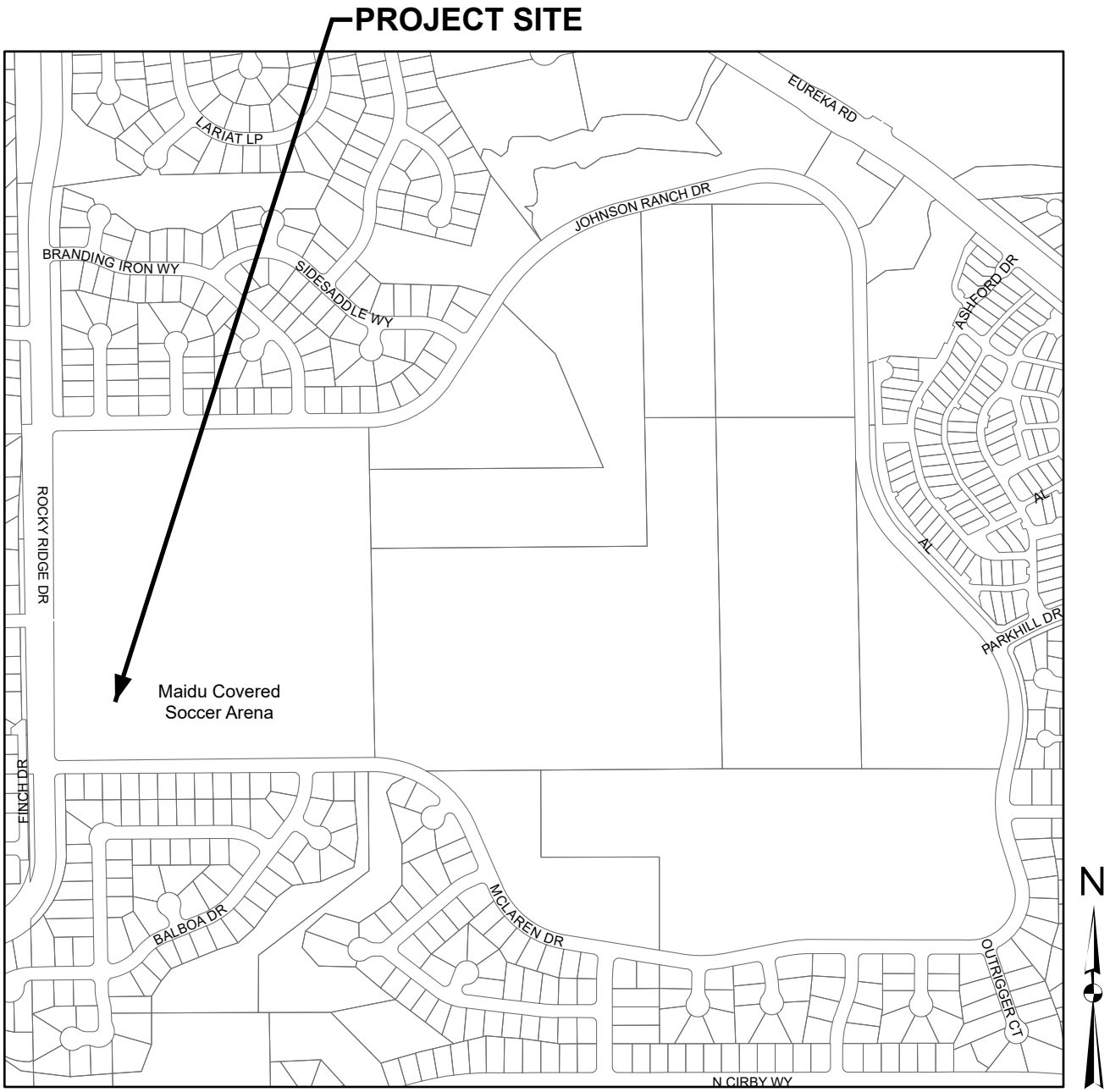
Signature of Notary Public

CITY OF ROSEVILLE CALIFORNIA

Exhibit A

Maidu Covered Soccer Arena

The project included the replacement of the existing netting and fencing with new netting and fencing, new shade for the bleachers, additional concrete walks, and electrically operated gates.



COUNCIL COMMUNICATION

CC #: 1546
File #: 0323-02

Title: Rotation Tow Program - Service Agreements
Contact: Scott Blynn 916-746-1076 sblynn@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 7.15.

RECOMMENDATION TO COUNCIL

Adopt a resolution authorizing the Police Chief, or his designee, to execute agreements with six tow companies to be included on the Police Department's rotation tow list for the two-year period following execution of the agreements.

BACKGROUND

The Police Department maintains a list of local towing companies to call when Police employees need a vehicle towed and stored, or they need a vehicle promptly removed from the roadway, and the driver doesn't have a preferred towing company available within an acceptable period of time. The towing companies on the Police Department's list are called in turn, so that they receive equal opportunities for business - therefore, they're called "rotation tows". The Police Department maintains no more than ten companies on the rotation tow list. This year, during a publicly advertised open enrollment period, six companies submitted applications. Staff reviewed their applications, conducted inspections and determined that they all met City requirements. They include Ace in the Hole Towing, Anderson Tow Service, Classic Tow Service, Jake's Towing & Recovery Inc, LJ's Towing and Neighborhood Enterprise Tow.

FISCAL IMPACT

Vehicle owners are responsible to pay towing companies for the towing and storage of their vehicles. The agreements stipulate that the tow companies will charge vehicle owners involved in Police Department tows according to the approved rate schedules listed in their agreements. There is no cost to the City.

ENVIRONMENTAL REVIEW

The California Environmental Quality Act (CEQA) does not apply to activities that will not result in a direct or reasonably foreseeable indirect physical change in the environment, or is otherwise not

considered a project as defined by CEQA Statute §21065 and CEQA State Guidelines §15060(c)(3) and §15378. Approval of the tow rotation service agreements meets the above criteria and is not subject to CEQA. No additional environmental review is required.

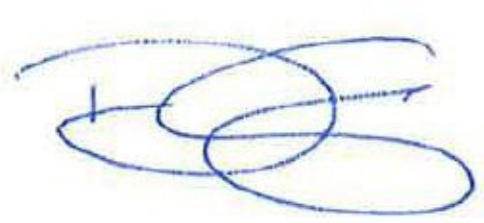
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Goal E - Deliver exceptional city services

Respectfully Submitted,

Scott Blynn, Police Lieutenant

Troy Bergstrom, Police Chief



_____

Dominick Casey, City Manager

ATTACHMENTS:

Description

Resolution 21-278

Tow service agreement

Ace Tow Contract

Anderson Tow Contract

Classic Tow Contract

Jakes Tow Contract

LJs Tow Contract

Neighborhood Tow Contract

RESOLUTION NO. 21-278

APPROVING TOW SERVICE AGREEMENTS AND AUTHORIZING THE POLICE CHIEF OR HIS DESIGNEE TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE

WHEREAS, the Police Department of the City of Roseville utilizes towing companies to tow disabled, abandoned, or other vehicles; and

WHEREAS, staff wishes to enter into Tow Service Agreements for rotation tow services, for a two year period commencing from execution of the Agreements, with the following companies:

- Ace In the Hole Towing
- Anderson Tow Service
- Classic Tow Service
- Jake's Towing & Recovery
- LJ's Towing
- Neighborhood Enterprise Towing

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Roseville that the Police Chief or his designee, is hereby authorized to execute Tow Service Agreements.

PASSED AND ADOPTED by the Council of the City of Roseville this_____day of _____, 20___, by the following vote on roll call:

AYES COUNCILMEMBERS:

NOES COUNCILMEMBERS:

ABSENT COUNCILMEMBERS:

_____
MAYOR

ATTEST:

_____
City Clerk

ROSEVILLE POLICE DEPARTMENT

TOW SERVICE AGREEMENT

This Tow Service Agreement (Agreement) contains rules and regulations that a company agrees to comply with in order to receive a rotation tow listing with the Roseville Police Department ("Department"). Participation in the Department Rotation Tow Program ("Program") is voluntary. Compliance with all of the terms and conditions of the Tow Service Agreement is mandatory for tow companies participating in the Department's Program. An Operator ("Operator"), by agreeing to participate in the Program, is not acting as an agent for the Department or the City of Roseville ("City") when performing services under the Agreement.

For clarification purposes, definitions are contained in Attachment A. Attachment B contains instructions for completing required application forms.

This Agreement, and the terms, conditions, and specifications contained herein, supersedes previous Agreements. The term of this Agreement is for two years from the date of execution by the City.

I. Lottery and Rotation List:

A. The Department shall conduct a bi-annual public lottery of all tow companies that desire to be placed on the rotational call list. The Department will randomly select ten (10) companies for the following two years. The selected companies are then placed on a Rotation Tow List which establishes a rotational system to facilitate the distribution of calls, meet the needs of the Department with regards to response time and available tow services, and to ensure an equitable distribution of calls. The Department shall maintain a separate RV Rotation Tow Lists for towing recreational vehicles (RVs) including Class B and/or C RVs. Nothing in this Agreement shall prohibit a Department supervisor from requesting a specific tow company when, in the supervisor's opinion, the necessary resources to clear a hazard as expeditiously as possible are not available from the tow company currently at the top of the rotation tow list.

1. In such instance, the tow company selected would be the next tow company on the list which has the qualifications (equipment, skills, timeliness, etc.) to provide the required service. After the request, the selected company would then go to the bottom of the rotation tow list and remain there until it rotates back into its original position.

   Tow companies on the list that were by-passed would remain in the same order until their selection for a rotation tow for which they are qualified.

2. The Department alternates rotation tow calls after every call. Call rotation order is established by the Department. A call to an Operator shall constitute one turn on the list and the Operator shall be moved to the bottom of the list. This includes when the Operator fails to answer the telephone or the telephone is busy after two (2) attempts, is unable to respond, or is unable to perform the required service. In this event, the next rotation tow, in order, will be called. An Operator who refuses to respond or provide service, or is canceled due to excessively delayed response time, will be moved to the bottom of the list.

    a. If it is determined that the Operator is not needed and is canceled by the Department, up to and including arrival at the scene, there shall be no monetary charges and the Operator will be placed back at the top of the list. There shall be no monetary charges for standby time which does not result in a tow.

    b. If the Operator is canceled by the vehicle's owner or agent prior to the Operator taking possession (as defined in Attachment A) of the vehicle, there shall be no charges for towing. The Operator shall immediately contact the Department and advise of the cancellation. The Operator will then be placed back at the top of the list.

    c. If service, other than towing and recovery, has begun and is canceled by the vehicle's owner or agent, the Operator may charge a minimum of one-half of the regular hourly service charge, for the time expended on the call. For purposes of cancellation, work begins when physical work on the vehicle has begun, not the response. No lien shall arise for the service unless the Operator has presented a written statement to the vehicle's owner or agent for the signed authorization of services to be performed.

        1. The Operator shall not attempt to take possession of the vehicle in order to establish a lien for any non-towing services performed, or begun and subsequently canceled, when not entitled to such lien by law. Refer to Civil Code Section 3068.1 for when a lien begins.

B. The Department shall determine the maximum response time, enrollment period, reasonable rates, and other applicable requirements.

    1. The enrollment period must be at least bi-annually commencing on the date the Agreement is executed by the City, and will be open for at least thirty (30) days. Department. The Agreement will be effective for the following two years.

    2. The Agreement will be based on the initial Approved Rates in Section XX of this Agreement. Though the Agreement term is two (2) years, the Department is willing to re-negotiate out-year pricing (increases and/or decreases) based on market fluctuations thirty (30) days prior to the end of the first year of this two (2) year Agreement. Any proposed rate changes will be evaluated based on what the Department deems to be fair and reasonable. Any requests made by an Operator for a price increase must be fully documented utilizing an appropriate Consumer or

Producer Price Index or other reputable relevant market data to justify a rate change. In its request for price increases Operator shall cite sources, specific conditions, and document how those market conditions affect the rate. Such rate adjustments will not be automatic. Any rate adjustment must be mutually agreed upon by both the Department and the Operator. The Department will review the proposed rate adjustment and determine if it is allowable, fair, reasonable, and in the best interest of the Department.

C. Nothing shall prohibit a Class B, Class C, or Class D Operator from maintaining a place on a lighter class rotation tow list provided the tow truck meets the equipment specifications for that class of operation.

D. Operators applying for a rotation tow listing shall have a minimum of three (3) years verifiable for-hire-towing experience, as an owner or principal or other position of comparable managerial experience, prior to the final filing date of the enrollment period in order to qualify for a Department rotation tow listing.

1. Operators who have less than the required three-years' experience who are currently on the Department rotation tow list are exempt from this provision.

2. Ownership status will be investigated and determined by the Department.

II. Tow Truck Classifications:

A. An Operator shall equip and maintain tow trucks covered under this Agreement (Attachments B and C) in accordance with the provisions set forth in the California Vehicle Code (CVC), Title 13 of the California Code of Regulations, and the specifications contained in this Agreement, and consistent with industry standards and practices. All Operator's must maintain tow trucks capable of towing a Class B and C recreational vehicle (RV), trailer, etc.

1. Notwithstanding Section 615 of the CVC, all tow trucks shall have recovery capabilities, wheel lift capabilities, and a boom meeting the specifications contained in this Agreement. For the purpose of this Agreement, "a trailer for hire that is being used to transport a vehicle" shall not qualify as a primary tow truck for a rotation tow listing.

2. An Operator who has a car carrier may be exempted from the recovery, wheel lift, and boom capability requirements. However, the car carrier must be an additional unit.

B. A violation of the Gross Vehicle Weight Rating (GVWR) and safe loading requirements of a tow truck may be cause for immediate suspension. This includes exceeding the tow truck's GVWR, front axle weight rating, rear axle weight rating, maximum tire weight ratings, or not maintaining fifty (50) percent of the tow truck's unladen front axle weight on the front axle when in tow.

C. There will be four classes of tow trucks covered under this Agreement, as follows:

1. **Class A - Light Duty**

   a. An Operator shall maintain a minimum of two (2) tow trucks which have a manufacturer's Gross Vehicle Weight Rating (GVWR) of at least 14,000 pounds. One truck may be a car carrier.

      (1) A “trailer for hire” shall not be approved for listing as a Class A tow truck.

2. **Class B - Medium Duty**

   a. An Operator shall maintain a minimum of one (1) tow truck with a GVWR of at least 19,501 pounds. The truck shall be equipped with air brakes and a tractor protection valve or device, and be capable of providing and maintaining continuous air to the towed vehicle.

      (1) Class B tow trucks that are not equipped with portable tow dollies 24 hours a day, 7 days a week, will not be allowed to operate on a Class A rotation tow list.

3. **Class C - Heavy Duty**

   a. An Operator shall maintain at least one (1) three-axle tow truck with a GVWR of at least 33,000 pounds. The truck shall be equipped with air brakes and must be capable of providing and maintaining continuous air to the towed vehicle.

4. **Class D - Super Heavy Duty**

   a. An Operator shall maintain at least one (1) three-axle tow truck with a GVWR of at least 50,000 pounds. The truck shall be equipped with air brakes and must be capable of providing and maintaining continuous air to the towed vehicle.

C. To properly and safely tow and service the wide variety of vehicles being operated on the highway, a towing procedure may require the use of auxiliary equipment specifically designed for the purpose. This auxiliary equipment should be used when appropriate.

D. The Operator understands and agrees that they may be called upon to tow recreational vehicles (RVs). Operator agrees that they will maintain storage space and provide tow trucks capable of towing Class B and/or C recreational vehicles (RVs) upon Department’s request.

III. Tow Truck Drivers:

A. All rotation tow truck drivers will attend or challenge and successfully pass a certified tow truck driver training course. Acceptable courses to fulfill this requirement will be reviewed and approved by the Department.

B. The Operator shall ensure that tow truck drivers responding to calls initiated by the Department have completed a certified tow truck driver training course and are qualified and competent employees of the Operator's company. The Operator shall ensure that the tow truck drivers are trained and proficient in the use of the tow truck and related equipment, including, but not limited to, the procedures necessary for the safe towing and recovery of the various types of vehicles serviced through Department rotation.

C. Tow truck drivers shall be at least eighteen (18) years old and possess the following minimum class driver's license:

1. Class A Tow Truck - A valid Class C license, or a valid Class A license with valid medical certificate.

2. Class B Tow Truck - A valid Class C license for nonregulated vehicles, or a valid Class A license with a valid medical certificate for regulated vehicles pursuant to Section 34500 (k) of the CVC.

3. Class C Tow Truck - A valid Class A license with a valid medical certificate.

4. Class D Tow Truck - A valid Class A license with a valid medical certificate.

C. The Class A (1) licenses must be endorsed to allow operation of special vehicle configurations and/or special cargoes.

D. The Operator shall maintain a current list of drivers.

1. Operators shall provide a current list of drivers to the Department upon implementation of this Agreement. The Operator shall notify the Department upon any change in driver status, including the addition of any new drivers, or the deletion of any drivers. An updated list shall be provided to the Department within seven (7) calendar days of any change in driver status.

2. All drivers are required to complete and sign the Tow Operator/Driver Information Sheet (CHP 234F). If drivers refuse to complete and sign the form, they shall not be permitted to respond to rotation calls.

3. Operators shall submit, with each annual application, a copy of the certified tow truck driver's training certificate for each driver.

4. Operators, shall as a minimum, maintain the following information for each employee:
   a. Full name.
   b. Date of birth.
   c. California driver's license number.
   d. Copy of a valid medical certificate (if required).
   e. Job title/description.
   f. Current home address.
   g. Current home telephone number.

h. Types of trucks the driver is trained and instructed to operate.
i. A copy of the tow truck driver training course certificate.

E. All tow truck drivers and owner/Operators shall be enrolled in the DMV Pull Notice Program.

1. Upon the addition of new drivers, an Operator will be granted a maximum of thirty (30) days to enroll drivers in the Pull Notice Program.

2. Pull Notices shall be kept on file, signed and dated by the Operator.

3. The Department may require an Operator to provide copies of Pull Notice Reports.

IV. Rates:

A. Fees charged for response to calls originating from the Department shall be reasonable and not in excess of those rates charged for similar services provided in response to requests initiated by any other public agency or private person. The reasonableness of the fees charged will be determined in the following manner:

1. The Operator shall submit the retail hourly rate to the Department. The Department shall determine the validity and reasonableness of the submitted rates.

a. Validity will be based upon telephone quotes, posted rates, charges to retail customers, etc. Any submitted rate in excess of an Operator's retail rate (as defined in Attachment A) will be considered invalid and will not be accepted. An Operator who submits an invalid rate shall not be allowed to resubmit a new rate and will be disqualified from Department rotation tow listing until the next enrollment period.

b. Reasonableness shall be determined as compared to other rates. An Operator who submits a rate that is determined to be excessive shall be allowed to resubmit rates only once.

2. In an effort to remain competitive in the open market, the Operator may lower retail rates at anytime by notifying the Department. When an Operator lowers the retail rate, that retail rate becomes the new approved Department rate. Operators may only raise rates for Department calls during enrollment periods. Operators may raise rates for non-Department calls at any time. Rates for Department calls shall remain at the lowest retail rate until the next enrollment period.

3. Any Operator which charges rates above the Operator’s retail hourly rates or submitted rates for a Department call shall be in violation of the Agreement and subject to disciplinary action.

B. The rate for towing shall be computed from portal to portal (as defined in Attachment A). Time expended shall be charged at a rate not to exceed the hourly rate. Time

expended in excess of the minimums shall also be at the hourly rate in no more than one (1) minute increments. There shall be no additional charges for mileage, labor, etc.

1. The Operator may charge up to a thirty (30) minute minimum per call for base services (as defined in Attachment A).

2. The Operator may charge up to a one (1) hour minimum per call on public safety response calls (as defined in Attachment A).

3. The Operator shall base towing charges upon the class of vehicle being towed regardless of the class of truck used, except when vehicle recovery operations require a larger class truck.

C. Rates for service calls (out of gas, lockouts, tire changes, etc.) shall be from portal to end of service, and may be at the hourly rate with up to a thirty (30) minute minimum. Charges in excess of thirty (30) minutes may be charged in no more than one (1) minute increments.

D. The approved schedule of rates charged by the Operator shall be available in the tow truck, and shall be presented upon demand to the person(s) for whom the tow services were provided, their agent, or any Department officer.

E. Fees for Special Operations

1. For special operations involving Class B, C, or D tow trucks, the Operator shall submit the proposed fees for vehicle recovery operations and load salvage operations (as defined in Attachment A) to the Department. Fees shall be reasonable and consistent with industry standards for similar operations. Charges in excess of thirty minutes may be charged in no more than one (1) minute increments.

   a. Hourly rates shall be established for the following categories:

      (1) Auxiliary Equipment, e.g., airbags, converter gear/dolly, additional trailers, etc.

      (2) Contracted Equipment, e.g., airbags, converter gear/dolly, additional trailers, forklifts, front loaders, etc.

      (3) Contract labor.

   b. The Department shall determine the reasonableness of the fees for these types of operations, based upon the average of the proposed fees submitted and a comparison to industry standards for similar operations.

   c. Operators shall submit a markup rate (percentage of the cost to the Operator) for retail equipment and specialized labor not otherwise listed on the application.

d. If an Operator performs a service for which a required rate was not submitted to, and approved by, the Department, the Operator shall only be entitled to charge for the actual cost of that service. Example: contract labor rate not submitted, the Operator may only charge for the actual rate paid for the labor.

F. The Operator, or his/her employee, shall accept a valid bank credit card or cash, at the customer's discretion, for payment of towing and/or storage costs.

1. Rates for services shall be charged on the basis of a credit card transaction. The tow Operator may charge a discounted rate for a cash transaction.

G. Storage Fees

1. The Operator shall submit proposed storage fees for inside and outside storage to the Department. The Department shall determine the validity and reasonableness of the fees for inside and outside storage, based upon the average of the proposed fees submitted by those applying for rotation.

2. The Operator shall display in plain view at all cashiers' stations, a sign as described in Section 3070 of the Civil Code, disclosing all storage fees and charges in force, including the maximum storage rate.

3. A request for outside or inside storage by the customer or Department officer shall be honored. If no request is made, the vehicle should be stored in the least costly manner to the customer's benefit, unless documentable circumstances dictate otherwise.

4. Upon request, Operators shall provide after-hour vehicle releases. After-hours release fees may only be charged for vehicles released after normal business hours.

a. For the purpose of this Agreement, "normal business hours" shall not be less than 8 a.m. to 5 p.m., Monday through Friday, except for the following state recognized holidays:

New Year’s Day, Martin Luther King Day, Lincoln Day, Presidents’ Day, Memorial Day, Independence Day, Labor Day, Columbus Day, Veterans’ Day, Thanksgiving Day, day after Thanksgiving Day, and Christmas Day.

b. Business hours shall be posted in plain view to the public.

c. The after-hours release contact telephone number(s) shall be posted in plain view to the public.

d. Employees and agents shall be properly trained to conduct business transactions related to towing, storage and release of vehicles/property.

e. The total fees charged for release after normal business hours shall be no more than one-half the hourly rate, and shall only be allowed outside posted business hours, after 5:00 p.m. on business days, weekends and holidays.

5. Vehicles stored twenty-four (24) hours or less shall be charged no more than one (1) day storage. Each day thereafter shall be calculated by calendar day. (Civil Code §3068.1(a))

6. Lien sales are the sole responsibility of the Operator and all such sales shall be conducted in accordance with the applicable provisions of California state law.

H. Rate requirements represent the maximums an Operator may charge on a Department call. An Operator is not precluded from charging less when deemed appropriate by the Operator. These requirements shall not be construed as requiring a charge when an Operator would not normally charge for such service.

1. No Operator, agent, or employee shall refer to any rate as the minimum required or set by the Department.

I. IMPOUND NOTIFICATION.

1. In the event that ANY vehicle impounded by this Department is expected to remain in storage thirty (30) days after impound, the Operator shall notify the Department's Operations Commander on the thirtieth (30th) day.

J. VEHICLE RELEASE.

1. No vehicle impounded by the Department shall be released to any party without a signed written authorization to release (CHP Form 180) from the Department.

V. Collusion:

A. The Operator and/or applicant shall not conspire, or attempt to conspire, or commit any act of collusion, with any other Operator or applicant for the purpose of secretly, or otherwise, establishing an unfair understanding regarding rates or conditions to the Agreement that would bring about any unfair condition which could be prejudicial to the Department, the motoring public, or other Operator(s).

1. An example of "collusion" includes, but is not limited to: conspiracy by any Operator(s) to establish artificially high or low rate(s) for services performed pursuant to the Agreement.

B. A finding by the Department that any Operator, applicant, or agent has been involved in collusion shall be cause for denial of an application or shall nullify the Agreement. Any Operator or applicant found to be involved in any act, or attempted act of collusion, shall be disqualified from participation on the Department rotation tow list for the current term, plus three (3) years.

VI. Response to Calls:

A. The Operator shall respond to Department calls 24 hours a day, seven days a week, within the maximum response time as established by the Department, and as specified in this Agreement. The Operator shall respond with a tow truck of the class required to tow the vehicle specified by the Department.

1. The maximum response time for Class A tow trucks is established as twenty (20) minutes, 24-hours a day. The maximum response time for Class B, C and D tow trucks is thirty (30) minutes, 24-hours a day, however Department and Operator agree that in non-emergency situations where there is no immediate threat to health or safety, the maximum response time for towing recreational vehicles, including Class B and/or C recreational vehicles shall bewithin one week and only during normal business hours Monday through Friday.

B. The Operator shall advise the Department's Communications Center, at the time of notification, if they are either unable to respond or unable to meet the maximum response time. If, after accepting the call, the Operator is unable to respond or will be delayed in responding, the Operator shall immediately notify the Department's Communications Center. The Operator shall not assign initial calls to other tow Operators.

1. A failure to respond and/or repeated failure to meet the maximum response time requirements shall constitute failure to comply with the terms and conditions of this Agreement.

a. The Department may take immediate disciplinary action for any flagrant violation of the requirement to respond within the maximum response time. Disciplinary action may include written reprimands, suspension from the rotation, and/or removal from the rotation.

b. When an Operator will be temporarily unavailable to provide services due to a preplanned/scheduled activity, e.g., vacation, maintenance, medical leave, etc., the Operator shall notify the Department Communications Center at least 24 hours prior to the date that services will be unavailable, noting the times and dates of the unavailability.

C. The Operator, or Operator's employees responding to a Department call, shall perform the towing or service required for which they were called. This requirement may be waived by the Department Incident Commander, if the requested equipment is inadequate for the service to be performed.

1. Any refusal to respond or to perform the required towing or service will subject the Operator to suspension, if deemed appropriate by the Department.

D. An Operator shall not respond to a Department call assigned to another Operator unless requested to do so by the Department.

1. There may be times when the Operator assigned the initial Department call, may require the assistance of an additional Operator at the scene. The Operator assigned the initial call may, with the concurrence of the Department Incident Commander, request a specific Operator for assistance. The request shall be routed to the additional Operator through the Department.

2. There may be times when an Operator, who was not called to a scene, comes upon a collision scene where a vehicle or vehicles are blocking a roadway and a Department officer requests assistance in clearing the roadway. In such a case, the Operator may be requested to move the vehicle to a safe location, as directed by the officer, and leave it. There shall be no charge for this assistance, and the assistance provided shall not change the Operator's place in the rotation.

E. Only the tow truck personnel and equipment requested shall respond to a Department call. Additional tow truck personnel and equipment shall be at the approval of the Incident Commander. This shall not preclude the Operator from responding to an incident to ascertain if additional assistance or equipment is required. There shall be no additional charge for any personnel or equipment that is not necessary to perform the required service and approved by the Incident Commander.

1. An Operator may dispatch more than one tow truck to a multi-vehicle collision scene in response to a rotation tow call.

F. If two or more Operators are called to the same incident, distribution of the vehicles shall be at the discretion of the Department Incident Commander.

1. The Department Incident Commander may direct an Operator to move vehicles to help clear a roadway or for lifesaving operations. Operators shall provide the requested assistance.

VII. Business and Storage Facility:

A. An Operator shall have a business office and storage facility located within the city limits of the City of Roseville. Prior to the execution of this Agreement, the Operator shall furnish the Department the address(es) of all facilities.

1. Operators shall maintain a City business license and comply with all City ordinances and zoning requirements.

2. Operators shall not share or jointly use with any other towing company doing business within the City any of the following: (i) towing equipment; (ii) personnel; (iii) insurance; or (iv) business license.

3. No employee of the City shall have any direct financial interest in this Agreement. This Agreement shall be voidable at the option of the City if this provision is violated.

B. The Operator shall be responsible for the security of vehicles and property at the place of storage. As a minimum, a fenced or enclosed area shall be provided. The Operator is responsible for the reasonable care, custody, and control of any property contained in towed or stored vehicles.

C. The Operator shall obtain approval from the Department prior to the removal of any property from a stored or impounded vehicle and shall provide a receipt, with a copy placed in the stored vehicle. This requirement to obtain approval from the Department prior to the removal of property may be waived by the Department if it is determined that proper safeguards and procedures are utilized by the Operator.

1. This requirement may not be waived in cases where a vehicle has been impounded for evidence or investigation.

2. Upon approval from the Department, the Operator shall release personal property from a stored or impounded vehicle at the request of the vehicle owner or agent.

a. There shall be no charge for the release of personal property during normal business hours. Operators may charge an after hours release fee for property released after normal business hours, consistent with the after hours vehicle release provisions.

b. Personal property is considered to be items which are not affixed to the vehicle.

(1) Personal property includes: papers, transportable cellular telephones, portable radios and/or portable stereo equipment, clothes, luggage, tools, etc.

(2) Personal property from a stored vehicle shall be released upon request of the vehicle owner or agent.

3. Cargo shall be released upon demand of the carrier or pursuant to a court order.

D. The primary storage facility shall normally be at the same location as the business address. If not at the same location, there shall be no charge for any additional distance traveled to and from a secondary location. The vehicle and/or personal property shall be released at the primary storage facility or place of business (when the primary storage facility and place of business are not at the same location) upon request of the owner or a person having a legal entitlement to the vehicle and/or property.

1. The following three requirements constitute a business office for purposes of this Agreement:

a. The business office shall be equipped with a telephone with a separate telephone number/line for the towing business.

b. At least one individual is available to answer the telephone during normal business hours.

c. If the business office is not staffed during normal business hours, then an Operator shall respond to the tow yard to release property or a vehicle within 30 minutes of receiving a call from a vehicle owner.

d. Vehicle owners shall be able to pay service charges at that location and make arrangements for reclaiming the towed vehicle (i.e., upon leaving the office, the owner can go directly to the tow yard without delay to reclaim their vehicle).

2. Prior to the utilization of new storage facilities that were not listed and approved on the application for rotation tow listing, the Operator shall furnish the address and obtain the Department's approval.

a. Secondary storage facilities shall be located reasonably close to the main business office and within the city limits.

E. Tow Operators shall maintain a sufficient number of outside or inside storage spaces to meet the needs of the Department and the public. This includes specifically enough storage for large vehicles such as a recreational vehicle (RV), trailer, etc.

F. An Operator's place of business shall have a sign that clearly identifies it to the public as a towing service. The sign shall have letters that are clearly visible to the public from the street. The sign shall be visible at night.

G. Personnel/employees shall be properly trained to conduct business transactions related to towing, storage and release of vehicles/property.

H. The release of vehicles shall be conducted in accordance with procedures established by the Department. Operators shall comply with the instructions on form CHP 180, issued at the time of the tow.

VIII. Insurance

A. The Operator shall maintain the following minimum levels of insurance from an insurance carrier admitted in California or admitted in the state in which the Operator's business is located and is authorized to do business in California:

1. Minimum Level of Financial Responsibility (as required by Section 34631.5 of the CVC) - Bodily injury and property damage with a combined single limit of not less than $750,000 for Class A tow trucks. The combined limits for Classes B, C and D shall be not less than $1,000,000. These minimum standards are to include non-owned and hired auto coverage.

2. Uninsured Motorist - Legal minimum, combined single limit.

3. On-Hook Coverage - Insuring the vehicle in tow with limits based on the size of the tow truck:

a.	Class A tow truck	-	$ 50,000
b.	Class B tow truck	-	$ 75,000
c.	Class C tow truck	-	$ 100,000
d.	Class D tow truck	-	$ 100,000

4. Garage Liability - Includes premises and operations. Coverage for bodily injury and property damage with a combined single limit of not less than $500,000.

5. Garage Keepers Liability - Shall be the same minimum as on-hook coverage for vehicles in the care, custody, and control of the Operator in the storage yard.

6. Workman's Compensation Insurance - Legal minimum requirement.

B. Proof of insurance shall be in the form of a certificate of insurance acceptable to the city. Policy expiration or cancellation will immediately nullify the Tow Service Agreement. The Operator's insurance policy shall provide for not less than thirty (30) days written notice to the Department in the event the insurance policy is canceled or is due to expire. Additionally, the Operator shall notify the Department in advance of the expiration or cancellation of the Operator's insurance policy.

1. The Operator may be reinstated only after proof of insurance has been presented to the Department and any subsequent disciplinary action for failure to notify the Department of insurance expiration/cancellation has been served.

C. Those tow truck Operators removing a vehicle from a hazardous materials incident to the nearest reasonable and safe stopping location will be considered to be transporting property subject to normal minimum insurance requirements of Section 34631.5 of the CVC.

D. Upon request of a customer, an Operator shall provide, in writing, the name, address, phone number and policy number of their insurance provider.

E. The ultimate responsibility for any damage to the vehicle or property, or the loss of the vehicle or any property contained in the vehicle, while the vehicle and/or property are in the Operator's care and custody, rests with the Operator. The Operator shall reimburse the vehicle or property owner for any loss or damage which has been identified in a Department inventory and is not covered by the Operator's insurance, if required by court order.

IX. Inspections:

A. The Department shall provide for not less than one (1) annual inspection of all tow trucks and business and storage facilities, at no charge to the Operator. The Department may conduct additional inspections without notice during normal business hours.

1. A tow truck, upon initial inspection or during an enrollment period, will be allowed one follow-up inspection. A tow truck which fails to pass the follow-up inspection will not be approved for use on the Department Rotation Tow List during the term of this Agreement.

2. The Department may waive the inspection of a tow truck which has been inspected by the CHP and has a current tow truck inspection certificate. To request a waiver, the Operator must submit a copy of the completed CHP inspection form to the Roseville Police Department.

B. The Operator shall not dispatch a tow truck to a Department call that has not been inspected (by the Department or the CHP) and approved for use by the Department.

X. Business Records:

A. The Operator shall maintain records of all tow services furnished. The records will be maintained at the Operator's place of business.

1. Invoices shall at a minimum include a description of each vehicle, nature of service, start time, end time, location of call, and itemized costs of towing and storage.

2. Records for each call shall indicate the tow truck driver's name and truck used.

B. The Operator shall also maintain business records relating to personnel, insurance, personnel taxes, payroll, applicable operating authorities, local operating authorities, lien sale actions, Federal Communications Commission licensing, and non-Department tows.

C. The Department may inspect all Operator records without notice during normal business hours.

D. Operators shall permit the Department to make copies of business records at their place of business, or to remove business records for the purpose of reproduction.

1. The Department shall provide a receipt for any (original) records removed from the place of business.

E. Records shall be maintained and available for inspection for a period of two (2) years plus the current term of this Agreement.

F. Failure of the Operator to comply with the inspection requirements shall be cause for suspension, if deemed appropriate by the Department.

XI. Financial Interest:

A. No Operator or applicant shall be directly involved in the towing related business of any other Operator or applicant within the City of Roseville. "Directly involved" shall mean anything in common between Operators or applicants with regards to any of the following: 1) business licenses; 2) insurance; 3) tow truck or equipment ownership; and 4) employees.

B. Storage facilities owned by an Operator, and shared with another Operator, shall only be approved if the owner/Operator charges for the space exclusively on a flat monthly rate rather than a vehicle-by-vehicle basis, or combination thereof.

    1. Facilities shared by Operators shall be physically separated and secured from each other.

C. The sale or transfer of the controlling interest in a company shall immediately terminate an Agreement. The new owner may apply for a rotation tow listing at any time during the remainder of the current Agreement term, regardless of the Department's enrollment period.

    1. Employees may work for more than one Operator, however, the specific hours of employment with each Operator shall be indicated in the list of employees.

        a. These employees shall be approved in advance by the Department.

D. A terminated or suspended Operator and/or the tow business owner at the time of the suspension or termination (as defined in Attachment A) shall not be eligible for a rotation listing for the duration of the suspension or termination.

    1. This provision applies to the Operator working in any capacity within any tow business, or operating any tow business, and to the tow business, even if operated under new ownership.

E. Any violation of this element is cause for suspension, if deemed appropriate by the Department.

XII. Meetings:

A. The Department shall conduct a meeting to discuss issues concerning the tow rotation. All meetings shall be mandatory for the Operator or Operator’s designee wishing to remain on rotation. The Department shall give the Operator fifteen (15) days written notice (as defined in Attachment A) of these meetings.

XIII. Demeanor and Conduct:

A. While involved in Department rotation tow operations or related business, the tow Operator and/or employees shall refrain from any acts of misconduct including, but not be limited to, any of the following:

1. Rude or discourteous behavior.

2. Lack of service, selective service, or refusal to provide service which the Operator is/should be capable of performing.

3. Any act of sexual harassment or sexual impropriety.

4. Unsafe driving practices.

5. Exhibiting any objective symptoms of alcohol and/or drug use.

6. Appearing at the scene of a Department rotation tow call with the odor of an alcoholic beverage emitting from the driver's or employee's breath.

    a. The Operator/tow truck driver shall submit to a preliminary alcohol screening test upon demand of the Department.

B. All Department related tow service complaints received by the Department against a tow Operator or tow Operator's employees will be accepted and investigated in a fair and impartial manner. As a result of the investigation, the Department may initiate disciplinary action as deemed appropriate. In any event, the Operator will be notified of the results of any investigation.

C. Should the filing of criminal charges be a possibility, the Department will conduct the investigation to conclusion or assist the lead investigating agency and, if warranted, request prosecution.

D. Any violation of this element is cause for suspension, if deemed appropriate by the Department.

XIV. Compliance with Law:

A. The tow Operator and employees shall, at all times, comply with federal, state and local laws and ordinances, which include, but are not limited to, those laws which are applicable to the Operator.

1. In the event of a minor traffic violation by the tow truck driver which is known by the Department, the Operator shall be advised of the violation by the Department. The Operator will be granted the opportunity to take necessary steps to ensure that the driver complies with the law. Any subsequent traffic violations may be cause for disciplinary action against the Operator and/or the involved employees.

    a. Any flagrant traffic violation may be cause for immediate disciplinary action against the Operator and/or the involved employees.

2. The provisions contained in this element do not preclude the Department from taking appropriate enforcement or administrative action for any violations of law.

B. Any conviction of the Operator involving a stolen or embezzled vehicle, fraud related to the towing business, stolen or embezzled property, crimes of violence, felony driving while under the influence of alcohol and/or a drug, misdemeanor driving while under the influence of alcohol and/or a drug while involved in a Department rotation tow call, or moral turpitude shall be cause for denial of application or termination of the Agreement.

C. Any conviction of an Operator's employee involving a stolen or embezzled vehicle, fraud related to the towing business, stolen or embezzled property, crimes of violence, felony driving while under the influence of alcohol and/or a drug, misdemeanor driving under the influence of alcohol and/or a drug while involved in a Department rotation tow call, or moral turpitude shall be cause for the removal of the employee from the list of current Department rotation tow truck drivers.

D. An Operator, or employee, arrested/charged for a violation involving any of the above crimes may be suspended until the case is adjudicated.

XV. Compliance with Agreement:

A. The Operator agrees, that as a condition of inclusion on the rotation tow list, to comply with the terms and conditions of this Tow Service Agreement. Furthermore, the Operator agrees that failure by the Operator or the Operator's agent to comply with these terms or conditions shall be cause for written reprimand (as defined in Attachment A), suspension, or termination from the Department's rotation tow list. Alleged violations of the Tow Service Agreement will be investigated by the Department. The Operator will be notified of the Department's findings within thirty (30) calendar days of the conclusion of the investigation.

XVI. Disciplinary Action:

A. The Department shall take disciplinary action against Operators for violations investigated and confirmed or sustained.

1. The Department shall retain discretion regarding the length of any suspension imposed pursuant to the terms and conditions of this Agreement.

B. Records of violations shall be retained by the Department for at least thirty-six (36) months.

C. A violation of the equipment requirements related to safety shall be cause for immediate suspension. The period of the suspension shall be determined by the Department. The suspension shall remain in effect until the period of suspension is completed and the Department has conducted an inspection and found that the Operator is in compliance.

D. A violation of the gross vehicle weight rating ("GVWR") and safe loading requirements of a tow truck may cause for immediate suspension. This includes exceeding the tow

truck's GVWR, front axle weight rating, rear axle weight rating, maximum tire weight ratings, or not maintaining fifty percent (50%) of the tow truck's unladen front axle weight on the front axle when in tow.

E. A violation of overcharging or a pattern of overcharging shall be cause for suspension. The period of the suspension shall be determined by the Department. The suspension will remain in effect until the period of suspension is completed and the Operator has presented proof to the Department that reimbursement has been made to the aggrieved customer.

F. Failure of the Operator to satisfy a court order mandating reimbursement to the vehicle or property owner for the damage or loss which occurred while the vehicle was in the Operator's custody will result in a suspension. The period of suspension shall be determined by the Department. The suspension will remain in effect until the period of suspension is completed and the Operator has presented proof of the reimbursement.

G. Failure of the Operator to comply with the inspection requirements of this Agreement will result in a suspension. The period of the suspension shall be determined by the Department. The suspension shall remain in effect until the period of suspension is completed and the Operator has complied with the inspection requirement.

H. Operators will not send tow truck drivers on Department calls unless the drivers have completed a certified tow truck driver training course. Failure of the Operator to comply with this requirement will result in a suspension. The period of suspension will be determined by the Department.

I. Failure of the Operator to maintain the minimum insurance requirements set forth in the Agreement will immediately nullify the Agreement and is deemed to be a major violation of the Agreement.

    1. The Operator shall be subject to additional suspension for failure to notify the Department in advance of the insurance policy expiration or cancellation.

J. Failure of the Operator or employee to comply with Element XIII, Demeanor and Conduct, and/or Element XIV, Compliance with Law, may be cause for suspension if deemed appropriate by the Department.

    1. Minor traffic violations may be considered minor violations of the Agreement.

    2. A tow truck driver, not under the immediate observations of the Operator, while on-duty and driving a tow truck, who is arrested and subsequently convicted for misdemeanor driving under the influence of alcohol and/or drugs, will be subject to suspension from participating as a tow truck driver under the provisions of this Agreement. The length of suspension will be at the Department's discretion.

K. If the Operator is serving a suspension for one year or more, the Operator shall be required to comply with all terms and conditions of the current Agreement at the time of the reinstatement. There will be no approval of equipment that is not in compliance with

the equipment specifications contained in the Agreement at the time of reinstatement. Elements of this Agreement which are commonly referred to as "grandfather clauses" shall no longer apply to the Operator who is suspended for one year or more.

L. **Major Violations**. Violations of the terms and conditions of the Agreement that are subject to suspension for the first violation are categorized as major violations. Any subsequent or continuing major violations may be cause for termination.

1. When considering punitive action for a major violation of the TSA, the Department may take into consideration all major and minor violations that occurred within thirty-six (36) months prior to the date of the current violation.

2. Termination shall be invoked if, in the Department's judgment, continued participation in the Rotation Tow Program by the affected tow Operator may result in a hazard to public safety and/or welfare, or the Operator has been convicted of a crime listed in Element XIV-B.

2. In lieu of termination, the Department may impose additional suspensions for longer periods, if deemed appropriate.

M. **Minor Violations.** Except as specifically stated in the Agreement, minor violations of the terms and conditions of the Agreement may be cause for disciplinary action in the following manner:

1. 1st violation within a 12 month period - letter of written reprimand.

2. 2nd violation within a 12 month period - up to 30 day suspension.

3. 3rd violation within a 12 month period - 60 to 90 day suspension.

4. 4th violation within a 12 month period - termination of the Agreement.

a. In lieu of termination, the Department may impose additional suspensions for longer periods, if deemed appropriate by the Department.

N. Nothing herein shall be deemed to prohibit the Department from immediately suspending any Operator or employee whose conduct, in the opinion of the Department, is deemed to be a danger to the motoring public or who has engaged in conduct constituting a flagrant violation of this Agreement.

XVII. HEARING/APPEAL:

A. In the event the Department serves the Operator with a written reprimand, suspension, or termination, the Operator may request a hearing within seven (7) calendar days by submitting a request in writing to the Department's Administrative Services Commander. If a hearing is requested, it shall be held as soon as practicable. The purpose of the hearing shall be to review all facts of the case and to determine if the

facts support the allegations and/or the prescribed level of disciplinary action. The hearing shall be conducted by the Administrative Services Commander or designee and the Operator shall be entitled to present all relevant facts and circumstances in support of the Operator's position. The Operator shall be further entitled to present testimony of at least one representative (as defined in Attachment A) of a tow truck association or other qualified person. The Operator shall be notified in writing of the decision of the Administrative Services Commander, within ten (10) business days of the date of the hearing.

B. Following a hearing, if the Operator is dissatisfied with the Administrative Services Commander's decision, the Operator may request an appeal (as defined in Attachment A) by submitting a request in writing to the Chief of Police within seven (7) calendar days. If an appeal is requested, it shall be held as soon as practicable. The appeal shall be conducted by the Chief of Police or designee. The Operator shall have the same rights as those provided at the hearing level. The Operator shall be notified in writing of the decision of the Chief of Police within ten (10) business days of the date of appeal. The Chief's decision shall be final and not subject to further administrative appeal.

C. A suspension or termination shall not take effect until the hearing and appeal process has been exhausted, with the exception of Operators whose conduct is deemed to be a danger to the motoring public or whose conduct grossly violates the terms and conditions of this Agreement. If an Operator fails to request a hearing or appeal within the specified time or fails to appear at a scheduled hearing or appeal, the action taken by the Administrative Services Commander shall be final and the suspension or termination shall take effect upon written notification to the Operator by the Department.

XVIII. Advertising:

A. The Operator shall not display any sign or engage any advertisement indicating an official or unofficial connection with the Department or the Department of Motor Vehicles.

1. Examples include, "Official Police Tow," "Approved by Roseville Police Department," "Roseville P.D. Rotation Tow," etc.

2. This will not preclude the Department from implementing a system to mark and identify particular tow trucks as having passed the CHP/Department inspection.

B. Any violation of this element is cause for suspension. At a minimum, the suspension should be for the duration of the advertisement.

XIX. Cancellation:

A. This Agreement may be cancelled by either party by giving written notice to the other party.

XX. Approval Specifications:

A. Geographical Area - The city limits of the City of Roseville.

B. Approved Rates:

	Class A	Class B	Class C	Class D
Approved Rate, Hourly	_____	_____	_____	_____
Approved Rate, Outside Storage	_____	_____	_____	_____
Approved Rate, Inside Storage	_____	_____	_____	_____
Approved Rate, Service Call	_____	_____	_____	_____
Approved Rate, Contract Labor	_____	_____	_____	_____

Approved Rate, Applicable Equipment

Equipment Description

1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____

C. Personal Property Removal Reporting Procedure Exempted Under Element VII? YES / NO

D. Additional waiver of requirements: (Department may attach any applicable waiver of requirements).

E. The term of this Agreement shall be for two (2) years, commencing on the date it is executed by the City.

F. DEPARTMENT Approval:

ROSEVILLE POLICE DEPARTMENT

_____
Signature - Chief of Police or Designee

_____
Typed Name and Title

_____
Date

G. OPERATOR APPROVAL:

I certify that I have read and understand this Tow Service Agreement and agree to abide by all of the provisions. I further agree to indemnify, defend and save and hold harmless the City of Roseville, its officers, agents, volunteers and employees from any and all claims, suits or actions of every name, kind and description brought forth, or on account of, injuries to or death of any person (including but not limited to workers and the public), or damage to property resulting from the Operator or its agent's willful misconduct or negligent act or omission while engaged in the performance of obligations or exercise of rights created by this Agreement, except those matters arising from City's sole or active negligence or willful misconduct Operator. The parties intend that this provision shall be broadly construed. The Operator's responsibility for such defense and indemnity obligations shall survive the termination or completion of this Agreement for the full period of time allowed by law.

The Operator, and the agents and employees of the Operator, in the performance of this Agreement, shall act in an independent capacity and not as officers or employees or agents of the City of Roseville.

_____
Signature - OPERATOR

_____
Typed Name and Title

_____
Company Name

_____
Date

ATTACHMENT A

DEFINITIONS

AGREEMENT:

For purposes of this document, Agreement and Tow Service Agreement are synonymous.

APPEAL:

The final level of review for written reprimands, suspensions, or terminations. An informal review conducted by the Chief of Police or his/her designee at which an Operator may present evidence or witnesses to show that an action taken by the Department was improper, or to mitigate the action taken.

AWR:

Axle Weight Rating

BASE SERVICES:

Any service or tow which is performed when the vehicle Operator or agent is present and the vehicle is not stored at the direction of an officer.

CHP:

The Department of the California Highway Patrol.

CITY:

The City of Roseville, California.

COLLUSION:

An agreement between two or more persons to defraud a person(s) or to obtain an object forbidden by law; conspiracy. It implies existence of fraud of some kind; the employment of fraudulent means or lawful means for the accomplishment of an unlawful purpose.

CVC:

California Vehicle Code

DEPARTMENT:

The City of Roseville Police Department.

ENROLLMENT PERIOD:

The period of time when a tow company may submit an application for inclusion on the Department's Rotation Tow List. The enrollment period will be open at least 30 days a year and is determined by the Department.

GVWR:

Gross Vehicle Weight Rating.

HEARING:

The first level of review for written reprimands, suspensions, or terminations. An informal process in which an Operator may present evidence or witnesses, which would show that an action taken by the Department was improper, or to mitigate the action taken. The review will be conducted by the Department's Administrative Services Commander, or his/her designee.

INCIDENT COMMANDER:

A representative from the Law Enforcement Agency who has scene management responsibilities.

LOAD SALVAGE OPERATIONS:
Any operation involving the recovery of a load which has been spilled, or the off-loading and reloading of a load from an overturned vehicle performed in order to upright the vehicle. This will usually be limited to operations involving Class B, C, and D tow trucks.

MAY:

“May” is permissive.

MORAL TURPITUDE:

“[G]ross violation of standards of moral conduct, vileness. An act involving moral turpitude is considered intentionally evil, making the act a crime. The existence of moral turpitude can bring a more severe criminal charge or penalty for a criminal defendant,” http://dictionary.law.com (last visited February 26, 2015).

NORMAL BUSINESS HOURS:

For purposes of this document, "Normal Business Hours" shall be not less than 8 a.m. to 5 p.m., Monday through Friday, except for state recognized holidays.

NOTICE:

All notices relating to this Agreement shall be in writing and delivered to the other party in person, via FAX, or by U.S. mail.

OPERATOR:

A tow service which has been issued a Letter of Authorization, has signed the Tow Service Agreement, and is approved to receive Department referred calls. The term "Operator" refers to the company, its owner(s), and its manager(s), who have authority to enter into an Agreement with the Department for towing services and/or to conduct business in accordance with the terms of this Agreement, as well as its agents and employees.

PARTY OF INTEREST:

Refers to the registered owner of the vehicle, or the owner's agent. An agent is a party who may lawfully act on behalf of the registered or legal owner of the vehicle.

PORTAL TO PORTAL:

Service shall start at the time of departure from the place of business or point of dispatch, whichever is closer to the location of the call, and shall end at the estimated time of return to the place of business or the completion of the call, if another call is pending, whichever is shorter. Return to place of business includes a reasonable and verifiable amount of time required to place the tow truck back into service when unusual circumstances require additional time that is not part of the normal operating procedures.

(Examples: 1) 4 X 4 recovery in the mud: Reasonable to charge for cleaning mud from the truck and equipment; 2) burned car on a car carrier: Reasonable to charge for cleaning burn debris from carrier bed; 3) car towed from side of road on misty night and leaves mud track on bed of carrier: not reasonable to charge for cleaning of carrier bed.) For the purpose of this agreement, "Portal to Portal" shall also mean "Portal to End of Service."

POSSESSION:

Pursuant to Section 3068.1 of the Civil Code, possession is deemed to arise when the vehicle is removed and is in transit, or when vehicle recovery operations or load salvage operations have begun.

PUBLIC SAFETY RESPONSE:

A response which results in a storage of a vehicle at the direction of a Department officer. This does not include a storage at the request of the vehicle Operator, registered owner, or agent thereof.

RESPONSE TIME:

The period of time from an Operator's notification by the Department's Communications Center of a call to the arrival of the tow truck at the location requested.

RETAIL RATE:

The usual customary retail rate charged by an Operator to individual retail customers is the competitive hourly rate a company has posted in the office and quotes over the phone.

ROTATION TOW BUSINESS:

A rotation tow business shall be sufficiently staffed to allow customers to talk face-to-face with a tow company's owner or agent to conduct the customer's business transactions during the Department approved business hours. The business shall be conveniently located within the City and available to the motoring public.

SERVICE CALL RATE:

The maximum rate which may be charged to the registered owner/agent of a vehicle which requires service to put the vehicle back into operation, (i.e., out of gas, change a flat tire, etc.) and the vehicle's owner/agent is able to pay the Operator for the services upon completion of the call. This rate shall be consistent with rates charged for similar services.

SHALL:

"Shall" is mandatory.

SUSPENSION:

Removal of an Operator from the Department's rotation tow list for a specified period of time. Suspensions may be for periods longer than the current term of the Agreement.

TERMINATION:

Permanent removal of a tow Operator from the Department's rotation tow list for the remainder of the term of the Tow Service Agreement and disqualification from any further participation in the Department's Rotation Tow Program.

TOW TRUCK:

A tow truck is defined in Section 615 of the CVC. Also includes slide-back carriers and wheel lift vehicles.

TOW SERVICE AGREEMENT (TSA):

A document which sets forth the terms and conditions of an Agreement between the Operator and the Department. For purposes of this document, the Agreement also means the "TSA".

VEHICLE RECOVERY OPERATION:

An operation involving the process of uprighting an overturned vehicle or returning a vehicle to a normal position on the roadway which requires the use of auxiliary equipment due to the size or location of the vehicle. This will usually be limited to operations requiring a Class B, C or D tow truck.

WAIVER OF REQUIREMENTS:

Provides for temporary relief from selected terms and conditions of the Tow Service Agreement.

WRITTEN REPRIMAND:

A written notice to an Operator which specifies any violation of the Tow Service Agreement, orders corrective action, and warns of further action to be taken if corrective action is not taken.

ATTACHMENT B

APPLICANT'S INSTRUCTIONS FOR COMPLETING THE RPD FORM 73.

I. GENERAL INFORMATION:

A. The following instructions are being provided to assist you in the accurate completion of the necessary forms. ***Please be sure to sign and date the application form as indicated.***

1. You should thoroughly read and understand the Tow Service Agreement prior to submitting your application.

2. Please be sure to sign and date the application form (RPD 73) as indicated.

3. After completing the application form, submit the following with the completed application:

   a. Completed Element XX (Pages 21 and 22) ***(return one copy of page 21 and both signed copies of page 23)***

   b. A copy of your current, valid City of Roseville business license.

   c. Signed and dated vehicle inspection forms for each vehicle to be used for rotation tows. (If inspected by the CHP within the past nine (9) months, a copy of the CHP inspection report should be submitted.) A second inspection will also need to be completed during the second year of the contract.

   d. A current, dated rate schedule.
   e. A list of drivers with information specified in Element III.
   f. A current copy of your DMV Motor Carrier Permit.

4. Submit the application to the Roseville Police Department at the address below. All TSA applications submitted through the mail shall be sent by certified mail, with return receipt requested. The return receipt shall be presented to the Department as proof that the application was mailed to the Department. All applications and attachments must be received by **April 30, 2021**. Return the application and required attachments to:

   Roseville Police Department
   Attn: Traffic Division Lieutenant
   1051 Junction Boulevard
   Roseville, California 95678-7191

   Applications received after April 30, 2021 will be rejected. No exceptions.

5. **Submit all required certificates of insurance (as specified in Element VIII), in a separate envelope, addressed to:**

City of Roseville
Risk Management Division
311 Vernon Street
Roseville, CA 95678

6. If your company receives preliminary approval, an inspection of your facilities and equipment will be scheduled, if necessary. (If you also tow for the CHP, we will accept a copy of the CHP's inspection of your truck(s) if conducted within the past nine (9) months.) A second inspection will also need to be completed during the second year of the contract.

7. Upon final approval, one copy the completed Element XX (page 22) will be signed and returned to you.

II. SPECIFIC INSTRUCTIONS FOR FORMS PREPARATION:

A. Application for Rotation Tow Listing (RPD 73). Complete and sign. All information on the RPD 73 must be complete. ***Incomplete applications will not be accepted and shall be grounds for immediate disqualification in the TSA process.*** Any misrepresentation on the application may be grounds for criminal and/or disciplinary action. Disciplinary action may include disqualification, written reprimands, suspension from the rotation, and/or removal from the rotation.

1. **Business Name and Mailing Address** - as it appears on your business license.

2. **Daytime Telephone Number** - Telephone number for the dispatch of tow services.

3. **Nighttime Telephone Number** - Telephone number for nighttime/holiday dispatch of tow services. If the daytime number is 24 hours a day, leave night phone blank.

4. **Business address**, if different than mailing address.

5. List any automobile club affiliations (i.e., AAA, National, etc.).

6. Do you provide towing services 24 hours-a-day? (Yes or No)

7. How many years have you been in the towing business?

8. Have you or anyone with financial interest ever been convicted of a crime involving stolen or embezzled vehicles, fraud related to the towing business, stolen or embezzled property, crimes of violence, drug related offenses, DUI offenses as specified, or moral turpitude? (Yes or No)

9. Check the class(es) and note the number of each class of truck that you operate.

10. Are any of your Class A tow trucks a car carrier? (Yes or No)

11. List your primary storage address and whether it is owned, leased, or rented.
12/13. List any secondary storage addresses and whether they are owned, leased or rented.

14. Are all the storage yards fenced? (Yes or No)

15. How many outside storage spaces are available?

16. Is inside storage available? (Yes or No)

17. How many inside storage spaces are available?

18. List all legal owner(s). If the owner is a firm, company, association or corporation, list all persons having financial interest.

19. Do you or any legal owner of your tow company have any financial interest in any other tow company within the City of Roseville? (Yes or No)

20. Do you have any family members who own or have financial interest in any other tow company within the City of Roseville? (Yes or No) (Family members are any person or persons related by blood or marriage.)

21. Do you share any facilities with any other tow company? (Yes or No)

22. A "yes" answer to 19, 20, or 21 shall be explained in the remarks section by listing the name of the tow company.

23. Accurately list the maximum hourly rate to be charged on Department calls for each tow truck class for which you are applying.

24. List the outside storage rate for each tow truck class for which you are applying.

25. List the inside storage rate for each tow truck class for which you are applying.

26. List the service call rate for each tow truck class for which you are applying.

27. List the contract labor rate for each tow truck class for which you are applying.

28. List the rate(s) for auxiliary equipment for each class for which you are applying.

29. Are you capable of towing Class A recreational vehicles (RVs)? (Yes or No)

30. Are you capable of towing Class B recreational vehicles (RVs)? (Yes or No)

31. Are you capable of towing Class C recreational vehicles (RVs)? (Yes or No)

32. Do you have storage space spaces for a recreational vehicle (RV)? (Yes or No)

33. List any comments or additional information, such as an explanation of any "Yes" response to questions 19, 20 and/or 21.

34. Read the statement and sign and date the application. Include the name and title of the person signing the application.

XX. Approval Specifications:

A. Geographical Area - The city limits of the City of Roseville.

B. Approved Rates:

	Class A	Class B	Class C	Class D
Approved Rate, Hourly	$260.00			
Approved Rate, Outside Storage	$70.00			
Approved Rate, Inside Storage	$70.00			
Approved Rate, Service Call	$130.00			
Approved Rate, Contract Labor	$25.00			

Approved Rate, Applicable Equipment

Equipment Description

1. 2015 Freightliner - Flatbed			
2. 2021 International - Flatbed			
3. 2016 Peterbuilt - Flatbed			
4. 2016 Dodge 4500 - Wheel lift			

C. Personal Property Removal Reporting Procedure Exempted Under Element VII? YES / NO

D. Additional waiver of requirements: (Department may attach any applicable waiver of requirements).

E. The term of this Agreement shall be for two (2) years, commencing on the date it is executed by the City.

F. DEPARTMENT Approval:

ROSEVILLE POLICE DEPARTMENT

_____
Signature - Chief of Police or Designee

_____
Typed Name and Title

_____
Date

G. OPERATOR APPROVAL:

I certify that I have read and understand this Tow Service Agreement and agree to abide by all of the provisions. I further agree to indemnify, defend and save and hold harmless the City of Roseville, its officers, agents, volunteers and employees from any and all claims, suits or actions of every name, kind and description brought forth, or on account of, injuries to or death of any person (including but not limited to workers and the public), or damage to property resulting from the Operator or its agent's willful misconduct or negligent act or omission while engaged in the performance of obligations or exercise of rights created by this Agreement, except those matters arising from City's sole or active negligence or willful misconduct Operator. The parties intend that this provision shall be broadly construed. The Operator's responsibility for such defense and indemnity obligations shall survive the termination or completion of this Agreement for the full period of time allowed by law.

The Operator, and the agents and employees of the Operator, in the performance of this Agreement, shall act in an independent capacity and not as officers or employees or agents of the City of Roseville.

Russell Cornett
Signature - OPERATOR

Russell Cornett - CEO
Typed Name and Title

Ace In The Hole Towing
Company Name

4-29-21
Date

(Rev. 02/26/21 SB)

XX. Approval Specifications:

A. Geographical Area - The city limits of the City of Roseville.

B. Approved Rates:

	Class A	Class B	Class C	Class D
Approved Rate, Hourly	$260	$260		
Approved Rate, Outside Storage	$ 70	$70		
Approved Rate, Inside Storage	$ 70	$70		
Approved Rate, Service Call	$130	$130		
Approved Rate, Contract Labor	$130pH	$130pH		

Approved Rate, Applicable Equipment

Equipment Description

1. Fork lift service	$260pH		
2. off Road Recovery	$440pH		
3.			
4.			

C. Personal Property Removal Reporting Procedure Exempted Under Element VII? (YES) / NO

D. Additional waiver of requirements: (Department may attach any applicable waiver of requirements).

E. The term of this Agreement shall be for two (2) years, commencing on the date it is executed by the City.

F. DEPARTMENT Approval:

ROSEVILLE POLICE DEPARTMENT

_____
Signature - Chief of Police or Designee

_____
Typed Name and Title

_____
Date

G. OPERATOR APPROVAL:

I certify that I have read and understand this Tow Service Agreement and agree to abide by all of the provisions. I further agree to indemnify, defend and save and hold harmless the City of Roseville, its officers, agents, volunteers and employees from any and all claims, suits or actions of every name, kind and description brought forth, or on account of, injuries to or death of any person (including but not limited to workers and the public), or damage to property resulting from the Operator or its agent's willful misconduct or negligent act or omission while engaged in the performance of obligations or exercise of rights created by this Agreement, except those matters arising from City's sole or active negligence or willful misconduct Operator. The parties intend that this provision shall be broadly construed. The Operator's responsibility for such defense and indemnity obligations shall survive the termination or completion of this Agreement for the full period of time allowed by law.

The Operator, and the agents and employees of the Operator, in the performance of this Agreement, shall act in an independent capacity and not as officers or employees or agents of the City of Roseville.

_____
Signature - OPERATOR

Brian V. Benedyuk
Typed Name and Title

Anderson Tow Service
Company Name

4-30-21
Date

(Rev. 02/26/21 SB)

XX. Approval Specifications:

A. Geographical Area - The city limits of the City of Roseville.

B. Approved Rates:

	Class A	Class B	Class C	Class D
Approved Rate, Hourly	275	375	425	
Approved Rate, Outside Storage	70	85	100	
Approved Rate, Inside Storage	90	NA	NA	
Approved Rate, Service Call	275/hr	375/hr	425/hr	
Approved Rate, Contract Labor	125	125	125	

Approved Rate, Applicable Equipment

Equipment Description

1. _____ _____ _____ _____
2. _____ _____ _____ _____
3. _____ _____ _____ _____
4. _____ _____ _____ _____

C. Personal Property Removal Reporting Procedure Exempted Under Element VII? YES / (NO)

D. Additional waiver of requirements: (Department may attach any applicable waiver of requirements).

E. The term of this Agreement shall be for two (2) years, commencing on the date it is executed by the City.

F. DEPARTMENT Approval:

ROSEVILLE POLICE DEPARTMENT

_____
Signature - Chief of Police or Designee

_____
Typed Name and Title

_____
Date

G. OPERATOR APPROVAL:

I certify that I have read and understand this Tow Service Agreement and agree to abide by all of the provisions. I further agree to indemnify, defend and save and hold harmless the City of Roseville, its officers, agents, volunteers and employees from any and all claims, suits or actions of every name, kind and description brought forth, or on account of, injuries to or death of any person (including but not limited to workers and the public), or damage to property resulting from the Operator or its agent's willful misconduct or negligent act or omission while engaged in the performance of obligations or exercise of rights created by this Agreement, except those matters arising from City's sole or active negligence or willful misconduct Operator. The parties intend that this provision shall be broadly construed. The Operator's responsibility for such defense and indemnity obligations shall survive the termination or completion of this Agreement for the full period of time allowed by law.

The Operator, and the agents and employees of the Operator, in the performance of this Agreement, shall act in an independent capacity and not as officers or employees or agents of the City of Roseville.

_____
Signature - OPERATOR

RICHARD W KELLER
Typed Name and Title

CLASSIC TOW SVC
Company Name

4-27-21
Date

(Rev. 02/26/21 SB)

XX. Approval Specifications:

A. Geographical Area - The city limits of the City of Roseville.

B. Approved Rates:

	Class A	Class B	Class C	Class D
Approved Rate, Hourly	295-	405-	475-	525-
Approved Rate, Outside Storage	75-	105-	130-	130-
Approved Rate, Inside Storage	85-	N/A	N/A	N/A
Approved Rate, Service Call	295-	405-	475-	525-
Approved Rate, Contract Labor	40-	40-	40-	40-
Approved Rate, Applicable Equipment (non skilled / skilled labor)	100-	100-	100-	100-

Equipment Description

1. Rotator	950-	950-	950-
2. Air Cushions	1000-	1000-	1000-
3. Landoll/Lowboy	500-	500-	500-
4. Forklift, ramp, Pallet jack	250-	250-	250-

C. Personal Property Removal Reporting Procedure Exempted Under Element VII? (YES) / NO

D. Additional waiver of requirements: (Department may attach any applicable waiver of requirements).

E. The term of this Agreement shall be for two (2) years, commencing on the date it is executed by the City.

F. DEPARTMENT Approval:

ROSEVILLE POLICE DEPARTMENT

_____
Signature - Chief of Police or Designee

_____
Typed Name and Title

_____
Date

G. OPERATOR APPROVAL:

I certify that I have read and understand this Tow Service Agreement and agree to abide by all of the provisions. I further agree to indemnify, defend and save and hold harmless the City of Roseville, its officers, agents, volunteers and employees from any and all claims, suits or actions of every name, kind and description brought forth, or on account of, injuries to or death of any person (including but not limited to workers and the public), or damage to property resulting from the Operator or its agent's willful misconduct or negligent act or omission while engaged in the performance of obligations or exercise of rights created by this Agreement, except those matters arising from City's sole or active negligence or willful misconduct Operator. The parties intend that this provision shall be broadly construed. The Operator's responsibility for such defense and indemnity obligations shall survive the termination or completion of this Agreement for the full period of time allowed by law.

The Operator, and the agents and employees of the Operator, in the performance of this Agreement, shall act in an independent capacity and not as officers or employees or agents of the City of Roseville.

_____
Signature - OPERATOR

Patrice Ubil, President
Typed Name and Title

Jake's Towing
Company Name

4-29-2021
Date

(Rev. 02/26/21 SB)

XX. Approval Specifications:

A. Geographical Area - The city limits of the City of Roseville.

B. Approved Rates:

	Class A	Class B	Class C	Class D
Approved Rate, Hourly	240-			
Approved Rate, Outside Storage	65-			
Approved Rate, Inside Storage	NA			
Approved Rate, Service Call	120-			
Approved Rate, Contract Labor	120-			

Approved Rate, Applicable Equipment

Equipment Description			
1. 3 wreckers	A		
2.			
3. 7 car carriers	A		
4. See attatched reg for truck info			

C. Personal Property Removal Reporting Procedure Exempted Under Element VII? YES / NO

D. Additional waiver of requirements: (Department may attach any applicable waiver of requirements).

E. The term of this Agreement shall be for two (2) years, commencing on the date it is executed by the City.

F. DEPARTMENT Approval:

ROSEVILLE POLICE DEPARTMENT

_____
Signature - Chief of Police or Designee

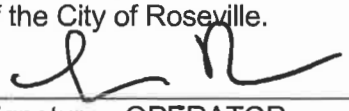
_____
Typed Name and Title

_____
Date

G. OPERATOR APPROVAL:

I certify that I have read and understand this Tow Service Agreement and agree to abide by all of the provisions. I further agree to indemnify, defend and save and hold harmless the City of Roseville, its officers, agents, volunteers and employees from any and all claims, suits or actions of every name, kind and description brought forth, or on account of, injuries to or death of any person (including but not limited to workers and the public), or damage to property resulting from the Operator or its agent's willful misconduct or negligent act or omission while engaged in the performance of obligations or exercise of rights created by this Agreement, except those matters arising from City's sole or active negligence or willful misconduct Operator. The parties intend that this provision shall be broadly construed. The Operator's responsibility for such defense and indemnity obligations shall survive the termination or completion of this Agreement for the full period of time allowed by law.

The Operator, and the agents and employees of the Operator, in the performance of this Agreement, shall act in an independent capacity and not as officers or employees or agents of the City of Roseville.


Signature - OPERATOR

Lee Pease & GM
Typed Name and Title

LJ's Towing
Company Name

4/26/2021
Date

(Rev. 02/26/21 SB)

XX. Approval Specifications:

A. Geographical Area - The city limits of the City of Roseville.

B. Approved Rates:

	Class A	Class B	Class C	Class D
Approved Rate, Hourly	285	375	—	—
Approved Rate, Outside Storage	70	85	—	—
Approved Rate, Inside Storage	75	75	—	—
Approved Rate, Service Call	142.50	187.50	—	—
Approved Rate, Contract Labor	—	—	—	—

Approved Rate, Applicable Equipment

Equipment Description

1. CLASS A TRUCKS QTY 5	5	—	—	
2. 4 FLATBEDS	—	—	—	
3.	—	—	—	
4.	—	—	—	

C. Personal Property Removal Reporting Procedure Exempted Under Element VII? (YES) / NO

D. Additional waiver of requirements: (Department may attach any applicable waiver of requirements).

E. The term of this Agreement shall be for two (2) years, commencing on the date it is executed by the City.

F. DEPARTMENT Approval:

ROSEVILLE POLICE DEPARTMENT

_____
Signature - Chief of Police or Designee

_____
Typed Name and Title

_____
Date

G. OPERATOR APPROVAL:

I certify that I have read and understand this Tow Service Agreement and agree to abide by all of the provisions. I further agree to indemnify, defend and save and hold harmless the City of Roseville, its officers, agents, volunteers and employees from any and all claims, suits or actions of every name, kind and description brought forth, or on account of, injuries to or death of any person (including but not limited to workers and the public), or damage to property resulting from the Operator or its agent's willful misconduct or negligent act or omission while engaged in the performance of obligations or exercise of rights created by this Agreement, except those matters arising from City's sole or active negligence or willful misconduct Operator. The parties intend that this provision shall be broadly construed. The Operator's responsibility for such defense and indemnity obligations shall survive the termination or completion of this Agreement for the full period of time allowed by law.

The Operator, and the agents and employees of the Operator, in the performance of this Agreement, shall act in an independent capacity and not as officers or employees or agents of the City of Roseville.

_____
Signature - OPERATOR

Henry M Reis
Typed Name and Title

Neighborhood Enterprise
Company Name

4-5-21
Date

(Rev. 02/26/21 SB)

COUNCIL COMMUNICATION

CC #: 1544
File #: 0721

Title:	Transit Bus Shelter Construction Fee Agreements
Contact:	Alison Winter 916-774-5365 awinter@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 7.16.

RECOMMENDATION TO COUNCIL

Staff recommends Council adopt a resolution approving the form of two template Transit Bus Shelter Construction Fee Agreements, authorizing the City Manager to execute all pending and future Agreements, and authorizing the City Attorney to make any non-substantive changes to the form of the template Agreements.

BACKGROUND

A Transit Bus Shelter Construction Fee Agreement (CFA) is the mechanism used by the City of Roseville to satisfy transit-related conditions placed on a developer to develop certain properties within the City of Roseville. Locations of bus shelters are typically identified in specific plans and determined at the time of the planning entitlement process.

A Transit Bus Shelter CFA is used when a bus shelter is planned at a location, but there is a benefit to postpone the installation of a shelter to a later date. The two (2) versions of Transit Bus Shelter CFA forms that are used are differentiated by the need to dedicate an easement around the bus shelter pad. In the case where an easement is needed, that document is recorded.

The requested action will result in a streamlined CFA process that will save developers and City staff time during the project approval process.

FISCAL IMPACT

The current construction fee of $10,000 per shelter provides security for future installation of transit improvements with no fiscal impact to the City's General Fund or Transportation Development Act (TDA) funds.

ENVIRONMENTAL REVIEW

The proposed project involves the construction and location of a limited number of small facilities. This activity is categorically exempt from CEQA as a Class 3 exemption (State CEQA Guidelines Section 15303). The Exemption has been prepared and no further CEQA action is required.

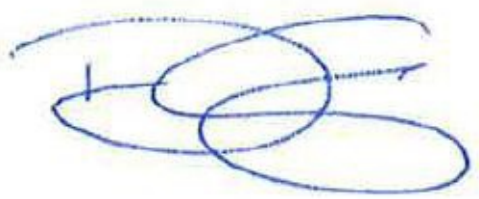
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Goal A - Remain fiscally responsible in a changing world
Goal E - Deliver exceptional city services
Goal F - Invest in well-planned infrastructure and growth

Respectfully Submitted,

Alison Winter, Alternative Transportation Analyst

Jason Shykowski, Public Works Director



_____
Dominick Casey, City Manager

ATTACHMENTS:

Description

Resolution 21-276

Transit Shelter CFA form (no recording)

Transit Shelter CFA form

RESOLUTION NO. 21-276

APPROVING THE FORM OF TWO TRANSIT BUS SHELTER CONSTRUCTION FEE AGREEMENTS, AUTHORIZING THE CITY MANAGER TO EXECUTE THEM ON BEHALF OF THE CITY OF ROSEVILLE AND AUTHORIZING THE CITY ATTORNEY TO MODIFY THE FORMS AS NECESSARY

WHEREAS, a Transit Bus Shelter Construction Fee Agreement (CFA) is the mechanism used by the City of Roseville to satisfy transit-related conditions placed on a developer to develop certain properties within the City of Roseville; and

WHEREAS, locations of bus shelters are typically identified in specific plans and determined at the time of the planning entitlement process; and

WHEREAS, a Transit Bus Shelter CFA is used when a bus shelter is planned at a location, but there is a benefit to postpone the installation of a shelter to a later date; and

WHEREAS, the two (2) versions of Transit Bus Shelter CFA forms that are used are differentiated by the need to dedicate an easement around the bus shelter pad, and in the case where an easement is needed, that document is recorded; and

WHEREAS, the requested action will result in a streamlined CFA process that will save developers and City staff time during the project approval process.

WHEREAS, both forms of the Transit Bus Shelter Construction Fee Agreements have been reviewed by City Council.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Roseville that two Transit Bus Shelter Construction Fee Agreement Forms have been approved, and the City Manager is authorized to execute all pending and future Transit Bus Shelter Construction Fee Agreements.

BE IT FURTHER RESOLVED that the City Attorney is authorized to make non-substantive changes to the form of the Transit Bus Shelter Construction Fee Agreements.

PASSED AND ADOPTED by the Council of the City of Roseville this____day of _____, 20__, by the following vote on roll call:

AYES COUNCILMEMBERS:
NOES COUNCILMEMBERS:
ABSENT COUNCILMEMBERS:

_____
MAYOR

ATTEST:

_____
City Clerk

TRANSIT BUS SHELTER
CONSTRUCTION FEE AGREEMENT

Project Name: _____

Shelter Number: _____

THIS AGREEMENT is made and entered into this _____ day of _____, 20___, by and between the CITY OF ROSEVILLE, a municipal corporation, ("CITY") and _____, a _____, ("DEVELOPER").

W I T N E S S E T H:

A. DEVELOPER is the owner of a parcel of real property located in Roseville, Placer County, California, which is more particularly described in Exhibit "A" and as shown on the map labeled Exhibit “B” ("the Subject Property"). DEVELOPER currently intends to develop the Subject Property, and as a condition of such development, or as provided for per the Development Agreement between DEVELOPER and CITY, the terms of which are fully incorporated herein by this reference, CITY requires that DEVELOPER construct or finance the construction of a bus shelter on the Subject Property, on real property dedicated to CITY as part of landscape corridor and/or public right-of-way.

B. In order to satisfy such condition(s) set forth in Paragraph A, DEVELOPER hereby desires to pay CITY the full present cost of constructing such bus shelter. DEVELOPER has previously provided to CITY an easement or right of way to allow for the construction, installation, operation, and maintenance of a bus shelter, or other transit related facilities, by CITY or its designated agents, in further satisfaction of such condition(s).

C. CITY is willing to accept and deems such payment and easement as in full compliance with the aforementioned condition(s) of the project permit for the Subject Property, with the understanding that the funds may be used as determined by CITY for the placement of any transit related improvement within the transit service area in which the Subject Property is located.

NOW, THEREFORE, the parties agree as follows:

1. Payment. Concurrent with the execution of this Agreement, DEVELOPER shall pay to CITY the sum of _____ ($_____), which represents the full current cost of constructing a bus shelter, or other transit related facility.

2. Location. CITY, in its sole discretion, may choose to construct, install, operate, and/or maintain a bus shelter upon the Subject Property, or may choose to use the funds in whole or in part to construct, install, operate, and/or maintain any other transit related facilities in the transit service area in which the Subject Property is located.

3. Right of Entry. Permission to enter onto the Subject Property or other property of DEVELOPER is hereby granted to CITY, or its designated agents, as may be necessary to construct, install, operate, or maintain such bus shelter or other transit related facilities.

4. Compliance with Conditions. Upon delivery to CITY of both the fully executed grant of easement specified in Paragraph B above and the payment specified in Section 1 above, DEVELOPER shall be deemed to have fully complied with and satisfied the condition of the Project Permit for the Subject Property for the financing and construction of the required bus shelter.

5. Integration. This is an integrated agreement, and contains the complete understanding of the parties. It shall be read as a whole.

6. Amendments. This Agreement and each provision contained herein may be waived, amended, supplemented, or terminated only by mutual written agreement of CITY and DEVELOPER.

7. Notices. Any notices required by this Agreement shall be personally delivered or mailed, U.S. Mail first class postage prepaid, addressed as follows:

CITY OF ROSEVILLE	DEVELOPER
City of Roseville	_____
316 Vernon Street Ste. 150	_____
Roseville, CA 95678	_____
Attn: Alternative Transportation Division	_____

Either party may amend its address for notice by notifying the other party in writing.

8. Venue. Any action arising out of this Agreement shall be brought in Placer County, regardless of where else it might otherwise be venued.

9. Attorney's Fees. In any action brought by either party to enforce the terms of this Agreement, the prevailing party shall be entitled to recover its reasonable attorney's fees.

IN WITNESS WHEREOF, the City of Roseville, a municipal corporation, has caused this Agreement to be executed in duplicate by its City Manager and attested to by its City Clerk under the authority of Resolution No. _____, adopted by the Council of the City of Roseville on the _____ day of _____, 20___, and DEVELOPER has caused this Agreement to be executed.

CITY OF ROSEVILLE, a municipal corporation	DEVELOPER:
	_____, a _____
BY:_____	BY:_____
DOMINICK CASEY City Manager	its: _____

ATTEST:

and

BY:_____ BY:_____

SONIA OROZCO
City Clerk

its: _____

APPROVED AS TO FORM:

BY:_____
MICHELLE SHEIDENBERGER
City Attorney

APPROVED AS TO SUBSTANCE:

BY:_____
JASON SHYKOWSKI
Public Works Director

RECORDING REQUESTED BY AND WHEN RECORDED,
PLEASE RETURN TO:

City Clerk
CITY OF ROSEVILLE
311 Vernon Street
Roseville, CA 95678

TRANSIT BUS SHELTER
CONSTRUCTION FEE AGREEMENT

Project Name: _____

Shelter Number: _____

THIS AGREEMENT is made and entered into this _____ day of _____, 20___, by and between the CITY OF ROSEVILLE, a municipal corporation, ("CITY") and _____, a _____, ("DEVELOPER"), and

W I T N E S S E T H:

A. DEVELOPER is the owner of a parcel of real property located in Roseville, Placer County, California, which is more particularly described in Exhibit "A" and as shown on the map labeled Exhibit “B” ("the Subject Property"). DEVELOPER currently intends to develop the Subject Property, and as a condition of such development, or as provided for per the Development Agreement between DEVELOPER and CITY, the terms of which are fully incorporated herein by this reference, CITY requires that DEVELOPER construct or finance the construction of a bus shelter on the Subject Property, on real property to be dedicated to CITY as part of landscape corridor and/or public right-of-way.

B. In order to satisfy such condition(s) set forth in Paragraph A, DEVELOPER hereby desires to pay CITY the full present cost of constructing such bus shelter. DEVELOPER has previously provided to CITY, or will provide to CITY concurrent to the execution of this Agreement, an easement to allow for the construction, installation, operation, and maintenance of a bus shelter, or other transit related facilities, by CITY or its designated agents, in further satisfaction of such condition(s).

C. CITY is willing to accept and deems such payment and easement as in full compliance with the aforementioned condition(s) of the project permit for the Subject Property, with the understanding that the funds may be used as determined by CITY for the placement of any transit related improvement within the transit service area in which the Subject Property is located.

NOW, THEREFORE, the parties agree as follows:

1. Agreement Runs with the Land. This Agreement is an instrument affecting the title or possession of the Subject Property. It shall run with the land, and all of the terms, covenants, conditions and restrictions of this Agreement shall be binding upon and inure to the benefit of all of the successors in interest of DEVELOPER. Upon sale or division of the Subject Property, the terms, conditions, covenants and restrictions of this Agreement shall apply to each parcel, and the owner or owners of each parcel of the Subject Property shall succeed to the obligations imposed upon DEVELOPER by this Agreement.

2. Payment. Concurrent with the execution of this Agreement, DEVELOPER shall pay to CITY the sum of _____ ($_____), which represents the full current cost of constructing a bus shelter, or other transit related facility.

3. Location. CITY, in its sole discretion, may choose to construct, install, operate, and/or maintain a bus shelter upon the Subject Property, or may choose to use the funds in whole or in part to construct, install, operate, and/or maintain any other transit related facilities in the transit service area in which the Subject Property is located.

4. Right of Entry. Permission to enter onto the Subject Property or other property of DEVELOPER is hereby granted to CITY, or its designated agents, as may be necessary to construct, install, operate, or maintain such bus shelter or other transit related facilities.

5. Compliance with Conditions. Upon delivery to CITY of both the fully executed grant of easement specified in Paragraph B above and the payment specified in Section 2 above, DEVELOPER shall be deemed to have fully complied with and satisfied the condition of the Project Permit for the Subject Property for the financing and construction of the required bus shelter.

6. Integration. This is an integrated agreement, and contains the complete understanding of the parties. It shall be read as a whole.

7. Amendments. This Agreement and each provision contained herein may be waived, amended, supplemented, or terminated only by mutual written agreement of CITY and DEVELOPER.

8. Notices. Any notices required by this Agreement shall be personally delivered or mailed, U.S. Mail first class postage prepaid, addressed as follows:

CITY OF ROSEVILLE	DEVELOPER
City of Roseville	_____
316 Vernon Street Ste. 150	_____
Roseville, CA 95678	_____
Attn: Alternative Transportation Division	_____

Either party may amend its address for notice by notifying the other party in writing.

9. Venue. Any action arising out of this Agreement shall be brought in Placer County, regardless of where else it might otherwise be venued.

10. Attorney's Fees. In any action brought by either party to enforce the terms of this Agreement, the prevailing party shall be entitled to recover its reasonable attorney's fees.

IN WITNESS WHEREOF, the City of Roseville, a municipal corporation, has caused this Agreement to be executed in duplicate by its City Manager and attested to by its City Clerk under the authority of Resolution No. _____, adopted by the Council of the City of Roseville on the _____ day of _____, 20___, and DEVELOPER has caused this Agreement to be executed.

CITY OF ROSEVILLE, a municipal corporation

BY:_____
DOMINICK CASEY
City Manager

ATTEST:

BY:_____
SONIA OROZCO
City Clerk

APPROVED AS TO FORM:

BY:_____
MICHELLE SHEIDENBERGER
City Attorney

APPROVED AS TO SUBSTANCE:

BY:_____
JASON SHYKOWSKI
Public Works Director

DEVELOPER:
_____, a
_____

BY:_____
its: _____

and

BY:_____
its: _____

(NOTARIZATION REQUIRED)

COUNCIL COMMUNICATION

CC #: 1540
File #: 0721

Title:	Roseville Transit System Management, Operations and Call Center Services - Agreement Amendment
Contact:	Ed Scofield 916-774-5449 ecscofield@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 7.17.

RECOMMENDATION TO COUNCIL

Staff recommends that the City Council adopt a resolution authorizing the City Manager to execute the First Amendment to the Agreement between the City of Roseville and MV Transportation, Inc. for the operation of the City of Roseville Transit System and the South Placer County Transit Information Center.

BACKGROUND

The City of Roseville operates transit services that include Commuter Service between Roseville and downtown Sacramento; Local Service within the City of Roseville; Dial-A-Ride Service that provides trips to the general public with advance reservations; Roseville Paratransit service for American with Disabilities Act (ADA) eligible passengers within the Roseville city limits; and Game Day Express. On behalf of a consortium of transit operators within the South Placer County region, the City of Roseville also administers the South Placer County Transit Information Center ('Call Center') which provides travel information, makes ride reservations, and answers questions.

Pursuant to an existing Agreement with the City, MV Transportation manages and operates Roseville Transit and the Call Center. The Agreement between the City and MV Transportation was approved on September 20, 2017 and is scheduled to terminate on June 30, 2021. The Agreement provides the City, at its sole discretion, the option to extend services for two additional two-year terms (Section 12.3). Staff performed an Independent Cost Evaluation (ICE) using costs from other nearby transit agencies and determined that the prices for the two additional years of service are still competitive.

The proposed Amendment No. 1 would extend the term of the Agreement two additional years to an end date of June 30, 2023. All provisions of the existing Agreement remain unchanged and in force. Since Roseville Transit receives Federal Transit Administration (FTA) funds, the proposed Amendment incorporates additional federal contracting clauses which were not included in the existing Agreement.

FISCAL IMPACT

Costs for option years FY2021-22 and FY2022-23 were established in the existing Agreement. The maximum obligation to the City for MV Transportation to manage and operate Roseville Transit and the Call Center are as follows:

FY2021-22

- $4,244,102.52 – Manage and Operate Roseville Transit
- $378,656.11 – Manage and Operate the South Placer County Transit Information Center

FY2022-23

- $4,509,198.27 – Manage and Operate Roseville Transit
- $385,561.41 – Manage and Operate the South Placer County Transit Information Center

Funding for transit services is provided primarily through FTA funds, Transportation Development Act (TDA) funds and fare revenue through the City's Transit Fund (6511). The call center is funded through the Consolidated Transportation Services Agency (CTSA) fund (6540), with TDA revenues provided by the West Placer CTSA. General Fund monies are not used for either transit operations or the call center.

ENVIRONMENTAL REVIEW

The California Environmental Quality Act (CEQA) only applies to projects which have the potential to cause a significant effect on the environment. Where it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment, the activity is not subject to CEQA. (CEQA Guidelines §15061(b)(3)).

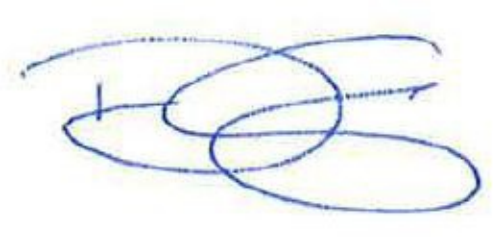
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Goal C - Maintain a safe and healthy community
Goal E - Deliver exceptional city services

Respectfully Submitted,

Ed Scofield, Transit Operations Analyst

Jason Shykowski, Public Works Director



Dominick Casey, City Manager

ATTACHMENTS:

Description

Resolution 21-272

Signed Amendment

RESOLUTION NO. 21-272

APPROVING AMENDMENT NO. 1 TO AGREEMENT FOR CITY OF ROSEVILLE TRANSIT SYSTEM MANAGEMENT, OPERATIONS AND CALL CENTER SERVICES, BY AND BETWEEN MV TRANSPORTATION, INC. AND THE CITY OF ROSEVILLE, AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE

WHEREAS, Amendment No. 1 to Agreement for City of Roseville Transit System Management, Operations and Call Center Services, by and between MV Transportation, Inc. and the City of Roseville, has been reviewed by the City Council; and

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Roseville that said Amendment No. 1 is hereby approved and that the City Manager is authorized to execute it on behalf of the City of Roseville.

PASSED AND ADOPTED by the Council of the City of Roseville this____day of _____, 20_, by the following vote on roll call:

AYES COUNCILMEMBERS:

NOES COUNCILMEMBERS:

ABSENT COUNCILMEMBERS:

_____
MAYOR

ATTEST:

_____
City Clerk

AMENDMENT NO. 1 TO

AGREEMENT FOR CITY OF ROSEVILLE TRANSIT SYSTEM MANAGEMENT, OPERATIONS AND CALL CENTER SERVICES

THIS AMENDMENT NO. 1 TO AGREEMENT is made and entered into this ___ day of _____, 20__, by and between the City of Roseville, a municipal corporation ("CITY"), and MV Transportation, Inc., a California corporation ("CONTRACTOR"); and

W I T N E S S E T H:

WHEREAS, CITY and CONTRACTOR previously entered into an Agreement for City of Roseville Transit System Management, Operations and Call Center Services dated September 20, 2017 ("Agreement"); and

WHEREAS, CITY desires to amend the Agreement for an additional term; and

WHEREAS, CONTRACTOR is willing and able to provide such additional services.

NOW, THEREFORE, the parties agree as follows:

1. A new Section 12.5 is added to the Agreement, to read as follows:

"CITY is exercising its option to extend the term of the Agreement for an additional two (2) year period commencing July 1, 2021 and ending on June 30, 2023".

2. Additional Federal Clauses which were not included in Exhibit "C" to the Agreement are contained in Exhibit "C-1", attached hereto and incorporated herein by this reference.

3. All other provisions of the Agreement shall remain unchanged and in full force and effect.

IN WITNESS WHEREOF, the City of Roseville, a municipal corporation, has authorized the execution of this Amendment No. 1 to Agreement in duplicate by its City Manager and attested to by its City Clerk under the authority of Resolution No. _____, adopted by the Council of the City of Roseville on the ___ day of _____, 20__, and CONTRACTOR has caused this Amendment No. 1 to Agreement to be executed.

CITY OF ROSEVILLE, a municipal corporation

BY: _____
DOMINICK CASEY
City Manager

ATTEST:

BY: _____
SONIA OROZCO
City Clerk

APPROVED AS TO FORM:

BY: _____
ROBERT R. SCHMITT
City Attorney

APPROVED AS TO SUBSTANCE:

BY: _____
JASON SHYKOWSKI
Public Works Director

MV TRANSPORTATION, INC., a California corporation

BY: _____

its: President & COO

and

BY: _____

its: Executive Vice President & CFO

EXHIBIT “C-1”

Exhibit C-1
ADDITIONAL FEDERAL CLAUSES*
***Clauses not listed in prior agreement.**

#19 - PUBLIC TRANSPORTATION EMPLOYEE PROTECTIVE ARRANGEMENTS

49 U.S.C. § 5333(b) ("13(c)")

29 C.F.R. part 215

Applicability to Contracts

The Public Transportation Employee Protective Arrangements apply to each contract for transit operations performed by employees of a Contractor recognized by FTA to be a transit operator.

Flow Down

The employee protective arrangements clause flows down to all third party contractors and their contracts at every tier.

Model Clause/Language

There is no required language for the Public Transportation Employee Protective Arrangements clause. Recipients can draw on the following language for inclusion in their federally funded procurements.

Public Transportation Employee Protective Arrangements

The Contractor agrees to comply with the following employee protective arrangements of 49 U.S.C. § 5333(b):

1. **U.S. DOL Certification**. Under this Contract or any Amendments thereto that involve public transportation operations that are supported with federal assistance, a certification issued by U.S. DOL is a condition of the Contract.
2. **Special Warranty**. When the Contract involves public transportation operations and is supported with federal assistance appropriated or made available for 49 U.S.C. § 5311, U.S. DOL will provide a Special Warranty for its Award, including its Award of federal

assistance under the Tribal Transit Program. The U.S. DOL Special Warranty is a condition of the Contract.

3. **Special Arrangements**. The conditions of 49 U.S.C. § 5333(b) do not apply to Contractors providing public transportation operations pursuant to 49 U.S.C. § 5310. FTA reserves the right to make case-by-case determinations of the applicability of 49 U.S.C. § 5333(b) for all transfers of funding authorized under title 23, United States Code (flex funds), and make other exceptions as it deems appropriate, and, in those instances, any special arrangements required by FTA will be incorporated herein as required.

#21 - SAFE OPERATION OF MOTOR VEHICLES

23 U.S.C. part 402
Executive Order No. 13043
Executive Order No. 13513
U.S. DOT Order No. 3902.10

Applicability to Contracts

The Safe Operation of Motor Vehicles requirements apply to all federally funded third party contracts. In compliance with Federal Executive Order No. 13043, "Increasing Seat Belt Use in the United States," April 16, 1997, 23 U.S.C. Section 402 note, FTA encourages each third party contractor to adopt and promote on-the-job seat belt use policies and programs for its employees and other personnel that operate company owned, rented, or personally operated vehicles, and to include this provision in each third party subcontract involving the project. Additionally, recipients are required by FTA to include a Distracted Driving clause that addresses distracted driving, including text messaging in each of its third party agreements supported with Federal assistance.

Flow Down Requirements

The Safe Operation of Motor Vehicles requirements flow down to all third party contractors at every tier.

Model Clause/Language

There is no required language for the Safe Operation of Motor Vehicles clause. Recipients can draw on the following language for inclusion in their federally funded procurements.

Safe Operation of Motor Vehicles

Seat Belt Use

The Contractor is encouraged to adopt and promote on-the-job seat belt use policies and programs for its employees and other personnel that operate company-owned vehicles, company-rented vehicles, or personally operated vehicles. The terms "company-owned" and "company-leased" refer to vehicles owned or leased either by the Contractor or CITY.

Distracted Driving

The Contractor agrees to adopt and enforce workplace safety policies to decrease crashes caused by distracted drivers, including policies to ban text messaging while using an electronic device supplied by an employer, and driving a vehicle the driver owns or rents, a vehicle Contactor owns, leases, or rents, or a privately-owned vehicle when on official business in connection with the work performed under this agreement.

#22 SCHOOL BUS OPERATIONS

49 U.S.C. 5323(f)

49 C.F.R. part 605

Applicability to Contracts

The School Bus requirements apply to contracts for operating public transportation service.

Flow Down Requirements

The School Bus requirements flow down from FTA recipients and subrecipients to first tier service contractors.

Model Clause/Language

The relevant statutes and regulations do not mandate any specific clause or language. Recipients can draw on the following language for inclusion in their federally funded procurements.

School Bus Operations

The contractor agrees to comply with 49 U.S.C. 5323(f), and 49 C.F.R. part 604, and not engage in school bus operations using federally funded equipment or facilities in competition with private operators of school buses, except as permitted under:

1. Federal transit laws, specifically 49 U.S.C. § 5323(f);
2. FTA regulations, "School Bus Operations," 49 C.F.R. part 605;
3. Any other Federal School Bus regulations; or
4. Federal guidance, except as FTA determines otherwise in writing. If Contractor violates this School Bus Agreement, FTA may:
    a. Bar the Contractor from receiving Federal assistance for public transportation; or
    b. Require the contractor to take such remedial measures as FTA considers appropriate.

When operating exclusive school bus service under an allowable exemption, the contractor may not use federally funded equipment, vehicles, or facilities.

The Contractor should include the substance of this clause in each subcontract or purchase under this contract that may operate public transportation services.

#28 – CONFLICT OF INTEREST

2 CFR 200.112

Applicability to Contracts

The requirements applies to all contracts using federal funding.

Conflict of Interest

The Contractor and its subcontractors that perform work under this Agreement shall comply with Federal and State conflict of interest laws, regulations and policies, and applicable provisions of the CITY'S conflict of interest policy in regards to federal funds (CITY A.R. 4.06).

COUNCIL COMMUNICATION

CC #: 1520
File #: 0800-06

Title:	Transportation Impact Studies - On-Call Professional Services Agreements
Contact:	Brandy LeBeau 916-774-5278 blebeau@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 7.18.

RECOMMENDATION TO COUNCIL

Staff recommends that the City Council adopt resolutions approving four (4) on-call professional services agreements for preparation of Transportation Impact Studies with Fehr & Peers, Kimley-Horn and Associates, DKS Associates, and T J K M, and authorizing the City Manager to execute them on behalf of the City of Roseville.

BACKGROUND

New development projects are often required to evaluate impacts to the City's transportation network during the entitlement and environmental review process, depending on the size and scope of the development project proposed. If a traffic impact study is deemed necessary, staff solicits a scope of work and not-to-exceed cost from the City's on-call consulting firms, which are reviewed and approved by staff, then forwarded to the project applicant for review and approval. Once the scope is approved by all parties, the applicant is required to submit a check for the entire not-to-exceed amount, which is deposited into an individual project account. Once funds have cleared, the study is authorized to begin. The City's current on-call agreements expire August 7, 2021.

Consistent with the City's contracting requirements, staff issued a Request for Proposals (RFP) for on-call traffic impact studies on November 13, 2020. Four firms submitted proposals in response to the RFP. Fehr & Peers, Kimley-Horn and Associates, DSK Associates and T J K M ranked highest in terms of service, experience, and available staffing resources to meet the City's needs. Similar to past practice, four separate firms will be engaged to eliminate any possible conflicts of interest that may arise as a result of any of the firms' existing or future contracts with other private entities (i.e., development interests). Each agreement has a not-to-exceed total of $500,000 and a term of one year with an option to extend for four additional years. The agreement grants the City Manager authority to approve the optional extensions with no further Council action.

FISCAL IMPACT

Approval of the on-call professional services agreements will have no impact to the City's General Fund. All development projects are required to pay the full cost of traffic impact studies prior to the City authorizing work to begin.

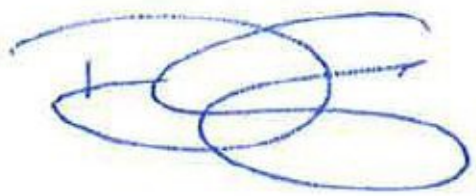
ENVIRONMENTAL REVIEW

The California Environmental Quality Act (CEQA) only applies to projects which have the potential to cause a significant effect on the environment. Where it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment, the activity is not subject to CEQA. (CEQA Guidelines §15061(b)(3)).

Respectfully Submitted,

Brandy LeBeau, Management Analyst

Mike Isom, Development Services Director



_____

Dominick Casey, City Manager

ATTACHMENTS:

Description

Resolution 21-256

Professional Service Agreement - Fehr & Peers

Resolution 21-257

Professional Service Agreement - Kimley-Horn

Resolution 21-258

Professional Service Agreement - DKS

Resolution 21-259

Professional Service Agreement - TJKM

RESOLUTION NO. 21-256

APPROVING AN ON-CALL PROFESSIONAL SERVICES AGREEMENT, BY AND BETWEEN THE CITY OF ROSEVILLE AND FEHR & PEERS, AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE

WHEREAS, an on-call professional services agreement regarding On-Call Transportation Impact Studies, by and between the City of Roseville and Fehr & Peers, has been reviewed by the City Council; and

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Roseville that said on-call agreement is hereby approved and the City Manager is authorized to execute it on behalf of the City of Roseville.

PASSED AND ADOPTED by the Council of the City of Roseville this____day of _____, 20___, by the following vote on roll call:

AYES COUNCILMEMBERS:

NOES COUNCILMEMBERS:

ABSENT COUNCILMEMBERS:

_____
MAYOR

ATTEST:

_____
City Clerk

ON-CALL PROFESSIONAL SERVICES AGREEMENT

Services: Transportation Impact Studies

THIS AGREEMENT is made and entered into this ___ day of _____, 20__, by and between the City of Roseville, a municipal corporation ("CITY"), and Fehr & Peers, a California corporation ("CONSULTANT"); and

W I T N E S S E T H:

WHEREAS, CITY issued Request for Proposal #06-0002 for professional services consisting of on-call transportation impact study services; and

WHEREAS, CONSULTANT has prepared a response to the Request for Proposal dated February 12, 2021, which describes the scope of services to be performed by CONSULTANT, and the hourly rates for performance of such services; and

WHEREAS, CONSULTANT is qualified and experienced to provide professional services on an on-call basis.

NOW, THEREFORE, the parties agree as follows:

1. Term. The term of this Agreement shall commence upon execution and expire on June 30, 2022. The City Manager may, in his or her discretion, elect to extend the Agreement in one (1) year increments for up to an additional four (4) years by giving CONSULTANT thirty (30) days advance written notice of each optional one (1) year renewal. Such extensions shall be memorialized by a written amendment to this Agreement.

2. Services. CONSULTANT shall perform, at the direction of CITY, the scope of the on-call services as described in EXHIBIT "A," attached hereto and incorporated herein by this reference. Individual tasks will be awarded by CITY on an as-needed basis. CITY may assign work to one, or more than one consultant from an approved qualified list. CITY reserves the right to unilaterally assign work to any consultant as it deems prudent or, if no services are required, no work. CITY makes no specific guarantee of a minimum or maximum number of hours or amount of tasks or services, which shall be required of any single consultant. In addition, the inclusion of any consultant on any qualified list, if so utilized by CITY, shall in no way be considered an exclusive agreement to provide service for CITY.

3. Compensation. For its services provided hereunder, CONSULTANT shall be compensated on a time and expense basis in accordance with the hourly rates as described in EXHIBIT "B," attached hereto and incorporated herein by this reference. Any proposed increase in the effective rates for future services must be preceded by at least a 90-day written notice to the contracting department. Total compensation shall not exceed five hundred thousand dollars ($500,000). Total compensation for optional renewal years of this Agreement shall not exceed five hundred thousand dollars per year ($500,000). Adjustment to the total compensation per year shall require a written amendment to this Agreement, subject to approval by the City Council.

CONSULTANT shall submit one monthly invoice for its services. Such invoices shall be delineated by task, the person performing the services, and the hourly rate, which shall be stated in time increments of not greater than one tenth (1/10) hours. CITY shall pay invoices within thirty (30) days after receipt, if the services specified in the invoice have been satisfactorily completed.

4. Indemnification. To the fullest extent allowed by law, CONSULTANT shall defend, indemnify, and save and hold harmless CITY, its officers, agents, employees and volunteers from any claims, suits or actions of every name, kind and description brought forth, or on account of, injuries to or death of any person (including but not limited to workers and the public), or damage to property, resulting from or arising out of CONSULTANT's willful misconduct or negligent act or omission while engaged in the performance of obligations or exercise of rights created by this Agreement, except those matters arising from CITY's sole negligence or willful misconduct. The parties intend that this provision shall be broadly construed.

CONSULTANT agrees to defend and indemnify CITY if, despite the parties intent and practice, any venue, agency, or court with competent jurisdiction determines that CONSULTANT and/or any of its agents, officers, employees, volunteers, independent contractors, or subcontractors, are characterized as employee(s) of CITY.

CONSULTANT's responsibility for such defense and indemnity obligations shall survive the termination or completion of this Agreement for the full period of time allowed by law. The defense and indemnity obligations of this Agreement are undertaken in addition to, and shall not in any way be limited by, the insurance obligations contained in this Agreement.

5. Insurance. CONSULTANT agrees to continuously maintain, in full force and effect, the following minimum policies of insurance during the term of this Agreement.

COVERAGE	LIMITS OF LIABILITY
Workers' Compensation	Statutory

Commercial General Liability	$1,000,000 each occurrence $2,000,000 aggregate Personal Injury: $1,000,000 each occurrence $2,000,000 aggregate
Automobile Liability	$1,000,000 combined single limit
Professional Liability (errors and omissions)	$1,000,000 per claim $2,000,000 aggregate

a. Form. CONSULTANT shall submit a certificate evidencing such coverage for the period covered by this Agreement in a form satisfactory to Risk Management and the City Attorney, prior to undertaking any work hereunder. Any insurance written on a claims made basis is subject to the approval of Risk Management and the City Attorney.

b. Additional Insureds. CONSULTANT shall also provide a separate endorsement form or section of the policy showing CITY, its officers, agents, employees and volunteers as additional insureds for each type of coverage, except for Workers' Compensation and Professional Liability. Such insurance shall specifically cover the contractual liability of CONSULTANT. The additional insured coverage under the CONSULTANT's policy shall be primary and noncontributory, as evidenced by a separate endorsement or section of the policy, and shall not seek contribution from CITY's insurance or self-insurance. In addition, the additional insured coverage shall be at least as broad as the Insurance Services Office ("ISO") CG 20 01 Endorsement. Any available insurance proceeds in excess of the specified minimum insurance coverage requirements and limits shall be available to the additional insureds. Furthermore, the requirements for coverage and limits shall be: (1) the minimum coverage and limits specified in this Agreement; or (2) the full coverage and maximum limits of any insurance proceeds available to the named insureds, whichever is greater.

c. Cancellation/Modification. CONSULTANT shall provide ten (10) days written notice to CITY prior to cancellation or modification of any insurance required by this Agreement.

d. Umbrella/Excess Insurance. The limits of insurance required in this Agreement may be satisfied by a combination of primary and excess insurance. Any excess insurance shall contain or be endorsed to contain a provision that such coverage shall also apply on a primary and noncontributory basis for the benefit of CITY (if agreed to in a written contract) before CITY's own insurance shall be called upon to protect it as a named insured.

e. Subcontractors. CONSULTANT agrees to include in its contracts with all subcontractors the same requirements and provisions of this Agreement, including the indemnity and insurance requirements, to the extent they apply to the scope of the subcontractor's work. Furthermore, CONSULTANT shall require its subcontractors to agree to be bound to CONSULTANT and CITY in the same manner and to the same extent as CONSULTANT is bound to CITY under this Agreement. Additionally, CONSULTANT shall obligate its subcontractors to comply with these same provisions with respect to any tertiary subcontractor, regardless of tier. A copy of CITY's indemnity and insurance provisions will be furnished to the subcontractor or tertiary subcontractor upon request.

f. Self-Insured Retentions. All self-insured retentions ("SIR") must be disclosed to Risk Management for approval and shall not reduce the limits of liability. Policies containing any SIR provision shall provide or be endorsed to provide that the SIR may be satisfied by either the named insured or CITY. CITY reserves the right to obtain a full certified copy of any insurance policy and endorsements. The failure to exercise this right shall not constitute a waiver of such right.

g. Waiver of Subrogation. CONSULTANT hereby agrees to waive subrogation which any insurer of CONSULTANT may acquire from CONSULTANT by virtue of the payment of any loss under a Workers Compensation, Commercial General Liability or Automobile Liability policy. All Workers Compensation, Commercial General Liability and Automobile Liability policies shall be endorsed with a waiver of subrogation in favor of CITY, its officers, agents, employees and volunteers for all worked performed by CONSULTANT, its employees, agents and subcontractors.

h. Liability/Remedies. Insurance coverage in the minimum amounts set forth herein shall not be construed to relieve CONSULTANT of liability in excess of such coverage, nor shall it preclude CITY from taking such other actions as are available to it under any other provisions of this Agreement or law.

6. Records. CONSULTANT and its subcontractors shall maintain all files and records relating to the services performed hereunder during the term of this Agreement and for a period of not less than one (1) year after the date of termination or expiration. Provided, however, that in the event of litigation or settlement of claims arising from the performance of this Agreement, CONSULTANT and its subcontractors shall maintain all files and records until such litigation, appeals or claims are resolved. Duly authorized representatives of CITY shall have right of access during normal business hours and after reasonable notice to CONSULTANT's and subcontractors' files and records relating to the services performed hereunder, and may review and copy the files and records at appropriate stages during performance of the services and during the one (1) year period following termination or expiration of this Agreement. CONSULTANT shall include this provisions in its contracts with all subcontractors.

7. Prevailing Wages. When applicable, for purposes of this Agreement, CONSULTANT and its subcontractors shall comply with all applicable prevailing wage laws, e.g., but not limited to, California Labor Code Sections 1770 et seq. In accordance with said Section 1775, CONSULTANT shall forfeit as a penalty to the City two hundred dollars ($200) for each calendar day or portion thereof for each worker paid less than the prevailing rates for such work or craft in which such worker is employed for any work done on-site under the Agreement by CONSULTANT or by any subcontractor in violation of the provisions of the Labor Code and in particular, Labor Code Sections 1770 to 1780, inclusive. In addition to said penalty and pursuant to said Section 1775, the difference between such stipulated prevailing wage rates and the amount paid to each worker for each calendar day or portion thereof for which each worker was paid less than the stipulated prevailing wage shall be paid to each worker by CONSULTANT or the applicable subcontractor.

Pursuant to the provisions of California Labor Code Section 1773, the contracting department has identified the source, stated below, of the general prevailing rate of wages applicable to the site to be done, for straight time, overtime, and holiday work. The holiday wage rate listed shall be applicable to all holidays recognized in the collective bargaining agreement of the particular craft, classification or type of worker concerned. These wage rates may be obtained from the State Department of Industrial Relations and/or the following website address: http://www.dir.ca.gov/dlsr/DPreWageDetermination.htm.

Pursuant to Labor Code Section 1773.2, general prevailing wage rates set forth above, which forms a part of this Agreement, shall be posted by CONSULTANT at a prominent place at the work site. Prevailing wage rates to be posted at the work site will be furnished by the contracting department. The possibility of wage increases is one of the elements to be

considered by CONSULTANT in determining its proposal, and will not under any circumstances be considered as the basis of a claim against CITY or the Agreement.

8. Contractor Registration. No contractor or subcontractor may work on a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5. During the performance of this Agreement, CONSULTANT and its subcontractors shall have a continuing legal obligation to maintain current registration with the Department of Industrial Relations. CONSULTANT is hereby notified that this Agreement is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

9. Time is of the Essence. Time is of the essence of this Agreement.

10. Compliance with Laws. CONSULTANT shall comply with all federal, state and local laws, ordinances and policies as may be applicable to the performance of services under this Agreement.

11. Ability to Perform. CONSULTANT agrees and represents that it has the time, ability and professional expertise to perform the services required under this Agreement.

12. Governing Agreement. In the event of any conflict between this Agreement and its EXHIBITS, the provisions of this Agreement shall govern. In the event of any conflict between any of the EXHIBITS, the provisions of the first in order of attachment shall govern.

13. Assignment. CONSULTANT is employed to perform unique personal services. CONSULTANT shall not assign this Agreement without the prior written consent of CITY. CONSULTANT shall not employ or otherwise incur any obligation to pay other specialists or experts for services in connection with this Agreement, without prior written consent of CITY.

14. Independent Contractor. CONSULTANT, inclusive of its agents, officers, employees, volunteers, independent contractors, and subcontractors, shall act as an independent

contractor, and covenants and agrees that it will conduct itself consistent with such status, that it will neither hold itself out as, nor claim to be, an officer or employee of CITY by reason of this Agreement.

CONSULTANT and CITY agree that: (a) CONSULTANT is free from the control and direction of CITY in connection with the performance of the work; (b) CONSULTANT is providing services directly to CITY; (c) CONSULTANT has and will maintain at all relevant times a business license; (d) CONSULTANT maintains a business location that is separate from CITY; (e) CONSULTANT is customarily engaged in an independently established business of the same nature as that involved in the work performed hereunder; (f) CONSULTANT actually contracts with other businesses to provide the same or similar services and maintains a clientele without restrictions from CITY; (g) CONSULTANT advertises and holds itself out to the public as available to provide the same or similar services; (h) CONSULTANT provides its own tools, vehicles, and equipment to perform the services; (i) CONSULTANT has negotiated its own rates; (j) CONSULTANT set its own hours and location of work in accomplishing CITY's on-call needs; and (k) CONSULTANT has the right to control the manner and means of accomplishing the result desired and exercises its own expert independent judgement.

15. Representations and Warranties. CONSULTANT warrants that it has not employed or retained any company or person, other than a bona fide employee working for CONSULTANT, to solicit or secure this Agreement, and that it has not paid or agreed to pay any company or person, other than a bona fide employee, any fee, commission, percentage, brokerage fee, gift or any other consideration, contingent upon or resulting from the award or making of this Agreement. For breach or violation of this warranty, CITY shall have the right to

terminate as void this Agreement, without liability, or, in its discretion, to deduct from the Agreement price or consideration, or otherwise recover, the full amount of such fee, commission, percentage, brokerage fee, gift or contingent fee.

16. Successors in Interest. This Agreement shall be binding upon the heirs, successors, executors, administrators and assigns of the respective parties hereto.

17. Copyright, Ownership and Use of Materials. All tangible material ("Material") created or delivered pursuant to this Agreement is considered a work made for hire under the Copyright Act. To the extent such Material does not qualify as a work made for hire, CONSULTANT hereby assigns to CITY all right, title, and interest, including but not limited to all copyrights, in all Material created by CONSULTANT in its performance under this Agreement. Material constitutes the scope of work outlined in Exhibit A and attached hereto, and all written and other tangible expressions, including but not limited to, drawings (including computer aided drawings), papers, documents, reports, surveys, renderings, exhibits, sketches, maps, models, prints, paintings or photographs, in any and all media or formats in which such materials have been created or are maintained. All Material furnished by CONSULTANT is, and shall remain, the property of CITY.

CONSULTANT shall execute any documents necessary to effectuate such assignment. In the event that CONSULTANT uses, employs, designates, or retains any person or entity who is not an employee of CONSULTANT, to perform any work required of it pursuant to this Agreement, CONSULTANT shall require said person or entity to execute an agreement containing the preceding paragraph.

18. Termination of Agreement. CITY may terminate this Agreement without cause by giving CONSULTANT ten (10) days advance written notice from the City Manager.

CONSULTANT may terminate this Agreement without cause by giving CITY thirty (30) days advance written notice. CONSULTANT understands that continuation of this Agreement past June 30th of any given year is contingent upon appropriation of funds for such purpose in the budget of the City of Roseville in the sole discretion of the City Council. In the event of termination through no fault of CONSULTANT, CITY shall compensate CONSULTANT for services performed as of the date of termination, upon the release to CITY of all Material hereunder, in any and all media or formats in which such materials have been created or are maintained. CITY retains the right to receive and use any MATERIAL, notwithstanding any termination or any dispute regarding the amount to be paid.

19. Attorney's Fees; Venue; Governing Law. If either party commences any legal action against the other party arising out of this Agreement or the performance hereof, the prevailing party in such action shall be entitled to recover its reasonable litigation expenses, including but not limited to, court costs, expert witness fees, discovery expenses, and attorney's fees. Any action arising out of this Agreement shall be brought in Placer County, California, regardless of where else venue may lie. This Agreement shall be governed by and construed in accordance with the laws of the State of California.

20. Modification. This Agreement and each provision contained herein may be waived, amended, supplemented or eliminated only by mutual written agreement of the parties.

21. Severability. If any of the provisions contained in this Agreement are for any reason held invalid or unenforceable, such holding shall not affect the remaining provisions or the validity and enforceability of the Agreement as a whole.

22. Notices. Any notices to parties required by this Agreement shall be delivered personally or mailed, U.S. first class postage prepaid, addressed as follows:

CITY OF ROSEVILLE	CONSULTANT
Mike Isom City of Roseville 311 Vernon Street Roseville, CA 95678	John Gard, PE Fehr & Peers 1013 Galleria Blvd, Suite 255 Roseville, CA 95678

Either party may amend its address for notice by giving notice to the other party in writing.

23. Integrated Agreement. This is an integrated agreement and contains all of the terms, considerations, understanding and promises of the parties. It shall be read as a whole.

IN WITNESS WHEREOF, the City of Roseville, a municipal corporation, has authorized the execution of this Agreement in duplicate by its City Manager and attested to by its City Clerk under the authority of Resolution No. _____, adopted by the Council of the City of Roseville on the ___ day of _____, 20__, and CONSULTANT has caused this Agreement to be executed.

CITY OF ROSEVILLE, a
municipal corporation

BY:_____
DOMINICK CASEY
City Manager

ATTEST:

BY:_____
SONIA OROZCO
City Clerk

FEHR & PEERS, a
California corporation

BY: _____
its: PRINCIPAL

and

BY: _____
its: _____

[SIGNATURES CONTINUED ON NEXT PAGE]

APPROVED AS TO FORM:

BY: _____
ROBERT R. SCHMITT
City Attorney

APPROVED AS TO SUBSTANCE:

BY: _____
MIKE ISOM
Development Services Director

Corporate Secretary's Certificate

I, Marion Donnelly, Secretary of Fehr & Peers, a corporation organized and existing under the laws of the State of California, hereby certify that the foregoing is a complete, true and correct copy of resolutions of the Board of Directors of the Corporation, duly and regularly adopted by the Board of Directors of the Corporation, duly and regularly adopted by the Board of Directors of the Corporation in all respects as required by law and the by-laws of the Corporation on July 10, 2019 at a meeting at which a quorum of the Board of Directors of the Corporation was present and the requisite number of such directors voted in favor of said resolutions, or by unanimous consent in writing of all members of the Board of Directors of the Corporation to the adoption of said resolutions.

I further certify that the said resolutions are still in force and effect and have not been amended or revoked and do not exceed the objects or powers of the Corporation or the powers of its directors.

IN WITNESS WHEREOF, I have hereunto set my hand as Secretary of the Corporation, an affixed the corporate seal of the Corporation, on July 10, 2019.

Affix Corporate Seal Here:

Marion Donnelly (signature), SECRETARY OF Fehr & Peers, A CORPORATION

UNANIMOUS WRITTEN CONSENT OF DIRECTORS OF

FEHR & PEERS

The undersigned, constituting all of the directors of the corporation, acting pursuant to the authority of 307(b) of the California General Corporation Law, hereby adopt the following recitals and resolution, effective on the date of the last signature hereof.

"RESOLVED, that the President and each director of this corporation is authorized to execute any contract by which the corporation would perform services for any client, and to bind the corporation thereto by his or her signature alone."

BE IT FURTHER RESOLVED, that any executed copy of this Resolution, duly signed as hereunder, shall constitute a Certificate of Corporate Resolution in the matters hereinabove recited.

DATED: July 10, 2019

Matthew J. Henry

Steven Brown

Ronald T. Milam

Sarah Brandenberg

Marion Donnelly

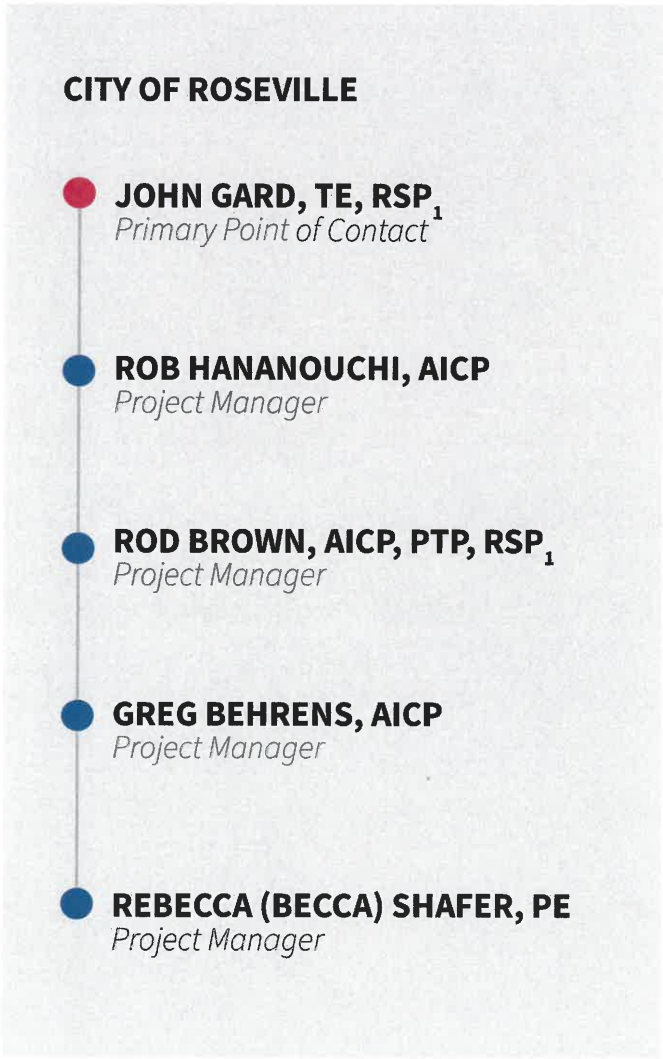
EXHIBIT "A"

C

Qualifications of Team

Team Qualifications

ORGANIZATION CHART



FEHR & PEERS STAFF

To ensure the City of Roseville receives a high level of support, we have designated five experienced staff to serve this on-call. The organization chart to the left illustrates our team's structure.

John Gard, TE, RSP$_1$ will serve as the Fehr & Peers primary point of contact. John is based in our Roseville office and has been continously employed with Fehr & Peers since 1995.

Supporting John with on-call project management task orders are four expert team members, whose relevant experience is summarized on the following pages (including experience working on projects in Roseville).

GEOGRAPHIC LOCATIONS

The vast majority of work will be performed by staff from the Fehr & Peers Roseville and Sacramento offices. On occasion, we may utilize staff with specific expertise from other Fehr & Peers offices.

Roseville Office: 1013 Galleria Blvd, Suite 255, 95678
Sacramento Office: 1001 K Street, 3rd Floor, 95814

SUBCONSULTANTS

Fehr & Peers proposes to perform all work using its own staff. No subconsultants or subcontractors are proposed.



JOHN GARD, TE, RSP$_1$

Principal-in-Charge. John is a Principal and has been employed with Fehr & Peers since 1995. He has an extensive history of studies within Roseville. John will serve as the primary point of contact for this on-call assignment and will be responsible for the overall quality and timeliness of work products. John's in-depth understanding of Roseville's transportation system, its planned growth, combined with his historical perspective having managed studies in the City for over 25 years, makes him highly qualified to lead Fehr & Peers' in this on-call assignment.

Geographical Location: Roseville Office

Years with FP: 25

Experience in City of Roseville

- Lifetime Fitness TIS
- Villasport TIS
- Campus Oaks Access Study
- Foothills Station Access Study
- Bayside Church TIS
- Sutter Roseville Medical Center Expansion
- Kaiser Cirby-Riverside Medical Center Expansion
- Kaiser Eureka Road Medical Center Expansion
- Placer Sports Complex EIR
- Roseville General Plan Update
- Roseville Travel Demand Model Update



ROB HANANOUCHI, AICP

Project Manager. Rob is an Associate in the Fehr & Peers Roseville office with more than 10 years of professional experience. He has served as Fehr & Peers' project manager for a variety of projects including transportation impact assessments, environmental impact reports, general plans, specific plans, corridor plans, active transportation plans, complete streets projects, and transportation infrastructure projects. Rob has extensive experience in developing travel forecasts, performing traffic operations analyses, and evaluating the transportation impacts of land development, transportation and land use plans, and transportation infrastructure projects in accordance with current CEQA and NEPA requirements.

Geographical Location: Roseville Office

Years with FP: 11

Experience in City of Roseville

- Roseville NCRSP Parcel 49 Phase 3 TIS
- Roseville NCRSP Parcel 49 TopGolf TIS
- Roseville NCRSP Parcel 44 Traffic Study



ROD BROWN, AICP, PTP, RSP$_1$

Project Manager. Rod is an Associate with Fehr & Peers. Rod contributes a solid background in transportation policy and a strong multimodal focus to each of his projects. Rod also brings to each of his projects an attention to detail and commitment to quality control that is rooted in his previous experience as an engineer and project manager for the United States Navy's Nuclear Propulsion Program and in the tech industry. After joining Fehr & Peers in early 2015, Rod quickly earned a reputation as a thoughtful and dependable project manager with a strong commitment to rigorous quality control. He has served as the project manager or lead planner on many complex transportation planning projects, including regional transportation plans, general plans, transportation impacts assessments, active transportation plans and model development for general plans.

Geographical Location: Roseville Office

Years with FP: 6

Experience in City of Roseville

- Roseville VMT Study Standards
- Roseville General Plan Update
- Roseville Travel Demand Model Update (for Housing Element Update)



GREG BEHRENS, AICP

Project Manager. Greg Behrens is an Associate with more than ten years of public and private sector transportation planning experience. He has served as project manager and lead planner on numerous community mobility and transit service improvement projects. His work focuses on helping communities solve complex transportation challenges, ranging from expanding active transportation options to enhancing public transit service access, performance, and operations, with an emphasis on enhancing the interface between transit systems and the communities they serve.

Geographical Location: Sacramento Office

Years with FP: 4

Experience in City of Roseville

- Placer-Sacramento Gateway Plan
- Pleasant Grove Blvd Coffee Shack Access Study
- Downtown Roseville Parking and Circulation Study



REBECCA (BECCA) SHAFER, PE

Project Manager. Becca is a Senior Transportation Engineer based in the Fehr & Peers Sacramento office. She holds a dual Masters in Transportation Engineering and City and Regional Planning from the University of California, Berkeley. Since joining Fehr & Peers, her primary area of focus is in traffic operations analysis. Rebecca has served as the lead traffic forecasting and/or operations analyst for several large and complex projects, including the Sacramento Railyards/Kaiser/MLS Stadium EIR, the Fresno Downtown Plans, and the Richards Boulevard / Olive Drive Circulation Study. Rebecca's projects benefit greatly from her commitment to efficiency and attention to detail.

Geographical Location: Sacramento Office

Years with FP: 6

Experience in City of Roseville

- Roseville General Plan
- Roseville Foothills Station TIS
- Roseville NCRSP Parcel 49 Phase 3 TIS

D

Project Understanding

Project Understanding

PROJECT UNDERSTANDING

Fehr & Peers has demonstrated competence, creativity, and responsiveness in conducting traffic studies within the City of Roseville. This has ranged from simple access studies (e.g., Pleasant Grove Boulevard Coffee Store), to complex access studies (e.g., Foothills Station), to highly controversial projects such as Villasport and LifeTime Family Fitness projects. We have also completed work for entire Specific Plans (e.g., Amoruso) and Major Project Permits (e.g., Campus Oaks).

We are intimately familiar with City of Roseville design standards and approaches to analyzing the traffic impacts of proposed land developments. The City typically supports the use of Institute of Transportation Engineers (ITE) trip rates to estimate project trips when determining off-site impacts and access needs for studies (i.e., "short-term" studies). But when examining if a project is consistent with the City's traffic model, it is customary to view the project using trip rates from the City's traffic model to determine whether the project would generate more trips than what the model currently assumes. Under circumstances where a project would generate more than 50 PM peak hour trips above what is assumed in the City's model that particular traffic analysis zone, the City requires a long-term traffic study. For large specific plans, the long-term analysis covers the entirety of the City to determine whether the City's 70 percent LOS C General Plan policy for operations at signalized intersections would continue to be met. For smaller projects, a more localized analysis of project effects is typically conducted.

PROJECT ACCESS REVIEWS

Analysis of project access focuses on a variety of traffic engineering and planning concepts including (but not limited to):

- Driveway design (placement, permitted movement, widths, curb return radii, throat depth)
- Need for deceleration lanes
- Median treatments including turn lane storage
- Sight distance considerations
- Traffic signal phasing changes and effects of new signals on signalized corridors
- Spacing of new traffic signals
- Adequacy of design to accommodate anticipated truck traffic
- Accommodation of bicyclists and pedestrians

ON-SITE CIRCULATION REVIEWS

The review of on-site circulation is also important. This includes review of parking lot layouts, drive-through storage capacity, dead-end drive aisles, pedestrian connections to adjacent streets, etc. Often, Fehr & Peers develops site access and on-site circulation recommendation in an illustrative format that can be used in public hearings and to develop conditions of approval for a project.

SITE ACCESS CHALLENGES AND SOLUTIONS

As the City builds out, it becomes more challenging to identify viable access solutions to remaining undeveloped parcels. We work cooperatively with City staff and offer many unique approaches to address these challenges. A recent example is a customized sight distance review we performed on the Foothills Station project, in which we determined how sight distance would be affected by the change in grade along the project frontage. This study also illustrated how we examine how multiple project access solutions may need to be considered for these complex project types. Additionally, published research by Fehr & Peers staff from years ago now forms the basis for how minimum required throat depths should be calculated per the City's Design Standards.

As a firm, we offer numerous tools to address built environment issues such as: crosswalk placement, bicyclist/pedestrian comfort, shared parking among complementary land uses, and curbspace requirements for pick-up/drop-off. We have built or have access to customized tools for these and other topics.

E

Project Plan

Project Plan

ANALYSIS METHODOLOGIES

Our extensive work history in Roseville has provided us with a strong understanding of the analysis methodologies preferred by City staff. Our analytical approaches are typically well-aligned with City staff when scoping studies. This includes selection of study intersections, choice of time periods, trip generation, analysis methods (e.g., microsimulation versus synchro), need for a long-term study, etc.

WORK SCHEDULE

The complexity of the project and type of study will dictate the schedule. For smaller, site-access studies, we can typically perform the study in as little as four weeks from authorization. For larger, more complex studies, up to eight weeks may be required.

ASSIGNED STAFF

All Fehr & Peers staff listed in this proposal have considerable prior work experience in the City of Roseville. We will staff this on-call assignment almost exclusively from our Roseville and Sacramento offices. On occasion, we may call upon experts from outside our region to provide specialized expertise. We do not propose including any subconsultants on our team.

NECESSARY EQUIPMENT/TRAINING

We do not require any special equipment or training to perform these studies. We have an excellent understanding of City design standards from years of work in the City. We know the City's travel demand model very well, being in the midst of updating it and using it on projects for decades. We know how to access traffic count data from the City's ITS database. We know which City staff to contact to request a range of data such as: engineering speed surveys, as-built drawings, etc.

PUBLIC HEARINGS

Fehr & Peers has attended numerous public hearings while serving as a consultant on behalf of the City. We not only work cooperatively with Engineering Department staff, but we regularly also collaborate with Community Development Department staff on a range of traffic and land use issues. We understand that our role may differ at Planning Commission and City Council hearings based on the type of project. In some instances, we will be present in the event questions should arise. In other instances, we may need to deliver a presentation on a complex transportation issue or to support City staff that are making this presentation.

EXHIBIT "B"

F

Cost Proposal

FEHR PEERS

2020-2021

(July 2020 through June 2021)

Hourly Billing Rates

Classification	**Hourly Rate**		
Principal	$180.00	-	$350.00
Senior Associate	$185.00	-	$340.00
Associate	$170.00	-	$245.00
Senior Engineer/Planner	$135.00	-	$215.00
Engineer/Planner	$115.00	-	$165.00
Senior Engineering Technician	$145.00	-	$195.00
Senior Project Accountant	$160.00	-	$165.00
Senior Project Coordinator	$120.00	-	$165.00
Project Coordinator	$85.00	-	$150.00
Technician	$115.00	-	$160.00
Intern	$90.00	-	$115.00

- *Other Direct Costs / Reimbursable expenses are invoiced at cost plus 10% for handling.*
- *Personal auto mileage is reimbursed at the then current IRS approved rate (56 cents per mile as of Jan 2021).*
- *Voice & Data Communications (Telephone, fax, computer, e-mail, etc.) are invoiced at cost as a percentage of project labor.*

Fehr & Peers reserves the right to change these rates at any time with or without advance notice.

RESOLUTION NO. 21-257

APPROVING AN ON-CALL PROFESSIONAL SERVICES AGREEMENT, BY AND BETWEEN THE CITY OF ROSEVILLE AND KIMLEY-HORN AND ASSOCIATES, AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE

WHEREAS, an on-call professional services agreement regarding On-Call Transportation Impact Studies, by and between the City of Roseville and Kimley-Horn and Associates, has been reviewed by the City Council; and

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Roseville that said on-call agreement is hereby approved and the City Manager is authorized to execute it on behalf of the City of Roseville.

PASSED AND ADOPTED by the Council of the City of Roseville this___day of _____, 20___, by the following vote on roll call:

AYES COUNCILMEMBERS:

NOES COUNCILMEMBERS:

ABSENT COUNCILMEMBERS:

_____
MAYOR

ATTEST:

_____
City Clerk

ON-CALL PROFESSIONAL SERVICES AGREEMENT

Services: Transportation Impact Studies

THIS AGREEMENT is made and entered into this ___ day of _____, 20__, by and between the City of Roseville, a municipal corporation ("CITY"), and Kimley-Horn and Associates, Inc., a North Carolina corporation ("CONSULTANT"); and

W I T N E S S E T H:

WHEREAS, CITY issued Request for Proposal #06-0002 for professional services consisting of on-call transportation impact study services; and

WHEREAS, CONSULTANT has prepared a response to the Request for Proposal dated February 16, 2021, which describes the scope of services to be performed by CONSULTANT, and the hourly rates for performance of such services; and

WHEREAS, CONSULTANT is qualified and experienced to provide professional services on an on-call basis.

NOW, THEREFORE, the parties agree as follows:

1. Term. The term of this Agreement shall commence upon execution and expire on June 30, 2022. The City Manager may, in his or her discretion, elect to extend the Agreement in one (1) year increments for up to an additional four (4) years by giving CONSULTANT thirty (30) days advance written notice of each optional one (1) year renewal. Such extensions shall be memorialized by a written amendment to this Agreement.

2. Services. CONSULTANT shall perform, at the direction of CITY, the scope of the on-call services as described in EXHIBIT "A," attached hereto and incorporated herein by this reference. Individual tasks will be awarded by CITY on an as-needed basis. CITY may assign work to one, or more than one consultant from an approved qualified list. CITY reserves the right to unilaterally assign work to any consultant as it deems prudent or, if no services are required, no work. CITY makes no specific guarantee of a minimum or maximum number of hours or amount of tasks or services, which shall be required of any single consultant. In addition, the inclusion of any consultant on any qualified list, if so utilized by CITY, shall in no way be considered an exclusive agreement to provide service for CITY.

3. Compensation. For its services provided hereunder, CONSULTANT shall be compensated on a time and expense basis in accordance with the hourly rates as described in EXHIBIT "B," attached hereto and incorporated herein by this reference. Any proposed increase in the effective rates for future services must be preceded by at least a 90-day written notice to the contracting department. Total compensation shall not exceed five hundred thousand dollars ($500,000). Total compensation for optional renewal years of this Agreement shall not exceed five hundred thousand dollars per year ($500,000). Adjustment to the total compensation per year shall require a written amendment to this Agreement, subject to approval by the City Council.

CONSULTANT shall submit one monthly invoice for its services. Such invoices shall be delineated by task, the person performing the services, and the hourly rate, which shall be stated in time increments of not greater than one tenth (1/10) hours. CITY shall pay invoices within thirty (30) days after receipt, if the services specified in the invoice have been satisfactorily completed.

4. Indemnification. To the fullest extent allowed by law, CONSULTANT shall defend, indemnify, and save and hold harmless CITY, its officers, agents, employees and volunteers from any claims, suits or actions of every name, kind and description brought forth, or on account of, injuries to or death of any person (including but not limited to workers and the public), or damage to property, resulting from or arising out of CONSULTANT's willful misconduct or negligent act or omission while engaged in the performance of obligations or exercise of rights created by this Agreement, except those matters arising from CITY's sole negligence or willful misconduct. The parties intend that this provision shall be broadly construed.

CONSULTANT agrees to defend and indemnify CITY if, despite the parties intent and practice, any venue, agency, or court with competent jurisdiction determines that CONSULTANT and/or any of its agents, officers, employees, volunteers, independent contractors, or subcontractors, are characterized as employee(s) of CITY.

CONSULTANT's responsibility for such defense and indemnity obligations shall survive the termination or completion of this Agreement for the full period of time allowed by law. The defense and indemnity obligations of this Agreement are undertaken in addition to, and shall not in any way be limited by, the insurance obligations contained in this Agreement.

5. Insurance. CONSULTANT agrees to continuously maintain, in full force and effect, the following minimum policies of insurance during the term of this Agreement.

COVERAGE	LIMITS OF LIABILITY
Workers' Compensation	Statutory

Commercial General Liability	$1,000,000 each occurrence $2,000,000 aggregate Personal Injury: $1,000,000 each occurrence $2,000,000 aggregate
Automobile Liability	$1,000,000 combined single limit
Professional Liability (errors and omissions)	$1,000,000 per claim $2,000,000 aggregate

a. Form. CONSULTANT shall submit a certificate evidencing such coverage for the period covered by this Agreement in a form satisfactory to Risk Management and the City Attorney, prior to undertaking any work hereunder. Any insurance written on a claims made basis is subject to the approval of Risk Management and the City Attorney.

b. Additional Insureds. CONSULTANT shall also provide a separate endorsement form or section of the policy showing CITY, its officers, agents, employees and volunteers as additional insureds for each type of coverage, except for Workers' Compensation and Professional Liability. Such insurance shall specifically cover the contractual liability of CONSULTANT. The additional insured coverage under the CONSULTANT's policy shall be primary and noncontributory, as evidenced by a separate endorsement or section of the policy, and shall not seek contribution from CITY's insurance or self-insurance. In addition, the additional insured coverage shall be at least as broad as the Insurance Services Office ("ISO") CG 20 01 Endorsement. Any available insurance proceeds in excess of the specified minimum insurance coverage requirements and limits shall be available to the additional insureds. Furthermore, the requirements for coverage and limits shall be: (1) the minimum coverage and limits specified in this Agreement; or (2) the full coverage and maximum limits of any insurance proceeds available to the named insureds, whichever is greater.

c. Cancellation/Modification. CONSULTANT shall provide ten (10) days written notice to CITY prior to cancellation or modification of any insurance required by this Agreement.

d. Umbrella/Excess Insurance. The limits of insurance required in this Agreement may be satisfied by a combination of primary and excess insurance. Any excess insurance shall contain or be endorsed to contain a provision that such coverage shall also apply on a primary and noncontributory basis for the benefit of CITY (if agreed to in a written contract) before CITY's own insurance shall be called upon to protect it as a named insured.

e. Subcontractors. CONSULTANT agrees to include in its contracts with all subcontractors the same requirements and provisions of this Agreement, including the indemnity and insurance requirements, to the extent they apply to the scope of the subcontractor's work. Furthermore, CONSULTANT shall require its subcontractors to agree to be bound to CONSULTANT and CITY in the same manner and to the same extent as CONSULTANT is bound to CITY under this Agreement. Additionally, CONSULTANT shall obligate its subcontractors to comply with these same provisions with respect to any tertiary subcontractor, regardless of tier. A copy of CITY's indemnity and insurance provisions will be furnished to the subcontractor or tertiary subcontractor upon request.

f. Self-Insured Retentions. All self-insured retentions ("SIR") must be disclosed to Risk Management for approval and shall not reduce the limits of liability. Policies containing any SIR provision shall provide or be endorsed to provide that the SIR may be satisfied by either the named insured or CITY. CITY reserves the right to obtain a full certified copy of any insurance policy and endorsements. The failure to exercise this right shall not constitute a waiver of such right.

g. Waiver of Subrogation. CONSULTANT hereby agrees to waive subrogation which any insurer of CONSULTANT may acquire from CONSULTANT by virtue of the payment of any loss under a Workers Compensation, Commercial General Liability or Automobile Liability policy. All Workers Compensation, Commercial General Liability and Automobile Liability policies shall be endorsed with a waiver of subrogation in favor of CITY, its officers, agents, employees and volunteers for all worked performed by CONSULTANT, its employees, agents and subcontractors.

h. Liability/Remedies. Insurance coverage in the minimum amounts set forth herein shall not be construed to relieve CONSULTANT of liability in excess of such coverage, nor shall it preclude CITY from taking such other actions as are available to it under any other provisions of this Agreement or law.

6. Records. CONSULTANT and its subcontractors shall maintain all files and records relating to the services performed hereunder during the term of this Agreement and for a period of not less than one (1) year after the date of termination or expiration. Provided, however, that in the event of litigation or settlement of claims arising from the performance of this Agreement, CONSULTANT and its subcontractors shall maintain all files and records until such litigation, appeals or claims are resolved. Duly authorized representatives of CITY shall have right of access during normal business hours and after reasonable notice to CONSULTANT's and subcontractors' files and records relating to the services performed hereunder, and may review and copy the files and records at appropriate stages during performance of the services and during the one (1) year period following termination or expiration of this Agreement. CONSULTANT shall include this provisions in its contracts with all subcontractors.

7. Prevailing Wages. When applicable, for purposes of this Agreement, CONSULTANT and its subcontractors shall comply with all applicable prevailing wage laws, e.g., but not limited to, California Labor Code Sections 1770 et seq. In accordance with said Section 1775, CONSULTANT shall forfeit as a penalty to the City two hundred dollars ($200) for each calendar day or portion thereof for each worker paid less than the prevailing rates for such work or craft in which such worker is employed for any work done on-site under the Agreement by CONSULTANT or by any subcontractor in violation of the provisions of the Labor Code and in particular, Labor Code Sections 1770 to 1780, inclusive. In addition to said penalty and pursuant to said Section 1775, the difference between such stipulated prevailing wage rates and the amount paid to each worker for each calendar day or portion thereof for which each worker was paid less than the stipulated prevailing wage shall be paid to each worker by CONSULTANT or the applicable subcontractor.

Pursuant to the provisions of California Labor Code Section 1773, the contracting department has identified the source, stated below, of the general prevailing rate of wages applicable to the site to be done, for straight time, overtime, and holiday work. The holiday wage rate listed shall be applicable to all holidays recognized in the collective bargaining agreement of the particular craft, classification or type of worker concerned. These wage rates may be obtained from the State Department of Industrial Relations and/or the following website address: http://www.dir.ca.gov/dlsr/DPreWageDetermination.htm.

Pursuant to Labor Code Section 1773.2, general prevailing wage rates set forth above, which forms a part of this Agreement, shall be posted by CONSULTANT at a prominent place at the work site. Prevailing wage rates to be posted at the work site will be furnished by the contracting department. The possibility of wage increases is one of the elements to be

considered by CONSULTANT in determining its proposal, and will not under any circumstances be considered as the basis of a claim against CITY or the Agreement.

8. Contractor Registration. No contractor or subcontractor may work on a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5. During the performance of this Agreement, CONSULTANT and its subcontractors shall have a continuing legal obligation to maintain current registration with the Department of Industrial Relations. CONSULTANT is hereby notified that this Agreement is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

9. Time is of the Essence. Time is of the essence of this Agreement. Notwithstanding any other provisions of this Agreement, the CONSULTANT shall not be deemed in breach because of minor reasonable delays caused by natural disasters, epidemics, pandemics, applicable quarantine restrictions, or acts of the City, third parties outside of CONSULTANT's control, or governmental agencies. CONSULTANT shall make best efforts to minimize and mitigate any such delay and shall provide notice to CITY within 24 hours of determining that a delay may occur.

10. Compliance with Laws. CONSULTANT shall comply with all federal, state and local laws, ordinances and policies as may be applicable to the performance of services under this Agreement.

11. Ability to Perform. CONSULTANT agrees and represents that it has the time, ability and professional expertise to perform the services required under this Agreement.

12. Governing Agreement. In the event of any conflict between this Agreement and its EXHIBITS, the provisions of this Agreement shall govern. In the event of any conflict between any of the EXHIBITS, the provisions of the first in order of attachment shall govern.

13. Assignment. CONSULTANT is employed to perform unique personal services. CONSULTANT shall not assign this Agreement without the prior written consent of CITY. CONSULTANT shall not employ or otherwise incur any obligation to pay other specialists or experts for services in connection with this Agreement, without prior written consent of CITY.

14. Independent Contractor. CONSULTANT, inclusive of its agents, officers, employees, volunteers, independent contractors, and subcontractors, shall act as an independent contractor, and covenants and agrees that it will conduct itself consistent with such status, that it will neither hold itself out as, nor claim to be, an officer or employee of CITY by reason of this Agreement.

CONSULTANT and CITY agree that: (a) CONSULTANT is free from the control and direction of CITY in connection with the performance of the work; (b) CONSULTANT is providing services directly to CITY; (c) CONSULTANT has and will maintain at all relevant times a business license; (d) CONSULTANT maintains a business location that is separate from CITY; (e) CONSULTANT is customarily engaged in an independently established business of the same nature as that involved in the work performed hereunder; (f) CONSULTANT actually contracts with other businesses to provide the same or similar services and maintains a clientele without restrictions from CITY; (g) CONSULTANT advertises and holds itself out to the public as available to provide the same or similar services; (h) CONSULTANT provides its own tools, vehicles, and equipment to perform the services; (i) CONSULTANT has negotiated its own rates; (j) CONSULTANT set its own hours and location of work in accomplishing CITY's on-call needs; and (k) CONSULTANT has the right to control the manner and means of accomplishing the result desired and exercises its own expert independent judgement.

15. Representations and Warranties. CONSULTANT warrants that it has not employed or retained any company or person, other than a bona fide employee working for CONSULTANT, to solicit or secure this Agreement, and that it has not paid or agreed to pay any company or person, other than a bona fide employee, any fee, commission, percentage, brokerage fee, gift or any other consideration, contingent upon or resulting from the award or making of this Agreement. For breach or violation of this warranty, CITY shall have the right to terminate as void this Agreement, without liability, or, in its discretion, to deduct from the Agreement price or consideration, or otherwise recover, the full amount of such fee, commission, percentage, brokerage fee, gift or contingent fee.

16. Successors in Interest. This Agreement shall be binding upon the heirs, successors, executors, administrators and assigns of the respective parties hereto.

17. Copyright, Ownership and Use of Materials. All tangible material ("Material") created or delivered pursuant to this Agreement is considered a work made for hire under the Copyright Act. To the extent such Material does not qualify as a work made for hire, CONSULTANT hereby assigns to CITY all right, title, and interest, including but not limited to all copyrights, in all Material created by CONSULTANT in its performance under this Agreement. Material constitutes the scope of work outlined in Exhibit A and attached hereto, and all written and other tangible expressions, including but not limited to, drawings (including computer aided drawings), papers, documents, reports, surveys, renderings, exhibits, sketches, maps, models, prints, paintings or photographs, in any and all media or formats in which such materials have been created or are maintained. All Material furnished by CONSULTANT is, and shall remain, the property of CITY.

CONSULTANT shall execute any documents necessary to effectuate such assignment. In the event that CONSULTANT uses, employs, designates, or retains any person or entity who is not an employee of CONSULTANT, to perform any work required of it pursuant to this Agreement, CONSULTANT shall require said person or entity to execute an agreement containing the preceding paragraph.

18. Termination of Agreement. CITY may terminate this Agreement without cause by giving CONSULTANT ten (10) days advance written notice from the City Manager. CONSULTANT may terminate this Agreement without cause by giving CITY thirty (30) days advance written notice. CONSULTANT understands that continuation of this Agreement past June 30th of any given year is contingent upon appropriation of funds for such purpose in the budget of the City of Roseville in the sole discretion of the City Council. In the event of termination through no fault of CONSULTANT, CITY shall compensate CONSULTANT for services performed as of the date of termination, upon the release to CITY of all Material hereunder, in any and all media or formats in which such materials have been created or are maintained. CITY retains the right to receive and use any MATERIAL, notwithstanding any termination or any dispute regarding the amount to be paid.

19. Attorney's Fees; Venue; Governing Law. If either party commences any legal action against the other party arising out of this Agreement or the performance hereof, the prevailing party in such action shall be entitled to recover its reasonable litigation expenses, including but not limited to, court costs, expert witness fees, discovery expenses, and attorney's fees. Any action arising out of this Agreement shall be brought in Placer County, California, regardless of where else venue may lie. This Agreement shall be governed by and construed in accordance with the laws of the State of California.

20. Modification. This Agreement and each provision contained herein may be waived, amended, supplemented or eliminated only by mutual written agreement of the parties.

21. Severability. If any of the provisions contained in this Agreement are for any reason held invalid or unenforceable, such holding shall not affect the remaining provisions or the validity and enforceability of the Agreement as a whole.

22. Notices. Any notices to parties required by this Agreement shall be delivered personally or mailed, U.S. first class postage prepaid, addressed as follows:

CITY OF ROSEVILLE	CONSULTANT
Mike Isom City of Roseville 311 Vernon Street Roseville, CA 95678	Matt Weir Kimley-Horn and Associates, Inc. 555 Capitol Mall, Suite 300 Sacramento, CA 95814

Either party may amend its address for notice by giving notice to the other party in writing.

23. Integrated Agreement. This is an integrated agreement and contains all of the terms, considerations, understanding and promises of the parties. It shall be read as a whole.

IN WITNESS WHEREOF, the City of Roseville, a municipal corporation, has authorized the execution of this Agreement in duplicate by its City Manager and attested to by its City Clerk under the authority of Resolution No. _____, adopted by the Council of the City of Roseville on the ___ day of _____, 20__, and CONSULTANT has caused this Agreement to be executed.

[SIGNATURES ON NEXT PAGE]

CITY OF ROSEVILLE, a
municipal corporation

BY: _____
DOMINICK CASEY
City Manager

ATTEST:

BY: _____
SONIA OROZCO
City Clerk

APPROVED AS TO FORM:

BY: _____
ROBERT R. SCHMITT
City Attorney

APPROVED AS TO SUBSTANCE:

BY: _____
MIKE ISOM
Development Services Director

KIMLEY-HORN AND ASSOCIATES,
INC., a North Carolina corporation

BY: _____
its: Vice President

and

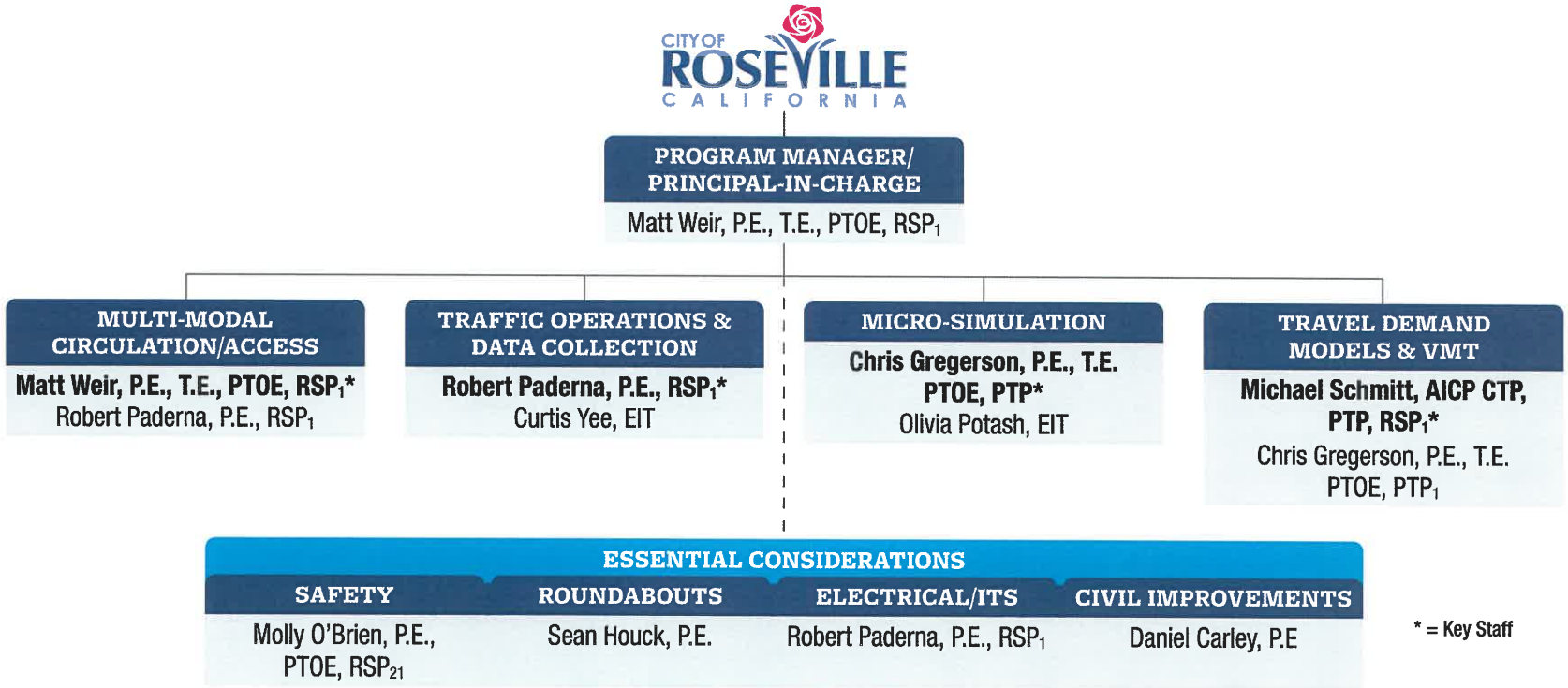
BY: _____
its: Assistant Secretary

EXHIBIT "A"

C: Qualifications of Team

Kimley-Horn knows that when you choose a consulting firm, you are really choosing the people who will bring you technical expertise, hands-on experience with similar projects, and commitment to timely and high-quality deliverables and client service. Our project team brings to this project local knowledge and extensive experience and has been structured to effectively provide strong support to the City of Roseville. Our team's leadership includes our project manager, **Matt Weir, P.E., T.E., PTOE, RSP$_1$**. We respect your requirement that our project manager role will not be changed without prior approval. Matt will serve as the City's main and day-to-day point of contact.

We have identified the most qualified personnel with recent, relevant, and local experience to be available to work with you. The organization chart below highlights our proposed team members' roles, with resumes in the following pages. The work for this on-call contract will be performed out of our Sacramento Office on Capitol Mall.





Matt Weir, P.E., T.E., PTOE, RSP$_1$

Program Manager

Matt is a civil/traffic engineer with more than 20 years of focused traffic engineering experience in traffic signal design, signal timing development and implementation, traffic impact studies, safety studies, parking and access studies, and ITS planning and design. Matt has a deep resume of traffic and ITS project experience throughout the Sacramento Region and Northern California.

Professional Credentials

- Master of Science, Civil Engineering (Transportation Systems), Georgia Institute of Technology
- Bachelor of Science, Civil Engineering, Clemson University
- Professional Civil Engineer in California #C70216
- Professional Traffic Engineer in California #TR2424
- Professional Traffic Operations Engineer (National) #2827
- Road Safety Professional 1 #571
- **Office Location:** Sacramento

RELEVANT EXPERIENCE

- **City of Roseville, On-Call Transportation Impact Studies, Roseville, CA** – Project Manager. Kimley-Horn was selected for this on-call roster to provide a variety of transportation planning and traffic operations services. In response to increasing development activity, the City of Roseville has been relying on their on-call transportation planning consultant roster to position themselves for the improving market. While mostly focused on development activity, these studies have included site access studies, multi-modal circulation and safety considerations, travel demand modeling and review, and general traffic impact and operations.
- **City of Roseville, Local Road Safety Plan (LRSP), Roseville, CA** – Principal-in-Charge. The City experiences a considerable multimodal mix of trips across its transportation network that serves a variety of needs and purposes, including high levels of bicycle and pedestrian activity. The City's top three primary collision factors include unsafe speed, automobile right-of-way, and traffic signal/sign violations. Our team is working with the City on the use of a data-driven analysis to further categorize collisions by intersection and roadway size and type, while working directly with local law enforcement to identify critical issues occurring on Roseville's roadways. Our scope of services includes the preparation of a public outreach plan as well as the completion of a focused countermeasure evaluation and project sheet development for five specific priority locations to assist with Highway Safety Improvement Program (HSIP) applications.
- **City of Roseville, Junction Boulevard at Vallejo Avenue Intersection Improvements, Roseville, CA** – QC/QA Reviewer. Kimley-Horn is supporting the City of Roseville with preparation of plans, specifications, and estimate (PS&E) for a new traffic signal at the intersection of Junction Boulevard and Vallejo Avenue. The intersection is being modified to convert an existing "T" intersection into a four leg intersection, with the new southern approach providing direct access to the Placer County Fairgrounds. The design includes traffic signals, signal interconnect, signing and striping, roadway, curb ramp modifications, utilities, and retaining walls. Kimley-Horn is coordinating closely with the Placer County Tourism (PVT) and its engineering design consultant who is leading the on-site design.
- **City of Roseville, Washington Boulevard at All America City Boulevard Roundabout Project, Roseville, CA** – Project Manager. Kimley-Horn was selected by the City of Roseville to prepare final design and construction documents for this important intersection improvement project. This intersection, located just north of downtown, serves as the gateway to the downtown core, and has critical interaction with Woodbridge Elementary, @ the Grounds, the Los Cerritos Neighborhood, and Washington Square. The Washington Boulevard corridor, Lincoln Street, and the adjacent Catalyst Site complete the diverse picture of challenges and opportunities. Kimley-Horn is preparing the design for a modern, multilane roundabout that is anticipated to reduce vehicle and pedestrian delay, and improve safety. This project includes additional Kimley-Horn services to assist with obtaining environmental clearance, developing streetscape concepts for application at this and the adjacent Oak Street roundabout, and inclusion of street lighting and ITS infrastructure for future use.
- **City of Roseville, ITS Master Plan Update, Roseville, CA** – Project Manager. Kimley-Horn has been assisting the City of Roseville for over 10 years as they implement their vision to be on the leading edge of the Sacramento region with its comprehensive and thorough traffic management system. The City's first ITS master plan was adopted in 2005. This plan strategically examined new traffic and ITS technologies, expanding City boundaries, and increasing population demand on its transportation system. After nearly a decade of successful ITS implementation, Kimley-Horn reviewed and updated the ITS Master Plan to confirm its current course, to assess emerging technologies, and to ensure an appropriate vision for expansion (both geographically and technologically). The plan will be implemented in phased deployments over five years.

- **City of Roseville, Roseville Parkway Extension, Roseville, CA** – Project Manager. Kimley-Horn is supporting the City of Roseville with the engineering design and traffic analysis services for the extension of Roseville Parkway between Foothills Boulevard and Washington Boulevard. The project includes a new bridge over the Union Pacific Railroad (UPRR) tracks and Industrial Avenue. Kimley-Horn is supporting the design team with preparation of plans, specifications, and engineer's estimate of probable construction costs (PS&E) for traffic signal modifications and lighting improvements at the Roseville Parkway intersections with Foothills Boulevard and Washington Boulevard, as well as the bridge lighting. We also performed a traffic operations and queuing analysis to inform intersection lane configurations and assess the effects of the extension of Roseville Parkway and the resulting operating conditions under Existing Base Year and Cumulative (Year 2035) conditions.
- **City of Sacramento, On-Call Traffic Impact Studies, Sacramento, CA** – Project Manager. Kimley-Horn is currently providing on-call traffic engineering services, including traffic impact studies, parking planning and policy, traffic scoping and design, and traffic signal timing and operations to the City of Sacramento for development related projects. As one of the first consultants to use SACOG's next generation activity-based travel demand model for the purposes of evaluating the traffic impacts associated with several development projects, we have developed a deep understanding of SACSIM. The development projects for which these traffic impact studies have been performed have ranged in size and complexity.
- **Various Traffic Impact Analyses (TIAs), Sacramento County, CA** – Project Manager. Kimley-Horn was one of the first consultants to use SACOG's next generation activity-based travel demand model, SACSIM, for the purposes of evaluating the traffic impacts associated with several development projects. These projects have enabled us to develop a deep understanding of SACSIM including experience with file sharing between multiple consultants who were working on adjacent projects. These projects have included Northborough, Barrett Ranch East, and Wilton Rancheria and each have required the preparation of an EIR into which our traffic analyses have been inserted. In addition, these projects have required frequent interaction with other technical study leads, such as Air Quality and Acoustic, to share technical data necessary to complete the various studies.
- **Citrus Heights, Local Roadway Safety Plan (LRSP), Citrus Heights, CA** – Principal-in-Charge. Kimley-Horn is currently assisting the City of Citrus Heights develop an LRSP to help the City identify and prioritize the most effective ways to improve traffic safety for all users, as part of a statewide goal to reduce traffic injuries and fatalities. The LRSP will address safety through roadway improvements, measures to modify driver behavior, and improved education, enforcement, and emergency response best practices. The LRSP will result in a set of data driven recommendations, coupled with input from key stakeholders representing the Safety Es included in the Strategic Highway Safety Plan (SHSP); engineering, enforcement, education, and emergency services. Detailed project sheets will be prepared for priority, high-crash locations to assist with the preparation of HSIP applications.
- **SACOG, Smart Region Sacramento: ITS Architecture and Future Technology Master and Implementation Plan, Sacramento Region, CA** – Project Manager. Kimley-Horn was selected by the Sacramento Area Council of Governments (SACOG) to develop a Regional Technology and Mobility Master Plan and individual agency Technology Implementation Plans. Greater Sacramento is comprised of diverse urban, suburban, and rural communities that routinely experience a wide range of demands and needs from their residents and users of the transportation system. Contributing to the region's challenges is the fact that some local agencies lack basic transportation communications and technology infrastructure while others are far more advanced and more appropriately positioned for evolving and disruptive technologies.
- **County of El Dorado, Traffic Impact Mitigation (TIM) Fee Update, El Dorado County, CA** – Principal-in-Charge. Kimley-Horn updated El Dorado County's TIM Fee program in conjunction with the newly adopted Capital Improvement Program (CIP). This update involved making changes to the Traffic Analysis Zones (TAZs) and TIM Fee Zone designations, running several different analysis scenarios and completing operations analysis for intersections and roadway segments throughout the County, and participating in public involvement with the Board of Supervisors meetings.
- **South of US 50 Analysis Forecast/VMT Tool, Folsom CA** – Project Manager. Kimley-Horn updated El Dorado County's TIM Fee program in conjunction with the newly adopted Capital Improvement Program (CIP). This update involved making changes to the Traffic Analysis Zones (TAZs) and TIM Fee Zone designations, running several different analysis scenarios and completing operations analysis for intersections and roadway segments throughout the County, and participating in public involvement with the Board of Supervisors meetings.



Robert Paderna, P.E., RSP$_1$

Multimodal Circulation/Access; Traffic Operations and Data Collection; Electrical/ITS

Professional Credentials

- Bachelor of Science, Civil Engineering, San Jose State University
- Professional Engineer in California #73262
- Road Safety Professional 1 #553
- **Office Location:** Sacramento

Robert has over 16 years of experience in transportation and traffic engineering. His experience includes safety studies, roadway safety signing audits, traffic control, engineering and traffic surveys, signal warrant analysis, pedestrian/bicycle facilities planning and design, signing and striping, traffic impact studies, signal timing, traffic signal design, street lighting, and ITS design. He is skilled in the application of California Manual on Uniform Traffic Control Devices (CA MUTCD) guidelines, ADA guidelines, Caltrans' HDM and Standard Plans, and industry best practices included in National Association of City Transportation Officials (NACTO) publications.

RELEVANT EXPERIENCE

- **City of Roseville, Junction Boulevard at Vallejo Avenue Intersection Improvements, Roseville, CA** – Project Manager. Kimley-Horn is supporting the City of Roseville with preparation of plans, specifications, and estimate (PS&E) for a new traffic signal at the intersection of Junction Boulevard and Vallejo Avenue. The intersection is being modified to convert an existing "T" intersection into a four-leg intersection, with the new southern approach providing direct access to the Placer County Fairgrounds. The design includes traffic signals, signal interconnect, signing and striping, roadway, curb ramp modifications, utilities, and retaining walls. Kimley-Horn is coordinating closely with the Placer County Tourism (PVT) and its engineering design consultant who is leading the on-site design.
- **City of Roseville, Roseville Parkway Extension, Roseville, CA** – Project Engineer. Kimley-Horn is supporting the City of Roseville with the engineering design and traffic analysis services for the extension of Roseville Parkway between Foothills Boulevard and Washington Boulevard. The project includes a new bridge over the Union Pacific Railroad (UPRR) tracks and Industrial Avenue. Kimley-Horn is supporting the design team with preparation of plans, specifications, and engineer's estimate of probable construction costs (PS&E) for traffic signal modifications and lighting improvements at the Roseville Parkway intersections with Foothills Boulevard and Washington Boulevard, as well as the bridge lighting. We also performed a traffic operations and queuing analysis to inform intersection lane configurations and assess the effects of the extension of Roseville Parkway and the resulting operating conditions under Existing Base Year and Cumulative (Year 2035) conditions.
- **City of Roseville, Local Road Safety Plan (LRSP), Roseville, CA** – Deputy Project Manager. The City experiences a considerable multimodal mix of trips across its transportation network that serves a variety of needs and purposes, including high levels of bicycle and pedestrian activity. The City's top three primary collision factors include unsafe speed, automobile right-of-way, and traffic signal/sign violations. Our team is working with the City on the use of a data-driven analysis to further categorize collisions by intersection and roadway size and type, while working directly with local law enforcement to identify critical issues occurring on Roseville's roadways. Our scope of services includes the preparation of a public outreach plan as well as the completion of a focused countermeasure evaluation and project sheet development for five specific priority locations to assist with Highway Safety Improvement Program (HSIP) applications.
- **City of Roseville, ITS Master Plan Update, Roseville, CA** – Project Engineer. Kimley-Horn has been assisting the City of Roseville for over 10 years as they implement their vision to be on the leading edge of the Sacramento region with its comprehensive and thorough traffic management system. The City's first ITS master plan was adopted in 2005. This plan strategically examined new traffic and ITS technologies, expanding City boundaries, and increasing population demand on its transportation system. After nearly a decade of successful ITS implementation, Kimley-Horn reviewed and updated the ITS Master Plan to confirm its current course, to assess emerging technologies, and to ensure an appropriate vision for expansion (both geographically and technologically). The plan will be implemented in phased deployments over five years.



Michael Schmitt, AICP CTP, PTP, RSP$_1$

Travel Demand Models and VMT

Professional Credentials

- Master of Science, Planning, University of Arizona
- Bachelor of Science, Regional Development, University of Arizona
- American Institute of Certified Planners Certified Transportation Planner (AICP CTP) #106984
- Professional Transportation Planner (PTP) #220
- Road Safety Professional 1 #185
- **Office Location:** Sacramento

Mike is one of only a handful of transportation professionals in the United States that is recognized by both the American Planning Association (APA) and Transportation Professional Certification Board (TPCB) as being an expert in transportation planning. With nearly two decades of experience, Mike has worked on a wide variety of multimodal transportation projects including those with a significant focus on transit planning and operations. Most recently, Mike has led the preparation of a detailed VISSIM analysis of BRT operations in a major downtown, prepared a "Best Practices" document on transit center design, and developed an organization wide public involvement plan for a major transit provider in the Bay Area. Mike's broader technical expertise includes public involvement, transportation modeling, multi-modal planning, land use planning, geographic information systems (GIS), traffic operations, technical writing, and research.

RELEVANT EXPERIENCE

- **County of El Dorado, Travel Demand Model Update, El Dorado County, CA** – Project Manager. Kimley-Horn is updating El Dorado County's Travel Demand Model base year to 2016 and the horizon year to 2040. This effort involves incorporating updated land use information for the buffer zone (the modelled area outside the County) and for the County itself. The resulting base year (2016) model will be validated using accepted standards and the underlying Geographical Information System (GIS) based parcel dataset will also be updated.
- **County of El Dorado, Travel Demand Update/Land Use Forecast/ Environmental Impact Report, El Dorado County, CA** – Project Manager. Kimley-Horn was responsible for completing this multifaceted transportation and land use planning project. Major activities being undertaken as part of this effort include the development of a new travel demand model that includes state-of the art methodologies, GIS integration, and GIS based data sets. Kimley-Horn was also responsible for developing a parcel-based land use forecast, providing transportation planning and policy expertise, public open houses and board of supervisor's presentations, and preparing the traffic chapter of the Environmental Impact Report being prepared to evaluate potential updates to the existing General Plan.
- **Sacramento International Airport (SMF), Master Infrastructure Plan SB 743 Analysis, Sacramento, CA** – Task Lead. Kimley-Horn completed a VMT assessment as a part of the airport's Master Infrastructure Plan update. The primary focus of the VMT assessment was to complete a CEQA level analysis of the expected passenger growth forecasted to occur over the next twenty years. The VMT assessment included tracking airport passengers throughout the six-County Sacramento Area Council of Governments (SACOG) region using SACOG's travel demand model, as well as determining the length passengers will travel to airports in the Bay Area due to unmet demand at SMF. Kimley-Horn determined the overall impact to VMT in the region due to passengers being recaptured by the airport due to future increases in flight supply, increased growth within the SACOG region, and increases to employment at the airport due to the increased supply of flights.
- **City of Folsom, South of US-50 Analysis Forecast/VMT Tool, Folsom, CA** – Project Manager. Kimley-Horn developed a transportation planning tool based on detailed land use forecasting and travel demand modeling to facilitate the orderly planning and financing of planned transportation infrastructure within the South of US-50 development area for the City of Folsom. The tool developed is a spreadsheet-based sketch planning tool that assists the City in determining the timing and need for specific planned transportation improvements within the South of US-50 development area.
- **County of Santa Cruz, Travel Demand Modeling and Vehicle Miles Traveled (VMT) Analysis for General Plan Update, Santa Cruz County, CA** – Project Planner. Kimley-Horn is working with the County of Santa Cruz to build on Kimley-Horn's previous effort of updating County's travel demand model to a base year of 2015 and future year of 2035. As a part of the County's General Plan Update, Kimley-Horn is working with the County to update the travel demand to a base year of 2019 and a future year of 2040. In addition, Kimley-Horn is completing a VMT analysis for the County and Cities of Capitola, Santa Cruz, Scotts Valley, and Watsonville as a part of the SB 743 threshold development process.



Chris Gregerson, P.E., T.E., PTOE, PTP

Micro-simulation; Travel Demand Models and VMT

Chris is a professional civil and traffic engineer with more than nine years of experience in developing traffic impact analyses for both new developments and the expansion of existing developments. He has aided in identifying levels of service and operations for both intersections and roadway and highway segments. Chris has experience in dealing with identifying unsafe roadway conditions due to vehicle speeds and volume as well as analyzing the minimum required throat depth (MRTD) for driveways at new developments. Chris has direct experience in running travel demand models in both the standard and activity-based approaches as well as calibrating mode choice models for metropolitan regions. Chris is skilled in GIS and has experience managing and interpreting data for special analysis and graphics creation.

Professional Credentials

- Master of Science, Transportation Engineering, University of Illinois at Urbana-Champaign
- Bachelor of Science, Industrial Engineering, Virginia Polytechnic Institute and State University
- Professional Engineer in California #C86812
- Professional Traffic Engineer in California #2860
- Professional Traffic Operations Engineer #4588
- Professional Transportation Planner #657
- **Office Location:** Sacramento

RELEVANT EXPERIENCE

- **City of Roseville, 850 Cirby Way Traffic Impact Analysis, Roseville, CA** – Project Manager. Kimley-Horn provided traffic impact analysis services for the proposed project, a modification of the Light of the Gospel Church's existing campus to include a new 900-1,000 seat, 20,000-square foot sanctuary building on the project site located in the southeast corner of the Cirby Way intersection with Orlando Avenue in the City of Roseville. Specifically, Kimley-Horn evaluated the proposed project's localized traffic operations and access points, including throat depths, tapers, storage, and driveway treatments that are necessary to ensure safe and efficient operations.
- **City of Sacramento, On-Call Traffic Impact Studies, Sacramento, CA** – Project Engineer. Kimley-Horn is currently providing on-call traffic engineering services, including traffic impact studies, parking planning and policy, traffic scoping and design, and traffic signal timing and operations to the City of Sacramento for development related projects. As one of the first consultants to use SACOG's next generation activity-based travel demand model for the purposes of evaluating the traffic impacts associated with several development projects, we have developed a deep understanding of SACSIM. The development projects for which these traffic impact studies have been performed have ranged in size and complexity.
- **County of El Dorado, Travel Demand Model Update, CA** – Project Engineer. Kimley-Horn is updating El Dorado County's Travel Demand Model base year to 2016 and the horizon year to 2040. This effort involves incorporating updated land use information for the buffer zone (the modelled area outside the County) and for the County itself. The resulting base year (2016) model will be validated using accepted standards and the underlying Geographical Information System (GIS) based parcel dataset will also be updated.
- **City of West Sacramento, NEPA/VMT Analysis, West Sacramento, CA** – Project Manager. Kimley-Horn completed a Vehicle Miles Traveled (VMT) evaluation for a proposed housing project in West Sacramento in support of the NEPA documentation being prepared by others. Specifically, Kimley-Horn completed an assessment of the VMT associated with the proposed project as it compares to the existing use, a twelve-unit apartment complex and a cigarette and tobacco store and documented the change in VMT based on the new homeless housing use.
- **City of West Sacramento, River Park TIA Peer Review, West Sacramento, CA** – Project Manager. Kimley-Horn completed a peer review of the River Park Development Transportation Impact Study. This review will primarily consist of a "fatal flaws" assessment, including a review of volumes (intersection and roadway segments), analysis methodologies (tools and calculations), threshold comparisons, mitigations, and VMT analysis.



Molly O'Brien, P.E., PTOE, RSP$_{2I}$

Safety

Molly has more than 17 years of safety, traffic, and transportation planning and design experience, which includes providing transportation safety consulting services to public agencies throughout the country. Her experience includes LRSPs, SSARs, RSAs, pedestrian/bicycle studies, and complete streets studies. Additionally, she has completed formal training on RSAs and the HSM IHSDM. She is experienced in conducting stakeholder workshops and prioritizing improvements to help maximize resources. Molly has also developed complete streets policies and concept plans that include bicycle and pedestrian facilities. She will use her experience and lessons learned on other systemic safety projects to provide solutions that enhance safety, while maximizing HSIP funding opportunities.

Professional Credentials

- Master of Science, Civil Engineering, Iowa State University, Ames
- Bachelor of Science, Civil Engineering, Iowa State University, Ames
- Professional Engineer in Nevada #17702
- Professional Traffic Operations Engineer #2534
- Road Safety Professional 1 #28
- Road Safety Professional 2I Infrastructure #8
- **Office Location:** Reno, NV

RELEVANT EXPERIENCE

- **City of Roseville, Local Roadway Safety Plan (LRSP), Roseville, CA** – Project Manager. Kimley-Horn is currently assisting the City of Roseville on their LRSP. The City experiences considerable multimodal mix of trips across its transportation network that serves a variety of needs and purposes, including high levels of bicycle and pedestrian activity. Our team is working with the City on the use of a data-driven analysis to further categorize collisions by intersection and roadway size and type, while working directly with local law enforcement to identify critical issues occurring on Roseville's roadways. Our scope of services includes the preparation of a public outreach plan, as well as the completion of a focused countermeasure evaluation and project sheet development for five specific priority locations to assist with HSIP applications.
- **City of Citrus Heights, Local Roadway Safety Plan (LRSP), Citrus Heights, CA** – Deputy Project Manager. Kimley-Horn is currently assisting the City of Citrus Heights develop an LRSP to help the City identify and prioritize the most effective ways to improve traffic safety for all users, as part of a statewide goal to reduce traffic injuries and fatalities. The LRSP will address safety through roadway improvements, measures to modify driver behavior, and improved education, enforcement, and emergency response best practices. The LRSP will result in a set of data driven recommendations, coupled with input from key stakeholders representing the Safety Es included in the SHSP; engineering, enforcement, education, and emergency services. Detailed project sheets will be prepared for priority, high-crash locations to assist with the preparation of HSIP applications.
- **City of Rocklin, Local Roadway Safety Plan (LRSP), Rocklin, CA** – Deputy Project Manager. Kimley-Horn is helping the City of Rocklin identify and prioritize the most effective ways to improve traffic safety for all users, as part of a statewide goal to reduce traffic injuries and fatalities. The City's LRSP will address safety through roadway improvements, measures to modify driver behavior, and improve education, enforcement, and emergency response best practices. The LRSP will result in a set of data driven recommendations, coupled with input from key stakeholders representing the Safety Es included in the Strategic Highway Safety Plan (SHSP): engineering, enforcement, education, and emergency services.
- **Caltrans, California Strategic Highway Safety Plan (SHSP) Update and Implementation, Statewide, CA** – Analyst. Kimley-Horn was selected by the Caltrans Division of Traffic Operations to lead California's 2020 to 2024 Strategic Highway Safety Plan (SHSP) Update and Implementation. The SHSP is a multi-agency collaborative effort between Caltrans and California Highway Patrol, Office of Traffic Safety, Department of Motor Vehicles, Emergency Medical Services Authority, Department of Public Health, Department of Alcoholic Beverage Control, Tribal/Native American Advisory Committee, Metropolitan Planning Organizations, State Association of Counties, League of Cities, and traffic safety advocates. The SHSP's mission is to ensure a safe and sustainable transportation system for all motorized and non-motorized users on all public roads in California and to work Toward Zero Deaths. Kimley-Horn's role is to assist with SHSP development, action plans, and compliance with federal requirements.



Sean Houck, P.E.

Roundabouts

Professional Credentials

- Master of Science, Civil Engineering, California State University, Long Beach
- Bachelor of Science, Civil Engineering, California State University, Long Beach
- Professional Engineer in California #C59500
- **Office Location:** Sacramento

Sean is a principal engineer with 24 years of success in the development and delivery of transportation projects for state and local agencies throughout California. His experience includes the preparation of feasibility studies, intersection control evaluations, project initiation documents, project assessment and environmental documents, construction documents, and construction administration and support. Project experience includes planning and design of urban highway interchanges, urban arterials and collectors, road diet and complete street projects, conventional highways, as well as rail and transit facilities. In addition to traditional civil roadway design, Sean has more than 13 years of experience in the planning and design of mini, single lane, and multilane roundabouts in Caltrans Districts 3, 4, 5, and 6.

RELEVANT EXPERIENCE

- **City of Roseville, Washington Boulevard at All America City Boulevard Roundabout Project, Roseville, CA** – Project Engineer. Kimley-Horn was selected by the City of Roseville to prepare final design and construction documents for this important intersection improvement project. This intersection, located just north of downtown, serves as the gateway to the downtown core, and has critical interaction with Woodbridge Elementary, @ the Grounds, the Los Cerritos Neighborhood, and Washington Square. The Washington Boulevard corridor, Lincoln Street, and the adjacent Catalyst Site complete the diverse picture of challenges and opportunities. Kimley-Horn is preparing the design for a modern, multi-lane roundabout that is anticipated to reduce vehicle and pedestrian delay, and improve safety. This project includes additional Kimley-Horn services to assist with obtaining environmental clearance, developing streetscape concepts for application at this and the adjacent Oak Street roundabout, and inclusion of street lighting and ITS infrastructure for future use.
- **City of Rocklin, Rocklin Road/Pacific Street Roundabout Design and Right-of-Way Services, Rocklin, CA** – Project Manager. Kimley-Horn was selected for the engineering design, right-of-way service, and environmental clearance for the Rocklin Road/Pacific Street Roundabout Project. For the environmental clearance, Kimley-Horn is preparing a Categorical Exclusion (CE) under NEPA with supporting technical studies. The project consists of improvements to the intersection of Rocklin Road and Pacific Street to remove traffic signals and replace them with a roundabout. These improvements will facilitate efficient vehicle traffic circulation through the intersection, as well as facility safer pedestrian crossings through the area. Technical studies managed by Kimley-Horn include an Historic Property Survey Report, Archaeological Survey Report, Natural Environment Study, and Phase I Initial Site Assessment.
- **City of Lincoln, Engineering Design Services on the East Joiner Parkway Widening Project, Lincoln, CA** – Project Manager. Kimley-Horn was selected by the City of Lincoln to perform engineering design and traffic analysis services for the widening of East Joiner Parkway between Twelve Bridges Drive and the Lincoln/Rocklin border, in which the total length will be 0.9 miles. The City's original project included widening the existing roadway from two lanes to four lanes, and installing two traffic signals. In working with the City and in anticipation of the new high school scheduled to open in 2021, we evaluated the long-term cost-effectiveness of implementing traffic signals or roundabouts at two intersection locations. Based on the future volumes and need to widen an existing culvert if a signal was installed at Fieldstone Drive, it was determined a roundabout would be a more appropriate choice for intersection control. The final project design will include widening, a new signal installation at Westview Drive, an emergency vehicle signal at the fire station, and a roundabout at Fieldstone Drive.



Daniel Carley, P.E.

Civil Improvements

Professional Credentials

- Bachelor of Science, Civil Engineering, California Polytechnic State University, San Luis Obispo
- Professional Engineer in California #76304
- **Office Location:** Sacramento

Daniel is a professional engineer with more than 17 years of experience, specializing in both municipal and State roadway design projects. He has been involved with and managed many different types of projects, from planning to preliminary engineering to final PS&E for roadway modifications, BRT systems, roundabouts, and freeway interchanges. With these different types of projects, Daniel has been responsible for developing design alternatives, estimates of probable cost, specifications, and final construction plans. Daniel is also up-to-date with the latest applicable design standards and guidelines, including ADA guidelines, Caltrans' HDM and Standard Plans, AASHTO design guidelines, and the California MUTCD.

RELEVANT EXPERIENCE

- **City of Roseville, Washington Boulevard at All America City Boulevard Roundabout Project, Roseville, CA** – Project Engineer. Kimley-Horn was selected by the City of Roseville to prepare final design and construction documents for this important intersection improvement project. This intersection, located just north of downtown, serves as the gateway to the downtown core, and has critical interaction with Woodbridge Elementary, @ the Grounds, the Los Cerritos Neighborhood, and Washington Square. The Washington Boulevard corridor, Lincoln Street, and the adjacent Catalyst Site complete the diverse picture of challenges and opportunities. Kimley-Horn is preparing the design for a modern, multilane roundabout that is anticipated to reduce vehicle and pedestrian delay and improve safety. This project includes additional Kimley-Horn services to assist with obtaining environmental clearance, developing streetscape concepts for application at this and the adjacent Oak Street roundabout, and inclusion of street lighting and ITS infrastructure for future use.
- **City of Roseville, Junction Boulevard at Vallejo Avenue Intersection Improvements, Roseville, CA** – Project Engineer. Kimley-Horn is supporting the City of Roseville with preparation of plans, specifications, and estimate (PS&E) for a new traffic signal at the intersection of Junction Boulevard and Vallejo Avenue. The intersection is being modified to convert an existing "T" intersection into a four-leg intersection, with the new southern approach providing direct access to the Placer County Fairgrounds. The design includes traffic signals, signal interconnect, signing and striping, roadway, curb ramp modifications, utilities, and retaining walls. Kimley-Horn is coordinating closely with the Placer County Tourism (PVT) and its engineering design consultant who is leading the on-site design.
- **City of Lincoln, Engineering Design Services on the East Joiner Parkway Widening Project, Lincoln, CA** – Project Engineer. Kimley-Horn was selected by the City of Lincoln to perform engineering design and traffic analysis services for the widening of East Joiner Parkway between Twelve Bridges Drive and the Lincoln/Rocklin border, in which the total length will be 0.9 miles. The City's original project included widening the existing roadway from two lanes to four lanes and installing two traffic signals. In working with the City and in anticipation of the new high school scheduled to open in 2021, we evaluated the long-term cost-effectiveness of implementing traffic signals or roundabouts at two intersection locations. Based on the future volumes and need to widen an existing culvert if a signal was installed at Fieldstone Drive, it was determined a roundabout would be a more appropriate choice for intersection control. The final project design will include widening, a new signal installation at Westview Drive, an emergency vehicle signal at the fire station, and a roundabout at Fieldstone Drive.
- **City of Santa Rosa, Bicycle and Pedestrian Gap Closures at Piner Road and Dutton Avenue, Santa Rosa, CA** – Project Manager. Kimley-Horn worked with the City of Santa Rosa on the Piner Road and Dutton Avenue Bicycle and Pedestrian Closure project. The City's existing bicycle and pedestrian facility network along Piner Road and Dutton Avenue had several critical gaps and deficiencies that the project sought to correct. Improvements included ADA curb ramp replacement at nine locations, new sidewalk for approximately 500 feet along Dutton Avenue, and pavement rehabilitation with designated bicycle lane striping along approximately three quarters of a mile of Piner Road. Kimley-Horn provided final PS&E and design services during construction, which was completed in summer 2020.



Curtis Yee, EIT

Traffic Operations and Data Collection

Professional Credentials

- Bachelor of Science, Civil Engineering, California Polytechnic State University, San Luis Obispo
- Engineer-in-Training (EIT) #163265
- **Office Location:** Sacramento

Curtis is a transportation analyst with experience in transportation design throughout Northern California. Curtis has worked on projects in which he supported tasks including data collection, temporary traffic control, and preparing PS&E for traffic signals, communications, and street lighting. He is proficient in AutoCAD, AGI, and Synchro. He is also adept in application of California Manual on Uniform traffic Control Devices (CAMUTCD) guidelines and Caltrans Standard Plans and Specifications.

RELEVANT EXPERIENCE

- **City of Roseville, Junction Boulevard at Vallejo Avenue Intersection Improvements, Roseville, CA** – Analyst. Kimley-Horn is supporting the City of Roseville with preparation of plans, specifications, and estimate (PS&E) for a new traffic signal at the intersection of Junction Boulevard and Vallejo Avenue. The intersection is being modified to convert an existing "T" intersection into a four-leg intersection, with the new southern approach providing direct access to the Placer County Fairgrounds. The design includes traffic signals, signal interconnect, signing and striping, roadway, curb ramp modifications, utilities, and retaining walls. Kimley-Horn is coordinating closely with the Placer County Tourism (PVT) and its engineering design consultant who is leading the on-site design.
- **City of Roseville, Washington Boulevard at All America City Boulevard Roundabout Project, Roseville, CA** – Analyst. Kimley-Horn was selected by the City of Roseville to prepare final design and construction documents for this important intersection improvement project. This intersection, located just north of downtown, serves as the gateway to the downtown core, and has critical interaction with Woodbridge Elementary, @ the Grounds, the Los Cerritos Neighborhood, and Washington Square. The Washington Boulevard corridor, Lincoln Street, and the adjacent Catalyst Site complete the diverse picture of challenges and opportunities. Kimley-Horn is preparing the design for a modern, multi-lane roundabout that is anticipated to reduce vehicle and pedestrian delay and improve safety. This project includes additional Kimley-Horn services to assist with obtaining environmental clearance, developing streetscape concepts for application at this and the adjacent Oak Street roundabout, and inclusion of street lighting and ITS infrastructure for future use.
- **City of West Sacramento, Harbor Blvd Corridor Signal Coordination, West Sacramento, CA** – Analyst. Kimley-Horn is currently working with the City of West Sacramento to develop and implement new weekday time-of-day coordination plans for three traffic signals along Harbor Boulevard. This corridor is a heavily used arterial providing a primary connection to the Southport area via Industrial Boulevard. This corridor experience high traffic volumes including a significant proportion of truck traffic. These near-term improvements will aid in improving access and circulation between US-50 and the Southport area. This effort follows the familiar task pattern in which three weekday timing plans are developed and implemented, and a final "after" study is completed to document the benefits of the retiming.
- **City of Citrus Heights, Greenback Lane Signal Retiming, Citrus Heights, CA** – Analyst. Kimley-Horn is providing traffic engineering services for the City of Citrus Heights to develop and implement new weekday and weekend time-of-day coordination plans for fourteen (14) traffic signals along Greenback Lane. These timings include three weekday plans, as well as the weekend peak periods (a total of 5 plans). The overall goals outlined by the City for the project include reducing delays and stops at signalized intersections, improving travel time and traffic flow, and improving the safety of motorists, pedestrians, and bicyclists. This project includes completion of a final "after" travel time study to field measure the improvements in system performance.



Olivia Potash, EIT

Microsimulation

Professional Credentials

- Bachelor of Science, Civil Engineering, University of California, Davis
- Engineer-in-Training (EIT) #162541
- **Office Location:** Sacramento

Olivia is a transportation analyst with experience in the public and private sectors. She has been involved in projects related to engineering and traffic surveys, roadway safety assessments, traffic impact studies, and integrated corridor management plans. She is well-versed in Synchro/Simtraffic, Vissim, HCS, and ArcGIS, and Adobe Illustrator.

RELEVANT EXPERIENCE

- **City of Roseville, Local Road Safety Plan (LRSP), Roseville, CA** – Analyst. The City experiences a considerable multimodal mix of trips across its transportation network that serves a variety of needs and purposes, including high levels of bicycle and pedestrian activity. The City's top three primary collision factors include unsafe speed, automobile right-of-way, and traffic signal/sign violations. Our team is working with the City on the use of a data-driven analysis to further categorize collisions by intersection and roadway size and type, while working directly with local law enforcement to identify critical issues occurring on Roseville's roadways. Our scope of services includes the preparation of a public outreach plan as well as the completion of a focused countermeasure evaluation and project sheet development for five specific priority locations to assist with Highway Safety Improvement Program (HSIP) applications.
- **Citrus Heights, Local Roadway Safety Plan (LRSP), Citrus Heights, CA** – Analyst. Kimley-Horn is currently assisting the City of Citrus Heights develop an LRSP to help the City identify and prioritize the most effective ways to improve traffic safety for all users, as part of a statewide goal to reduce traffic injuries and fatalities. The LRSP will address safety through roadway improvements, measures to modify driver behavior, and improved education, enforcement, and emergency response best practices. The LRSP will result in a set of data driven recommendations, coupled with input from key stakeholders representing the Safety Es included in the Strategic Highway Safety Plan (SHSP); engineering, enforcement, education, and emergency services. Detailed project sheets will be prepared for priority, high-crash locations to assist with the preparation of HSIP applications.
- **City of Folsom, Safety Assessment of East Natoma Street and Blue Ravine Road, Folsom, CA** – Analyst. Kimley-Horn is providing traffic engineering services to identify multi-modal safety improvements along the East Natoma Street and Blue Ravine Road corridors. As part of this project, our team has implemented robust, automated data collection methods including Mobile LiDar for sign inventory/ analysis and intersection sight distance (ISD) analysis; Rieker's Curve Advisory Reporting System (CARS) for automated ball bank analysis along horizontal curves; and field testing of High Friction Surface Treatment (HFST). This comprehensive and cost-effective approach to data collection, coupled with application of sound civil and traffic engineering principles, has enabled us to produce a comprehensive safety assessment of both roadway corridors. As part of the assessment, Kimley-Horn performed traffic signal control warrants, traffic operations analysis, comprehensive review of historical collision data, and conducted field observations in support of development of recommended multi-modal safety improvements. The results of the safety assessment with conceptual level exhibits illustrating recommended improvements will be documented in a Final Project Report.
- **Caltrans, California Strategic Highway Safety Plan (SHSP) Update and Implementation, Statewide, CA** – Analyst. Kimley-Horn was selected by the Caltrans Division of Traffic Operations to lead California's 2020 to 2024 Strategic Highway Safety Plan (SHSP) Update and Implementation. The SHSP is a multi-agency collaborative effort between Caltrans and California Highway Patrol, Office of Traffic Safety, Department of Motor Vehicles, Emergency Medical Services Authority, Department of Public Health, Department of Alcoholic Beverage Control, Tribal/Native American Advisory Committee, Metropolitan Planning Organizations, State Association of Counties, League of Cities, and traffic safety advocates. The SHSP's mission is to ensure a safe and sustainable transportation system for all motorized and non-motorized users on all public roads in California and to work Toward Zero Deaths. Kimley-Horn's role is to assist with SHSP development, action plans, and compliance with federal requirements.

D: Project Understanding

The public development process in California requires a deep understanding of regulatory requirements. The California Environmental Quality Act (CEQA) provides the overall analysis framework, defining the necessity and requirements for documentation, analysis, mitigation, and other considerations. In addition, local agencies, such as the City of Roseville, provide additional guidance and requirements specific to their local needs.

To this end, the City has published guidelines for the preparation of traffic impact studies (City of Roseville Design Standards, Section 4, January 2016) to "ensure consistency of analysis and adequacy of information to aid City staff and decision makers in the consideration of project approval with regard to impacts to the City's transportation system." It is important to note that Senate Bill 743 (SB 743) and the associated change in the metric used to identify significant transportation impacts (from delay/Level of Service to Vehicle Miles Traveled) is accommodated separately through the recently adopted Vehicle Miles Traveled (VMT) Impact Studies documentation. The Design Standards inform the nature of the typical studies required to maintain the safety of the City's transportation network and include several critical considerations for conducting traffic impact studies, including:

Short-term vs. Long-term Studies. Using a 50 PM peak-hour trip threshold and the project's consistency with the General Plan, studies are classified as short-term or long-term. Short-term studies focus primarily on existing and near-term conditions, while long-term studies consider future conditions using the City's CIP travel demand model.

LOS C Threshold. The City's LOS policy specifies the requirement to maintain LOS C at a minimum of 70 percent of all signalized intersections and roadway segments during the PM peak-hour.

Site Access Considerations. Driveway configurations, in particular throat depths, are an important site development feature that must satisfy specific requirements specified in the traffic study guidelines. When designed and constructed adequately, off-site traffic is much less likely to be adversely affected by onsite operations. This resultant environment improves safety and operations for the general project area for all users. It is important that site access considerations are vetted early in the project development as modifications to access could trickle down and affect site trip assignment and, subsequently, the evaluation of project trips at the surrounding transportation facilities.

Off-Site Signal Progression. Awareness of, and consideration for the complexity and operational features of the City's coordinated signal systems must be accounted for in the proposal and consideration of offsite mitigation measures. Introducing mid-block driveways and even adding new traffic signals must be considered and evaluated in the context of the broader ITS. Changes to the system's traffic volumes, in number, direction, and peak period characteristics, all have to be considered as they affect the current coordinated signal timing's ability to most efficiently handle traffic demand.

Other Considerations

We also understand the importance of being able to conduct as-needed travel demand modeling to support studies in Roseville. We understand that the City uses a variant of the SACMET model so given our demonstrated experience using SACMET we are well qualified to complete any needed services.

One of the more significant improvements to travel demand models has been the introduction of submodels that are sensitive to non-motorized travel opportunities, transit-oriented development, and mixed-use development (commonly considered Smart Growth Strategies). Simply put, the latest generation of travel demand models does a better job of recognizing and accounting for the vehicular trip reductions that result from these strategies. These model additions (often referred to as 4D or 5D models) can significantly change the results of model forecasts under certain circumstances. We have created these types of solutions for models throughout the United States including one most recently for the El Dorado County travel demand model. However given that a variant of the SACOG SACMET model which was used as the basis for the Roseville model, it is likely that these features may be underrepresented in the resulting analysis. As a result, our expertise with infill trip generation could be invaluable to ensuring that trip generation, analysis, and the resulting mitigations as provided for in traffic impact studies are appropriately determined.

The Project Manager for NCHRP Report 758, a comprehensive study on infill trip generation, are members of the local team identified for this on-call. The resulting methodology is expected to also be incorporated in the Third Edition of ITE's Trip Generation Handbook (again, one of our local team members is on the committee developing ITE's approach). The NCHRP 8-66 methodology advances and provides a more modern and accurate tool to account for the internalization of site trips. Depending on the site, the internalization of project's trips can reduce off-site roadway mitigation and has the potential to redistribute and alter the on-site transportation infrastructure.

Our understanding of travel demand models, model data, and the American Community Survey (ACS), as well as other data sets when coupled with Geographical Information Systems (GIS) can also result in a better product. Depending on the circumstances we often use GIS as a base source for developing trip distributions for development sites. Using overlay and banding functions we can determine the attractiveness, based on the number of probable origins or destinations within a fixed distance of a development site. With this information in hand, we can establish distributions that have a strong quantitative backing and better distributions lead to better traffic assignments and a better understanding of impacts and required mitigations. Likewise, we have also used select link and select zone modeling functions to better understand likely development site origins and destinations.

We are also familiar with the numerous other City documents that guide the development of projects. Including the General Plan, ITS Master Plan, Pedestrian Master Plan, Bicycle Master Plan, and Long Range and Short-Range Transit Plans which include their own respective requirements that must be considered as land develops in the City. It is the awareness of these documents and their effect on both onsite and offsite project features that is critical to the thorough evaluation of a project's impacts.

While projects developed within the City of Roseville may only be required to abide by the City's development requirements, traffic from some projects may be determined to potentially adversely affect facilities in adjacent jurisdictions. Because of this situation, traffic studies in Roseville must allow for the concerns of adjoining agencies and must adequately document the project's traffic effect in these jurisdictions according to their own individual traffic study guidelines. Accordingly, it is important for the City's traffic consultant to have a thorough understanding of the policies, guidelines, thresholds, and other requirements for each of the following agencies: Caltrans, City of Rocklin, City of Citrus Heights, Placer County, Sutter County, and Sacramento County.

Potential Challenges

Senate Bill 743 updated CEQA Guidelines on evaluating transportation impacts in CEQA. It is intended to promote active transportation and transit, as well as reduce Vehicle Miles Traveled (VMT) to comply with other regulations (such as reductions in greenhouse gas emissions). SB 743 eliminated Level of Service (LOS)/Delay as a CEQA impact and replaced it with the VMT metric for CEQA transportation analyses. The Kimley-Horn team is well versed with SB 743 and the determination and application of VMT.

Unique Approaches and Strengths

Our team has extensive experience in travel demand modeling throughout California, including locally with the SACSIM and SACMET models. We have been using a version of SACMET that this project team developed in nearby El Dorado County as the basis for establishing their CIP, evaluating General Plan updates, and as the basis for their Impact Fee program since 2010, so we are well versed in the technical aspects of applying SACMET. Additionally, SACSIM is a useful tool and we have prepared many project specific SACSIM models, including most recently developing the Capital SouthEast Connector JPA Model which covers an area that extends from El Dorado County to Elk Grove. SACSIM is best applied for significant regional considerations, not on on-going project evaluations where its intense labor requirements make it less flexible when compared to SACMET.

Impact Fees. In addition to nearby El Dorado County's impact fee program, we have prepared impact fee programs throughout the state. We regularly do this work and in fact the team on this project is currently preparing TVTC's and the City of Fremont's Impact Fee programs.

One of the newest areas of focus when it comes to Impact Fees is VMT mitigation We also are preparing one of the first VMT Banking Projects in the State for the City of Salinas. We think the insight from this project will be invaluable to planning for successful mitigation from SB 743 for this project.

SB 743. The team for this project has been selected to prepare the policy and thresholds for more than 25 jurisdictions (including 3 counties) in California and have completed countless VMT projects. Our team has presented more than 100 times on the subject throughout the State, were participants in both the ITE California SB 743 Task Force and Caltrans SB 743 Implementation Technical Roundtable, and most recently presented two VMT abstracts at the ITE Western District Annual Meeting. Not only do we know SB 743 backwards and forwards, and know how to address its complexities, we know how make it easier to handle

E: Project Plan

Detailed Typical Approach & Methodologies

Task 1: Project Administration

This task includes general project administration, including management of project staff, quality control, and project accounting.

Task 2: Data Collection

Kimley-Horn shall be entitled to rely on the completeness and accuracy of all information provided by the City. The City shall provide all information requested by Kimley-Horn during the project including, but not limited to the following:

- Proposed project information including existing/proposed uses
- Information pertaining to approved and/or pending transportation improvements in the project vicinity.
- Traffic signal timing information and traffic count data for the study area (counts to be obtained from the City's ITS).

Kimley-Horn will complete a site visit(s) to observe existing project site operations including intersection/driveway lane configurations, vehicle storage lengths, lane utilization, existing traffic control, speed limits, adjacent land uses, and other readily apparent features that are deemed applicable to the Scope of Services. We will complete an evaluation of sight distance for the site access driveway(s) based on observed horizontal and vertical geometric conditions. This evaluation will be performed in accordance with the guidelines presented in the Geometric Design of Highways and Streets published by the American Association of State Highway and Transportation Officials (AASHTO), and the Highway Design Manual, published by Caltrans.

Kimley-Horn will endeavor to obtain readily available intersection turning movement traffic count data from the City's internet Traffic Count Tool.

Task 3: Trip Generation and Distribution

The number of trips anticipated to be generated by the proposed project will be approximated using Trip Generation Manual, 10th Edition, published by the Institute of Transportation Engineers (ITE). As deemed appropriate by Kimley-Horn and allowable by the City, adjustments will be made to the proposed project's trip generation to account for alternate mode trips, and the interaction between project and adjacent land uses. Project traffic will be distributed to the roadway network based on existing traffic volumes, output from the City's travel demand model, or professional judgment.

In an effort to streamline the project, Kimley-Horn will summarize our proposed trip generation and distribution assumptions in a brief memorandum to be submitted electronically (in PDF format) to the City.

Task 4: SB 743 Assessment

Kimley-Horn will perform a qualitative evaluation of the Proposed Project's Vehicle Miles Traveled (VMT) characteristics in a manner consistent with the December 2018 guidance provided by the Governor's Office of Planning and Research (OPR)[1]. OPR's guidance provides several screening criteria for projects in which a quantitative VMT analysis is deemed unnecessary, including retail projects that are less than 50,000 square-feet, such as the Proposed Project. Kimley-Horn will coordinate with the City to determine whether the project can be considered local-serving, and therefore not require a quantitative VMT analysis. For the purposes of this Scope of Services, we anticipate providing supporting documentation of the project's compliance with SB-743 and the City's VMT Impact Standards using a strictly qualitative approach.

Should a quantitative VMT analysis ultimately be required, Kimley-Horn will conduct an analysis consistent with the methodology included in the Final VMT Impact Standards recently approved by the City Council. These services are specified in optional Task 8 below.

Task 5: Technical Analyses

Offsite Operations

Because the proposed project is anticipated to have a net increase in project site traffic, the effect of this additional traffic will be evaluated to ensure the surrounding transportation facilities operate at acceptable levels. Consistent with the City's guidelines, a "Short-Term" traffic study will be performed to identify the project's effect on the external roadway network under existing conditions and to evaluate site access and operations. A short-term traffic analysis will be conducted for the following scenarios:

- Existing (2021) Conditions
- Existing (2021) plus Proposed Project Conditions

[1] *Technical Advisory on Evaluating Transportation Impacts in CEQA. Governor's Office of Planning and Research, State of California, December 2018.*

This analysis will be performed for up to five intersections.

Delay, queuing, and Levels of Service will be determined using methods defined in the Highway Capacity Manual, using the Synchro® traffic analysis software. The interaction of project trips with other turning movements will also be considered and recommendations will be developed to maximize safety for all users of the roadway.

Onsite Operations

Kimley-Horn will review the proposed project's anticipated onsite operations. The primary focus of this evaluation will be the access, circulation, and queuing in the vicinity of the site driveways. Because the proposed project is proposing to alter site access and circulation, this evaluation will also consider the effect of the proposed onsite changes on offsite traffic operations in the vicinity of the site.

Task 6: Draft Report

Analyses completed in Tasks 1-5 will be documented in technical memorandum format. Kimley-Horn will prepare and submit an electronic (PDF) Draft Report to the City for review. We will participate in a face-to-face meeting with the City to receive and review comments on the Draft Report.

Quality Control: Kimley-Horn will provide an independent, internal quality control review of the Draft Report.

Task 7: Final Report

Kimley-Horn will address one set of consolidated, non-conflicting City comments on the Draft Report. If the comments require additional analysis or data collection beyond that provided for in this Scope of Services, this work will be considered as an additional service. Any additional comment responses, regardless of origin, will also be considered as an additional service. Kimley-Horn will prepare and submit an electronic (PDF) Final Report to the City.

Task 8: Quantitative VMT Analysis (Optional)

If requested and authorized, and as per the findings of Task 4 above, Kimley-Horn will prepare a quantitative VMT analysis consistent with the methodology included in the Vehicle Miles Traveled (VMT) Impact Studies guidelines recently approved by the City Council. This effort is anticipated to include a comparison of the net change in VMT between existing conditions and the addition of the proposed project. This effort will be completed using the City's Travel Demand Model (TDM) by comparing the region's VMT without the project to the region's VMT with the addition of the project. The addition of the project will be determined to result in a significant impact if the region's VMT increases by more than 1,000 daily VMT compared to existing conditions.

Typical Schedule

We will provide our services as expeditiously as practicable to meet the mutually agreed upon schedule. We anticipate delivery of the Draft Report within three (3) weeks of receipt of a Notice-to-Proceed and all required information.

Workload and Availability

The members of our project team have firsthand experience in responding effectively and efficiently to the needs and requirements of clients under many different types of projects. We constantly prepare plans and estimates from concepts all the way through construction. We not only have the detailed technical expertise that is required to complete your designs, we proactively plan and set aside adequate time and staff availability provide the City with a high level of responsiveness. Our proposed team all have detailed and intimate design experience working on projects of different sizes and complexity for agencies across California.

Our workload planning is a two-step process called Milestones and Cast-aheads, which look at short-term and long-term workload, respectively. Every week, each Kimley-Horn office meets to discuss workload for the following week and determine deliverables, staffing needs, and adjust staff hours accordingly. After each office meets, representatives from each office attend a conference call to determine if staff reallocation ("shift") are needed to meet deadlines. Since we have three major offices in the Bay Area, we can easily shift staff between offices and assign the most qualified staff to a particular project. If needed, we also have the ability to shift staff from throughout California and across the country if needed to work on larger or more complex projects.

Kimley-Horn's long-term workload planning is called cast-aheads. Our cast-ahead forecast summarizes every work plan for all Kimley-Horn projects and provides an accurate projection of staffing needs and overloads with detailed information for the upcoming month and summary information for the next six months. Kimley-Horn's production managers use this tool to facilitate the shifting and balancing of work across our entire firm. The cast-ahead process provides the following benefits:

- Enables us to better serve our clients and meet their deadlines
- Assigns specialists to tackle more complex project issues
- Facilitates teamwork through a one-profit center approach
- Keeps our people productive and our firm stable

Schedule and Cost Control Procedures

Kimley-Horn is well suited to manage and administer your projects. We are prepared to commit the necessary resources to ensure the success of your efforts. Moreover, we also have the tools that tell us exactly how and when to implement these resources. While this can be perceived as an internal issue to Kimley-Horn, the tools we use to manage and administer a project are really for the client's benefit because a firm basis is established for on-time, within-budget delivery of all services. Schedule and budget are extremely important to Kimley-Horn, and our resources will allow us to meet the goals established for your project. To assist our project managers in efficient administration of projects, Kimley-Horn maintains a detailed, integrated management information system (MIS). This system, designed primarily to focus on schedule adherence and cost control, has proved to be a valuable tool internally to Kimley-Horn and externally to our clients.

Schedule control begins with the preparation of a detailed schedule that includes milestone completion dates for specific tasks and the overall project. We will develop for your project, as we do for every project we undertake, a work plan that allocates item and person-hour commitments by individual for each task. Bi-monthly, the MIS generates a Project Effort Report showing actual effort expended by task. This internal control allows us to make, on a timely basis, any adjustments that may be necessary to maintain your schedule and stay within your budget.

Cost control is achieved through two independent processing systems within our MIS program that we integrate to provide a complete financial and report overview of each individual task, as well as the entire project. Project managers and task managers receive status reports twice each month as to the costs associated with the project. This level of tracking allows us to control project budgets and to keep our clients fully informed of the administrative aspects of each project.

EXHIBIT "B"

F: Cost Proposal

Rate Schedule

Effective September 1, 2020 to June 30, 2021

Classification	Labor Rate* (per hour)
Support Staff	$85 - $120
Technical Support	$100 - $135
Senior Technical Support	$135 - $205
Analyst	$130 - $180
Professional	$185 - $225
Senior Professional I	$225 - $315
Senior Professional II	$295 - $350

**Billing Rates are reviewed yearly and are adjusted as necessary on July 1st.*

Other Direct Costs: Outside Printing/Reproduction, Delivery Services/USPS, Misc. Field Equipment/Supplies, and Travel Expenses will be billed at cost plus 10 percent. Mileage will be billed at the Federal Rate.

Subconsultants: Billed at cost plus 10 percent.

Office Expenses: 5 percent will be applied to labor fees to cover direct expenses, such as in-house duplicating and blueprinting, local mileage, telephone/mobile calls, electronic messaging, postage, and word processing.

Client#: 25320 KIMLHORN

ACORD™

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY) 3/27/2021

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer any rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Greyling Ins. Brokerage/EPIC 3780 Mansell Road, Suite 370 Alpharetta, GA 30022	CONTACT NAME: Jerry Noyola PHONE (A/C, No, Ext): 770-220-7699 FAX (A/C, No): E-MAIL ADDRESS: jerry.noyola@greyling.com
INSURED Kimley-Horn and Associates, Inc. 421 Fayetteville Street, Suite 600 Raleigh, NC 27601	INSURER(S) AFFORDING COVERAGE — NAIC # INSURER A : National Union Fire Ins. Co. — 19445 INSURER B : Allied World Assurance Company (U.S.) — 19489 INSURER C : Everest National Ins Co — 10120 INSURER D : New Hampshire Ins. Co. — 23841 INSURER E : Lloyds of London — 085202 INSURER F :

COVERAGES CERTIFICATE NUMBER: 21-22 REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X COMMERCIAL GENERAL LIABILITY CLAIMS-MADE X OCCUR X Contractual Liab GEN'L AGGREGATE LIMIT APPLIES PER: POLICY X PRO-JECT X LOC OTHER:			GL5268169	04/01/2021	04/01/2022	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG	$1,000,000 $500,000 $25,000 $1,000,000 $2,000,000 $2,000,000
A	AUTOMOBILE LIABILITY X ANY AUTO OWNED AUTOS ONLY / SCHEDULED AUTOS X HIRED AUTOS ONLY / X NON-OWNED AUTOS ONLY			CA4489663	04/01/2021	04/01/2022	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident)	$2,000,000 $ $ $
B	X UMBRELLA LIAB X OCCUR			03127930	04/01/2021	04/01/2022	EACH OCCURRENCE	$5,000,000
C	X EXCESS LIAB CLAIMS-MADE			XC8EX00363211	04/01/2021	04/01/2022	AGGREGATE	$5,000,000
	DED X RETENTION $10,000							$
D A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? Y/N N (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	N/A		WC015893685 (AOS) WC015893686 (CA)	04/01/2021 04/01/2021	04/01/2022 04/01/2022	X PER STATUTE / OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	 $1,000,000 $1,000,000 $1,000,000
E	Professional Liab			B0146LDUSA2104949	04/01/2021	04/01/2022	Per Claim $2,000,000 Aggregate $2,000,000	

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

Re: Ref. #R100000333; MW - All Projects. The City of Roseville, its officers, agents, employees & volunteers are named as Additional Insureds with respects to General Liability where required by written contract. The above referenced liability policies with the exception of workers compensation & professional liability are primary & non-contributory where required by written contract. Waiver of Subrogation in favor of Additional Insureds with respects to General Liability & Workers Compensation where required by written contract & (See Attached Descriptions)

CERTIFICATE HOLDER

City of Roseville
Insurance Compliance
P.O. Box 100085 - R1
Duluth, GA 30096-0000

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

Dan H. Collings

© 1988-2015 ACORD CORPORATION. All rights reserved.

DESCRIPTIONS (Continued from Page 1)

allowed by law. Should any of the above described policies be cancelled by the issuing insurer before the expiration date thereof, 30 days' written notice (except 10 days for nonpayment of premium) will be provided to the Certificate Holder.

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

ADDITIONAL INSURED - OWNERS, LESSEES OR CONTRACTORS - SCHEDULED PERSON OR ORGANIZATION

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART

SCHEDULE

Name Of Additional Insured Person(s) Or Organization(s)	Location(s) Of Covered Operations
ANY PERSON OR ORGANIZATION WHOM YOU BECOME OBLIGATED TO INCLUDE AS AN ADDITIONAL INSURED AS A RESULT OF ANY CONTRACT OR AGREEMENT YOU HAVE ENTERED INTO.	PER THE CONTRACT OR AGREEMENT.
Information required to complete this Schedule, if not shown above, will be shown in the Declarations.	

A. Section II 6 Who Is An Insured is amended to include as an additional insured the person(s) or organization(s) shown in the Schedule, but only with respect to liability for "bodily injury", "property damage" or "personal and advertising injury" caused, in whole or in part, by:

1. Your acts or omissions; or
2. The acts or omissions of those acting on your behalf;

in the performance of your ongoing operations for the additional insured(s) at the location(s) designated above.

However:

1. The insurance afforded to such additional insured only applies to the extent permitted by law; and
2. If coverage provided to the additional insured is required by a contract or agreement, the insurance afforded to such additional insured will not be broader than that which you are required by the contract or agreement to provide for such additional insured.

B. With respect to the insurance afforded to these additional insureds, the following additional exclusions apply:

This insurance does not apply to "bodily injury" or "property damage" occurring after:

1. All work, including materials, parts or equipment furnished in connection with such work, on the project (other than service, maintenance or repairs) to be performed by or on behalf of the additional insured(s) at the location of the covered operations has been completed; or
2. That portion of "your work" out of which the injury or damage arises has been put to its intended use by any person or organization other than another contractor or subcontractor engaged in performing operations for a principal as a part of the same project.

© Insurance Services Office, Inc., 2018

C. With respect to the insurance afforded to these additional insureds, the following is added to **Section III – Limits Of Insurance:**

If coverage provided to the additional insured is required by a contract or agreement, the most we will pay on behalf of the additional insured is the amount of insurance:

1. Required by the contract or agreement; or
2. Available under the applicable limits of insurance;

whichever is less.

This endorsement shall not increase the applicable limits of insurance.

© Insurance Services Office, Inc., 2018

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

ADDITIONAL INSURED - OWNERS, LESSEES OR CONTRACTORS - COMPLETED OPERATIONS

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART
PRODUCTS/COMPLETED OPERATIONS LIABILITY COVERAGE PART

SCHEDULE

Name Of Additional Insured Person(s) Or Organization(s)	Location And Description Of Completed Operations
ANY PERSON OR ORGANIZATION WHOM YOU BECOME OBLIGATED TO INCLUDE AS AN ADDITIONAL INSURED AS A RESULT OF ANY CONTRACT OR AGREEMENT YOU HAVE ENTERED INTO.	PER THE CONTRACT OR AGREEMENT.
Information required to complete this Schedule, if not shown above, will be shown in the Declarations.	

A. **Section II – Who Is An Insured** is amended to include as an additional insured the person(s) or organization(s) shown in the Schedule, but only with respect to liability for "bodily injury" or "property damage" caused, in whole or in part, by "your work" at the location designated and described in the Schedule of this endorsement performed for that additional insured and included in the "products-completed operations hazard".

However:

1. The insurance afforded to such additional insured only applies to the extent permitted by law; and
2. If coverage provided to the additional insured is required by a contract or agreement, the insurance afforded to such additional insured will not be broader than that which you are required by the contract or agreement to provide for such additional insured.

B. With respect to the insurance afforded to these additional insureds, the following is added to **Section III – Limits Of Insurance:**

If coverage provided to the additional insured is required by a contract or agreement, the most we will pay on behalf of the additional insured is the amount of insurance:

1. Required by the contract or agreement; or
2. Available under the applicable limits of insurance;

whichever is less.

This endorsement shall not increase the applicable limits of insurance.

© Insurance Services Office, Inc., 2018

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

PRIMARY AND NONCONTRIBUTORY - OTHER INSURANCE CONDITION

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART
LIQUOR LIABILITY COVERAGE PART
PRODUCTS/COMPLETED OPERATIONS LIABILITY COVERAGE PART

The following is added to the **Other Insurance** Condition and supersedes any provision to the contrary:

Primary And Noncontributory Insurance

This insurance is primary to and will not seek contribution from any other insurance available to an additional insured under your policy provided that:

(1) The additional insured is a Named Insured under such other insurance; and

(2) You have agreed in writing in a contract or agreement that this insurance would be primary and would not seek contribution from any other insurance available to the additional insured.

© Insurance Services Office, Inc., 2018

WAIVER OF TRANSFER OF RIGHTS OF RECOVERY AGAINST OTHERS TO US (WAIVER OF SUBROGATION)

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART
ELECTRONIC DATA LIABILITY COVERAGE PART
LIQUOR LIABILITY COVERAGE PART
POLLUTION LIABILITY COVERAGE PART DESIGNATED SITES
POLLUTION LIABILITY LIMITED COVERAGE PART DESIGNATED SITES
PRODUCTS/COMPLETED OPERATIONS LIABILITY COVERAGE PART
RAILROAD PROTECTIVE LIABILITY COVERAGE PART
UNDERGROUND STORAGE TANK POLICY DESIGNATED TANKS

SCHEDULE

Name Of Person(s) Or Organization(s):
PURSUANT TO APPLICABLE WRITTEN CONTRACT OR AGREEMENT YOU ENTER INTO.
Information required to complete this Schedule, if not shown above, will be shown in the Declarations.

The following is added to Paragraph **8. Transfer Of Rights Of Recovery Against Others To Us** of **Section IV – Conditions:**

We waive any right of recovery against the person(s) or organization(s) shown in the Schedule above because of payments we make under this Coverage Part. Such waiver by us applies only to the extent that the insured has waived its right of recovery against such person(s) or organization(s) prior to loss. This endorsement applies only to the person(s) or organization(s) shown in the Schedule above.

© Insurance Services Office, Inc., 2018

BLANKET WAIVER OF OUR RIGHT TO RECOVER FROM OTHERS ENDORSEMENT

This endorsement changes the policy to which it is attached effective on the inception date of the policy unless a different date is indicated below.

(The following "attaching clause" need be completed only when this endorsement is issued subsequent to preparation of the policy).

This endorsement, effective 12:01 AM **04/01/2021** forms a part of Policy No. **WC** 015-89-3686

Issued to **KIMLEY-HORN AND ASSOCIATES, INC.**

By **NATIONAL UNION FIRE INSURANCE COMPANY OF PITTSBURGH, PA.**

We have a right to recover our payments from anyone liable for an injury covered by this policy. We will not enforce our right against any person or organization with whom you have a written contract that requires you to obtain this agreement from us, as regards any work you perform for such person or organization.

The additional premium for this endorsement shall be **2.00** % of the total estimated workers compensation premium for this policy.

WC 04 03 61
(Ed. 11/90)

Countersigned by _____

Authorized Representative

RESOLUTION NO. 21-258

APPROVING AN ON-CALL PROFESSIONAL SERVICES AGREEMENT, BY AND BETWEEN THE CITY OF ROSEVILLE AND DKS ASSOCIATES, AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE

WHEREAS, an on-call professional services agreement regarding On-Call Transportation Impact Studies, by and between the City of Roseville and DKS Associates, has been reviewed by the City Council; and

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Roseville that said on-call agreement is hereby approved and the City Manager is authorized to execute it on behalf of the City of Roseville.

PASSED AND ADOPTED by the Council of the City of Roseville this____day of _____, 20___, by the following vote on roll call:

AYES COUNCILMEMBERS:

NOES COUNCILMEMBERS:

ABSENT COUNCILMEMBERS:

_____
MAYOR

ATTEST:

_____
City Clerk

RESOLUTION NO. 21-259

APPROVING AN ON-CALL PROFESSIONAL SERVICES AGREEMENT, BY AND BETWEEN THE CITY OF ROSEVILLE AND T J K M, AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE

WHEREAS, an on-call professional services agreement regarding On-Call Transportation Impact Studies, by and between the City of Roseville and T J K M, has been reviewed by the City Council; and

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Roseville that said on-call agreement is hereby approved and the City Manager is authorized to execute it on behalf of the City of Roseville.

PASSED AND ADOPTED by the Council of the City of Roseville this____day of _____, 20___, by the following vote on roll call:

AYES COUNCILMEMBERS:

NOES COUNCILMEMBERS:

ABSENT COUNCILMEMBERS:

_____
MAYOR

ATTEST:

_____
City Clerk

COUNCIL COMMUNICATION

CC #: 1514
File #: 0400-04-13-1

Title:	Creekview - Phase 1 Village 10, 11 & 15 - Notice of Completion
Contact:	Ignacio Vizcarra 916-774-5578 ivizcarra@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 7.19.

RECOMMENDATION TO COUNCIL

Staff recommends that the City Council adopt the attached resolution accepting Creekview Phase 1-Village 10, 11 & 15, CWJ# 190186, as complete and authorizing the City Engineer to execute the Notice of Completion, therefore, and accepting all dedications offered on the recorded map of the subdivision.

BACKGROUND

The Engineering Division has made a final inspection of the above project and has found the roadway infrastructure work complete in accordance with the improvement plans and City specifications.

FISCAL IMPACT

The actions requested as part of this action have no impact to the City's General Fund. Construction costs were paid by the developer.

ENVIRONMENTAL REVIEW

The California Environmental Quality Act (CEQA) does not apply to activities that will not result in a direct or reasonably foreseeable indirect physical change in the environment, or is otherwise not considered a project as defined by CEQA Statute §21065 and CEQA State Guidelines §15060(c)(3) and §15378. Approval of a Notice of Completion meets the above criteria and is not subject to CEQA. No additional environmental review is required.

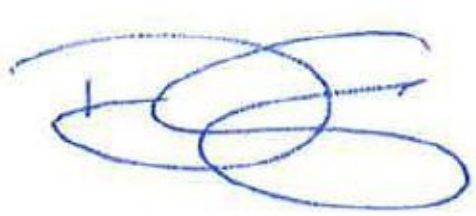
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Goal F - Invest in well-planned infrastructure and growth

Respectfully Submitted,

Ignacio Vizcarra, Construction Inspector

Mike Isom, Development Services Director



_____

Dominick Casey, City Manager

ATTACHMENTS:

Description

Resolution 21-267

NOC. Creekview Phase 1 Village 10, 11 & 15.

Exhibit A. Creekview Phase 1 Village 10, 11 & 15.

Final Map Creekview Phase 1 Villages 10, 11 & 15.

RESOLUTION NO. 21-267

RESOLUTION OF THE COUNCIL OF THE CITY OF ROSEVILLE ACCEPTING THE PUBLIC WORK KNOWN AS **CREEKVIEW PHASE 1, VILLAGE 10, 11 & 15** PROJECT, APPROVING THE "NOTICE OF COMPLETION", AND AUTHORIZING AND DIRECTING THE CITY ENGINEER TO EXECUTE SAID NOTICE ON BEHALF OF THE CITY OF ROSEVILLE, THEREFORE, AND ACCEPTING ALL DEDICATIONS OFFERED ON THE RECORDED MAP OF THE SUBDIVISION.

BE IT RESOLVED by the Council of the City of Roseville as follows:

1. The "Notice of Completion" on file in the City Clerk's Department relative to that public work known as the **Creekview Phase 1, Village 10, 11 & 15** is hereby approved and the public work accepted.

2. All rights of way and easements as offered on the final map of recorded with Placer County Recorder's Office Book **FF** of Maps, Page **22** is hereby accepted.

3. The City Engineer is hereby authorized and directed to execute said Notice on behalf of the City of Roseville.

PASSED AND ADOPTED by the Council of the City of Roseville, this_____day of_____, 2021, by the following vote on roll call:

AYES COUNCILMEMBERS:

NOES COUNCILMEMBERS:

ABSENT COUNCILMEMBERS:

_____
MAYOR

ATTEST:

_____
CITY CLERK

RECORDING REQUESTED BY AND WHEN
RECORDED MAIL TO:

CITY CLERK
CITY OF ROSEVILLE
311 VERNON STREET
ROSEVILLE, CA 95678

Exempt from recording fees
Pursuant to Gov't Code §27383

NOTICE OF COMPLETION

NOTICE IS HEREBY GIVEN that the public work of improvement known as the _____ Project was completed and accepted by the City of Roseville on _____. The location is situated in the City of Roseville, County of Placer, State of California and is indicated on the attached map, marked as Exhibit "A" and incorporated herein by this reference. The real property herein described is owned by the City of Roseville, 311 Vernon Street, Roseville CA 95678.

The direct/general contractor on said project was _____.

The surety on said project was _____

_____.

_____

City of Roseville
Owner

ATTEST:

_____
Sonia Orozco, City Clerk

State of California)
County of Placer)

I,_____, being first duly sworn, depose and say: I am the _____ of the City of Roseville, a municipal corporation in the State of California, owner of the property described in the above Notice. I am duly authorized to make this verification for and on behalf of the City of Roseville. I have read the Notice of Completion and know its contents and the facts stated therein are true.

_____

City of Roseville

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California)
County of Placer)

Subscribed and sworn to (or affirmed) before me on this _____ day of _____,

20___, _____

proved to me on the basis of satisfactory evidence to be the person(s) who appeared before me.

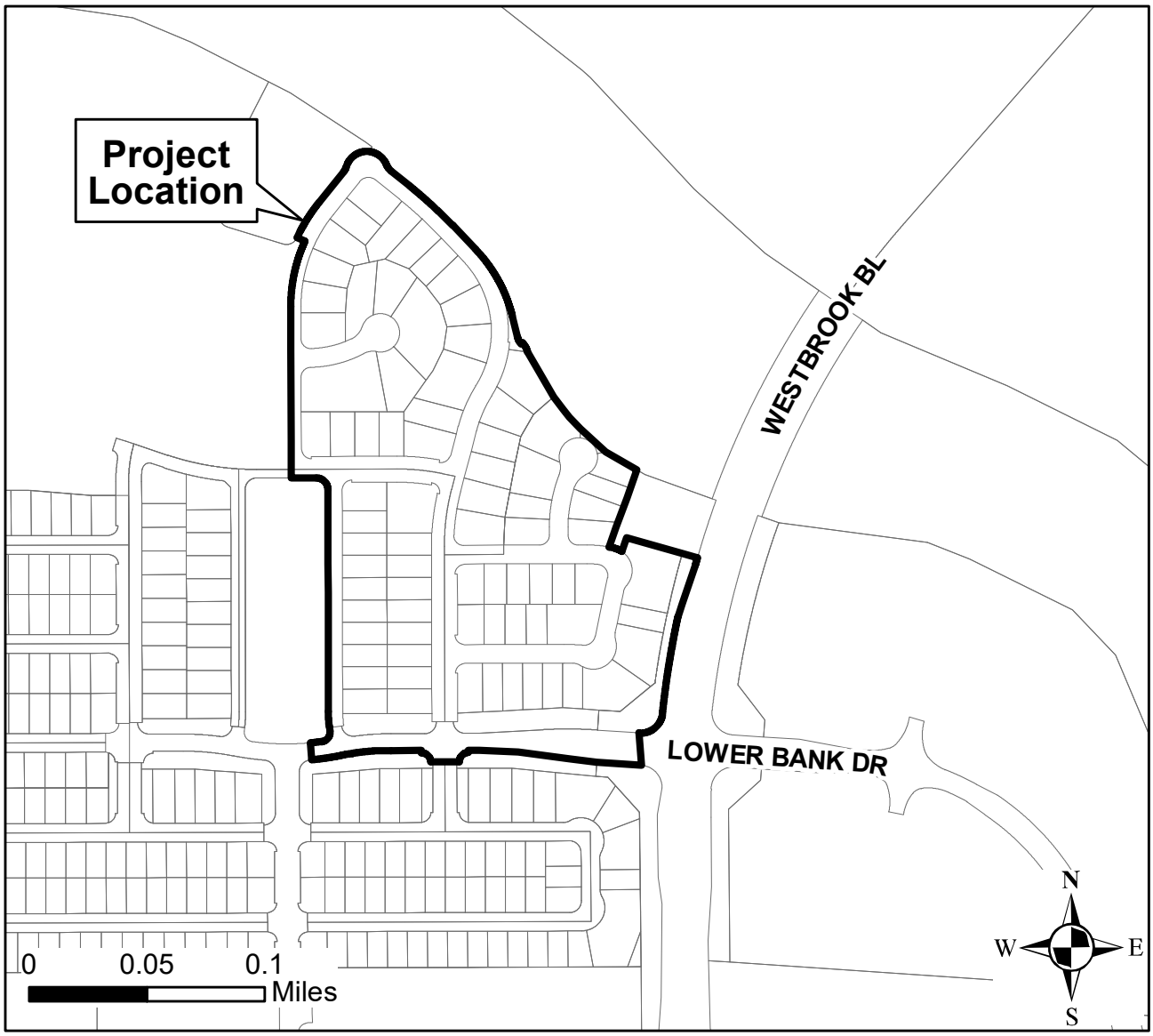
_____

Place Notary Seal and/or Stamp Above

Signature of Notary Public

EXHIBIT A

City of Roseville
Creekview Phase 1
Village 10, 11 & 15



OWNER'S STATEMENT

THE UNDERSIGNED HEREBY CERTIFY THAT THEY ARE THE ONLY PERSONS HAVING ANY RECORD TITLE INTEREST IN THE REAL PROPERTY INCLUDED WITHIN THE SUBDIVISION SHOWN UPON THIS FINAL MAP OF "CREEKVIEW - PHASE 1 VILLAGE 10, 11 & 15" AND THEY HEREBY CONSENT TO THE PREPARATION AND RECORDATION OF THIS FINAL MAP AND HEREBY OFFER FOR DEDICATION AND DO HEREBY DEDICATE FOR SPECIFIC PURPOSES THE FOLLOWING:

THE REAL PROPERTY DESCRIBED BELOW IS DEDICATED AS EASEMENTS FOR PUBLIC PURPOSES:

(A) A PUBLIC EASEMENT FOR THE INSTALLATION AND MAINTENANCE OF, BUT NOT LIMITED TO ELECTROLIERS, WATER AND GAS PIPES, SEWER AND DRAINAGE PIPES, AND FOR UNDERGROUND WIRE AND CONDUITS FOR ELECTRIC, TELEPHONE AND TELEVISION SERVICES AND TRAFFIC CONTROL APPURTENANCES TOGETHER WITH ANY AND ALL APPURTENANCES PERTAINING THERETO ON, OVER, UNDER AND ACROSS LOTS A, B, C AND D, THE STREETS SHOWN HEREON AS PEACEFUL COURT, WALKABOUT COURT, BACKWATER COVE CIRCLE, GRASSCREEK DRIVE, LEMONADE LANE, SKIPPING STONE WAY, AND WHISTLING BEND WAY AND THOSE STRIPS OF LAND LYING CONTIGUOUS TO THE RIGHTS-OF-WAY AS SHOWN HEREON AND DESIGNATED "P.U.E." (PUBLIC UTILITY EASEMENT).

(B) A PUBLIC EASEMENT FOR PEDESTRIAN / BICYCLE ACCESS AND THE INSTALLATION, REPAIR, REMOVAL OR REPLACEMENT OF LANDSCAPING TOGETHER WITH ANY AND ALL APPURTENANCES THERETO, ON, OVER, UNDER AND ACROSS LOTS A, B, C AND D SHOWN HEREON AND DESIGNATED "PASEO EASEMENT" (P.E.)

THE REAL PROPERTY DESCRIBED BELOW IS DEDICATED IN FEE FOR PUBLIC PURPOSES:

(A) AS PUBLIC RIGHTS-OF-WAY (INCLUDING ALL IMPROVEMENTS THEREON) THE STREETS SHOWN HEREON AS PEACEFUL COURT, WALKABOUT COURT, BACKWATER COVE CIRCLE, GRASSCREEK DRIVE, LEMONADE LANE, SKIPPING STONE WAY, AND WHISTLING BEND WAY.

(B) LOTS A, B, C AND D AS SHOWN HEREON TO THE CITY OF ROSEVILLE FOR LANDSCAPING AND AS PUBLIC RIGHTS-OF-WAY.

ANTHEM UNITED CREEKVIEW DEVELOPMENTS LIMITED PARTNERSHIP,
A WASHINGTON LIMITED PARTNERSHIP

BY: BZ Brian Moore
Vice President

NOTARY'S ACKNOWLEDGMENT

A NOTARY PUBLIC OR OTHER OFFICER COMPLETING THIS CERTIFICATE VERIFIES ONLY THE IDENTITY OF THE INDIVIDUAL WHO SIGNED THE DOCUMENT TO WHICH THIS CERTIFICATE IS ATTACHED, AND NOT THE TRUTHFULNESS, ACCURACY OR VALIDITY OF THAT DOCUMENT.

STATE OF CALIFORNIA

COUNTY OF Placer

ON 9/8/20 BEFORE ME, Karron M. Vasquez NOTARY PUBLIC

PERSONALLY APPEARED Brian Moore

WHO PROVED TO ME ON THE BASIS OF SATISFACTORY EVIDENCE TO BE THE PERSON(S) WHOSE NAME(S) IS/ARE SUBSCRIBED TO THE WITHIN INSTRUMENT AND ACKNOWLEDGED TO ME THAT HE/SHE/THEY EXECUTED THE SAME IN HIS/HER/THEIR AUTHORIZED CAPACITY(IES), AND THAT BY HIS/HER/THEIR SIGNATURE(S) ON THE INSTRUMENT THE PERSON(S), OR THE ENTITY UPON BEHALF OF WHICH THE PERSON(S) ACTED, EXECUTED THE INSTRUMENT.

I CERTIFY UNDER PENALTY OF PERJURY UNDER THE LAWS OF THE STATE OF CALIFORNIA THAT THE FOREGOING PARAGRAPH IS TRUE AND CORRECT.

WITNESS MY HAND AND OFFICIAL SEAL.

SIGNATURE Karron M. Vasquez PRINTED NAME

MY PRINCIPAL PLACE OF BUSINESS IS Solano COUNTY

MY COMMISSION EXPIRES: 2/14/22 MY COMMISSION NUMBER: 2228832

SURVEYOR'S STATEMENT

THIS MAP OF "CREEKVIEW - PHASE 1 VILLAGE 10, 11 & 15" WAS PREPARED BY ME OR UNDER MY DIRECTION AND IS BASED UPON A FIELD SURVEY IN CONFORMANCE WITH THE REQUIREMENTS OF THE SUBDIVISION MAP ACT AND LOCAL ORDINANCE AT THE REQUEST OF ANTHEM UNITED CREEKVIEW DEVELOPMENTS LIMITED PARTNERSHIP, IN JANUARY, 2019, I HEREBY STATE THAT THE SURVEY IS TRUE AND COMPLETE AS SHOWN, THAT ALL THE MONUMENTS ARE OF THE CHARACTER AND OCCUPY THE POSITIONS INDICATED OR THAT THEY WILL BE SET IN THOSE POSITIONS BEFORE DECEMBER 31, 2022, AND THAT THE MONUMENTS ARE, OR WILL BE, SUFFICIENT TO ENABLE THE SURVEY TO BE RETRACED, AND THAT THIS FINAL MAP SUBSTANTIALLY CONFORMS TO THE CONDITIONALLY APPROVED TENTATIVE MAP.

MACKAY & SOMPS CIVIL ENGINEERS, INC.

BY: Paul Ferguson Jr.
PAUL FERGUSON, JR., PLS 9265
EXPIRATION DATE: MARCH 31, 2022

DATE: 9/4/2020

LICENSED LAND SURVEYOR
PAUL FERGUSON, JR.
3-31-22
No. 9265
STATE OF CALIFORNIA

CITY ENGINEER'S STATEMENT

I HEREBY STATE THAT I HAVE EXAMINED THIS FINAL MAP OF "CREEKVIEW - PHASE 1 VILLAGE 10, 11 & 15" AND FIND IT TO BE SUBSTANTIALLY THE SAME AS THE TENTATIVE MAP ON FILE AND ANY APPROVED ALTERATIONS THEREOF; THAT ALL PROVISIONS OF THE SUBDIVISION MAP ACT AND ALL APPLICABLE CITY ORDINANCES HAVE BEEN COMPLIED WITH.

DATE: 9/15/20

MARC STOUT, R.C.E. 69879
CITY ENGINEER, CITY OF ROSEVILLE
LICENSE EXPIRES: SEPTEMBER 30, 2022

I HEREBY STATE THAT I AM SATISFIED THIS FINAL MAP OF "CREEKVIEW - PHASE 1 VILLAGE 10, 11 & 15" IS TECHNICALLY CORRECT.

FOR MARC STOUT, CITY ENGINEER, CITY OF ROSEVILLE

DATE: 9/29/20

TIMOTHY G. BLAIR, PLS 8278
EXPIRES DECEMBER 31, 2021

LICENSED LAND SURVEYOR
TIMOTHY G BLAIR
Exp. 12-31-21
No. 8278
STATE OF CALIFORNIA

CITY CLERK'S STATEMENT

I HEREBY CERTIFY THAT THE CITY COUNCIL, CITY OF ROSEVILLE, HAS APPROVED THIS FINAL MAP OF "CREEKVIEW - PHASE 1 VILLAGE 10, 11 & 15", AND HAS ACCEPTED ON BEHALF OF THE PUBLIC, THE PUBLIC UTILITY EASEMENTS OFFERED HEREON FOR DEDICATION AND HAS ACCEPTED, SUBJECT TO IMPROVEMENT, LOTS A, B, C AND D, THE RIGHTS-OF-WAY AND PASEO EASEMENTS OFFERED HEREON FOR DEDICATION, AND HEREBY APPROVES THE ABANDONMENT OF THE EASEMENT LISTED WITHIN NOTE 6 ON SHEET 2.

CITY CLERK, CITY OF ROSEVILLE

DATE: 10/8/2020 BY: _____
ASSISTANT CITY CLERK

RECORDER'S STATEMENT

FILED THIS 5TH DAY OF NOVEMBER, 2020, AT 10:46 A.M. IN BOOK FF OF MAPS, AT PAGE 22, IN THE OFFICE OF THE PLACER COUNTY RECORDER, AT THE REQUEST OF MACKAY & SOMPS CIVIL ENGINEERS, INC.

RYAN RONCO
RECORDER OF PLACER COUNTY
STATE OF CALIFORNIA

DOCUMENT NO.: 2020-0126901

BY: D. Bustamante
DEPUTY

FEE: $ 101.00

FINAL MAP OF
CREEKVIEW - PHASE 1
VILLAGE 10, 11 & 15
SUBDIVISION No. PL18-0190

BEING A SUBDIVISION OF LOTS 16, 19 AND 20 AS SHOWN ON THAT CERTAIN FINAL MAP ENTITLED "CREEKVIEW - PHASE 1 LARGE LOT SUBDIVISION, SUBDIVISION NO. PL18-0190" FILED FOR RECORD ON JUNE 01, 2020 IN BOOK EE OF MAPS, AT PAGE 97, PLACER COUNTY RECORDS, WITHIN SECTION 14, TOWNSHIP 11 NORTH, RANGE 5 EAST, MOUNT DIABLO MERIDIAN

CITY OF ROSEVILLE • PLACER COUNTY • CALIFORNIA

OCTOBER 2020

MACKAY & SOMPS
ENGINEERS PLANNERS SURVEYORS
1025 Creekside Ridge Drive, Suite 150, Roseville, CA 95678 (916) 773-1189

18431.000

TRUSTEE'S STATEMENT

FIRST AMERICAN TITLE COMPANY, A NEBRASKA CORPORATION, AS TRUSTEE UNDER DEED OF TRUST RECORDED ON MAY 24, 2019, AS INSTRUMENT NO. 2019-34783, OFFICIAL RECORDS OF PLACER COUNTY, AGAINST THE LAND HEREIN SHOWN CONSENTS TO THE MAKING AND FILING OF THIS MAP.

BY: Diana L Edwards

DIANA L EDWARDS

NORTHERN CA ESCROW MANAGER

*Insurance
#2019-0034783

NOTARY'S ACKNOWLEDGMENT

A NOTARY PUBLIC OR OTHER OFFICER COMPLETING THIS CERTIFICATE VERIFIES ONLY THE IDENTITY OF THE INDIVIDUAL WHO SIGNED THE DOCUMENT TO WHICH THIS CERTIFICATE IS ATTACHED, AND NOT THE TRUTHFULNESS, ACCURACY OR VALIDITY OF THAT DOCUMENT.

STATE OF CALIFORNIA

COUNTY OF Placer

ON September 8, 2020 BEFORE ME, Christina Edwards, A NOTARY PUBLIC

PERSONALLY APPEARED Diana Edwards

WHO PROVED TO ME ON THE BASIS OF SATISFACTORY EVIDENCE TO BE THE PERSON(S) WHOSE NAME(S) IS/ARE SUBSCRIBED TO THE WITHIN INSTRUMENT AND ACKNOWLEDGED TO ME THAT HE/SHE/THEY EXECUTED THE SAME IN HIS/HER/THEIR AUTHORIZED CAPACITY(IES), AND THAT BY HIS/HER/THEIR SIGNATURE(S) ON THE INSTRUMENT THE PERSON(S), OR THE ENTITY UPON BEHALF OF WHICH THE PERSON(S) ACTED, EXECUTED THE INSTRUMENT.

I CERTIFY UNDER PENALTY OF PERJURY UNDER THE LAWS OF THE STATE OF CALIFORNIA THAT THE FOREGOING PARAGRAPH IS TRUE AND CORRECT.

WITNESS MY HAND AND OFFICIAL SEAL.

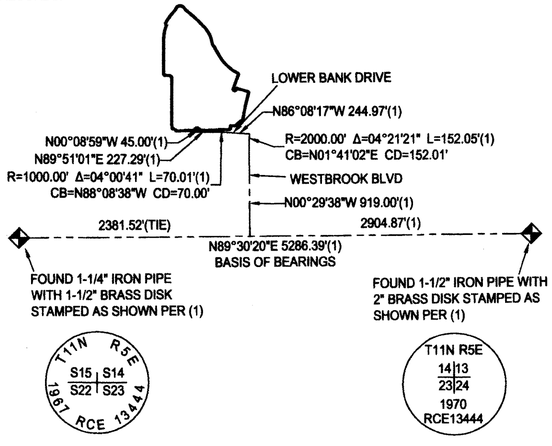
SIGNATURE — PRINTED NAME: Christina Edwards

MY PRINCIPAL PLACE OF BUSINESS IS Sacramento COUNTY

MY COMMISSION EXPIRES: May 31, 2023 MY COMMISSION NUMBER: 2290674

BASIS OF BEARING

THE BASIS OF BEARING FOR THIS MAP IS N 89°30'20" W, BEING THE SOUTH LINE OF SECTION 14 AS SHOWN ON THAT CERTAIN FINAL MAP ENTITLED "CREEKVIEW PHASE 1, LARGE LOT SUBDIVISION SUBDIVISION NO. PL18-0190", RECORDED ON JUNE 1, 2020 IN BOOK EE OF MAPS, AT PAGE 97, PLACER COUNTY RECORDS.



NOTES

1. TOTAL AREA OF THIS SUBDIVISION IS 17.121± ACRES +/-, GROSS, CONSISTING OF 90 RESIDENTIAL LOTS AND 4 LANDSCAPE LOTS.
2. ALL CURVES ARE DIMENSIONED WITH RADIUS, DELTA, ARC LENGTH, CHORD BEARING AND CHORD LENGTH. DISTANCES SHOWN HEREON ARE IN FEET AND DECIMALS THEREOF AND ARE "GROUND" DISTANCES. DUE TO ROUNDING, THE SUM OF INDIVIDUAL DIMENSIONS MAY NOT EQUAL THE OVERALL DIMENSION.
3. A PRELIMINARY SOILS REPORT WAS PREPARED BY GEOCON CONSULTANTS, INC. DATED AUGUST, 2014; PROJECT NO. S9578-05-05 AND ON FILE WITH THE CITY OF ROSEVILLE DEVELOPMENT SERVICES - ENGINEERING DEPARTMENT, FILE No. 308-885.
4. ALL FRONT CORNERS ARE MARKED BY A 1" BRASS MARKER STAMPED "LS 9265" IN THE SIDEWALK ON THE EXTENSION OF SIDE LOT LINES 1.00' FROM THE FRONT PROPERTY LINE UNLESS OTHERWISE NOTED.
5. ALL REAR CORNERS AND ANGLE POINTS WILL BE SET WITH A 5/8" REBAR AND PLASTIC CAP STAMPED "LS 9265". WHERE REAR CORNER FALLS WITHIN A MASONRY RETAINING WALL, MASONRY SOUND WALL OR CONCRETE FOOTING, A 5/8" REBAR WITH PLASTIC CAP STAMPED "LS 9265" WILL BE SET ON THE SIDE LOT LINE 4.00 FOOT OFFSET TO THE REAR CORNER OR A BRASS TAG STAMPED "LS 9265" WILL BE SET WITH EPOXY TO THE FACE WALL 2.00 FOOT ABOVE GROUND OR ON TOP OF WALL WHERE AN OFFSET MONUMENT CANNOT BE SET.
6. PURSUANT TO GOVERNMENT CODE SECTION 66434(G), THE FOLLOWING PUBLIC EASEMENT IS HEREBY ABANDONED:

   A. THE PORTIONS OF THE FORTY (40) FOOT WIDE IRREVOCABLE OFFERS OF DEDICATION/RIGHT OF WAY (I.O.D./RO.W.) AS SHOWN ON THAT CERTAIN FINAL MAP ENTITLED "CREEKVIEW PHASE 1 LARGE LOT MAP" RECORDED IN BOOK EE OF MAPS, AT PAGE 97, PLACER COUNTY RECORDS, LYING WITHIN THE BOUNDARY OF THIS FINAL MAP NOT SHOWN HEREON.

LEGEND

◉	FOUND COPPERWELD SURVEY MONUMENT WITH CENTER PUNCH IN MONUMENT WELL STAMPED "LS 9265"
◆	FOUND SECTION CORNER AS NOTED
●	5/8" REBAR WITH PLASTIC CAP STAMPED "LS 9265" TO BE SET PER (1)
◎	SET COPPERWELD SURVEY MONUMENT WITH CENTER PUNCH IN MONUMENT WELL STAMPED "LS 9265" PER CITY OF ROSEVILLE STANDARDS.
o	DIMENSION POINT
( )	RECORD DATA PER REFERENCE
AC	ACRES
B.P.E.	BIKE PATH EASEMENT
CB	CHORD BEARING
CD	CHORD DISTANCE
IOD	IRREVOCABLE OFFER OF DEDICATION
(OA)	OVERALL
P.E.	PASEO EASEMENT
P.U.E.	PUBLIC UTILITY EASMENT
(R)	RADIAL BEARING
ROW	RIGHT-OF-WAY
SF	SQUARE FEET
(X)	SHEET REFERENCE
———	SUBDIVISION BOUNDARY
——— - ———	CENTER LINE
— — —	IOD/ROW
———	LOT LINE & ROW
———	LOT LINE
- - - - -	EASEMENT LINE
----------	ADJACENT PROPERTY LINE
⊤	FRONT MONUMENT SEE NOTE 4 HEREON
⊥	REAR MONUMENT SEE NOTE 5 HEREON

REFERENCES:

(1) EE MAPS 97 (CREEKVIEW PHASE 1 LLM)

FINAL MAP OF

CREEKVIEW - PHASE 1

VILLAGE 10, 11 & 15

SUBDIVISION No. PL18-0190

BEING A SUBDIVISION OF LOTS 16, 19 AND 20 AS SHOWN ON THAT CERTAIN FINAL MAP ENTITLED "CREEKVIEW - PHASE 1 LARGE LOT SUBDIVISION, SUBDIVISION NO. PL18-0190" FILED FOR RECORD ON JUNE 01, 2020 IN BOOK EE OF MAPS, AT PAGE 97, PLACER COUNTY RECORDS, WITHIN SECTION 14, TOWNSHIP 11 NORTH, RANGE 5 EAST, MOUNT DIABLO MERIDIAN

CITY OF ROSEVILLE • PLACER COUNTY • CALIFORNIA

MACKAY & SOMPS
ENGINEERS PLANNERS SURVEYORS
1025 Creekside Ridge Drive, Suite 150, Roseville, CA 95678 (916) 773-1189

OCTOBER 2020

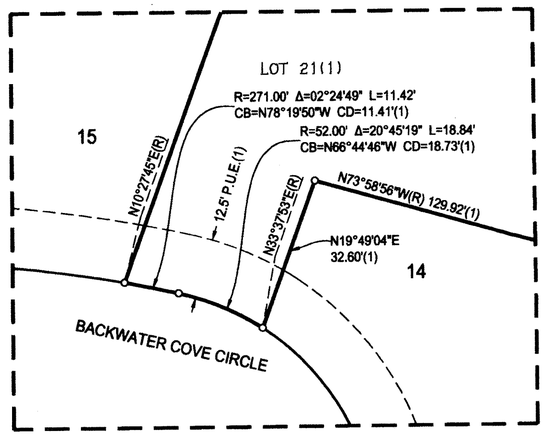
18431.000

N

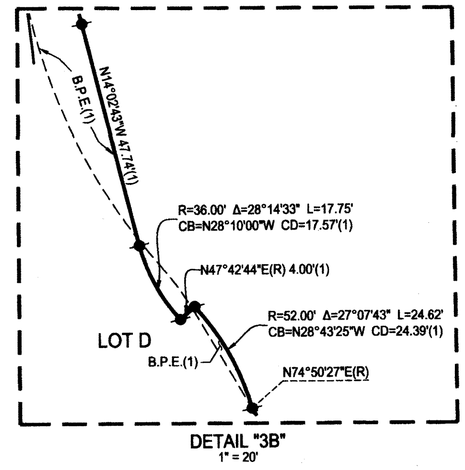
0 50 100 200
SCALE: 1"=100'

Curve Table					
Curve #	Radius	Delta	Length	Chord Bearing	Chord Distance
C1(1)	1000.00'	07°00'41"	122.37'	N89° 38' 38"W	122.30'
C2(1)	26.00'	90°00'00"	40.84'	N45° 08' 59"W	36.77'
C3(1)	26.00'	90°00'00"	40.84'	N44° 51' 01"E	36.77'
C4(1)	619.00'	07°32'57"	81.56'	N86° 04' 33"E	81.50'
C5(1)	26.00'	91°02'16"	41.31'	N52° 10' 48"W	37.10'

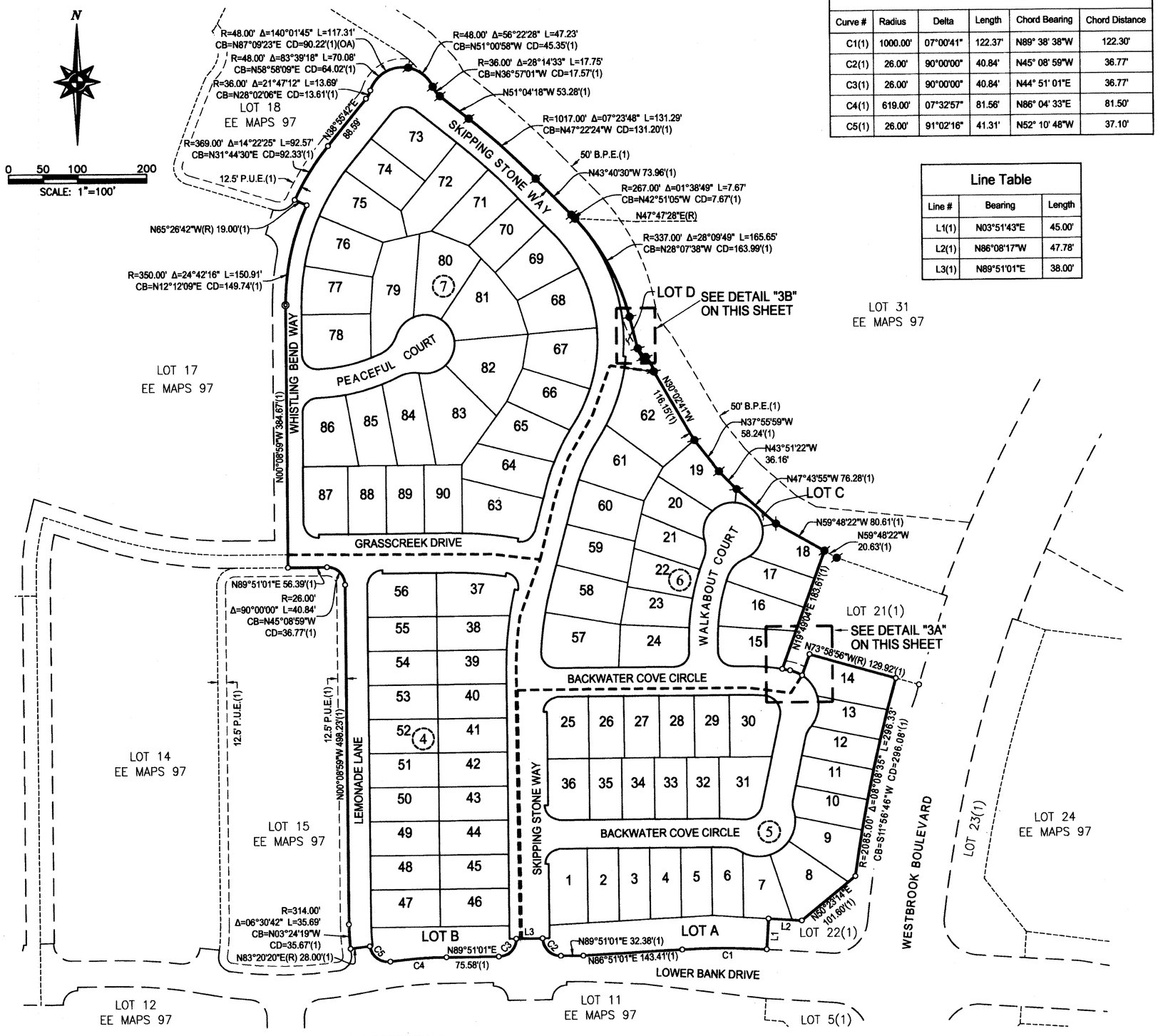
Line Table		
Line #	Bearing	Length
L1(1)	N03°51'43"E	45.00'
L2(1)	N86°08'17"W	47.78'
L3(1)	N89°51'01"E	38.00'



DETAIL "3A"
1" = 20'



DETAIL "3B"
1" = 20'



SEE SHEET 2 FOR NOTES, BASIS OF BEARINGS, LEGEND & REFERENCES

FINAL MAP OF
CREEKVIEW - PHASE 1
VILLAGE 10, 11 & 15
SUBDIVISION No. PL18-0190

BEING A SUBDIVISION OF LOTS 16, 19 AND 20 AS SHOWN ON THAT CERTAIN FINAL MAP ENTITLED "CREEKVIEW - PHASE 1 LARGE LOT SUBDIVISION, SUBDIVISION NO. PL18-0190" FILED FOR RECORD ON JUNE 01, 2020 IN BOOK EE OF MAPS, AT PAGE 97, PLACER COUNTY RECORDS, WITHIN SECTION 14, TOWNSHIP 11 NORTH, RANGE 5 EAST, MOUNT DIABLO MERIDIAN

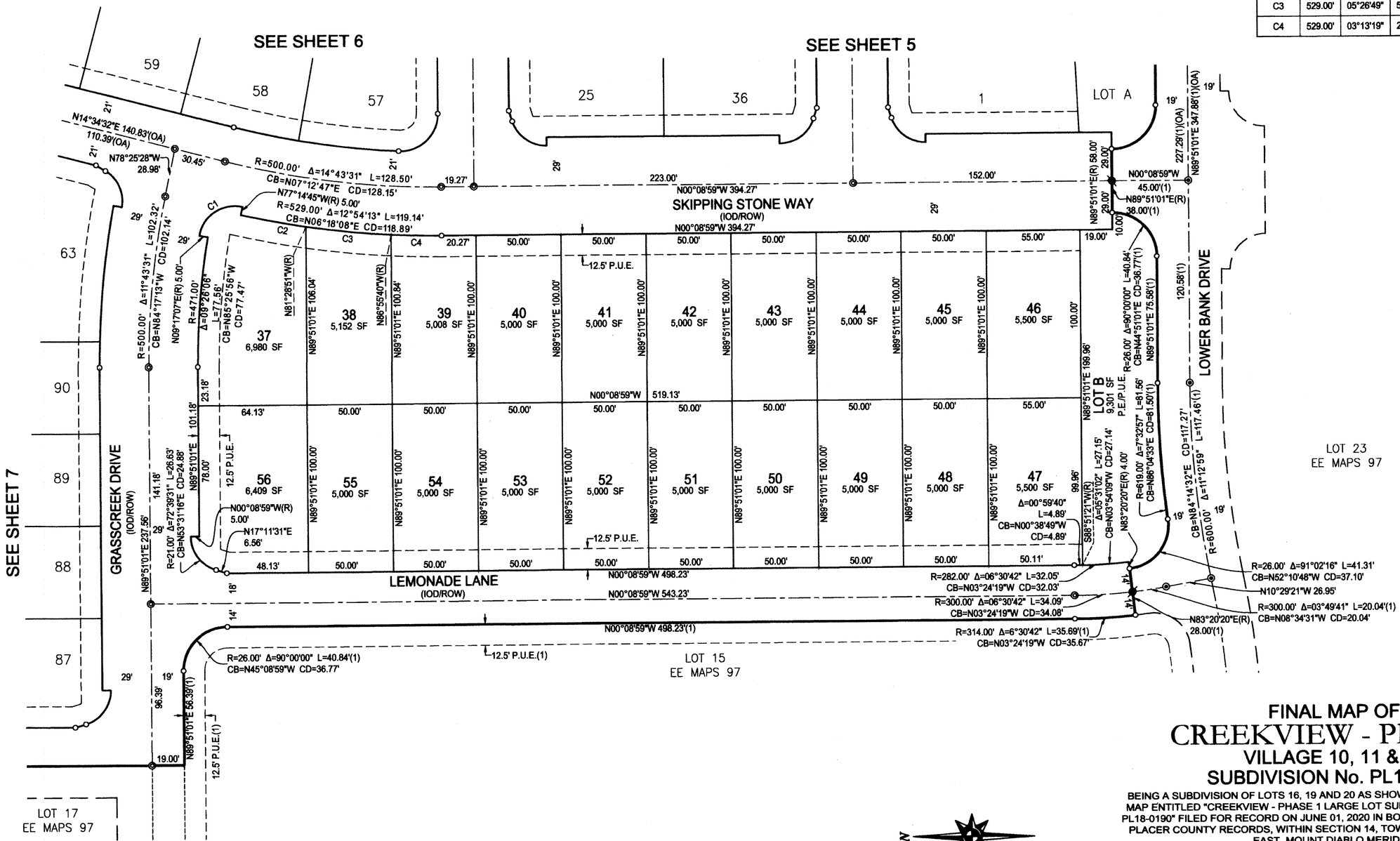
CITY OF ROSEVILLE • PLACER COUNTY • CALIFORNIA

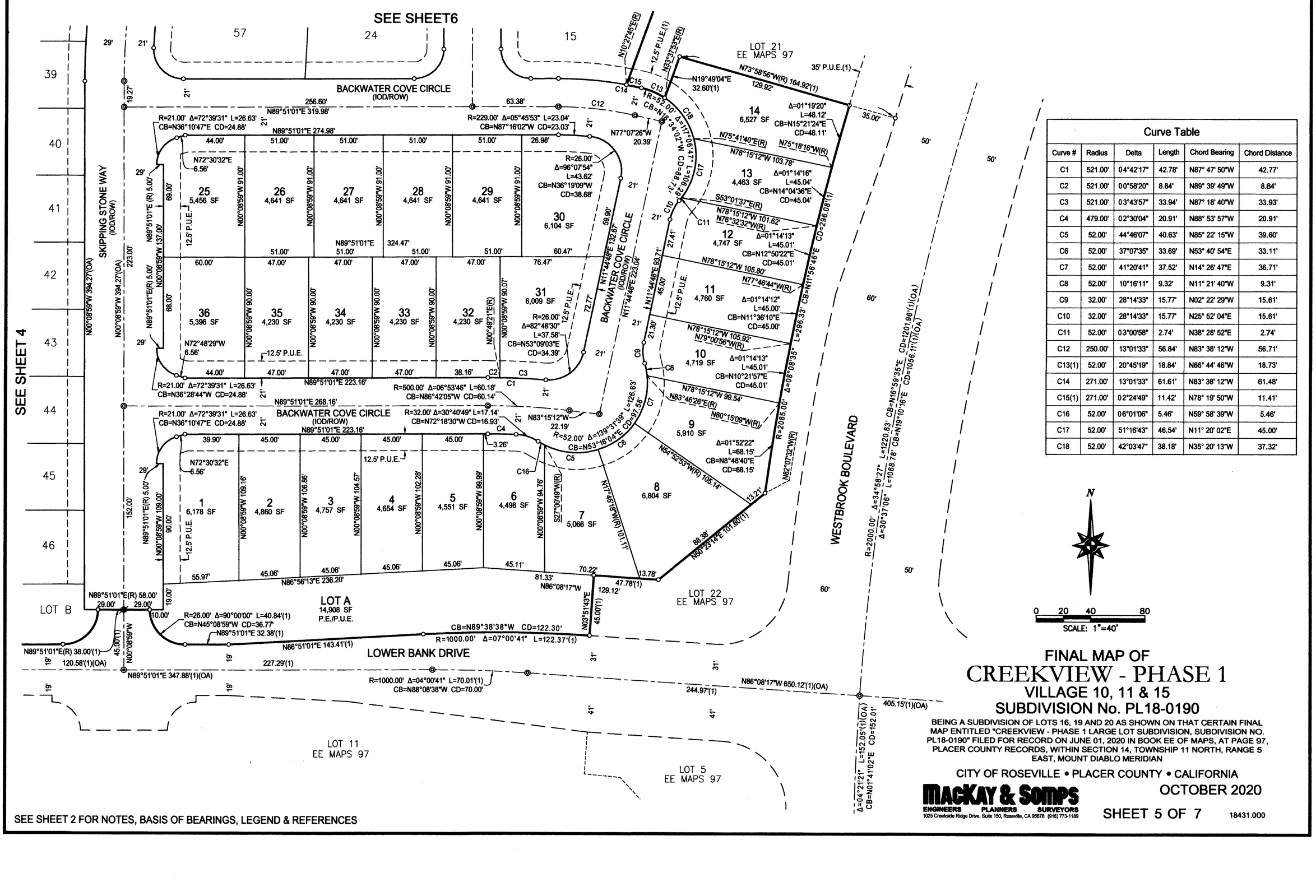
OCTOBER 2020

MACKAY & SOMPS
ENGINEERS PLANNERS SURVEYORS
1025 Creekside Ridge Drive, Suite 150, Roseville, CA 95678 (916) 773-1189

18431.000

Curve Table					
Curve #	Radius	Delta	Length	Chord Bearing	Chord Distance
C1	21.00'	93°28'07"	34.26'	N33° 58' 49"W	30.58'
C2	529.00'	04°14'06"	39.10'	N10° 38' 12"E	39.09'
C3	529.00'	05°26'49"	50.29'	N05° 47' 45"E	50.27'
C4	529.00'	03°13'19"	29.75'	N01° 27' 41"E	29.74'


SEE SHEET 6
SEE SHEET 5
SEE SHEET 7
SKIPPING STONE WAY
(IOD/ROW)
N00°08'59"W 394.27'
LEMONADE LANE
(IOD/ROW)
GRASSCREEK DRIVE
(IOD/ROW)
LOWER BANK DRIVE
LOT A
LOT B
9,301 SF
P.E./P.U.E.
LOT 23
EE MAPS 97
LOT 15
EE MAPS 97
LOT 17
EE MAPS 97
37 6,980 SF
38 5,152 SF
39 5,008 SF
40 5,000 SF
41 5,000 SF
42 5,000 SF
43 5,000 SF
44 5,000 SF
45 5,000 SF
46 5,500 SF
47 5,500 SF
48 5,000 SF
49 5,000 SF
50 5,000 SF
51 5,000 SF
52 5,000 SF
53 5,000 SF
54 5,000 SF
55 5,000 SF
56 6,409 SF
12.5' P.U.E.
N00°08'59"W 519.13'
N00°08'59"W 496.23'
N00°08'59"W 543.23'
N00°08'59"W 498.23'(1)
12.5' P.U.E.(1)
N14°34'32"E 140.83'(OA)
110.39'(OA)
N78°25'28"W
28.98'
R=500.00' Δ=14°43'31" L=128.50'
CB=N07°12'47"E CD=128.15'
N77°14'45"W(R) 5.00'
R=529.00' Δ=12°54'13" L=119.14'
CB=N06°18'08"E CD=118.89'
R=282.00' Δ=06°30'42" L=32.05'
CB=N03°24'19"W CD=32.03'
R=300.00' Δ=06°30'42" L=34.09'
CB=N03°24'19"W CD=34.08'
R=314.00' Δ=6°30'42" L=35.69'(1)
CB=N03°24'19"W CD=35.67'
R=26.00' Δ=90°00'00" L=40.84'(1)
CB=N45°08'59"W CD=36.77'
R=26.00' Δ=91°02'16" L=41.31'
CB=N52°10'48"W CD=37.10'
N10°29'21"W 26.95'
R=300.00' Δ=03°49'41" L=20.04'(1)
CB=N08°34'31"W CD=20.04'
N89°51'01"E(R) 58.00'
N00°08'59"W 45.00'(1)
N89°51'01"E(R) 38.00'(1)
227.29'(1)(OA) N89°51'01"E 347.88'(1)(OA)
120.56'(1)
N89°51'01"E 75.58'(1)
R=26.00' Δ=90°00'00" L=40.84'
CB=N44°51'01"E CD=36.77'(1)
N89°51'01"E 199.96'
S88°51'21"W(R) 99.96'
R=619.00' Δ=7°32'57" L=81.56'
CB=N86°04'33"E CD=81.50'(1)
R=600.00' Δ=11°12'59" L=117.46'(1)
CB=N84°14'32"E CD=117.27'
N83°20'20"E(R) 4.00'
N83°20'20"E(R) 28.00'(1)
R=21.00' Δ=72°39'31" L=26.63'
CB=N53°31'16"E CD=24.88'
N00°08'59"W(R) 5.00'
N17°11'31"E 6.56'
N89°51'01"E 237.56'
N89°51'01"E 56.39'(1)
141.18'
101.18'
78.00'
96.39'
23.18'
R=500.00' Δ=11°43'31" L=102.32'
CB=N84°17'13"W CD=102.14'
N09°17'07"E(R) 5.00'
R=471.00' Δ=09°28'06" L=77.56'
CB=N85°25'56"W CD=77.47'
N81°28'51"W(R)
N86°55'40"W(R)
N89°51'01"E 106.04'
N89°51'01"E 100.84'
N89°51'01"E 100.00'
N89°51'01"E 199.96'
N89°51'01"E 100.00'
N89°51'01"E 100.84'
N89°51'01"E 100.00'
N89°51'01"E 100.00'
N89°51'01"E 100.00



Curve Table

Curve #	Radius	Delta	Length	Chord Bearing	Chord Distance
C1	521.00'	04°42'17"	42.78'	N87° 47' 50"W	42.77'
C2	521.00'	00°58'20"	8.84'	N89° 39' 49"W	8.84'
C3	521.00'	03°43'57"	33.94'	N87° 18' 40"W	33.93'
C4	479.00'	02°30'04"	20.91'	N88° 53' 57"W	20.91'
C5	52.00'	44°46'07"	40.63'	N85° 22' 15"W	39.60'
C6	52.00'	37°07'35"	33.69'	N53° 40' 54"E	33.11'
C7	52.00'	41°20'41"	37.52'	N14° 26' 47"E	36.71'
C8	52.00'	10°16'11"	9.32'	N11° 21' 40"W	9.31'
C9	32.00'	28°14'33"	15.77'	N02° 22' 29"W	15.61'
C10	32.00'	28°14'33"	15.77'	N25° 52' 04"E	15.61'
C11	52.00'	03°00'58"	2.74'	N38° 28' 52"E	2.74'
C12	250.00'	13°01'33"	56.84'	N83° 38' 12"W	56.71'
C13(1)	52.00'	20°45'19"	18.84'	N66° 44' 46"W	18.73'
C14	271.00'	13°01'33"	61.61'	N83° 38' 12"W	61.48'
C15(1)	271.00'	02°24'49"	11.42'	N78° 19' 50"W	11.41'
C16	52.00'	06°01'06"	5.46'	N59° 58' 39"W	5.46'
C17	52.00'	51°16'43"	46.54'	N11° 20' 02"E	45.00'
C18	52.00'	42°03'47"	38.18'	N35° 20' 13"W	37.32'

FINAL MAP OF CREEKVIEW - PHASE 1

VILLAGE 10, 11 & 15

SUBDIVISION No. PL18-0190

BEING A SUBDIVISION OF LOTS 16, 19 AND 20 AS SHOWN ON THAT CERTAIN FINAL MAP ENTITLED "CREEKVIEW - PHASE 1 LARGE LOT SUBDIVISION, SUBDIVISION NO. PL18-0190" FILED FOR RECORD ON JUNE 01, 2020 IN BOOK EE OF MAPS, AT PAGE 97, PLACER COUNTY RECORDS, WITHIN SECTION 14, TOWNSHIP 11 NORTH, RANGE 5 EAST, MOUNT DIABLO MERIDIAN

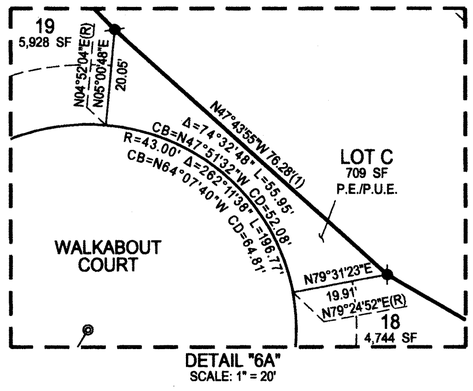
CITY OF ROSEVILLE • PLACER COUNTY • CALIFORNIA

MACKAY & SOMPS
ENGINEERS PLANNERS SURVEYORS
1025 Creekside Ridge Drive, Suite 150, Roseville, CA 95678 (916) 773-1189

OCTOBER 2020

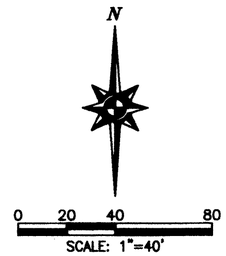
18431.000





DETAIL "6A"
SCALE: 1" = 20'

Curve Table					
Curve #	Radius	Delta	Length	Chord Bearing	Chord Distance
C1	52.00'	117°06'47"	106.29'	N18° 34' 02"W	88.73'
C2 (1)	52.00'	20°45'19"	18.84'	N66° 44' 46"W	18.73'
C3	271.00'	13°01'33"	61.61'	N83° 38' 12"W	61.48'
C4 (1)	271.00'	02°24'49"	11.42'	N78° 19' 50"W	11.41'
C5	271.00'	10°36'44"	50.19'	N84° 50' 37"W	50.12'
C6	279.00'	01°10'15"	5.70'	N18° 16' 34"E	5.70'
C7	45.00'	48°06'27"	37.78'	N42° 54' 55"E	36.68'
C8	43.00'	10°00'04"	7.51'	N61° 58' 07"E	7.50'



FINAL MAP OF CREEKVIEW - PHASE 1

VILLAGE 10, 11 & 15

SUBDIVISION No. PL18-0190

BEING A SUBDIVISION OF LOTS 16, 19 AND 20 AS SHOWN ON THAT CERTAIN FINAL MAP ENTITLED "CREEKVIEW - PHASE 1 LARGE LOT SUBDIVISION, SUBDIVISION NO. PL18-0190" FILED FOR RECORD ON JUNE 01, 2020 IN BOOK EE OF MAPS, AT PAGE 97, PLACER COUNTY RECORDS, WITHIN SECTION 14, TOWNSHIP 11 NORTH, RANGE 5 EAST, MOUNT DIABLO MERIDIAN

CITY OF ROSEVILLE • PLACER COUNTY • CALIFORNIA

OCTOBER 2020

MACKAY & SOMPS
ENGINEERS PLANNERS SURVEYORS
1025 Creekside Ridge Drive, Suite 150, Roseville, CA 95678 (916) 773-1189

18431.000

SEE SHEET 2 FOR NOTES, BASIS OF BEARINGS, LEGEND & REFERENCES

Curve Table					
Curve #	Radius	Delta	Length	Chord Bearing	Chord Distance
C1(1)	36.00'	21°47'12"	13.69'	N28° 02' 06"E	13.61'
C2	979.00'	00°28'12"	8.03'	N50° 50' 12"W	8.03'
C3	267.00'	47°08'31"	219.68'	N18° 27' 25"W	213.54'
C4	271.00'	03°23'16"	16.02'	N06° 48' 29"E	16.02'
C5	21.00'	68°25'32"	25.08'	N66° 07' 47"E	23.62'
C6	22.00'	91°38'39"	35.19'	N45° 58' 18"W	31.56'
C7	229.00'	03°36'13"	14.40'	N66° 32' 45"E	14.40'
C8	45.00'	46°43'20"	36.70'	N41° 22' 58"E	35.69'
C9	43.00'	49°46'00"	37.35'	N42° 54' 18"E	36.19'
C10	45.00'	38°02'39"	29.88'	N81° 28' 15"E	29.33'
C11	327.00'	02°11'19"	12.49'	N37° 50' 03"E	12.49'

Line Table		
Line #	Bearing	Length
L1	N84°53'10"W(R)	4.00'

SEE SHEET 2 FOR NOTES, BASIS OF BEARINGS, LEGEND & REFERENCES

SEE SHEET 6

SEE SHEET 4

SCALE: 1"=40'

FINAL MAP OF CREEKVIEW - PHASE 1

VILLAGE 10, 11 & 15

SUBDIVISION No. PL18-0190

BEING A SUBDIVISION OF LOTS 16, 19 AND 20 AS SHOWN ON THAT CERTAIN FINAL MAP ENTITLED "CREEKVIEW - PHASE 1 LARGE LOT SUBDIVISION, SUBDIVISION NO. PL18-0190" FILED FOR RECORD ON JUNE 01, 2020 IN BOOK EE OF MAPS, AT PAGE 97, PLACER COUNTY RECORDS, WITHIN SECTION 14, TOWNSHIP 11 NORTH, RANGE 5 EAST, MOUNT DIABLO MERIDIAN

CITY OF ROSEVILLE • PLACER COUNTY • CALIFORNIA

OCTOBER 2020

MACKAY & SOMPS
ENGINEERS PLANNERS SURVEYORS
1025 Creekside Ridge Drive, Suite 150, Roseville, CA 95678 (916) 773-1189

18431.000

COUNCIL COMMUNICATION

CC #: 1515
File #: 0400-04-13-1

Title:	Creekview Phase 1 Village 13 & 14 - Notice of Completion
Contact:	Ignacio Vizcarra 916-774-5578 ivizcarra@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 7.20.

RECOMMENDATION TO COUNCIL

Staff recommends that the City Council adopt the attached resolution accepting Creekview Phase 1 Village 13 & 14 (Imp. Plan), CWJ# 190188, as complete and authorizing the City Engineer to execute the Notice of Completion.

BACKGROUND

The Engineering Division has made a final inspection of the above project and has found the roadway infrastructure work complete in accordance with the improvement plans and City specifications.

FISCAL IMPACT

The actions requested as part of this action have no impact to the City's General Fund. Construction costs were paid by the developer.

ENVIRONMENTAL REVIEW

The California Environmental Quality Act (CEQA) does not apply to activities that will not result in a direct or reasonably foreseeable indirect physical change in the environment, or is otherwise not considered a project as defined by CEQA Statute §21065 and CEQA State Guidelines §15060(c)(3) and §15378. Approval of a Notice of Completion meets the above criteria and is not subject to CEQA. No additional environmental review is required.

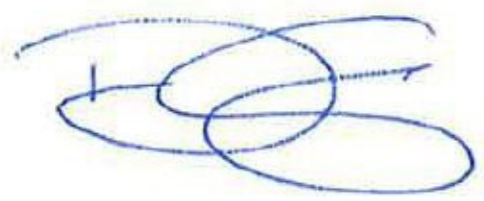
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Goal F - Invest in well-planned infrastructure and growth

Respectfully Submitted,

Ignacio Vizcarra, Construction Inspector

Mike Isom, Development Services Director



_____

Dominick Casey, City Manager

ATTACHMENTS:

Description

Resolution 21-253

NOC. Creekview Phase 1 Village 13 & 14.

Exhibit A. Creekview Phase 1 Village 13 & 14.

Final Map Creekview Phase 1 Villages 13 & 14

RESOLUTION NO. 21-253

RESOLUTION OF THE COUNCIL OF THE CITY OF ROSEVILLE ACCEPTING THE PUBLIC WORK KNOWN AS **CREEKVIEW PHASE 1, VILLAGE 13 & 14** PROJECT, APPROVING THE "NOTICE OF COMPLETION", AND AUTHORIZING AND DIRECTING THE CITY ENGINEER TO EXECUTE SAID NOTICE ON BEHALF OF THE CITY OF ROSEVILLE, THEREFORE, AND ACCEPTING ALL DEDICATIONS OFFERED ON THE RECORDED MAP OF THE SUBDIVISION.

BE IT RESOLVED by the Council of the City of Roseville as follows:

1. The "Notice of Completion" on file in the City Clerk's Department relative to that public work known as the **Creekview Phase 1, Village 13 & 14** is hereby approved and the public work accepted.

2. All rights of way and easements as offered on the final map of recorded with Placer County Recorder's Office Book **FF** of Maps, Page **23** is hereby accepted.

3. The City Engineer is hereby authorized and directed to execute said Notice on behalf of the City of Roseville.

PASSED AND ADOPTED by the Council of the City of Roseville, this_____day of_____, 2021, by the following vote on roll call:

AYES COUNCILMEMBERS:

NOES COUNCILMEMBERS:

ABSENT COUNCILMEMBERS:

_____
MAYOR

ATTEST:

_____
CITY CLERK

RECORDING REQUESTED BY AND WHEN
RECORDED MAIL TO:

CITY CLERK
CITY OF ROSEVILLE
311 VERNON STREET
ROSEVILLE, CA 95678

Exempt from recording fees
Pursuant to Gov't Code §27383

NOTICE OF COMPLETION

NOTICE IS HEREBY GIVEN that the public work of improvement known as the _____ Project was completed and accepted by the City of Roseville on _____. The location is situated in the City of Roseville, County of Placer, State of California and is indicated on the attached map, marked as Exhibit "A" and incorporated herein by this reference. The real property herein described is owned by the City of Roseville, 311 Vernon Street, Roseville CA 95678.

The direct/general contractor on said project was _____.

The surety on said project was _____

_____.

_____

City of Roseville
Owner

ATTEST:

_____
Sonia Orozco, City Clerk

State of California)
County of Placer)

I,_____, being first duly sworn, depose and say: I am the _____ of the City of Roseville, a municipal corporation in the State of California, owner of the property described in the above Notice. I am duly authorized to make this verification for and on behalf of the City of Roseville. I have read the Notice of Completion and know its contents and the facts stated therein are true.

_____

City of Roseville

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California)
County of Placer)

Subscribed and sworn to (or affirmed) before me on this _____ day of _____,

20___, _____

proved to me on the basis of satisfactory evidence to be the person(s) who appeared before me.

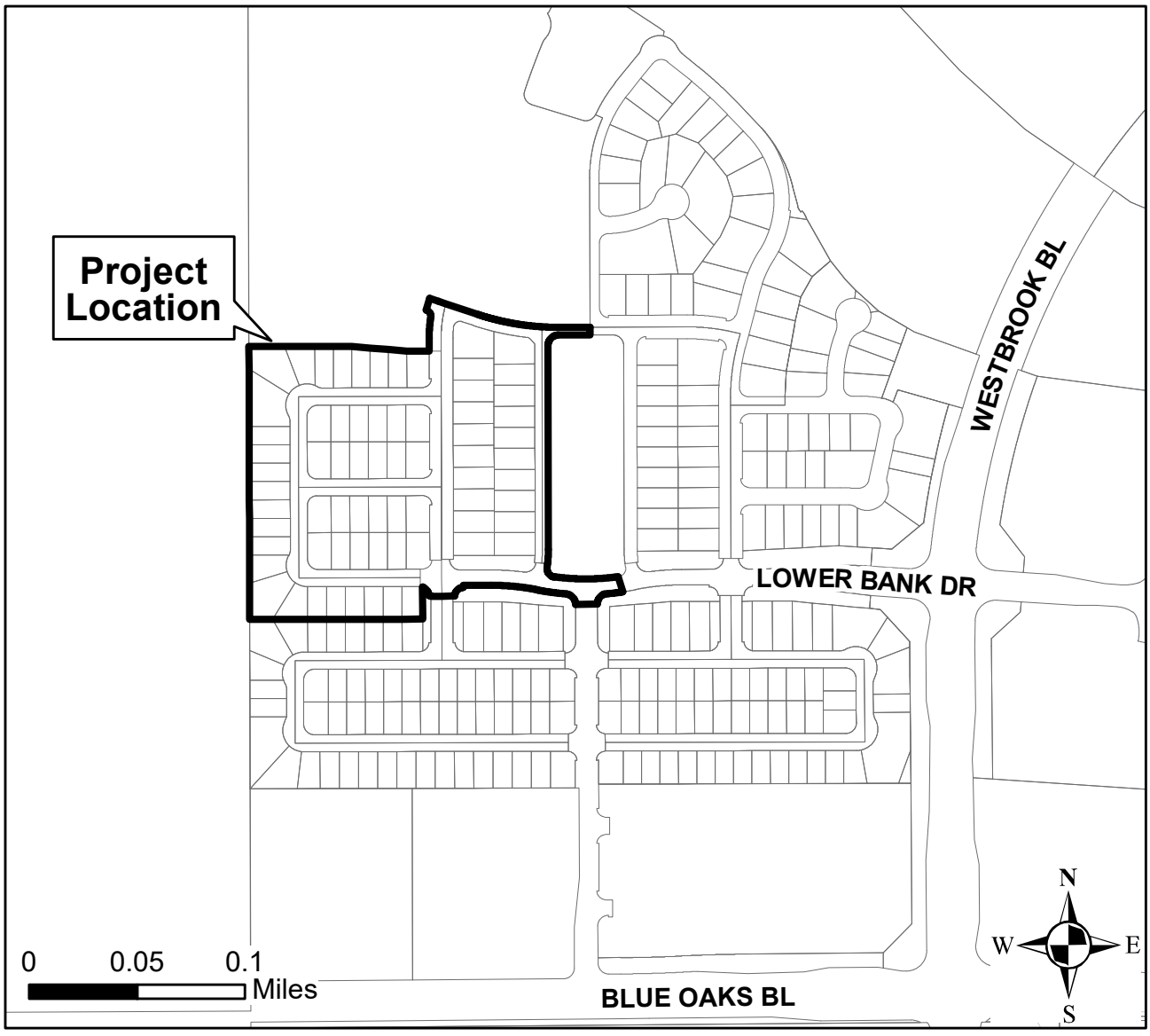
_____

Place Notary Seal and/or Stamp Above

Signature of Notary Public

EXHIBIT A

City of Roseville
Creekview Phase 1
Village 13 & 14



OWNER'S STATEMENT

THE UNDERSIGNED HEREBY CERTIFY THAT THEY ARE THE ONLY PERSONS HAVING ANY RECORD TITLE INTEREST IN THE REAL PROPERTY INCLUDED WITHIN THE SUBDIVISION SHOWN UPON THIS FINAL MAP OF "CREEKVIEW - PHASE 1 VILLAGE 13 & 14" AND THEY HEREBY CONSENT TO THE PREPARATION AND RECORDATION OF THIS FINAL MAP AND HEREBY OFFER FOR DEDICATION AND DO HEREBY DEDICATE FOR SPECIFIC PURPOSES THE FOLLOWING:

THE REAL PROPERTY DESCRIBED BELOW IS DEDICATED AS EASEMENTS FOR PUBLIC PURPOSES:

(A) A PUBLIC EASEMENT FOR THE INSTALLATION AND MAINTENANCE OF, BUT NOT LIMITED TO ELECTROLIERS, WATER AND GAS PIPES, SEWER AND DRAINAGE PIPES, AND FOR UNDERGROUND WIRE AND CONDUITS FOR ELECTRIC, TELEPHONE AND TELEVISION SERVICES AND TRAFFIC CONTROL APPURTENANCES TOGETHER WITH ANY AND ALL APPURTENANCES PERTAINING THERETO ON, OVER, UNDER AND ACROSS LOT A, THE STREETS SHOWN HEREON AS CLOUDCREST PLACE, DAYDREAM DRIVE, GRASSCREEK DRIVE, OXBOW LANDING LOOP AND TREEHOUSE LANE, AND THOSE STRIPS OF LAND LYING CONTIGUOUS TO THE RIGHTS-OF-WAY AS SHOWN HEREON AND DESIGNATED "P.U.E." (PUBLIC UTILITY EASEMENT).

(B) A PUBLIC EASEMENT FOR PEDESTRIAN / BICYCLE ACCESS AND THE INSTALLATION, REPAIR, REMOVAL OR REPLACEMENT OF LANDSCAPING TOGETHER WITH ANY AND ALL APPURTENANCES THERETO, ON, OVER, UNDER AND ACROSS LOT A SHOWN HEREON AND DESIGNATED "PASEO EASEMENT" (P.E.)

THE REAL PROPERTY DESCRIBED BELOW IS DEDICATED IN FEE FOR PUBLIC PURPOSES:

(A) AS PUBLIC RIGHTS-OF-WAY (INCLUDING ALL IMPROVEMENTS THEREON) THE STREETS SHOWN HEREON AS CLOUDCREST PLACE, DAYDREAM DRIVE, GRASSCREEK DRIVE, OXBOW LANDING LOOP AND TREEHOUSE LANE.

(B) LOT A AS SHOWN HEREON TO THE CITY OF ROSEVILLE FOR LANDSCAPING AND AS PUBLIC RIGHT-OF-WAY.

ANTHEM UNITED CREEKVIEW DEVELOPMENTS LIMITED PARTNERSHIP,
A WASHINGTON LIMITED PARTNERSHIP

BY: BZ Brian Moore
Vice President

NOTARY'S ACKNOWLEDGMENT

A NOTARY PUBLIC OR OTHER OFFICER COMPLETING THIS CERTIFICATE VERIFIES ONLY THE IDENTITY OF THE INDIVIDUAL WHO SIGNED THE DOCUMENT TO WHICH THIS CERTIFICATE IS ATTACHED, AND NOT THE TRUTHFULNESS, ACCURACY OR VALIDITY OF THAT DOCUMENT.

STATE OF CALIFORNIA
COUNTY OF Placer
ON 9/8/20 BEFORE ME, Karron M. Vasquez NOTARY PUBLIC
PERSONALLY APPEARED Brian Moore
WHO PROVED TO ME ON THE BASIS OF SATISFACTORY EVIDENCE TO BE THE PERSON(S) WHOSE NAME(S) IS/ARE SUBSCRIBED TO THE WITHIN INSTRUMENT AND ACKNOWLEDGED TO ME THAT HE/SHE/THEY EXECUTED THE SAME IN HIS/HER/THEIR AUTHORIZED CAPACITY(IES), AND THAT BY HIS/HER/THEIR SIGNATURE(S) ON THE INSTRUMENT THE PERSON(S), OR THE ENTITY UPON BEHALF OF WHICH THE PERSON(S) ACTED, EXECUTED THE INSTRUMENT.

I CERTIFY UNDER PENALTY OF PERJURY UNDER THE LAWS OF THE STATE OF CALIFORNIA THAT THE FOREGOING PARAGRAPH IS TRUE AND CORRECT.

WITNESS MY HAND AND OFFICIAL SEAL.
SIGNATURE Karron M. Vasquez PRINTED NAME
MY PRINCIPAL PLACE OF BUSINESS IS Solano COUNTY
MY COMMISSION EXPIRES: 2/19/22 MY COMMISSION NUMBER: 2228832

CITY ENGINEER'S STATEMENT

I HEREBY STATE THAT I HAVE EXAMINED THIS FINAL MAP OF "CREEKVIEW - PHASE 1 VILLAGE 13 & 14" AND FIND IT TO BE SUBSTANTIALLY THE SAME AS THE TENTATIVE MAP ON FILE AND ANY APPROVED ALTERATIONS THEREOF; THAT ALL PROVISIONS OF THE SUBDIVISION MAP ACT AND ALL APPLICABLE CITY ORDINANCES HAVE BEEN COMPLIED WITH.

DATE: 9/15/20

MARC STOUT, R.C.E. 69879
CITY ENGINEER, CITY OF ROSEVILLE
LICENSE EXPIRES: SEPTEMBER 30, 2022

I HEREBY STATE THAT I AM SATISFIED THIS FINAL MAP OF "CREEKVIEW - PHASE 1 VILLAGE 13 & 14" IS TECHNICALLY CORRECT.

FOR MARC STOUT, CITY ENGINEER, CITY OF ROSEVILLE

DATE: 9/29/20

TIMOTHY G. BLAIR, PLS 8278
EXPIRES DECEMBER 31, 2021

LICENSED LAND SURVEYOR
TIMOTHY G. BLAIR
Exp. 12-31-21
No. 8278
STATE OF CALIFORNIA

SURVEYOR'S STATEMENT

THIS FINAL MAP OF "CREEKVIEW - PHASE 1 VILLAGE 13 & 14" WAS PREPARED BY ME OR UNDER MY DIRECTION AND IS BASED UPON A FIELD SURVEY IN CONFORMANCE WITH THE REQUIREMENTS OF THE SUBDIVISION MAP ACT AND LOCAL ORDINANCE AT THE REQUEST OF ANTHEM UNITED CREEKVIEW DEVELOPMENTS LIMITED PARTNERSHIP, IN JANUARY, 2019, I HEREBY STATE THAT THE SURVEY IS TRUE AND COMPLETE AS SHOWN, THAT ALL THE MONUMENTS ARE OF THE CHARACTER AND OCCUPY THE POSITIONS INDICATED OR THAT THEY WILL BE SET IN THOSE POSITIONS BEFORE DECEMBER 31, 2022, AND THAT THE MONUMENTS ARE, OR WILL BE, SUFFICIENT TO ENABLE THE SURVEY TO BE RETRACED, AND THAT THIS FINAL MAP SUBSTANTIALLY CONFORMS TO THE CONDITIONALLY APPROVED TENTATIVE MAP.

MACKAY & SOMPS CIVIL ENGINEERS, INC.

BY: Paul Ferguson

PAUL FERGUSON, JR., LS 9265
EXPIRATION DATE: MARCH 31, 2022

DATE: 9/4/2020

LICENSED LAND SURVEYOR
PAUL FERGUSON, JR.
3-31-22
No. 9265
STATE OF CALIFORNIA

CITY CLERK'S STATEMENT

I HEREBY CERTIFY THAT THE CITY COUNCIL, CITY OF ROSEVILLE, HAS APPROVED THIS FINAL MAP OF "CREEKVIEW - PHASE 1 VILLAGE 13 & 14", AND HAS ACCEPTED ON BEHALF OF THE PUBLIC, THE PUBLIC UTILITY EASEMENTS OFFERED HEREON FOR DEDICATION AND HAS ACCEPTED, SUBJECT TO IMPROVEMENT, LOT A, THE RIGHTS-OF-WAY AND PASEO EASEMENT OFFERED HEREON FOR DEDICATION, AND HEREBY APPROVES THE ABANDONMENT OF THE EASEMENT LISTED WITHIN NOTE 3 ON SHEET 2.

Sonia Orozco
CITY CLERK, CITY OF ROSEVILLE

DATE: 10/8/2020 BY: _____
ASSISTANT CITY CLERK

RECORDER'S STATEMENT

FILED THIS 5TH DAY OF NOVEMBER, 2020, AT 10:56 A.M. IN BOOK FF OF MAPS, AT PAGE 23, IN THE OFFICE OF THE PLACER COUNTY RECORDER, AT THE REQUEST OF MACKAY & SOMPS CIVIL ENGINEERS, INC.

RYAN RONCO
RECORDER OF PLACER COUNTY
STATE OF CALIFORNIA

DOCUMENT NO.: 2020-0126903

BY: D. Butters
DEPUTY

FEE: $ 104.00

FINAL MAP OF
CREEKVIEW - PHASE 1
VILLAGE 13 & 14
SUBDIVISION No. PL18-0190

BEING A SUBDIVISION OF LOTS 13 AND 14 AS SHOWN ON THAT CERTAIN FINAL MAP ENTITLED "CREEKVIEW - PHASE 1 LARGE LOT SUBDIVISION PL18-0190" FILED FOR RECORD ON JUNE 01, 2020 IN BOOK EE OF MAPS, AT PAGE 97, PLACER COUNTY RECORDS, WITHIN SECTION 14, TOWNSHIP 11 NORTH, RANGE 5 EAST, MOUNT DIABLO MERIDIAN

CITY OF ROSEVILLE • PLACER COUNTY • CALIFORNIA

OCTOBER 2020

MACKAY & SOMPS
ENGINEERS PLANNERS SURVEYORS
1025 Creekside Ridge Drive, Suite 150, Roseville, CA 95678 (916) 773-1189

18431.000

TRUSTEE'S STATEMENT

FIRST AMERICAN TITLE COMPANY, A NEBRASKA CORPORATION, AS TRUSTEE UNDER DEED OF TRUST RECORDED ON MAY 24, 2019, AS INSTRUMENT NO. 2019-34783, OFFICIAL RECORDS OF PLACER COUNTY, AGAINST THE LAND HEREIN SHOWN CONSENTS TO THE MAKING AND FILING OF THIS MAP.

*Insurance
** 2019-0034783

BY: Diana L. Edwards
DIANA L. EDWARDS
NORTHERN CA BRANCH MANAGER

NOTARY'S ACKNOWLEDGMENT

A NOTARY PUBLIC OR OTHER OFFICER COMPLETING THIS CERTIFICATE VERIFIES ONLY THE IDENTITY OF THE INDIVIDUAL WHO SIGNED THE DOCUMENT TO WHICH THIS CERTIFICATE IS ATTACHED, AND NOT THE TRUTHFULNESS, ACCURACY OR VALIDITY OF THAT DOCUMENT.

STATE OF CALIFORNIA

COUNTY OF Placer

ON September 8, 2020 BEFORE ME, Christina Edwards, A NOTARY PUBLIC

PERSONALLY APPEARED Diana Edwards

WHO PROVED TO ME ON THE BASIS OF SATISFACTORY EVIDENCE TO BE THE PERSON(S) WHOSE NAME(S) IS/ARE SUBSCRIBED TO THE WITHIN INSTRUMENT AND ACKNOWLEDGED TO ME THAT HE/SHE/THEY EXECUTED THE SAME IN HIS/HER/THEIR AUTHORIZED CAPACITY(IES), AND THAT BY HIS/HER/THEIR SIGNATURE(S) ON THE INSTRUMENT THE PERSON(S), OR THE ENTITY UPON BEHALF OF WHICH THE PERSON(S) ACTED, EXECUTED THE INSTRUMENT.

I CERTIFY UNDER PENALTY OF PERJURY UNDER THE LAWS OF THE STATE OF CALIFORNIA THAT THE FOREGOING PARAGRAPH IS TRUE AND CORRECT.

WITNESS MY HAND AND OFFICIAL SEAL.

SIGNATURE — Christina Edwards PRINTED NAME

MY PRINCIPAL PLACE OF BUSINESS IS Sacramento COUNTY

MY COMMISSION EXPIRES: May 31, 2023 MY COMMISSION NUMBER: 2290674

NOTES:

1. ALL CURVES ARE DIMENSIONED WITH RADIUS, DELTA, ARC LENGTH, CHORD BEARING AND CHORD LENGTH. ALL DISTANCES SHOWN ARE FEET AND DECIMALS THEREOF AND ARE "GROUND" DISTANCES. DUE TO ROUNDING, THE SUM OF INDIVIDUAL DIMENSIONS MAY NOT EQUAL THE OVERALL DIMENSION.
2. TOTAL AREA FOR THIS SUBDIVISION IS 10.912± ACRES, CONSISTING OF 70 RESIDENTIAL LOTS AND 1 LANDSCAPE LOT.
3. PURSUANT TO GOVERNMENT CODE SECTION 66434(G), THE FOLLOWING PUBLIC EASEMENT IS HEREBY ABANDONED:

   a. THE PORTIONS OF FORTY (40) FOOT WIDE IRREVOCABLE OFFERS OF DEDICATION/RIGHT OF WAY (I.O.D./RO.W.) AS SHOWN ON THAT CERTAIN FINAL MAP ENTITLED "CREEKVIEW PHASE 1 LARGE LOT MAP" RECORDED IN BOOK EE OF MAPS, AT PAGE 97, PLACER COUNTY RECORDS, LYING WITHIN THE BOUNDARY OF THIS FINAL MAP NOT SHOWN HEREON.
4. ALL FRONT LOT CORNERS WILL BE SET WITH A 1" DIAMETER BRASS DISC STAMPED "LS 9265" IN THE SIDEWALK ON THE EXTENSION OF SIDE LOT LINES 1.00 FOOT FROM THE FRONT PROPERTY LINE UNLESS OTHERWISE NOTED.
5. ALL REAR LOT CORNERS AND ANGLE POINTS WILL BE SET WITH A 5/8" REBAR WITH PLASTIC CAP STAMPED "LS 9265". WHERE MONUMENTS FALL WITHIN A SOUND WALL OR CONCRETE FOOTING A 5/8" REBAR, WITH PLASTIC CAP STAMPED "LS 9265" WILL BE SET ON THE SIDE LOT LINE ON A 4.00 FOOT OFFSET TO THE REAR LOT CORNER.
6. A PRELIMINARY SOILS REPORT WAS PREPARED BY GEOCON CONSULTING, INC., DATED AUGUST 2014; PROJECT NUMBER S9578-05-05 AND ON FILE WITH THE CITY OF ROSEVILLE DEVELOPMENT SERVICES - ENGINEERING DEPARTMENT, FILE NO. 308-885.

LEGEND:

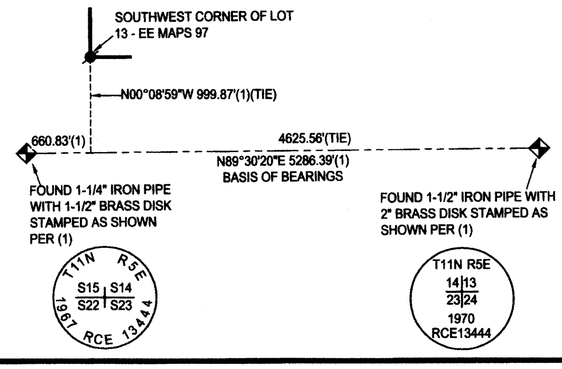
o	DIMENSION POINT
◆	FOUND SECTION CORNER AS NOTED
●	FOUND 5/8" REBAR WITH PLASTIC CAP STAMPED "LS 9265" PER (1)
◉	FOUND COPPERWELD SURVEY MONUMENT WITH CENTER PUNCH PER (1) IN MONUMENT WELL STAMPED "LS 9265"
⊙	SET COPPERWELD SURVEY MONUMENT WITH CENTER PUNCH IN MONUMENT WELL STAMPED "LS 9265"
AC.	ACRES
CB	CHORD BEARING
CD	CHORD DISTANCE
FD	FOUND
IOD/ROW	IRREVOCABLE OFFER OF DEDICATION/RIGHT-OF-WAY
OD	OUTSIDE DIAMETER
(OA)	OVERALL
O.R.	OFFICIAL RECORDS OF PLACER COUNTY
P.E.	PASEO EASEMENT
P.U.E.	PUBLIC UTILITY EASEMENT
S.F.	SQUARE FEET
(R)	RADIAL BEARING
(X)	SHEET INDEX
———	SUBDIVISION BOUNDARY
——-·——-	CENTER LINE
— — —	IOD/ROW
———	LOT LINE & ROW
———	LOT LINE
- - - - -	EASEMENT LINE
----------	ADJACENT PROPERTY LINE
⊤	FRONT MONUMENT SEE NOTE 4 HEREON
⊥	REAR MONUMENT SEE NOTE 5 HEREON

REFERENCES:

(1) EE MAPS 97 CREEKVIEW PHASE 1 LLM
(2) FF MAPS 22 CREEKVIEW PHASE 1 VILLAGE ~~10-11-15~~ 10, 11 & 15

BASIS OF BEARINGS:

THE BASIS OF BEARINGS FOR THIS MAP IS N 89°30'20" E AS SHOWN ON THE SOUTH LINE OF SECTION 14 PER THAT CERTAIN FINAL MAP ENTITLED "CREEKVIEW PHASE 1 LARGE LOT MAP" FILED FOR RECORD ON JUNE 1, 2020 IN BOOK EE OF MAPS, AT PAGE 97, PLACER COUNTY RECORDS.



FINAL MAP OF
CREEKVIEW - PHASE 1
VILLAGE 13 & 14
SUBDIVISION No. PL18-0190

BEING A SUBDIVISION OF LOTS 13 AND 14 AS SHOWN ON THAT CERTAIN FINAL MAP ENTITLED "CREEKVIEW - PHASE 1 LARGE LOT SUBDIVISION PL18-0190" FILED FOR RECORD ON JUNE 01, 2020 IN BOOK EE OF MAPS, AT PAGE 97, PLACER COUNTY RECORDS, WITHIN SECTION 14, TOWNSHIP 11 NORTH, RANGE 5 EAST, MOUNT DIABLO MERIDIAN

CITY OF ROSEVILLE • PLACER COUNTY • CALIFORNIA

MACKAY & SOMPS
ENGINEERS PLANNERS SURVEYORS
1025 Creekside Ridge Drive, Suite 150, Roseville, CA 95678 (916) 773-1189

OCTOBER 2020

 18431.000

LOT 17
CREEKVIEW PHASE 1
EE MAPS 97

20' GRASSCREEK DRIVE I.O.D./R.O.W.(1)
R=625.00' Δ=02°08'34" L=23.38'
CB=N72°35'31"W CD=23.37'(1)
N16°20'12"E(R) 29.00'(1)
N71°31'13"W 98.23'(1)
R=625.00' Δ=18°37'45" L=203.21'
CB=N80°50'06"W CD=202.32'(1)
R=16.00' Δ=82°28'24" L=23.03'
CB=N32°25'36"W CD=21.09'(1)
R=329.00' Δ=08°57'35" L=51.45'
CB=N04°19'49"E CD=51.40'(1)
N00°08'59"W 31.42'(1)
N89°51'01"E 245.00'(1)
N85°17'54"W 141.89'(1)
N89°51'01"E(1)
55.00'

LOT 17
CREEKVIEW PHASE 1
EE MAPS 97

19' WHISTLING BEND WAY I.O.D./R.O.W.(1)
WHISTLING BEND WAY
CREEKVIEW PHASE 1
VILLAGE 10, 11 & 15
FF MAPS 22
GRASSCREEK DRIVE
N89°51'01"E 77.61'(1)
N89°51'01"E 96.39'(2)
N00°08'59"W 19.00'(1)
N89°51'01"E 77.61'(1)
R=26.00' Δ=90°00'00" L=40.84'(1)
CB=N44°51'01"E CD=36.77'
12.5' P.U.E.(1)

DAYDREAM DRIVE
R=21.00' Δ=72°39'31" L=26.63'
CB=N36°28'44"W CD=24.88'(1)
N72°48'29"W 6.29'(1)
46
4,005 SF
N00°08'59"W 78.13'(1)
N72°48'29"W 0.27'(1)
LOT 12
CREEKVIEW PHASE 1
EE MAPS 97

DETAIL "3A"
NTS

GRASSCREEK DRIVE
20 19 18 17 16 15 14 13 11
1 2 3 4 5 6 7 8 9
(7) (6)

28 27 26 25 24 23 22 21
29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46
OXBOW LANDING LOOP
65 66 67 68 69 70
(5)
64 63 62 61 60 59
CLOUDCREST PLACE
53 54 55 56 57 58
(4)
52 51 50 49 48 47
OXBOW LANDING LOOP
OXBOW LANDING LOOP
SEE DETAIL "3A" ON THIS SHEET

017-101-008
CITY OF ROSEVILLE
N00°08'59"W 668.00'(1)
DAYDREAM DRIVE
TREEHOUSE LANE
N00°08'59"W 498.23'(1)
12.5' P.U.E.(1)
LOT 15
CREEKVIEW PHASE 1
EE MAPS 97
LEMONADE LANE
N00°08'59"W 543.23'(2)
CREEKVIEW PHASE 1
VILLAGE 10, 11 & 15
FF MAPS 22

N89°51'01"E 5.00'(R)(1)
45.00'(1)
N00°08'59"W 90.00'(1)
45.00'(1)
N89°51'01"E 27.00'(1)
N00°08'59"W 2.00'(1)
R=21.00' Δ=72°39'31" L=26.63'
CB=N36°28'44"W CD=24.88'(1)
N00°08'59"W 78.13'(1)
N89°51'01"E 423.39'(1)
LOT 12
CREEKVIEW PHASE 1
EE MAPS 97

R=619.00' Δ=07°32'57" L=81.56'
CB=N86°22'30"W CD=81.50'(1)
N89°51'01"E 75.58'(1)
N89°51'01"E 19.00'(R)(1)
N89°51'01"E 120.58'(1)
LOT A
R=600.00' Δ=11°12'59" L=117.46'
CB=N84°32'29"W CD=117.27'(1)
R=26.00' Δ=91°02'16" L=41.31'
CB=N51°52'51"E CD=37.10'(1)
Δ=11°12'59" L=117.46'
CB=N84°32'29"W CD=117.27'(1)
Δ=11°12'59" L=117.46'
CB=N84°14'32"E CD=117.27')(1)

R=600.00' Δ=22°25'58" L=234.91'
CB=N89°51'01"E CD=233.42'(OA)(1)
R=314.00' Δ=06°30'42" L=35.69'
CB=N03°06'22"E CD=35.67'(1)
N83°38'17"W(R) 28.00'(OA)(1)
R=300.00' Δ=03°49'41" L=20.04'
CB=N08°16'34"E CD=20.04'(1)
N10°11'24"E 26.95'(1)
S11°04'00"W(R)
LOWER BANK DRIVE
R=300.00' Δ=6°30'45" L=34.10'
CB=N3°24'18"W CD=34.08'(2)
R=300.00' Δ=03°49'41" L=20.04'
CB=N8°34'31"W CD=20.04'(1)
N10°29'21"W
26.95'(1)

N
0 30 60 120
SCALE:1"=60'

FINAL MAP OF
CREEKVIEW - PHASE 1
VILLAGE 13 & 14
SUBDIVISION No. PL18-0190

BEING A SUBDIVISION OF LOTS 13 AND 14 AS SHOWN ON THAT CERTAIN FINAL MAP ENTITLED "CREEKVIEW - PHASE 1 LARGE LOT SUBDIVISION PL18-0190" FILED FOR RECORD ON JUNE 01, 2020 IN BOOK EE OF MAPS, AT PAGE 97, PLACER COUNTY RECORDS, WITHIN SECTION 14, TOWNSHIP 11 NORTH, RANGE 5 EAST, MOUNT DIABLO MERIDIAN

CITY OF ROSEVILLE • PLACER COUNTY • CALIFORNIA

OCTOBER 2020

MACKAY & SOMPS
ENGINEERS PLANNERS SURVEYORS
1025 Creekside Ridge Drive, Suite 150, Roseville, CA 95678 (916) 773-1189

SEE SHEET 2 FOR NOTES, BASIS OF BEARINGS, REFERENCES AND LEGEND

18431.000

SEE SHEET 5

017-101-008
CITY OF ROSEVILLE

OXBOW LANDING LOOP

CLOUDCREST PLACE

DAYDREAM DRIVE

SEE SHEET 6

DETAIL "4A"
NTS

SEE DETAIL "4A" ON THIS SHEET

LOT A

LOT 12
CREEKVIEW PHASE 1
EE MAPS 97

SCALE:1"=30'

FINAL MAP OF
CREEKVIEW - PHASE 1
VILLAGE 13 & 14
SUBDIVISION No. PL18-0190

BEING A SUBDIVISION OF LOTS 13 AND 14 AS SHOWN ON THAT CERTAIN FINAL MAP ENTITLED "CREEKVIEW - PHASE 1 LARGE LOT SUBDIVISION PL18-0190" FILED FOR RECORD ON JUNE 01, 2020 IN BOOK EE OF MAPS, AT PAGE 97, PLACER COUNTY RECORDS, WITHIN SECTION 14, TOWNSHIP 11 NORTH, RANGE 5 EAST, MOUNT DIABLO MERIDIAN

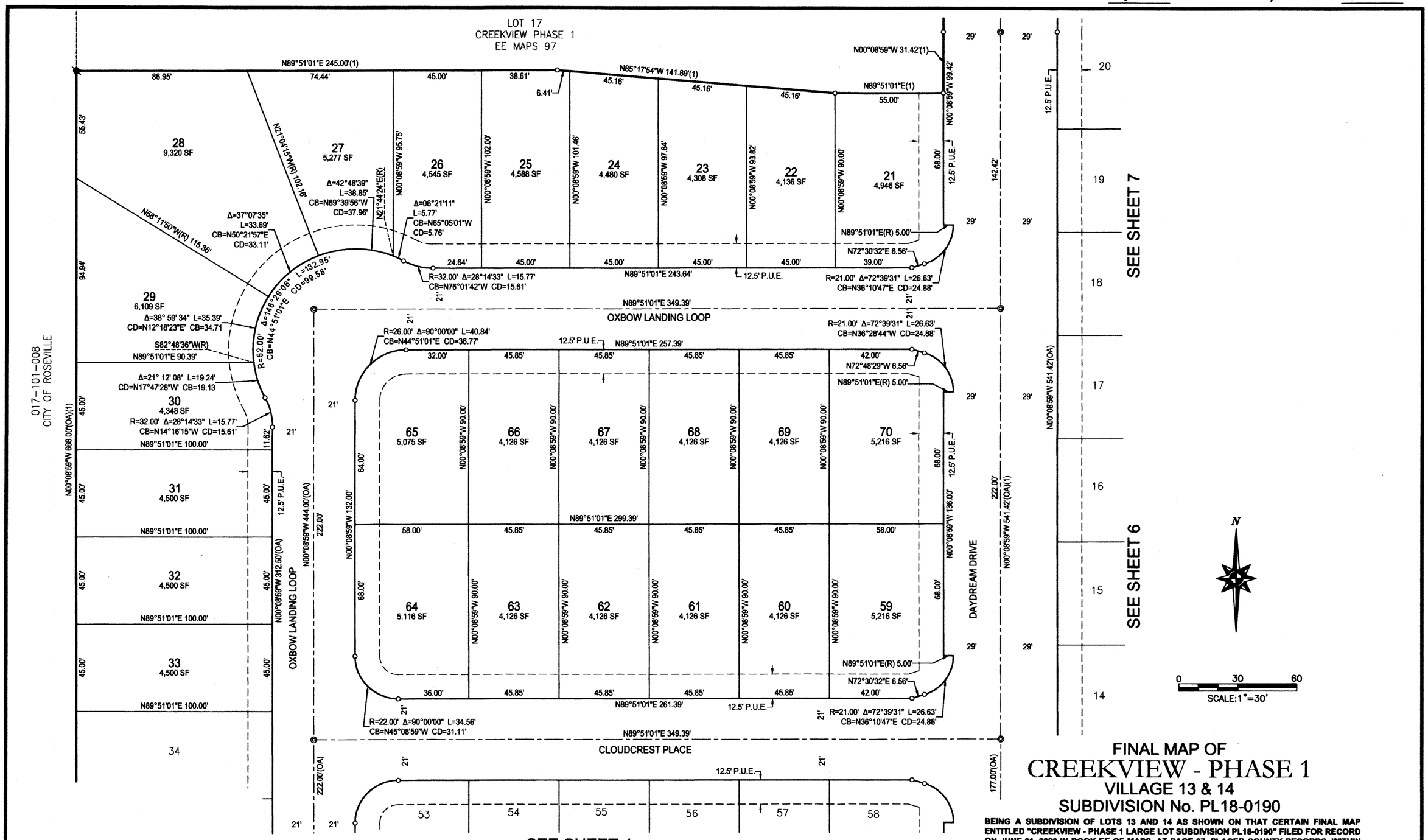
CITY OF ROSEVILLE • PLACER COUNTY • CALIFORNIA

OCTOBER 2020

MACKAY & SOMPS
ENGINEERS PLANNERS SURVEYORS
1025 Creekside Ridge Drive, Suite 150, Roseville, CA 95678 (916) 773-1189

SEE SHEET 2 FOR NOTES, BASIS OF BEARINGS, REFERENCES AND LEGEND

18431.000



FINAL MAP OF
CREEKVIEW - PHASE 1
VILLAGE 13 & 14
SUBDIVISION No. PL18-0190

BEING A SUBDIVISION OF LOTS 13 AND 14 AS SHOWN ON THAT CERTAIN FINAL MAP ENTITLED "CREEKVIEW - PHASE 1 LARGE LOT SUBDIVISION PL18-0190" FILED FOR RECORD ON JUNE 01, 2020 IN BOOK EE OF MAPS, AT PAGE 97, PLACER COUNTY RECORDS, WITHIN SECTION 14, TOWNSHIP 11 NORTH, RANGE 5 EAST, MOUNT DIABLO MERIDIAN

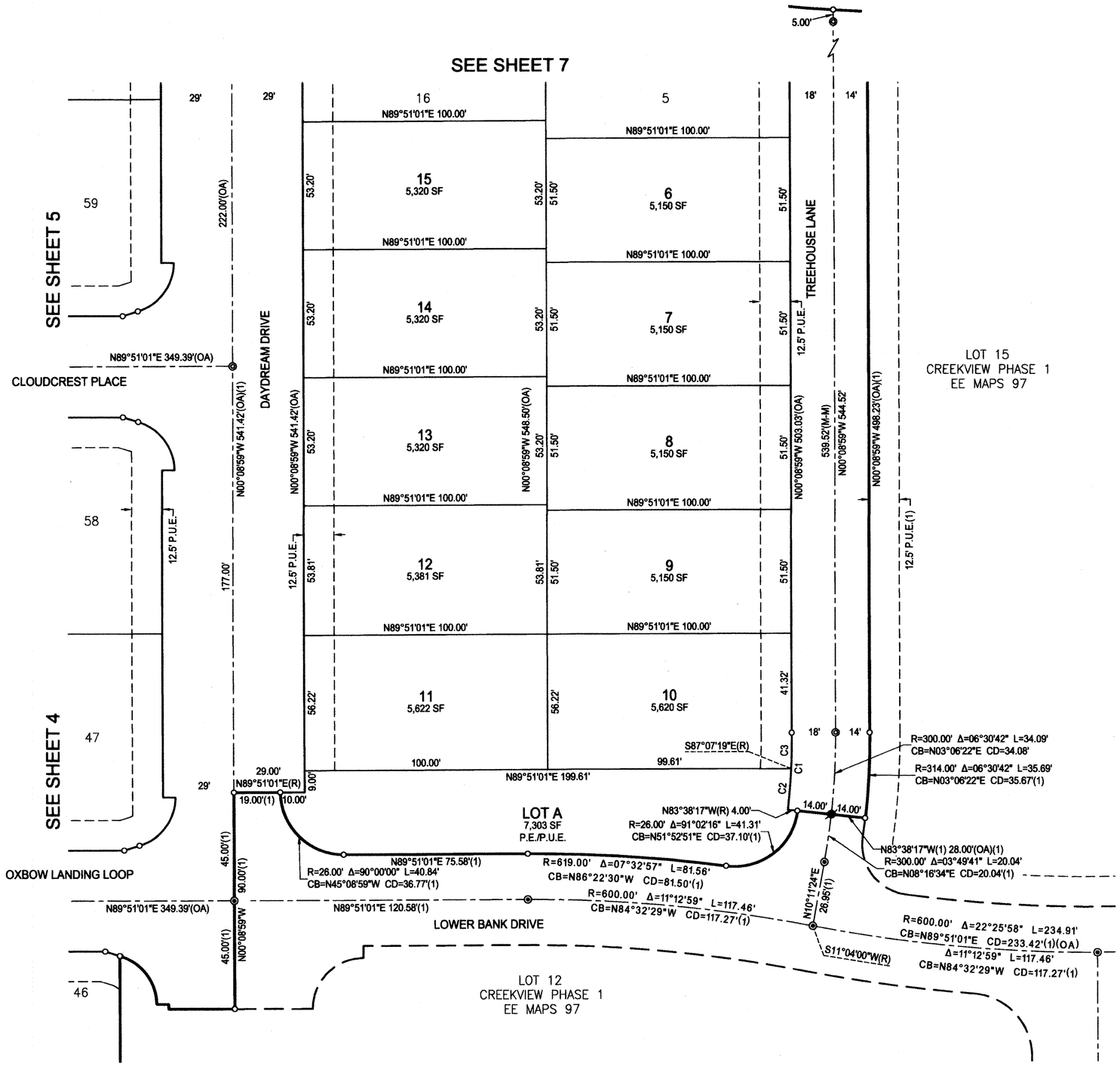
CITY OF ROSEVILLE • PLACER COUNTY • CALIFORNIA

OCTOBER 2020

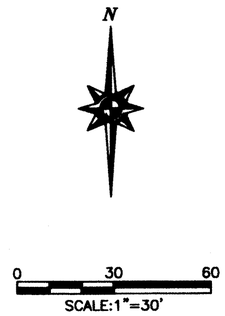
MACKAY & SOMPS
ENGINEERS PLANNERS SURVEYORS
1025 Creekside Ridge Drive, Suite 150, Roseville, CA 95678 (916) 773-1189

SEE SHEET 2 FOR NOTES, BASIS OF BEARINGS, REFERENCES AND LEGEND

18431.000



Curve Table					
Curve #	Radius	Delta	Length	Chord Bearing	Chord Length
C1	282.00	06°30'42"	32.05'	N03° 06' 22"E	32.03'
C2	282.00	03°29'02"	17.15'	N04° 37' 12"E	17.14'
C3	282.00	03°01'39"	14.90'	N01° 21' 51"E	14.90'



FINAL MAP OF
CREEKVIEW - PHASE 1
VILLAGE 13 & 14
SUBDIVISION No. PL18-0190

BEING A SUBDIVISION OF LOTS 13 AND 14 AS SHOWN ON THAT CERTAIN FINAL MAP ENTITLED "CREEKVIEW - PHASE 1 LARGE LOT SUBDIVISION PL18-0190" FILED FOR RECORD ON JUNE 01, 2020 IN BOOK EE OF MAPS, AT PAGE 97, PLACER COUNTY RECORDS, WITHIN SECTION 14, TOWNSHIP 11 NORTH, RANGE 5 EAST, MOUNT DIABLO MERIDIAN

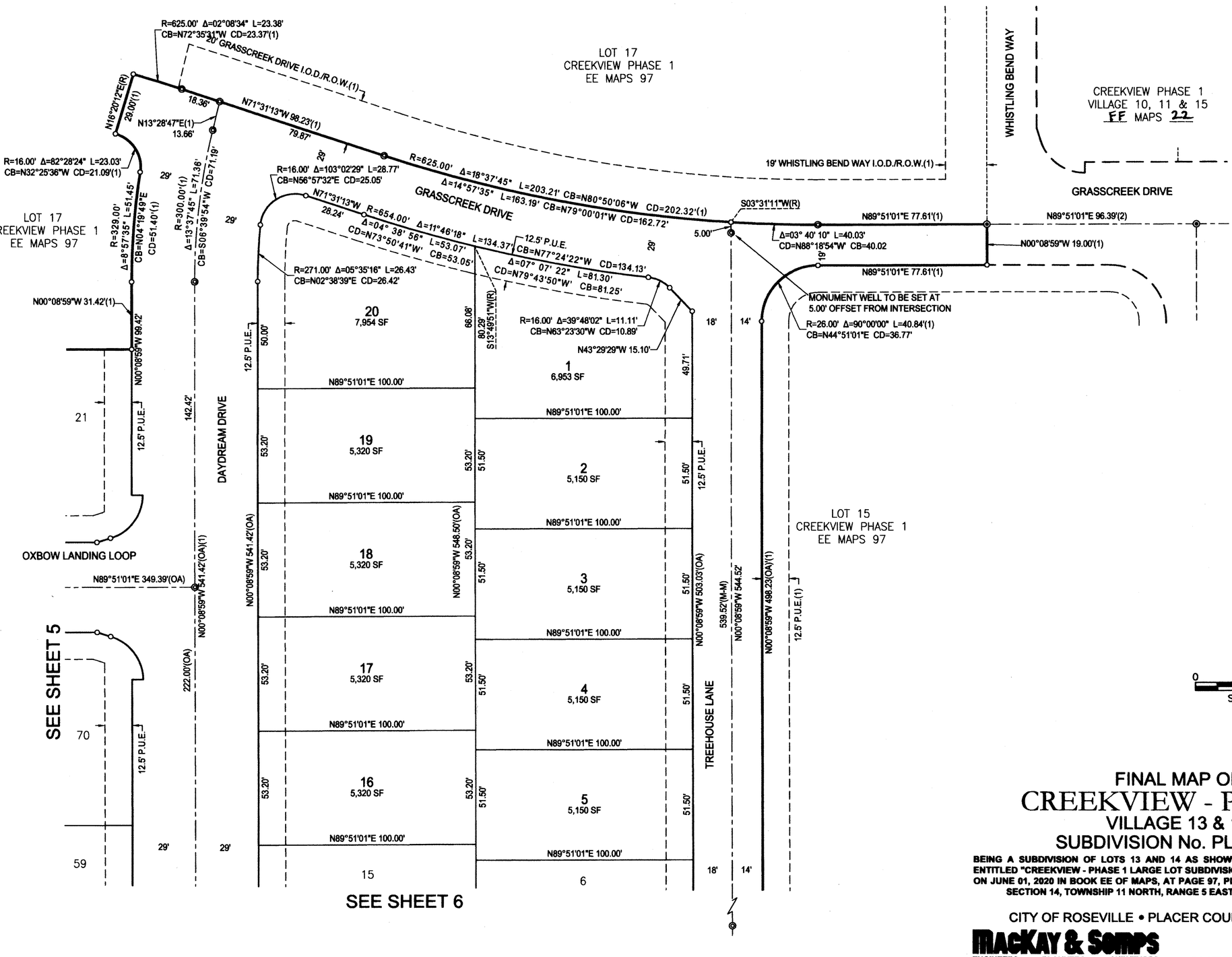
CITY OF ROSEVILLE • PLACER COUNTY • CALIFORNIA

OCTOBER 2020

MACKAY & SOMPS
ENGINEERS PLANNERS SURVEYORS
1025 Creekside Ridge Drive, Suite 150, Roseville, CA 95678 (916) 773-1189

SHEET 6 OF 8 18431.000

SEE SHEET 2 FOR NOTES, BASIS OF BEARINGS, REFERENCES AND LEGEND



FINAL MAP OF
CREEKVIEW - PHASE 1
VILLAGE 13 & 14
SUBDIVISION No. PL18-0190

BEING A SUBDIVISION OF LOTS 13 AND 14 AS SHOWN ON THAT CERTAIN FINAL MAP ENTITLED "CREEKVIEW - PHASE 1 LARGE LOT SUBDIVISION PL18-0190" FILED FOR RECORD ON JUNE 01, 2020 IN BOOK EE OF MAPS, AT PAGE 97, PLACER COUNTY RECORDS, WITHIN SECTION 14, TOWNSHIP 11 NORTH, RANGE 5 EAST, MOUNT DIABLO MERIDIAN

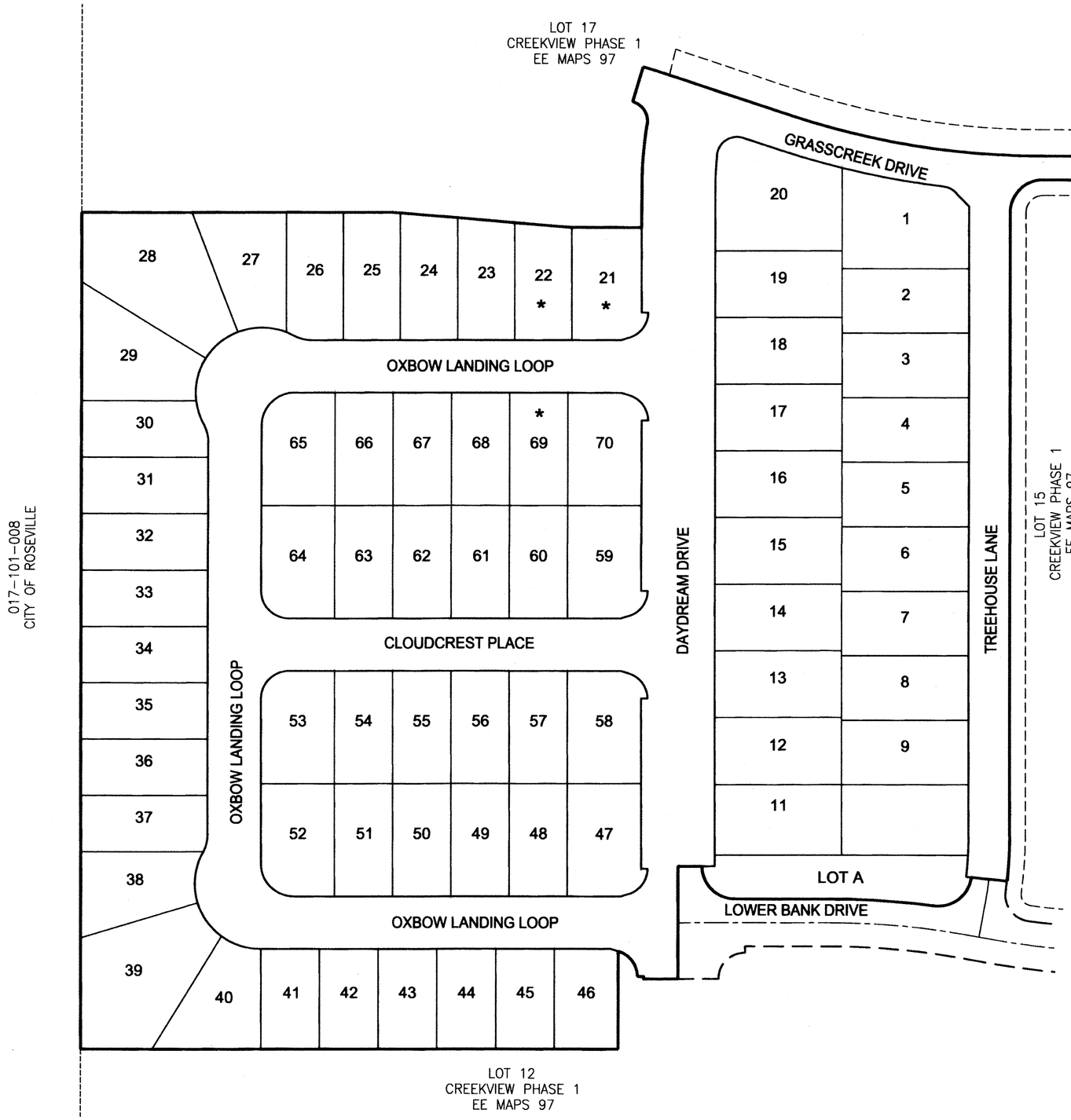
CITY OF ROSEVILLE • PLACER COUNTY • CALIFORNIA

OCTOBER 2020

MACKAY & SOMPS
ENGINEERS PLANNERS SURVEYORS
1025 Creekside Ridge Drive, Suite 150, Roseville, CA 95678 (916) 773-1189

SEE SHEET 2 FOR NOTES, BASIS OF BEARINGS, REFERENCES AND LEGEND

 18431.000



ADDITIONAL INFORMATION FOR INFORMATIONAL PURPOSE ONLY PURSUANT TO SECTION 66434.2 OF THE GOVERNMENT CODE

EACH RESIDENTIAL DWELLING CONSTRUCTED ON ANY OF THE LOTS INDICATED SHALL BE FITTED WITH A SEWER BACKFLOW PREVENTER VALVE AS APPROVED BY THE CITY OF ROSEVILLLE. IT SHALL BE THE RESPONSIBILITY OF THE OWNER OF SAID DWELLING TO MAINTAIN THE VALVE AND PREVENT DAMAGE FROM OCCURRING THERETO. THE CITY OF ROSEVILLE SHALL NOT BE RESPONSIBLE FOR THE MAINTENANCE OR PERFORMANCE OF THE VALVE, AND THE CITY OF ROSEVILLE SHALL NOT BE LIABLE FOR ANY DAMAGE OCCURRING TO ANY SUCH DWELLING OR ITS CONTENTS DUE TO FAILURE OF THE VALVE FOR ANY REASON WHATSOEVER.

LEGEND

* DENOTES SEWER BACKFLOW PREVENTER VALVE REQUIRED ON SANITARY SEWER CONNECTION BY THE CITY OF ROSEVILLE WITH THE BUILDING PERMIT AND MAINTAINED THEREAFTER BY THE OWNER.

N

0 30 60 120
SCALE:1"=60'

FINAL MAP OF
CREEKVIEW - PHASE 1
VILLAGE 13 & 14
SUBDIVISION No. PL18-0190

BEING A SUBDIVISION OF LOTS 13 AND 14 AS SHOWN ON THAT CERTAIN FINAL MAP ENTITLED "CREEKVIEW - PHASE 1 LARGE LOT SUBDIVISION PL18-0190" FILED FOR RECORD ON JUNE 01, 2020 IN BOOK EE OF MAPS, AT PAGE 97, PLACER COUNTY RECORDS, WITHIN SECTION 14, TOWNSHIP 11 NORTH, RANGE 5 EAST, MOUNT DIABLO MERIDIAN

CITY OF ROSEVILLE • PLACER COUNTY • CALIFORNIA

MACKAY & SOMPS
ENGINEERS PLANNERS SURVEYORS
1025 Creekside Ridge Drive, Suite 150, Roseville, CA 95678 (916) 773-1189

OCTOBER 2020

SHEET 8 OF 8

18431.000

COUNCIL COMMUNICATION

CC #: 1518
File #: 0400-04-12-1

Title:	Sierra Vista - Village JM-21 - Final Map and Subdivision Agreement
Contact:	Jeff Hendrix 916-774-5463 jhendrix@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 7.21.

RECOMMENDATION TO COUNCIL

It is recommended that the City Council take the following actions:

1. Approve the final map on file with the City Clerk and accept on behalf of the public, the public utility and the emergency access easements offered thereon, and accept, subject to improvement, the public rights of way and Lot F, offered thereon, and approve the abandonment of the easement listed thereon.

2. Adopt the attached resolution approving the Subdivision Agreement and authorize the City Manager to execute the agreement on behalf of the City.

BACKGROUND

The Development Services Engineering section has reviewed the subject final map and found that it is in compliance with the Subdivision Map Act and the City's Subdivision Ordinance and all conditions of the tentative map have been met.

This map will create 80 residential lots, 1 public landscape lot, 4 private common area lots and 1 private roads lot.

FISCAL IMPACT

There is no fiscal impact to the City's General Fund associated with this approval.

ENVIRONMENTAL REVIEW

Approval of the Sierra Vista Village JM-21 final map is an action that is subject to California Environmental Quality Act (CEQA). Project level CEQA compliance for the Sierra Vista Village JM-21 final map final map was accomplished with preparation of the Sierra Vista Specific Plan

EIR (Adopted: May 5, 2010) (SCH#2008032017) and the Mitigated Negative Declaration (MND) and associated Mitigation Monitoring Program approved by the City of Roseville on June 6, 2012. Because the Sierra Vista Village JM-21 final map is consistent with the project evaluated in the Sierra Vista Specific Plan Environmental Impact Report (EIR), no new effects would be expected to occur and all applicable mitigation measures from the Sierra Vista Specific Plan EIR will be implemented. As such, no additional CEQA action is required at this time.

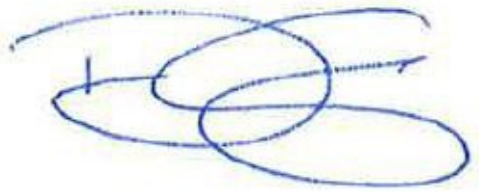
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Goal F - Invest in well-planned infrastructure and growth

Respectfully Submitted,

Jeff Hendrix, Associate Engineer

Mike Isom, Development Services Director



_____
Dominick Casey, City Manager

ATTACHMENTS:

Description

Resolution 21-254

Subdivision Agreement

Final Map

RESOLUTION NO. 21-254

APPROVING A SUBDIVISION AGREEMENT, BY AND BETWEEN THE CITY OF ROSEVILLE AND JOHN MOURIER CONSTRUCTION, INC., AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE

WHEREAS, a subdivision agreement, by and between the City of Roseville and John Mourier Construction, Inc., for the Sierra Vista – Village JM-21 subdivision, has been reviewed by the City Council; and

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Roseville that said agreement is approved and that the City Manager is authorized to execute it on behalf of the City of Roseville.

PASSED AND ADOPTED by the Council of the City of Roseville this____day of _____, 20_, by the following vote on roll call:

AYES COUNCILMEMBERS:

NOES COUNCILMEMBERS:

ABSENT COUNCILMEMBERS:

_____
MAYOR

ATTEST:

_____
City Clerk

RECORDING REQUESTED BY AND WHEN RECORDED, PLEASE RETURN TO:

City Clerk
CITY OF ROSEVILLE
311 Vernon Street
Roseville, CA 95678

Exempt from recording fees
Pursuant to Govt. Code §27383

SUBDIVISION AGREEMENT

Sierra Vista - Village JM-21 SUBDIVISION

THIS AGREEMENT, made and entered into this ___ day of _____, 20__, by and between the CITY OF ROSEVILLE, a municipal corporation ("CITY"), and John Mourier Construction, Inc., a California corporation, ("SUBDIVIDER"),

W I T N E S S E T H:

WHEREAS, SUBDIVIDER is possessed of a tract of land lying in the City of Roseville, County of Placer, known as "Sierra Vista - Village JM-21 Subdivision" (Subdivision no. PL 20-0191; "the Subdivision"); and

WHEREAS, a tentative map of the Subdivision was approved by the City Planning Commission on the 8th day of September, 2020, and the final map of the Subdivision has been approved subject to the execution of this Agreement; and

WHEREAS, the final map has been filed on the ____ day of _____, 20__ in Book _____ of Parcel/Subdivision Maps at Page _____ in the Official Records, Placer County Recorder, file no. _____; and

WHEREAS, Section 18.20.110 of the Roseville Municipal Code, regulating the subdivision of land in the City, requires that SUBDIVIDER shall execute and file an agreement between itself and CITY relating to the improvements to be made in a subdivision, prior to the approval by the City Council of the final map.

NOW, THEREFORE, the parties agree as follows:

1. Rights-of-Way. Except as otherwise provided by this Agreement, CITY rejects all lands, right-of-ways, and easements offered for dedication on the final map of the Subdivision. All such offers shall, however, remain open, and shall constitute irrevocable offers of dedication in accordance with Government Code Section 66477.2. All such offers may be accepted by CITY in its sole discretion at any later date without further notice to SUBDIVIDER as provided by law.

By way of explanation only, it is the current intention of CITY to accept all or part of such irrevocable offers to dedicate upon acceptance of the improvements called for in this Agreement.

2. Improvements - Time Limit. SUBDIVIDER agrees to cause all improvements to be made and constructed in the Subdivision to fully comply with the requirements of the Roseville Municipal Code and the Subdivision Map Act of the State of California according to the improvement plans for the Subdivision prepared by MacKay & Somps, Civil Engineers, Inc., dated March 2021 and approved by the City Engineer and including any changes or

alterations to such improvements required by the City Engineer, and to install, on or before December 31, 2022, such survey monuments as may be required by the City Engineer ("the Work"). SUBDIVIDER agrees to pay for any materials, provisions or other supplies used in, upon, for or about the performance of the Work, or for any work or labor of any kind done in connection with the Work, or for any amounts due under the Unemployment Insurance Act with respect to such work or labor.

SUBDIVIDER agrees to complete all of the Work on or before twenty-four (24) months from the date of this Agreement. If in the opinion of the City Engineer of CITY, an extension of this Agreement is not detrimental to the public welfare, he or she is, in his or her sole discretion, hereby authorized to extend the time within which the Work shall be completed for a period not to exceed twelve (12) months. Upon a written application made by SUBDIVIDER, further extensions, not to exceed an additional six (6) months, shall be reviewed and approved at the discretion of the City Engineer of CITY. Any such application extension request by SUBDIVIDER shall fully state the grounds and facts relied upon for the granting of additional extensions.

In the event that SUBDIVIDER shall fail to complete the Work within the time provided by this Agreement, CITY may, in its sole discretion and in addition to any other remedy provided in this Agreement or by law, enter upon the Subdivision and complete the Work and recover the full cost and expense of such construction from SUBDIVIDER, SUBDIVIDER's successors and assigns, or from the then owner of the Subdivision, and/or place a lien upon the Subdivision for such cost and expense.

If at anytime prior to the expiration of the time provided by this Agreement the City Engineer of CITY determines that a safety hazard exists within an existing public right-of-

way, the City Engineer shall give written notice to SUBDIVIDER to eliminate the safety hazard. If SUBDIVIDER fails to eliminate the safety hazard within five (5) calendar days of the written notice, CITY may, in its sole discretion and in addition to any other remedy provided in this Agreement or by law, eliminate the safety hazard and recover the full cost and expense of such work from SUBDIVIDER, SUBDIVIDER's successors and assigns, or from the then owner of the Subdivision, and/or place a lien upon the Subdivision for such cost and expense.

3. Acquisition and Dedication of Easements or Rights-of-Ways. If any of the Work is to be constructed or installed on land not within the Subdivision or already existing public right-of-way, no construction or installation shall be commenced before:

a. The irrevocable offer of dedication or conveyance to CITY of appropriate right-of-ways, easements or other interest in real property, and appropriate authorization from the property owner to allow construction or installation of the improvements or work; or

b. The issuance of an order of possession by a court of competent jurisdiction pursuant to the State Eminent Domain Law. SUBDIVIDER shall comply in all respects with any such order of possession.

Nothing in this Section 3 shall be construed as authorizing or granting an extension of time to SUBDIVIDER for completion of the Work.

4. Inspection Fees and Costs. The City Engineer shall inspect all of the Work improvements made in the Subdivision to see that they comply with CITY's subdivision regulations and specifications. SUBDIVIDER shall deposit the estimated inspection fee and reimburse CITY for the cost of such inspections in accordance with Roseville Municipal Code section 18.20.070.

5. Securities.

a. SUBDIVIDER shall file with this Agreement two (2) improvement securities as set forth in Roseville Municipal Code Sections 18.20.150 and 18.20.160. Each security shall be in the amount of one hundred percent (100%) of the total estimated cost of the Work as determined by the City Engineer which amount is the sum of $--1,779,377.50--. One improvement security shall secure faithful performance of this Agreement as required by Section 66499.3(a) of the Government Code of the State of California (the "faithful performance" security). The second improvement security shall, as required by Section 66499.3(b) of the Government Code of the State of California, secure the obligations set forth in Title 15 (commencing with Section 3082) of Part 4 of Division 3 of the Civil Code of the State of California for payment to the contractor, his subcontractors and to persons renting equipment or furnishing labor or materials to them for the Work (the "payment security"). The improvement securities required under this paragraph shall also secure placement of monumentation and guarantee payment therefor as provided by California Government Code section 66496.

b. SUBDIVIDER shall also file with this Agreement a "guarantee and warranty security" in the amount of ten percent (10%) of the City Engineer's estimated cost of the Work as set forth in Section 18.20.170 of the Roseville Municipal Code to guarantee and warrant the Work for a period of one year following its completion and acceptance against any defective work or labor done, or defective materials furnished, as required by Section 66499(a)(5) of the Government Code of the State of California. The guarantee and warranty security shall be released upon SUBDIVIDER's request following expiration of the warranty period and subject to the reasonable determination of the City Engineer that SUBDIVIDER's warranty obligations have been satisfied.

c. Any bonds submitted as security pursuant to this section shall be executed by a surety company authorized to transact a surety business in the State of California. All required securities shall be in a form approved by the City Attorney of CITY.

6. Successors and Assigns – Covenant Running with the Land. This Agreement shall inure to the benefit of, and be binding upon, the successors and assigns of the respective parties. It shall be recorded in the Office of the Recorder of Placer County concurrently with the final map of the Subdivision, and shall constitute a covenant running with the land and an equitable servitude upon the real property within the Subdivision.

7. Acceptance of Improvements Upon Completion. Upon satisfactory completion of the Work, in accordance with this Agreement, CITY agrees to accept the Work and its improvements and the offers of dedication described in paragraph 1, subject to the provisions of paragraphs 1 and 10 of this Agreement.

8. Notice Regarding Construction. SUBDIVIDER shall notify the City Engineer of CITY in writing three (3) days prior to the commencement of construction of the Work.

9. Subdivider's Obligation to Warn Public During Construction. Until final acceptance of the Work, SUBDIVIDER shall give good and adequate warning to the public of each and every dangerous condition which may exist in the Work, and will take all reasonable actions to protect the public from any such dangerous condition.

10. Warranty.

a. SUBDIVIDER guarantees and warrants the public improvements which constitute the Work required by this Agreement, and agrees to remedy any defects in the improvements or the Work arising from faulty or defective materials or construction of said improvements or the Work occurring within twelve (12) months after their acceptance by CITY.

SUBDIVIDER agrees to permit inspection of all improvements in the Subdivision by the City Engineer of CITY for such period, and to reimburse CITY for the cost of such inspections.

b. If, within the warranty period, the Work or improvement or any part of the Work done, furnished, installed, or constructed fails to fulfill any of the requirements of this Agreement or the improvement plans and specifications, SUBDIVIDER shall, without delay or cost to CITY, repair, replace or reconstruct any defective or otherwise unsatisfactory part or parts of the Work. CITY may, at its sole option, perform such repair or replacement itself if SUBDIVIDER has failed to commence such repair within twenty (20) days after CITY has mailed written notice of default to SUBDIVIDER and to SUBDIVIDER'S Surety. In such event, SUBDIVIDER agrees to pay the cost of such repair and replacement by CITY and CITY may, at its option, recover such cost as a lien against the Subdivision should the cost exceed the inspection fee deposited pursuant to paragraph 4 of this Agreement.

Should CITY determine that the public safety requires repairs or replacements to be made before SUBDIVIDER can be notified, CITY may, in its sole discretion, make the necessary repairs or replacement or perform the necessary work. SUBDIVIDER shall pay to CITY the cost of such repairs and CITY may at its option recover such cost as a lien against the Subdivision.

11. Indemnification. To the fullest extent allowed by law, SUBDIVIDER shall defend, indemnify, and save and hold harmless CITY, its officers, agents, employees and volunteers from any claims, suits or actions of every name, kind and description brought forth, or on account of, injuries to or death of any person (including but not limited to workers and the public), or damage to property, resulting from or arising out of SUBDIVIDER 's willful misconduct or negligent act or omission while engaged in the performance of obligations or

exercise of rights created by this Agreement, except those matters arising from CITY's sole or active negligence or willful misconduct. The parties intend that this provision shall be broadly construed.

SUBDIVIDER's responsibility for such defense and indemnity obligations shall survive the termination or completion of this Agreement for the full period of time allowed by law. The defense and indemnity obligations of this Agreement are undertaken in addition to, and shall not in any way be limited by, the insurance obligations contained in this Agreement.

12. Insurance. SUBDIVIDER agrees to continuously maintain, in full force and effect, at a minimum the following policies of insurance during the term of this Agreement.

COVERAGE	LIMITS OF LIABILITY
General Liability	$2,000,000 per occurrence $3,000,000 aggregate Personal Injury: $2,000,000 per occurrence $3,000,000 aggregate
Automobile Liability	$1,000,000 combined single limit
Workers' Compensation	Statutory

a. Form. SUBDIVIDER shall submit a certificate evidencing such coverage for the period covered by this Agreement in a form satisfactory to Risk Management and the City Attorney, prior to undertaking any work hereunder. Any insurance written on a claims made basis is subject to the approval of Risk Management and the City Attorney.

b. Additional Insureds. SUBDIVIDER shall also provide a separate endorsement form or section of the policy showing CITY, its officers, agents, employees and volunteers as additional insureds for each type of coverage, except for Workers' Compensation, for ongoing and completed operations. Such insurance shall specifically cover the contractual

liability of SUBDIVIDER. The additional insured coverage under the SUBDIVIDER's policy shall be primary and noncontributory, as evidenced by a separate endorsement or section of the policy, and shall not seek contribution from CITY's insurance or self-insurance. In addition, the additional insured coverage shall be at least as broad as the Insurance Services Office ("ISO") CG 20 01 Endorsement. Any available insurance proceeds in excess of the specified minimum insurance coverage requirements and limits shall be available to the additional insureds. Furthermore, the requirements for coverage and limits shall be: (1) the minimum coverage and limits specified in this Agreement; or (2) the full coverage and maximum limits of any insurance proceeds available to the named insureds, whichever is greater.

c. Cancellation/Modification. SUBDIVIDER shall provide ten (10) days written notice to CITY prior to cancellation or modification of any insurance required by this Agreement.

d. Umbrella/Excess Insurance. The limits of insurance required in this Agreement may be satisfied by a combination of primary and excess insurance. Any excess insurance shall contain or be endorsed to contain a provision that such coverage shall also apply on a primary and noncontributory basis for the benefit of CITY (if agreed to in a written contract) before CITY's own insurance shall be called upon to protect it as a named insured.

e. Self-Insured Retentions. All self-insured retentions ("SIR") must be disclosed to Risk Management for approval and shall not reduce the limits of liability. Policies containing any SIR provision shall provide or be endorsed to provide that the SIR may be satisfied by either the named insured or CITY. CITY reserves the right to obtain a full certified copy of any insurance policy and endorsements. The failure to exercise this right shall not constitute a waiver of such right.

f. Waiver of Subrogation. SUBDIVIDER hereby agrees to waive subrogation which any insurer of SUBDIVIDER may acquire from SUBDIVIDER by virtue of the payment of any loss under a Workers Compensation, Commercial General Liability or Automobile Liability policy. All Workers Compensation, Commercial General Liability and Automobile Liability policies shall be endorsed with a waiver of subrogation in favor of CITY, its officers, agents, employees and volunteers for all worked performed by SUBDIVIDER, its employees, agents and subcontractors.

g. Liability/Remedies. Insurance coverage in the minimum amounts set forth herein shall not be construed to relieve SUBDIVIDER of liability in excess of such coverage, nor shall it preclude CITY from taking such other actions as are available to it under any other provisions of this Agreement or law.

13. Irrevocability of Security. The improvement securities furnished pursuant to paragraph 5 shall be irrevocable, shall not be limited as to time (except as to the one-year guarantee and warranty period specified in paragraph 10) and shall provide that they may be released, in whole or part, only upon the written approval of the City Engineer of CITY.

14. Attorney's Fees; Venue; Governing Law. Any action by any party to this Agreement, or any action concerning a security furnished pursuant to paragraph 5, shall be brought in the appropriate court of competent jurisdiction within the County of Placer, State of California, notwithstanding any other provision of law which may provide that such action may be brought in some other location. In the event it becomes necessary for either party to bring an action with respect to enforcement of the provisions of this Agreement, or the security therefor, the prevailing party in such action shall be awarded a reasonable attorney's fee, as may be

determined by the Court. This Agreement shall be governed by and construed in accordance with the laws of the State of California.

15. Release of Faithful Performance Security. Release of faithful performance security shall be in compliance with and pursuant to the procedures set forth in Government Code Section 66499.7. Upon the completion of all secured Work by SUBDIVIDER and written acceptance of that completed Work by CITY, and the furnishing of the warranty security as required by paragraph 5(b), the City Engineer shall authorize the release of the remaining faithful performance security.

16. Release of Payment Security. Thirty-five (35) days after a notice of completion is recorded with respect to the Work, the City Engineer of CITY may authorize the release of the payment security, in the event that no claims have been filed against said security. In the event that claims or actions are filed against the security, the City Engineer may release so much of such security as is in excess of the total of the claims made against it, plus a reasonable amount of costs and attorney's fees.

17. Automatic Termination Upon Completion and Sale of Residential Unit. This Agreement and any lien pursuant hereto shall automatically be terminated, without any further action by either party or need to record any additional document, with respect to any single-family residential lot within a parcel designated by the Specific Plan for residential use, upon completion of construction and issuance by the City of a final inspection for a dwelling unit upon such residential lot and conveyance of such improved residential lot to a bona-fide good faith purchaser thereof. In connection with its issuance of a final inspection for such improved lot, City shall confirm that: (i) all improvements which are required to serve the lot, as determined by City, have been accepted by City; (ii) the lot is included within the Maintenance CFD required

by Section 3.20 or other financing mechanism acceptable to the City, to the extent required hereby; and (iii) if and to the extent applicable to such lot, an affordable purchase or rental housing agreement has been recorded on the lot. Termination of this Agreement for any such residential lot as provided for in this section shall not in any way be construed to terminate or modify any assessment district or Mello-Roos Community Facilities District lien affecting such lot at the time of termination.

18. Failure of Performance. In addition to any other remedies provided in this Agreement or by law, in the event SUBDIVIDER fails to perform one or more of the covenants or conditions of this Agreement, CITY shall have recourse to the security given to guarantee the performance of such acts. CITY may do, or cause to be done, those acts required of SUBDIVIDER, and shall have recourse against so much of the security as is necessary to discharge the responsibility of SUBDIVIDER. In the event CITY seeks recourse against a security, CITY shall also have recourse against SUBDIVIDER for any and all amounts necessary to complete the obligations of SUBDIVIDER in the event the security is insufficient to pay such amounts. All administrative costs, including reasonable attorney's fees pursuant to Section 66499.4 of the Government Code, incurred by CITY, in addition to the costs of the improvements, shall be a proper charge against the security and SUBDIVIDER.

19. Integration. This Agreement is an integrated agreement. It supersedes all prior negotiations, representations, or agreements, either written or oral.

20. Modification. This Agreement and each provision contained herein may be waived, amended, supplemented or eliminated only by mutual written agreement of the parties.

21. Notices. Any notices sent to the parties relating to this Agreement shall be sent by first class mail, postage prepaid or delivered to the following addresses:

Marc Stout, City Engineer
City of Roseville
311 Vernon Street
Roseville, CA 95678

John Mourier Construction, Inc.
Attn: Steve Schnable
1430 Blue Oaks Boulevard, Suite 190
Roseville, CA 95747

Either party may amend its address by giving written notice to the other.

22. Severability. If any of the provisions contained in this Agreement are for any reason held invalid or unenforceable, such holding shall not affect the remaining provisions or the validity and enforceability of the Agreement as a whole.

IN WITNESS WHEREOF, the City of Roseville, a municipal corporation, has authorized the execution of this Agreement in duplicate by its City Manager and attestation by its City Clerk under authority of Resolution No. ____, adopted by the Council of the City of Roseville on the ___ day of _____, 20__, and SUBDIVIDER has caused this Agreement to be executed.

CITY OF ROSEVILLE, a municipal corporation,

BY: _____
DOMINICK CASEY
City Manager

ATTEST:

BY: _____
SONIA OROZCO
City Clerk

JOHN MOURIER CONSTRUCTION, INC.,
a California corporation

BY: _____

its: President

and

BY: _____

its: _____

(NOTARIZATION REQUIRED)

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT **CIVIL CODE § 1189**

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California)
County of Placer)

On May 11, 2021 *Date* before me, Karen Headley, a notary Public *Here Insert Name and Title of the Officer*,

personally appeared John L. Mourier III *Name(s) of Signer(s)*

,

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

KAREN HEADLEY
Notary Public - California
Placer County
Commission # 2258771
My Comm. Expires Oct 16, 2022

Signature _____ *Signature of Notary Public*

Place Notary Seal Above

OPTIONAL

Though this section is optional, completing this information can deter alteration of the document or fraudulent reattachment of this form to an unintended document.

Description of Attached Document

Title or Type of Document: _____ Document Date: _____

Number of Pages: _____ Signer(s) Other Than Named Above: _____

Capacity(ies) Claimed by Signer(s)

Signer's Name: _____	Signer's Name: _____
☐ Corporate Officer — Title(s): _____	☐ Corporate Officer — Title(s): _____
☐ Partner — ☐ Limited ☐ General	☐ Partner — ☐ Limited ☐ General
☐ Individual ☐ Attorney in Fact	☐ Individual ☐ Attorney in Fact
☐ Trustee ☐ Guardian or Conservator	☐ Trustee ☐ Guardian or Conservator
☐ Other: _____	☐ Other: _____
Signer Is Representing: _____	Signer Is Representing: _____

©2014 National Notary Association • www.NationalNotary.org • 1-800-US NOTARY (1-800-876-6827) Item #5907

APPROVED AS TO FORM:

BY:_____
ROBERT R. SCHMITT
City Attorney

APPROVED AS TO SUFFICIENCY:

BY: _____
MARC STOUT
City Engineer

OWNER'S STATEMENT

THE UNDERSIGNED HEREBY CERTIFY THAT THEY ARE THE ONLY PERSONS HAVING ANY RECORD TITLE INTEREST IN THE REAL PROPERTY INCLUDED WITHIN THE SUBDIVISION SHOWN UPON THIS FINAL MAP OF "SIERRA VISTA - VILLAGE JM-21" AND THEY HEREBY CONSENT TO THE PREPARATION AND RECORDATION OF THIS FINAL MAP AND HEREBY OFFER FOR DEDICATION AND DO HEREBY DEDICATE FOR SPECIFIC PURPOSES THE FOLLOWING:

THE REAL PROPERTY DESCRIBED BELOW IS DEDICATED AS EASEMENTS FOR PUBLIC PURPOSES:

(A) A PUBLIC EASEMENT FOR THE INSTALLATION AND MAINTENANCE OF, BUT NOT LIMITED TO ELECTROLIERS, WATER AND GAS PIPES, SEWER AND DRAINAGE PIPES, AND FOR UNDERGROUND WIRE AND CONDUITS FOR ELECTRIC, TELEPHONE AND TELEVISION SERVICES AND TRAFFIC CONTROL APPURTENANCES TOGETHER WITH ANY AND ALL APPURTENANCES PERTAINING THERETO ON, OVER, UNDER AND ACROSS THE PUBLIC STREET SHOWN HEREON AS SAN FERNANDO DRIVE, LOTS A, B, C, D, E AND F, AND THOSE STRIPS OF LAND LYING CONTIGUOUS TO LOT A AS SHOWN HEREON AND DESIGNATED "P.U.E." (PUBLIC UTILITY EASEMENT).

(B) EMERGENCY ACCESS EASEMENT FOR THE INGRESS AND EGRESS OF EMERGENCY SERVICE VEHICLES ON, OVER AND ACROSS LOT A (PRIVATE ROADS) FOR USE BY PUBLIC, CITY, COUNTY OR STATE AGENCIES IN RESPONSE TO LAW ENFORCEMENT, FIRE, MEDICAL OR EMERGENCIES CAUSED BY NATURAL DISASTERS, AS SHOWN HEREON AND DESIGNATED "E.A.E." (EMERGENCY ACCESS EASEMENT).

THE REAL PROPERTY DESCRIBED BELOW IS DEDICATED IN FEE FOR PUBLIC PURPOSES:

(A) AS PUBLIC RIGHT-OF-WAY (INCLUDING ALL IMPROVEMENTS THEREON) THE STREET SHOWN HEREON AS SAN FERNANDO DRIVE.

(B) LOT F AS SHOWN HEREON TO THE CITY OF ROSEVILLE FOR LANDSCAPING PURPOSES AND AS PUBLIC RIGHT-OF-WAY.

JOHN MOURIER CONSTRUCTION, INC.
A CALIFORNIA CORPORATION

BY: John L. Mourier
NAME: John L. Mourier III
TITLE: President

BY: Rod Yamanaka
NAME: Rod Yamanaka
TITLE: CFO

NOTARY'S ACKNOWLEDGMENT

A NOTARY PUBLIC OR OTHER OFFICER COMPLETING THIS CERTIFICATE VERIFIES ONLY THE IDENTITY OF THE INDIVIDUAL WHO SIGNED THE DOCUMENT TO WHICH THIS CERTIFICATE IS ATTACHED, AND NOT THE TRUTHFULNESS, ACCURACY OR VALIDITY OF THAT DOCUMENT.

STATE OF CALIFORNIA

COUNTY OF Placer

ON May 11, 2021 BEFORE ME, Karen Headley, A NOTARY PUBLIC

PERSONALLY APPEARED John L. Mourier III and Rod Yamanaka

WHO PROVED TO ME ON THE BASIS OF SATISFACTORY EVIDENCE TO BE THE PERSON(S) WHOSE NAME(S) IS/ARE SUBSCRIBED TO THE WITHIN INSTRUMENT AND ACKNOWLEDGED TO ME THAT HE/SHE/THEY EXECUTED THE SAME IN HIS/HER/THEIR AUTHORIZED CAPACITY(IES), AND THAT BY HIS/HER/THEIR SIGNATURE(S) ON THE INSTRUMENT THE PERSON(S), OR THE ENTITY UPON BEHALF OF WHICH THE PERSON(S) ACTED, EXECUTED THE INSTRUMENT.

I CERTIFY UNDER PENALTY OF PERJURY UNDER THE LAWS OF THE STATE OF CALIFORNIA THAT THE FOREGOING PARAGRAPH IS TRUE AND CORRECT.

WITNESS MY HAND AND OFFICIAL SEAL.

SIGNATURE Karen Headley PRINTED NAME

MY PRINCIPAL PLACE OF BUSINESS IS Placer COUNTY

MY COMMISSION EXPIRES: 10-16-2022 MY COMMISSION NUMBER: 2258771

SURVEYOR'S STATEMENT

THIS MAP OF "SIERRA VISTA - VILLAGE JM-21" WAS PREPARED BY ME OR UNDER MY DIRECTION AND IS BASED UPON A FIELD SURVEY IN CONFORMANCE WITH THE REQUIREMENTS OF THE SUBDIVISION MAP ACT AND LOCAL ORDINANCE AT THE REQUEST OF WESTPARK SIERRA VISTA, LLC, IN NOVEMBER, 2017, I HEREBY STATE THAT THE SURVEY IS TRUE AND COMPLETE AS SHOWN, THAT ALL THE MONUMENTS ARE OF THE CHARACTER AND OCCUPY THE POSITIONS INDICATED OR THAT THEY WILL BE SET IN THOSE POSITIONS BEFORE DECEMBER 31, 2022, AND THAT THE MONUMENTS ARE, OR WILL BE, SUFFICIENT TO ENABLE THE SURVEY TO BE RETRACED, AND THAT THIS FINAL MAP SUBSTANTIALLY CONFORMS TO THE CONDITIONALLY APPROVED TENTATIVE MAP.

MACKAY & SOMPS CIVIL ENGINEERS, INC.

BY: Paul Ferguson Jr.
PAUL FERGUSON, JR., PLS 9265
EXPIRATION DATE: MARCH 31, 2022

DATE: 4/29/2021

LICENSED LAND SURVEYOR
PAUL FERGUSON, JR.
3-31-22
No. 9265
STATE OF CALIFORNIA

CITY ENGINEER'S STATEMENT

I HEREBY STATE THAT I HAVE EXAMINED THIS FINAL MAP OF "SIERRA VISTA - VILLAGE JM-21" AND FIND IT TO BE SUBSTANTIALLY THE SAME AS THE TENTATIVE MAP ON FILE AND ANY APPROVED ALTERATIONS THEREOF; THAT ALL PROVISIONS OF THE SUBDIVISION MAP ACT AND ALL APPLICABLE CITY ORDINANCES HAVE BEEN COMPLIED WITH.

_____ DATE: _____

MARC STOUT, R.C.E. 69879
CITY ENGINEER, CITY OF ROSEVILLE
LICENSE EXPIRES: SEPTEMBER 30, 2022

I HEREBY STATE THAT I AM SATISFIED THIS FINAL MAP OF "SIERRA VISTA - VILLAGE JM-21" IS TECHNICALLY CORRECT.

FOR MARC STOUT, CITY ENGINEER, CITY OF ROSEVILLE

_____ DATE: _____

TIMOTHY G. BLAIR, PLS 8278
EXPIRES DECEMBER 31, 2021

LICENSED LAND SURVEYOR
TIMOTHY G. BLAIR
Exp. 12-31-21
No. 8278
STATE OF CALIFORNIA

CITY CLERK'S STATEMENT

I HEREBY CERTIFY THAT THE CITY COUNCIL, CITY OF ROSEVILLE, HAS APPROVED THIS FINAL MAP OF "SIERRA VISTA - VILLAGE JM-21", AND HAS ACCEPTED ON BEHALF OF THE PUBLIC THE PUBLIC UTILITY EASEMENTS AND EMERGENCY ACCESS EASEMENTS OFFERED HEREON FOR DEDICATION AND HAS ACCEPTED, SUBJECT TO IMPROVEMENT, THE PUBLIC RIGHTS-OF-WAY AND LOT F OFFERED HEREON FOR DEDICATION AND DOES ALSO HEREBY APPROVE THE ABANDONMENT OF THE EASEMENT LISTED HEREON WITHIN NOTE 6 ON SHEET 2.

_____
CITY CLERK, CITY OF ROSEVILLE

DATE: _____ BY: _____
ASSISTANT CITY CLERK

RECORDER'S STATEMENT

FILED THIS _____ DAY OF _____, 2021, AT _____ .M. IN BOOK _____ OF MAPS, AT PAGE _____, IN THE OFFICE OF THE PLACER COUNTY RECORDER, AT THE REQUEST OF MACKAY & SOMPS CIVIL ENGINEERS, INC.

_____ DOCUMENT NO.: _____
RECORDER OF PLACER COUNTY
STATE OF CALIFORNIA

BY: _____ FEE: $ _____
DEPUTY

FINAL MAP OF
SIERRA VISTA - VILLAGE JM-21
SUBDIVISION NO. PL20-0191

BEING A SUBDIVISION OF LOT 26 AND SAN FERNANDO DRIVE AS SHOWN ON THAT CERTAIN FINAL MAP ENTITLED "A FINAL MAP OF THE VILLAGES AT SIERRA VISTA, A LARGE LOT SUBDIVISION, SUBDIVISION NO. SUBD 000157", FILED FOR RECORD ON JULY 29, 2015 IN BOOK DD OF MAPS, AT PAGE 26, PLACER COUNTY RECORDS, BEING A PORTION OF SECTION 36, TOWNSHIP 11 NORTH, RANGE 5 EAST, MOUNT DIABLO MERIDIAN.

CITY OF ROSEVILLE • PLACER COUNTY • CALIFORNIA

JUNE 2021

MACKAY & SOMPS
ENGINEERS PLANNERS SURVEYORS
1025 Creekside Ridge Drive, Suite 150, Roseville, CA 95678 (916) 773-1189

BOOK_____ OF MAPS, PAGE_____

BASIS OF BEARINGS:

THE BEARING N 00°27'58" W, BEING THE EAST LINE OF SECTION 36 AS SHOWN ON THAT CERTAIN FINAL MAP ENTITLED "FINAL MAP OF THE VILLAGES AT SIERRA VISTA, LARGE LOT SUBDIVISION SUBDIVISION NO. SUBD 000157", FILED FOR RECORD ON JULY 29, 2015 IN BOOK DD OF MAPS, AT PAGE 26, PLACER COUNTY RECORDS.

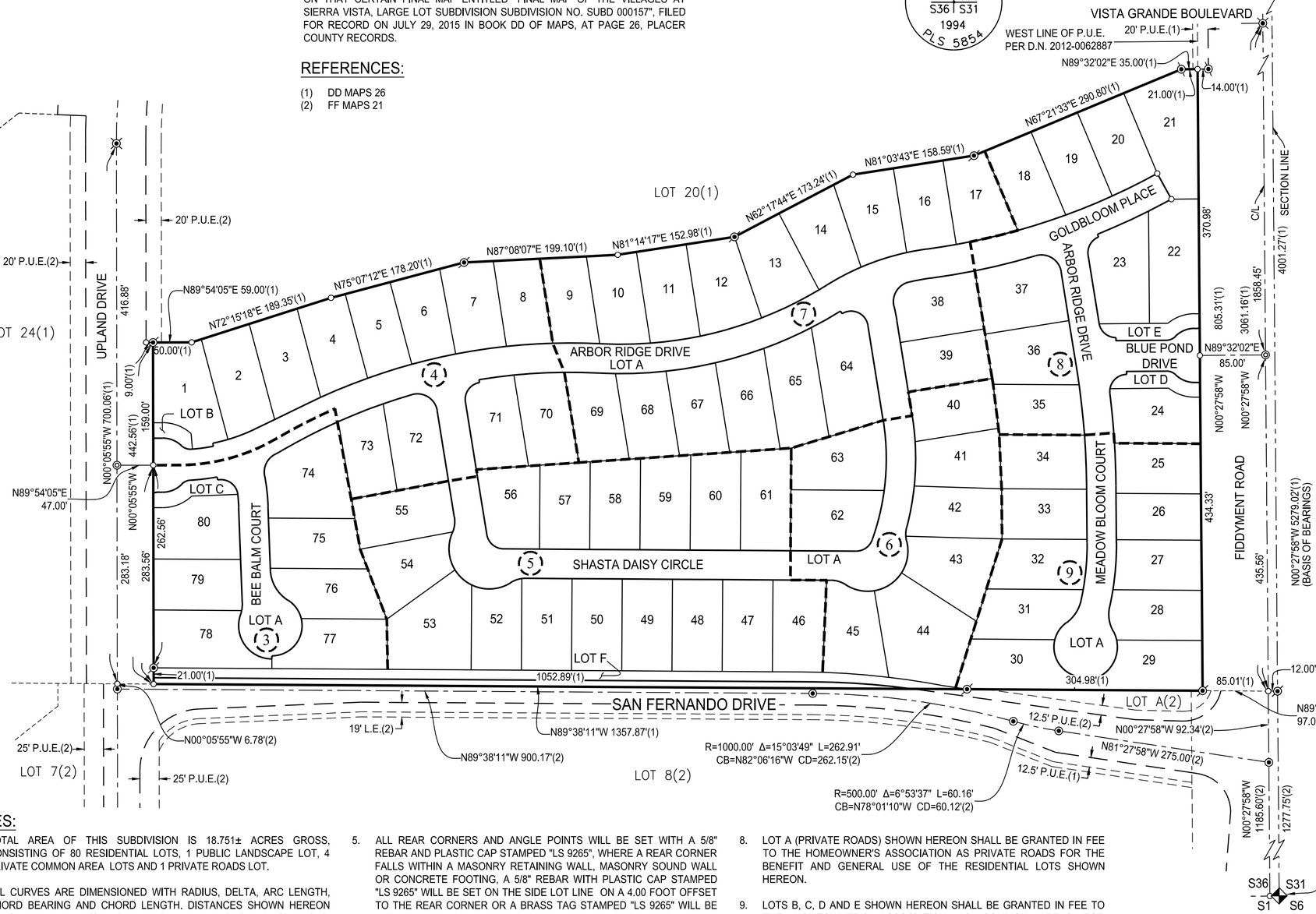
REFERENCES:

(1) DD MAPS 26
(2) FF MAPS 21

T 11 N
R5E R6E
S25 | S30
S36 | S31
1994
PLS 5854

SECTION CORNER - FOUND 1 1/2" BRASS DISC IN A MONUMENT WELL MARKED AS SHOWN PER (1)

S25 S30
S36 S31



FOUND 2.5" BRASS DISC IN MONUMENT WELL MARKED AS SHOWN PER (1)(2)

T 11 N
R5E R6E
S36 | S31
LS 3680 1988

LEGEND:

○	DIMENSION POINT
◆	FOUND SECTION CORNER AS NOTED
⊙	3/4" IRON PIPE WITH ALUMINUM CAP STAMPED "LS 7820" TO BE SET PER (1)
⊗	COPPERWELD SURVEY MONUMENT WITH CENTER PUNCH IN MONUMENT WELL STAMPED "LS 7820" TO BE SET PER (1)
◉	COPPERWELD SURVEY MONUMENT WITH CENTER PUNCH IN MONUMENT WELL STAMPED "LS 9265" TO BE SET PER (2)
◎	SET COPPERWELD SURVEY MONUMENT WITH CENTER PUNCH IN MONUMENT WELL STAMPED "LS 9265"
CB	CHORD BEARING
CD	CHORD DISTANCE
C/L	CENTERLINE
D.N.	DOCUMENT NUMBER
E.A.E.	EMRGENCEY ACCESS EASEMENT
(OA)	OVERALL
O.R.	OFFCIAL RECORDS
L.E.	LANDSCAPE EASEMENT
P.U.E.	PUBLIC UTILITY EASEMENT
(R)	RADIAL BEARING
R.O.W.	RIGHT-OF-WAY
S.F.	SQUARE FEET
(X)	SHEET INDEX
———	SUBDIVISION BOUNDARY
—— - ——	CENTER LINE
— — —	IOD/ROW
———	LOT LINE & ROW
———	LOT LINE
— — —	EASEMENT LINE
----------	ADJACENT PROPERTY LINE

NOTES:

1. TOTAL AREA OF THIS SUBDIVISION IS 18.751± ACRES GROSS, CONSISTING OF 80 RESIDENTIAL LOTS, 1 PUBLIC LANDSCAPE LOT, 4 PRIVATE COMMON AREA LOTS AND 1 PRIVATE ROADS LOT.

2. ALL CURVES ARE DIMENSIONED WITH RADIUS, DELTA, ARC LENGTH, CHORD BEARING AND CHORD LENGTH. DISTANCES SHOWN HEREON ARE IN FEET AND DECIMALS THEREOF AND ARE "GROUND" DISTANCES. DUE TO ROUNDING, THE SUM OF INDIVIDUAL DIMENSIONS MAY NOT EQUAL THE OVERALL DIMENSION.

3. A PRELIMINARY SOILS REPORT WAS PREPARED BY YOUNGDAHL CONSULTING GROUP, INC. PROJECT NO. E13171.000, DATED SEPTEMBER 10, 2013, AND IS ON FILE WITI THE CITY OF ROSEVILLE, DEVELOPMENT SERVICES - ENGINEERING DEPARTMENT, FILE NO. 308-810.

4. ALL FRONT CORNERS ARE MARKED BY A 1" DIAMETER BRASS DISC STAMPED "LS 9265" IN THE SIDEWALK ON THE EXTENSION OF SIDE LOT LINES 1.00' FROM THE PROPERTY LINE. WHERE SIDEWALK DOES NOT EXIST, FRONT CORNERS SHALL BE MARKED BY A 1" DIAMETER BRASS DISC STAMPED "LS 9265" ON A 2.00' EXTENSION OF SIDE LOT LINES IN THE GUTTER PAN, UNLESS OTHERWISE NOTED.

5. ALL REAR CORNERS AND ANGLE POINTS WILL BE SET WITH A 5/8" REBAR AND PLASTIC CAP STAMPED "LS 9265", WHERE A REAR CORNER FALLS WITHIN A MASONRY RETAINING WALL, MASONRY SOUND WALL OR CONCRETE FOOTING, A 5/8" REBAR WITH PLASTIC CAP STAMPED "LS 9265" WILL BE SET ON THE SIDE LOT LINE ON A 4.00 FOOT OFFSET TO THE REAR CORNER OR A BRASS TAG STAMPED "LS 9265" WILL BE SET WITH EPOXY TO THE FACE OF WALL 2.00 FOOT ABOVE GROUND OR ON TOP OF WALL WHERE AN OFFSET MONUMENT CANNOT BE SET.

6. PURSUANT TO SECTION 66499.20.2 OF THE GOVERNMENT CODE, THE LANDS SHOWN HEREON, ARE HEREBY MERGED AND RE-SUBDIVIDED AND THE FOLLOWING EASEMENT IS HEREBY ABANDONED:

   a. THE IRREVOCABLE OFFER OF DEDICATION IN FEE FOR SAN FERNANDO DRIVE AS SHOWN ON THAT CERTAIN FINAL MAP ENTITLED "THE VILLAGES AT SIERRA VISTA" RECORDED IN BOOK DD OF MAPS, AT PAGE 26, PLACER COUNTY RECORDS, LYING WITHIN THE BOUNDARY OF THIS FINAL MAP NOT SHOWN HEREON

7. STREET OWNERSHIP AND MAINTENCE INCLUDING STREET LIGHTS, LOT DRAINAGE SYSTEMS AND SURFACE DRAINAGE SYSTEMS ARE PRIVATE AND THE REPSONSIBLITY OF THE HOMEOWNER'S ASSOCIATION.

8. LOT A (PRIVATE ROADS) SHOWN HEREON SHALL BE GRANTED IN FEE TO THE HOMEOWNER'S ASSOCIATION AS PRIVATE ROADS FOR THE BENEFIT AND GENERAL USE OF THE RESIDENTIAL LOTS SHOWN HEREON.

9. LOTS B, C, D AND E SHOWN HEREON SHALL BE GRANTED IN FEE TO THE HOMEOWNER'S ASSOCIATION AS COMMON AREAS FOR LANDSCAPING AND FOR THE BENEFIT AND GENERAL USE OF THE RESIDENTIAL LOTS SHOWN HEREON.

10. LOT F SHOWN HEREON SHALL BE GRANTED TO THE CITY OF ROSEVILLE FOR LANDSCAPING PURPOSES AND AS PUBLIC RIGHT-OF-WAY.

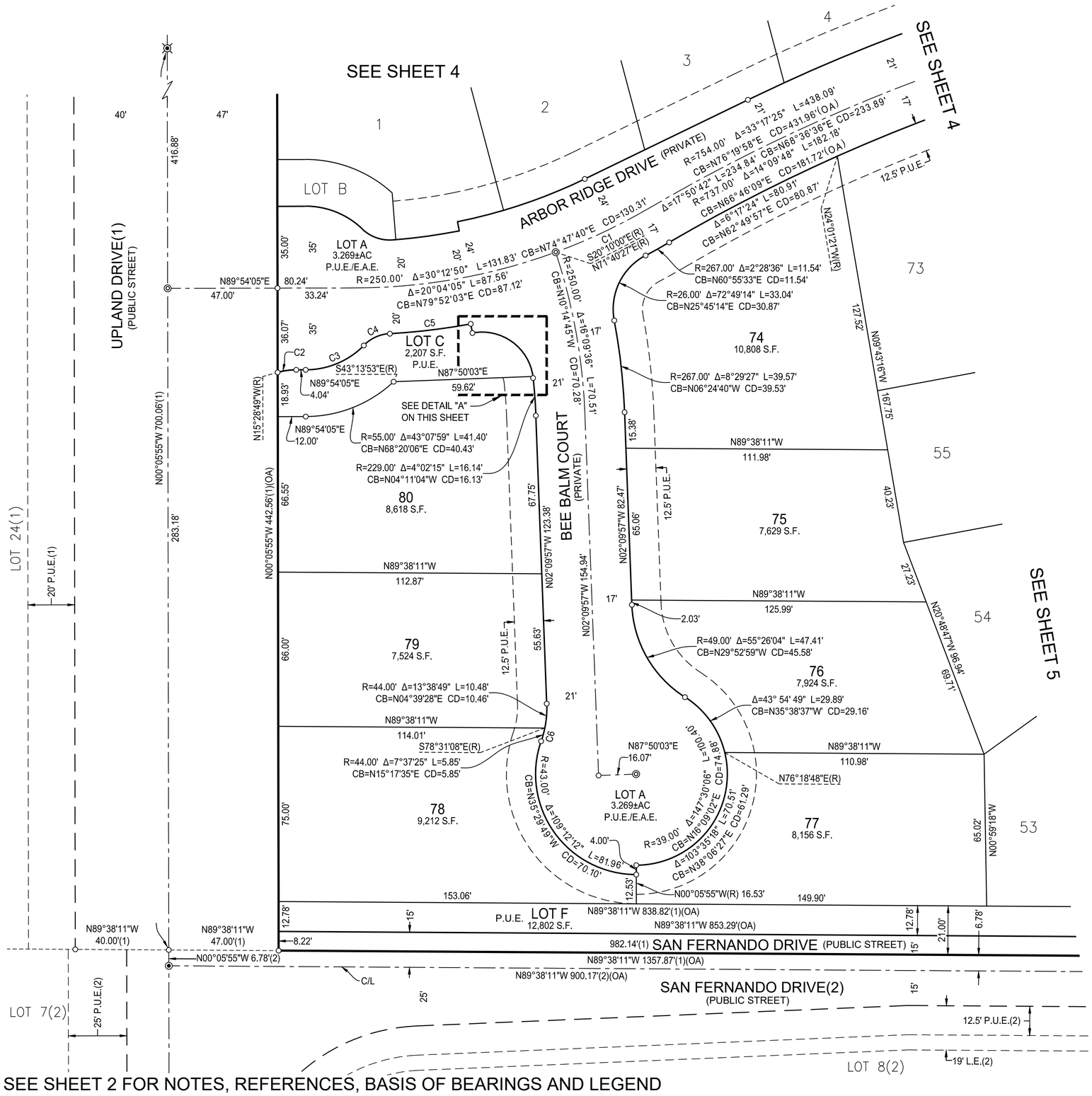
FINAL MAP OF
SIERRA VISTA - VILLAGE JM-21
SUBDIVISION NO. PL20-0191

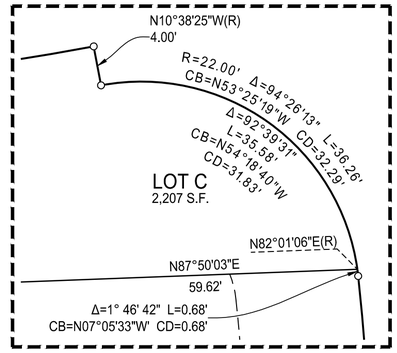
BEING A SUBDIVISION OF LOT 26 AND SAN FERNANDO DRIVE AS SHOWN ON THAT CERTAIN FINAL MAP ENTITLED "A FINAL MAP OF THE VILLAGES AT SIERRA VISTA, A LARGE LOT SUBDIVISION, SUBDIVISION NO. SUBD 000157", FILED FOR RECORD ON JULY 29, 2015 IN BOOK DD OF MAPS, AT PAGE 26, PLACER COUNTY RECORDS, BEING A PORTION OF SECTION 36, TOWNSHIP 11 NORTH, RANGE 5 EAST, MOUNT DIABLO MERIDIAN.

CITY OF ROSEVILLE • PLACER COUNTY • CALIFORNIA

JUNE 2021

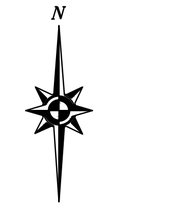
MACKAY & SOMPS
ENGINEERS PLANNERS SURVEYORS
1025 Creekside Ridge Drive, Suite 150, Roseville, CA 95678 (916) 773-1189





DETAIL "A"
SCALE: 1"=10'

Curve Table					
Curve #	Radius	Delta	Length	Chord Bearing	Chord Length
C1	250.00	10°08'45"	44.27'	N64° 45' 38"E	44.21'
C2	30.00	15°22'54"	8.05'	N82° 12' 38"E	8.03'
C3	35.00	45°18'44"	27.68'	N67° 14' 43"E	26.96'
C4	17.00	42°10'14"	12.51'	N65° 40' 28"E	12.23'
C5	270.00	7°24'00"	34.87'	N83° 03' 35"E	34.85'
C6	44.00	21°16'14"	16.33'	N08° 28' 10"E	16.24'



SEE SHEET 2 FOR NOTES, REFERENCES, BASIS OF BEARINGS AND LEGEND

FINAL MAP OF

SIERRA VISTA - VILLAGE JM-21

SUBDIVISION NO. PL20-0191

BEING A SUBDIVISION OF LOT 26 AND SAN FERNANDO DRIVE AS SHOWN ON THAT CERTAIN FINAL MAP ENTITLED "A FINAL MAP OF THE VILLAGES AT SIERRA VISTA, A LARGE LOT SUBDIVISION, SUBDIVISION NO. SUBD 000157", FILED FOR RECORD ON JULY 29, 2015 IN BOOK DD OF MAPS, AT PAGE 26, PLACER COUNTY RECORDS, BEING A PORTION OF SECTION 36, TOWNSHIP 11 NORTH, RANGE 5 EAST, MOUNT DIABLO MERIDIAN.

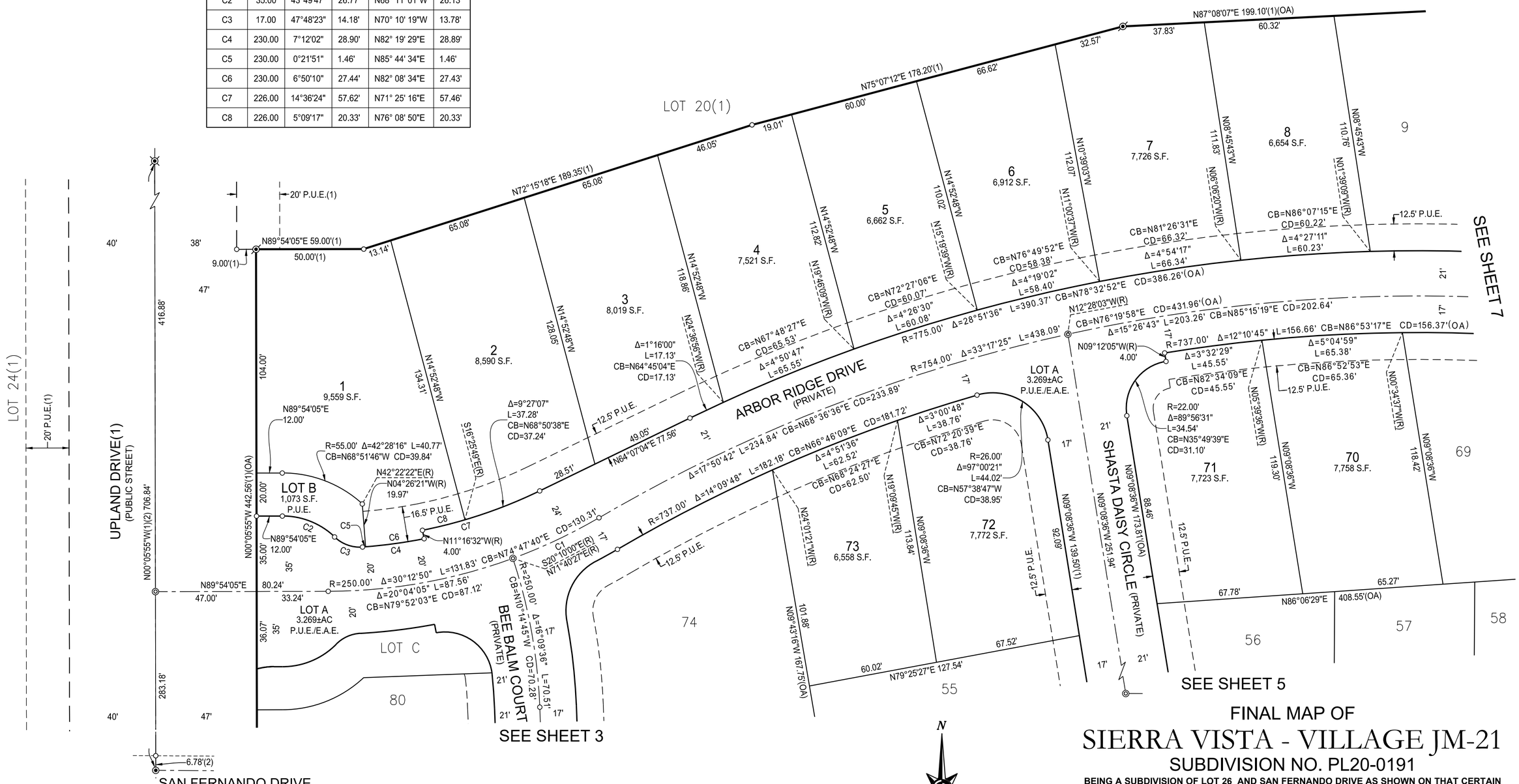
CITY OF ROSEVILLE • PLACER COUNTY • CALIFORNIA

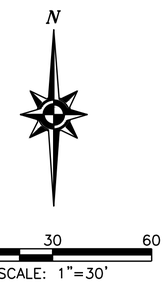
JUNE 2021

MACKAY & SOMPS
ENGINEERS PLANNERS SURVEYORS
1025 Creekside Ridge Drive, Suite 150, Roseville, CA 95678 (916) 773-1189

BOOK_____ OF MAPS, PAGE_____

Curve Table					
Curve #	Radius	Delta	Length	Chord Bearing	Chord Length
C1	250.00	10°08'45"	44.27'	N64° 45' 38"E	44.21'
C2	35.00	43°49'47"	26.77'	N68° 11' 01"W	26.13'
C3	17.00	47°48'23"	14.18'	N70° 10' 19"W	13.78'
C4	230.00	7°12'02"	28.90'	N82° 19' 29"E	28.89'
C5	230.00	0°21'51"	1.46'	N85° 44' 34"E	1.46'
C6	230.00	6°50'10"	27.44'	N82° 08' 34"E	27.43'
C7	226.00	14°36'24"	57.62'	N71° 25' 16"E	57.46'
C8	226.00	5°09'17"	20.33'	N76° 08' 50"E	20.33'





FINAL MAP OF

SIERRA VISTA - VILLAGE JM-21

SUBDIVISION NO. PL20-0191

BEING A SUBDIVISION OF LOT 26 AND SAN FERNANDO DRIVE AS SHOWN ON THAT CERTAIN FINAL MAP ENTITLED "A FINAL MAP OF THE VILLAGES AT SIERRA VISTA, A LARGE LOT SUBDIVISION, SUBDIVISION NO. SUBD 000157", FILED FOR RECORD ON JULY 29, 2015 IN BOOK DD OF MAPS, AT PAGE 26, PLACER COUNTY RECORDS, BEING A PORTION OF SECTION 36, TOWNSHIP 11 NORTH, RANGE 5 EAST, MOUNT DIABLO MERIDIAN.

CITY OF ROSEVILLE • PLACER COUNTY • CALIFORNIA

JUNE 2021

MACKAY & SOMPS
ENGINEERS PLANNERS SURVEYORS
1025 Creekside Ridge Drive, Suite 150, Roseville, CA 95678 (916) 773-1189

SEE SHEET 2 FOR NOTES, REFERENCES, BASIS OF BEARINGS AND LEGEND

ARBOR RIDGE DRIVE

SEE SHEET 4

SEE SHEET 7

SEE SHEET 6

SEE SHEET 3

SHASTA DAISY CIRCLE (PRIVATE)

SAN FERNANDO DRIVE (PUBLIC)

SAN FERNANDO DRIVE(2)

LOT A
3.269±AC
P.U.E./E.A.E.

LOT F
12,802 S.F.
P.U.E.

LOT 8(2)

Curve Table					
Curve #	Radius	Delta	Length	Chord Bearing	Chord Length
C1	36.00	32°45'50"	20.59'	N07° 14' 19"E	20.31'
C2	36.00	32°45'50"	20.59'	N73° 58' 54"E	20.31'

SEE SHEET 2 FOR NOTES, REFERENCES, BASIS OF BEARINGS AND LEGEND

N

0 30 60

SCALE: 1"=30'

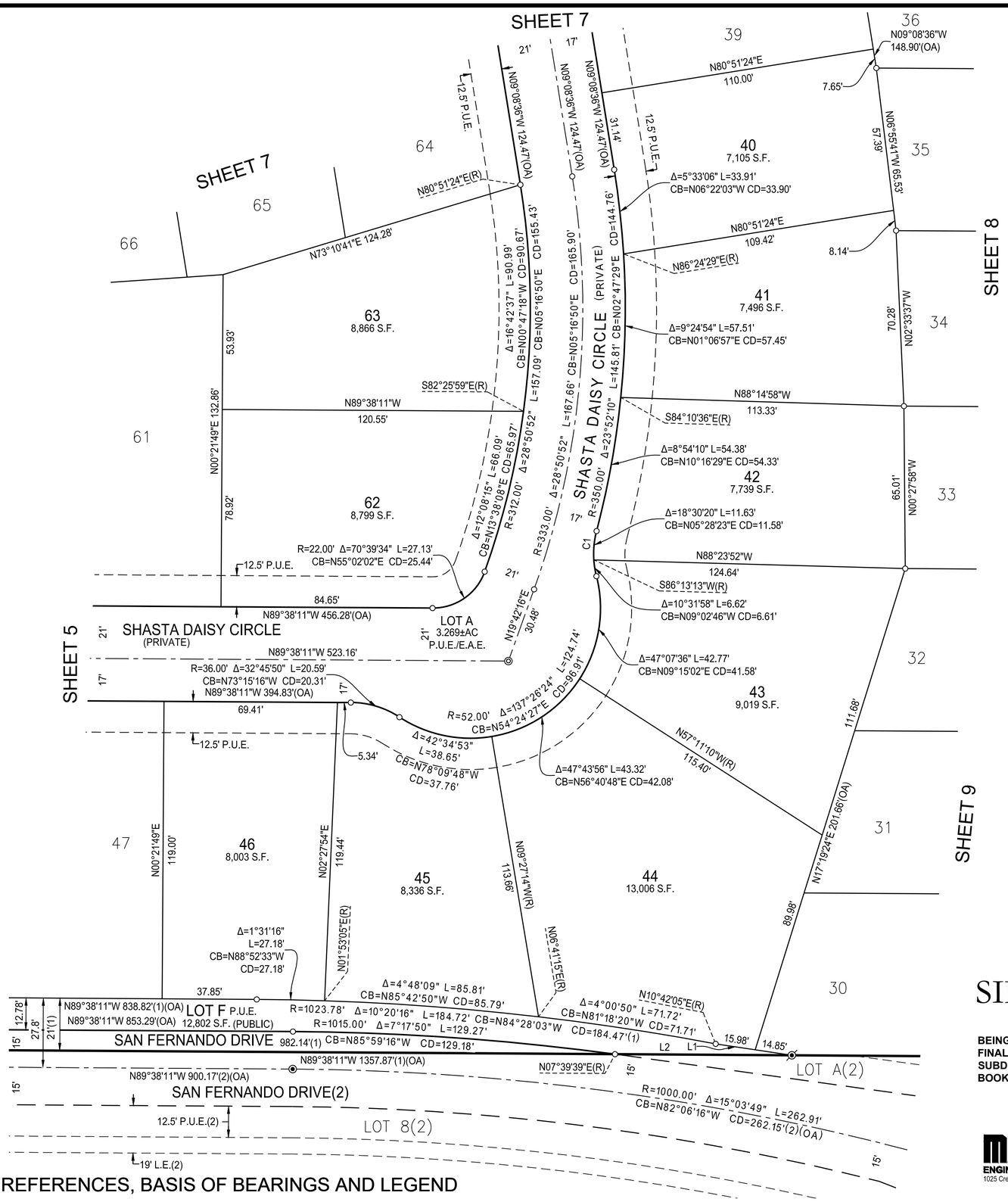
FINAL MAP OF
SIERRA VISTA - VILLAGE JM-21
SUBDIVISION NO. PL20-0191

BEING A SUBDIVISION OF LOT 26 AND SAN FERNANDO DRIVE AS SHOWN ON THAT CERTAIN FINAL MAP ENTITLED "A FINAL MAP OF THE VILLAGES AT SIERRA VISTA, A LARGE LOT SUBDIVISION, SUBDIVISION NO. SUBD 000157", FILED FOR RECORD ON JULY 29, 2015 IN BOOK DD OF MAPS, AT PAGE 26, PLACER COUNTY RECORDS, BEING A PORTION OF SECTION 36, TOWNSHIP 11 NORTH, RANGE 5 EAST, MOUNT DIABLO MERIDIAN.

CITY OF ROSEVILLE • PLACER COUNTY • CALIFORNIA

JUNE 2021

MACKAY & SOMPS
ENGINEERS PLANNERS SURVEYORS
1025 Creekside Ridge Drive, Suite 150, Roseville, CA 95678 (916) 773-1189



Line Table		
Line #	Bearing	Length
L1(1)	N81°27'58"W	30.83'
L2	N89°38'11"W	70.74'

Curve Table					
Curve #	Radius	Delta	Length	Chord Bearing	Chord Length
C1	36.00	29°02'19"	18.25'	N00° 12' 24"E	18.05'

0 30 60

SCALE: 1"=30'

FINAL MAP OF

SIERRA VISTA - VILLAGE JM-21

SUBDIVISION NO. PL20-0191

BEING A SUBDIVISION OF LOT 26 AND SAN FERNANDO DRIVE AS SHOWN ON THAT CERTAIN FINAL MAP ENTITLED "A FINAL MAP OF THE VILLAGES AT SIERRA VISTA, A LARGE LOT SUBDIVISION, SUBDIVISION NO. SUBD 000157", FILED FOR RECORD ON JULY 29, 2015 IN BOOK DD OF MAPS, AT PAGE 26, PLACER COUNTY RECORDS, BEING A PORTION OF SECTION 36, TOWNSHIP 11 NORTH, RANGE 5 EAST, MOUNT DIABLO MERIDIAN.

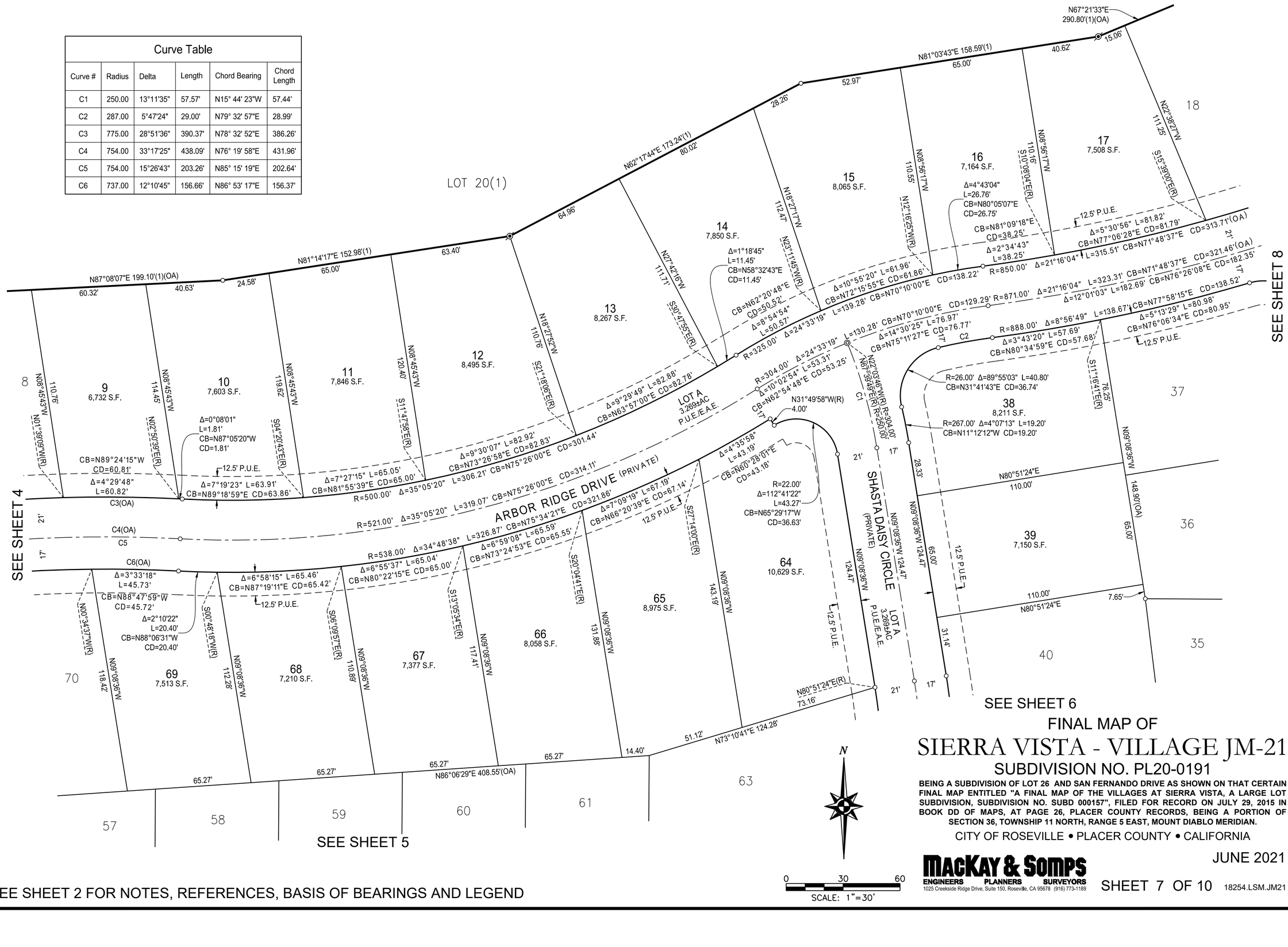
CITY OF ROSEVILLE • PLACER COUNTY • CALIFORNIA

JUNE 2021

MACKAY & SOMPS
ENGINEERS PLANNERS SURVEYORS
1025 Creekside Ridge Drive, Suite 150, Roseville, CA 95678 (916) 773-1189

SEE SHEET 2 FOR NOTES, REFERENCES, BASIS OF BEARINGS AND LEGEND

Curve Table					
Curve #	Radius	Delta	Length	Chord Bearing	Chord Length
C1	250.00	13°11'35"	57.57'	N15° 44' 23"W	57.44'
C2	287.00	5°47'24"	29.00'	N79° 32' 57"E	28.99'
C3	775.00	28°51'36"	390.37'	N78° 32' 52"E	386.26'
C4	754.00	33°17'25"	438.09'	N76° 19' 58"E	431.96'
C5	754.00	15°26'43"	203.26'	N85° 15' 19"E	202.64'
C6	737.00	12°10'45"	156.66'	N86° 53' 17"E	156.37'



FINAL MAP OF

SIERRA VISTA - VILLAGE JM-21

SUBDIVISION NO. PL20-0191

BEING A SUBDIVISION OF LOT 26 AND SAN FERNANDO DRIVE AS SHOWN ON THAT CERTAIN FINAL MAP ENTITLED "A FINAL MAP OF THE VILLAGES AT SIERRA VISTA, A LARGE LOT SUBDIVISION, SUBDIVISION NO. SUBD 000157", FILED FOR RECORD ON JULY 29, 2015 IN BOOK DD OF MAPS, AT PAGE 26, PLACER COUNTY RECORDS, BEING A PORTION OF SECTION 36, TOWNSHIP 11 NORTH, RANGE 5 EAST, MOUNT DIABLO MERIDIAN.

CITY OF ROSEVILLE • PLACER COUNTY • CALIFORNIA

JUNE 2021

MACKAY & SOMPS
ENGINEERS PLANNERS SURVEYORS
1025 Creekside Ridge Drive, Suite 150, Roseville, CA 95678 (916) 773-1189

SEE SHEET 2 FOR NOTES, REFERENCES, BASIS OF BEARINGS AND LEGEND

BOOK____ OF MAPS, PAGE____

S30 S31
S25 S36
RANGE 6 EAST
RANGE 5 EAST
(BASIS OF BEARINGS)
N00°27'58"W 5279.02'(1)(OA)
4001.27'(1)
N00°27'58"W 2294.01'(1)
N89°38'11"W 12.00'(1)(2)
1858.45'
C/L
435.56'
30' HIGHWAY EASEMENT TO PLACER COUNTY PER 2213 O.R. 024
CITY OF ROSEVILLE R.O.W. PER D.N. 2012-0062887
43' PG&E EASEMENT PER D.N. 2006-0029983
CITY OF ROSEVILLE P.U.E. PER D.N. 2012-0062887
VISTA GRANDE BOULEVARD
CITY OF ROSEVILLE P.U.E. PER D.N. 2012-0062887
FIDDYMENT ROAD
12'
85'
85.00'
20' P.U.E.(1)
N89°32'02"E 14.00'(1)
SEE DETAIL"B" ON THIS SHEET
N89°32'02"E 21.00'(1)
168.21'
148.77'
N89°32'02"E 35.21'
N89°32'02"E 7.00'
18.58'
35.42'
C1
N89°32'02"E 2.00'
S10°03'37"E(R)
N00°27'58"W
193.37'
805.31'(1)(OA)
35.00'
N89°32'02"E 7.00'
19.00'
60.30'
N89°32'02"E 7.00'
65.01'
60.01'
LOT A
3.269±AC
P.U.E./E.A.E.
C11
C10
LOT D
2,331 S.F.
P.U.E.
S38°28'34"W(R)
R=54.00' Δ=38°56'33" L=36.70'
CB=N70°59'42"W CD=36.00'
R=54.00' Δ=38°56'33" L=36.70'
CB=N70°03'45"E CD=36.00'
22
9,856 S.F.
C2
C3
N39°24'31"W(R)
LOT E
2,623 S.F.
P.U.E.
21
11,030 S.F.
12.5' P.U.E.
N28°49'25"W(R) 38.00'
17.00'
21.00'
C14
Δ=2°09'46" L=33.52'
CB=N62°15'28"E CD=33.52'
12.5' P.U.E.
24.06'
20'
108.37'
20'
N89°32'02"E 89.06'
N00°27'58"W 4.00'
64.83'
N89°32'02"E
BLUE POND DRIVE
(PRIVATE)
N00°27'58"W 145.41'
S26°39'39"E(R)
R=888.00' Δ=4°40'48" L=72.53'
CB=N65°40'45"E CD=72.51'
Δ=4°23'35" L=65.17'
CB=N63°22'23"E CD=65.16'
GOLDBLOOM PLACE
(PRIVATE)
R=850.00' Δ=4°22'57" L=65.02'
CB=N61°45'39"E CD=65.00'
Δ=8°50'34" L=106.05'
CB=N65°40'45"E CD=105.99'
C13
R=871.00' Δ=21°16'04" L=323.31'
CB=N71°48'37"E CD=313.71'(OA)
23
9,334 S.F.
N21°58'51"W(R)
4.00'
R=22.00' Δ=77°09'45" L=29.63'
CB=N29°26'17"E CD=27.44'
12.5' P.U.E.
C6
S79°03'29"W(R)
65.00'
C5
C4
88.92'
N09°08'36"W
21'
17'
N08°45'49"W(R)
11.98'
R=1017.00' Δ=8°40'38" L=154.02' CB=N04°48'17"W CD=153.87'
N00°27'58"W 73.50'
MEADOW BLOOM COURT
(PRIVATE)
N00°27'58"W 73.50'
65.01'
12.5' P.U.E.
4.23'
4.27'
R=1000.00' Δ=8°40'38" L=151.44' CB=N04°48'17"W CD=151.30'
Δ=3°44'56" L=65.43'
CB=N06°07'21"W CD=65.42'
Δ=3°46'55" L=66.01'
CB=N02°21'26"W CD=66.00'
C12
LOT A
3.269±AC
P.U.E./E.A.E.
R=250.00' Δ=7°56'34" L=34.66'
CB=N13°06'53"W CD=34.63'
131.53'
N09°08'36"W 143.52'
ARBOR RIDGE DRIVE (PRIVATE)
N09°08'36"W 128.20'
64.29'
63.91'
12.5' P.U.E.
Δ=1°08'47" L=20.01'
CB=N08°34'13"W CD=20.01'
N82°00'11"E(R)
N85°45'07"E(R)
R=26.00' Δ=97°21'34" L=44.18'
CB=N57°49'23"W CD=39.05'
S19°34'24"E(R) R= 871.00'
N72°54'50"E(R) R=250.00'
17'
21'
R=888.00' Δ=8°56'49" L=138.67' CB=N77°58'15"E CD=138.52'
CB=N76°06'34"E CD=80.95'
Δ=5°13'29" L=80.98'
12.5' P.U.E.
S11°16'41"E(R)
83.00'
N09°08'36"W 148.90'(OA)
65.91'
65.53'
N06°55'41"W
70.28'
N02°33'37"W
65.01'
N00°27'58"W
N80°51'24"E
110.00'
111.33'
N89°38'11"W
111.48'
110.40'
110.01'
9.82'
3.68'
12.5' P.U.E.
Δ=3°02'56" L=55.24'
CB=N01°59'27"W CD=55.23'
Δ=3°33'15" L=64.39'
CB=N05°17'32"W CD=64.38'
R=1038.00' Δ=6°36'12" L=119.63'
CB=N03°46'04"W CD=119.56'(OA)
25
7,178 S.F.
26
6,601 S.F.
24
7,795 S.F.
27
32
33
7,151 S.F.
34
7,764 S.F.
35
7,230 S.F.
36
8,261 S.F.
37
9,408 S.F.
38
39
40
41
42
43
N89°32'02"E 51.49'
N00°27'58"W(R) 4.00'
N89°32'02"E
75.72'
N79°59'26"W(R)
C8
C9
C1
N86°29'05"E(R)
20'
N22°38'27"W 112.62'
80.74'
65.00'
N22°38'27"W 117.15'
S24°25'49"E(R)
N67°21'33"E 290.60'(1)
LOT 20(1)
19
7,627 S.F.
N22°38'27"W 116.70'
S20°02'52"E(R)
18
7,436 S.F.
S15°39'00"E(R)
111.25'
N22°38'27"W
17
16
15.06'
N81°00'43"E 158.59'(1)
ARBOR RIDGE DRIVE
(PRIVATE)
21'
17'
N
0
30
60
SCALE: 1"=30'

WEST LINE OF CITY OF ROSEVILLE P.U.E. PER D.N. 2012-0062887
N89°32'02"E 14.00'(1)
13.72'
0.28'
DETAIL"B"
NTS

Curve Table					
Curve #	Radius	Delta	Length	Chord Bearing	Chord Length
C1	30.00	9°35'39"	5.02'	N84° 44' 13"E	5.02'
C2	35.00	44°38'24"	27.27'	N67° 12' 50"E	26.58'
C3	17.00	44°38'23"	13.24'	N67° 12' 50"E	12.91'
C4	22.00	81°19'22"	31.23'	N49° 48' 17"W	28.67'
C5	22.00	79°31'28"	30.54'	N50° 42' 15"W	28.14'
C6	22.00	1°47'55"	0.69'	N10° 02' 33"W	0.69'
C7	22.00	96°36'12"	37.09'	N41° 13' 56"E	32.85'
C8	22.00	17°04'44"	6.56'	N01° 28' 12"E	6.53'
C9	22.00	79°31'28"	30.54'	N49° 46' 18"E	28.14'
C10	17.00	44°38'23"	13.24'	N68° 08' 47"W	12.91'
C11	35.00	44°38'23"	27.27'	N68° 08' 47"W	26.58'
C12	250.00	8°17'51"	36.20'	N85° 23' 06"E	36.17'
C13	871.00	8°55'17"	135.62'	N65° 57' 58"E	135.48'
C14	871.00	0°19'44"	5.00'	N61° 20' 27"E	5.00'

SEE SHEET 2 FOR NOTES, REFERENCES, BASIS OF BEARINGS AND LEGEND

SEE SHEET 7

SEE SHEET 9

FINAL MAP OF

SIERRA VISTA - VILLAGE JM-21

SUBDIVISION NO. PL20-0191

BEING A SUBDIVISION OF LOT 26 AND SAN FERNANDO DRIVE AS SHOWN ON THAT CERTAIN FINAL MAP ENTITLED "A FINAL MAP OF THE VILLAGES AT SIERRA VISTA, A LARGE LOT SUBDIVISION, SUBDIVISION NO. SUBD 000157", FILED FOR RECORD ON JULY 29, 2015 IN BOOK DD OF MAPS, AT PAGE 26, PLACER COUNTY RECORDS, BEING A PORTION OF SECTION 36, TOWNSHIP 11 NORTH, RANGE 5 EAST, MOUNT DIABLO MERIDIAN.

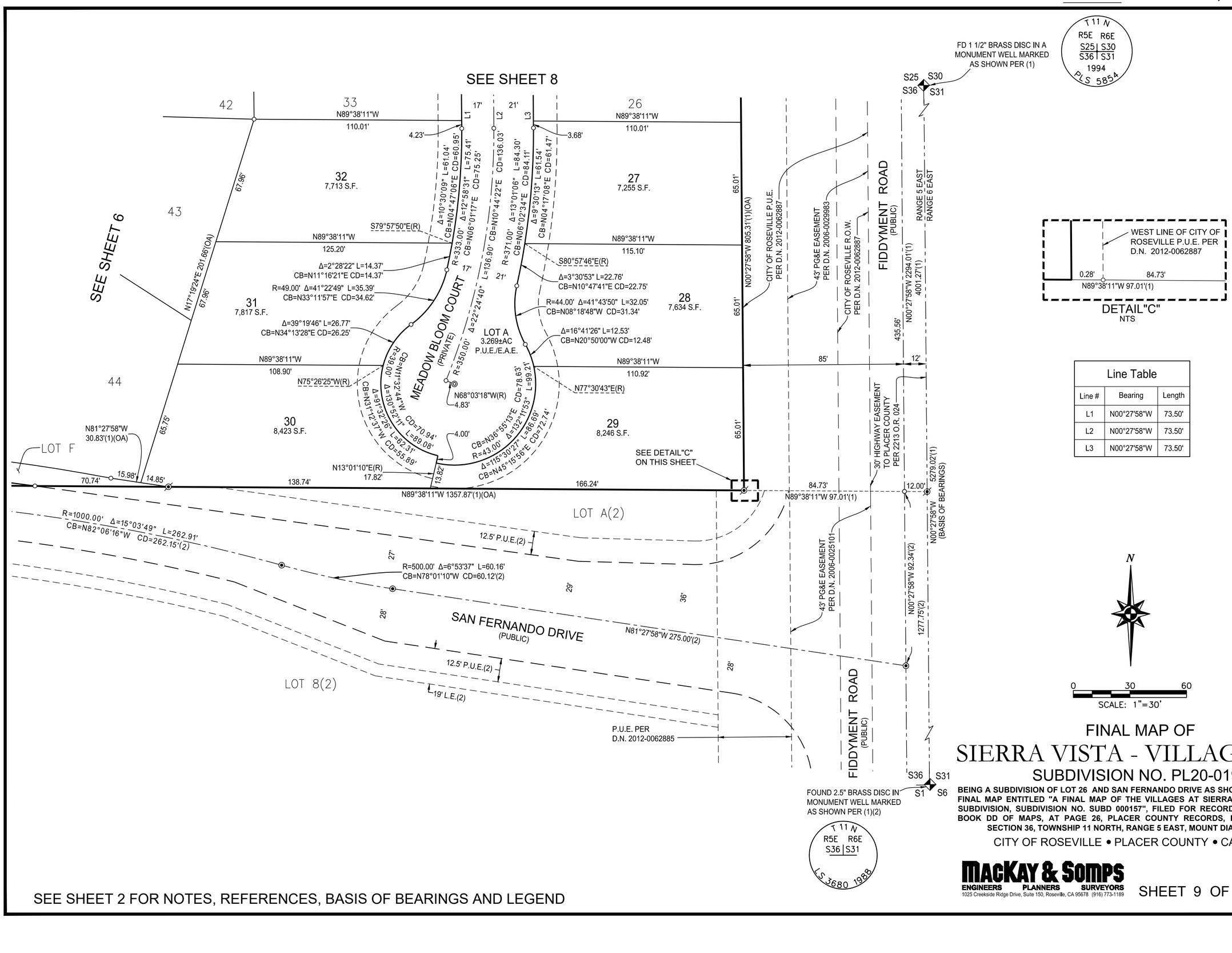
CITY OF ROSEVILLE • PLACER COUNTY • CALIFORNIA

JUNE 2021

MACKAY & SOMPS
ENGINEERS PLANNERS SURVEYORS
1025 Creekside Ridge Drive, Suite 150, Roseville, CA 95678 (916) 773-1189

 18254.LSM.JM21

BOOK____ OF MAPS, PAGE____



Line Table		
Line #	Bearing	Length
L1	N00°27'58"W	73.50'
L2	N00°27'58"W	73.50'
L3	N00°27'58"W	73.50'

FINAL MAP OF
SIERRA VISTA - VILLAGE JM-21
SUBDIVISION NO. PL20-0191

BEING A SUBDIVISION OF LOT 26 AND SAN FERNANDO DRIVE AS SHOWN ON THAT CERTAIN FINAL MAP ENTITLED "A FINAL MAP OF THE VILLAGES AT SIERRA VISTA, A LARGE LOT SUBDIVISION, SUBDIVISION NO. SUBD 000157", FILED FOR RECORD ON JULY 29, 2015 IN BOOK DD OF MAPS, AT PAGE 26, PLACER COUNTY RECORDS, BEING A PORTION OF SECTION 36, TOWNSHIP 11 NORTH, RANGE 5 EAST, MOUNT DIABLO MERIDIAN.

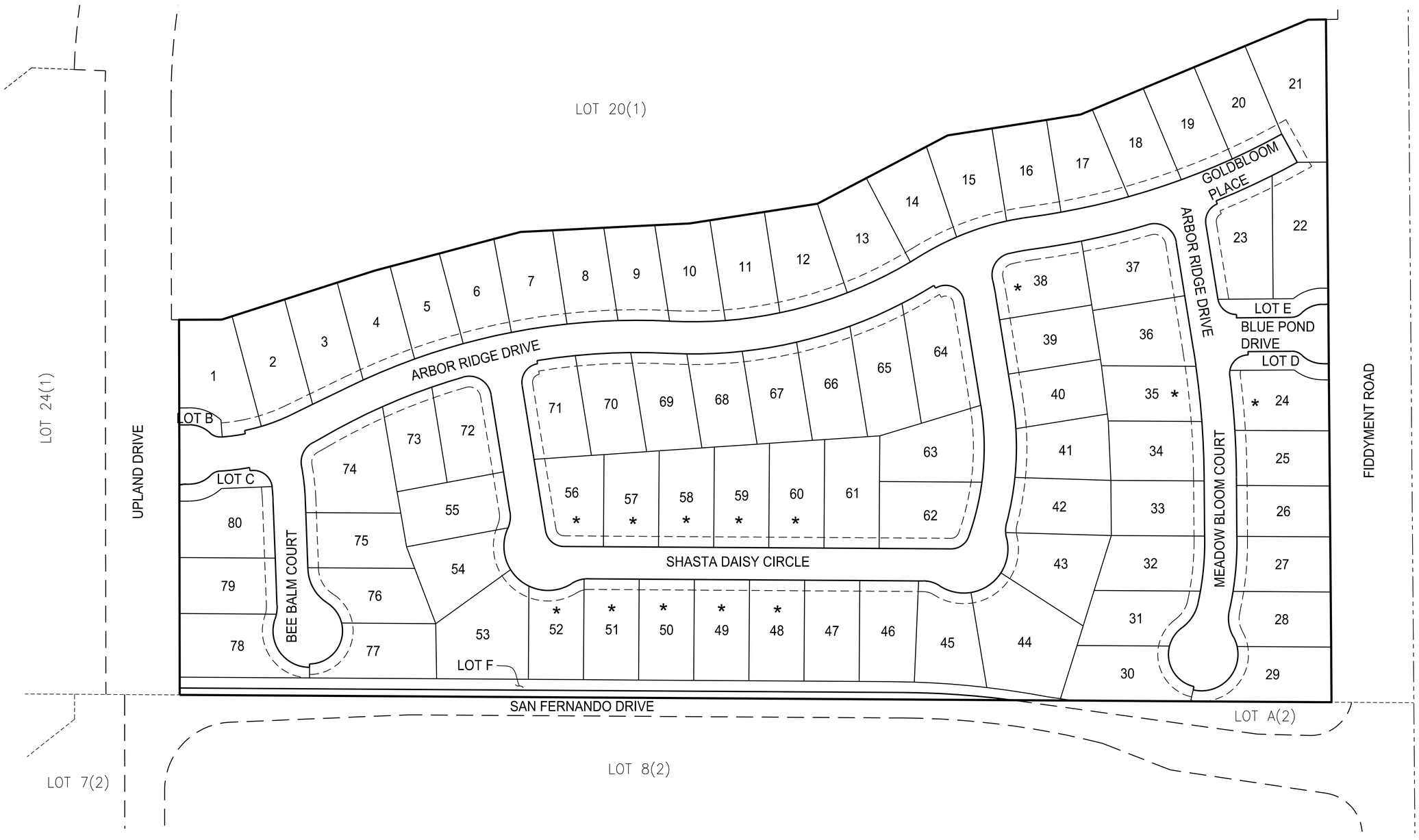
CITY OF ROSEVILLE • PLACER COUNTY • CALIFORNIA

JUNE 2021

MACKAY & SOMPS
ENGINEERS PLANNERS SURVEYORS
1025 Creekside Ridge Drive, Suite 150, Roseville, CA 95678 (916) 773-1189

SEE SHEET 2 FOR NOTES, REFERENCES, BASIS OF BEARINGS AND LEGEND

BOOK_____OF MAPS, PAGE_____



LEGEND

* DENOTES SEWER BACKFLOW PREVENTER VALVE REQUIRED ON SANITARY SEWER CONNECTION BY THE CITY OF ROSEVILLE WITH THE BUILDING PERMIT AND MAINTAINED THEREAFTER BY THE OWNER.

ADDITIONAL INFORMATION FOR INFORMATIONAL PURPOSES ONLY PURSUANT TO SECTION 66434.2 OF THE GOVERNMENT CODE

EACH RESIDENTIAL DWELLING CONSTRUCTED ON ANY OF THE LOTS INDICATED SHALL BE FITTED WITH A SEWER BACKFLOW PREVENTER VALVE AS APPROVED BY THE CITY OF ROSEVILLLE. IT SHALL BE THE RESPONSIBILITY OF THE OWNER OF SAID DWELLING TO MAINTAIN THE VALVE AND PREVENT DAMAGE FROM OCCURRING THERETO. THE CITY OF ROSEVILLE SHALL NOT BE RESPONSIBLE FOR THE MAINTENANCE OR PERFORMANCE OF THE VALVE, AND THE CITY OF ROSEVILLE SHALL NOT BE LIABLE FOR ANY DAMAGE OCCURRING TO ANY SUCH DWELLING OR ITS CONTENTS DUE TO FAILURE OF THE VALVE FOR ANY REASON WHATSOEVER.

N

0 40 80 160

SCALE: 1"=80'

FINAL MAP OF

SIERRA VISTA - VILLAGE JM-21

SUBDIVISION NO. PL20-0191

BEING A SUBDIVISION OF LOT 26 AND SAN FERNANDO DRIVE AS SHOWN ON THAT CERTAIN FINAL MAP ENTITLED "A FINAL MAP OF THE VILLAGES AT SIERRA VISTA, A LARGE LOT SUBDIVISION, SUBDIVISION NO. SUBD 000157", FILED FOR RECORD ON JULY 29, 2015 IN BOOK DD OF MAPS, AT PAGE 26, PLACER COUNTY RECORDS, BEING A PORTION OF SECTION 36, TOWNSHIP 11 NORTH, RANGE 5 EAST, MOUNT DIABLO MERIDIAN.

CITY OF ROSEVILLE • PLACER COUNTY • CALIFORNIA

JUNE 2021

MACKAY & SOMPS
ENGINEERS PLANNERS SURVEYORS
1025 Creekside Ridge Drive, Suite 150, Roseville, CA 95678 (916) 773-1189

 18254.LSM.JM21

COUNCIL COMMUNICATION

CC #: 1519
File #: 0400-04-12-1

Title:	Sierra Vista - Village JM-40 - Final Map and Subdivision Agreement
Contact:	Edward Winston 916-774-5432 ewinston@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 7.22.

RECOMMENDATION TO COUNCIL

1. Approve the final map on file with the City Clerk and accept on behalf of the public, the public utility and storm drain easements offered thereon, and accept, subject to improvement, the public rights of way and Lot A offered thereon.

2. Adopt the attached resolution approving the Subdivision Agreement and authorize the City Manager to execute the agreement on behalf of the City.

BACKGROUND

The Development Services Engineering section has reviewed the subject final map and found that it is in compliance with the Subdivision Map Act and the City's Subdivision Ordinance and all conditions of the tentative map have been met.

This map will create 35 residential lots and 1 public landscape lot.

FISCAL IMPACT

There is no fiscal impact to the City's General Fund associated with this approval.

ENVIRONMENTAL REVIEW

Approval of the Sierra Vista Village JM-40 final map is an action that is subject to California Environmental Quality Act (CEQA). Project level CEQA compliance for the Sierra Vista Village JM-40 final map final map was accomplished with preparation of the Sierra Vista Specific Plan EIR (Adopted: May 5, 2010) (SCH#2008032017) and the Mitigated Negative Declaration (MND) and associated Mitigation Monitoring Program approved by the City of Roseville on June 6, 2012. Because the Sierra Vista Village JM-40 final map is consistent with the project evaluated in the Sierra Vista Specific Plan Environmental Impact Report (EIR), no new effects would be expected

to occur and all applicable mitigation measures from the Sierra Vista Specific Plan EIR will be implemented. As such, no additional CEQA action is required at this time.

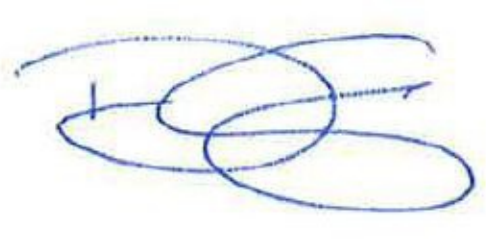
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Goal F - Invest in well-planned infrastructure and growth

Respectfully Submitted,

Edward Winston, Associate Engineer

Mike Isom, Development Services Director



_____
Dominick Casey, City Manager

ATTACHMENTS:

Description

Resolution 21-255

Subdivision Agreement

Sierra Vista Village JM-40 Final Map

RESOLUTION NO. 21-255

APPROVING A SUBDIVISION AGREEMENT, BY AND BETWEEN THE CITY OF ROSEVILLE AND JOHN MOURIER CONSTRUCTION, INC., AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE

WHEREAS, a subdivision agreement, by and between the City of Roseville and John Mourier Construction, Inc., for the Sierra Vista Village JM-40 subdivision, has been reviewed by the City Council; and

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Roseville that said agreement is approved and that the City Manager is authorized to execute it on behalf of the City of Roseville.

PASSED AND ADOPTED by the Council of the City of Roseville this____day of _____, 20_, by the following vote on roll call:

AYES COUNCILMEMBERS:

NOES COUNCILMEMBERS:

ABSENT COUNCILMEMBERS:

_____
MAYOR

ATTEST:

_____
City Clerk

RECORDING REQUESTED BY AND WHEN RECORDED, PLEASE RETURN TO:

City Clerk
CITY OF ROSEVILLE
311 Vernon Street
Roseville, CA 95678

Exempt from recording fees
Pursuant to Govt. Code §27383

SUBDIVISION AGREEMENT
Sierra Vista Village JM-40 SUBDIVISION

THIS AGREEMENT, made and entered into this ___ day of _____, 20__, by and between the CITY OF ROSEVILLE, a municipal corporation ("CITY"), and John Mourier Construction, Inc., a a California corporation, ("SUBDIVIDER"),

W I T N E S S E T H:

WHEREAS, SUBDIVIDER is possessed of a tract of land lying in the City of Roseville, County of Placer, known as "Sierra Vista Village JM-40 Subdivision" (Subdivision no. PL20-0103; "the Subdivision"); and

WHEREAS, a tentative map of the Subdivision was approved by the City Planning Commission on the 10th day of December, 2020, and the final map of the Subdivision has been approved subject to the execution of this Agreement; and

WHEREAS, the final map has been filed on the ____ day of _____, 20__ in Book _____ of Parcel/Subdivision Maps at Page _____ in the Official Records, Placer County Recorder, file no. _____; and

WHEREAS, Section 18.20.110 of the Roseville Municipal Code, regulating the subdivision of land in the City, requires that SUBDIVIDER shall execute and file an agreement between itself and CITY relating to the improvements to be made in a subdivision, prior to the approval by the City Council of the final map.

NOW, THEREFORE, the parties agree as follows:

1. Rights-of-Way. Except as otherwise provided by this Agreement, CITY rejects all lands, right-of-ways, and easements offered for dedication on the final map of the Subdivision. All such offers shall, however, remain open, and shall constitute irrevocable offers of dedication in accordance with Government Code Section 66477.2. All such offers may be accepted by CITY in its sole discretion at any later date without further notice to SUBDIVIDER as provided by law.

By way of explanation only, it is the current intention of CITY to accept all or part of such irrevocable offers to dedicate upon acceptance of the improvements called for in this Agreement.

2. Improvements - Time Limit. SUBDIVIDER agrees to cause all improvements to be made and constructed in the Subdivision to fully comply with the requirements of the Roseville Municipal Code and the Subdivision Map Act of the State of California according to the improvement plans for the Subdivision prepared by Baker Williams Engineering Group, dated 04/08/2021 and approved by the City Engineer and including any changes or alterations to such improvements required by the City Engineer, and to install, on or before December 31, 2021, such survey monuments as may be required by the City Engineer ("the Work"). SUBDIVIDER agrees to pay for any materials, provisions or other supplies used in, upon, for or about the performance of the Work, or for any work or labor of any kind done in

connection with the Work, or for any amounts due under the Unemployment Insurance Act with respect to such work or labor.

SUBDIVIDER agrees to complete all of the Work on or before twenty-four (24) months from the date of this Agreement. If in the opinion of the City Engineer of CITY, an extension of this Agreement is not detrimental to the public welfare, he or she is, in his or her sole discretion, hereby authorized to extend the time within which the Work shall be completed for a period not to exceed twelve (12) months. Upon a written application made by SUBDIVIDER, further extensions, not to exceed an additional six (6) months, shall be reviewed and approved at the discretion of the City Engineer of CITY. Any such application extension request by SUBDIVIDER shall fully state the grounds and facts relied upon for the granting of additional extensions.

In the event that SUBDIVIDER shall fail to complete the Work within the time provided by this Agreement, CITY may, in its sole discretion and in addition to any other remedy provided in this Agreement or by law, enter upon the Subdivision and complete the Work and recover the full cost and expense of such construction from SUBDIVIDER, SUBDIVIDER's successors and assigns, or from the then owner of the Subdivision, and/or place a lien upon the Subdivision for such cost and expense.

If at anytime prior to the expiration of the time provided by this Agreement the City Engineer of CITY determines that a safety hazard exists within an existing public right-of-way, the City Engineer shall give written notice to SUBDIVIDER to eliminate the safety hazard. If SUBDIVIDER fails to eliminate the safety hazard within five (5) calendar days of the written notice, CITY may, in its sole discretion and in addition to any other remedy provided in this Agreement or by law, eliminate the safety hazard and recover the full cost and expense of such work from SUBDIVIDER, SUBDIVIDER's successors and assigns, or from the then owner of the Subdivision, and/or place a lien upon the Subdivision for such cost and expense.

3. Acquisition and Dedication of Easements or Rights-of-Ways. If any of the Work is to be constructed or installed on land not within the Subdivision or already existing public right-of-way, no construction or installation shall be commenced before:

a. The irrevocable offer of dedication or conveyance to CITY of appropriate right-of-ways, easements or other interest in real property, and appropriate authorization from the property owner to allow construction or installation of the improvements or work; or

b. The issuance of an order of possession by a court of competent jurisdiction pursuant to the State Eminent Domain Law. SUBDIVIDER shall comply in all respects with any such order of possession.

Nothing in this Section 3 shall be construed as authorizing or granting an extension of time to SUBDIVIDER for completion of the Work.

4. Inspection Fees and Costs. The City Engineer shall inspect all of the Work improvements made in the Subdivision to see that they comply with CITY's subdivision regulations and specifications. SUBDIVIDER shall deposit the estimated inspection fee and reimburse CITY for the cost of such inspections in accordance with Roseville Municipal Code section 18.20.070.

5. Securities.

a. SUBDIVIDER shall file with this Agreement two (2) improvement securities as set forth in Roseville Municipal Code Sections 18.20.150 and 18.20.160. Each security shall be in the amount of one hundred percent (100%) of the total estimated cost of the Work as determined by the City Engineer which amount is the sum of $---936,950---. One improvement security shall secure faithful performance of this Agreement as required by Section 66499.3(a) of the Government Code of the State of California (the "faithful performance" security). The second improvement security shall, as required by Section 66499.3(b) of the Government Code of the State of California, secure the obligations set forth in Title 15

(commencing with Section 3082) of Part 4 of Division 3 of the Civil Code of the State of California for payment to the contractor, his subcontractors and to persons renting equipment or furnishing labor or materials to them for the Work (the "payment security"). The improvement securities required under this paragraph shall also secure placement of monumentation and guarantee payment therefor as provided by California Government Code section 66496.

b. SUBDIVIDER shall also file with this Agreement a "guarantee and warranty security" in the amount of ten percent (10%) of the City Engineer's estimated cost of the Work as set forth in Section 18.20.170 of the Roseville Municipal Code to guarantee and warrant the Work for a period of one year following its completion and acceptance against any defective work or labor done, or defective materials furnished, as required by Section 66499(a)(5) of the Government Code of the State of California. The guarantee and warranty security shall be released upon SUBDIVIDER's request following expiration of the warranty period and subject to the reasonable determination of the City Engineer that SUBDIVIDER's warranty obligations have been satisfied.

c. Any bonds submitted as security pursuant to this section shall be executed by a surety company authorized to transact a surety business in the State of California. All required securities shall be in a form approved by the City Attorney of CITY.

6. Successors and Assigns – Covenant Running with the Land. This Agreement shall inure to the benefit of, and be binding upon, the successors and assigns of the respective parties. It shall be recorded in the Office of the Recorder of Placer County concurrently with the final map of the Subdivision, and shall constitute a covenant running with the land and an equitable servitude upon the real property within the Subdivision.

7. Acceptance of Improvements Upon Completion. Upon satisfactory completion of the Work, in accordance with this Agreement, CITY agrees to accept the Work and its

improvements and the offers of dedication described in paragraph 1, subject to the provisions of paragraphs 1 and 10 of this Agreement.

8. Notice Regarding Construction. SUBDIVIDER shall notify the City Engineer of CITY in writing three (3) days prior to the commencement of construction of the Work.

9. Subdivider's Obligation to Warn Public During Construction. Until final acceptance of the Work, SUBDIVIDER shall give good and adequate warning to the public of each and every dangerous condition which may exist in the Work, and will take all reasonable actions to protect the public from any such dangerous condition.

10. Warranty.

a. SUBDIVIDER guarantees and warrants the public improvements which constitute the Work required by this Agreement, and agrees to remedy any defects in the improvements or the Work arising from faulty or defective materials or construction of said improvements or the Work occurring within twelve (12) months after their acceptance by CITY. SUBDIVIDER agrees to permit inspection of all improvements in the Subdivision by the City Engineer of CITY for such period, and to reimburse CITY for the cost of such inspections.

b. If, within the warranty period, the Work or improvement or any part of the Work done, furnished, installed, or constructed fails to fulfill any of the requirements of this Agreement or the improvement plans and specifications, SUBDIVIDER shall, without delay or cost to CITY, repair, replace or reconstruct any defective or otherwise unsatisfactory part or parts of the Work. CITY may, at its sole option, perform such repair or replacement itself if SUBDIVIDER has failed to commence such repair within twenty (20) days after CITY has mailed written notice of default to SUBDIVIDER and to SUBDIVIDER'S Surety. In such event, SUBDIVIDER agrees to pay the cost of such repair and replacement by CITY and CITY may, at its option, recover such cost as a lien against the Subdivision should the cost exceed the inspection fee deposited pursuant to paragraph 4 of this Agreement.

Should CITY determine that the public safety requires repairs or replacements to be made before SUBDIVIDER can be notified, CITY may, in its sole discretion, make the necessary repairs or replacement or perform the necessary work. SUBDIVIDER shall pay to CITY the cost of such repairs and CITY may at its option recover such cost as a lien against the Subdivision.

11. Indemnification. To the fullest extent allowed by law, SUBDIVIDER shall defend, indemnify, and save and hold harmless CITY, its officers, agents, employees and volunteers from any claims, suits or actions of every name, kind and description brought forth, or on account of, injuries to or death of any person (including but not limited to workers and the public), or damage to property, resulting from or arising out of SUBDIVIDER 's willful misconduct or negligent act or omission while engaged in the performance of obligations or exercise of rights created by this Agreement, except those matters arising from CITY's sole or active negligence or willful misconduct. The parties intend that this provision shall be broadly construed.

SUBDIVIDER's responsibility for such defense and indemnity obligations shall survive the termination or completion of this Agreement for the full period of time allowed by law. The defense and indemnity obligations of this Agreement are undertaken in addition to, and shall not in any way be limited by, the insurance obligations contained in this Agreement.

12. Insurance. SUBDIVIDER agrees to continuously maintain, in full force and effect, at a minimum the following policies of insurance during the term of this Agreement.

COVERAGE	LIMITS OF LIABILITY
General Liability	$2,000,000 per occurrence $3,000,000 aggregate Personal Injury: $2,000,000 per occurrence $3,000,000 aggregate
Automobile Liability	$1,000,000 combined single limit

Workers' Compensation Statutory

a. Form. SUBDIVIDER shall submit a certificate evidencing such coverage for the period covered by this Agreement in a form satisfactory to Risk Management and the City Attorney, prior to undertaking any work hereunder. Any insurance written on a claims made basis is subject to the approval of Risk Management and the City Attorney.

b. Additional Insureds. SUBDIVIDER shall also provide a separate endorsement form or section of the policy showing CITY, its officers, agents, employees and volunteers as additional insureds for each type of coverage, except for Workers' Compensation, for ongoing and completed operations. Such insurance shall specifically cover the contractual liability of SUBDIVIDER. The additional insured coverage under the SUBDIVIDER's policy shall be primary and noncontributory, as evidenced by a separate endorsement or section of the policy, and shall not seek contribution from CITY's insurance or self-insurance. In addition, the additional insured coverage shall be at least as broad as the Insurance Services Office ("ISO") CG 20 01 Endorsement. Any available insurance proceeds in excess of the specified minimum insurance coverage requirements and limits shall be available to the additional insureds. Furthermore, the requirements for coverage and limits shall be: (1) the minimum coverage and limits specified in this Agreement; or (2) the full coverage and maximum limits of any insurance proceeds available to the named insureds, whichever is greater.

c. Cancellation/Modification. SUBDIVIDER shall provide ten (10) days written notice to CITY prior to cancellation or modification of any insurance required by this Agreement.

d. Umbrella/Excess Insurance. The limits of insurance required in this Agreement may be satisfied by a combination of primary and excess insurance. Any excess insurance shall contain or be endorsed to contain a provision that such coverage shall also apply

on a primary and noncontributory basis for the benefit of CITY (if agreed to in a written contract) before CITY's own insurance shall be called upon to protect it as a named insured.

e. Self-Insured Retentions. All self-insured retentions ("SIR") must be disclosed to Risk Management for approval and shall not reduce the limits of liability. Policies containing any SIR provision shall provide or be endorsed to provide that the SIR may be satisfied by either the named insured or CITY. CITY reserves the right to obtain a full certified copy of any insurance policy and endorsements. The failure to exercise this right shall not constitute a waiver of such right.

f. Waiver of Subrogation. SUBDIVIDER hereby agrees to waive subrogation which any insurer of SUBDIVIDER may acquire from SUBDIVIDER by virtue of the payment of any loss under a Workers Compensation, Commercial General Liability or Automobile Liability policy. All Workers Compensation, Commercial General Liability and Automobile Liability policies shall be endorsed with a waiver of subrogation in favor of CITY, its officers, agents, employees and volunteers for all worked performed by SUBDIVIDER, its employees, agents and subcontractors.

g. Liability/Remedies. Insurance coverage in the minimum amounts set forth herein shall not be construed to relieve SUBDIVIDER of liability in excess of such coverage, nor shall it preclude CITY from taking such other actions as are available to it under any other provisions of this Agreement or law.

13. Irrevocability of Security. The improvement securities furnished pursuant to paragraph 5 shall be irrevocable, shall not be limited as to time (except as to the one-year guarantee and warranty period specified in paragraph 10) and shall provide that they may be released, in whole or part, only upon the written approval of the City Engineer of CITY.

14. Attorney's Fees; Venue; Governing Law. Any action by any party to this Agreement, or any action concerning a security furnished pursuant to paragraph 5, shall be

brought in the appropriate court of competent jurisdiction within the County of Placer, State of California, notwithstanding any other provision of law which may provide that such action may be brought in some other location. In the event it becomes necessary for either party to bring an action with respect to enforcement of the provisions of this Agreement, or the security therefor, the prevailing party in such action shall be awarded a reasonable attorney's fee, as may be determined by the Court. This Agreement shall be governed by and construed in accordance with the laws of the State of California.

15. Release of Faithful Performance Security. Release of faithful performance security shall be in compliance with and pursuant to the procedures set forth in Government Code Section 66499.7. Upon the completion of all secured Work by SUBDIVIDER and written acceptance of that completed Work by CITY, and the furnishing of the warranty security as required by paragraph 5(b), the City Engineer shall authorize the release of the remaining faithful performance security.

16. Release of Payment Security. Thirty-five (35) days after a notice of completion is recorded with respect to the Work, the City Engineer of CITY may authorize the release of the payment security, in the event that no claims have been filed against said security. In the event that claims or actions are filed against the security, the City Engineer may release so much of such security as is in excess of the total of the claims made against it, plus a reasonable amount of costs and attorney's fees.

17. Automatic Termination Upon Completion and Sale of Residential Unit. This Agreement and any lien pursuant hereto shall automatically be terminated, without any further action by either party or need to record any additional document, with respect to any single-family residential lot within a parcel designated by the Specific Plan for residential use, upon completion of construction and issuance by the City of a final inspection for a dwelling unit upon such residential lot and conveyance of such improved residential lot to a bona-fide good faith

purchaser thereof. In connection with its issuance of a final inspection for such improved lot, City shall confirm that: (i) all improvements which are required to serve the lot, as determined by City, have been accepted by City; (ii) the lot is included within the Maintenance CFD required by Section 3.20 or other financing mechanism acceptable to the City, to the extent required hereby; and (iii) if and to the extent applicable to such lot, an affordable purchase or rental housing agreement has been recorded on the lot. Termination of this Agreement for any such residential lot as provided for in this section shall not in any way be construed to terminate or modify any assessment district or Mello-Roos Community Facilities District lien affecting such lot at the time of termination.

18. Failure of Performance. In addition to any other remedies provided in this Agreement or by law, in the event SUBDIVIDER fails to perform one or more of the covenants or conditions of this Agreement, CITY shall have recourse to the security given to guarantee the performance of such acts. CITY may do, or cause to be done, those acts required of SUBDIVIDER, and shall have recourse against so much of the security as is necessary to discharge the responsibility of SUBDIVIDER. In the event CITY seeks recourse against a security, CITY shall also have recourse against SUBDIVIDER for any and all amounts necessary to complete the obligations of SUBDIVIDER in the event the security is insufficient to pay such amounts. All administrative costs, including reasonable attorney's fees pursuant to Section 66499.4 of the Government Code, incurred by CITY, in addition to the costs of the improvements, shall be a proper charge against the security and SUBDIVIDER.

19. Integration. This Agreement is an integrated agreement. It supersedes all prior negotiations, representations, or agreements, either written or oral.

20. Modification. This Agreement and each provision contained herein may be waived, amended, supplemented or eliminated only by mutual written agreement of the parties.

21. Notices. Any notices sent to the parties relating to this Agreement shall be sent by first class mail, postage prepaid or delivered to the following addresses:

Marc Stout, City Engineer
City of Roseville
311 Vernon Street
Roseville, CA 95678

John Mourier Construction, Inc.
Attn: Steve Schnable
1430 Blue Oaks Boulevard, Suite 190
Roseville, CA 95747

Either party may amend its address by giving written notice to the other.

22. Severability. If any of the provisions contained in this Agreement are for any reason held invalid or unenforceable, such holding shall not affect the remaining provisions or the validity and enforceability of the Agreement as a whole.

IN WITNESS WHEREOF, the City of Roseville, a municipal corporation, has authorized the execution of this Agreement in duplicate by its City Manager and attestation by its City Clerk under authority of Resolution No. ____, adopted by the Council of the City of Roseville on the ___ day of _____, 20__, and SUBDIVIDER has caused this Agreement to be executed.

CITY OF ROSEVILLE, a municipal corporation,

BY: _____
DOMINICK CASEY
City Manager

John Mourier Construction, Inc.,
a California corporation

BY: _____

its: President

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT **CIVIL CODE § 1189**

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California)
County of Placer)

On May 11, 2021 *Date* before me, Karen Headley, a notary Public, *Here Insert Name and Title of the Officer*

personally appeared John L. Mourier III *Name(s) of Signer(s)*

,

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

KAREN HEADLEY
Notary Public - California
Placer County
Commission # 2258771
My Comm. Expires Oct 16, 2022

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature _____ *Signature of Notary Public*

Place Notary Seal Above

OPTIONAL

Though this section is optional, completing this information can deter alteration of the document or fraudulent reattachment of this form to an unintended document.

Description of Attached Document

Title or Type of Document: _____ Document Date: _____

Number of Pages: _____ Signer(s) Other Than Named Above: _____

Capacity(ies) Claimed by Signer(s)

Signer's Name: _____
☐ Corporate Officer — Title(s): _____
☐ Partner — ☐ Limited ☐ General
☐ Individual ☐ Attorney in Fact
☐ Trustee ☐ Guardian or Conservator
☐ Other: _____
Signer Is Representing: _____

Signer's Name: _____
☐ Corporate Officer — Title(s): _____
☐ Partner — ☐ Limited ☐ General
☐ Individual ☐ Attorney in Fact
☐ Trustee ☐ Guardian or Conservator
☐ Other: _____
Signer Is Representing: _____

©2014 National Notary Association • www.NationalNotary.org • 1-800-US NOTARY (1-800-876-6827) Item #5907

ATTEST:

BY:_____
SONIA OROZCO
City Clerk

APPROVED AS TO FORM:

BY:_____
MICHELLE SHEIDENBERGER
City Attorney

APPROVED AS TO SUFFICIENCY:

BY: 
MARC STOUT
City Engineer

John Mourier Construction, Inc.
a California corporation

and

BY:_____

its:_____

(NOTARIZATION REQUIRED)

BOOK _____ OF MAPS, PAGE _____

PLAT OF

SIERRA VISTA VILLAGE JM-40

SUBDIVISION NO.: PL20-0103

ALL OF LOT 76 AS SHOWN ON THE THAT FINAL MAP OF
"SIERRA VISTA VILLAGE JM-20B - PHASE 2" - 'EE' BM 96
LOCATED IN SECTION 36, T. 11 N., R. 5 E., M.D.M.
CITY OF ROSEVILLE, COUNTY OF PLACER, STATE OF CALIFORNIA

JUNE 2021

BAKER WILLIAMS ENGINEERING GROUP

SHEET 1 OF 3

OWNER'S STATEMENT:

THE UNDERSIGNED HEREBY STATE THAT THEY ARE THE ONLY PERSONS HAVING ANY RECORD TITLE INTERESTS IN THE REAL PROPERTY INCLUDED WITHIN THIS PLAT OF "SIERRA VISTA VILLAGE JM-40" SHOWN UPON THIS MAP AND THEY HEREBY CONSENT TO THE PREPARATION AND RECORDING OF THIS MAP AND OFFER FOR DEDICATION AND DO HEREBY DEDICATE FOR SPECIFIC PURPOSES THE FOLLOWING:

THE REAL PROPERTY DESCRIBED BELOW IS DEDICATED AS AN EASEMENT FOR PUBLIC PURPOSES:

(A) PUBLIC EASEMENTS FOR INSTALLATION AND MAINTENANCE OF BUT NOT LIMITED TO WATER, GAS AND SEWER PIPES, AND FOR POLES AND OVERHEAD AND UNDERGROUND WIRES AND CONDUITS FOR ELECTRIC, TELEVISION AND TELEPHONE SERVICES AND TRAFFIC CONTROL APPURTENANCES TOGETHER WITH ANY AND ALL APPURTENANCES PERTAINING THERETO ON, OVER, UNDER AND ACROSS SWALLOWTAIL DRIVE, ORANGE TIP WAY, GOSSAMER STREET, SKIPPERLING STREET, LOT 'A' AND THOSE STRIPS OF LAND LYING CONTIGUOUS TO THE DRIVE, WAY AND STREETS SHOWN HEREON AND DESIGNATED "P.U.E." (PUBLIC UTILITY EASEMENT).

(B) PUBLIC EASEMENTS FOR THE INSTALLATION AND MAINTENANCE OF DRAINAGE PIPES TOGETHER WITH ANY AND ALL APPURTENANCES PERTAINING THERETO ON, OVER, UNDER AND ACROSS THOSE STRIPS OF LAND SHOWN HEREON AND DESIGNATED "STORM DRAIN EASEMENT". (S.D.E.)

THE REAL PROPERTY DESCRIBED BELOW IS DEDICATED IN FEE FOR PUBLIC PURPOSES:

(A) AS PUBLIC RIGHT-OF-WAY (INCLUDING ALL IMPROVEMENTS THEREON) THE STREETS SHOWN HEREON AS GOSSAMER STREET, SKIPPERLING STREET, SWALLOWTAIL DRIVE AND ORANGE TIP WAY.

(B) LOT 'A' SHOWN HEREON AS PUBLIC RIGHT-OF-WAY FOR LANDSCAPE PURPOSES.

JOHN MOURIER CONSTRUCTION, INC., A CALIFORNIA CORPORATION

BY: _____
PRINT NAME:
TITLE:

BY: _____
PRINT NAME:
TITLE:

NOTARY ACKNOWLEDGEMENT:

A NOTARY PUBLIC OR OTHER OFFICER COMPLETING THIS CERTIFICATE VERIFIES ONLY THE IDENTITY OF THE INDIVIDUAL WHO SIGNED THE DOCUMENT TO WHICH THIS CERTIFICATE IS ATTACHED, AND NOT THE TRUTHFULNESS, ACCURACY, OR VALIDITY OF THAT DOCUMENT.

STATE OF CALIFORNIA

COUNTY OF PLACER

ON _____, 2021, BEFORE ME, _____ A NOTARY PUBLIC
(PRINT NAME AND TITLE OF OFFICER)

PERSONALLY APPEARED _____
WHO PROVED TO ME ON THE BASIS OF SATISFACTORY EVIDENCE TO BE THE PERSON(S) WHOSE NAME(S) IS/ARE SUBSCRIBED TO THE WITHIN INSTRUMENT AND ACKNOWLEDGED TO ME THAT HE/SHE/THEY EXECUTED THE SAME IN HIS/HER/THEIR AUTHORIZED CAPACITY(IES), AND THAT BY HIS/HER/THEIR SIGNATURE(S) ON THE INSTRUMENT THE PERSON(S), OR THE ENTITY UPON BEHALF OF WHICH THE PERSON(S) ACTED, EXECUTED THE INSTRUMENT.

I CERTIFY UNDER PENALTY OF PERJURY UNDER THE LAWS OF THE STATE OF CALIFORNIA THAT THE FOREGOING PARAGRAPH IS TRUE AND CORRECT.

WITNESS MY HAND AND OFFICIAL SEAL.

MY COMMISSION EXPIRES _____.
MY PRINCIPAL PLACE OF BUSINESS IS IN _____ COUNTY.

_____
NOTARY PUBLIC

_____
PRINT NAME

SURVEYOR'S STATEMENT:

THIS MAP OF "SIERRA VISTA VILLAGE JM-40" WAS PREPARED BY ME OR UNDER MY DIRECTION AND IS BASED UPON A FIELD SURVEY IN CONFORMANCE WITH THE REQUIREMENTS OF THE SUBDIVISION MAP ACT AND LOCAL ORDINANCE AT THE REQUEST OF JOHN MOURIER CONSTRUCTION, INC. IN JUNE, 2020. I HEREBY STATE THAT ALL THE MONUMENTS ARE OF THE CHARACTER AND OCCUPY THE POSITIONS INDICATED OR THAT THEY WILL BE SET IN THOSE POSITIONS ON OR BEFORE DECEMBER 31, 2021, THAT THE MONUMENTS WILL BE SUFFICIENT TO ENABLE THE SURVEY TO BE RETRACED AND THAT THIS FINAL MAP SUBSTANTIALLY CONFORMS TO THE CONDITIONALLY APPROVED TENTATIVE MAP.

DATE _____

_____
JOHN KARL JEFFRIES L.S. 7820
EXPIRES 12/31/2021

LICENSED LAND SURVEYOR
JOHN KARL JEFFRIES
No. 7820
EXPIRES
12/31/2021
STATE OF CALIFORNIA

CITY ENGINEER'S STATEMENT:

I HEREBY STATE THAT I HAVE EXAMINED THIS PLAT OF "SIERRA VISTA VILLAGE JM-40" AND FIND IT TO BE SUBSTANTIALLY THE SAME AS THE TENTATIVE MAP ON FILE AND ANY APPROVED ALTERATIONS THEREOF, THAT ALL PROVISIONS OF THE SUBDIVISION MAP ACT AND ALL APPLICABLE CITY ORDINANCES HAVE BEEN COMPLIED WITH.

DATED_____

_____
MARC STOUT R.C.E. 69879
CITY ENGINEER, CITY OF ROSEVILLE
EXPIRATION DATE 09/30/2022

I HEREBY STATE THAT I AM SATISFIED THAT THIS PLAT OF "SIERRA VISTA VILLAGE JM-40" IS TECHNICALLY CORRECT.

FOR MARC STOUT, CITY ENGINEER, CITY OF ROSEVILLE

DATED_____

_____
TIMOTHY G. BLAIR
P.L.S. 8278 EXPIRATION DATE 12/31/2021

PROFESSIONAL LAND SURVEYOR
TIMOTHY G. BLAIR
No. 8278
EXP. 12/31/21
STATE OF CALIFORNIA

CITY CLERK'S STATEMENT:

I HEREBY STATE THAT THE CITY COUNCIL OF THE CITY OF ROSEVILLE HAS APPROVED THIS PLAT OF "SIERRA VISTA VILLAGE JM-40" AND HAS ACCEPTED ON BEHALF OF THE PUBLIC THE STORM DRAIN EASEMENT AND PUBLIC UTILITY EASEMENTS OFFERED HEREON FOR DEDICATION AND HAS ACCEPTED SUBJECT TO IMPROVEMENT LOT 'A' AND THE RIGHTS OF WAY HEREON OFFERED FOR DEDICATION.

DATED_____

_____
CITY CLERK, CITY OF ROSEVILLE

BY:_____
ASSISTANT CITY CLERK

RECORDER'S STATEMENT:

ACCEPTED FOR RECORD AND FILED IN THE OFFICE OF THE RECORDER OF PLACER COUNTY, STATE OF CALIFORNIA, AT THE REQUEST OF OLD REPUBLIC TITLE COMPANY, AT _____ MINUTES AFTER _____ O'CLOCK__M. ON THE ____ DAY OF _____, 2021 AND RECORDED IN BOOK ____ OF MAPS, AT PAGE ____.

DOCUMENT NO. _____

_____
COUNTY RECORDER OF PLACER COUNTY

FEE _____

BY:_____
DEPUTY

JOB NO. 20-06-023

SHEET 1 OF 3

BOOK _____ OF MAPS, PAGE _____

PLAT OF

SIERRA VISTA VILLAGE JM-40

SUBDIVISION NO.: PL20-0103

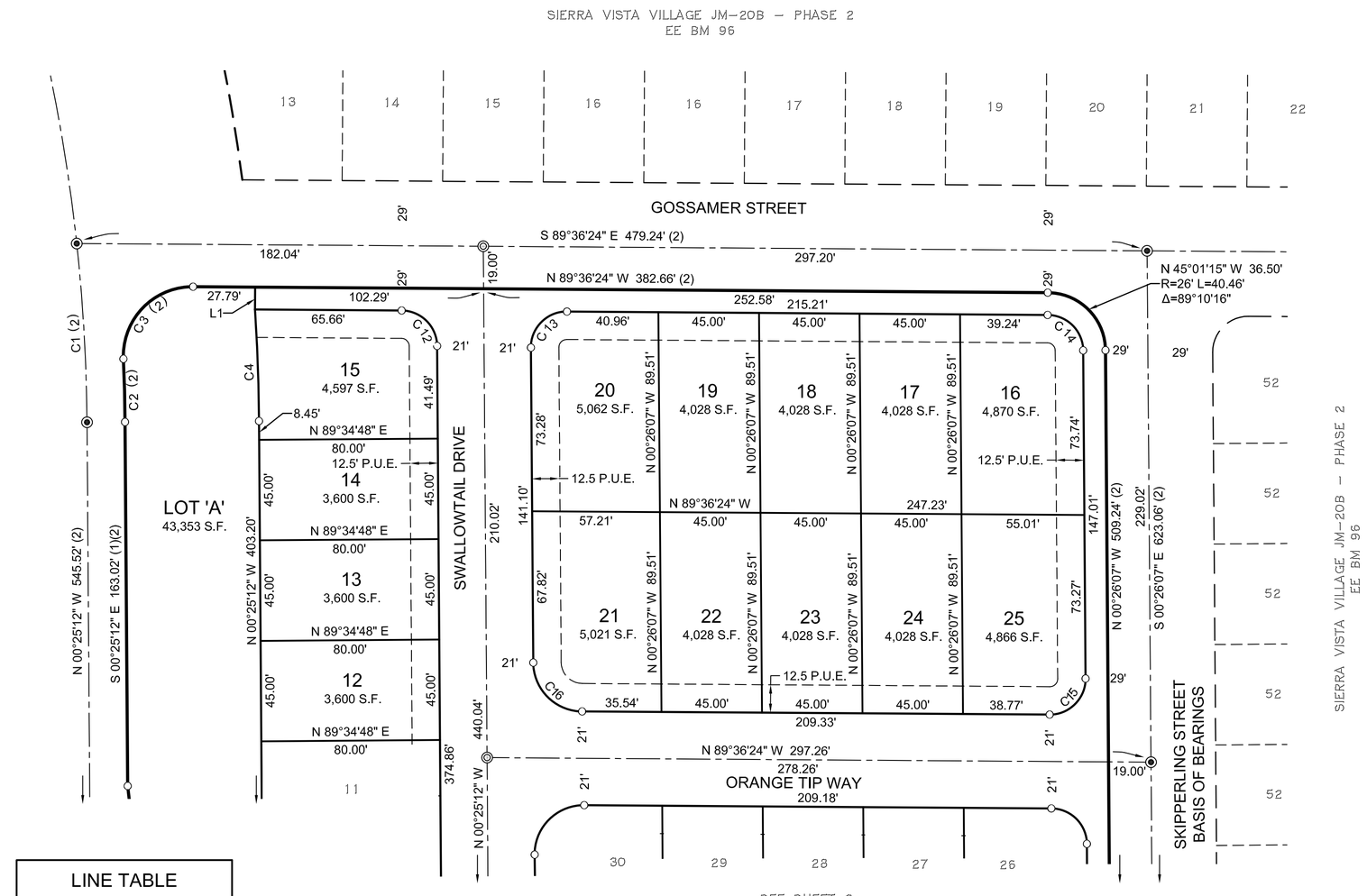
ALL OF LOT 76 AS SHOWN ON THE THAT FINAL MAP OF
"SIERRA VISTA VILLAGE JM-20B - PHASE 2" - 'EE' BM 96
LOCATED IN SECTION 36, T. 11 N., R. 5 E., M.D.M.
CITY OF ROSEVILLE, COUNTY OF PLACER, STATE OF CALIFORNIA

JUNE 2021 SCALE: 1" = 40'

BAKER WILLIAMS ENGINEERING GROUP

SHEET 2 OF 3

CURVE TABLE					
CURVE #	LENGTH	RADIUS	DELTA	CHORD DIRECTION	CHORD LENGTH
C1	80.24'	800.00'	5°44'49"	N 3°17'37" W	80.21'
C2	28.30'	817.00'	1°59'05"	S 1°24'45" E	28.30'
C3	50.21'	31.00'	92°47'54"	S 43°59'39" W	44.90'
C4	50.00'	877.00'	3°16'00"	N 2°03'12" W	49.99'
C12	24.91'	16.00'	89°11'11"	N 45°00'48" W	22.47'
C13	25.36'	16.00'	90°48'49"	S 44°59'12" W	22.79'
C14	24.90'	16.00'	89°10'16"	N 45°01'15" W	22.46'
C15	25.36'	16.00'	90°49'44"	N 44°58'45" E	22.79'
C16	34.25'	22.00'	89°11'11"	S 45°00'48" E	30.89'



LINE TABLE		
LINE #	LENGTH	DIRECTION
L1	10.00'	N 0° 23' 36" E

NOTES:

1. ALL BEARINGS ALONG CURVED LINES ARE CHORD MEASUREMENTS.
2. THIS SUBDIVISION CONTAINS 5.570 ACRES MORE OR LESS, CONTAINING 35 RESIDENTIAL LOTS NUMBERED 1-35 AND 1 LANDSCAPE LOT LETTERED LOT 'A'.
3. ALL DISTANCES SHOWN HEREON ARE EXPRESSED IN FEET AND DECIMALS THEREOF.
4. A PRELIMINARY SOILS REPORT WAS PREPARED BY YOUNGDAHL CONSULTING GROUP, PROJECT NO. E133171.000 DATED SEPTEMBER 10, 2013. A COPY OF THIS REPORT IS AVAILABLE FOR PUBLIC INSPECTION AT THE CITY OF ROSEVILLE ENGINEERING DEPARTMENT (FILE NUMBER 308-810).
5. ALL REAR PROPERTY CORNERS AND ANGLE POINTS SHALL BE MONUMENTED WITH A 5/8" REBAR WITH METAL CAP STAMPED "LS7820". IN THE EVENT OF A CONFLICT WITH A RETAINING WALL OR FENCE, A 3.0' WITNESS CORNER SHALL BE SET ONLINE.
6. ALL FRONT PROPERTY CORNERS SHALL BE MONUMENTED WITH A 1" BRASS DISK STAMPED "LS7820", 1.0' FROM PROPERTY CORNER INTO THE SIDEWALK ON A PROJECTION OF PROPERTY LINE AT FRONT AND/OR SIDE LOT LINES PRODUCED.

LEGEND:

P.U.E.	PUBLIC UTILITY EASEMENT
(R)	RADIAL LINE
S.D.E.	STORM DRAIN EASEMENT
○	DIMENSION POINT, NOTHING FOUND OR SET
◎	SET BRASS MONUMENT IN STANDARD CITY OF ROSEVILLE MONUMENT WELL STAMPED L.S. 7820
⌀	FND 3/4" IRON PIPE TAGGED "L.S. 7820" PER EE BM 96
◉	FND BRASS MONUMENT IN STANDARD CITY OF ROSEVILLE MONUMENT WELL STAMPED "L.S. 7820" PER EE BM 96
(1)	RECORD PER DD BM 26
(2)	RECORD PER EE BM 96

BASIS OF BEARINGS:

THE BASIS OF BEARINGS FOR THIS SURVEY IS IDENTICAL TO THE CENTERLINE OF SKIPPERLING STREET, BEING S 00°26'07" W AND ESTABLISHED BY MONUMENTS FOUND AS SHOWN HEREON PER EE BM 96.

JOB NO. 20-06-023

BOOK _____ OF MAPS, PAGE _____

SEE SHEET 2 FOR BASIS OF BEARINGS, NOTES AND LEGEND.

PLAT OF

SIERRA VISTA VILLAGE JM-40

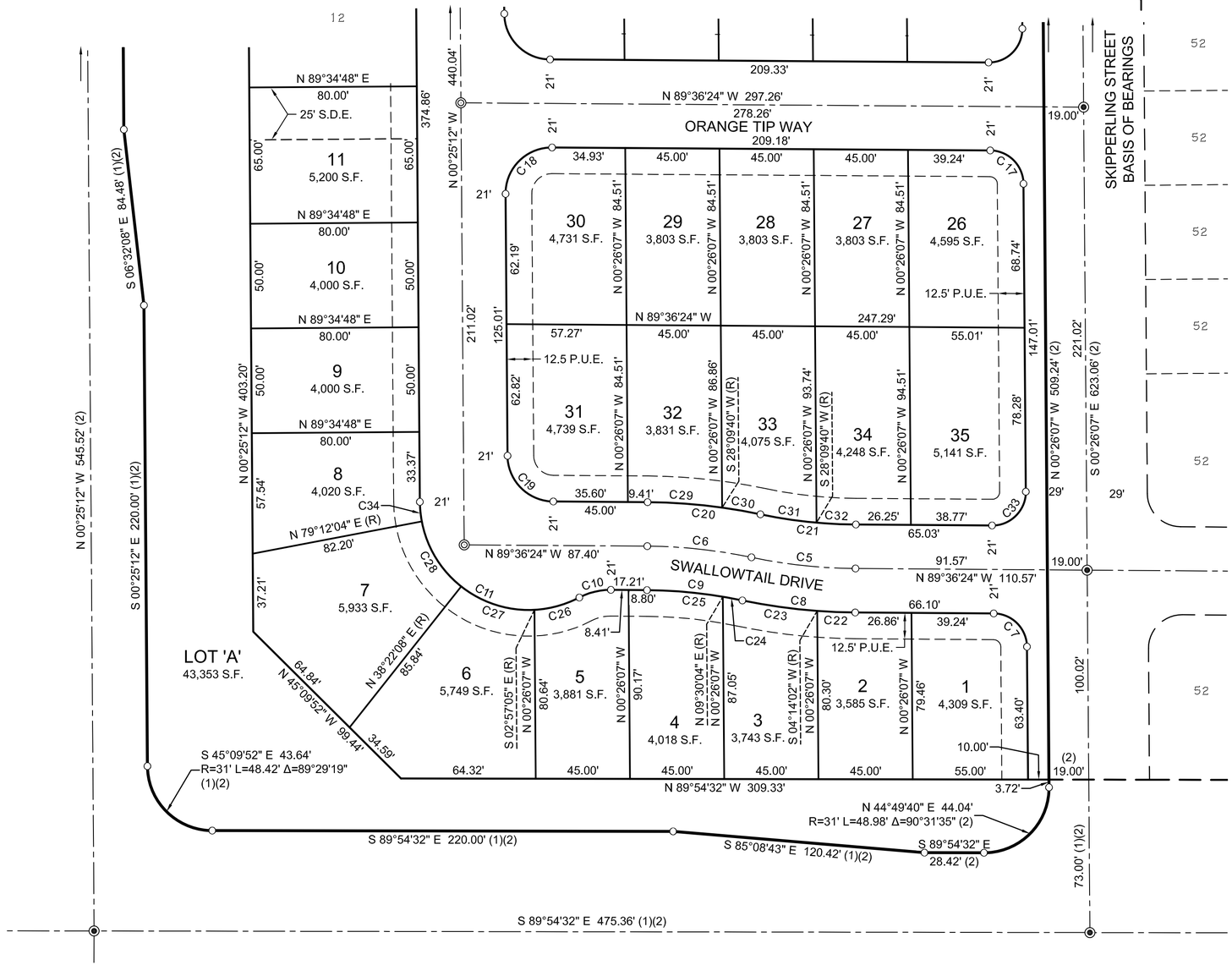
SUBDIVISION NO.: PL20-0103

ALL OF LOT 76 AS SHOWN ON THE THAT FINAL MAP OF
"SIERRA VISTA VILLAGE JM-20B - PHASE 2" - 'EE' BM 96
LOCATED IN SECTION 36, T. 11 N., R. 5 E., M.D.M.
CITY OF ROSEVILLE, COUNTY OF PLACER, STATE OF CALIFORNIA

JUNE 2021 SCALE: 1" = 40'

BAKER WILLIAMS ENGINEERING GROUP

SHEET 3 OF 3



CURVE TABLE

CURVE #	LENGTH	RADIUS	DELTA	CHORD DIRECTION	CHORD LENGTH
C5	50.08'	250.00'	11°28'42"	S 83°52'03" E	50.00'
C6	50.08'	250.00'	11°28'42"	N 83°52'03" W	50.00'
C7	24.90'	16.00'	89°10'16"	N 45°01'15" W	22.46'
C8	54.29'	271.00'	11°28'42"	S 83°52'03" E	54.20'
C9	45.88'	229.00'	11°28'42"	N 83°52'03" W	45.80'
C10	15.66'	32.00'	28°02'14"	S 76°22'30" W	15.50'
C11	106.39'	52.00'	117°13'25"	S 59°01'55" E	88.78'
C17	24.90'	16.00'	89°10'16"	N 45°01'15" W	22.46'
C18	34.87'	22.00'	90°48'49"	S 44°59'12" W	31.33'
C19	34.25'	22.00'	89°11'11"	S 45°00'48" E	30.89'
C20	54.29'	271.00'	11°28'42"	N 83°52'03" W	54.20'
C21	45.88'	229.00'	11°28'42"	S 83°52'03" E	45.80'
C22	18.16'	271.00'	3°50'26"	S 87°41'11" E	18.16'
C23	36.13'	271.00'	7°38'16"	S 81°56'50" E	36.10'
C24	9.47'	229.00'	2°22'14"	N 79°18'49" W	9.47'
C25	36.40'	229.00'	9°06'28"	N 85°03'10" W	36.36'
C26	22.41'	52.00'	24°41'32"	N 74°42'09" E	22.24'
C27	37.50'	52.00'	41°19'13"	S 72°17'29" E	36.69'
C28	37.06'	52.00'	40°49'57"	S 31°12'54" E	36.28'
C29	35.74'	271.00'	7°33'20"	N 85°49'43" W	35.71'
C30	18.55'	271.00'	3°55'22"	N 80°05'22" W	18.55'
C31	27.09'	229.00'	6°46'45"	S 81°31'04" E	27.08'
C32	18.78'	229.00'	4°41'57"	S 87°15'25" E	18.78'
C33	25.36'	16.00'	90°49'44"	N 44°58'45" E	22.79'
C34	9.42'	52.00'	10°22'43"	S 5°36'34" E	9.41'

JOB NO. 20-06-023

COUNCIL COMMUNICATION

CC #: 1552
File #: 0400-04-17-1

Title:	Community Facilities District No. 3 (Municipal Services) - Annexation No. 25 (Villages at Sierra Vista - Phase B) - Resolution of Intention to Annex Territory
Contact:	Jeannine Thrash 916-774-5473 jthrash@roseville.ca.us Dennis Kauffman 916-774-5313 dkauffman@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 7.23.

RECOMMENDATION TO COUNCIL

Staff recommends that Council adopt a Resolution of Intention to Annex Territory to Community Facilities District and to Authorize the Levy of Special Taxes Therein, City of Roseville Community Facilities District No. 3 (Municipal Services), Annexation No. 25. Staff also recommend that Council set Wednesday, July 21, 2021 at 6:00 pm in the Roseville City Council Chambers at 311 Vernon Street, Roseville, California as the time and place to conduct a public hearing on the formation and annexation.

BACKGROUND

The landowner is obligated per the Developer Agreement by and between the City of Roseville and the developers relative to the Sierra Vista Specific Plan, to annex into the Municipal Services Community Facilities District ("CFD") No. 3 prior to the issuance of the first residential building permit.

The property is being annexed into CFD No. 3 in order to offset the property's impact on City General Fund resources available to pay for municipal services citywide, including the project area.

FISCAL IMPACT

The CFD will generate special taxes levied on the landowner's annual property tax bill. Annexation into Community Facilities District No. 3 (Municipal Services) helps offset the property's impact on City General Fund resources available to pay for municipal services and therefore will not negatively impact the General Fund.

ENVIRONMENTAL REVIEW

The California Environmental Quality Act (CEQA) does not apply to activities that will not result in a direct or reasonably foreseeable indirect physical change in the environment, or is otherwise not considered a project as defined by CEQA Statute §21065 and CEQA State Guidelines §15060(c)(3) and §15378. Adoption of the resolution meets the above criteria and is not subject to CEQA. No additional environmental review is required.

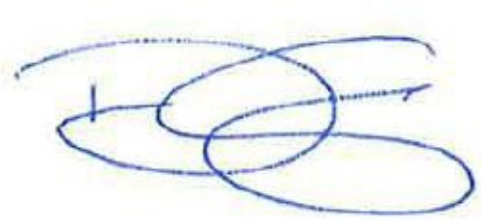
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Goal A - Remain fiscally responsible in a changing world

Respectfully Submitted,

Jeannine Thrash, Management Analyst

Dennis Kauffman, Assistant City Manager/Chief Financial Officer



_____

Dominick Casey, City Manager

ATTACHMENTS:

Description

Resolution 21-282

Proposed Boundary Map

CITY COUNCIL OF THE CITY OF ROSEVILLE

RESOLUTION NO. 21-282

A RESOLUTION OF INTENTION TO ANNEX TERRITORY TO COMMUNITY FACILITIES DISTRICT AND TO AUTHORIZE THE LEVY OF SPECIAL TAXES THEREIN

CITY OF ROSEVILLE
Community Facilities District No. 3
(Municipal Services)

Annexation No. 25 (Villages at Sierra Vista-Phase B)

WHEREAS, the City Council (the "Council") of the City of Roseville (the "City") has conducted proceedings to establish Community Facilities District No. 3 (Municipal Services) (the "CFD") pursuant to the Mello-Roos Community Facilities Act of 1982, as amended (the "Act"), Chapter 2.5 of Part 1 of Division 2 of Title 5, commencing at Section 53311, of the California Government Code; and

WHEREAS, under the Act, this Council, as the legislative body for the CFD, is empowered with the authority to annex territory to the CFD, and now desires to undertake proceedings to annex territory to the CFD.

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF ROSEVILLE RESOLVES AS FOLLOWS:

1. Findings. This Council hereby finds and determines that public convenience and necessity require that territory be added to the CFD.

2. Territory Described. The name of the existing CFD is "City of Roseville Community Facilities District No. 3 (Municipal Services)." The territory originally included in the existing CFD is set forth in the map of the CFD heretofore recorded in the Placer County Recorder's Office on August 18, 2004, in Book 3 at Page 41 of Maps of Assessment and Community Facilities Districts, to which map reference is hereby made, as such map has been supplemented in connection with subsequent annexations.

The territory now proposed to be annexed to the CFD is as shown on the Annexation Map for the captioned Annexation No. 25 (Villages at Sierra Vista-Phase B) to the CFD, on file with the Clerk, the boundaries of which territory are hereby preliminarily approved and to which map reference is hereby made for further particulars. The City Clerk is hereby directed to cause to be recorded such Annexation Map, showing the territory to be annexed, in the office of the County Recorder of the County of Placer within 15 days of the date of adoption of this resolution.

3. The Services. The types of public services financed by the CFD and pursuant to the Act consist of those services (the "Services") as described in Exhibit B to the Resolution of Formation with respect to the CFD adopted by the Council as Resolution No. 04-426 on September 15, 2004 (the "Resolution of Formation") and included as Exhibit B hereto. It is

presently intended that the Services will be provided, without preference or priority, to the existing territory in the CFD and the territory proposed to be annexed to the CFD.

4. Special Tax. Except to the extent that funds are otherwise available to the CFD to pay for the Services, a special tax sufficient to pay the costs thereof is intended to be levied annually within the CFD, and collected in the same manner as ordinary *ad valorem* property taxes.

The special tax proposed to pay for Services to be supplied within the territory proposed to be annexed will be equal to the special taxes levied to pay for the same Services in the CFD, except that a higher or lower tax may be levied within the territory proposed to be annexed or to be annexed in the future to the extent that the actual cost of providing the Services in that territory is higher or lower than the cost of providing those Services in the CFD.

The proposed rate and method of apportionment of the special tax among the parcels of real property within the CFD, as now in existence and following the annexation proposed herein, in sufficient detail to allow each landowner within the territory proposed to be annexed to the CFD to estimate the maximum amount such owner will have to pay, are described in the Resolution of Formation and included as Exhibit A hereto.

5. Hearing. Wednesday, July 21, 2021 at 6:00 p.m. or as soon as possible thereafter, at the City of Roseville Civic Center Council Chambers located at 311 Vernon Street, Roseville, California 95678, be, and the same are hereby appointed and fixed as the time and place when and where this Council, as legislative body for the CFD, will conduct a public hearing on the matters described in this Resolution.

6. Notice. The City Clerk is hereby directed to cause notice of said public hearing to be given by publication one time in a newspaper of general circulation in the area of the CFD, including the area to be annexed to the CFD. The publication of said notice shall be completed at least 7 days before the date herein set for said hearing. The City Clerk may also cause a copy of such notice and a copy of this Resolution to be mailed to each landowner within the territory proposed to be annexed, which notice and resolution shall be mailed at least 15 days before the date of said hearing. Such notice shall be substantially in the form specified in Section 53339.4 of the Act, with a summary form specifically authorized.

7. Effective Date. This Resolution shall take effect upon its adoption.

* * * * * *

I hereby certify that the foregoing Resolution was duly adopted by the City Council of the City of Roseville, California, at a regularly scheduled meeting thereof, held on the___day of_____20__, by the following vote of the City Council:

AYES: COUNCILMEMBERS
NOES: COUNCILMEMBERS
ABSENT: COUNCILMEMBERS
ABSTAIN: COUNCILMEMBERS

_____
Mayor

ATTEST:

_____

City Clerk

EXHIBIT A

CITY OF ROSEVILLE
COMMUNITY FACILITIES DISTRICT NO. 3
(MUNICIPAL SERVICES)

RATE AND METHOD OF APPORTIONMENT OF SPECIAL TAX

A Special Tax applicable to each Assessor's Parcel in Community Facilities District No. 3 (Municipal Services) [herein "CFD No. 3"] shall be levied and collected according to the tax liability determined by the City Council, acting in its capacity as the legislative body of CFD No. 3, through the application of the appropriate Special Tax rate, as described below. All of the property in CFD No. 3, unless exempted by law or by the provisions of Section E below, shall be taxed for the purposes, to the extent, and in the manner herein provided.

A. DEFINITIONS

The terms hereinafter set forth have the following meanings:

"Acreage" or **"Acre"** means the land area making up an Assessor's Parcel as shown on an Assessor's Parcel Map, or if the land area is not shown on an Assessor's Parcel Map, the land area shown on the applicable final subdivision map or other parcel map recorded at the County Recorder's Office.

"Administrative Expenses" means the costs incurred by the City to determine, levy and collect the Special Tax, including salaries of City employees and fees of consultants and the costs of collecting installments of the Special Taxes upon the general tax rolls; preparation of required reports, and any other costs required to administer the CFD as determined by the Finance Director.

"Administrator" means the person or firm designated by the City to administer the Special Taxes according to this Rate and Method of Apportionment of Special Tax.

"Affordable Housing Director" means, at any point in time, the person within the City who services as head of the department that is in charge of the City's affordable housing program.

"Affordable Unit" means a Unit built on a Parcel for which an Affordable Purchase Development Agreement or similar agreement has been recorded on title of the property designating the Unit as affordable (as determined by the City) and resulting in a deed of trust on the Parcel in favor of the City. The City's Affordable Housing Director shall determine which Units are designated as Affordable Units and maintain an Affordable

Unit Listing which shall contain all designated buildable parcels by tract and lot number. The Affordable Unit Listing shall also be updated to reflect those Units no longer qualifying as Affordable Units, also known as Market Rate Units. The Affordable Unit Listing, which shall contain all qualifying Affordable Units as of April 30, shall be made available to the Administrator by July 1 of each year for purposes of determining the Maximum Special Tax for Parcels pursuant to Section C.

"Affordable Unit Assignment" means a reduction in the Maximum Special Tax for a Parcel due to the assignment of an Affordable Unit(s) to the Parcel.

"Annual Tax Escalation Factor" means an annual increase in the Maximum Special Tax following the Base Year in an amount equal to the lesser of: (i) the combined percentage increase, if any, in the City of Roseville General Fund Operating Budget for police and fire services, or (ii) four percent (4%).

"Assessor's Parcel" or **"Parcel"** means a lot or parcel shown in an Assessor's Parcel Map with an assigned Assessor's Parcel number.

"Assessor's Parcel Map" means an official map of the County Assessor designating parcels by Assessor's Parcel number.

"Authorized Services" means the public services authorized to be funded by CFD No. 3 as set forth in the documents adopted by the City Council when the CFD was formed.

"Base Year" means Fiscal Year 2009-10.

"City" means the City of Roseville.

"City Council" means the City Council of the City of Roseville, acting as the legislative body of CFD No. 3.

"County" means the County of Placer.

"Developed Property" means, in any Fiscal Year, both of the following:

- For Condominium Conversion Parcels, all individual Units for which an escrow has closed prior to June 30 of the preceding Fiscal Year; and
- All other Parcels of Taxable Property within the CFD for which a use permit or building permit for new construction of a residential or non-residential structure was issued prior to June 30 of the preceding Fiscal Year.

"**Finance Director**" means the Finance Director for the City of Roseville or his or her designee or successor.

"**Fiscal Year**" means the period starting on July 1 and ending on the following June 30.

"Land Use Designation" means the land use designated to be built on a particular Parcel based on reference to an adopted community plan or specific plan or, to the extent that such a plan has not been approved for a Parcel, to the City's general plan.

"Market Rate Unit" means a Unit that is not an Affordable Unit.

"Multi-Family Property" means, in any Fiscal Year, all Parcels in CFD No. 3 for which a building permit was issued or may be issued for construction of a residential structure with multiple units that share common walls, all of which are offered for rent to the general public.

"Maximum Special Tax" means the maximum Special Tax determined in accordance with Section C below that can be levied on Taxable Property in any Fiscal Year.

"Public Property" means any property within the boundaries of CFD No. 3 that is owned by the federal government, State of California, County, City, or other public agency.

"Single Family Attached Property" means, in any Fiscal Year, all Parcels in CFD No. 3 for which a building permit was issued for construction of a residential structure consisting of two or more Units that share common walls and are offered as for-sale Units, including such residential structures that meet the statutory definition of a condominium contained in Civil Code Section 1351.

"Single Family Detached Property" means, in any Fiscal Year, all Parcels in CFD No. 3 for which a building permit was issued for construction of a Unit that does not share a common wall with another Unit.

"Special Tax" means any tax levied to pay for Authorized Services.

"Taxable Property" means all Assessor's Parcels within the boundaries of CFD No. 3 which are not exempt from the Special Tax pursuant to law or Section E below.

"Unit" means an individual single-family detached unit or an individual residential unit within a duplex, triplex, fourplex, townhome, condominium, or apartment structure.

"Zoning Designation" means, for a particular Parcel, the designation of zoning for the Parcel based on the zoning map symbols set forth in the City's zoning ordinance or, if the designation is inconsistent with the City's zoning ordinance, as determined by the Administrator.

B. CATEGORIZING PARCELS FOR ANNUAL TAX LEVY

Each Fiscal Year, the Administrator shall identify the current Assessor's Parcel numbers for all Parcels of Developed Property within CFD No. 3. The Administrator shall then identify the Land Use Designation for each Parcel of Developed Property to determine the appropriate Maximum Special Tax pursuant to Section C below. If a Land Use Designation has not been assigned to a Parcel of Developed Property, the Administrator shall determine the Zoning Designation for the Parcel and reference Table 1 below to determine the Maximum Special Tax associated with that Zoning Designation. If the Zoning Designation for the Parcel applies to more than one Land Use Designation as reflected in Table 1, the Administrator shall determine the appropriate Maximum Special Tax rate for the Parcel by identifying the Maximum Special Tax shown in Table 1 for the land use category that is most similar to the land use that will be built on the Parcel.

For Single Family Attached Property or multi-family property, the number of Units shall be determined by referencing the condominium plan, apartment plan, site plan or other development plan for the property. For Condominium Parcels, the Administrator shall also determine the date of which escrow closed for any Units that were sold to individual buyers in the prior Fiscal Year.

For Parcels with a Land Use Designation of Residential, Mixed Use; Village Center – Medium Density Residential; Village Center – High Density Residential; or Commercial, Mixed Use, the Administrator shall determine whether (i) residential units that have been or will be built on the Parcel will be offered for sale to individual home buyers and (ii) a separate Assessor's Parcel number will be assigned to the airspace parcel associated with each residential unit. Once separate Parcel numbers have been assigned to the residential airspace Parcels, the Administrator shall assign a Maximum Special Tax to the airspace Parcel for each residential unit. In addition, the Administrator shall tax the commercial land uses on the Parcel using the Maximum Special Tax for the appropriate commercial Land Use Designation in Table 1 below. The acreage to be used to calculate the Maximum Special Tax on the commercial uses shall be the full land area of the underlying Assessor's Parcel on which the residential and commercial land uses are located.

Upon recordation of each Final Map creating Single Family Detached Property and/or Single Family Attached Property, the ECS Director is to determine the number of Affordable Units included within the Final Map. When building permits are issued for the Affordable Units designated on each Parcel, the Administrator shall reduce the Maximum Special Tax for each Affordable Unit to fifty percent (50%) of the Maximum Special Tax that applies to the Market Rate Units with the same Zoning Designation. After May 1 of each Fiscal Year, the Administrator shall obtain the Affordable Unit Listing from the Affordable Housing Director to confirm which Parcels qualify for an Affordable Unit Adjustment in the following Fiscal Year.

C. MAXIMUM SPECIAL TAX

All Taxable Property within the CFD shall be subject to a Maximum Special Tax that will be levied each Fiscal Year to pay for Authorized Services. As discussed above, the Administrator shall rely first on the Land Use Designation for a Parcel to determine the appropriate Maximum Special Tax in Table 1 below but, in the absence of an assigned Land Use Designation, the Administrator shall refer to the Zoning Designation and land use to be built on the Parcel. The following Maximum Special Tax rates apply to all Parcels of Developed Property within CFD No. 3:

Table 1
Maximum Special Taxes

Land Use Designation	Zoning Designation	Maximum Special Tax (Fiscal Year 2009-10) *
Low Density Residential (LDR)	R1	$342.00 per Unit
Medium Density Residential (MDR)	RS R2	$200.00 per Unit
High Density Residential (HDR)	R3	$100.00 per Unit
Community Commercial	CC	$932.00 per Acre
General Commercial	GC	$932.00 per Acre
Highway Commercial	HC	$932.00 per Acre
Regional Commercial	RC	$932.00 per Acre
Central Business District	CBD	$932.00 per Acre
Business Professional	BP, MP	$801.00 per Acre

* Beginning July 1, 2010 and each July 1 thereafter, the Maximum Special Taxes shown above shall be adjusted by applying the Annual Tax Escalation Factor. The Maximum Special Tax for Affordable Units within a particular Zoning Designation shall be fifty percent (50%) of the amount shown above for that Zoning Designation, as adjusted by the Annual Tax Escalation Factor.

D. METHOD OF LEVY AND COLLECTION OF SPECIAL TAX

Each Fiscal Year, the Administrator shall levy the Maximum Special Tax on each Parcel of Developed Property in CFD No. 3. The Special Tax for CFD No. 3 shall be collected in the same manner and at the same time as ordinary ad valorem property taxes provided, however, that CFD No. 3 may (under the authority of Government Code Section 53340) in any particular case bill the taxes directly to the property owner off the County tax roll, and the Special Tax will be equally subject to foreclosure if delinquent.

E. LIMITATIONS

Notwithstanding any other provision of this Rate and Method of Apportionment of Special Tax, no Special Tax shall be levied on Public Property.

F. INTERPRETATION OF SPECIAL TAX FORMULA

The City reserves the right to make minor administrative and technical changes to this document that does not materially affect the rate and method of apportioning the Special Taxes. In addition, the interpretation and application of any section of this document shall be left to the City's discretion. Interpretations may be made by the City by ordinance or resolution for purposes of clarifying any vagueness or ambiguity in this Rate and Method of Apportionment of Special Tax.

EXHIBIT B

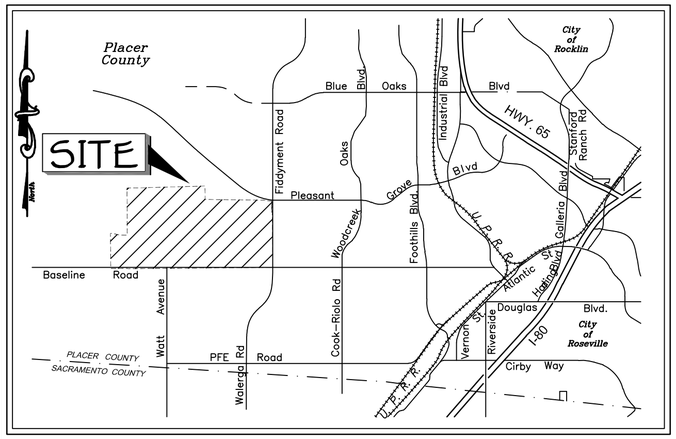
CITY OF ROSEVILLE
COMMUNITY FACILITIES DISTRICT NO. 3
(MUNICIPAL SERVICES)

LIST OF AUTHORIZED SERVICES

The Community Facilities District No. 3 (Municipal Services) (the "CFD") shall include the City services authorized under Section 53313 of the Community Facilities Act of 1982, Chapter 2.5 of Division 2 of Title 5 of the California Government Code, commencing with Section 53311 (the "Act"), which include the following services, to the extent that such services are in addition to those provided in the territory of the CFD before the CFD was created (or, as to territory which may be annexed to the CFD, before such territory was annexed to the CFD.) In accordance with Section 53313 of the Act, the additional services may not supplant services already available within the territory when the district was created.

(a) Police protection services, including, but not limited to, criminal justice services. However, criminal justice services are limited to providing services for jails, detention facilities, and juvenile halls.
(b) Fire protection and suppression services, and ambulance and paramedic services.
(c) Recreation program services, library services, maintenance services for elementary and secondary school sites and structures, and the operation and maintenance of museums and cultural facilities, subject to the limitations contained in Section 53313 of the Act.
(d) Maintenance of parks, parkways, and open space.
(e) Flood and storm protection services, including, but not limited to, the operation and maintenance of storm drainage systems, and sandstorm protection systems.
(f) Services with respect to removal or remedial action for the cleanup of any hazardous substance released or threatened to be released into the environment, subject to the limitations contained in Section 53313 of the Act.

BOOK _____ OF COMMUNITY FACILITIES DISTRICT, PAGE _____



VICINITY MAP

#	APN
1	498-020-016
2	498-020-020
3	498-020-021
4	498-020-022
5	498-020-023
6	498-020-024
7	498-020-025
8	498-020-026
9	498-020-032
10	498-020-033
11	498-020-036
12	498-020-037
13	498-180-001
	498-180-002
	498-180-003
	498-180-004
14	498-020-039
15	498-020-040
16	498-020-041
17	498-020-042
18	498-020-043
	498-010-026
19	499-010-005
	499-010-006
	499-010-025
20	499-010-007
21	499-010-008
22	499-010-009
23	499-010-024

Scale: 1"=800'

800' 0' 800' 1600' 2400'

GRAPHIC SCALE: 1"=800'

PROPOSED BOUNDARY MAP

ANNEXATION MAP NO. 25

COMMUNITY FACILITIES DISTRICT NO. 3

THE VILLAGES AT SIERRA VISTA - PHASE B

(MUNICIPAL SERVICES)

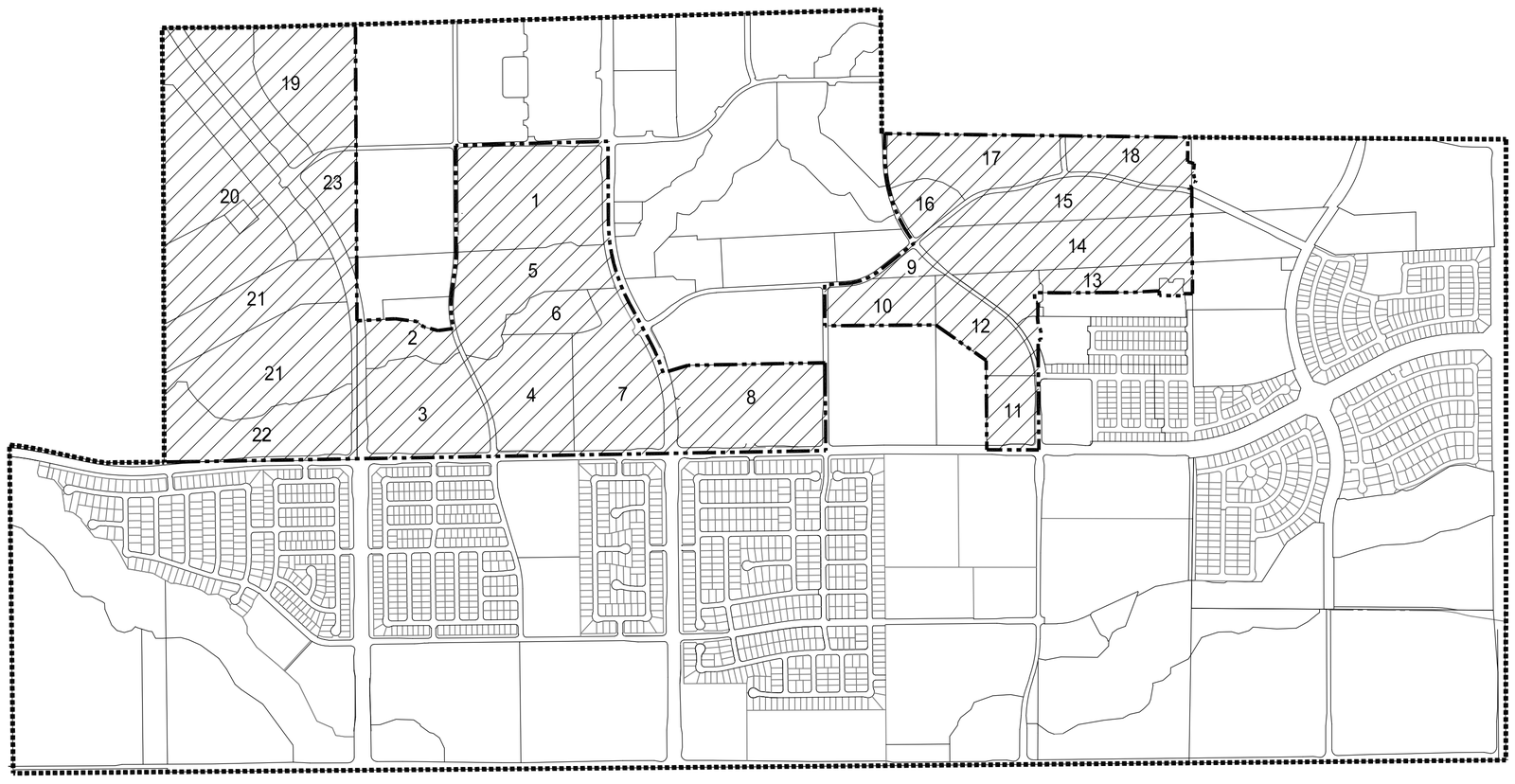
CITY OF ROSEVILLE, COUNTY OF PLACER, STATE OF CALIFORNIA

SCALE: 1" = 800' SHEET 1 OF 1

LEGEND:

PROPOSED ANNEXATION BOUNDARY

AREAS OF FUTURE ANNEXATION



REFERENCE IS HEREBY MADE TO THAT CERTAIN MAP ENTITLED "AMENDED BOUNDARIES OF COMMUNITY FACILITIES DISTRICT NO. 3 (MUNICIPAL SERVICES), CITY OF ROSEVILLE, COUNTY OF PLACER, STATE OF CALIFORNIA," FILED THE 18TH DAY OF AUGUST, 2004, AS DOCUMENT NO. 2004-362 IN BOOK 3 OF MAPS OF ASSESSMENT AND COMMUNITY FACILITIES DISTRICT AT PAGE 41, IN THE OFFICE OF THE COUNTY RECORDER OF THE COUNTY OF PLACER, STATE OF CALIFORNIA, WHICH THIS ANNEXATION MAP EXISTS.

I HEREBY CERTIFY THAT THE WITHIN MAP SHOWING PROPOSED BOUNDARIES OF ANNEXATION MAP NO. 25, TO COMMUNITY FACILITIES DISTRICT NO. 3 (MUNICIPAL SERVICES), CITY OF ROSEVILLE, COUNTY OF PLACER, STATE OF CALIFORNIA WAS APPROVED BY THE CITY COUNCIL OF THE CITY OF ROSEVILLE, AT A REGULAR MEETING THEREOF HELD ON THE _____ DAY OF _____, 2021, BY ITS RESOLUTION NUMBER _____.

_____
SONIA OROZCO, CITY CLERK
CITY OF ROSEVILLE
PLACER COUNTY, CALIFORNIA

FILED THIS _____ DAY OF _____, 2021, AT THE HOUR OF _____ O'CLOCK, __.M.,

IN BOOK _____ OF MAPS OF COMMUNITY FACILITIES DISTRICT, AT PAGE _____,

IN THE OFFICE OF THE RECORDER OF THE COUNTY OF PLACER, STATE OF CALIFORNIA.

DOC NO._____

RYAN RONCO
PLACER COUNTY RECORDER

FEE: _____

BY:_____
DEPUTY

FILED IN THE OFFICE OF THE CITY CLERK OF THE CITY OF ROSEVILLE, COUNTY OF PLACER, STATE OF CALIFORNIA THIS _____ DAY OF _____, 2021.

_____
SONIA OROZCO, CITY CLERK
CITY OF ROSEVILLE
PLACER COUNTY, CALIFORNIA

MAP PREPARED BY: MAY, 2021

BAKER-WILLIAMS ENGINEERING GROUP
Engineering / Surveying / Land Planning / Entitlement Processing / GPS Services
6020 Rutland Drive, Suite 19 ~ Carmichael CA 95608
(916) 331-4336 ~ fax (916) 331-4430 ~ office@bwengineers.com

S:\BWEG Jobs\2018 Jobs\18-03-010 Sierra Vista TM3\Final Map\18-03-010-ANNEX - CFD No. 3.dwg, CFD No. 2, 5/17/2021 7:19:46 AM, David Cobbs

COUNCIL COMMUNICATION

CC #: 1539
File #: 0200

Title: Audit Services - Agreement
Contact: Nick Rosas 916-774-5314 nrosas@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 7.24.

RECOMMENDATION TO COUNCIL

Staff recommends that the City Council adopt a resolution authorizing the City Manager to execute an Agreement for Audit Services with Lance, Soll & Lunghard, LLP.

BACKGROUND

As stated in Article VII, Section 7.19 of the Roseville City Charter, the City Council shall provide for an annual audit of the City by a firm of independent certified public accountants who are in no other way connected with the City government. The firm shall be retained subject to the restrictions and limitations prescribed by state law. A comprehensive audit shall be made covering each fiscal year to assure that the City's financial transactions, accounts and records are maintained in accordance with the requirements of the City charter, state and federal laws and generally accepted accounting principles.

In March 2021, the City issued a request for proposals to conduct a competitive procurement process to engage a CPA firm for this purpose. After staff from multiple City departments reviewed the nine submitted proposals and conducted interviews, staff recommends engaging Lance, Soll & Lunghard, LLP to be the City's new audit firm.

FISCAL IMPACT

The cost of the audit services is $157,160 per year, for a total of $314,320.00 over the two-year period, part of which will be paid for by the General Fund. The cost of the first year of the audit services has been included in the proposed FY2021-22 budget. The cost of the second year of the audit services will be included in the FY2022-23 budget, pending City Council approval.

ENVIRONMENTAL REVIEW

The California Environmental Quality Act (CEQA) only applies to projects which have the potential to cause a significant effect on the environment. Where it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment, the

activity is not subject to CEQA. (CEQA Guidelines §15061(b)(3)).

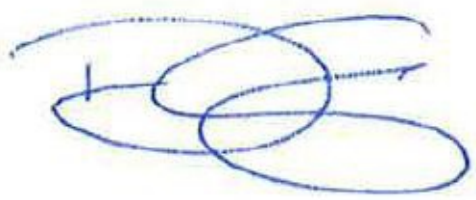
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Goal A - Remain fiscally responsible in a changing world

Respectfully Submitted,

Nick Rosas, Accounting Manager

Dennis Kauffman, Assistant City Manager/Chief Financial Officer



_____
Dominick Casey, City Manager

ATTACHMENTS:

Description

Resolution 21-271

Audit Services Contract

RESOLUTION NO. 21-271

APPROVING AN AGREEMENT FOR AUDIT SERVICES, BY AND BETWEEN THE CITY OF ROSEVILLE AND LANCE, SOLL & LUNGHARD, LLP, AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE

WHEREAS, an Agreement for Audit Services, by and between the City of Roseville and Lance, Soll & Lunghard, LLP, has been reviewed by the City Council; and

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Roseville that said agreement is hereby approved and that the City Manager is authorized to execute it on behalf of the City of Roseville.

PASSED AND ADOPTED by the Council of the City of Roseville this____day of _____, 20_, by the following vote on roll call:

AYES COUNCILMEMBERS:

NOES COUNCILMEMBERS:

ABSENT COUNCILMEMBERS:

_____
MAYOR

ATTEST:

_____
City Clerk

AGREEMENT FOR AUDIT SERVICES

THIS AGREEMENT, is made and entered into this ____ day of _____, 20__, by and between the City of Roseville, a municipal corporation ("CITY"), and Lance, Soll & Lunghard, LLP, a California limited liability partnership ("AUDITOR"); and

W I T N E S S E T H:

WHEREAS, CITY desires a public accounting firm to provide auditing services; and

WHEREAS, AUDITOR has prepared a proposal in response to RFP #10-020, dated April 7, 2021, which describes the scope of work to be performed by AUDITOR, the budget for the work, and the schedule for performance of the work; and

WHEREAS, AUDITOR is qualified and experienced to provide auditing services.

NOW, THEREFORE, the parties agree as follows:

1. Qualifications. AUDITOR certifies its status as a firm of certified public accountants, or as an individual certified public accountant, with the time and ability to perform the services required hereunder in an efficient, trustworthy and businesslike manner. AUDITOR certifies that it and its officers, employees and agents have no personal or financial interest that would conflict with or interfere with the provision of the services to be rendered. The services to be rendered shall be performed in accordance with generally accepted auditing standards in effect at the time of the rendition of such services.

2. Services. AUDITOR shall render the following services:

a. Conduct audits in accordance with auditing standards generally accepted in the United States of America (GAAS), the standards set forth for financial audits contained in Government Auditing Standards issued by the Comptroller General of the United States (GAGAS), and Uniform Administrative Requirements, Cost Principals, and Audit Requirements for Federal Awards issued by the Office of Management and Budget (Uniform Guidance).

b. Annual audit and management letter for the following fiscal years shall be prepared for the fees listed immediately below:

i. 2020 -21 - - $157,160

ii. 2021 -22 - - $157,160

c. The fees to be paid for the annual audit and management letter described in subparagraph b(i) through (ii) shall not exceed in any event the amounts listed above, except in the event of the approval of additional services.

d. AUDITOR shall, during the term of this Agreement, provide advice to CITY on appropriate accounting changes or updates. This service is included in the fees described in subparagraph b(i) through (ii).

3. Fee Adjustment. In the event that the hours worked are less than the quotient of the applicable fee as dividend, divided by the hourly rate, as divisor, then the fee shall be adjusted downward by multiplying the hours worked by the hourly rate and adding thereto the actual expenses incurred, but in no event shall the fee exceed the maximum fee shown above.

4. Additional Services. In the event circumstances disclosed by the audit indicate that more detailed procedures are required in addition to that which would have been sufficient under ordinary circumstances, AUDITOR agrees to provide CITY in writing with an explanation of the extraordinary circumstances, together with an estimate of the additional fee necessary for

such detailed procedures. If CITY approves the additional fee, the work shall proceed; however, CITY may conditionally approve such fee under protest, in which case a payment of the fee shall not be deemed to waive any legal right which CITY might have to contest the propriety of the amount. Any additional services to be rendered hereunder shall be rendered on the basis of the hourly rate incorporated herein.

5. Hourly Rates. The hourly rates for rendition of services by AUDITOR are as listed on EXHIBIT "B", attached hereto and incorporated herein by this reference, for each principal and employee of AUDITOR who may perform services directly under this Agreement.

6. Expenses. AUDITOR may claim the actual, reasonable and necessary out-of-pocket expenses incurred in the reproduction of the annual audit and management letter and for such other actual expenses which are reasonable and necessary for the completion of the audit and management letter, if the same are approved in advance by CITY.

7. Default. Since time is of the essence of this Agreement, and because AUDITOR and CITY understand a late or incomplete audit may frustrate this Agreement entirely, the parties agree that if AUDITOR fails to render services in time, through no fault of CITY, CITY may, at its option, cancel this Agreement and upon giving written notice to AUDITOR of such cancellation, CITY shall be completely free of further liability to AUDITOR for services rendered or for contractual rights after the date of notification, or CITY may elect to enforce this Agreement by requiring AUDITOR to comply with the exact terms hereof. AUDITOR shall only be entitled to payment for the services rendered in preparing the report if the same is delivered in full and complete form to CITY. If delivery is late, then the parties hereby agree that the damages to CITY would be difficult if not impossible to determine; therefore, the total

fee, as calculated by the hours multiplied by the hourly rate, shall be reduced by five (5%) percent for each week the report is late.

8. Indemnification. To the fullest extent allowed by law, AUDITOR shall defend, indemnify, and save and hold harmless CITY, its officers, agents, employees and volunteers from any claims, suits or actions of every name, kind and description brought forth, or on account of, injuries to or death of any person (including but not limited to workers and the public), or damage to property, resulting from or arising out of AUDITOR's willful misconduct or negligent act or omission while engaged in the performance of obligations or exercise of rights created by this Agreement, except those matters arising from CITY's sole negligence, active negligence or willful misconduct. The parties intend that this provision shall be broadly construed.

AUDITOR's responsibility for such defense and indemnity obligations shall survive the termination or completion of this Agreement for the full period of time allowed by law. The defense and indemnity obligations of this Agreement are undertaken in addition to, and shall not in any way be limited by, the insurance obligations contained in this Agreement.

9. Insurance. AUDITOR agrees to continuously maintain, in full force and effect, the following minimum policies of insurance during the term of this Agreement.

COVERAGE	LIMITS OF LIABILITY
Workers' Compensation	Statutory
Commercial General Liability	$1,000,000 each occurrence $2,000,000 aggregate Personal Injury: $1,000,000 each occurrence $2,000,000 aggregate

Automobile Liability	$1,000,000 combined single limit
Professional Liability (errors and omissions)	$1,000,000 per claim $2,000,000 aggregate

a. Form. AUDITOR shall submit a certificate evidencing such coverage for the period covered by this Agreement in a form satisfactory to Risk Management and the City Attorney, prior to undertaking any work hereunder. Any insurance written on a claims made basis is subject to the approval of Risk Management and the City Attorney.

b. Additional Insureds. AUDITOR shall also provide a separate endorsement form or section of the policy showing CITY, its officers, agents, employees and volunteers as additional insureds for each type of coverage, except for Workers' Compensation and Professional Liability. Such insurance shall specifically cover the contractual liability of AUDITOR. The additional insured coverage under the AUDITOR's policy shall be primary and noncontributory, as evidenced by a separate endorsement or section of the policy, and shall not seek contribution from CITY's insurance or self-insurance. In addition, the additional insured coverage shall be at least as broad as the Insurance Services Office ("ISO") CG 20 01 Endorsement. Any available insurance proceeds in excess of the specified minimum insurance coverage requirements and limits shall be available to the additional insureds. Furthermore, the requirements for coverage and limits shall be: (1) the minimum coverage and limits specified in this Agreement; or (2) the full coverage and maximum limits of any insurance proceeds available to the named insureds, whichever is greater.

c. Cancellation/Modification. AUDITOR shall provide ten (10) days written notice to CITY prior to cancellation or modification of any insurance required by this Agreement.

d. Umbrella/Excess Insurance. The limits of insurance required in this Agreement may be satisfied by a combination of primary and excess insurance. Any excess insurance shall contain or be endorsed to contain a provision that such coverage shall also apply on a primary and noncontributory basis for the benefit of CITY (if agreed to in a written contract) before CITY's own insurance shall be called upon to protect it as a named insured.

e. Subcontractors. AUDITOR agrees to include in its contracts with all subcontractors the same requirements and provisions of this Agreement, including the indemnity and insurance requirements, to the extent they apply to the scope of the subcontractor's work. Furthermore, AUDITOR shall require its subcontractors to agree to be bound to AUDITOR and CITY in the same manner and to the same extent as AUDITOR is bound to CITY under this Agreement. Additionally, AUDITOR shall obligate its subcontractors to comply with these same provisions with respect to any tertiary subcontractor, regardless of tier. A copy of CITY's indemnity and insurance provisions will be furnished to the subcontractor or tertiary subcontractor upon request.

f. Self-Insured Retentions. All self-insured retentions ("SIR") must be disclosed to Risk Management for approval and shall not reduce the limits of liability. Policies containing any SIR provision shall provide or be endorsed to provide that the SIR may be satisfied by either the named insured or CITY. CITY reserves the right to obtain a full certified copy of any insurance policy and endorsements. The failure to exercise this right shall not constitute a waiver of such right.

g. Waiver of Subrogation. AUDITOR hereby agrees to waive subrogation which any insurer of AUDITOR may acquire from AUDITOR by virtue of the payment of any loss under a Workers Compensation, Commercial General Liability or Automobile Liability policy. All Workers Compensation, Commercial General Liability and Automobile Liability policies shall be endorsed with a waiver of subrogation in favor of CITY, its officers, agents, employees and volunteers for all worked performed by AUDITOR, its employees, agents and subcontractors.

h. Liability/Remedies. Insurance coverage in the minimum amounts set forth herein shall not be construed to relieve AUDITOR of liability in excess of such coverage, nor shall it preclude CITY from taking such other actions as are available to it under any other provisions of this Agreement or law.

10. Term and Termination. This Agreement commences on July 1, 2021 and expires on May 31, 2023. Upon expiration of the initial term, the CITY has two (2) options to renew this Agreement for additional two (2) year terms. Such renewals shall be by written amendments to this Agreement.

CITY may terminate this Agreement, without any cause whatsoever by giving five (5) days advance written notice to AUDITOR, in which event, AUDITOR shall be entitled to be compensated for the services rendered up to the date and time of termination, provided that AUDITOR furnishes CITY with copies of all of its written work and data produced up to the time of its termination.

11. Waiver. The failure of CITY to enforce any provision of this Agreement shall not be construed as a waiver of the right of CITY to compel enforcement or demand recompense for damage.

12. Access to Records. Duly authorized representatives of CITY shall have right of access during normal business hours to AUDITOR's files and records relating to the services performed hereunder, and may review the files and records at appropriate stages during performance of the services.

13. Time is of the Essence. Time is of the essence of this Agreement.

14. Compliance with Laws. AUDITOR shall comply with all federal, state and local laws, ordinances and policies as may be applicable to the performance of services under this Agreement.

15. Ability to Perform. AUDITOR agrees and represents that it has the time, ability and professional expertise to perform the services required under this Agreement.

16. Assignment. AUDITOR is employed to perform unique personal services. AUDITOR shall not assign this Agreement without the prior written consent of City. AUDITOR shall not employ or otherwise incur any obligation to pay other specialists or experts for services in connection with this Agreement, without prior written consent of CITY.

17. Independent Contractor. AUDITOR shall act as an independent contractor, and covenants and agrees that it will conduct itself consistent with such status, that it will neither hold itself out as, nor claim to be, an officer or employee of CITY by reason of this Agreement. AUDITOR has the right to exercise its professional control over the manner in which it renders services, except as set out in this Agreement.

18. Representations and Warranties. AUDITOR warrants that it has not employed or retained any company or person, other than a bona fide employee working for AUDITOR, to solicit or secure this Agreement, and that it has not paid or agreed to pay any company or person, other than a bona fide employee, any fee, commission, percentage, brokerage fee, gift or any

other consideration, contingent upon or resulting from the award or making of this Agreement. For breach or violation of this warranty, CITY shall have the right to terminate as void this Agreement, without liability, or, in its discretion, to deduct from the Agreement price or consideration, or otherwise recover, the full amount of such fee, commission, percentage, brokerage fee, gift or contingent fee.

19. Successors in Interest. This Agreement shall be binding upon the heirs, successors, executors, administrators and assigns of the respective parties hereto.

20. Copyright, Ownership and Use of Materials. All tangible material ("Material") created or delivered pursuant to this Agreement is considered a work made for hire under the Copyright Act. For purposes of this Agreement, Material excludes tangible material related to AUDITOR's audit strategy, such as materiality calculations, risk assessments and testing thresholds. To the extent Material does not qualify as a work made for hire, AUDITOR hereby assigns to CITY all right, title, and interest, including but not limited to all copyrights, in all Material created by AUDITOR in its performance under this Agreement. Material constitutes the scope of work outlined in EXHIBIT "A" and attached hereto, and all written and other tangible expressions, including but not limited to, drawings (including computer aided drawings), papers, documents, reports, surveys, renderings, exhibits, sketches, maps, models, prints, paintings or photographs, in any and all media or formats in which such materials have been created or are maintained. All Material furnished by AUDITOR is, and shall remain, the property of CITY.

AUDITOR shall execute any documents necessary to effectuate such assignment. In the event that AUDITOR uses, employs, designates, or retains any person or entity who is not an employee of AUDITOR, to perform any work required of it pursuant to this Agreement,

AUDITOR shall require said person or entity to execute an agreement containing the preceding paragraph.

21. Attorney's Fees; Venue; Governing Law. If either party commences any legal action against the other party arising out of this Agreement or the performance hereof, the prevailing party in such action shall be entitled to recover its reasonable litigation expenses, including but not limited to, court costs, expert witness fees, discovery expenses, and attorney's fees. Any action arising out of this Agreement shall be brought in Placer County, California, regardless of where else venue may lie. This Agreement shall be governed by and construed in accordance with the laws of the State of California.

22. Modification. This Agreement and each provision contained herein may be waived, amended, supplemented or eliminated only by mutual written agreement of the parties.

23. Severability. If any of the provisions contained in this Agreement are for any reason held invalid or unenforceable, such holding shall not affect the remaining provisions or the validity and enforceability of the Agreement as a whole.

24. Notices. Any notices to parties required by this Agreement shall be delivered personally or mailed, U.S. first class postage prepaid, addressed as follows:

CITY OF ROSEVILLE	AUDITOR
Dennis Kauffman Assistant City Manager/Chief Financial Officer 311 Vernon Street Roseville, CA 95678	Deborah Harper Lance, Soll, & Lunghard, LLP 2151 River Plaza Drive, Ste 150 Sacramento, CA 95833

Either party may amend its address for notice by giving notice to the other party in writing.

25. Proposal of Audit Services. A copy of AUDITOR's "Proposal for Audit Services to City of Roseville" dated April 7, 2021 is attached to this Agreement as EXHIBIT "A," for

information. The duties of AUDITOR and CITY include all matters within EXHIBIT "A," provided, however, that in the event of any inconsistency of this Agreement and EXHIBIT "A" the provisions of this Agreement shall govern.

26. Integrated Agreement. This is an integrated agreement and contains all of the terms, considerations, understanding and promises of the parties. It shall be read as a whole.

IN WITNESS WHEREOF, the City of Roseville, a municipal corporation, has caused this Agreement to be executed in duplicate by its City Manager and attested to by its City Clerk under the authority of Resolution No. _____, adopted by the Council of the City of Roseville on the _____ day of _____, 20__, and AUDITOR has caused this Agreement to be executed.

CITY OF ROSEVILLE, a municipal corporation

BY:_____
DOMINICK CASEY
City Manager

ATTEST:

BY:_____
SONIA OROZCO
City Clerk

LANCE, SOLL, & LUNGHARD, a California limited liability partnership

BY: Debbie A. Harper

its: Partner

and

BY: BJ

its: Partner

[SIGNATURES CONTINUED ON NEXT PAGE]

APPROVED AS TO FORM:

BY:_____
MICHELLE SHEIDENBERGER
City Attorney

APPROVED AS TO SUBSTANCE:

BY:_____
DENNIS KAUFFMAN
Assistant City Manager/Chief Financial Officer

EXHIBIT “A”

Proposal for Audit Services

QUALIFICATIONS OF TEAM (Continued)

CONTINUING EDUCATION

As a firm policy, all professional government staff meet the requirement of 40 hours of continuing education every year, with at least 24 hours in governmental accounting and auditing in a two-year period. Our educational programs include training from CalCPA, AICPA, Government Audit Quality Center, and GFOA.

We have continuous talent development throughout the year that focuses on new government pronouncements. Deborah Harper, the Engagement Partner assigned to this engagement and the firm's Learning Director, is an elite executive member of the AICPA Government Audit Quality Center Executive Committee. As a member of this committee, she routinely participates in the creating process of new AICPA Audit Guides and partakes in the discussion of Uniform Guidance requirements and changes, which allows her immediate access to oversight and cognizant agencies for any technical questions that may arise.

QUALITY OF STAFF ASSURANCE

LSL will ensure the quality of staffing over the term of the engagement through firm policies which provide for maintaining continuity of engagement teams, except in instances where an employee has left the firm or has been promoted. All other changes in staffing supervisor and above will first have the City's expressed written permission. Our focused efforts to obtain and retain quality staff have further enabled us to provide high levels of services to our clients. If changes are required, our extensive team of government auditors provides for qualified replacements.

LOCATION OF OFFICES

LSL is a regional firm with offices in Brea, Santa Ana and Sacramento, California, as well as Houston, Texas. The audit for the City of Roseville will be staffed primarily from our Sacramento Office, with additional resources utilized from our Brea Office.

PROJECT UNDERSTANDING

Lance, Soll & Lunghard, LLP (LSL) agrees to audit the City of Roseville financial statements for fiscal year ending June 30, 2021, with the options of two (2) additional two-year periods. LSL will perform the services listed in the "Scope of Services" under Section 3 of the RFP.

These audits are to be performed in accordance with generally accepted auditing standards as set forth by the American Institute of Certified Public Accountants; the standards applicable to financial audits contained in Government Auditing Standards (current edition), issued by the Comptroller General of the United States; the provisions of the Single Audit Act (current version at the time of the audit); the provisions of the U.S. Office of Management and Budget (OMB) Circular A-133, Audits of States, Local Governments, and Non-Profit Organizations; the audit requirements of Title 2 U.S. Code of Federal Regulations Part 200, Uniform Administrative Requirements, Cost Principles, and Audit Requirements of Federal Awards (Uniform Guidance); and when applicable, provisions of the American Recovery and Reinvestment Act.

PROJECT UNDERSTANDING (Continued)

The reports to be issued will include the following:

- An audit opinion on the fair presentation of the City's financial statements (CAFR) in conformity with generally accepted accounting principles.
- All reports required for a Single Audit in compliance with the provisions of *OMB Circular A-133,* the *Single Audit Act and the Uniform Guidance*.
- An Agreed-Upon Procedures report on the City's calculation of its Appropriation Limit in accordance with the *Article XIIIB Appropriations Limit Uniform Guidelines* and as mandated by the California Constitution.
- An Agreed-Upon Procedures report on the City's South Placer Wastewater Authority related to connection fees.
- An audit opinion for the "Bizz Johnson" Highway Interchange Joint Powers Authority financial statements.
- An audit opinion for the Community Development Corporation financial statements.
- An audit opinion for the Roseville Natural Gas Financing Authority financial statements.
- All reports required for the Roseville School-Age Child Care Program financial statements.
- An audit opinion for the Roseville Electric Enterprise Fund Basic financial statements.
- An audit opinion for the Roseville Environmental Utilities Enterprise Funds basic financial statements.
- An audit opinion for the South Placer Wastewater Authority financial statements.
- A report on internal control over financial reporting and on compliance and other matters based on an audit of financial statements performed in accordance with *Government Auditing Standards*. The report will communicate any significant deficiencies found during the audit important enough to merit attention by those charged with governance. Significant deficiencies will be identified as either material weaknesses or significant deficiencies. The report will also include material non-compliance noted.
- Other matters that are not significant deficiencies or material weaknesses and other non-material instances of non-compliance discovered during our audit will be reported in a separate letter to management.
- An audit communication letter addressed to the City of Roseville City Council including all required disclosures under SAS 114.

DISCUSSION OF RELEVANT ACCOUNTING ISSUES

The most recent relevant accounting issue impacting the City is the implementation of GASB Statement No. 95, *Postponement of Effective Dates of Certain Authoritative Guidance*. This statement postponed several key GASB pronouncements as a temporary relief to governments and other stakeholders in light of the COVID-19 pandemic. The two major pronouncements that could impact the City being delayed are GASB Statement No. 84, *Fiduciary Activities,* and GASB Statement No. 87, *Leases.* These statements are now effective in fiscal years 2021 and 2022, respectively.

Regarding how these pronouncements could impact the presentation of the City's financial reports, GASB Statement No. 84 will require all current fiduciary activities to be identified and analyzed. Agency Funds will no longer be valid and will be replaced with Custodial Funds that are required to present assets, liabilities, and equities in the Statement of Fiduciary Net Position. This statement could require the change in classification of some Fiduciary Funds to Special Revenue Funds, and vice versa, depending on the relationship to the City.

GASB Statement No. 87 will require all leases the City currently is under contract for, both as the lessor and lessee, to be analyzed and recorded on the City's financial statements. The term "operating", and "capital" leases will no longer be relevant, and all leases the City is under contract for will now be recorded and disclosed in some form.

PROJECT UNDERSTANDING (Continued)

IDENTIFICATION OF ANTICIPATED POTENTIAL AUDIT PROBLEMS

With our familiarity with similar government agencies, we do not anticipate unusual audit problems. The primary challenge we anticipate in general is the new audit landscape we have been put into given the current COVID-19 related pandemic. Audits are now being performed primarily remote, and we plan on this remaining in place for the future. This challenge will be alleviated by frequent communication between the audit team and the City of Roseville, a secure upload system to provide all documents, and clear expectations as far as fieldwork dates and timing of reports. The only special assistance requested form City staff would be the need to possibly scan documents that are currently not available in electronic form, as well as potentially read-only access to the City's financial reporting system to view items and information remotely.

TECHNOLOGICAL CAPABILITIES

LSL is always at the forefront of technology and finding ways to increase efficiency in our audits. Our goal is to effectively streamline the audit process to make the burden of an audit easier on our clients.

Adapting to a Post COVID-19 Audit Relationship

At LSL with technology being one of our core values, we were already operating in a cloud-based, often remote environment prior to the onset of COVID-19. We experienced no issues performing audits in a remote environment and have found ways to increase efficiencies and the quality of our audits utilizing some of the tools available. Having the ***LSL CaseWare Cloud Portal*** makes the exchange of secure information easy and painless, while utilizing ***Zoom and Microsoft Teams*** has allows us to communicate in a face-to-face setting, giving us the ability to share screens and information in real time.

CaseWare

We are partners with and utilize ***CaseWare*** to perform our audit, retain electronic work papers and supporting documentation in a completely cloud-based platform. During our preparation of the CAFR, all financial statements and schedules are linked to ***CaseWare*** and audit documentation which ensures accuracy and consistency with City records and eliminates the risk of manual errors.

LSL CaseWare Cloud Portal

Our web-based portal system gives our clients the ability to share information in a secure platform that is user friendly and easy to use. This portal is integrated with ***CaseWare OnPoint Collaborate***, a state-of-the-art tool which takes collaborative and accounting and auditing to the next level. It facilitates direct communication with clients throughout the audit to both provide and receive feedback, tracking of activity, audit requests and audit progress, all within a secure hub where access can be restricted to only individuals needing the information where necessary. This tool eliminates the need to send sensitive documents through e-mail and will reduce the confusion on the status of items being requested. Each client's dashboard can be customized to ensure it fits their exact needs.

Data Extraction & Audit Analytics

At LSL we believe a software is only as effective as those who know how to use it. That is why we train all of our staff on and incorporate into our audit approach the use of ***CaseWare Analytics AI*** *and* ***CaseWare IDEA***. These two complement one another to create a risk-based transaction analysis tool that we utilize to scan transaction sets and find exceptions that warrant further investigation, as well as give our clients additional assurances that previously may not have existed. These tools give a high-level summary to users and reduce the time spent in transaction analysis but automatically performing multiple tests on the entire transaction set assisting in identifying duplicate payments, fictitious journal entries and developing expectations for analytical procedures utilized during the audit.

PROJECT UNDERSTANDING (Continued)

Experience with ERP Systems

More and more of our clients have updated their systems software with new Enterprise Resource Planning (ERP) systems in the past three years. We have been available for questions and recommendations, including assistance with the vendor selection process. Our clients upgrading to more sophisticated ERP systems has allowed us to gain a better understanding of each ERP system and its unique capabilities. We often obtain read-only access to our clients' software and can work directly within the system. This allows us to provide useful observations and recommendations in internal control and also provides for efficient audit test work. Some of the ERP and Property Tax System we have extensive experience with include ***Tyler Technologies (Munis, New World, Eden), One Solution, Oracle, Infor & Megabyte*.**

Innovation & Partnerships

At LSL, innovation is one our core values and principles at the firm. As mentioned previously, we utilize and are working with ***CaseWare*** and are creating ways to incorporate artificial intelligence techniques and robotic process automation into both the audit and financial reporting process. We are working to design these tools to not only maximize efficiency during the audit process, but also to give our clients tool and real-time data that they can utilize throughout the year to make informed decisions. Our goal is to create client dashboards that can **pull data directly from your ERP system** to ease your burden on reporting and to ensure the information you have at your fingertips is always as up to date as possible, providing the utmost value to our clients as more than just auditors.

PROJECT PLAN

We utilize a governmental audit program which we will tailor to the City's operations. The tailoring is necessary to accommodate specific client circumstances and to recognize differences in the organizational structure. Our audit programs are organized by financial statement category. This approach takes full advantage of our accumulated experience. The primary benefit is that the risk of omitting important procedures is substantially reduced. We believe that this approach tends to be the most effective and efficient for an entity such as the City. The audit procedures are listed in the most logical sequence which improves efficiency. The savings in effort and time gained by using our audit program can free an auditor's attention for unusual or difficult situations that may arise. The audit programs are designed to increase audit efficiency by linking financial statement assertions, audit objectives, and procedures that are basic to most governmental audit engagements.

PROPOSED SEGMENTATION

The services will be divided into three segments.

Segment 1 - Planning and Obtaining an Understanding: LSL will provide an annual audit communication letter, engagement letter, and Government Audit Quality Center information letter. The audit communication letter is to be provided to the City Council. In addition, this can be communicated orally to the City Council or audit-committee, if requested. This communication will discuss the planning stages, the responsibilities of the City Council, auditors, and management, and provide an opportunity for communication with us as the auditors.

An entrance conference will be scheduled ahead of the on-site visit that is used to obtain an understanding of the City's internal controls. This meeting helps to ensure that the transition to new auditors is as seamless as possible. Discussions in this meeting include, but are not limited to, the following: Understanding of reports and key milestones for deliverables, prior audit reportable conditions and issues, and "Prepared by Client" (PBC) schedules.

PROJECT PLAN (Continued)

LSL's audit team will meet before our initial on-site visit to brainstorm and discuss economic conditions, industry elements, and new standards that will affect the City. A trial balance is requested for our planning meeting to assist the LSL team in obtaining knowledge and preparing expectations for the audit year. We will compile a list of PBC items based on our review of the prior year's financial statements and the information gathered. This will be provided to the City one month prior to our visit or earlier if requested. We operate on a paperless software system and provide a secured cloud-based portal for all clients. The City will have a separate folder that can be customized to organize, and upload requested schedules, support documents, etc.

If available, a current Schedule of Expenditures of Federal Awards (SEFA) will be evaluated during this segment to make a preliminary determination of the City's major programs. This allows us to properly plan and schedule the timing of the Single Audit with the appropriate finance personnel as well as appropriate grant managers. LSL will make every effort to be proactive in our network of federal grants during the interim stages of the audit.

After our interim on-site visit, we will have an exit meeting to discuss potential weaknesses, if any, and provide any feedback for improvements or valuable information we have gathered from our outside clientele that would benefit the City.

Segment 2 - Financial Audit Testing: Based on the information gathered each year thus far, we will utilize a customized audit program based on the risk assessment developed during our assessment of the City's internal controls and *Government Auditing Standards*. The primary benefit of a tailored program is a focused set of procedures to address relevant areas. We believe that this approach will be the most effective and efficient by linking financial statement assertions, audit objectives, and procedures that are basic to most governmental audit engagements and critical to compliance with other material laws and regulations. We will annually compile another customized PBC list for the year-end on-site visit provided at least one month prior or earlier if requested. We will request a trial balance for our analytical review to be provided one week before our arrival.

Year-end fieldwork will include testing of the balance sheet, revenue and expenditures accounts, confirmation of selected balances, analytical procedures, evaluation of the internal controls, and preparation of reports and letters.

***Segment 3* - Conclusion:** Based on our year-end exit meeting we will schedule a plan to finalize the CAFR according to the timetable of the City. We will schedule dates for the initial and final drafts including time for the City review and approval of the financial statements. This period will also account for the review of the engagement partner and quality assurance partner. After the review and receipt of the signed representation letter from the City, we will provide the final report by **October 31st** or **December 23rd** of each year, depending on the report.

SAMPLE SIZE AND EXTENT OF STATISTICAL SAMPLING

Our approach may be to utilize statistical sampling in the areas of receipts, disbursements, utility billing, and payroll. Here we develop a statistical conclusion based upon an initial computer selected random sample which is based on the population and other risk factors identified. If errors are noted in the sample, the sample size will be expanded. We believe that a random selection can be efficient while providing each item in the population an equal chance of being selected. Additionally, we may select a stratified sample of all transactions over a specified dollar limit for review. This allows us to cover all high dollar value transactions not otherwise selected in the random sample. Our samples are selected randomly utilizing IDEA data analysis software.

PROJECT PLAN (Continued)

TYPE AND EXTENT OF ANALYTICAL PROCEDURES

For the audits of the financial statements, we will use analytical procedures as an overall review of the financial information in the preliminary and final stages of the audits. These procedures are designed to assist us in planning our audits and in assessing the propriety of the conclusions reached and evaluating the overall financial statement presentation. The procedures to be utilized consist of determining expectations for changes to significant revenue, expenditure, and balance sheet accounts, reading the financial statements and related notes, reviewing the budget and related material, and focusing on overall relationships within the financial statements. Once determined, these are reviewed to evaluate if the changes appear reasonable or require further analysis. For all significant differences, explanations are obtained as to why the situation occurred and additional substantive procedures may be applied, and related evidence gathered to resolve concerns and questions.

We ask that the City provide a check register electronically for July 1st forward (period after the audit year), so we can pre-select our sample for accounts payable cut-off test work and provide that information ahead of time. Our PBC list will detail out schedules we would like provided, which is directed straight from the audit report. Support requested and sampling for these schedules will be assessed each year based on the strengths and weaknesses of the internal control processes of the City, and the materiality level of the account. We will discuss our analytical variances with the City and obtain documentation that provides support for the accounts. Interim procedures will be completed no later than April 30th of each year.

APPROACH TO UNDERSTANDING THE CITY'S INTERNAL CONTROL STRUCTURE

To gain an understanding of the internal control structure over the financial statements, we will perform procedures as required by SAS 122-125. This will include a review of internal controls in the areas of financial reporting, cash, revenues and receivables, utility billing, expenses, accounts payable, payroll, capital assets, long-term debt, and grant reporting, as applicable.

Based on the result of our review, we will issue a management letter (SAS 115 Letter) that will identify any significant deficiencies and/or material weaknesses noted. This report is required by the *Government Auditing Standards* issued by the Comptroller General of the United States. Auditing Standards require auditors to obtain an understanding of the entity and its environment along with assessing the risks of material misstatements. LSL obtains an understanding through a variety of ways throughout the year, but the most pertinent time each year is during our interim on-site visit. We will conduct interviews with the management of finance along with each audit section responsible party (e.g., cashier, accounts payable clerk, payroll clerk, etc.) to review the processes and controls through observation and discussions. Based on our observations, we will sample transactions as part of a "walk-through" to verify the system of control is working in accordance with policies and procedures. Each year, we will provide a list of randomly selected City employees to interview for SAS 99 fraud interviews. This list will consist of all levels and across all departments within the City.

DETERMINING LAWS AND REGULATIONS SUBJECT TO AUDIT TEST WORK

The laws and regulations that will be subject to audit test work are determined from the applicable laws, regulations, contracts, and grant agreements which we identify through the understanding we obtain of the City and our extensive experience with governmental entities.

PROJECT PLAN (Continued)

DRAWING AUDIT SAMPLES

For tests of controls, we use audit sampling. Tests of controls are procedures directed towards determining the effectiveness of the design or operation of an internal structure policy or procedures. Normally, audit sampling is used for tests of controls and tests of compliance that involve inspection of documents and reports indicating the performance of the applicable policy or procedures and compliance with the applicable laws and regulations. These sampling procedures test the operating effectiveness of an internal control structure policy or procedures by determining how the policy or procedure was applied, the consistency with which it was applied during the audit period, and by whom it was applied. To achieve this goal, we will draw samples for disbursements, receipts, and payroll when applicable. Each document selected will be tested for various attributes that are designed to verify compliance with different aspects of internal controls and applicable laws and regulations. Additionally, each sample item will be tested for coding to the proper accounts and posting to the general ledger. Sample sizes vary based on the population and risk-based calculations.

LEVEL OF STAFF AND NUMBER OF HOURS TO BE ASSIGNED

TOTAL PROPOSED HOURS FOR REQUIRED SERVICES									
Segment/Task	Partners	Senior Manager	Manager	Supervisor	Senior	Experienced Staff	Staff	Clerical	Total
Comprehensive Annual Financial Report (CAFR) & Related Reports									
Interim Testwork	8	8	16	40	40	40	40	2	194
Year-End Testwork	8	8	16	60	100	50	50	-	292
Report/Review/Supervision	24	8	24	60	-	-	-	24	140
Subtotal	**40**	**24**	**56**	**160**	**140**	**90**	**90**	**26**	**626**
"Bizz Johnson" Highway Interchange JPA Basic Financial Statements									
Testwork	-	-	-	-	-	-	16	-	16
Report/Review/Supervision	1	-	2	4	-	-	4	1	12
Subtotal	**1**	**-**	**2**	**4**	**-**	**-**	**20**	**1**	**28**
City of Roseville Other Post-Employement Benefits Trust Annual Financial Report									
Testwork	-	-	-	2	16	-	-	-	18
Report/Review/Supervision	1	-	2	4	8	-	-	2	17
Subtotal	**1**	**-**	**2**	**6**	**24**	**-**	**-**	**2**	**35**
Roseville Community Development Corporation Financial Statements									
Testwork	-	-	-	2	-	16	-	-	18
Report/Review/Supervision	1	1	1	2	-	4	-	1	10
Subtotal	**1**	**1**	**1**	**4**	**-**	**20**	**-**	**1**	**28**
Roseville Natural Gas Financing Authority Basic Financial Statements									
Testwork	-	-	-	-	-	32	-	-	32
Report/Review/Supervision	1	-	2	4	-	8	-	1	16
Subtotal	**1**	**-**	**2**	**4**	**-**	**40**	**-**	**1**	**48**
City of Roseville School-Age Child Care Program Financial Statements & Compliance Report									
Testwork	-	-	-	-	-	-	40	-	40
Report/Review/Supervision	1	-	2	4	-	-	5	1	13
Subtotal	**1**	**-**	**2**	**4**	**-**	**-**	**45**	**1**	**53**
City of Roseville Electric Enterprise Fund Basic Financial Statements									
Testwork	-	-	-	2	-	-	32	-	34
Report/Review/Supervision	1	-	2	4	-	-	8	3	18
Subtotal	**1**	**-**	**2**	**6**	**-**	**-**	**40**	**3**	**52**

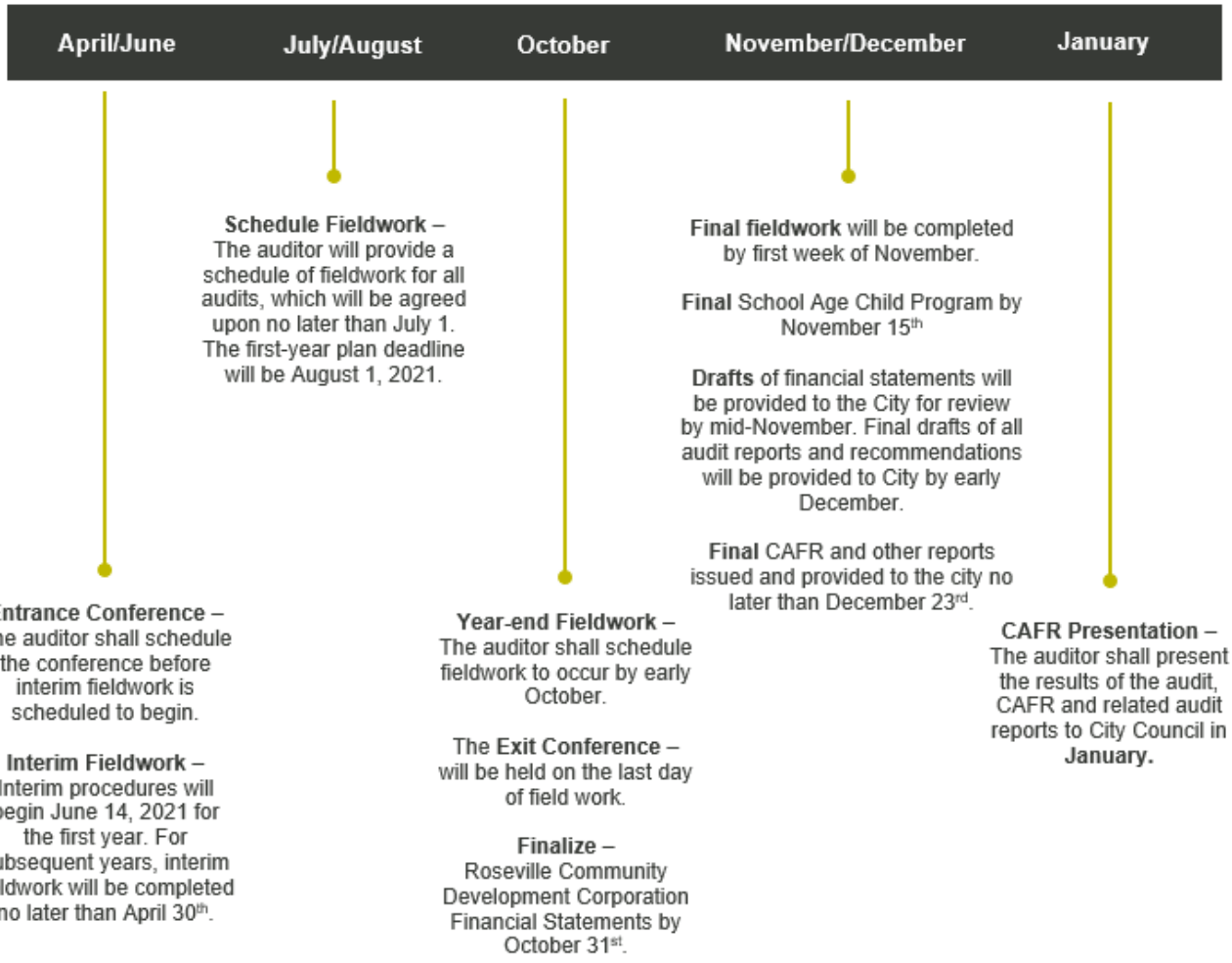
PROJECT PLAN (Continued)

TOTAL PROPOSED HOURS FOR REQUIRED SERVICES (CONTINUED)									
Segment/Task	Partners	Senior Manager	Manager	Supervisor	Senior	Experienced Staff	Staff	Clerical	Total
City of Roseville Enviornmental Utilities Enterprise Fund Basic Financial Statements									
Testwork	-	-	-	2	-	-	32	-	34
Report/Review/Supervision	1	-	2	4	-	-	8	3	18
Subtotal	**1**	**-**	**2**	**6**	**-**	**-**	**40**	**3**	**52**
South Placer Wastewater Authority Financial Report									
Testwork	-	-	-	8	40	-	40	-	88
Report/Review/Supervision	2	2	4	8	8	-	-	2	26
Subtotal	**2**	**2**	**4**	**16**	**48**	**-**	**40**	**2**	**114**
Independent Accountant's Report on Applying Agreed-Upon Procedures related to the Article XIII-B Appropriations Limit Calculation									
Testwork	-	-	-	-	-	-	1	-	1
Report/Review/Supervision	1	-	1	1	-	-	1	1	5
Subtotal	**1**	**-**	**1**	**1**	**-**	**-**	**2**	**1**	**6**
South Placer Wastewater Authority AUP									
Testwork	-	-	-	2	-	24	-	-	26
Report/Review/Supervision	1	1	1	2	-	4	-	2	11
Subtotal	**1**	**1**	**1**	**4**	**-**	**28**	**-**	**2**	**37**
Golf Programs AUP									
Testwork	-	-	-	-	-	-	16	-	16
Report/Review/Supervision	1	1	1	2	-	-	3	2	10
Subtotal	**1**	**1**	**1**	**2**	**-**	**-**	**19**	**2**	**26**
Real Estate Assessment Center (REAC) AUP									
Testwork	-	-	-	-	-	-	1	-	1
Report/Review/Supervision	1	-	1	1	-	-	1	1	5
Subtotal	**1**	**-**	**1**	**1**	**-**	**-**	**2**	**1**	**6**
Single Audit and Related Reports **									
Testwork	-	-	-	40	40	-	40	-	120
Report/Review/Supervision	2	2	4	24	-	-	-	2	34
Subtotal	**2**	**2**	**4**	**64**	**40**	**-**	**40**	**2**	**154**
TOTAL PROPOSED HOURS:	**55**	**31**	**81**	**282**	**252**	**178**	**338**	**48**	**1,265**

** The Single Audit hours assumes 3 progams.

PROJECT PLAN (Continued)

TIMING AND APPROACH



LANCE, SOLL & LUNGHARD, LLP

AUDIT WORK COST PROPOSAL FORM

Name of Firm: Lance, Soll & Lunghard, LLP

Office Address: 2151 River Plaza Dr., Suite 150, Sacramento, CA 95835

Contact Name: Deborah Harper, CPA, Engagement Partner

Contact Phone: (916) 503-9691 **Fax #:** (714) 672-0331

Contact Email: Deborah.Harper@lslcpas.com

REQUIRED SERVICES						
Service	2020/21	2021/22	Optional 2022/23	Optional 2023/24	Optional 2024/25	Optional 2025/26
Comprehensive Annual Financial Report Audit & Related Reports*	$ 69,000	$ 69,000	$ 70,380	$ 70,380	$ 71,788	$ 71,788
"Bizz Johnson" Highway Interchange JPA Basic Financial Statements	$ 2,440	$ 2,440	$ 2,489	$ 2,489	$ 2,539	$ 2,539
City of Roseville Other Post-Employement Benefits Trust Annual Financial Report	$ 3,510	$ 3,510	$ 3,580	$ 3,580	$ 3,652	$ 3,652
Roseville Community Development Corporation Financial Statements	$ 2,670	$ 2,670	$ 2,723	$ 2,723	$ 2,777	$ 2,777
Roseville Natural Gas Financing Authority Basic Financial Statements	$ 4,090	$ 4,090	$ 4,172	$ 4,172	$ 4,255	$ 4,255
City of Roseville School-Age Child Care Program Financial Statements & Compliance Report	$ 3,970	$ 3,970	$ 4,049	$ 4,049	$ 4,130	$ 4,130
City of Roseville Electric Enterprise Fund Basic Financial Statements	$ 3,970	$ 3,970	$ 4,049	$ 4,049	$ 4,130	$ 4,130
City of Roseville Enviornmental Utilities Enterprise Fund Basic Financial Statements	$ 3,970	$ 3,970	$ 4,049	$ 4,049	$ 4,130	$ 4,130
South Placer Wastewater Authority Financial Report	$ 10,940	$ 10,940	$ 11,159	$ 11,159	$ 11,382	$ 11,382
Independent Accountant's Report on Applying Agreed-Upon Procedures related to the Article XIII-B Appropriations Limit Calculation	$ 770	$ 770	$ 785	$ 785	$ 801	$ 801
South Placer Wastewater Authority AUP	$ 3,880	$ 3,880	$ 3,958	$ 3,958	$ 4,037	$ 4,037
Real Estate Assessment Center (REAC) AUP	$ 770	$ 770	$ 785	$ 785	$ 801	$ 801
Single Audit and Related Reports **	$ 17,230	$ 17,230	$ 17,575	$ 17,575	$ 17,927	$ 17,927
Preparation of Financial Statements						
Comprehensive Annual Financial Report	$ 6,920	$ 6,920	$ 7,058	$ 7,058	$ 7,199	$ 7,199
"Bizz Johnson" Highway Interchange JPA Basic Financial Statements	$ 310	$ 310	$ 316	$ 316	$ 322	$ 322
City of Roseville Other Post-Employement Benefits Trust Annual Financial Report	$ 540	$ 540	$ 551	$ 551	$ 562	$ 562
Roseville Community Development Corporation Financial Statements	$ 380	$ 380	$ 388	$ 388	$ 396	$ 396
Roseville Natural Gas Financing Authority Basic Financial Statements	$ 820	$ 820	$ 836	$ 836	$ 853	$ 853
City of Roseville School-Age Child Care Program Financial Statements & Compliance Report	$ 810	$ 810	$ 826	$ 826	$ 843	$ 843
City of Roseville Electric Enterprise Fund Basic Financial Statements	$ 800	$ 800	$ 816	$ 816	$ 832	$ 832
City of Roseville Enviornmental Utilities Enterprise Fund Basic Financial Statements	$ 800	$ 800	$ 816	$ 816	$ 832	$ 832
South Placer Wastewater Authority Financial Report	$ 1,110	$ 1,110	$ 1,133	$ 1,133	$ 1,156	$ 1,156
Out-of-Pocket Expenses	Included	Included	Included	Included	Included	Included
TOTAL FOR FISCAL YEAR - (Not to Exceed)	**$ 139,700**	**$ 139,700**	**$ 142,493**	**$ 142,493**	**$ 145,344**	**$ 145,344**

* Financial Audit and Related Reports includes the Independent Auditor's Report, Report on Internal Control over Financial Reporting and on Compliance, and other communications with the City Council required by auditing standards.

** The Single Audit fee assumes 2 major program. Each additional major program is $4,500.

OPTIONAL SERVICES						
Optional - Golf Programs AUP	$ 2,520	$ 2,520	$ 2,570	$ 2,570	$ 2,621	$ 2,621
Optional - State Controller Report - City of Roseville	$ 7,040	$ 7,040	$ 7,181	$ 7,181	$ 7,325	$ 7,325
Optional - State Controller Report - Roseville Financing Authority	$ 1,860	$ 1,860	$ 1,897	$ 1,897	$ 1,935	$ 1,935
Optional - State Controller Report - Roseville Natural Gas Financing Authority	$ 1,510	$ 1,510	$ 1,540	$ 1,540	$ 1,571	$ 1,571
Optional - State Controller Report - South Placer Wastewater Authority	$ 1,510	$ 1,510	$ 1,540	$ 1,540	$ 1,571	$ 1,571
Optional - State Controller Report - "Bizz Johnson" Highway Interchange Joint Powers Authority	$ 1,510	$ 1,510	$ 1,540	$ 1,540	$ 1,571	$ 1,571
Optional - State Controller Report - City of Roseville Transit Operators	$ 1,510	$ 1,510	$ 1,540	$ 1,540	$ 1,571	$ 1,571
Total for Fiscal Year - With Optional Items (Not to Exceed)	**$ 157,160**	**$ 157,160**	**$ 160,301**	**$ 160,301**	**$ 163,509**	**$ 163,509**

EXHIBIT “B”

Rates for Additional Professional Services

RATES FOR ADDITIONAL PROFESSIONAL SERVICES

The City, during the term of this agreement, may request that LSL provide special services in accordance with the provisions of this agreement. If LSL agrees to perform the special services, LSL's hourly fees to perform these services for the term of the agreement are as follows, unless a lesser fee is agreed to in a separate agreement.

AUDITOR'S STANDARD HOURLY BILLING RATES						
Position	2020/21	2021/22	Optional 2022/23	Optional 2023/24	Optional 2024/25	Optional 2025/26
Partner	$ 261	$ 261	$ 266	$ 266	$ 271	$ 271
Senior Manager	$ 180	$ 180	$ 184	$ 184	$ 188	$ 188
Manager	$ 149	$ 149	$ 152	$ 152	$ 155	$ 155
Supervisor	$ 126	$ 126	$ 129	$ 129	$ 132	$ 132
Senior	$ 108	$ 108	$ 110	$ 110	$ 112	$ 112
Experienced Staff	$ 95	$ 95	$ 97	$ 97	$ 99	$ 99
Staff	$ 81	$ 81	$ 83	$ 83	$ 85	$ 85
Clerical	$ 68	$ 68	$ 69	$ 69	$ 70	$ 70
Other	N/A	N/A	N/A	N/A	N/A	N/A

The quoted fees for the services above include all out-of-pocket expenses and expenses will not be charged to the City. Progress payments will be made on the basis of hours of work completed during the course of the engagement. Interim billings shall cover a period of not less than a calendar month. The final ten percent (10%) of the total all-inclusive maximum price will be paid upon delivery of the firm's final reports.

COUNCIL COMMUNICATION

CC #: 1526
File #: 0200

Title:	General Financial Analysis Services - Professional Services Agreement
Contact:	Jeannine Thrash 916-774-5473 jthrash@roseville.ca.us Dennis Kauffman 916-774-5313 dkauffman@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 7.25.

RECOMMENDATION TO COUNCIL

Staff recommends Council adopt a resolution to approve a professional services agreement with Economic & Planning Systems, Inc. (EPS), and authorize the City Manager to execute it on behalf of the City.

BACKGROUND

The City contracts with consultants to perform various financial consulting services. EPS is a land economics consulting firm with over 30 years of experience in the full spectrum of services related to fiscal impact and analysis, public finance, and real estate market analysis. The City is currently working on several projects with EPS, including community facilities district formations and annexations, and staff recommends retaining EPS as the City's fiscal consultant. EPS is currently working on several projects for the City, but the current professional services agreement is set to expire on June 30, 2021. Approving a new agreement is in the City's best interests because it will allow the current projects to continue without delay and the City will not lose any traction by retaining a different consultant for these projects.

FISCAL IMPACT

There will be no fiscal impact from this agreement since the consulting services it covers will be for projects that will either be charged to an external party or, if not already budgeted, require staff to return to Council to recommend a budget adjustment. The three-year agreement allows services up to $100,000 per year, for an overall total compensation not to exceed $300,000.

ENVIRONMENTAL REVIEW

The California Environmental Quality Act (CEQA) only applies to projects which have the potential to cause a significant effect on the environment. Where it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment, the

activity is not subject to CEQA. (CEQA Guidelines §15061(b)(3)).

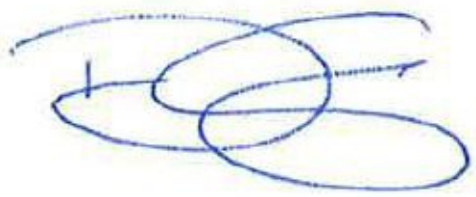
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Goal A - Remain fiscally responsible in a changing world
Goal F - Invest in well-planned infrastructure and growth

Respectfully Submitted,

Jeannine Thrash, Management Analyst

Dennis Kauffman, Assistant City Manger/Chief Financial Officer



_____
Dominick Casey, City Manager

ATTACHMENTS:

Description

Resolution 21-261

Professional Services Agreement

RESOLUTION NO. 21-261

APPROVING A PROFESSIONAL SERVICES AGREEMENT, BY AND BETWEEN THE CITY OF ROSEVILLE AND ECONOMIC & PLANNING SYSTEMS, INC., AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE

WHEREAS, a professional services agreement for general financial analysis services, between the City of Roseville and Economic & Planning Systems, Inc., has been reviewed by the City Council; and

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Roseville that said agreement is hereby approved and that the City Manager is authorized to execute it on behalf of the City of Roseville.

PASSED AND ADOPTED by the Council of the City of Roseville this____day of _____, 20_, by the following vote on roll call:

AYES COUNCILMEMBERS:

NOES COUNCILMEMBERS:

ABSENT COUNCILMEMBERS:

_____
MAYOR

ATTEST:

_____
City Clerk

PROFESSIONAL SERVICES AGREEMENT

Project: General Financial Analysis Services

THIS AGREEMENT is made and entered into this 20th day of May, 2021, by and between the City of Roseville, a municipal corporation ("CITY"), and Economic & Planning Systems, Inc., a California corporation ("CONSULTANT"); and

W I T N E S S E T H:

WHEREAS, CITY desires professional services consisting of general financial analysis services; and

WHEREAS, CONSULTANT has prepared a proposal dated May 18, 2021, which describes the scope of work to be performed by CONSULTANT, the budget for the work, and the schedule for performance of the work; and

WHEREAS, CONSULTANT is qualified and experienced to provide such professional services.

NOW, THEREFORE, the parties agree as follows:

1. Services. CONSULTANT shall perform, at the direction of CITY, the scope of services as described in EXHIBIT "A," attached hereto and incorporated herein by this reference.

2. Term. The term of this Agreement shall be for three (3) years, commencing on July 1, 2021 and expiring on June 30, 2024.

3. Compensation. For its services provided hereunder, CONSULTANT shall be compensated on a time and expense basis in accordance with the budget estimate as described in EXHIBIT "A". Total compensation shall not exceed one hundred thousand dollars ($100,000) per year, for an overall total compensation not to exceed three hundred thousand dollars ($300,000).

CONSULTANT shall submit one monthly invoice for its services. Such invoices shall be delineated by task, the person performing the services, and the hourly rate, which shall be stated in time increments of not greater than one tenth (1/10) hours. CITY shall pay invoices within thirty (30) days after receipt, if the services specified in the invoice have been satisfactorily completed.

4. Indemnification. To the fullest extent allowed by law, CONSULTANT shall defend, indemnify, and save and hold harmless CITY, its officers, agents, employees and volunteers from any claims, suits or actions of every name, kind and description brought forth, or on account of, injuries to or death of any person (including but not limited to workers and the public), or damage to property, resulting from or arising out of CONSULTANT's willful misconduct or negligent act or omission while engaged in the performance of obligations or exercise of rights created by this Agreement, except those matters arising from CITY's sole negligence or willful misconduct. The parties intend that this provision shall be broadly construed.

CONSULTANT's responsibility for such defense and indemnity obligations shall survive the termination or completion of this Agreement for the full period of time allowed by law. The defense and indemnity obligations of this Agreement are undertaken in addition to, and shall not in any way be limited by, the insurance obligations contained in this Agreement.

5. Insurance. CONSULTANT agrees to continuously maintain, in full force and effect, the following minimum policies of insurance during the term of this Agreement.

COVERAGE	LIMITS OF LIABILITY
Workers' Compensation	Statutory
Commercial General Liability	$1,000,000 each occurrence $2,000,000 aggregate Personal Injury: $1,000,000 each occurrence $2,000,000 aggregate
Automobile Liability	$1,000,000 combined single limit
Professional Liability (errors and omissions)	$1,000,000 per claim $2,000,000 aggregate

a. Form. CONSULTANT shall submit a certificate evidencing such coverage for the period covered by this Agreement in a form satisfactory to Risk Management and the City Attorney, prior to undertaking any work hereunder. Any insurance written on a claims made basis is subject to the approval of Risk Management and the City Attorney.

b. Additional Insureds. CONSULTANT shall also provide a separate endorsement form or section of the policy showing CITY, its officers, agents, employees and volunteers as additional insureds for each type of coverage, except for Workers' Compensation and Professional Liability. Such insurance shall specifically cover the contractual liability of CONSULTANT. The additional insured coverage under the CONSULTANT's policy shall be primary and noncontributory, as evidenced by a separate endorsement or section of the policy, and shall not seek contribution from CITY's insurance or self-insurance. In addition, the additional insured coverage shall be at least as broad as the Insurance Services Office ("ISO") CG 20 01 Endorsement. Any available insurance proceeds in excess of the specified minimum

insurance coverage requirements and limits shall be available to the additional insureds. Furthermore, the requirements for coverage and limits shall be: (1) the minimum coverage and limits specified in this Agreement; or (2) the full coverage and maximum limits of any insurance proceeds available to the named insureds, whichever is greater.

c. Cancellation/Modification. CONSULTANT shall provide ten (10) days written notice to CITY prior to cancellation or modification of any insurance required by this Agreement.

d. Umbrella/Excess Insurance. The limits of insurance required in this Agreement may be satisfied by a combination of primary and excess insurance. Any excess insurance shall contain or be endorsed to contain a provision that such coverage shall also apply on a primary and noncontributory basis for the benefit of CITY (if agreed to in a written contract) before CITY's own insurance shall be called upon to protect it as a named insured.

e. Subcontractors. CONSULTANT agrees to include in its contracts with all subcontractors the same requirements and provisions of this Agreement, including the indemnity and insurance requirements, to the extent they apply to the scope of the subcontractor's work. Furthermore, CONSULTANT shall require its subcontractors to agree to be bound to CONSULTANT and CITY in the same manner and to the same extent as CONSULTANT is bound to CITY under this Agreement. Additionally, CONSULTANT shall obligate its subcontractors to comply with these same provisions with respect to any tertiary subcontractor, regardless of tier. A copy of CITY's indemnity and insurance provisions will be furnished to the subcontractor or tertiary subcontractor upon request.

f. Self-Insured Retentions. All self-insured retentions ("SIR") must be disclosed to Risk Management for approval and shall not reduce the limits of liability.

Policies containing any SIR provision shall provide or be endorsed to provide that the SIR may be satisfied by either the named insured or CITY. CITY reserves the right to obtain a full certified copy of any insurance policy and endorsements. The failure to exercise this right shall not constitute a waiver of such right.

g. Waiver of Subrogation. CONSULTANT hereby agrees to waive subrogation which any insurer of CONSULTANT may acquire from CONSULTANT by virtue of the payment of any loss under a Workers Compensation, Commercial General Liability or Automobile Liability policy. All Workers Compensation, Commercial General Liability and Automobile Liability policies shall be endorsed with a waiver of subrogation in favor of CITY, its officers, agents, employees and volunteers for all worked performed by CONSULTANT, its employees, agents and subcontractors.

h. Liability/Remedies. Insurance coverage in the minimum amounts set forth herein shall not be construed to relieve CONSULTANT of liability in excess of such coverage, nor shall it preclude CITY from taking such other actions as are available to it under any other provisions of this Agreement or law.

6. Records. CONSULTANT and its subcontractors shall maintain all files and records relating to the services performed hereunder during the term of this Agreement and for a period of not less than one (1) year after the date of termination or expiration. Provided, however, that in the event of litigation or settlement of claims arising from the performance of this Agreement, CONSULTANT and its subcontractors shall maintain all files and records until such litigation, appeals or claims are resolved. Duly authorized representatives of CITY shall have right of access during normal business hours and after reasonable notice to CONSULTANT's and subcontractors' files and records relating to the services performed

hereunder, and may review and copy the files and records at appropriate stages during performance of the services and during the one (1) year period following termination or expiration of this Agreement. CONSULTANT shall include this provisions in its contracts with all subcontractors.

7. Time is of the Essence. Time is of the essence of this Agreement.

8. Compliance with Laws. CONSULTANT shall comply with all federal, state and local laws, ordinances and policies as may be applicable to the performance of services under this Agreement.

9. Ability to Perform. CONSULTANT agrees and represents that it has the time, ability and professional expertise to perform the services required under this Agreement.

10. Governing Agreement. In the event of any conflict between this Agreement and its EXHIBITS, the provisions of this Agreement shall govern. In the event of any conflict between any of the EXHIBITS, the provisions of the first in order of attachment shall govern.

11. Assignment. CONSULTANT is employed to perform unique personal services. CONSULTANT shall not assign this Agreement without the prior written consent of CITY. CONSULTANT shall not employ or otherwise incur any obligation to pay other specialists or experts for services in connection with this Agreement, without prior written consent of CITY.

12. Independent Contractor. CONSULTANT, inclusive of its agents, officers, employees, volunteers, independent contractors, and subcontractors, shall act as an independent contractor, and covenants and agrees that it will conduct itself consistent with such status, that it will neither hold itself out as, nor claim to be, an officer or employee of CITY by reason of this Agreement.

13. Representations and Warranties. CONSULTANT warrants that it has not employed or retained any company or person, other than a bona fide employee working for CONSULTANT, to solicit or secure this Agreement, and that it has not paid or agreed to pay any company or person, other than a bona fide employee, any fee, commission, percentage, brokerage fee, gift or any other consideration, contingent upon or resulting from the award or making of this Agreement. For breach or violation of this warranty, CITY shall have the right to terminate as void this Agreement, without liability, or, in its discretion, to deduct from the Agreement price or consideration, or otherwise recover, the full amount of such fee, commission, percentage, brokerage fee, gift or contingent fee.

14. Successors in Interest. This Agreement shall be binding upon the successors, executors, administrators and assigns of the respective parties hereto.

15. Copyright, Ownership and Use of Materials. All tangible material ("Material") created or delivered pursuant to this Agreement is considered a work made for hire under the Copyright Act. To the extent such Material does not qualify as a work made for hire, CONSULTANT hereby assigns to CITY all right, title, and interest, including but not limited to all copyrights, in all Material created by CONSULTANT in its performance under this Agreement. Material constitutes the scope of work outlined in Exhibit A and attached hereto, and all written and other tangible expressions, including but not limited to, drawings (including computer aided drawings), papers, documents, reports, surveys, renderings, exhibits, sketches, maps, models, prints, paintings or photographs, in any and all media or formats in which such materials have been created or are maintained. All Material furnished by CONSULTANT is, and shall remain, the property of CITY.

CONSULTANT shall execute any documents necessary to effectuate such assignment. In the event that CONSULTANT uses, employs, designates, or retains any person or entity who is not an employee of CONSULTANT, to perform any work required of it pursuant to this Agreement, CONSULTANT shall require said person or entity to execute an agreement containing the preceding paragraph.

16. Termination of Agreement. The City may terminate this Agreement without cause by giving CONSULTANT ten (10) days advance written notice from the City Manager. CONSULTANT may terminate this Agreement without cause by giving CITY thirty (30) days advance written notice. In the event of termination through no fault of CONSULTANT, CITY shall compensate CONSULTANT for services performed as of the date of termination, upon the release to CITY of all Material hereunder, in any and all media or formats in which such materials have been created or are maintained. CITY retains the right to receive and use any Material, notwithstanding any termination or any dispute regarding the amount to be paid.

17. Attorney's Fees; Venue; Governing Law. If either party commences any legal action against the other party arising out of this Agreement or the performance hereof, the prevailing party in such action shall be entitled to recover its reasonable litigation expenses, including but not limited to, court costs, expert witness fees, discovery expenses, and attorney's fees. Any action arising out of this Agreement shall be brought in Placer County, California, regardless of where else venue may lie. This Agreement shall be governed by and construed in accordance with the laws of the State of California.

18. Modification. This Agreement and each provision contained herein may be waived, amended, supplemented or eliminated only by mutual written agreement of the parties.

19. Severability. If any of the provisions contained in this Agreement are for any reason held invalid or unenforceable, such holding shall not affect the remaining provisions or the validity and enforceability of the Agreement as a whole.

20. Notices. Any notices to parties required by this Agreement shall be delivered personally or mailed, U.S. first class postage prepaid, addressed as follows:

CITY OF ROSEVILLE	CONSULTANT
Dennis Kauffman Assistant City Manager/Chief Financial Officer 311 Vernon Street Roseville, CA 95678	Jamie Gomes, Managing Principal Economic & Planning Systems, Inc. P.O. Box 340176 Sacramento, CA 95834

Either party may amend its address for notice by giving notice to the other party in writing.

20. Integrated Agreement. This is an integrated agreement and contains all of the terms, considerations, understanding and promises of the parties. It shall be read as a whole.

IN WITNESS WHEREOF, the City of Roseville, a municipal corporation, has authorized the execution of this Agreement in duplicate by its City Manager and attested to by its City Clerk under the authority of Resolution No. _____, adopted by the Council of the City of Roseville on the ___ day of _____, 20__, and CONSULTANT has caused this Agreement to be executed.

CITY OF ROSEVILLE, a municipal corporation	ECONOMIC & PLANNING SYSTEMS, INC., a California corporation
BY:_____ DOMINICK CASEY City Manager	BY: _____ its: Jason Moody, President/CEO

[SIGNATURES CONTINUED ON NEXT PAGE]

and

ATTEST:

BY: _____
its: Darin Smith, Secretary/CAO

BY: _____
SONIA OROZCO
City Clerk

APPROVED AS TO FORM:

BY: _____
MICHELLE SHEIDENBERGER
City Attorney

APPROVED AS TO SUBSTANCE:

BY: _____
DENNIS KAUFFMAN
Assistant City Manager/Chief Financial Officer

EXHIBIT “A”

May 18, 2021

Dennis Kaufmann
Assistant City Manager/Chief Financial Officer
City of Roseville
311 Vernon Street
Roseville, CA 95678

Subject: Master Services Agreement for Financial Consulting Services for Fiscal Year 2022-25; EPS #212082

Dear Dennis:

Economic & Planning Systems, Inc. (EPS) appreciates the opportunity to submit this proposal to provide consulting services to the City of Roseville (City). EPS has enjoyed working with the City over the years and looks forward to continuing that relationship in the next fiscal year and beyond. EPS understands the annual master services agreement for financial consulting services would begin in Fiscal Year 2021-22 and would be for a 3-year term.

Scope of Services

As may be requested by the City, EPS will provide ongoing financial consulting services to support the City's needs. Historically, EPS has assisted the City with the following types of analyses:

- Fiscal Impact Analyses
- Land-Secured Financing District Formation (Mello-Roos Community Facilities Districts)
- Economic Impact Analyses
- Public Finance (e.g., development impact fees)
- Real Estate Market and Feasibility Analyses
- Reuse, Revitalization, and Redevelopment Projects

Consistent with ongoing practices, when the City requests one or more specific services, EPS would prepare a Scope of Work in response to such a request. That specific Scope of Work would be accompanied by a budget identified for the specific task order.

The Economics of Land Use

Economic & Planning Systems, Inc.
P.O. Box 340176
Sacramento, CA 95834
916 649 8010 tel
916 649 2070 fax

Oakland
Sacramento
Denver
Los Angeles

www.epsys.com

Staffing

Key personnel expected to respond to City needs are Jamie Gomes, Ellen Martin, Amy Lapin, and David Zehnder, all of whom work in EPS's Sacramento office. Jamie and David are both Managing Principals of EPS and Amy and Ellen are both EPS Principals. Additional EPS staff are anticipated to provide additional technical support as needed.

Budget

EPS charges for its services on a direct-cost (hourly billing rates plus direct expenses), not-to-exceed basis; therefore, you will be billed only for the work completed up to the maximum authorized annual budget amount of **$100,000**. Travel, data, or reproduction expenses will be billed at cost, and invoices are submitted monthly and are payable on receipt. EPS's current Hourly Billing Rates are attached as part of this letter scope.

Again, EPS appreciates the opportunity to work with the City. Please call either of us at (916) 649-8010 if you have questions or require changes to this proposal.

Sincerely,

ECONOMIC & PLANNING SYSTEMS, INC. (EPS)

Jamie Gomes
Managing Principal

David Zehnder
Managing Principal

Attachment

2021 Hourly Billing Rates

	Sacramento Office
Managing Principal	$285–$300
Senior Principal	$350
Principal	$265
Executive/Senior Vice President	$240
Senior Consultant	$240
Vice President	$215
Senior Technical Associate	$195
Senior Associate	$185
Associate	$170
Research Analyst II	$130
Research Analyst I	$95
Production and Administrative Staff	$80

Billing rates updated annually.

COUNCIL COMMUNICATION

CC #: 1536
File #: 0800-03

Title:	Read-Only Sublicense To License and Software Services - Agreement
Contact:	William Forsythe 916-774-5619 wforsythe@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 7.26.

RECOMMENDATION TO COUNCIL

Staff recommends City Council adopt a resolution authorizing the City Manager to execute the Sublicense To License and Software Services Agreement (Agreement) with the Sacramento Municipal Utility District (SMUD) and its software vendor PowerSettlements.

BACKGROUND

Roseville Electric and its Balancing Authority of Northern California (BANC) partners joined the California Independent System Operator's (CAISO) voluntary Energy Imbalance Market (EIM) on March 25, 2021. Participating in the EIM involves interacting with the CAISO through BANC. The monthly settlements for energy imbalances with CAISO are aggregated by BANC and distributed to members like Roseville according to our level of voluntary participation. BANC selected PowerSettlements as the software vendor for BANC and members like Roseville to check and validate the CAISO and BANC settlements. Since SMUD joined EIM two years ahead of Roseville and the other BANC members, PowerSettlements was selected by SMUD as the BANC-wide settlement system. Accordingly, Roseville was requested to enter into an Agreement to extend the software licensing terms to cover Roseville's use.

FISCAL IMPACT

There is no added fiscal impact to executing the sublicense Agreement. The funds for the software were already budgeted in the Electric Department FY2020-21 budget and will be in future years' budget requests for ongoing costs.

ENVIRONMENTAL REVIEW

The California Environmental Quality Act (CEQA) only applies to projects which have the potential to cause a significant effect on the environment. Where it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment, the

activity is not subject to CEQA. (CEQA Guidelines §15061(b)(3)).

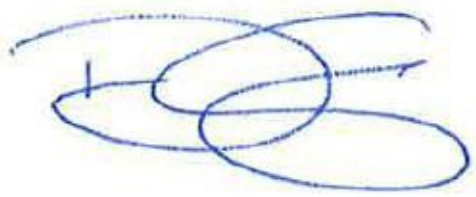
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Goal F - Invest in well-planned infrastructure and growth

Respectfully Submitted,

William Forsythe, Power Supply & Portfolio Administrator

Michelle Bertolino, Electric Utility Director



_____
Dominick Casey, City Manager

ATTACHMENTS:

Description

Resolution 21-268

Power Settlements SMUD Roseville Exhibit C Sublicense

RESOLUTION NO. 21-268

APPROVING AN AGREEMENT, BY AND BETWEEN SACRAMENTO MUNICIPAL UTILITY DISTRICT AND THE CITY OF ROSEVILLE, AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE

WHEREAS, a Read-Only Sublicense to License and Software Services Agreement (Non-Exclusive), by and between Sacramento Municipal Utility District and the City of Roseville, has been reviewed by the City Council; and

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Roseville that said agreement is hereby approved and that the City Manager is authorized to execute it on behalf of the City of Roseville.

PASSED AND ADOPTED by the Council of the City of Roseville this____day of _____, 20_, by the following vote on roll call:

AYES COUNCILMEMBERS:

NOES COUNCILMEMBERS:

ABSENT COUNCILMEMBERS:

_____
MAYOR

ATTEST:

_____
City Clerk

READ-ONLY SUBLICENSE TO LICENSE AND SOFTWARE SERVICES AGREEMENT (NON-EXCLUSIVE)

This Read-Only Sublicense to the License and Software Services Agreement (this "Read-Only Sublicense") is agreed to and made effective as of January 1, 2021 ("Effective Date") by and between Sacramento Municipal Utility District (hereinafter "SMUD," "BANC Administrator," or "Sublicensor"), a political subdivision of the State of California, on behalf of the Balancing Authority of Northern California (hereinafter "BANC"), and the City of Roseville, a municipal corporation of the State of California, (hereinafter a "Read-Only Sublicensee"). This Read-Only Sublicense and all terms and conditions herein are incorporated into the License and Software Services Agreement (Non-Exclusive) entered into by SMUD and Power Settlements Consulting and Software, LLC ("Power") on the December 26, 2019 (the "Agreement"). Capitalized terms used in this Read-Only Sublicense, which are not defined in this Read-Only Sublicense, will have the respective meanings ascribed to them in the Agreement.

1. License.

a. Grant of License to Read-Only Sublicensees. In consideration of the fees payable to Power pursuant to Article 5 of the Agreement, and the rights and obligations granted by Power to SMUD pursuant to Article 2 and Section 13.1 of the Agreement, Sublicensor hereby grants to each Read-Only Sublicensee a revocable, non-transferable, non-sublicenseable, non-exclusive right and sublicense to access on a read-only basis Sublicensor's hosted environment deployment of the Software, including the ISO Downloader Module, the Visual Analytics Module, the Settlement Analyzer Module, and the PPA Module (as Software and each module is defined in Article 1 of the Agreement), provided that each Read-Only Sublicensee shall have read-only access to and may use the PPA Module solely for the settlement of its PPAs in the EIM Market resulting from BANC entity scheduling coordinator allocation results processed by the BANC Administrator.

b. Obligations and Restrictions.

i. Sublicensor shall grant to each Read-Only Sublicensee access to Sublicensor's servers and the hosted environment deployment of the Software solely as necessary to perform under and effectuate this Read-Only Sublicense.

ii. Each Read-Only Sublicensee may only use the Software for One (1) of Sublicensee's CAISO scheduling coordinator IDs.

iii. Each Read-Only Sublicensee shall also adhere to the Restrictions set forth in Section 2.2 of the Agreement.

2. **Additional Payments for License to Read-Only Sublicensees**. Section Not used.

3. **Representations and Warranties**.

a. Sublicensor represents and warrants that it has the authority to enter into this Read-Only Sublicense on behalf of itself, BANC, and the BANC Members.

b. Each Read-Only Sublicensee represents and warrants that it has received, has reviewed, undertakes the obligations of Licensee specified in, and will be responsible for its own compliance with the following provisions of the Agreement: Section 2.2; Sections 6.1 and 6.2 (Audits); Article 7 (Confidential Information); Sections 8.1 and 8.4; Section 9.4; Sections 11.1 and 11.3; Article 12; and Appendix (Mutual Confidentiality and Non-Disclosure Agreement).

c. Each Read-Only Sublicensee further assumes all responsibility and liability on behalf of itself in exercising this Sublicense. Power's responsibilities are solely to Sublicensor and may not be assigned by Sublicensor, without Power's express written permission.

4. **Term and Termination of Read-Only Sublicense**.

a. The Term of this Read-Only Sublicense shall begin on the Effective Date and shall continue until the earlier of (i) termination or expiration of the Agreement by any party for any reason, or (ii) termination of this Read-Only Sublicense pursuant to Section 4(b), below.

b. Any of Sublicensor, a Read-Only Sublicensee, or Power may terminate this Read-Only Sublicense at any time, with or without cause, upon written notice to the other parties.

c. Section not used.

d. In the event of termination or expiration of the Agreement or this Read-Only Sublicense, all support and maintenance of the Software within the Read-Only Sublicense shall discontinue.

5. **Further Indemnification by Read-Only Sublicensee**. Each Read-Only Sublicensee shall indemnify, defend, and hold harmless Sublicensor and its officers, directors, shareholders, members, employees, agents, representatives, and customers (collectively, "Sublicensor Indemnitees") against (i) all liability, claims, costs, damages, and expenses incurred by Sublicensor Indemnitees relating to or arising out of the willful misconduct or negligence of Sublicensee from or concerning the Software, and (ii) all liability,

claims, costs, damages, and expenses incurred by the Sublicensor Indemnitees relating to or arising out of the Agreement and/or this Read-Only Sublicense. Each Read-Only Sublicensee agrees to reimburse Sublicensor for any amounts owed hereunder immediately upon demand, or alternatively, at the election of Sublicensor, to promptly and directly pay any such amounts with respect to any matter for which Sublicensor is indemnified pursuant to this Read-Only Sublicense (including attorneys' fees by Sublicensor in defense or prosecution of any claim to which this Read-Only Sublicense applies) to such person or entity as Sublicensor designates. Any amount to be paid by the Read-Only Sublicensee shall be paid to Sublicensor or designee, within a reasonable time following written demand therefore by Sublicensor. This provision survives termination or expiration of the Agreement or termination of this Read-Only Sublicense.

6. Limitation of Liability.

6.1 Exclusion of Consequential Damages. TO THE EXTENT NOT PROHIBITED BY LAW, IN NO EVENT SHALL EITHER PARTY BE LIABLE TO THE OTHER (NOR POWER TO ANY SUBLICENSEE) FOR ANY CONSEQUENTIAL, INDIRECT, SPECIAL, OR INCIDENTAL DAMAGES, INCLUDING BUT NOT LIMITED TO FAILURES OR LIMITATIONS OF THE SOFTWARE OR SOFTWARE SERVICES, INCLUDING LOSS, DAMAGE, CORRUPTION OR RECOVERY OF DATA, EVEN IF SUCH PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH POTENTIAL LOSS OR DAMAGE. THIS MUTUAL WAIVER OF CONSEQUENTIAL DAMAGES SHALL NOT APPLY TO THOSE CLAIMS FOR DAMAGES ARISING FROM THE GROSS NEGLIGENCE OR INTENTIONAL OR WILLFUL MISCONDUCT OF THE OTHER PARTY.

6.2 Limit on Damages. READ-ONLY SUBLICENSEE AGREES THAT POWER SHALL HAVE A MAXIMUM LIABILITY TO READ-ONLY SUBLICENSEE OF ONE HUNDRED AND NO/100 DOLLARS ($100.00).

7. Miscellaneous.

a. The parties agree and acknowledge that Power is a third-party beneficiary to this Read-Only Sublicense.

b. This Read-Only Sublicense supersedes any prior agreements, negotiations and communications, oral or written, and contains the entire agreement between any of Sublicensor, any Read-Only Sublicensee, and/or Power, as to the subject matter hereof. No subsequent agreement, representation or promise made by either party hereto, or by or to any employee, officer, agent or representative of either party shall be of any effect unless it is in writing and executed by the party to be bound thereby.

c. The Agreement, which is incorporated herein by reference, and any and all terms and conditions therein, shall apply with equal force and effect on each Read-Only Sublicensee.

d. Attorney's Fees. If any legal action is taken to enforce the terms of this Agreement by any party, the prevailing party shall be entitled to recover reasonable attorney fees and other costs and expenses incurred in connection with that legal action.

IN WITNESS WHEREOF, the parties hereto have executed this Read-Only Sublicense as of the day and year first above written.

SMUD:

By: _____

READ-ONY SUBLICENSEE:

City of Roseville

By: _____
Printed Name: _____
Title: _____

ACCEPTED AND AGREED:

POWER: Power Settlements Consulting and Software, LLC

By: _____
David Dan, President

COUNCIL COMMUNICATION

CC #: 1530
File #: 0103-17 & 0201

Title: Roseville Natural Gas Financing Authority - Fiscal Year 2021-22 Budget
Contact: Nick Rosas 916-774-5314 nrosas@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 7.27.

RECOMMENDATION TO COUNCIL

Staff is recommending the City Council, acting as the Roseville Natural Gas Financing Authority (RNGFA), approve the attached resolution adopting the RNGFA FY2021-22 budget.

BACKGROUND

Attached is the RNGFA budget for FY2021-22. The debt service expense budget of $16,784,500 represents principal and interest payments on the 2007 Gas Revenue Bonds, which financed the prepayment of natural gas used for power generation at the Roseville Energy Park.

FISCAL IMPACT

The budget document provides a financial summary of the revenues and expenses of the RNGFA. Approval of the annual budget has no new fiscal impact.

ENVIRONMENTAL REVIEW

The California Environmental Quality Act (CEQA) does not apply to activities that will not result in a direct or reasonably foreseeable indirect physical change in the environment, or is otherwise not considered a project as defined by CEQA Statute §21065 and CEQA State Guidelines §15060(c)(3) and §15378. Approval of a yearly budget meets the above criteria and is not subject to CEQA. No additional environmental review is required.

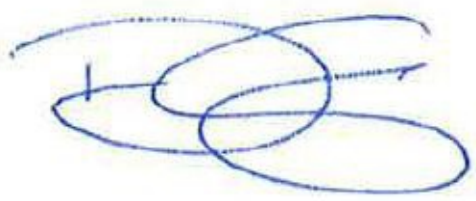
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Goal A - Remain fiscally responsible in a changing world

Respectfully Submitted,

Nick Rosas, Accounting Manager

Dennis Kauffman, Assistant City Manager/Chief Financial Officer



_____

Dominick Casey, City Manager

ATTACHMENTS:

Description

Resolution 2-21

FY 2022 Budget

ROSEVILLE NATURAL GAS FINANCING AUTHORITY
RESOLUTION NO. 2-21

ADOPTING THE ANNUAL BUDGET FOR THE FISCAL YEAR 2021-22

WHEREAS, the Roseville Natural Gas Financing Authority has reviewed the proposed Roseville Natural Gas Financing Authority Budget FY2021-22;

NOW, THEREFORE, the Roseville Natural Gas Financing Authority does hereby resolve that the attached Roseville Natural Gas Financing Authority Budget FY2021-22 is hereby approved.

PASSED AND ADOPTED by the Roseville Natural Gas Financing Authority this___day of_____, 20___, by the following vote on roll call:

AYES AGENCY MEMBERS:

NOES AGENCY MEMBERS:

ABSENT AGENCY MEMBERS:

_____
CHAIR

ATTEST:

_____
Secretary

Roseville Natural Gas Financing Authority

	Actual FY2020	Estimate FY2021	Budget FY2022
OPERATING REVENUES			
Current Services - Sale of Natural Gas to Roseville Electric	$ 16,521,170	$ 16,803,750	$ 16,749,500
Administrative Fees	50,190	55,000	55,000
Total Revenues	**16,571,360**	**16,858,750**	**16,804,500**
LESS OPERATING EXPENSES			
Administrative Expenses (Audit, Fiscal Agent & Rating Agency)	19,159	20,000	20,000
Interest Expense	859	-	-
Total Operating Expenses	**20,018**	**20,000**	**20,000**
LESS CAPITAL AND DEBT EXPENSES			
Debt Service - Series 2007 Gas Revenue Bonds	16,571,250	16,818,750	16,784,500
Total Capital and Debt Expenses	**16,571,250**	**16,818,750**	**16,784,500**
INCREASE (DECREASE) FROM OPERATIONS	**(19,908)**	**20,000**	**-**
FUND BALANCE, BEGINNING OF YEAR	**-**	**(19,908)**	**92**
INCREASE (DECREASE) FROM OPERATIONS	**(19,908)**	**20,000**	**-**
FUND BALANCE, END OF YEAR	**$ (19,908)**	**$ 92**	**$ 92**

COUNCIL COMMUNICATION

CC #: 1538
File #: 0800-02

Title:	Pleasant Grove Wastewater Treatment Plant Energy Recovery Project Design-Assist and Construction Contract - Change Order Allowance Increase
Contact:	Tracie Mueller 916-774-5688 trmueller@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 7.28.

RECOMMENDATION TO COUNCIL

Staff recommends that City Council authorize the Environmental Utilities Director or his designee to approve and pay for contract change orders for the Design-Assist and Construction Agreement for the Pleasant Grove Wastewater Treatment Plant Energy Recovery Project with W.M. Lyles Company that could increase the original contract amount ($23,349,729) by no more than 10% ($2,334,973) or not to exceed a total contract amount of $25,684,702.

BACKGROUND

The City of Roseville (City) owns and operates the Pleasant Grove Wastewater Treatment Plant (PGWWTP) on behalf of the South Placer Wastewater Authority (SPWA) partner agencies. The PGWWTP Energy Recovery Project (Project) is currently being constructed as a separate parallel project to the PGWWTP Expansion Project and is being built on City-owned property located adjacent to, and immediately south of the existing PGWWTP fence line.

The Project is adding energy-recovery facilities at the PGWWTP that will beneficially utilize digester gas (which has a high methane fraction) produced by the new treatment processes constructed as part of the PGWWTP Expansion Project. The Project includes the following facilities: three microturbines (with plans for possible future fourth unit), receiving facility for High Strength Waste (such as pre-processed food waste and fats, oils and grease), systems for conditioning and upgrading the digester gas to produce renewable compressed natural gas r(CNG) to be used by the City's solid waste collection vehicles as fuel, a fueling station, and associated parking.

The newly added microturbines will produce electrical power to offset a portion of the PGWWTP's power demands and the heat needed for the anaerobic digestion process, thereby making it possible for all the methane gas generated from the PGWWTP Expansion Project to be consumed and converted to heat and electricity.

On November 6, 2019, the City Council approved and awarded a Design-Assist and Construction

Agreement to W.M. Lyles Company for the Project in the amount of $23,394,729 (Attachment A). In addition, the City Council authorized the Environmental Utilities Director or his designee to approve and pay for contract change orders for the Project that could increase the contract amount by no more than 5% or $1,169,736.

W.M. Lyles received the Notice to Proceed on November 13, 2019 which began the approximate 27-month period of construction of the Project with completion expected in February 2022. The current approved change orders on the Project total $412,564; however the next change order is expected to be approximately $546,000 which would use approximately $958,564 of the previously approved 5% change order allowance of $1,169,736. It is expected that the total change orders will continue to increase over the next 9 months of construction and soon exceed the approved 5% allowance; therefore staff recommend increasing the change order allowance from 5% to 10% to assure there is enough contract allowance to complete this Project.

The cause of the Project construction changes is based on many factors including material suppliers issues due to COVID-19, City staff requested changes due to lessons learned on the recent Dry Creek Wastewater Treatment Plant Cogeneration Project, City standards updates, clarifications to the design documents and other recommended improvements to the construction through the design-assist construction process.

FISCAL IMPACT

The cost of the agreement is $23,394,729 and any approved change orders will be expended over a 27-month period. Funding for this Project is provided under the capital improvement program for SPWA. The SPWA Board has authorized the Project and adequate budget to fund the requested increase in change order allowance from $1,169,736 to $2,334,973. This project is jointly funded between SPWA Regional Partners (approximately 65% City of Roseville, 11% Placer County and 24% South Placer Municipal Utility District), as well as, the following grants and loan:

- California Energy Commission grant for up to $3,000,000, which was approved at the July 17, 2019, City Council Meeting (Resolution No. 19-334).
- Carl Moyer Grant through the Placer County Air Pollution Control District for up to $180,000, which was approved at the May 15, 2019, City Council Meeting (Resolution No. 19-205).
- State Water Resources Control Board State Revolving Fund loan for up to $32,748,824, which was approved at the April 15, 2020, City Council Meeting (Resolution No. 20-110).

ENVIRONMENTAL REVIEW

Implementation of the PGWWTP Energy Recovery Project was previously evaluated in the Pleasant Grove Wastewater Treatment Plant Expansion and Energy Recovery Project Final Initial Study/Mitigated Negative Declaration (IS/MND) (SCH# 2016122040) (certified by the City Council on April 6, 2017), and the Addendum to the IS/MND (SCH# 2016122040) (certified by the City Council on November 7, 2018). The improvement plans included in the design-assist and construction agreement are consistent with the project evaluated in the certified Final IS/MND and the Addendum, and consequently no additional CEQA action is required for the design-assist and construction agreement contract change order allowance approval.

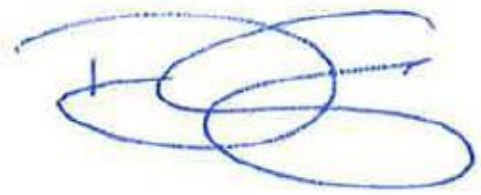
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Goal F - Invest in well-planned infrastructure and growth

Respectfully Submitted,

Tracie Mueller, Senior Engineer

Richard Plecker, Environmental Utilities Director



Dominick Casey, City Manager

ATTACHMENTS:

Description

Resolution 21-270

Attachment A - Fully Executed Agreement Part One

Attachment A - Fully Executed Agreement Part Two

RESOLUTION NO. 21-270

APPROVING AN INCREASE IN CHANGE ORDER AUTHORITY

WHEREAS, a contract with W.M. Lyles Company for the Pleasant Grove Wastewater Treatment Plant Energy Recovery Project was approved by City Council on November 6, 2019; and

WHEREAS, due to material supplier issues due to COVID-19, City staff requested changes, City standards updates, clarification to design documents and other recommended improvements, it is expected that the total change orders will continue to increase over the next 9 months of construction and soon exceed the approved 5% allowance; and

WHEREAS, staff is therefore recommending a five percent (5%) increase in change order authority amount from five percent (5%) to ten percent (10%) of the total contract price; and

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Roseville that the Environmental Utilities Director, or his designee, is authorized to approve change orders for the project, consistent with the contract terms, provided that the net cost of all change orders shall not exceed ten percent (10%) of the original contract price.

PASSED AND ADOPTED by the Council of the City of Roseville this____day of _____, 20_, by the following vote on roll call:

AYES COUNCILMEMBERS:

NOES COUNCILMEMBERS:

ABSENT COUNCILMEMBERS:

_____
MAYOR

ATTEST:

_____
City Clerk

CITY OF ROSEVILLE CALIFORNIA

City Clerk
311 Vernon Street
Roseville, California 95678-2649

November 7, 2019

W.M. Lyles Company
PO BOX 4377
Fresno, CA 93744

RE: **DESIGN-ASSIST & CONSTRUCTION AGREEMENT – Pleasant Grove Wastewater Treatment Plant Energy Recovery Project**

At the Roseville City Council meeting of November 6, 2019, the Roseville City Council approved the above referenced agreement between you and the City. Enclosed please find a fully executed agreement and a certified copy of Resolution Number 19-475.

If you have any questions, please contact Senior Engineer Tracie Mueller at 916-774-5688.

SONIA OROZCO, MMC
CITY CLERK

By:

Cary Busterna

Cary Busterna
City Clerk Technician

cc: Tracie Mueller/ Environmental Utilities

AGREEMENT FOR THE DESIGN-ASSIST AND CONSTRUCTION OF

Pleasant Grove Wastewater Treatment Plant Energy Recovery Project

THIS AGREEMENT, made and entered into in duplicate, on November 6, 2019, by and between the CITY OF ROSEVILLE, a municipal corporation and located in Placer County, CA (hereinafter referred to as "City"), and W.M. Lyles Co. (Lyles) (CSLB License #422390 A and B), doing business as a California corporation hereinafter referred to as "Contractor").

RECITALS

WHEREAS, the City gave published NOTICE TO GENERAL CONTRACTORS requesting Statements of Pre-Qualifications ("SOPQ") to be submitted by April 1, 2019 for consideration by the City to become a Pre-Qualified Contractor approved by the City to submit a Bid Proposal for the design-assist and construction of the Pleasant Grove Wastewater Treatment Plant Energy Recovery Project; and

WHEREAS, Contractor, pursuant to the provisions of said notice requesting Statements of Pre-Qualifications, submitted an SOPQ to the City and such SOPQ is included in this Agreement and made a part hereof as Exhibit A; and

WHEREAS, the City, based on the representations and statements made by Contractor in its SOPQ, approved the Contractor as a Pre-Qualified Contractor which allowed Contractor to submit a Bid Proposal for the design-assist and construction of the Pleasant Grove Wastewater Treatment Plant Energy Recovery Project; and

WHEREAS, the City issued Request for Bid Proposals ("RFBP") to the approved list of Pre-Qualified Contractors to be submitted by July 22, 2019 to allow for the City to determine the best value ranking of all responsive and responsible Proposals using all technical information, required forms, cost information provided by Proposers in the Proposals, and other investigations by the City; and

WHEREAS, the Contractor, pursuant to the requirements of the City's RFBP submitted a Bid Proposal for the design-assist and construction of the Pleasant Grove Wastewater Treatment Plant Energy Recovery Project and such Technical Bid Proposal is included in this Agreement and part hereof as Exhibit B; and

WHEREAS, the City, after an evaluation of all opened Bid Proposals, ranked the Contractor's Bid Proposal as the highest ranked and best value Bid Proposal, and after final negotiations with Contractor, issued a written Notice of Intent to award a Contract to the Contractor on October 31, 2019 for the design-assist and construction of the Pleasant Grove Wastewater Treatment Plant Energy Recovery Project; and

WHEREAS, at a regular meeting of the City Council held on the 6th day of November 2019 by Resolution 2019-475 the City Council found and declared the Bid Proposal of Contractor to be the highest ranked best value Bid Proposal and thereupon awarded this Agreement to the Contractor for the construction of the Pleasant Grove Wastewater Treatment Plant Energy Recovery Project; and

WHEREAS, the Contractor is ready, willing and able to perform the aforementioned services required in accordance with the terms and conditions of this Agreement; and

NOW, THEREFORE, the City and Contractor agree as follows:

ARTICLE 1 - DEFINITIONS OF LANGUAGE USED, WORDS AND TERMS

Where used in the Contract Documents, the following words and terms shall have the meanings indicated. The meanings shall be applicable to the singular, plural, masculine and feminine of the words and terms.

The Contract Documents include the terms "as allowed," "as approved," "as ordered", "as directed" or terms of like effect to authorize an exercise of professional judgment by the City, Construction Manager or Engineer. In addition, the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect are used to describe an action or determination of the City, Construction Manager or Engineer as to the Work. It is intended that such exercise of professional judgment, action or determination will be solely to evaluate, in general, the Work for compliance with the requirements of and information in the Contract Documents and conformance with the design concept of the completed Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term is not intended to and shall not be effective to assign to City, Construction Manager or Engineer any duty or authority to supervise or direct the performance of the Work or any duty or authority contrary to the other provisions of the Contract Documents.

Specification Section Paragraphs entitled "Section Includes" summarize briefly what is generally included in the section. Requirements of Specifications are not limited by "Section Includes" paragraphs. Specifications and Drawings have been partially streamlined by intentionally omitting words and phrases, such as "the Contractor shall," "in conformity therewith," "shall be" following "as indicated," "a," "an," "the" and "all." Phrase "by City's Representative" or "by Engineer" or "by Construction Manager" modifies words such as "accepted," "directed," "selected," "inspected," and "permitted," when they are unmodified.

Phrase "to City's Representative " or "to Engineer" or "by Construction Manager" modifies words such as "submit," "report," and "satisfactory," when they are unmodified.

Words "Contractor shall" are implied when direction is stated.

Colons (:) are used to introduce a list of particulars, an amplification, or an illustrative quotation:

1. When used after designation of product, colons are used in place of words "shall be."

Whether the term or phrase is capitalized or in all capitals (for example, Contractor or CONTRACTOR) in the Contract Documents shall be deemed to be the same for purposes of the Definitions of Language Used, Words and Terms.

Agreement. This Agreement for design-assist and construction of the Pleasant Grove Wastewater Treatment Plant Energy Recovery Project, its exhibits, all documents incorporated therein, and all amendments and/or modifications hereto executed by the parties concerning the performance of the Work and the furnishing of labor, equipment, materials and incidentals in the construction of the Work. This Agreement supersedes all prior negotiations, representations, and/or agreements, whether written or oral.

Allowance. "Allowance" shall mean an amount of money set aside under the Contract for a special purpose identified and defined in the Contract Documents. See Exhibit D, ALLOWANCES AND ALLOWANCE AMOUNTS.

Applicable Laws. All laws, codes, ordinances, rules and regulations of governmental authorities having jurisdiction over the Site and/or the Work.

Application for Payment. A document prepared by Contractor and submitted to the City showing Contractor's entitlement to payments, the requirements of which are more fully described in Article 12.3, Applications for Payment.

Asbestos. Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

Beneficial Occupancy. Beneficial occupation or "Beneficial Occupancy" is a term that can be used to describe a distinct portion of the Work, that in the City's Representative's opinion, is capable of being used for its intended purpose, even though it may have some minor deficiencies, including outstanding punch list items to complete.

Bid Proposal. The offer of a Proposer to perform the Work pursuant to completed prescribed Bid Proposal requirements and forms, properly executed and guaranteed, and timely submitted.

Bonds: Labor and Material Bond, Performance Bond, and Warranty Bond. The payment bond (Labor and Materials Payment Bond) and Performance Bond issued by an admitted Surety covering the faithful performance and completion of the Work, including payment for all materials and labor furnished or supplied in connection with the Work, by Contractor. The Labor and Material Bond shall be in an amount equal to one hundred percent (100%) of the GMP and shall be for payment of just claims for materials, equipment, labor and subcontractors employed by the Contractor thereon. See Exhibit G, FAITHFUL PERFORMANCE BOND; Exhibit H, LABOR AND MATERIAL PAYPMENT BOND; and Exhibit I, WARRANTY BOND.

The Faithful Performance Bond shall be in an amount equal to one hundred percent (100%) of the GMP and shall be for the faithful performance of the Agreement, and for the fulfillment of such other requirements as may be provided by Law.

The Warranty Bond shall be issued by an admitted Surety and be in the penal sum equal to ten percent (10%) of the GMP.

The surety company shall familiarize itself with all of the conditions and provisions of this Agreement, and it waives the right of special notification of any change or modification of this Agreement or of extension of time, or of decreased or increased work, or of the cancellation of the Agreement, or of any other act or acts by the City or its authorized agents under the terms of this Agreement; and failure to so notify the aforesaid surety companies of changes shall not relieve the surety companies of their obligations under this Agreement.

All premiums for the Performance Bond, Labor and Materials Payment Bond, and Warranty Bond shall be included in the Cost of the Work and GMP. The City shall have the right to withhold any payment(s) under this Agreement until Contractor has fully complied with all bonding requirements.

Business Day. "Business Day" means any day when the office of the City Clerk of the City of Roseville is open for business.

Change Order. A document which is signed as recommended by the Construction Manager, accepted by the Contractor, and accepted by an authorized representative of the City, which authorizes an addition, deletion, or revision in the Work or an adjustment in the Guaranteed Maximum Price (GMP) or the Contract Time, issued on or after the Effective Date of the Agreement.

City. The word "City" refers to the City of Roseville, the governing body of which is termed the "City Council".

City's Representative. The person(s) designated by the Director of the City's Environmental Utilities Department who has been duly authorized to exercise control and supervision of the Work. A City's Representative generally will be either a professional engineer or architect, depending on the nature of the Work, but is not required to be a professional engineer or architect.

Claim. A demand or assertion by the Contractor seeking an adjustment of the GMP or Contract Times, or both, or other relief with respect to the terms of the Agreement. A demand for money or services by a third party is not a Claim.

Construction Change Directive (CCD). A CCD is a written order prepared by the Construction Manager and signed by the City, directing a change in the Work and stating a proposed basis for adjustment, if any, in the Contract GMP amount or Contract Time.

Construction Manager. The person designated, in writing, by the City to act as its representative at the Site and to perform administrative functions relating to this Agreement. The Construction Manager shall also furnish inspection services as provided by the contract between the Construction Manager and the City. All contact by the Contractor with the City shall be through the Construction Manager; unless otherwise specified or directed. Only the City may modify the Agreement.

Contract Documents. The "Contract Documents" shall consist of the following documents and all documents incorporated therein:

- Request for Bid Proposal (including appendices);
- Agreement (including exhibits A-L attached thereto);
- General Requirements (Division 1);
- Technical Specifications (Divisions 2 through 46);
- Appendices included with Technical Specifications;
- Contract Drawings, prepared by Engineer;
- Addenda issued during the RFBP period; and
- Permits from other agencies specifically required for the performance of the Work as may be required by law.
- City of Roseville's most current version (and Amendments to the current version) of Construction Standards and Design Standards
- Other Referenced Standard Specifications;
- Other Referenced Standard Plans

Exhibits to this Agreement (enumerated as follows):

- Exhibit A - Contractor's SOPQ dated April 1, 2019 excluding the financial statement;
- Exhibit B - Contractor's Technical Bid Proposal dated July 22, 2019 excluding Sections 7 through 11 and the appendices;
- Exhibit C - Guaranteed Maximum Price, Cost of Work and Fees;
- Exhibit D - Allowances and Allowance Amounts;
- Exhibit E - Designation of Subcontractors;
- Exhibit F - Completion Times and Liquidated Damages;
- Exhibit G - Faithful Performance Bond;
- Exhibit H - Labor and Materials Payment Bond;
- Exhibit I - Warranty Bond;
- Exhibit J - Escrow Agreement For Security Deposits In Lieu of Retention;
- Exhibit K - Workers' Compensation Insurance Certification;
- Exhibit L - Contractor's Insurance Certificates;

The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:

- Notice to Proceed;
- Field Directive(s);
- Change Order(s);
- Construction Change Directive;
- Field Order(s).

There shall be no Contract Documents other than those listed above.

The Contract Documents are complementary; what is called for by any one of the documents is as binding as if called for by all the documents. It is the intent of the Drawings and Specifications to describe the Work to be constructed in accordance with the requirements of the Contract Documents. Any work, materials or equipment that may reasonably be inferred from the requirements of the Contract will be furnished and performed whether or not specifically called for. When words or phrases that have a well-known technical or construction industry or trade meaning are used to describe Work, materials or equipment, such words or phrases shall be interpreted in accordance with that meaning. The intent of the Drawings specifically includes the intent to depict construction that complies with all applicable laws, codes and standards. Subject to applicable law, including but not limited to California Public Contract Code Section 4100 et seq., and the terms of this Contract governing subcontracting, the Divisions and Sections of the Specifications and identifications of any Drawings shall not control Contractor in dividing the Work among subcontractors or suppliers or delineating the work to be performed by any specific trade.

Reasonably implied parts of the Work shall be performed as "incidental work" even though absent from the Drawings and Specifications. "Incidental" work shall be performed by Contractor and included in the Cost of the Work without an increase in the GMP. Incidental work includes any work not shown on Drawings nor described in Specifications, but which is necessary or normally or customarily required as a part of the Work shown on the Drawings or described in the Specifications to provide a complete installation which is fully connected and tied into the existing facilities and processes and is fully functional and operational. Incidental work shall be treated as if fully described in Specifications and shown on Drawings, and expense thereof shall be included in the GMP. Incidental work includes, but is not limited to, tasks required to be performed under Division 1, GENERAL REQUIREMENTS of the Specifications.

The technical specifications are presented in paragraphs for convenience. However, this presentation does not necessarily delineate trades or limits of responsibility. All paragraphs of the Specifications and Plans are interdependent and applicable to the Work as a whole.

The Specifications and all notes on the Drawings are directed to the Contractor unless otherwise indicated, and all work shall be performed by the Contractor even though phrases such as "the Contractor shall" or "shall be done by the Contractor" are omitted. Where terms such as "approved," "acceptable," "favorably reviewed," "review," "selected," "directed," "equivalent," "equal," or "satisfactory" are used, it shall mean by or to the Construction Manager and/or City's Representative and/or Engineer.

In resolving conflicts resulting from errors or discrepancies in any of the Contract Documents, the order of precedence shall be as follows:

(1) Permits from other agencies specifically required for the performance of the Work as may be required by law;
(2) Supplemental Agreements and Change Orders, the one dated later having the precedence over another dated earlier;
(3) Agreement;
(4) General Requirements (Sections 01 11 00 through 01 99 90);
(5) Technical Specifications (Division 2 and all other Divisions following);
(6) Contract Drawings;
(7) City of Roseville's most current version of Construction Standards and Design Standards and Amendments to the Current Version
(8) Other Referenced Standard Specifications;
(9) Other Referenced Standard Plans.

With reference to the Drawings, the order of precedence is as follows:

(1) Addenda/Change Order drawings govern over any other drawings;
(2) Enumerated dimensions govern over scaled dimensions;

(3) Detail drawings govern over general drawings; and
(4) Contract Drawings govern over standard drawings/plans.

The provisions of the Contract Documents shall take precedence over any Laws or Regulations applicable to the performance of the work unless such an interpretation of the provisions of the Contract Documents would result in a violation of such Law or Regulation.

Contract Time. The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any, (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Construction Manager's written recommendation of final payment. See Exhibit F, COMPLETION TIMES AND LIQUIDATED DAMAGES.

Contractor. The individual, partnership, corporation or limited liability company who enters into the Agreement for the performance of the Work. The term "Contractor" means the Contractor or his authorized representative. The term "Contractor" also may include subcontractors, sub-tier subcontractors, consultants, equipment and material suppliers, and their employees.

Contractor's Plant and Equipment. The equipment, material, supplies and all other items, except labor, brought onto the Site by the Contractor to carry out the Work, but not to be incorporated in the Work.

Cost of the Work. Consists of those items of Work, which are paid for by City to Contractor, and consist of those categories of costs set forth as allowable on Exhibit C, GUARANTEED MAXIMUM PRICE, COST OF WORK AND FEE. The "Actual Total Cost of the Work" is the aggregate amount of costs and fee actually chargeable to City under the provisions of Exhibit C, GUARANTEED MAXIMUM PRICE, COST OF WORK AND FEE, up to the GMP.

County. Refers to Placer County where the Site is located.

CPM. A critical path method schedule in the form of precedents, networks, and time sequences.

Days. The word "Days" shall mean calendar days, including legal holidays, Saturdays and Sundays, unless specifically noted otherwise. The day shall be 24 hours measured from midnight to the next midnight.

Defective Work. Defective Work refers to Work that does not meet the requirements of the Contract Documents and has been identified to the Contractor by the Construction Manager in writing because the Work:

A. Does not meet the requirements of or conform to the Contract Documents; or

B. Does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or

C. Has been damaged prior to Construction Manager's or Engineer's recommendation of final payment (unless responsibility for the protection thereof has been assumed by City as of the Substantial Completion date in accordance with the Contract Documents).

Punch list or other minor corrective items of work that are not in compliance with the Contract Documents do not meet to the definition of "Defective Work" as used in these Contract Documents. For work to be deemed "Defective Work," the Construction Manager must have notified the Contractor in writing of a defective item of the Work.

Engineer. The engineer, architect or specialty design consultant designated by the City to have design control over the Work or a specified portion of the Work, acting either directly or through duly authorized representatives. Such representatives shall act within the scope of the particular duties delegated to them. The Engineer may also furnish inspection services as provided by the Agreement. The Engineer may also

be referred to as the "City's Representative " if the definition is used in an Engineer role and capacity. For the purposes of this Agreement, the Engineer is Brown and Caldwell, Inc.

Direct. Action of the City or Construction Manager by which the Contractor is ordered to perform or refrain from performing work under the Agreement.

Drawings. Also referred to as "Plans." That part of the Contract Documents consisting of the graphical and technical requirements of the Agreement as included on the plan, profile, section and detail sheets, included in a response to Request for Information or any revisions issued by Engineer. Drawings, or reproductions thereof, show the location, character, dimensions and details of the Work to be done. Shop drawings and other Contractor submittals are not Drawings as so defined.

Equipment. (Construction): All machinery and equipment, together with the necessary supplies for upkeep and maintenance, including tools and apparatus necessary for the proper construction and acceptable completion of the Work contemplated. (Installation): All material or articles used in equipping a facility or apparatus required to fulfill a functional design.

Execution. Field or site performance, workmanship, installation, erection, application, field fabrication, quality control, and protection of installed products on the Site.

Extra Work. New or unforeseen work, or added work of a different character or function; or that involves revisions of the details of the Work on which Contractor based its GMP. If the extra work increases the Contractor's Cost of the Work and/or time to perform the Work, and is approved by the City via a written Change Order, the GMP and/or Contract Times shall be adjusted as provided in the Contract Documents. Extra Work shall not include Work which is shown, detailed or specified in the Contract Documents or which constitutes "Incidental Work" as defined within the Contract Documents definition above.

Fee. As applicable, means the fee payable to Contractor pursuant to this Agreement and as part of the GMP, as shown on Exhibit C, GUARANTEED MAXIMUM PRICE, COST OF WORK AND FEE.

Field Directive. A change in the scope of the Agreement that does not cause an increase in the Cost of the Work, nor an adjustment to the GMP or the Contract Time(s), unless the Construction Manager determines the Field Directive warrants a Change Order. Also referred to as a "Directive".

Field Order. A written instruction given to the Contractor by Construction Manager authorizing work that is a change to the scope of Work to be performed on a time and material basis or a lump sum cost agreed to between City and the Contractor.

Final Acceptance. Formal approval by City in accepting a portion of the Contractor's work as completed.

Final Completion. The date when the Work is 100% complete, including completion and acceptance of all punch list corrections, as certified by the Construction Manager.

Force Majeure. Force Majeure includes industry wide or nationwide labor dispute (excluding labor shortage), fire, unusual delay in transportation or delivery, unavoidable casualty, flood (assuming Contractor has taken reasonable precautions), earthquake, epidemic, civil disturbance, war, freight embargo, riot, sabotage (by persons other than Contractor or subcontractors), material shortage or any other similar act or condition, in each case only to the extent the event in question is beyond the reasonable control of and without the fault or negligence of Contractor. It is expressly agreed that the following matters shall not constitute Force Majeure:

- Lack of or inability to use funds for any reason;
- Any occurrence which results from the wrongful act, or wrongful omission, of the affected party, or the failure by the affected party to act in a prudent and proper manner and in accordance with good and accepted industry practices;

- Any failure by the affected party to reach agreement with any third party necessary to enable the affected party to perform its obligations under this Agreement;
- An event or circumstance, where the event or circumstance, or its effects on the affected party, or the resulting inability of the affected party to perform its obligations could have been prevented, overcome or remedied by the exercise by the affected party of the standard of care and diligence consistent with that of a reasonable and prudent person;
- Breakdown of Contractor's Equipment;
- Strike or industrial action of Contractor's employees or those of subcontractors; or
- Adverse weather conditions including, without limitation, wet weather, unless the weather is unusually severe for the Site.

Funding Agency or Funding Agencies. A government agency or agencies that the City is in contract with or planning to execute a contract with to obtain construction funds for financing of the Project. For this Project this includes:

- State Water Resources Control Board (SWRCB) including the United States Environmental Protection Agency (USEPA), the State of California and the California Infrastructure and Economic Development Bank that fund and administer the Clean Water State Revolving Fund (CWSRF) Program.

- California Energy Commission (CEC) that fund and administer the Alternative and Renewable Fuel and Vehicle Technology Program.

- Placer County Air Pollution Control District (PCAPCD) that fund and administer the Carl Moyer Program.

Furnish. The word "furnish" when used in connection with services, materials, or equipment, shall mean to supply and deliver specified services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

Guaranteed Maximum Price or "GMP". The amount set forth on Exhibit C, GUARANTEED MAXIMUM PRICE, COST OF WORK AND FEE, hereto, which may be increased or decreased in accordance with the provisions of the Contract Documents.

General Requirements. Division 1, GENERAL REQUIREMENTS, which forms the part of the Contract Documents establishing special conditions or requirements peculiar to the Work.

Hazardous Waste. The term Hazardous Waste shall include the meaning provided in Section 100 of the Solid Waste Disposal Act (42 USC Section 6903 and/or Section 25117 of the California Health and Safety Code) as amended from time to time, or any other hazardous material, hazardous waste, hazardous substance, pollutant, and/or contaminant with requirements under federal, State of California, or local law, statute, regulation, rule, ordinance, order, action, policy or common law.

Herein. Refers to information presented in the Contract Documents.

Hold Harmless. An agreement by one (1) party to indemnify and defend a second party when the second party is sued by a third party as a result of the first party's actions or inactions.

Holidays. The legal holidays as designated by the City including: New Year's Day, Martin Luther King Jr. Day, President's Day, Memorial Day, Independence Day, Labor Day, Columbus Day, Veteran's Day, Thanksgiving Day, the day after Thanksgiving and Christmas Day.

Inspector. Inspector shall mean the person(s), firm(s), or agency(ies) employed by the City to perform inspection during construction of the Work, under the direction of the Construction Manager. It shall also mean any representative of the City who will perform inspections of the Work for code compliance and

quality assurance reporting in addition to those inspections performed by the City's Representative and/or the Engineer. Said inspector may be the Construction Manager or may be another representative of the City.

Install. The word "install" when used in connection with services, materials, or equipment, shall mean to put into use or place in final position the services, materials, or equipment, complete and ready for intended use.

Laws and Regulations; Laws or Regulations. Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction over the Site or the Work.

Liens. Charges, security interests, or encumbrances upon Project funds, or personal property.

Liquidated Damages. The amount of dollars assessed for each and every calendar day required to complete the Agreement in excess of the Contract Time. See Exhibit F, COMPLETION TIMES AND LIQUIDATED DAMAGES.

May. "May," wherever or in whatever manner used, refers to permissive actions.

Milestone. An event specified in the Contract Documents relating to an intermediate completion date or time prior to Final Completion of all the work.

Notice of Completion. Formal action taken by the City in determining that the Contractor's Work has been completed, or as delegated pursuant to a City Council resolution, accepting the Work as fully completed. The written notice is signed by the City and filed with the County Recorder.

Notice to Proceed. A written notice given by the City to the Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents.

Or Equal. Any product, equipment, material, thing, service, mean/method or service which is proposed by the Contractor for use in the Work, which is equal to or better than, and is as suitable as the product, equipment, material, thing, service, mean/method or service specified in the Contract Documents as to function, performance, reliability, quality, schedule and general configuration. Any "or equal" substitutions must be approved by the City.

Paragraph. For reference or citation purposes, a paragraph shall refer to the paragraph, or paragraphs, called out by paragraph number and alphanumeric designator.

Party. The City or the Contractor individually, and "Parties" shall mean the City and the Contractor collectively.

Perform. Refer to "Provide."

Person. The term, "person", includes firms, companies, corporations and partnerships.

Plans. See "Drawings."

Preconstruction Services. Work performed prior to the issuance of first Drawing(s) for construction to the Contractor, which shall initiate the start of construction services.

Prejudiced. As used herein, the term "Prejudiced" shall include, but is not limited to, material interference with the City's timely consideration of action to prevent increases in the cost or time required to perform the

Work, ability to monitor the Contractor's increased costs resulting from the situation, to timely marshal facts, and to timely plan its affairs.

Product Data. Type of Shop Drawing comprised of standard illustrations, schedules, performance charts, instructions, brochures, diagrams, catalog cuts, and other information assembled by or for the Contractor and submitted by the Contractor to illustrate materials or equipment for some portion of the Work.

Products. Materials, equipment, systems, shop fabrications, mixtures, and source controls.

Progress Schedule. A schedule, prepared and maintained by the Contractor, describing the sequence and duration of the activities comprising of the Contractor's plan to accomplish the Work within the Contract Times.

Project. The design-assist and construction of the Pleasant Grove Wastewater Treatment Plant (PGWWTP) Energy Recovery Project (ERP), together with all on-site infrastructure, site improvements and appurtenances to be designed, constructed and installed in connection therewith, as more fully set forth and described in the Contract Documents and as required thereby or reasonably inferred therefrom.

Proposer. Any individual, firm, partnership, corporation or limited liability company, submitting a Bid Proposal for the Work contemplated, acting directly or through a duly authorized representative.

Provide. The words "provide" or "perform," when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use. When "furnish," "install," "perform," or "provide" is not used in connection with services, materials, or equipment in context clearly requiring an obligation of Contractor, "provide" is implied.

Punch List. Those minor items of work to be completed after Substantial Completion and prior to Final Completion, which do not prevent others from taking over defined areas of the Work to complete the Project.

Reference Specifications. Those standards, rules, method of tests or analysis, codes, and specifications of other agencies, engineering societies, or industrial associations referred to in the Contract Documents.

Request for Information. Also referred to as "Request for Clarification". A Request for Information (RFI) is issued by the Contractor to the Construction Manager requesting additional information necessary to clarify or amplify an item in the Contract Documents that the Contractor believes is not clearly shown or called for in the Drawings or Specifications or other portions of the Contract Documents, or to address problems which have arisen under field conditions. A RFI is not to be used for request for materials/equipment substitutions or value engineering/cost reduction incentive proposals.

Request for Quotation. A request for a proposed cost made to the Contractor by the City to add, delete or change the Work. A Request for Quote (RFQ) shall not be deemed to be a direction to proceed with any addition, deletion or change to the Work.

Samples. Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

Separate Contractors. Those individuals or entities (including, but not limited to, concessionaires) who have entered into arrangements with City for the provision of labor, materials or other services in connection with the Project or other projects. The terms "Others" or "Expansion Project Contractor" or "EP Contractor" may also be used to indicate "Separate Contractors".

Shall or Will. Refers to actions entered into by the Contractor or the City as a covenant with the other party to do or to perform the action.

Shop Drawings (Submittals). Shop drawings (submittals) are drawings, diagrams, illustrations, schedules, performance charts, instructions, brochures, and other data which are prepared by the Contractor or any subcontractor, manufacturer, supplier, or distributor and which illustrate some portion of the Work.

Shown. Refers to information presented on the drawings, with or without reference to the drawings.

Site. Lands or areas indicated in the Contract Documents as being furnished by City upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by the City which are designated for the use of Contractor.

Specifications. That part of the Contract Documents consisting of written descriptions of the technical features of materials, equipment, construction systems, standards, and workmanship.

Specify. Refers to information described, shown, noted or presented in any manner in any part of the Agreement.

State. State of California.

State of California Specifications. The State of California Department of Transportation Standard Specifications in effect as documented in the Specifications and/or Drawings. Also referred to as State Standard Specifications and Caltrans Standard Specifications.

Subcontractor. An individual or entity who has entered into an agreement with Contractor or another subcontractor for the provision of labor, materials or other services required to be performed by Contractor under the Contract Documents. The term subcontractor does not include any separate contractor or any separate contractor's subcontractors.

Submittals. The information which is specified for submission to the Construction Manager in accordance with the Contract Documents.

Substantial Completion. Sufficient completion of the Project or the portion thereof to permit a utilization of the Project. Determination of Substantial Completion is solely at the discretion of the City. Substantial Completion does not mean complete in accordance with the Agreement nor shall Substantial Completion of all or any part of the Project entitle the Contractor to Final Completion under the Agreement.

Substantial Completion Date. Date when the City puts into service, the Project or that portion of the Project that has been determined to be Substantially Complete.

Sub-subcontractor. A sub-subcontractor is a person or entity who has a direct or indirect contract with a subcontractor to perform any of the Work associated with the Project. The term sub-subcontractor means a sub-subcontractor or an authorized representative thereof, also referred to as subtier-subcontractor.

Supplier. A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or any subcontractor.

Surety. One or more issuers of the Labor and Material Payment, Faithful Performance, and Warranty Bonds, each of which shall be admitted and licensed to do business in the State of California.

Surveyor. A land surveyor licensed in the State of California.

Trade Names. Where a certain product is called by its Trade Name, it is intended as a guide for type and quality.

Typical Details. Details of standard structures, devices or instructions referred to on the Plans and Specifications by title or number and developed by the Engineer.

Underground Facilities. All underground pipelines, including but not limited to, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electrical, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

Unit Price Work. Work to be paid for on the basis of unit prices.

Utility. Public or private fixed works for, including but not limited to, the transportation of fluids, gasses, power, signals, or communications.

Work. Any and all direct and/or incidental obligations, duties, and responsibilities necessary to complete the design-assist and construction assigned to, or undertaken by, the Contractor pursuant to the Contract Documents including all labor necessary to produce such construction and all materials, equipment, and supplies incorporated or to be incorporated in the construction. Also, the completed construction or parts thereof required to be provided under the Contract Documents to provide a complete installation which is fully connected and tied into the existing facilities and processes and is fully integrated, functional and operational.

Work Day. A working day is defined as any day, except Saturdays, Sundays and City's Legal Holidays. Any work scheduled by the Contractor on non-working days (Saturdays, Sundays, and City Legal Holidays) shall be verified with the City at least 72 hours in advance. Depending on the circumstances, the City may request Contractor compensation for inspection work, at an hourly rate, for any work performed on non-working days and for overtime.

Work Site. Any and all areas where Work is be performed by Contractor as required in the Contract Documents with particular emphasis of Work performed at or adjacent to the City's Pleasant Grove Wastewater Treatment Plant located at 5051 Westpark Dr. Roseville, CA 95747.

ARTICLE 2 - SCOPE OF WORK

The City, in conjunction with its Engineer and other consultants, developed the Design-Assist and Construction of the Pleasant Grove Wastewater Treatment Plant Energy Recovery Project Contract Documents. The Contract Documents include the RFBP, this Agreement, Drawings, Specifications, and supplemental information to present the City's Final Design Submittal and timeline to meet the City's needs at the City's Pleasant Grove Wastewater Treatment Plant for this Project.

The Work includes but is not limited to construction of a new compressed natural gas (CNG) fueling station to fuel the City's solid waste garbage truck fleet including all the compressors, dispensers, high pressure storage, and fuel management systems required for a fully operational fast-fill station, biogas upgrading system to treat the City's digester gas (from anaerobic digesters constructed as part of the PGWWTP Expansion Project) to meet CNG engine fuel quality requirements, a microturbine cogeneration facility to use a blend of biogas-upgrading tail gas and natural gas to produce electricity and heat, and a high strength waste receiving station to allow for offloading of trucked material to be fed to the PGWWTP anaerobic digesters. The Work also includes all interconnecting and associated yard piping, electrical and instrumentation duct banks, and all other miscellaneous improvements in support of the Project, including asset management, start up and testing to provide a complete, integrated and operational system as specified and shown within these Contract Documents.

Based on the Final Design Submittal, and in accordance with the Contract Documents, the Contractor will work with the City, Engineer, Construction Manager and possibility other personnel that have regulatory and/or funding authority and as a Design Assist Team member and complete the following design assist activities:

- Conduct a constructability review of the Final Design Submittal Drawings and Specifications, and submit comments and identified mitigation solutions to the City.
- Identify cost savings and added value alternative design/construction solutions, and submit to the City for evaluation.
- Develop detailed cost estimates for identified alternatives when requested by City for the City's evaluation.
- Identify construction sequencing and the impacts of the identified alternatives on the sequencing.
- Develop a detailed schedule and the impacts of the identified alternatives on the schedule.
- Participate in a cooperative partnership relationship with City, Engineer, and Construction Manager to develop a comprehensive construction plan to address project risk and minimize existing facility disruptions.
- Participate in up to twelve (12) Final Design Coordination Meetings lasting up to four (4) hours each to present and work collaboratively to allow for issuance of the Project Drawings and Specifications for construction.

Note that the Engineer is the entity professionally responsible for the design of the Project. City acknowledges that Contractor is a general contractor and not an architect or engineer. Except with respect to any subcontractors of Contractor providing architectural or engineering services for the Project as design-build work, the Contractor's review of or input for any design documents, or Contractor's recommendation for any design concepts, is made solely in Contractor's capacity as a licensed contractor and not as a licensed design professional. Contractor is not responsible for any errors in the Engineer's design or failure of the design to comply with applicable laws, codes, rules and regulations, or lawful orders of public authorities. However, if Contractor observes any such nonconformity or errors it shall promptly notify City's Representative and the Engineer.

The City is working with the SWRCB to obtain CWSRF Program Project funding, and has already obtained funding from CEC and PCAPCD. Compliance with the Funding Agencies requirements contained within the Contract Documents RFBP and Specifications is required as part of the Contractor's Scope of Work. Whether listed or not in the Contract Documents, the Contractor shall meet the Funding Agencies requirements and cooperate in partnership with the City and Engineer as required to obtain grant and/or loan funding and payments.

In accordance with the timeline found in See Exhibit F, COMPLETION TIMES AND LIQUIDATED DAMAGES, the Contractor will commence construction at the Site of the Work on portions of the Work based on partial Construction Documents, provided these documents have been approved by the City and the Engineer. The Contractor shall provide all supervision, testing, construction, equipment, labor, materials, tools, subcontractors and services to complete the construction within the Contract Times listed in See Exhibit F, COMPLETION TIMES AND LIQUIDATED DAMAGES.

The Contractor is solely responsible for the proper handling, storage, installation, testing and demonstration; all in accordance with the Contract Documents and each manufacturer's recommendations/instructions. Failure to meet any performance requirement due to improper handling, storage, installation, testing or demonstrating will be corrected by the Contractor without an increase to the GMP.

ARTICLE 3 – CITY'S REPRESENTATIVE AND CITY'S CONSULTANTS

3.1 City's Representative. The City's Director of the Environmental Utilities Department has designated Tracie Mueller to act as the City's Representative. The City may change the individual(s) acting as the City's Representative(s), or delegate one or more specific functions to one or more specific City's Representative at any time without notice and without liability to Contractor. Each City's Representative is the beneficiary of all Contractor obligations to City, including without limitation, all releases and indemnities.

3.2 Engineer. The City has designated Brown and Caldwell to act as the Engineer. The City may assign all or part of the City's Representative's duties, rights and responsibilities to the Engineer. The Engineer is the beneficiary of all Contractor obligations to City, including without limitation, all releases and indemnities.

3.3 Construction Manager. The City has designated Brown and Caldwell to act as Construction Manager. The City may assign all or part of the City's Representative's duties, rights and responsibilities to the Construction Manager. The Construction Manager is the beneficiary of all Contractor obligations to City, including without limitation, all releases and indemnities.

3.4 Construction Consultant. The City may retain, a Construction Consultant(s) as it deems necessary to assist/advise the City staff and/or other City consultants during the progress of the Work. Any Construction Consultant retained by City for this Project will not have any formal contract administration responsibilities. The Construction Consultant(s) is the beneficiary of all Contractor obligations to City, including without limitation, all releases and indemnities.

ARTICLE 4 - CONTRACTOR'S REPRESENTATIONS

4.1 Representations and Warranties. In order to induce the City to enter into this Agreement, Contractor makes the following representations and warranties:

A. Contractor has visited the Site, has observed, familiarized itself with and understands the nature and extent of the Contract Documents, Work, Site, locality, actual conditions apparent upon reasonable observation, visible as-built conditions, and local conditions, and federal, state and local laws and regulations that in any manner may affect cost, progress, performance or furnishing of Work or which relate to any aspect of the means, methods, techniques, sequences or procedures of construction to be employed by Contractor and safety precautions and programs incident thereto.

B. Contractor has correlated its knowledge and the results of all such observations, examinations, investigations, explorations, tests, reports and studies with the terms and conditions of the Contract Documents in its capacity as a contractor and not as an architect or engineer.

C. Contractor has given City prompt written notice of all conflicts, errors, ambiguities, or discrepancies that it has discovered in or among the Contract Documents and record drawings and actual conditions in its capacity as a contractor and not as an architect or engineer.

D. Contractor is duly organized, existing and in good standing under applicable state law, and is duly qualified to conduct business in the State of California, including, but not limited to, maintaining in good standing its Contractor's license issued by the State of California.

E. Contractor has represented to the City that it has significant knowledge and experience and the requisite expertise, skills, labor, equipment, capabilities and all other necessary resources required to perform the Work.

F. Contractor has duly authorized the execution, delivery and performance of this Agreement, the other Contract Documents and the Work to be performed herein. The Contract Documents do not violate or create a default under any instrument, agreement, order or decree binding on Contractor.

The failure or neglect of Contractor to receive or examine any of the Contract Documents shall in no way relieve it from any obligation with respect to the Contract, and no claim for additional compensation or time will be allowed which is based upon a lack of knowledge of any Contract Documents.

Moreover, the Contractor acknowledges that its observation of the Site prior to the execution of the Agreement has provided information related to existing conditions, as described in paragraph 4.1.A, above, which may affect cost, progress or performance of the Work. Contractor further acknowledges and agrees that, in executing the Agreement, it is relying on its own observation of (1) the Site of the Work, (2) access to the Site, (3) all other data and matters requisite to the fulfillment of the Work and on its own knowledge of existing facilities on and in the vicinity of the Site of the Work to be constructed under the Agreement, (4) the conditions to be encountered, (5) the character, quality and scope of the proposed Work, (6) the quality and quantity of the materials to be furnished, and (7) the requirements of the Contract Documents, and other related information made available to Contractor by the City.

4.2 Supplementary Information. The Contractor hereby acknowledges that, prior to the execution of the Agreement, City has furnished the following Supplementary Information. These Supplementary Information documents are not part of the Contract Documents.

- Geotechnical Report for Pleasant Grove WWTP Cogeneration Facility, Roseville, California dated April 2017 prepared by Blackburn Consulting
- Placer County Air Pollution Control District Carl Moyer Grant Agreement Contract No. SCN101486 for the PGWWTP ERP
- California Energy Commission Grant Agreement Exhibit A – Scope of Work for the PGWWTP ERP
- California Energy Commission Grant Agreement Exhibit C – Alternative and Renewable Fuel and Vehicle Technology Program (ARFVTP) Terms and Conditions
- California Energy Commission Budget Forms Template
- Pleasant Grove Wastewater Treatment Plant Topographic Survey, dated December 2016, prepared by KSN, Inc.

ARTICLE 5 - CONTRACT ADMINISTRATION

5.1 Administration of the Contract

The City's Representative and the Construction Manager will provide administration of the Agreement as hereinafter described. If the status of any of the above parties should change, the City will provide written notice to the Contractor of such change.

5.2 City's Representative

5.2.1 General – The City's Representative has the authority to act on behalf of the City on change orders, field orders, progress payments, Contract Decisions, acceptability of the Contractor's work, and early possession.

5.2.2 Change Orders – The City's Representative has the authority to accept or reject change orders and cost proposals submitted by the Contractor or as recommended by the Construction Manager.

5.2.3 Progress Payments – The City's Representative has the authority to accept or reject requests for progress payments which have been submitted by the Contractor and recommended by the Construction Manager.

5.2.4 Contract Decisions – Should the Contractor disagree with the Construction Manager's decision with respect to the Agreement, the Contractor may appeal to the City's Representative in accordance with the provisions of the Agreement.

5.2.5 Acceptability of Work – The City's Representative has the authority to make the final determination of the acceptability of the Work.

5.3 Construction Manager

5.3.1 General - The Construction Manager is a representative of the City employed to act as advisor and consultant to the City in construction matters related to the Agreement. The term Construction Manager may include more than one individual to perform contract administration and construction observation. Hereinafter, the term Construction Manager includes any and all representatives working under the direction of the Construction Manager.

All instructions to the Contractor and all communications from the Contractor to the City or the City's Representative shall be forwarded through the Construction Manager. The Construction Manager will have authority to act on behalf of the City only to the extent provided in the Contract Documents. The City has delegated its authority to the Construction Manager to make initial decisions regarding questions which may arise as to the quality or acceptability of materials furnished and work performed, and as to the manner of performance and rate of progress of the Work. The Construction Manager shall make initial decisions with respect to the Contractor's fulfillment of the Agreement and the Contractor's entitlement to compensation. The Contractor shall look initially to the Construction Manager in matters relating to the Agreement.

The Construction Manager's authority to act under ARTICLE 5, CONTRACT ADMINISTRATION, herein, and any decision made by it in good faith either to exercise or not to exercise such authority, shall not be interpreted or construed as control of or responsibility for any of the Work performed under this Agreement.

5.3.2 On-Site Representative - The Construction Manager will observe the progress, quality, and quantity of the Work to determine, in general, if the Work is proceeding in accordance with the provisions of the Contract Documents. The Construction Manager shall not be responsible for the superintendence of the construction site conditions; construction means, methods, appliances techniques, sequences, or procedures; operation of equipment; Contractor's personnel; or for safety practices or unsafe practices, precautions, and programs in connection with the Work.

In accordance with the provisions of these Contract Documents, the Construction Manager will make decisions relative to all matters of interpretation or execution of the Contract Documents.

5.3.3 Observation and Inspections of Construction - The Construction Manager shall observe the construction and shall have the authority to reject work and materials which do not conform to the Contract Documents, and to require special inspection or testing. Observation and inspection by the Construction Manager or an inspector is not an authorization to revoke, alter, or waive any requirements of the Specifications. Observation and inspection is the authorization to call the attention of the Contractor to any failure of the Work, materials or workmanship to conform to the Contract Documents. The Construction Manager shall have this authority including the ability to reject materials or, in any emergency, suspend the Work. The Contractor may appeal any such issue which it disagrees with to the Construction Manager for decision. If the decision of the Construction Manager is not satisfactory to the Contractor, the Contractor may appeal such decision to the City's Representative.

5.3.4 Acceptability of the Work - The Construction Manager has the authority to make a recommendation as to the acceptability of the Work.

5.3.5 Change Orders - The Construction Manager has the authority to initiate change orders; to

reject change orders proposed by the Contractor; to negotiate and recommend acceptance of change orders to the City; or to order minor changes in the Work that result in no cost to the City.

5.3.6 Construction Schedule - The Construction Manager has the authority to review and recommend acceptance of the progress schedule submitted by the Contractor at the start of the Work and subsequent significant revisions for conformance to the specified sequence of Work and logic.

5.3.7 Progress Payments - The Construction Manager has the authority to recommend acceptance or rejection of requests for progress payments which have been submitted by the Contractor.

5.3.8 Final Payment - The Construction Manager, with the assistance of the City's Representative and the Engineer, will conduct inspections to determine the date of Final Completion of the Work, and the Construction Manager will receive and forward to the City, for the City's review, written warranties and related documents required by the Agreement and assembled by the Contractor.

5.3.9 Contract Interpretation by the Construction Manager – Notwithstanding any omission from the Specifications or the Drawings it shall be the duty of the Contractor to call the Construction Manager's attention to apparent errors or omissions upon discovery by the Contractor and request instructions in writing before proceeding with the Work. The Contractor shall not unreasonably take advantage of any errors or omissions found by Contractor. If the Contractor discovers any errors or omissions that it believes affect the time or cost of performing the Work, it shall be entitled to request a Change Order. Contractor shall promptly notify the Construction Manager in writing of any design, materials, or specified method that the Contractor identifies as defective or insufficient, provided, however, that in doing so Contractor will be acting in its capacity as a contractor and not an architect or engineer, and that this section does not affect City's responsibility with regard to the Contract Documents. The Construction Manager may, by appropriate written instructions, correct errors and supply omitted information, which instructions shall be as binding upon the Contractor as though contained in the original Specifications or Drawings when incorporated into Change Orders. Such instructions shall be incorporated into the Agreement in accordance with the Change Order provisions of the Agreement.

Any discrepancies discovered by the Contractor between the Contract Documents and Site conditions or any inconsistencies or ambiguities in the Contract Documents shall be promptly reported, in writing, to the Construction Manager. Questions regarding the meaning and intent of the Contract Documents shall be referred in writing by the Contractor to the Construction Manager with a Request for Information (RFI). RFI procedures are further described in Section 01 33 50, REQUESTS FOR INFORMATION AND CLARIFICATIONS.

Work done by the Contractor after its discovery of such errors, omissions, discrepancies, inconsistencies or ambiguities without such notice and prior to response from the Construction Manager shall be done at the Contractor's risk and shall not be reimbursed as a Cost of the Work, nor be a basis for an increase in the GMP.

5.4 Engineer

5.4.1 General – The Engineer will have the authority to act on behalf of the City only to the extent provided in the Contract Documents. The Engineer shall not be responsible or have authority for the superintendence of construction site conditions; construction means, methods, appliances techniques, sequences, or procedures; operation of equipment; Contractor's personnel; or for safety practices or unsafe practices; precautions and programs in connection with the Work; or for any failure of the Contractor to comply with laws, regulations, rules, ordinances, codes, or orders applicable to the Contractor furnishing and performing the Work.

5.4.2 Interpretations - The Engineer has the authority to be the initial interpreter of the technical requirements of the Contract Documents. Either party to the Agreement may make written request to the Construction Manager for interpretations necessary for the proper execution or progress of the Work. The

Construction Manager shall refer such written requests to the Engineer, who will render such interpretations. Where the Contractor has requested an interpretation from the Construction Manager, or been notified by the Construction Manager that such interpretation has been requested by the City, any work done before receipt of such interpretations, if not in accordance with same, shall be removed and replaced or adjusted as directed by the Construction Manager without additional expense to City and shall not be reimbursed as a Cost of the Work, or be a basis for an increase in the GMP.

5.4.3 Acceptability of the Work – The Engineer has the authority to make a recommendation as to the acceptability of the Work. The Engineer has the authority to recommend acceptance regarding the remediation or retention of Defective Work.

5.4.4 Submittal – The Engineer shall receive, through the Construction Manager, shop drawings, product data and samples for review in accordance with Section 01 33 00, SUBMITTAL PROCEDURES.

The Engineer has the authority to review and take other appropriate action upon the Contractor's submittal such as shop drawings, product data and samples, but only for conformance with the design concept of the Work and the information given in the Contract Documents.

ARTICLE 6 - CITY

6.1 General

The City, acting through the City's Representative or the Construction Manager, shall have the authority to act as the sole judge of the Work and materials with respect to both quantity, quality function, performance and reliability as set forth in the Agreement except as delegated to the Construction Manager in these Contract Documents.

6.2 Attention to Work

The City's Representative, Construction Manager and Engineer are designated in ARTICLE 3 herein. The Construction Manager will normally be available at the Site of the Work. An alternate Construction Manager representative will be designated when the designated Construction Manager's representative is not available at the Site of the Work. The Engineer may be available at the Site of the Work at certain specific times as needed to facilitate the Work. If the Contractor requires assistance from the Engineer, this assistance shall be coordinated through the Construction Manager. The Engineer will assign a representative to be available at the Site of the Work during the said specific times as needed.

6.3 Observation and Inspection

In addition to the Construction Manager's designated representative, the City may provide one or more inspectors to the Construction Manager to observe the Work and with the same authority as provided for in Article 5.3.3, Observation and Inspections of Construction.

Separate and independent from the observations and inspections above, the Work may be inspected by Building Officials, Fire Officials , Roseville Electric and/or Pacific Gas and Electric for code compliance. Such inspectors shall have the authority provided to them by their jurisdiction. Any design deficiencies or additional work required by these code inspections not required by the Contract Documents may be incorporated into the Work in accordance with the Change Order provisions of the Agreement

6.4 City's Right to Use or Occupy

The City reserves the right, prior to Final Completion, to occupy, or use, any completed part or parts of the Work, providing these areas have been approved for occupancy by the City. The exercise of this right shall in no way constitute a Final Acceptance of such parts, or any part of the Work, nor shall it in anyway affect the dates and times when progress payments shall become due from the City to the Contractor or in any

way prejudice the City's rights in the Agreement, or any bonds guaranteeing the same. The Agreement shall be deemed completed only when all the Work contracted has been duly and properly performed and accepted by the City.

Prior to such occupancy or use, the City and Contractor shall agree in writing regarding the responsibilities assigned to each of them for payments, security, maintenance, heat, utilities, damage to the Work, insurance, the period for correction of the Work, and the commencement of warranties required by the Contract Documents.

In exercising the right to occupy or use completed parts of the Work prior to the Final Acceptance thereof, the City shall not make any use which will materially increase the cost to the Contractor, without increasing the GMP, nor materially delay the completion of the Agreement, without extending the time for completion.

The part or parts of the Work, if any, which the City anticipates the use or occupancy of prior to Final Completion are noted in Section 01 12 16, WORK SEQUENCE. Failure to include a part of the Work in the above referenced Section, shall not limit the City's right to use or occupy parts of the Work not listed.

6.5 City's Right to Carry Out the Work

If the Contractor should neglect to prosecute the Work in accordance with the Contract Documents or fail to perform any provision of the Agreement, and fails within seven (7) days after receipt of written notice from the City to commence and continue correction of such neglect or deficiency with diligence and promptness, the City may, and without prejudice to any other remedy, make good such default, neglect or failure. A Change Order shall be issued unilaterally deducting from the payments then or thereafter due the Contractor, for the cost of correcting such deficiencies and for performing such work, including compensation for the Engineer's, the Construction Manager's, and City's additional services made necessary by such default, neglect or failure.

The City also reserves the right to perform and suspend any portion of the Work due to an emergency threatening the safety of the Work, public, City, and any property or equipment. No deductive Change Order shall be issued for an emergency not caused by Contractor.

6.6 City's Right to Perform Work and to Award Separate Contracts

The City reserves the right to perform work related to the Project with the City's own forces, and to award separate contracts in connection with the Project or other work on the Site. If the Contractor claims that delay, damage, or additional cost is involved because of such action by the City, the Contractor shall make such claim as provided elsewhere in the Contract Documents.

When separate agreements are awarded for different portions of the Project or other work on the Site, the term "Contractor" in the Contract Documents in each case shall mean the contractor who executes each separate Agreement.

The City will provide for the coordination of the work of the City's own forces and of each separate contractor with the Work of the Contractor, who shall cooperate therewith as provided in Article 7.10, Cooperation with Other Contractors.

6.7 Non-Responsibility of the City

The City shall not be held responsible for the care or protection of any material or parts of the Work prior to the Final Acceptance, except as expressly provided in the Contract Documents.

ARTICLE 7 - CONTRACTOR

7.1 Status of Contractor and Subcontractors

7.1.1 Contractor – It is stipulated and agreed that the Contractor shall be an independent contractor in the performance of this Agreement and shall have complete charge of persons engaged in performance of the Work. The Contractor shall perform the Work in accordance with its own means, methods, and appliances subject to compliance with the requirements of the Agreement.

7.1.2 Subcontractors – If any part of the Work to be done under this Agreement is subcontracted, the subcontract shall be in writing and shall provide that all Work to be performed thereunder shall be performed in accordance with the terms of the Contract Documents. The subcontracting of any or all of the Work to be done will in no way relieve the Contractor of any part of its responsibility under the Agreement. Subcontractors will not be recognized as having a direct relationship with the City. The persons engaged in the Work, including employees of subcontractors and suppliers, will be considered employees of the Contractor and their work shall be subject to the provisions of the Agreement. References in the Contract Documents to actions required of subcontractors, manufacturers, suppliers, or any person other than the Contractor, the City or the Construction Manager shall be interpreted as requiring that the Contractor shall require such subcontractor, manufacturer, supplier or person to perform the specified action.

The Contractor shall only employ subcontractors that are properly licensed in accordance with State law and are registered with the California Department of Industrial Relations (DIR).

Prior to commencement of any work by a subcontractor, the Contractor shall submit to the Construction Manager:

A. Verification that the subcontractor is properly licensed for the work it will perform.
B. Upon City's request, copies of subcontract agreements.
C. Copies of subcontractor's insurance certificates and endorsements.

7.2 Contractor's Representative

The Contractor shall provide in writing, a request to the City to delegate authority to an individual to serve in the capacity of authorized representative and shall wait to receive written confirmation from the City, before the authorized representative can start work. The authorized representative shall be qualified for the duties required and have complete authority to represent and to act for the Contractor. Said authorized representative has the authority to act in matters relating to the Agreement, and shall be personally present at the Site at all times while work is actually in progress on the Agreement. During periods when the Work is suspended, arrangements acceptable to the Construction Manager shall be made for any emergency work that may be required. The Contractor's authorized representative shall be fluent and proficient in the English language in order to understand, receive, and carry out oral and written communications or instructions relating to all job functions and responsibilities. All communications to and from the Contractor's authorized representative shall be binding as if given to or by the Contractor.

Contractor shall provide its authorized representative's contact information which shall include the representative's name, office street address, office telephone number, mobile phone number, home phone number, email address and the office mailing address if different from the street address.

The Contractor's authorized representative shall give its personal attention to and shall supervise the Work to the end that it shall at all reasonable times be prosecuted faithfully; and when the authorized representative is not personally present on the Work, the representative shall at all reasonable times be represented by a competent designated alternate, superintendent or foreman (approved in writing by the City, to act in this capacity) who shall receive and obey all instructions or orders given under this Agreement, and who shall have full authority to supply materials, tools, and labor without delay, and who shall be the legally appointed representative of the Contractor. The Contractor shall be liable for the faithful observation of any instructions delivered to the Contractor or to its authorized representative.

The Contractor's authorized representative shall not be replaced by a person to whom City has a reasonable objection. Furthermore, the City shall have the authority to remove the Contractor's authorized representative from the Project for reasons found in Article 8.3, Character of Workers.

7.3 Use and Protection of City's Site and Adjacent Property

7.3.1 With the approval of the Construction Manager, the Contractor may use designated portions of the City's Site for storage of construction equipment, materials and field offices provided the Contractor does not interfere with City's operations. The Contractor will not be allowed to unreasonably encumber the Site or adjacent areas with its materials and/or equipment. The City will not accept any responsibility for damage to or loss of the Contractor's equipment or materials stored on any Project related site caused by vandalism, nature, or otherwise, suffered by the Contractor. Protection of all construction equipment, stores, and supplies shall be the sole responsibility of the Contractor. Where additional work space is desired by the Contractor or where the City cannot provide the space to the Contractor, it shall be the Contractor's sole responsibility and expense to obtain such a space for its use.

7.3.2 All workers or representatives of the Contractor, subcontractors or suppliers are admitted to the Site only for the proper execution of the Work and have no tenancy without the express written permission of the City. Furthermore, no persons may occupy property owned by the City outside the limit of the Work, as indicated on the Drawings, without the express written permission of the City.

7.3.3 The Contractor shall enforce any instructions from the City or Construction Manager regarding combustible materials, placement of signs, danger signals, barricades, radios, noise, dust, and smoking. Upon completion of the Work, the Contractor shall remove all temporary barricades, signs and related materials.

7.3.4 The Contractor shall determine safe loading capacities and shall not overload any structure, building, pipe or other existing facility beyond its safe capacity during construction. In addition to any requirements imposed by law, the Contractor shall shore up, brace, underpin and protect as may be necessary all foundations and other parts of all existing structures, facilities and improvements on the Site or adjacent to the Site which are in any way affected by the Contractor's excavations or other operations connected with the Work. Prior to commencing any work which in any way affects adjoining or adjacent land or buildings thereon, or public utilities, the Contractor shall notify the Construction Manager to discuss responsibilities for properly notifying the owners/occupants of adjacent land and the protective measures taken by the Contractor. Upon request of the Construction Manager, the Contractor shall meet with the recipient of any notice or attend local public meetings as proper public outreach on local impacts caused by completion of the Work should be communicated to any parties that may be affected prior to commencing any work.

7.3.5 The Contractor shall take all necessary precautions to protect existing facilities on which Contractor is performing Work against the effects of weather and environmental elements.

7.3.6 All existing improvements and facilities shall be protected from any damage resulting from the operations, equipment or workers of the Contractor during the entire Contract Time.

7.3.7 The Contractor shall take all steps necessary to protect all structures, buildings, land and other facilities from fires and sparks originating from the Work. The Contractor shall comply with all laws and regulations regarding fire protection and shall comply with all instructions given by the City's fire department.

7.3.8 Any damage to existing conditions, or to any other improvement or property above or below the ground surface, whether public or private, arising from the Contractor's operations or performance of the Work shall be repaired within forty-eight (48) hours by the Contractor without expense to the City, unless disruption of the City's operations or creation of a safety hazard has occurred, in which case damage will be repaired immediately. The forty-eight (48) hour non-emergency repair response time may be extended

only if agreed to in writing by the City and/or private property owner. Any delays to the Project completion times caused by such repairs shall be considered non-compensable and no further extension of the Contract Time will be granted therefor. Should the Contractor not be timely in repairing damage caused by its operations or performance, the City shall take steps to protect against loss of property and life, in its sole discretion, and deduct entire cost of such Work from the next payment due the Contractor. No prior notice to the Contractor shall be necessary for the City to take such action.

7.3.9 The Contractor shall keep the Site reasonably free from debris, trash and construction wastes to permit Contractor to perform construction services efficiently, safely and without interfering with the use of adjacent land areas, and as further stipulated in the Contract Documents. When the Work is Substantially Complete, or a portion of the Work has been completed, Contractor shall remove all debris, trash, construction wastes, materials, equipment, machinery and tools arising from the Work or applicable portions thereof to permit City to occupy the Project or a portion of the Project for its intended use. Contractor shall provide a finished cleaning of all areas acceptable to the City before releasing any area to the City for occupancy.

7.4 Fees and Permits

The permit requirements for the Project are specified in Section 01 35 43, ENVIRONMENTAL PROCEDURES.

7.5 Compliance with Laws

The City is a municipal corporation in the State of California and is subject to the applicable provisions of law relating to public contracts as a Charter City. It is agreed that all provisions of law applicable to public contracts are a part of these Contract Documents to the same extent as though set forth herein and will be complied with by Contractor.

The Contractor, shall at its own cost and expense, observe and keep itself and its subcontractors fully informed of all existing and future legislated State and Federal Laws and City and County ordinances and regulations which in any manner affect those engaged or employed in the Work, or the materials and equipment used in the Work, or which in any way affect the conduct of the Work, and all such orders and decrees of bodies or tribunals having any jurisdiction or authority over the same. If any discrepancy or inconsistency is discovered in the Drawings, Specifications, or in any other part of this Agreement, in relation to any such law, ordinance, regulation, order or decree, the Contractor shall immediately report the same to the Construction Manager in writing. The Contractor shall at all times observe and comply with all existing laws, ordinances, regulations, orders and decrees; and shall protect, indemnify, and defend the City, the Construction Manager, the Engineer, the Funding Agencies and all of their officers, officials, employees, agents, volunteers, and servants against any claim or liability arising from or based upon the violation of any such law, ordinance, regulation, order, or decree, whether by the Contractor itself, employees, or its subcontractors.

Attention is directed to the following specific regulations and requirements that are included in the Contract Documents. This list of regulations is not warranted to be complete and the burden of ascertaining legal requirements that must be satisfied shall rest solely with the Contractor.

7.5.1 Davis-Bacon Wages- Pursuant to State Water Resources Control Board (SWRCB) Division of Financial Assistance Guidelines for Clean Water State Revolving Fund (CWSRF), the successful bidder must comply with the Davis-Bacon Act (40 U.S.C. 276a to a-7) as supplemental by Department of Labor regulations (29 CFR Part 5) it shall be mandatory upon the Contractor to whom the Work is awarded and upon any subcontractor under the Contractor to pay not less than Davis-Bacon wage rates. The Davis-Bacon requirements and rate determination is included within the RFBP APPENDIX A. The rate determinations may also be found on the Department of Labor's website at: http://www.wdol.gov/dba.aspx. It shall be mandatory upon the Contractor to whom the work is awarded and upon any subcontractor under the Contractor to pay not less than said specified rates or Davis-Bacon wage rates, whichever is higher, to all workmen employed by them in the execution of the Agreement.

7.5.2 Prevailing Wage Rates – This Agreement is subject to prevailing wage requirements pursuant to Section 1770 et seq. of the California Labor Code, which are hereby incorporated by reference and made a part hereof. Accordingly, Contractor shall comply with all applicable laws and regulations related to payment of prevailing wages and Contractor shall ensure that every lower-tier subcontractor complies with all applicable laws and regulations related to payment of prevailing wages. The Contractor and every lower-tier subcontractor shall pay not less than the prevailing rate of wages, as determined by the Director of the California Department of Industrial Relations pursuant to California Labor Code section 1773. The Contractor and every lower-tier subcontractor shall submit certified payrolls and labor compliance documentation electronically as required by the DIR and City, and via hard copy to the Construction Manager. Contractor is responsible for compliance with all prevailing wage requirements, and shall include these requirements in every subcontract. This Agreement is subject to compliance monitoring and enforcement by the California Department of Industrial Relations, as specified in California Labor Code section 1771.4.

7.5.3 DIR Registration- California Labor Code section 1725.5 requires the Contractor and all lower-tier subcontractors performing public works services to be currently registered with the California DIR, as specified in California Labor Code section 1725.5. California Labor Code section 1771.1 provides that a contractor or subcontractor shall not be qualified to bid on, be listed in a bid proposal (subject to the requirements of Section 4104 of the California Public Contract Code), or engage in the performance of any contract for public work, unless currently registered and qualified to perform public work pursuant to California Labor Code section 1725.5. The Contractor shall list the Contractor's current DIR registration number, and the current DIR registration number of all subcontractors, as part of its Bid Proposal.

Further information can be found on DIR's website at http://www.dir.ca.gov/Public-Works/Contractors.html. The above summary is provided solely for informational purposes, and does not in any way affect the Contractor's and subcontractors' obligation to comply in all respects with all other applicable laws and regulations. The Contractor shall disseminate these provisions to every lower-tier subcontractor.

7.5.4 Apprentices on Public Work Projects- The Contractor and any subcontractor or subconsultant shall comply with California Labor Code section 1777.5 et seq., and implementing regulations set forth in Title 8 of the California Code of Regulations, governing the employment of apprentices. Contractor and any subcontractor or subconsultant performing Public Work will be subject to penalties for apprenticeship violations in accordance with Labor Code section 1777.7. Please refer to the link below for guidance in meeting your obligation to satisfy the apprentice requirements for this Project: https://www.dir.ca.gov/das/DASApprenticesOnPublicWorksSummaryOfRequirements.htm.

7.5.5 Contractor Agrees to the Following:

7.5.5.1 The Contractor and subcontractors shall pay all mechanics and laborers employed directly on the Site of the Work, unconditionally and at least once a week, and without subsequent deduction or rebate on any account, the full amounts accrued at time of payment, computed at wage rates not less than those stated in the advertised specifications, regardless of any contractual relationship which may be alleged to exist between the Contractor or subcontractor and the laborers and mechanics.

7.5.5.2 The Contractor will post the scale of wages to be paid in a prominent and easily accessible place at the Site of the Work.

7.5.5.3 There may be withheld from the Contractor so much of accrued payments as the City considers necessary to pay to laborers and mechanics employed by Contractor or any subcontractor on the work the difference between the rates of wages required by the contract to be paid laborers and mechanics on the Work and the rates of wages received by the laborers and mechanics and not refunded to Contractor or subcontractors or their agents.

7.5.6 Travel and Subsistence Payments – Each worker needed to execute the Work must be paid travel and subsistence payments as defined in the applicable collective bargaining agreements filed in accordance with Section 1773.1 of the California Labor Code.

7.5.7 Workday – In accordance with the provisions of Division 2, Part 7, Chapter 1, Article 3 of the Labor Code, State of California, and in particular Sections 1810 to 1815 inclusive, thereof, eight (8) hours labor shall constitute a days' work and no laborer, worker, or mechanic in the employ of said Contractor, or any subcontractor doing or contracting to do any part of the Work contemplated by this Agreement, shall be required or permitted to work more than eight (8) hours in any one calendar day, and forty (40) hours in any one calendar week unless compensated at not less than time and a half as set forth in California Labor Code Section 1815. However, if the prevailing wage determination requires a higher rate of pay for overtime than is required under said Section 1815, then the overtime rate must be paid, as specified in California Code of Regulation Title 8, Group 3, Section 16200(a)(3)(F). The Contractor and each subcontractor shall also keep an accurate record showing the names and actual hours worked of all workers employed by them in connection with the work contemplated by this Agreement, which record shall be open at all reasonable hours for the inspection of the City or its officers or agents and by the Division of Labor Standards Enforcement of the Department of Industrial Relations, their deputies or agents; and it is hereby further agreed that said Contractor shall forfeit as a penalty to the City, the sum of the greater of (i) Twenty-Five and No/100 Dollars ($25.00) or (ii) the maximum penalty allowable by statute for each laborer, worker or mechanic employed in the execution of this Agreement by the Contractor or by any subcontractor for each calendar day during which such laborer, worker or mechanic is required or permitted to labor more than eight (8) hours in any one calendar day and forty (40) hours in one calendar week in violation of these provisions.

7.5.8 Certified Electricians – Workers performing work for an electrical contractor installing, constructing, or maintaining any electrical system covered by the National Electrical Code shall be certified as a General Electrician per California Labor Code Section 3099.

7.5.9 Receipt of Workers' Wages, Fee for Registering or Placing Persons In Public Works – Attention is directed to the provisions of sections 1778 and 1779 of the California Labor Code, which reads as follows:

> "Section 1778. Every person, who individually or as a representative of an awarding or public body or officer, or as a contractor or subcontractor doing public work, or agent or officer thereof, who takes, receives or conspires with another to take or receive, for his own use or the use of any other person any portion of the wages of any workman or working subcontractor, in connection with services rendered upon any public work is guilty of a felony."
>
> "Section 1779. Any person or agent or officer thereof who charges, collects, or attempts to charge or collect, directly or indirectly, a fee or valuable consideration for registering any person for public work, or for giving information as to where such employment may be procured, or for placing, assisting in placing, or attempting to place, any person in public work, whether the person is to work directly for the State, or any political subdivision or for a contractor or subcontractor doing public work is guilty of a misdemeanor."

7.5.10 Labor Discrimination – Attention is directed to Section 1735 of the Labor Code, which reads as follows:

> "No discrimination shall be made in the employment of persons upon public works because of the race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, marital status, or sex of such persons, except as provided in Section 12940 of the Government Code, and every contractor for public works violating this Section is subject to all the penalties imposed for violation of this chapter."
>
> Non-Discrimination. Contractor agrees that it shall not discriminate against any person on account of their sex, race, color, religious creed, ancestry, national origin, disability, medical condition, marital status, age, gender, military or veteran status, genetic information, or sexual orientation in violation of the Fair Employment and Housing Act or the Unruh Civil Rights Act. Upon a final determination by a court of competent jurisdiction

that the Grantee has violated either of these Acts, the City may, at its option, (1) withhold payments to Contractor under this Agreement until Contractor complies; or (2) suspend or terminate this Agreement. Contractor shall include the provisions of this paragraph in every subcontract, including procurement of materials and lease of equipment, unless specifically exempted by the City.

7.5.11 Workers' Compensation Insurance – The provisions of Article 13.1.2, Workers' Compensation Insurance, shall be considered as repeated herein.

7.5.12 Not Used.

7.5.13 Safety Standards – The Contractor shall comply with all applicable provisions of the Safety and Health Regulations of Construction, promulgated by the Secretary of Labor under Section 107 of the Contract Work Hours and Safety Standards Act (40 USC 327 et. seq.) as set forth in Title 29, C.F.R., CAL/OSHA, and the regulations issued thereunder. Compliance shall be the Contractor's sole responsibility, and neither the City, the Construction Manager nor the Engineer shall have any liability for non-compliance. See Article 7.7, Safety, for additional safety requirements.

7.5.14 Asbestos Related Work – All work involving asbestos containing material must be performed in accordance with California Labor Code, Sections 6501.5 through 6510, inclusive, and California Administrative Code, Title 8, Section 5208 and all other pertinent laws, rules, regulations, codes, ordinances, decrees and orders.

7.5.15 Public Records Act –

A. Ownership and Disclosure

Except as otherwise provided herein, all records, documents, drawings, plans, specifications, and all other information relating to the conduct of City's business, including information submitted by the Contractor ("Records"), shall become the exclusive property of City and shall be deemed public records. Said Records are subject to the provisions of the California Public Records Act (Government Code § 6250 et seq.). The City's use and disclosure of its records are governed by this Act. The City will use its best efforts to inform the Contractor of any request for any financial records or documents marked "Trade Secret," "Confidential" or "Proprietary" provided by the Contractor to City. The City will not advise as to the nature or content of documents entitled to protection from disclosure under the California Public Records Act.

B. Litigation Related to Disclosure

In the event of litigation concerning the disclosure of any Records, City's sole involvement will be as a stakeholder, retaining the Records until otherwise ordered by a court. The submitting party, at its sole expense and risk, shall be fully responsible for any and all fees for prosecuting or defending any action concerning the Records and shall indemnify and hold City harmless from all costs and expenses including attorney's fees in connection with any such action.

7.6 Compliance with Environmental Laws

During construction, the Contractor shall comply with all pertinent requirements of Federal, State, and local environmental laws and regulations, including, but not limited to, the Federal Clean Air Act, State and local air pollution and noise ordinances, construction site erosion control regulations. Specific requirements are further specified in Section 01 11 80, ENVIRONMENTAL CONDITIONS.

7.7 Safety

7.7.1 Contractor's Safety Responsibility – The Contractor shall be solely and completely responsible for conditions of the jobsite, including safety of all persons and property during performance of the Work. This requirement shall apply continuously and not be limited to normal working hours. Safety provisions shall conform to U.S. Department of Labor (OSHA), the California Occupational Safety and Health Act (CalOSHA), and all other applicable Federal, State, County, and local laws, ordinances, codes, including but not limited to the requirements set forth below, and any regulations that may be detailed in other parts of these Contract Documents. In the event of conflicting requirements, the most stringent requirement as it pertains to the Contractor's safety responsibility, shall be followed by the Contractor.

No provision of the Contract Documents shall act to make the City, the Construction Manager, Engineer or any other party than the Contractor responsible for safety. Neither the City nor the Construction Manager, Engineer or their respective officers, officials, employees, agents or volunteers or other authorized representatives will be responsible for having hazards, and/or potential hazards, corrected and/or removed at the location(s) where the work is to be performed. The Contractor agrees that neither the City nor the Construction Manager, Engineer or their respective officers, officials, employees, agents or volunteers or other authorized representatives will be responsible for taking steps to protect the Contractor's employees from such hazards and/or potential hazards, or for instructing the Contractor's employees to recognize such hazards and/or potential hazards, or to avoid the associated dangers. The Contractor agrees that with respect to the Work to be performed under this Agreement and the location(s) where such Work is to be performed, the Contractor will be responsible for not creating hazards, and for having hazards corrected and/or removed. The Contractor agrees that through the safety obligations contained in this Agreement and the Contractor's own inspection of the Site(s) where the Work is to be performed, the Contractor is aware and has been notified of the hazards and/or potential hazards to which the Contractor's employees may be exposed in the performance of the Work. The Contractor has taken and/or will take appropriate, feasible steps to protect the Contractor's employees from such hazards, and has instructed and/or will instruct its employees to recognize such hazards and/or potential hazards and how to avoid the associated dangers. The Contractor agrees that neither the City nor the Construction Manager, Engineer or their respective officers, officials, employees, agents or volunteers or other authorized representatives will be "employers" pursuant to California Labor Code Section 6400 and related provisions of law with respect to the Contractor, the Contractor's privities or subcontractors or Material Suppliers acting pursuant to this Agreement.

The Contractor shall indemnify, defend and hold City and Construction Manager, Engineer, Funding Agencies and their respective officers, officials, employees, agents and volunteers or other authorized representatives harmless to the full extent permitted by law concerning liability related to the Contractor's safety obligations in accordance with Article 13.2, General Indemnification Obligations.

If death or serious injuries or serious damages occur, the accident shall be reported immediately by telephone or messenger to both the Construction Manager and the City. In addition, the Contractor shall furnish the Construction Manager with a copy of the Employer's Report of Injury immediately following any incident requiring the filing of said report during the prosecution of the Work under this Agreement. The Contractor shall also furnish the Construction Manager with a copy of the Employer's Report of Injury involving any subcontractors on this Project. The Contractor shall make all reports as are, or may be, required by any authority having jurisdiction, and permit all safety inspections of the Work being performed under this Agreement.

If a claim is made by anyone against the Contractor or any subcontractor on account of any accident, the Contractor shall promptly report the facts in writing to the Construction Manager, giving full details of the claim.

7.7.2 Safety Program – The Contractor shall establish, implement, and maintain a written injury prevention program as required by Labor Code Section 6401.7. Before beginning the Work, the Contractor shall file with the Construction Manager a written Contractor Safety Program that provides for the implementation of all of the Contractor's safety responsibilities in connection with the Work at the Site and the coordination of that program and its associated procedures and precautions with safety programs,

precautions and procedures of each of its subcontractors and other Contractors performing work at the Site. The Contractor shall be solely responsible for initiating, maintaining, monitoring, coordinating, and supervising all safety programs, precautions, and procedures in connection with the Work and for coordinating its programs, precautions, and procedures of the other contractors and subcontractors performing the Work at the Site. The Safety Program should contain all the necessary elements for the Contractor to administer its program on the Site. At a minimum, this written Safety Program shall address the elements required by Labor Code Section 6401.7.

The Contractor's compliance with requirements for safety and/or the Construction Manager's acceptance for filing of the Contractor's Safety Program shall not relieve or decrease the liability of the Contractor for safety. The Construction Manager's review of the Contractor's Safety Program is only to determine if the above listed elements are included in the program. The Contractor's completion of review of the Safety Program does not confirm adequacy of the Program to protect workers. The Contractor is solely responsible to determine adequacy of the program to protect workers per the applicable Labor Code Section.

7.7.3 Safety Supervisor – The Contractor shall appoint an employee as safety supervisor who is qualified and authorized to supervise and enforce compliance with the Safety Program. The Contractor shall notify the Construction Manager in writing prior to the commencement of work of the name of the person who will act as the Contractor's safety supervisor and furnish the safety supervisor's resume to the Construction Manager.

The Contractor will, through and with its Safety Supervisor, ensure that all of its employees and its subcontractors of any tier, fully comply with the Project Safety Policies. The Safety Supervisor shall be a full-time employee of the Contractor whose responsibility shall be for supervising compliance with applicable safety requirements on the Site and for developing and implementing safety training classes for all job personnel. The City shall have the authority to require removal of the Contractor's Safety Supervisor if the representative is judged to be improperly or inadequately performing the duties; however, this authority shall not in any way affect the Contractor's sole responsibility for performing this work safely, nor shall it impose any obligation upon the City to ensure the Contractor performs its work safely.

7.7.4 Safety and Protection – The Contractor shall take all necessary precautions to prevent damage, injury, and loss to:

A. All employees on the Project, employees of all subcontractors, and other persons and organizations who may be affected thereby;

B. All the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

C. Other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, wetlands, pavements, roadways, structures, utilities, and underground facilities not designated for removal, relocation, or replacement in the course of construction.

The Contractor shall comply with all applicable laws and regulations of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss and shall erect and maintain all necessary safeguards for such safety and protection. The Contractor shall notify owners of adjacent property and of underground facilities and utility districts when prosecution of the Work may affect them and shall cooperate with them in the protection, removal, relocation, and replacement of their property. All injury or loss to any property caused, directly or indirectly, in whole or in part, by the Contractor, any subcontractor, supplier or any other person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, shall be remedied by the Contractor.

7.7.5 Excavation Safety – In accordance with the provisions of Section 6705 of the Labor Code, the Contractor shall submit, in advance of excavation of any trench or trenches five feet or more in depth,

a detailed plan showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection from the hazard of caving ground during the excavation of such trench or trenches. If such plans vary from the shoring system standards set forth in the Construction Safety Orders of the Division of Industrial Safety in Title 8, Subchapter 4, Article 6, California Code of Regulations, the plans shall be prepared and signed by a registered civil or structural engineer employed by the Contractor, and all costs therefore shall be included in the price named in the Agreement for completion of the Work as set forth in the Contract Documents. Nothing in this article shall be deemed to allow the use of a shoring, bracing, sloping, or other protective system less effective than that required by the Construction Safety Orders. Nothing in this article shall be construed to impose a tort liability on the City, the Engineer, the Construction Manager, nor any of their officers, officials, employees, agents, consultants or volunteers. The City's review of the Contractor's excavation plan is only for general conformance to the Construction Safety Orders.

Prior to commencing any excavation, the Contractor shall designate in writing to the Construction Manager the "competent person(s)" with the authority and responsibilities designated in the Construction Safety Orders.

7.7.6 Safety Emergencies – In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, the Contractor, without special instruction or authorization from the Construction Manager, will take reasonable action to prevent threatened damage, injury or loss. The Contractor shall give the Construction Manager prompt written notice if the Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby.

7.7.7 Safety Violations – Should the Contractor fail to correct an unsafe condition, the City shall have the right to notify the Contractor through the Construction Manager that an unsafe condition may exist and must be corrected or the Work in question can be stopped in accordance with Article 9.6, **City Suspension of Work**, until the condition is corrected to the satisfaction of the City. No extension of time or additional compensation will be granted as a result of any stop order so issued. The notification and suspension of such Work or the failure to provide such notification and suspension by the City shall not relieve the Contractor of its sole responsibility and liability for safety and the correction of any unsafe conditions.

The City shall have the authority to require the removal from the Project of any worker and the foreman and/or superintendent in responsible charge of the work where safety violations occur. The City also delegates such authority to the Construction Manager as well.

7.7.8 Equipment Safety Provisions – The completed Work shall include the specified permanent safety devices, such as machinery guards and similar safety items, required by the State and Federal (OSHA) industrial authorities and applicable local and national codes. Further, any features of the Work, including City-selected equipment, subject to such safety regulations shall be fabricated, furnished, and installed in compliance with these requirements. All equipment furnished shall be grounded and provided guards and protection as required by safety codes. Where vapor-tight or explosion-proof electrical installation is required by safety codes, this shall be provided. Contractors and manufacturers of equipment shall be held responsible for compliance with the requirements included herein. The Contractor shall notify all equipment suppliers and subcontractors of the provisions of this paragraph.

7.7.9 Confined Spaces – The Project requires work in confined spaces and requires compliance with CAL/OSHA and Federal OSHA requirements. Confined spaces for the purposes of this article shall be as defined by the Division of Industrial Safety. Work within confined spaces of this Project is subject to the definitions and applicable provisions of Section 5156 *et seq.*, Title 8, Division 1, Chapter 4, Subchapter 7, Group 16, Article 108 of California Code of Regulations, and Title 29 Part 1926 of the Code of Federal Regulations.

In addition the City classifies the following existing facilities as confined space: the interior of pipelines, vaults, manholes, reservoirs and any other such structure or space which is similarly surrounded by confining surfaces as to permit the accumulation of dangerous gases or vapors. The confined spaces are "permit" confined spaces as defined by OSHA and CAL/OSHA and therefore entry is allowed only through

compliance with a confined space entry permit program by the Contractor that meets the requirements of 8 C.C.R. Section 5157. While the above mentioned locations have been identified as permit confined spaces, other permit confined spaces may exist. It shall be the responsibility of the Contractor to identify and classify these confined spaces.

It is anticipated that the Contractor may encounter hazardous conditions within these permit confined spaces which include, but are not limited to the following:

A. Exposure to hydrogen sulfide, methane, carbon dioxide and other gases and vapors commonly found in municipal sewers which could have or has the potential of having Immediate Danger to Life or Health Conditions (IDLH).

B. Exposure to atmosphere containing insufficient oxygen to support human life.

C. Exposure to combustible, flammable and/or explosive atmosphere.

D. Exposure to sewage which may contain bacteriological, chemical and other constituents harmful to humans.

E. Work in conditions where engulfment or entrapment may occur.

F. Work in environments which may be slippery and/or have uneven work surfaces.

G. Work in structures where workers may trip, slip and/or fall several feet.

H. Exposure to an oxygen enriched environment.

7.7.10 Public Safety and Convenience – The Contractor shall conduct its work so as to ensure the least possible obstruction to traffic and inconvenience to the general public and the residents in the vicinity of the Work and to ensure the protection of persons and property. No road or street shall be closed to the public except with the permission of the Construction Manager and the written approval by the proper governmental authority. Fire hydrants on or adjacent to the Work shall be accessible to firefighting equipment. Temporary provisions shall be made by the Contractor to ensure the use of sidewalks, private and public driveways and proper functioning of gutters, sewer inlets, drainage ditches and culverts, irrigation ditches and natural water courses.

7.8 Provisions for Handling Emergencies

It is possible that emergencies may arise during the progress of the Work, which may require special treatment or make advisable extra shifts of labor forces to continue the Work for twenty-four (24) hours per day. These emergencies may be caused by damage or possible damage to nearby existing structures or property by reason of the work under construction, or by storm, accidents, or leakage. The Contractor shall be prepared in case of such emergencies to make all necessary repairs and shall promptly execute such work when required; such emergency work will be reimbursed as a Cost of the Work and the GMP increased accordingly.

Upon start of the Work, Contractor shall provide means for immediate emergency notification of Contractor's designated representative and designated emergency alternates.

7.9 Nonstandard Working Hours

The Contractor may be required to prosecute the Work at night or outside of the normal working hours defined in Section 01 12 16-1.03.B, Hours of Work. Such work may be required due to project or operational constraints as defined in Section 01 12 16, WORK SEQUENCE, or if emergencies arise as provided for in Article 7.8, Provisions for Handling Emergencies. When required, ordered, or permitted to work at night,

the Contractor shall provide sufficient and satisfactory lighting and other facilities therefore. Except as provided in Article 7.8, above, for work outside of the normal working hours, the Contractor shall receive no extra payment, but compensation shall be considered as having been included in the GMP stipulated for the Work, except for authorized work performed outside of the Agreement.

7.10 Cooperation with Other Contractors

This paragraph shall serve as notice to the Contractor that the City may allow other contracts for other work at or near the Site of this Work. The Contractor shall afford other Contractors reasonable opportunity for the delivery and storage of their materials and the execution of their work, and shall properly connect and coordinate its work with theirs.

Should construction be under way by other forces or by other Contractors within or adjacent to the limits of the work or in the vicinity of the work to be done under this Agreement, the Contractor shall so conduct its operations as to interfere to the least possible extent with the work of such other forces or Contractors.

Any difference or conflicts which may arise between the Contractor and any other forces or Contractors, creating delays or hindrance to each other, shall be adjusted as determined by the Construction Manager.

Section 01 12 16, WORK SEQUENCE, indicates anticipated other construction activities within or adjacent to work to performed in this Agreement. City shall require contractors performing Work by Others to cooperate with Contractor and not unduly interfere with Contractor's performance of the Work.

ARTICLE 8 - CONTROL OF WORK AND MATERIAL

8.1 Means, Methods and Appliances

The means, methods and appliances adopted by the Contractor shall be planned and executed to produce the highest grade quality of work and will enable the Contractor to complete the Work in the time agreed upon. The City and Construction Manager shall not supervise, direct, or have control over, or be responsible for, Contractor's means, methods and appliances of construction or for the safety precautions and programs incident thereto, or for any failure of Contractor to comply with laws and regulations applicable to the furnishing or performance of Work.

8.2 Contractor's Responsibility for Work

Unless specified otherwise in the Contract Documents, until the Final Completion of the Work by the City, the Contractor shall have the charge and care and shall bear the risk of damage to any part thereof by the action of the elements or from any other cause, whether arising from the execution or non-execution of the Work.

The Contractor shall rebuild, repair, restore and make good all damages to any portion of the Work occasioned by any of the above causes before Final Completion and shall bear the expense, except such damages occasioned by the acts of the Federal government or acts of war.

In case of suspension of work from any cause whatsoever, the Contractor shall be responsible for the Work as previously specified and shall also be responsible for all materials delivered to the Site. Where necessary to protect the Work from damage, the Contractor shall, at its own expense, provide suitable drainage of the worksite and erect such temporary structures as necessary to protect the Work from damage during any period of suspension of work.

The Contractor shall provide twenty-four (24) hour emergency service for all maintenance and operations of the Work specified and shall supply the City with the name and phone number of the responsible person. Contractor will respond to requests for emergency service for the Work promptly upon notification. If the Contractor fails to provide this service after notice from City, City may perform such emergency service and the cost thereof shall be deducted from the next Progress Pay Estimate due the Contractor.

8.3 Character of Workers

None but competent superintendents, forepersons and workers shall be employed on the Work by the Contractor and its subcontractors at all tier levels. The Contractor shall remove from the Work any person who commits trespass, possesses firearms or other weaponry, is under the influence or is in the possession of alcohol or other drugs/controlled substance, or is, in the opinion of the City or Construction Manager, disorderly or profane, dangerous, abusive, insubordinate, incompetent, or otherwise objectionable. Such discharge shall not be the basis of any claim for compensation or damages against the City, its officers, officials, employees, agents, and volunteers, the Engineer, the Construction Manager, and their partners, officers, employees, agents or any representatives.

8.4 Supply of Sufficient Workers

The Contractor shall at all times employ qualified workers sufficient to prosecute the Work at a rate and in a sequence and manner necessary to complete the Work within the required Contract Time. This obligation shall remain in full force and effect notwithstanding disputes or claims of any type. At any time during the progress of Work, should the Contractor directly or indirectly (through subcontractors), refuse, neglect, or be unable to employ a sufficient number of qualified workers to prosecute the Work as required, then the City may require the Contractor to accelerate the Work and/or furnish additional qualified workers as City may consider necessary, at no cost to City.

If Contractor does not comply with the notice within seven (7) days of date of service thereof, City shall have the right (but not a duty) to provide qualified workers to finish the Work or any affected portion of Work, as City may elect. City may at its discretion, exclude Contractor from the Site, or portions of the Site or separate Work elements during the time period that City exercises this right. City will deduct from moneys due or which may thereafter become due under the Contract Documents, the sums necessary to meet expenses thereby incurred and paid to persons doing Work. City will deduct from funds or appropriations set aside for purposes of Contract Documents, the amount of such payments and charge them to Contractor as if paid to Contractor. Contractor shall remain liable for resulting delay, including liquidated damages and indemnification of City from claims of others.

Exercise by the City of the rights conferred upon the City in this Agreement is entirely discretionary on the part of the City. The City shall have no duty or obligation to exercise the rights referred to this Article 8.4, Supply of Sufficient Workers, and its failure to exercise such rights shall not be deemed an approval of existing Work progress or a waiver or limitation of City's right to exercise such rights in other concurrent or future similar circumstances. The rights conferred upon City under this Article 8.4, Supply of Sufficient Workers, are cumulative to City's other rights under any provision of the Contract Documents.

8.5 Materials and Workmanship

The Contractor shall provide safe access, including plants where materials or equipment are manufactured or fabricated, for the City Representative and inspectors to adequately inspect the quality of work and for conformance with the Contract Documents. The Contractor shall furnish the City Representative the necessary labor and facilities for such things as excavation in the compacted fill to the depths required to take samples. The Contractor shall provide adequate lighting, ventilation, ladders and other protective facilities as may be necessary for the safe performance of inspections.

Unless otherwise indicated in the Contract Documents or favorably reviewed by the Engineer, materials and equipment for the Work shall be the best grade in quality of a manufacturer regularly engaged in the production of such materials and equipment, or materials and equipment of comparable character. All materials must be of the specified quality and equal to approved samples, if samples have been submitted. All Work shall be done and completed in the best workmanlike manner, obtainable in the local market. All permanent materials and equipment shall be new unless otherwise specified.

Construction Manager will notify Contractor of Defective Work promptly upon identifying the Work at issue. All Defective Work or materials shall be promptly removed from the premises by the Contractor, whether in place or not, and shall be replaced or renewed with Work that meets the requirements of the Contract Documents. All materials and workmanship of whatever description shall be subjected to the inspection of, and rejection by, the Construction Manager if not in conformance with the Contract Documents.

Defective Work shall be modified, replaced, repaired or redone by the Contractor at no change in GMP (nor will any of the costs to correct Defective Work be reimbursable as a Cost of the Work) or Contract Time. Acceptance of Defective Work, without specific written acknowledgement and approval of the City, shall not relieve the Contractor of the obligation to correct such Work. Should the City determine that it is not feasible or in the City's interest to require Defective Work to be repaired or replaced, an equitable credit shall be made to the Costs of Work owed to the Contractor and a corresponding reduction in the GMP shall be made by agreement between the City and the Contractor (If the Contractor has been paid in full for its Work, the Contractor agrees to pay City the amount of the equitable credit mutually agreed to leave in place the Defective Work). If an equitable amount cannot be agreed upon, a Change Order will be issued and the amount in dispute resolved in accordance with the Contract Documents. The City and the City's consultants disclaim any and all responsibility for Work that is not in conformance with the Contract Documents. The Contractor shall have full responsibility for all direct consequences resulting from Defective Work, including without limitation all delays (pursuant to Section 01 40 00, QUALITY REQUIREMENTS), extra inspection and correction costs, consultant and attorneys' fees costs by the Contractor and re-Work.

The City agrees that after providing the Contractor with written notice of works that it deems to be Defective Work, the City shall allow the Contractor fifteen (15) days to investigate the Defective Work in order for the Contractor to determine whether it agrees that the work is Defective Work and if so, submit to the City, for its approval, a proposed remedy for the Defective Work, before the City shall charge the Contractor for any reasonable extra inspection, consultant and attorneys' fees costs associated with the Defective Work. If it is determined by a court or arbitrator, or the City otherwise agrees, that the work was not Defective Work, City shall bear all inspection, consultant and attorneys' fees costs incurred by City or Contractor as a result of the alleged Defective Work.

Unless otherwise stipulated in the Contract Documents, any defective material, equipment or workmanship, or any unsatisfactory or imperfect work which may be discovered before the Final Completion of the Work or within one (1) year thereafter, shall be corrected immediately upon the receipt of notice from the City, without extra charge, notwithstanding that it may have been overlooked in previous inspections and estimates. The City's failure to inspect work shall not relieve the Contractor from any obligation to perform sound and reliable Work as herein described. Any material, equipment and/or workmanship determined to be defective after the expiration of the one year express warranty provision (or beyond any furnished warranty extending beyond one year) shall be subject to the ten year statute relating to latent defects. The express warranties of the Contract Documents are in addition to, not in lieu of, the ten year statutory obligations.

In the event that the Contractor shall fail to comply with the conditions of the foregoing guarantee within fifteen (15) calendar days after the date of written notification of the defect, the City shall have the right, but shall not be obligated to repair, or obtain the repair of, the defect and the Contractor shall pay to the City on demand all costs and expense of such repair. Notwithstanding anything herein to the contrary, in the event that any defect in workmanship or material covered by the foregoing guarantee results in a condition which constitutes an immediate hazard to the health or safety, or any property interest, or any person, the City shall have the right to immediately repair, or cause to be repaired, such defect, and the Contractor shall pay to the City on demand all costs and expense of such repair. The foregoing statement relating to hazards to health, safety or property shall be deemed to include either temporary or permanent repairs which may be required as determined in the sole discretion and judgment of the City.

8.6 Use of Materials Found on the Site

The City does not warrant the suitability of any native material on the Site for use in the Project. The Contractor, with the approval of the Engineer, may use in the proposed construction such stone, gravel,

sand or other material as may be found on the Site and deemed suitable in the opinion of the Engineer. The Contractor shall replace at its own expense all of that portion of the material so removed and replaced with other suitable material. No charge for native materials so used will be made against the Contractor. The Contractor shall not excavate or remove any material from any location that is not within the excavation, as indicated by the slope and grade lines shown on the Drawings, without written authorization from the Engineer.

8.7 Existing Utilities

8.7.1 General – The location of known existing utilities and pipelines are shown on the Drawings in their approximate locations. However, nothing herein shall be deemed to require the City to indicate the presence of existing service laterals or appurtenances whenever the presence of such utilities on the Site of the Work can be inferred from the presence of other visible facilities, such as buildings, cleanouts, meter and junction boxes, on or adjacent to the Site of the Work.

The City will assume the responsibility for the timely removal, relocation, or protection of existing main or trunkline utility facilities located on the Site if such utilities are not identified by the City in the Contract Documents or which cannot reasonably be inferred from the presence of other visible facilities to the extent required by law.

8.7.2 Utility Location – It shall be the Contractor's responsibility to determine the exact location and depth of all utilities, including service connections, which have been marked by the respective utility owners and which the Contractor believes may affect or be affected by the Contractor's operations. The Contractor shall not be entitled to additional compensation or time extensions for work necessary to avoid interferences nor for repair to damaged utilities if the Contractor does not expose all such existing utilities as required by this Article.

Pursuant to Government Code Section 4216.2 the Contractor shall contact the appropriate regional notification center at least two (2) working days, but not more than fourteen (14) calendar days, before performing any excavation. The Contractor shall request that the utility owners conduct a utility survey and mark or otherwise indicate the location of their service.

After the utility survey is completed, the Contractor shall commence "potholing" or hand digging to determine the actual location of the pipe, duct, or conduit. The Construction Manager shall be given notice prior to commencing potholing operations. The Contractor shall uncover all piping and conduits, to a point one (1) foot below the pipe, where crossings, interferences, or connections are shown on the Drawings or indicated based on the utility survey, and prior to trenching or excavating for any pipe or structures, to determine actual elevations. New pipelines shall be laid to such grade as to clear all existing facilities which are to remain in service for any period subsequent to the construction of the run of pipe involved.

8.7.3 Utility Relocation and Repair – If interferences occur at locations other than those indicated in the Contract Documents with reasonable accuracy, the Contractor shall notify the Construction Manager in writing. The Construction Manager shall work together with the Contractor to supply a method for correcting said interferences in accordance with the responsibilities of this Article and Government Code Section 4215.

The City shall compensate the Contractor for the costs of locating and repairing damage not due to the failure of the Contractor to exercise reasonable care, and for removing or relocating such main(s) or trunkline utility facilities not indicated in the Contract Documents with reasonable accuracy, and for the cost of equipment on the Project necessarily idled during such work. The payment for such costs will be made as provided in Article 10.1, Change Orders. The Contractor shall not be assessed liquidated damages for delay in completion of the Project, when such delay is caused by the failure of the City or utility company to provide adequate advance information to the Contractor for removal or relocation of such utility facilities. Requests for extensions of time arising out of utility relocation or repair delays shall be filed in accordance with Section 01 32 16-1.13, ADJUSTMENT OF PROJECT TIME.

The public utility, that owns the affected utility/asset, shall have the sole discretion to perform repairs or relocation work or permit the Contractor to do such repairs or relocation work at a reasonable price. The right is reserved to the City and the owners of utilities or their authorized agents to enter into the Site for the purpose of making such changes as are necessary for the rearrangement of their facilities or for making necessary connections or repairs to their properties. The Contractor shall cooperate with forces engaged in such work and shall conduct its operations in such a manner as to avoid any unnecessary delay or hindrance to the work being performed by such forces and shall allow the respective utilities time to relocate their facility.

When the Agreement indicates that a utility is to be relocated, altered or constructed by others, the City will conduct all negotiations with the utility company and the work will be done at no cost to the Contractor, unless otherwise stipulated in the Agreement.

Temporary or permanent relocation or alteration of utilities approved by the utility owner and the City that is desired by the Contractor for its own convenience shall be the Contractor's responsibility and it shall make arrangements and bear all costs for such work.

8.8 Surface Restoration

Surface restoration shall be defined as that work necessary to restore the excavated area above backfill and the scarred surrounding work areas to a condition equivalent to or better than existed prior to the construction. This may include pavement replacement, concrete curbs and surface replacement, seeding, shrub and plant replacement, and restoration of ditches and drainage areas.

The replacement of grass and/or wild flowers shall be accomplished by seeding. The kind and type of seed is to be determined by the City. The City and Contractor shall agree before proceeding as to which plants and shrubs shall be saved or replaced.

The restoration of trench surfaces shall include measures to prevent surface erosion of the trench. This shall include seeding, cutoff walls, surface header boards, water bars, interceptor dikes, gravel filter dikes, or rip rap energy dissipaters. These measures shall be used as required to prevent surface erosion.

8.9 Disposal of Materials

Unless otherwise specified in the Contract Documents, the Contractor shall make arrangements for disposing of materials. Excess excavated material not required for backfill, debris, chemicals, sledges and other removed materials shall be disposed of legally by the Contractor.

When any materials, including excess of unsuitable excavated earth or other materials are to be disposed of off the Site, the Contractor shall first obtain a written permit from the property owner on whose property the disposal is to be made and shall file said permit or certified copy together with a written release from the property owner absolving the City from any and all responsibility in connection with the disposal of material on said property. Before any material is disposed of on said property, the Contractor shall obtain permission from the City's Representative to dispose of the material at the location designated in said permit.

Unless otherwise provided in the Contract Documents, full compensation for all cost involved in disposing of materials as above specified, including all costs of overhaul, shall be considered as included in the prices paid for the various contract items of work and no additional allowance will be made.

8.10 American Iron and Steel Requirement Compliance

Goods and services under this Agreement may be funded with monies made available by CWSRF that have statutory requirements commonly known as "American Iron and Steel;" that requires all of the iron and steel products used in the Project to be produced in the United States ("American Iron and Steel

Requirement") including iron and steel products provided by the Contactor pursuant to this Agreement. The Contractor shall comply with the American Iron and Steel Requirement, and all of the iron and steel products applicable to the American Iron and Steel Requirement used in the Project shall be and/or have been produced in the United States in a manner that complies with the American Iron and Steel Requirement, unless a waiver of the requirement is approved. The Contractor shall also provide any further verified information, certification or assurance of compliance with this paragraph, or information necessary to support a waiver of the American Iron and Steel Requirement, as may be requested by the City or Funding Agency. Notwithstanding any other provision of this Agreement, any failure to comply with this paragraph by the Contractor shall permit the City to recover as damages against the Contractor any loss, expense, or cost including without limitation attorney's fees incurred by the City or Funding Agency resulting from any such failure including without limitation any impairment or loss of funding, whether in whole or in part, from the Funding Agency or any damages owed to the Funding Agency by the City.

ARTICLE 9 - PROGRESS OF THE WORK

9.1 Commencement of Work

Within forty-five (45) calendar days after executed of the Agreement, written Notice to Proceed will be issued by the City to Contractor. Notwithstanding other provisions of the Agreement, the Contractor shall not be obligated to perform the Work, and the City shall not be obligated to accept or pay for such Work performed by the Contractor, prior to City's issuance of the Notice to Proceed. The Contractor shall provide the required Agreement bonds and evidences of insurance prior to the City's execution of this Agreement and prior to commencement of any Work.

The Contractor shall commence execution of the Work within ten (10) days after the date established in the Notice to Proceed for the commencement of Contract Time.

The Contractor shall give the Construction Manager written notice not less than five (5) working days in advance of the actual date on which the Work is to begin on the Site (excluding Preconstruction Services performed under the Agreement) will be started. The Contractor shall be entirely responsible for any delay in the Work which may be caused by its failure to give such notice.

9.2 Contract Time

All time limits for Substantial Completion, and Final Completion as stated in the Contract Documents are of the essence of the Agreement. The counting of Working or Calendar Days shall begin ten (10) Calendar Days from the date the Notice to Proceed is issued. The Contractor shall prosecute the Work so that the various portions of the Work shall be complete and ready for use within the times specified in Exhibit F, COMPLETION TIMES AND LIQUIDATED DAMAGES. It is expressly understood and agreed by and between the Contractor and the City that the Contract Time(s) for Contract Milestones, Substantial Completion of the Work and for Final Completion are reasonable times taking into consideration the average climatic and economic conditions and other factors prevailing in the locality and the nature of the Work known as of the date this Agreement is entered into.

9.3 Delays

9.3.1 Notice of Delays - When the Contractor foresees a delay in the prosecution of the Work and, in any event, promptly upon the occurrence of a delay to its Work, the Contractor shall notify the Construction Manager in writing of the occurrence of delay, providing the estimated extent of the delay and its cause. The Contractor shall take immediate steps to prevent or mitigate, if possible the occurrence or continuance of the delay.

The Contractor agrees that no claim shall be made for any occurrence of delay that is not the subject of a written notice and that is not submitted to the attention of the Construction Manager within ten (10) calendar days of its occurrence. The City may accept a delay with more than ten (10) calendar days of notice if the

City finds that the Contract was acting in good faith and the City was not Prejudiced by the Contractor's failure to timely provide the required notice.

9.3.2 Non-Excusable Delays – Non-excusable delays in the prosecution of the Work are delays which were caused by the Contractor, or by its subcontractors and suppliers, at any tier level, or delays which could have been avoided by the exercise of care, prudence, and diligence on the part of the Contractor or its subcontractors or suppliers, at any tier level. The Contractor shall receive no compensation or time extension for such delay. The determination of Non-Excusable Delays shall be made solely by the Construction Manager. In the event that the Contractor is not in agreement with the Construction Manager's decision, the Contractor may appeal the decision by submitting to the City (for consideration), evidence that supports the Contractor's claim for an Excusable Delay consideration.

9.3.3 Excusable Delays - Excusable Delays in the prosecution or completion of the Work are delays which are not caused by or within the control of Contractor and which could not have been avoided by the exercise of care, prudence, foresight, and diligence on the part of the Contractor or its subcontractors or suppliers, at any tier level. In addition, before a delay will be deemed an "Excusable Delay," the delay must prevent the Contractor from proceeding with at least seventy-five (75%) percent of the normal labor and equipment force for at least five (5) hours per day toward completion of the current critical activity item(s) on the latest approved progress schedule submitted by Contractor in accordance with the Contract Documents. The Contractor shall receive no compensation for such delay unless such delay also qualifies as a Compensable Delay, as described below. The following are examples of Excusable Delays:

A. Abnormal Delays - Delays caused by fire, unusual storms, floods, tidal waves, earthquakes, strikes, labor disputes, freight embargoes, and shortages of materials shall be considered as Excusable Delays insofar as they prevent the Contractor from proceeding with at least seventy-five (75%) percent of the normal labor and equipment force for at least five (5) hours per day toward completion of the current critical activity item(s) on the latest favorably reviewed progress schedule.

B. Weather Delays – Delays caused by inclement weather conditions or the conditions resulting from inclement weather shall be considered as "Excusable Delays" if they prevent the Contractor from proceeding with seventy-five (75%) percent of the normal labor and equipment force engaged in the current critical activity item for a period of at least five (5) hours per day toward completion of such operation or operations, and the crew is dismissed as a result thereof.

C. Material Shortages - Upon the Contractor's submission of satisfactory proof to the Construction Manager, shortages of material may be considered an "Excusable Delay" upon the satisfaction of the conditions set forth herein. The Contractor must demonstrate that the Contractor has made every effort to obtain such materials from all known sources within reasonable reach of the proposed Work. Only the physical shortage of material, caused by unusual and unforeseeable circumstances, will be considered as eligible for an "Excusable Delay," and no consideration will be given to any claim that the material could not be obtained at a reasonable, practical, or economical cost or price, unless it is shown to the satisfaction of the Construction Manager that such material could have been obtained only at exorbitant prices entirely out of line with current rates, taking into account the quantities involved and usual practices in obtaining such quantities. A time extension for shortage of material will not be considered for material ordered or delivered late or whose availability is affected by virtue of the Contractor's or its subcontractor's or supplier's mishandling of the procurement for such material. The above provisions apply equally to equipment to be installed in the Work. Nothing herein is intended to affect the Contractor also needing to demonstrate that the delay must prevent the Contractor from proceeding with at least seventy-five (75%) percent of the normal labor and equipment force for at least five (5) hours per day toward completion of the current critical activity item(s) on the latest favorably reviewed progress schedule.

9.3.4 Compensable Delays – Compensable Delays in the prosecution or completion of the Work are delays which meet each of the following three elements: (1) delays which result from causes beyond the control of the Contractor and which could not have been avoided by the reasonable exercise of care, prudence, and diligence on the part of the Contractor or its subcontractors or suppliers, at any tier level; (2) delays that prevent the Contractor from proceeding with at least seventy-five (75%) percent of the normal labor and equipment force for at least five (5) hours per day toward completion of the current critical activity item(s) on the latest approved progress schedule; and (3) delays that are caused by one of the following three causes:

A. Delays due to the actions and/or inactions of the City, Construction Manager, Engineer or any of their agents or employees.

B. Delays due to differing site conditions as defined in Article 10.2, DIFFERING SITE CONDITIONS.

C. Delays due to other contractors (excluding W. M. Lyles) employed by the City who interfere with the Contractor's prosecution of the Work as defined above.

9.3.5 Concurrent Delays – Concurrent delays are those delay periods when the prosecution of the Work is delayed during the same period of time due to causes from a combination of the delays defined in Article 9.3.2, NON-EXCUSABLE DELAYS, Article 9.3.3, EXCUSABLE DELAYS, or Article 9.3.4, COMPENSABLE DELAYS. During such concurrent delay periods, time extensions will be granted in accordance with Article 9.4, TIME EXTENSIONS; however, the Contractor will be granted a non-compensable time extension, and the City shall not assess its actual costs as defined in Article 9.4.1, NON-EXCUSABLE DELAYS, nor will the City assess Liquidated Damages.

9.4 Time Extensions

9.4.1 Non-Excusable Delays – The Contractor shall receive no compensation or time extension for Non-Excusable Delays.

9.4.2 Excusable or Compensable Delays – If the Contractor is delayed in the performance of its Work as defined in Article 9.3.3, EXCUSABLE DELAYS, or Article 9.3.4, COMPENSABLE DELAYS, then the Contract Time(s) will be extended by the City for such time that, the Contractor shows, and the City agrees (which agreement will not be unreasonably withheld), the Project's critical path completion dates will be delayed, provided that the Contractor strictly fulfills the following:

A. The Contractor shall have provided written notification, in accordance with Article 9.3.1, NOTICE OF DELAYS;

B. The Contractor shall have submitted in writing a request for an extension of time to the Construction Manager stating at a minimum the cause of the delay and the estimated number of days being requested. Such request for an extension of time shall be submitted in accordance with the requirements of 01 32 16-1.13, ADJUSTMENT OF PROJECT TIME. As provided therein, the Contractor's request for a time extension shall be submitted within fifteen (15) days of the Contractor furnishing its written notice pursuant to Article 9.3.1, NOTICE OF DELAYS. In the case of an Excusable Delay or Compensable Delay that allegedly is impacting the Contractor's operations for a period longer than fifteen (15) days, the Contractor shall update its request for a time extension, including updating its time impact analysis, every thirty (30) days until the delay is no longer allegedly impacting the Contractor's operations.

C. If the Contractor maintains that the delay at issue is a Compensable Delay, the Contractor shall submit an estimate of the additional compensation for Field Overhead and Indirect Home Office Overhead (per Article 9.4.3, FIELD OVERHEAD AND INDIRECT HOME OFFICE OVERHEAD FOR COMPENSABLE DELAYS) that it is seeking in regards to the alleged

delay. This estimate shall be included with the Contractor's request for time extension that is described in paragraph B, above. In the case of a Compensable Delay that allegedly is impacting the Contractor's operations for a period longer than fifteen (15) days, the Contractor shall update its estimate of additional compensation every thirty (30) days until the delay is no longer allegedly impacting the Contractor's operations.

D. If requested by the Construction Manager, the Contractor shall provide sufficient information to the Construction Manager to assess the cause or effect of the alleged delay (as well as additional compensation in the case of Compensable Delay), or to determine if other concurrent delays affected the Work. Such additional information shall be furnished within fifteen (15) days of the Construction Manager's request for additional information.

E. Time extensions due to Excusable or Compensable Delays will be granted only if such delays involve controlling critical path operations which would prevent completion of the whole Work within the specified Contract Time(s), as described in the above conditions for determination of "Excusable Delay" or "Compensable Delay."

F. **Force Majeure**. Force Majeure events shall be considered Excusable Delays. Any claim by Contractor to classify a Force Majeure event as a Compensable Delay shall be handled pursuant to Article 11.1, RESOLUTION OF DISPUTES. See definition of Force Majeure in Article 1, DEFINITIONS OF LANGUAGE USED, WORDS AND TERMS.

Construction Manager will, in writing, approve or reject the Contractor's request for a time extension within fifteen (15) days of the latter of (i) the Construction Manager's receipt of the Contractor's complete request for a time extension; or (ii) the Construction Manager's receipt of the additional information referenced in paragraph C, above. Should Construction Manager not provide a written response within such fifteen (15) day time period, the Contractor's request shall be deemed denied by the City.

If the Construction Manager determines that the Contractor is entitled to a time extension, during such approved extension of time, neither extra compensation for engineering, inspection and administration nor damages for delay will be charged to the Contractor.

For Weather Delays, the Contractor will be granted a non-compensable time extension for weather caused delays, pursuant to Article 9.3.3.B, WEATHER DELAYS, over and above an allowance as provided for in Exhibit F, COMPLETION TIMES AND LIQUIDATED DAMAGES. No time extensions for weather delays will be granted until the total number of weather days exceeds this allowance.

Should the Contractor fail to complete the Work within the time specified in the Agreement, as extended in accordance with this clause if appropriate, the Contractor shall pay to the City liquidated damages in accordance with Article 9.5, LIQUIDATED DAMAGES.

9.4.3 Field Overhead and Indirect Home Office Overhead for Compensable Delays

The Contractor shall be compensated for field overhead and indirect home office overhead expenses due to Compensable Delays for periods of time when the Work is delayed as defined in Article 9.3.4, COMPENSABLE DELAYS. However, no payment shall be made for compensable delays which occur during a concurrent delay as defined in Article 9.3.5, CONCURRENT DELAYS. As a condition precedent to payment for field overhead and indirect home office overhead, the Contractor must fulfill all conditions as provided in Article 9.4.2, EXCUSABLE OR COMPENSABLE DELAYS. Compensation will be calculated in accordance with 9.4.3.1 and 9.4.3.2, below. No additional markup for overhead or profit shall be provided for such field overhead and indirect home office overhead expenses.

Payment to the Contractor for indirect overhead expenses will be made only if the extended Contract Time period granted for the compensable delay(s) is required to complete the Work following the depletion of the original Contract Time period and any time extensions granted other than compensable time extensions. Payment for field overhead and indirect home office overhead shall be calculated as follows:

9.4.3.1 Field Overhead – For those allowable delay periods as described in Article 9.4.3, FIELD OVERHEAD AND INDIRECT HOME OFFICE OVERHEAD FOR COMPENSABLE DELAYS, the Contractor shall be reimbursed for its field overhead based on:

A. Actual invoice costs for on-site field offices and temporary utilities as described in Section 01 50 00, TEMPORARY FACILITIES AND CONTROLS.

B. Actual labor costs as shown in Exhibit C, GUARANTEED MAXIMUM PRICE, COST OF WORK AND FEE, for field office staff.

C. Fair rental values acceptable to the Construction Manager as described in Section 01 26 00-3.2, COST DETERMINATION, for construction equipment idled due to the delay.

D. Actual Errors and Omissions insurance costs attributable to delay periods.

9.4.3.2 Indirect Home Office Overhead – For those delay periods as described in the introduction of Article 9.4.3, FIELD OVERHEAD AND INDIRECT HOME OFFICE OVERHEAD FOR COMPENSABLE DELAYS, the Contractor shall be reimbursed for its indirect home office overhead based on the following formula:

[Guaranteed Maximum Price ($) divided by the Contract Time Period (Calendar Days)] x 0.03 = Daily Indirect Home Office Overhead ($/Calendar Day)

As it is impractical to determine the actual home office overhead, such reimbursement shall encompass full payment for any and all indirect home office overhead expenses for such periods of time for the Contractor and all subcontractors. Distribution of the markup amount among the Contractor and all subcontractors and suppliers is the responsibility of the Contractor.

9.5 Liquidated Damages

9.5.1 City and the Contractor recognize that time is of the essence of this Agreement and that the City will suffer financial loss if the Work is not completed within the times specified in Exhibit F, COMPLETION TIMES AND LIQUIDATED DAMAGES, plus any extensions thereof allowed in accordance with Article 9.4, TIME EXTENSIONS. It is hereby understood and agreed that it is and will be difficult and/or impossible to ascertain and determine the actual damage which the City will sustain in the event of and by reason of the Contractor's failure to fully perform the Work or to fully perform all of its Agreement obligations that have accrued by the times for completion as specified in Exhibit F, COMPLETION TIMES AND LIQUIDATED DAMAGES.

9.5.2 It is, therefore, agreed in accordance with California Government Code Section 53069.85 that the Contractor will forfeit and pay to the City liquidated damages in the amount set forth in Exhibit F, COMPLETION TIMES AND LIQUIDATED DAMAGES, per day for each and every calendar day that expires after the times for completion specified in Exhibit F, COMPLETION TIMES AND LIQUIDATED DAMAGES, and/or as specified for completion of any scheduled operations or works described in Exhibit F, COMPLETION TIMES AND LIQUIDATED DAMAGES, except as otherwise provided by extension of time pursuant to Article 9.4, TIME EXTENSIONS. It is further understood and agreed in accordance with California Government Code Section 53069.85 that the liquidated damages sum specified in this provision is not manifestly unreasonable under the circumstances existing at the time this Agreement was made, and that the City may deduct liquidated damages sums in accordance with this provision from any payments due or that may become due the Contractor.

9.5.3 Liquidated damages will continue to accrue at the stated rate until the completion of any defined completion milestone(s) and Final Completion of Work, all as set forth in Exhibit F, COMPLETION TIMES AND LIQUIDATED DAMAGES. Accrued liquidated damages may be deducted by the City from

amounts due or that become due to the Contractor for performance of the Work. Liquidated damages may not be waived or reduced by the City unless expressly waived or reduced in writing by the City.

9.6 City Suspension of Work

9.6.1 If the Contractor fails to correct Defective Work as required by Article 8.5, MATERIALS AND WORKMANSHIP, or fails to carry out the Work in accordance with the Contract Documents or any other applicable rules and regulations, or otherwise breaches a material provision of the Agreement, and fails to respond to the City's written notice of the alleged default within ten (10) days, the City, by a written order of the City's Representative or signed personally by an agent specifically so empowered by the City, in writing, may order the Contractor to stop the Work, in its entirety or any portion thereof. In the event of a suspension of only a portion of the Work, the Contractor is obligated to perform the portion of the Work not suspended. The suspension of Work shall remain in effect until the condition or cause for such order has been eliminated. The City's concurrence that the condition or cause has been eliminated will be provided to the Contractor in writing. This right of the City to stop and suspend the Work shall not give rise to any duty on the part of the City to exercise this right for the benefit of the Contractor or any other person or entity. All delays in the Work occasioned by such stoppage shall not relieve the Contractor of any duty to perform the Work or serve to extend the time for its completion. Any and all work necessary to correct Defective Work in order to comply with the Contract Documents shall be performed at no cost to the City.

9.6.2 In the event that a suspension of Work is ordered as provided for in paragraph 9.6.1, the Contractor, at its expense (i.e., without reimbursement as a Cost of Work or an increase in the GMP), shall perform all Work necessary to provide a safe, smooth, and unobstructed passageway through construction for use by the City, the City's other contractors, public, pedestrian, and vehicular traffic, during the period of such use by suspension. Should the Contractor fail to perform the Work as specified, the City may perform such Work and the cost thereof may be deducted from partial payments and/or final payment due the Contractor under the Agreement. The City is also entitled to withhold any costs, expenses and/or damages incurred, in proportion to the Contractor's proportion of responsibility for the suspension, including consultants' costs and fees, due to the suspension of Work if the suspension was due to Contractor's fault. Contractor shall not be entitled to any relief pursuant to an Excusable Delay or Compensable Delay for the Work impacted by any suspension hereunder.

9.6.3 The City shall also have authority to suspend the Work wholly or in part, for such period as the City may deem necessary, due to convenience to the City, unsuitable weather, or to such other conditions as are considered unfavorable for the suitable prosecution of the Work. Such temporary suspension of the Work, if for City's convenience and reasons unrelated to deficiencies in Contractor's performance, shall be a Compensable Delay in accordance with Article 9.3.4, COMPENSABLE DELAYS and justification for time extension pursuant to the provisions set forth in Article 9.4, TIME EXTENSIONS.

9.6.4 The Contractor as directed by the City shall comply with the provisions in Article 9.6, CITY SUSPENSION OF WORK, above. Such additional work shall be compensated as provided for in Article 10, CHANGES IN THE WORK, unless the City's suspension of the Work is caused by the Contractor's failure to prosecute the Work in accordance with the Contract Documents.

9.7 City's Right to Terminate Contract

9.7.1 Termination for Default – If the Contractor refuses or fails to prosecute the Work or any separable part thereof with such diligence as will ensure its completion within the Contract Time(s) specified herein, or any authorized extension thereof, or fails to perform the Work in a manner required by the Contract Documents, or fails to complete such Work within such time as required under the Contract Documents or, if the Contractor should be adjudged as bankrupt, or is otherwise deemed insolvent by the City based on good cause and is unable to proceed with the Work, or if the Contractor should make a general assignment for the benefit of creditors, or if a receiver should be appointed on account of insolvency, or if the Contractor files a petition to take advantage of any debtor's act, or if the Contractor should persistently or repeatedly refuse or fail (except in cases for which an authorized extension of time is provided) to supply enough properly skilled workers or proper materials to complete the Work in the time

specified, or if the Contractor should fail to make prompt payment to subcontractors of undisputed amounts due for material or labor, or if the Contractor should persistently disregard laws or instructions given by City, or if the Contractor otherwise substantially fails to fulfill its obligations under the Contract Documents the City may, without prejudice to any other right or remedy, serve written notice upon the Contractor and Sureties of the City's intention to terminate the Contractor's performance under the Agreement. Said notice shall contain the reasons for such intention to terminate the Contractor's performance under the Agreement, and unless, within seven (7) days after the service of such notice, such alleged violations cease and satisfactory arrangements for the corrections thereof have been made, the City may terminate Contractor's performance under the Agreement and the Contractor shall not be entitled to receive any further payment until the Work is finished.

In the event of any such termination, the City shall serve written notice thereof upon the Surety and Contractor, and the Surety shall have the right to take over and perform the Agreement. However, if the Surety, within ten (10) days after the service of a notice of termination, does not give the City written notice of its intention to take over and perform the Agreement, or if it serves such notice of its intent to take over and perform the Agreement and does not begin performance thereof within fifteen (15) days from the date of serving said notice, the City may take over the Work and prosecute the same to completion by contract or by any other method it may deem advisable for the account and at the expense of the Contractor, and the Sureties and/or Contractor shall be liable to the City for any excess cost or other damage incurred by the City thereby. In such an event, the City may without liability for so doing, take possession of and utilize such materials, supplies and other property belonging to the Contractor and/or assume assignment of any and all subcontracts for subcontractors and/or suppliers that may be on the worksite and be necessary to complete the Work. For any portion of such Work that City elects to complete by furnishing its own employees, materials, tools, and equipment, the City shall be compensated in accordance with the schedule of compensation for force account work as stated in Section 01 26 00, CONTRACT MODIFICATION PROCEDURES.

If the Surety assumes the Contractor's terminated Work, it shall take the Contractor's place in all respects for that part and shall be paid by City for all Work performed by it in accordance with the terms of the Contract Documents, less any amounts City is entitled to withhold pursuant to the Contract Documents. If the Surety assumes the entire Agreement, all money due the Contractor at the time of its default shall be payable to the Surety as the Work progresses, subject to the terms of the Agreement.

In the event of a termination based on Contractor's default, the Contractor will be paid the actual amount due in accordance with the Contract Documents less damages caused to the City arising from the termination, including but not limited to, consultants' costs, attorneys' fees and all costs to the City to complete the Work including all costs generated to insure or bond the work of substituted contractors or subcontractors utilized to complete the Work, such excess shall be paid to the Contractor. If City's costs to complete the Work, including the aforementioned costs exceed the unpaid balance, the Contractor shall pay the difference to the City promptly upon demand. On failure of the Contractor to pay, the Surety shall pay upon demand by City. Any portion of such difference not paid by the Contractor or Surety within thirty (30) days following the mailing of a demand for such costs shall earn interest at the maximum rate authorized by California law.

The Contractor and the City agree that nothing in this article is intended to create a right to recover attorney fees as prevailing party in any lawsuit on this Agreement.

The foregoing provisions are in addition to and not in limitation of any other rights or remedies under law or in equity available to City.

If it is later determined by the City that the Contractor had an excusable reason for not performing, such as, by way of example and not limitation, a fire, flood, or other event which was not the fault of or was beyond the control of the Contractor, the City may allow the Contractor to continue Work on a mutually agreeable schedule, or treat the termination as a termination for convenience, and the rights and obligations of the parties shall be the same as if the termination had been issued for the convenience of the City. Also, in the event that it is determined by a third party, including a judge, jury or arbitrator, that the Contractor should

not have been terminated for fault, then Contractor agrees that the termination will be deemed to be a termination for convenience under Article 9.7.2, TERMINATION FOR CONVENIENCE.

9.7.2 Termination for Convenience – The City, by written notice to the Contractor from the City Manager, may terminate the Contractor's performance under the Agreement, either in whole or in part, at its own discretion or when conditions encountered during the Work make it impossible or impracticable to proceed, or when the City is prevented from proceeding with the Agreement by an act of God, by law, or by official action of a public authority, or upon a determination that such termination is in the best interest and convenience of the City, or whenever the City is prohibited from completing the Work for any reason. The City shall provide no less than seven (7) days written notice of its intent to terminate the Agreement for convenience, but in no event shall City provide written notice of its intent to terminate without having a prior consultation with Contractor.

A. Upon receipt of such written notice of termination, the Contractor shall:

1. Stop Work as specified in the written notice;

2. Terminate all orders and subcontractors except as necessary to complete Work which is not terminated;

3. If directed in writing by the City to do so, assign all right, title and interest in materials in progress, in which case the City will have the right at its discretion to settle, or pay any or all Claims arising out of the termination of such materials contracts, but in no event shall recovery by any Contractor include lost profits for uncompleted portions of Work;

4. Deliver or otherwise make available to the City all data, drawings, specifications, reports, estimates, summaries and such other information and material as may have been accumulated by the Contractor in performing this Agreement whether completed or in process;

5. Settle outstanding liabilities and Claims with the approval of City;

6. Complete performance of such part of the Work as has not been terminated; and

7. Take such other actions as may be necessary, or as may be directed by the City for the protection and preservation of the Project and/or property related to the Agreement.

B. Upon receipt of City's written notice of termination for convenience, and within a period of 30 to 60 days, as determined by the City at the time of termination, the Contractor shall submit to the Construction Manager a Termination Proposal which shall include, but is not limited to, the Contractor's estimate of costs to be incurred by the Contractor as a result of the termination for convenience, and as allowed by the Contract Documents, including documentation reasonably necessary to support such costs; the status of the Work at time of termination; the status of termination of the Contractor's subcontractor(s) and Supplier(s) agreement(s) including the amount of each agreement, amount paid under each agreement up to the date of termination, and the amount that currently remains due and owing under each agreement for Work completed as of the date of termination, if any; a list, certified as to quantity and quality, of termination inventory not previously disposed of, excluding items authorized for disposition by the Construction Manager; and any other information and/or documentation as required by City. Within thirty (30) days of receipt of Contractor's Termination Proposal, City shall provide to Contractor written acceptance of Contractor's Termination Proposal or exceptions to items within the Termination Proposal which must be modified in order to gain City's acceptance of the Termination Proposal.

Upon receipt of City's written acceptance of, or exceptions to, Contractor's Termination Proposal, the Contractor shall submit to the Construction Manager a request for final payment (or the undisputed portion of the Termination Proposal) pursuant to the Contract Document requirements. Such request shall be submitted promptly, but no later than fifteen (15) days from the effective date of receipt of City's written acceptance of, or exceptions to, Contractor's Termination Proposal.

C. Contractor shall not be entitled to recover any lost profits, fee or any other cost or expense on portion of the Work terminated. The final payment to the Contractor after termination for convenience shall not exceed the amounts due and owing under the Agreement at time of termination, including the following:

1. Any actual costs incurred by the Contractor for restocking charges or other costs reasonably incurred in negotiating termination of subcontracts and/or supply contracts;

2. The cost of the Work for protecting the Work in any manner, if any, as directed by the City; and

3. The cost of settling and paying Claims arising out of the termination of the Work under subcontract agreements or orders with the City's approval, as specified above, exclusive of the amounts paid or payable on account of goods delivered or Work furnished by subcontractor prior to the effective date of the termination; and

4. The cost of the Work and Fee allocable to the portion of the Work properly performed or goods supplied by the Contractor as of the date of termination, as determined in accordance with the Contract Documents, reduced by any sums previously paid to the Contractor.

D. The City's right to withhold under Article 12.9, WITHHOLDING OF PAYMENT shall apply to payments made under this article.

ARTICLE 10 - CHANGES IN THE WORK

10.1 Change Orders

10.1.1 Without invalidating the Agreement and without notice to sureties or insurers, the City through the Construction Manager, may at any time or from time to time, order additions, deletions, or revisions in the Work; these will be authorized by Field Directive, Field Order or Change Order. A Change Order will not be issued for a Field Directive unless the Construction Manager agrees that such Field Directive is a change in the scope of the Agreement that causes an increase in the Cost of the Work or an adjustment to the GMP or the Contract Time(s) and therefore warrants development of a Change Order. The Contractor shall comply promptly with the requirements for all Change Orders, Field Orders or Field Directives. The work involved in Change Orders and Field Orders shall be executed under the applicable conditions and requirements of the Contract Documents. By signing a Change Order, the Contractor waives any claim for additional time, not included in the Change Order, for the work covered by that Change Order. Additional or extra work performed by the Contractor without written authorization of a Change Order or Field Order will not entitle the Contractor to an increase in the GMP or an extension of the Contract Time(s).

10.1.2 Extra Work is defined in Contract Documents found in Article 1, DEFINITIONS OF LANGUAGE USED, WORDS AND TERMS. Such work shall be governed by all applicable provisions of the Contract Documents. In giving instructions, the Construction Manager shall have authority to make minor changes in the Work in writing by way of a Field Directive, not involving extra cost, and not inconsistent with the purposes of the Work; but otherwise, except in an emergency endangering life or property, no extra work or change shall be made unless in pursuance of a written order by the City through

the Construction Manager, and no claim for an addition to the GMP and/or Contract Time(s) shall be valid unless so ordered.

10.1.3 In case any authorized change increases or decreases the Work shown in a Change Order, the Contractor shall be paid for the work actually done at a mutually agreed upon adjustment to the GMP, in accordance with the provisions of Section 01 26 00, CONTRACT MODIFICATION PROCEDURES.

10.1.4 If the Contractor refuses to accept a proposed Change Order, the City may issue it unilaterally with a Construction Change Directive in accordance with the provisions of Section 01 26 00, CONTRACT MODIFICATION PROCEDURES. The Contractor shall comply with the requirements of the Construction Change Directive. The City shall provide for an equitable adjustment, if any, to the GMP and/or Contract Time, and compensate the Contractor accordingly. If the Contractor does not agree that the adjustment or refusal to adjust is equitable, it may submit a claim in accordance with ARTICLE 11, DISPUTES.

10.2 Differing Site Conditions

Pursuant to Public Contract Code Section 7104, the Contractor shall promptly, and before such conditions are disturbed, notify the Construction Manager, in writing, of any:

A. Material that the Contractor believes may be material that is hazardous waste, as defined in Section 25117 of the Health and Safety Code, which is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law.

B. Subsurface or latent physical conditions at the Site differing from those indicated by information about the Site made available to Proposers prior to the deadline for submitting bid proposals.

C. Unknown physical conditions at the Site of any unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Agreement.

The Contractor's written notice must be furnished to Construction Manager within ten (10) calendar days of Contractor discovering the alleged differing site condition. The Contractor agrees that no claim shall be made for any differing site conditions that is not the subject of a written notice submitted to the attention of the Construction Manager within ten (10) calendar days of their occurrence. The City may accept a claim with more than ten (10) calendar days of notice if the City finds that the Contract was acting in good faith and the City was not Prejudiced by the Contractor's failure to timely provide the required notice.

The City shall promptly investigate the conditions, and if it finds that the conditions do materially differ, or do involve hazardous waste, and cause a decrease or increase in the Contractor's cost of, or the time required for, performance of any part of the Work, the City shall cause to be issued a Change Order under the procedures provided in Article 10.1, CHANGE ORDERS.

In the event that a dispute arises between the City and the Contractor whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in the Contractor's cost of, or time required for, performance of any part of the work the Contractor shall not be excused from any scheduled completion date provided for by the Agreement, but shall proceed with all work to be performed under the Agreement. The Contractor shall retain any and all rights provided either by Agreement or by law which pertain to the resolution of disputes and protests between the contracting parties, Article 11.1, RESOLUTION OF DISPUTES.

No claim of the Contractor under this clause shall be allowed unless the Contractor has given the notice required.

10.3 Taxes. A Change Order shall be executed due to any new or increased taxes arising after the date of this Agreement (other than taxes assessed based on the income of Contractor). The Change Order shall consist of the incremental amount of such new or increased taxes only. With respect to reductions in taxes arising after the date of this Agreement (other than taxes assessed based on the income of Contractor), the Change Order shall consist of the difference in amount as a result of such reduced taxes only.

10.4 Permit Fees. With respect to increases or decreases in fees for permits or other governmental certificates or instruments arising after the effective date of this Agreement, a Change Order will be prepared and proposed to Contractor that shall consist of the incremental amount of such increases or decreases. To the extent this Agreement states that a permit or certificate is not required and Contractor is later required to procure such permit or certificate, all out-of-pocket costs reasonably associated therewith shall be included in the Change Order. The fees for permits and related costs associated with permits that was included in the GMP shall be listed in Exhibit C, GUARANTEED MAXIMUM PRICE, COST OF WORK AND FEES.

ARTICLE 11 - DISPUTES

11.1 Resolution of Disputes

It is the intent of this Agreement that disputes regarding the Agreement be resolved promptly and fairly between the Construction Manager and Contractor. However, it is recognized that some disputes will require detailed investigation and review by one or both parties before a determination and resolution can be reached. For the protection of the rights of both the Contractor and City the following provisions are provided for the resolution of disputes which cannot be resolved by the Contractor and Construction Manager.

11.1.1 Notice and Contract Claim. Either party shall provide written notice of disputed or potentially disputed Work to the other party prior to the commencement of and sufficiently in advance of performing the disputed Work to allow both parties joint initial review of the disputed Work. If there is disagreement subsequent to the initial review, the Contractor shall formally request a Contract Interpretation by the Construction Manager in accordance with Article 5.3.9, CONTRACT INTERPRETATION BY THE CONSTRUCTION MANAGER. If the Contractor disagrees with the Construction Manager's decision or in any case where the Contractor deems additional compensation or a time extension to the Contract Time is due the Contractor for work or materials not covered in the Agreement or which the Construction Manager has not recognized as extra work, the Contractor may file a written "Contract Claim" with the Construction Manager within ten (10) days of receipt of the Construction Manager's contract interpretation decision or, if the claim does not involve a Construction Manager contract interpretation decision, within ten (10) days after the date of the occurrence, event or circumstance giving rise to the claim. Additionally, if the claim relates to extra, additional or unforeseen work for which the Contractor intends to demand additional compensation, a time extension, or both, notice shall be given to the Construction Manager prior to the time that the Contractor commences performance of the work giving rise to the potential claim for additional compensation or time extension, and Contractor shall not proceed with that work until so directed by the Construction Manager. A Contract Claim must (a) be in writing, (b) be labeled or clearly indicated as a claim under the Agreement, (c) set forth in detail the reasons why the Contractor believes additional compensation or a time extension is or may be due, the nature of the costs involved, and, insofar as possible, the amount of the claim, and (d) include (or reference earlier provided) documents that support and substantiate the claim as to both entitlement and quantification of time, money, or both. A claim for purposes of this article means a separate demand by the Contractor for (a) a time extension (including a demand for relief from damages or penalties for delay assessed by the City under the Agreement), (b) payment of money or damages arising from work done by, or on behalf of, the Contractor pursuant to the Agreement and payment of which is not otherwise expressly provided for or the Contractor is not otherwise entitled to, or (c) an amount the payment of which is disputed by the City.

Additionally, no claim for additional compensation or extension of time for a delay will be considered unless the provisions of Article 9.3, DELAYS, and Article 9.4, TIME EXTENSIONS, are complied with. No untimely claim or claim filed after the date of final payment will be considered.

Unless a timely Contract Claim is properly given, the Contractor shall not recover costs incurred by it as a result of the alleged extra work, changed work or other situation which had proper notice been given would have supported a claim for additional compensation. The Contractor should understand that timely notice of a Contract Claim is of great importance to the Construction Manager and City, and is not merely a formality. Such notice permits the City to consider preventative action, to monitor the Contractor's increased costs resulting from the situation, to marshal facts, and to plan its affairs. Such notice by the Contractor, and the fact that the Construction Manager has kept account of the work in question, shall not in any way be construed as proving the validity of any claim.

11.1.2 Processing of Claims, Generally. This Agreement provides for three types of Contract Claims, which will be processed and resolved under different terms as described below. Any claim for money or damages of $375,000 or less or for a time extension (i.e., any claim subject to Public Contract Code section 20104) shall be processed and resolved in accordance with Article 11.1.3. Any claim for money or damages of more than $375,000 (i.e., any claim not subject to Public Contract Code section 9204 or 20104) shall be processed and resolved in accordance with Article 11.1.4. Any Contract Claim sent to City by registered mail or certified mail with return receipt requested (i.e., any claim subject to Public Contract Code section 9204) shall be processed and resolved pursuant to Article 11.1.5.

11.1.3 Claims for $375,000 or Less or for Time Extension and Not Sent by Registered or Certified Mail.

11.1.3.1 Application. This article applies to all claims (not sent by registered or certified mail) for $375,000 or less in value, including any claim for a time extension or for a time extension that includes claimed delay damages of $375,000 or less.

11.1.3.2 City Response to Contract Claim. The Construction Manager shall respond in writing to the Contract Claim within 60 days of receipt of the claim (or within 45 days of receipt for claims of less than $50,000), or may request, in writing, within 30 days of receipt of the claim, any additional documentation supporting the claim or relating to defenses to the claim the City may have against the Contractor. If additional information is thereafter required, it shall be requested and provided pursuant to this article, upon mutual agreement of the Construction Manager and the Contractor. The Construction Manager's written response to the claim, as further documented, shall be submitted to the Contractor within 30 days after receipt (or 20 days after receipt for claims of less than $50,000) of the further documentation. The City shall not fail to pay money as to any portion of a Contact Claim that is undisputed except as otherwise provided in the Contract Documents.

11.1.3.3 Meet and Confer. If the Contractor disputes the Construction Manager's written response, or the Construction Manager fails to respond within the time prescribed, the Contractor may notify the City, in writing, either within 15 days of receipt of the Construction Manager's response or within 15 days of the Construction Manager's failure to respond within the time prescribed, respectively, and demand an informal conference to meet and confer for settlement of the issues in dispute. Upon such a demand, the City shall schedule a meet and confer conference within 30 days for the parties to consider settlement of the dispute. If the Contractor fails to timely demand a meet and confer conference within the applicable 15-day period, then the Contractor shall be deemed not to dispute the Construction Manager's written response to the Contract Claim and the Construction Manager's decision on the Contract Claim shall be final, conclusive and binding, and the Contractor shall be deemed to have waived all its rights to further protest, judicial or otherwise.

11.1.3.4 Government Code Claim. Following the meet and confer conference, if the Contract Claim or any portion remains in dispute, the Contractor may file a Government Code Claim as provided in Government Code title 1, division 3.6, part 3, chapters 1 (commencing with section 900) and 2 (commencing with section 910). The running of the period of time within which Contractor must file a Government Code Claim shall be tolled from the time the Contractor submits a timely Contract Claim pursuant to Article 11.1.1, NOTICE AND CONTRACT CLAIM until the time that the Contract Claim is denied as a result of the meet and confer process, including any period of time utilized by the meet and confer process. The City shall respond to any Government Code Claim in accordance with the Government Claims Act.

11.1.3.5 Lawsuit. If the claim is not resolved pursuant to Article 11.1.3.4, GOVERNMENT CODE CLAIM, the Contractor may file a lawsuit on the claim within the limitations period provided by the Government Claims Act. If the Contractor fails to timely file a lawsuit within the limitations period of the Government Claims Act, then the City's response to the Government Code Claim shall be final, conclusive and binding on the Contractor, and the Contractor thereafter shall be barred from filing a lawsuit on the claim.

11.1.3.6 Mediation. If the Contractor timely files a lawsuit, then within 60 days, but no earlier than 30 days, following the filing of responsive pleadings, the court shall submit the matter to non-binding mediation (unless waived by mutual stipulation of both parties). The mediation process shall provide for the selection within 15 days by both parties of a disinterested third person as mediator, shall be commenced within 30 days of the submittal, and shall be concluded within 15 days from the commencement of the mediation unless a time requirement is extended upon a good cause showing to the court or by stipulation of both parties. If the parties fail to select a mediator within the 15-day period, any party may petition the court to appoint the mediator. The mediator's fees and expenses shall be split and paid equally between the parties. The court may, upon request by any party, order any witnesses to participate in the mediation process.

11.1.3.7 Arbitration. If the matter remains in dispute following the mediation or if the parties waive the mediation, then the case shall be submitted to judicial arbitration pursuant to Code of Civil Procedure part 3, title 3, chapter 2.5 (commencing with section 1141.10), notwithstanding section 1141.11 of that code. The Civil Discovery Act of 1986 (Code of Civil Procedure part 4, title 3, chapter 3, article 3 (commencing with section 2016)) shall apply to any proceeding brought under this article consistent with the rules pertaining to judicial arbitration. The arbitrator shall be experienced in public works construction law. The arbitrator's fees and expenses shall be split and paid equally by the parties, except where the arbitrator, for good cause, determines a different division. The court may, upon request by any party, order any witnesses to participate in the arbitration process. Any party who, after receiving an arbitration award, requests a trial de novo but does not obtain a more favorable judgment shall (in addition to payment of any costs and fees under Code of Civil Procedure part 3, title 3, chapter 2.5 (commencing with section 1141.10)) pay the attorney's fees of the other party arising out of the trial de novo.

11.1.3.8 Interest. In any lawsuit filed under this article, the City shall pay interest at the legal rate on any arbitration award or judgment. The interest shall begin to accrue on the date the lawsuit is filed in court.

11.1.4 Claims for More Than $375,000 and Not Sent by Registered or Certified Mail

11.1.4.1 Application. This article applies to all claims (not sent by registered or certified mail) that exceed $375,000 in value, including any claim for a time extension that includes claimed delay damages exceeding $375,000.

11.1.4.2 City's Response to Contract Claim. The Construction Manager shall respond in writing to the Contract Claim within 60 days of receipt of the claim, or may request, in writing, within 30 days of receipt of the claim, any additional documentation supporting the claim or relating to defenses to the claim that the City may have against the Contractor. If additional information is thereafter required, it shall be requested and provided pursuant to this article, upon mutual agreement of the Construction Manager and the Contractor. The Construction Manager's written response to the claim, as further documented, shall be submitted to the Contractor within 30 days after receipt of the further documentation. If the Contractor fails to timely dispute the Construction Manager's decision on the matter in accordance with Article 11.1.4.3, GOVERNMENT CODE CLAIM, then the Contractor shall be deemed not to dispute the Construction Manager's written response to the Contract Claim and the Construction Manager's decision shall be final, conclusive and binding, and the Contractor shall be deemed to have waived all its rights to further protest, judicial or otherwise.

11.1.4.3 Government Code Claim. If the Contractor disputes the Construction Manager's written response to the Contract Claim, the Contractor may file a Government Code Claim as provided in Government Code title 1, division 3.6, part 3, chapters 1 (commencing with section 900) and 2 (commencing with section 910). The City shall respond to any Government Code Claim in accordance with the California Government Claims Act.

11.1.4.4 Lawsuit. If the claim is not resolved pursuant to Article 11.1.4.3, GOVERNMENT CODE CLAIM, the Contractor may file a lawsuit on the claim within the limitations period provided by the Government Claims Act. If the Contractor fails to timely file a lawsuit within the limitations period of the Government Claims Act, then the City's response to the Government Code Claim shall be final, conclusive and binding on the Contractor, and the Contractor thereafter shall be barred from filing a lawsuit on the claim.

11.1.4.5 Judicial Reference. If the Contractor timely files a lawsuit, the case shall be submitted to judicial reference pursuant to California Code of Civil Procedure Sections 638 and 640 through 645.1 (or any successor statute) and California Rules of Court title 3, division 9 (commencing with section 3.900). As authorized by Code of Civil Procedure section 638, a referee will consider and decide all factual and legal issues in the action. Each party acknowledges that it will not have any right to a jury trial or to have any judicial officer besides the referee hear or decide the action. When Contractor initiates the superior court lawsuit, it will, at the same time it files the complaint in the action, also file a motion for appointment of a single referee.

A. Appointment of a referee shall be by mutual agreement within 30 days between the parties, and if unsuccessful, then by the court and will be governed by Code of Civil Procedure Section 640, and subject to objection by either party as provided by Code of Civil Procedure Section 641. The referee must be a retired judge or a licensed attorney with at least ten (10) years substantive experience in public works construction matters.

B. The parties shall be entitled to discovery and the referee shall oversee discovery and may enforce all discovery orders in the same manner as a superior court judge. The referee shall have the authority to consider and rule on appropriate pre-hearing and post-hearing motions in the same manner as a superior court judge. The referee will have the authority to set a briefing and hearing schedule for any such motion or for a hearing on the merits.

C. The referee's statement of decision shall include findings of fact and conclusions of law. The statement of decision will stand as the decision of the superior court and, upon filing of the statement with the clerk of the court, judgment may be entered pursuant to Code of Civil Procedure Section 644, subsection (a). The parties will have rights to appeal the final judgment so entered.

D. (d) Each party will pay half of the costs of the referee and the administrative fees of the reference proceeding, and each party will bear its own costs, expenses and attorney fees for the reference proceeding.

11.1.5 Claims Subject to Public Contract Code Section 9204

11.1.5.1 This article applies to all Contract Claims sent by registered or certified mail with return receipt requested. The Contract Claim will be processed and resolved pursuant to Public Contract Code Section 9204, which is summarized here:

E. City's Review of Claim. Within 45 days after receiving a complete Contract Claim, City shall review the claim and provide the Contractor a written statement identifying what

portion of the claim is disputed and what portion is undisputed. The City will pay any undisputed portion of the claim within 60 days from the date of the written statement. If the City fails to timely issue a written statement, then the claim shall be deemed rejected in its entirety.

F. Meet and Confer Conference. If the Contractor disputes the City's written statement or if the Contract Claim is deemed rejected, the Contractor may demand and the parties will conduct an informal conference to meet and confer regarding settlement in accordance with Section 9204, subsection (d)(2). Within 10 business days following the conclusion of the meet and confer conference, the City shall provide Contractor a written statement identifying the portion (if any) of the claim remaining in dispute and any undisputed portion will be paid by the City within 60 days after this written statement.

G. Non-Binding Mediation. Any remaining disputed portion of the claim shall be submitted to nonbinding mediation in accordance with Section 9204, subsection (d)(2).

H. Interest. Any amount not paid in a timely manner as required by this article shall bear interest at a rate of 7 percent per annum until paid.

The foregoing is a summary of section 9204. In the event of any conflict between the summary and section 9204, the statute will govern.

11.1.5.2 Lawsuit and Reference. If mediation is unsuccessful and all or parts of the Contract Claim remain in dispute, then the Contractor may pursue a lawsuit (with judicial reference) in accordance with the procedures set forth at Articles 11.1.4.4 through 11.1.4.5. Any lawsuit under this Article 11.1.5 will be subject to judicial reference in the same manner as under Article 11.1.4.

11.1.6 Contract Work Pending Claim Resolution. Unless otherwise directed in writing by the Construction Manager, pending resolution of a claim under this article, the Contractor shall continue to diligently prosecute the Work in accordance with the Contract Documents and the instructions of the Construction Manager.

11.1.7 Records of Disputed Work. In proceeding with a disputed portion of the Work, the Contractor shall keep accurate daily records of all costs, including a summary of the hours and classification of equipment and labor utilized on the disputed work, as well as a summary of any materials or any specialized services that are used. Such information shall be submitted to the Construction Manager on a daily basis, receipt of which shall not be construed as an authorization for or acceptance of the disputed work. Failure to comply with this paragraph shall constitute a waiver of the Contractor's claim for additional compensation or a time extension as to that day.

11.1.8 Submission of Claim Costs. Within thirty (30) days after incurring the last cost of work for which the Contractor contends it is due additional compensation is incurred, but if costs are incurred over a span of more than thirty (30) days, then within fifteen (15) days after the thirtieth day and every month thereafter, the Contractor shall submit to the Construction Manager, as best the Contractor is able, its costs incurred for the claimed matter. Claims shall be made in itemized detail, and should the Construction Manager be dissatisfied with the format or detail of presentation, upon request for more or different information, the Contractor will promptly comply, to the satisfaction of the Construction Manager. If the additional costs are not fully ascertainable, they shall be estimated with as much accuracy as possible in the circumstances. The Construction Manager shall have the right as provided in Section 01 26 00-3.4, COST PRICING DATA AND ACCESS TO RECORDS, to review the Contractor's records pertaining to a submitted claim. In case the claim is found to be just, it shall be allowed and paid for as provided in Section 01 26 00, CONTRACT MODIFICATION PROCEDURES.

11.1.9 Claim Meetings. From time to time the Contractor may request or the Construction Manager may call a special meeting to discuss outstanding claims should it deem this a means of possible help in the resolution of the claim. The Contractor shall cooperate and attend prepared to discuss its claims, and make available the personnel, subcontractors and suppliers necessary for resolution, of the claim. In addition, the Contractor shall timely provide all documents relevant to the claim which may reasonably be requested by the Construction Manager.

11.1.10 Tort Claims. The provisions of this Article 11.1 apply only to contract-based claims and they shall not apply to tort claims, and nothing in this Article 11.1 is intended nor shall be construed to change the time periods for filing tort claims or actions specified by Government Code title 1, division 3.6, part 3, chapters 1 (commencing with section 900) and 2 (commencing with section 910).

ARTICLE 12 - PAYMENT AND COMPLETION

12.1 Guaranteed Maximum Price (GMP). The City shall pay for Contractor's performance under this Agreement the Cost of the Work and Fee (as defined in Exhibit C, GUARANTEED MAXIMUM PRICE, COST OF WORK AND FEE, hereto), provided, however, that the sum of the Cost of the Work and Fee shall not exceed the GMP, as adjusted by Change Order and/or Field Order in accordance with the Contract Documents.

12.2 Not Used.

12.3 Applications for Payment. Within ten (10) business days following execution of this Agreement, the City and Contractor shall meet to discuss the format, cost breakdown and level of detail required in each Contractor Payment Application. The cost breakdown shall be generally in the same format as typical CSI Document Divisions and Subdivisions, with major items of work listed individually. The cost breakdown shall be by structure, civil, landscaping, or other logical divisions of work. The cost breakdown for architectural, structural, mechanical, and electrical work shall include separate items for identifiable portions of the structures. The cost breakdown shall include separate items for all testing and startup work required. The cost breakdown shall also have separate items for all mobilization costs, direct job overhead costs, bonds, builder's risk insurance, supervision, subcontractors, special services and major suppliers.

The Contractor's cost breakdown and accounting system to produce the Contractor's Application for Payment must provide the City the means to efficiently substantiate the Cost of the Work completed each month and to date for the timely processing for payment to the Contractor.

Contractor shall deliver to City not more than once each month an Application for Payment covering the Cost of Work and Fee applicable to the Work performed during the immediately preceding month. With each Application for Payment Contractor shall submit a line item detailed billing to demonstrate costs incurred on account of Cost of the Work during such month.

Each progress payment request and the final payment request shall be deemed "proper" only if it is submitted on the form approved by the City, with all of the requested information completely and accurately provided by the Contractor and such completed progress payment request form or final payment request form is accompanied by: (i) certified payrolls of the Contractor and all subcontractors, of any tier, for laborers performing any portion of the Work for which a progress payment or final payment is requested; (ii) duly completed and executed Conditional Waiver and Release Upon Progress Payment or Final Payment forms in accordance with California Civil Code §§ 8132 and 8136 for all subcontractors of any tier, and material suppliers covering the progress payment or final payment requested; (iii) duly completed and executed Unconditional Waiver and Release Upon Progress Payment forms in accordance with California Civil Code §§ 8134 and 8138 for all subcontractors of any tier, and material suppliers covering the progress payment received by the Contractor under the prior progress payment request.

City may reject requests for payment, or portions thereof, for Work, or portions thereof, not performed or completed.

City may request additional detail or breakdown of costs to meet Funding Agency reimbursement requirements.

12.4 Amount of Progress Payments. City shall pay Contractor the actual Cost of the Work and Fee through the period covered by the Application for Payment, less Retention as set forth in Article 12.5, EFFECT OF PAYMENT below. City may additionally withhold from progress payments such amounts pursuant to stop notice claims as required by law and pursuant to Article 12.9, WITHHOLDING OF PAYMENTS.

12.5 Effect of Payment. Payment will be made by City based on the Construction Manager's observations at the Site and the data comprising the progress payment request. Payment will not be a representation that the City has:

A. Made exhaustive or continuous on-site inspections to check the quality or quantity of Work;

B. Reviewed construction means, methods, techniques, sequences or procedures;

C. Reviewed copies of requisitions received from subcontractors and material suppliers and other data requested by City to substantiate Contractor's right to payment;

D. Made examination to ascertain how or for what purpose Contractor has used money previously paid on account of the Contract Sum; or

E. Accepted all or part of the Work.

12.6 Retention; Escrow Agreement; Final Payment. Five percent (5%) Retention shall be withheld from each progress payment until the expiration of 35 days following City's filing of the Notice of Completion for the Project or as required in California Public Contract Code Section 7107, whichever is earlier; provided, however, City shall continue to retain such amount as required by law and City's right to withhold in accordance with Article 12.9, WITHHOLDING OF PAYMENT, herein.

For any retention of amount earned by the Contractor as provided for in this article, the Contractor may substitute securities as provided in Section 22300 of the Public Contract Code, as amended, which states in part as follows:

> "Provisions shall be included in any invitation for bid and in any contract documents to permit the substitution of securities for any moneys withheld by a public agency to ensure performance under a contract, provided that substitution of securities provisions shall not be required where federal regulations or policies, or both, do not allow the substitution of securities. At the request and expense of the Contractor, securities equivalent to the amount withheld shall be deposited with the public agency, or with a state or federally chartered bank as the escrow agent, who shall then pay those monies to the Contractor. Upon satisfactory completion of the contract, the securities shall be returned to the Contractor."
>
> "Alternatively, the contractor may request and the City shall make payment of retentions earned directly to the escrow agent at the expense of the Contractor. At the expense of the contractor, the contractor may direct the investment of the payments into securities and the contractor shall receive the interest earned on the investments upon the same terms provided for in this Article for securities deposited by the Contractor. Upon satisfactory completion of the contract, the Contractor shall receive from the escrow agent all securities, interest and payments received by the escrow agent from the City, pursuant to the terms of this Article. The Contractor shall pay to each subcontractor, not later than 20 days of receipt of the payment, the respective amount of interest earned, net of costs attributed to retention withheld from each subcontractor, on the amount of retention withheld to insure the performance of the Contractor."

"The Contractor shall be the beneficial City of any securities substituted for money withheld and shall receive any interest thereon."

Securities eligible for investment under Section 22300 shall be limited to those listed in Section 16430 of the Government Code and to bank or savings and loan certificates of deposit, interest-bearing demand deposit accounts, standby letters of credit, or any other security mutually agreed to by the Contractor and the City.

The escrow agreement used hereunder shall be null, void, and unenforceable unless it is substantially similar to the form in Exhibit J, ESCROW AGREEMENT FOR SECURITY DEPOSITS IN LIEU OF RETENTION. Release of Retention monies shall constitute the Final Payment.

12.7 Not Used.

12.8 **Title to Construction Work.** Title to all Work covered by an Application for Payment shall pass to City no later than the time of payment. Upon submittal of an Application for Payment, all Work for which Applications for Payment have been previously issued and payments received from City shall, to the best of Contractor's knowledge, information and belief, be free and clear of liens, claims, security interests or encumbrances in favor of Contractor, subcontractors, material suppliers, or other persons or entities, except work, labor, materials or services that are the subject of a Claim.

No material, supplies, or equipment for the Work under this Agreement shall be purchased subject to any chattel mortgage, security agreement, or under a conditional sale or other agreement by which an interest therein or any part thereof is retained by the seller or supplier. The Contractor warrants good title to all material, supplies, and equipment installed or incorporated in the Work and agrees upon completion of all Work to deliver the premises, together with all improvements and appurtenances constructed or placed thereon by the Contractor, to the City free from any third party claims, liens, security interests, or charges.

Nothing contained in this article, however, shall defeat or impair the right of such persons furnishing materials or labor under any bond given by the Contractor for their protection or any rights under any law permitting such persons to look to funds due the Contractor in the hands of the City.

12.9 **Withholding of Payment.** City may withhold payment on account of an Application for Payment if required or authorized by any Applicable Law, or to the extent necessary to protect City from loss because of the following:

A. Defective Work not remedied, irrespective of when any such work be found to be defective.

B. Non adherence to Funding Agency requirements including, but not limited to, the Iron and Steel Requirements.

C. Damage to another contractor or third party, or to property that Contractor has failed to resolve within 30 days after receiving written notice of the damage.

D. A reasonable amount for failure of the Contractor to maintain Record Drawings current as required in Section 01 33 23, AS-BUILT DRAWINGS.

E. Cost of insurance arranged by the City due to cancellation or reduction of the Contractor's insurance.

F. Failure to submit, revise, resubmit or otherwise conform to the requirements herein for preparing and maintaining a construction schedule as required in Section 01 32 16, PROGRESS SCHEDULES AND REPORTS.

G. Failure to provide the required payment documentation, including required waivers, releases, and Funding Agency documentation.

H. Payments due the City from the Contractor as provided for in the Contract Documents.

I. Failure to comply with environmental and other regulatory requirements that Contractor has failed to resolve within 30 days after receiving written notice of the noncompliance.

J. Failure to comply with equipment storage requirements and/or equipment installation guidelines.

K. Provisions of law that enable or require the City to withhold such payments in whole or in part, including, but not limited to California Public Contract Code

L. Stop Payment Notice claims filed by Contractor's subcontractors of any tier, or its material suppliers.

M. Contractor's failure to timely complete its Work, including Punch List items in the time required and issuance of operations and maintenance (O&M) manuals.

N. Any other breach of a material provision of this Agreement if Contractor has failed to respond to the City's written Notice of the alleged breach within 10 days.

When the above reasons for withheld amounts are removed, payment will be made to the Contractor for amount withheld because of them.

12.10 Failure of Payment. In accordance with Public Contract Code § 20104.50, City shall pay Contractor interest on any progress payment, which is made by City more than thirty (30) days after City receives an undisputed and properly submitted written payment request. Any written request for a progress payment which City determines not to be a proper payment request suitable for payment shall be returned to the Contractor within seven (7) days after receipt by City, along with a written statement of the reason or reasons why such request is not proper.

12.11 Occupancy by City Prior to Final Completion. The City reserves the right to Beneficial Occupancy without charge by Contractor. In those areas of the Work, which are deemed substantially completed the City may store materials, equipment, and supplies, and may perform partial operation.

12.12 Substantial Completion. When the Contractor considers the entire Work substantially complete, or a portion of the Work substantially complete as defined by the Contract Milestones or as needed for Beneficial Occupancy is complete and ready for its intended use, the Contractor shall certify in writing to the City through the Construction Manager that the entire Work, or a portion of the Work as defined by the Contract Milestones or needed for Beneficial Occupancy is substantially complete and provide the City with a Certificate of Substantial Completion. If the Construction Manager agrees that an inspection to determine the status of completion is warranted, the City, Construction Manager and Contractor shall make an inspection of the Work to determine the status of completion. Substantial Completion shall be defined as completion of Work in accordance with the Contract Documents, including Extra Work, except for minor punch list items, and suitable for the City's Beneficial Occupancy. Issuance of Substantial Completion requires submittal of associate as-built drawings, operations and maintenance manuals, asset management data and other related submittals for the portion of Work being assessed for Substantial Completion.

If the City does not consider the Work substantially complete, the Construction Manager will notify the Contractor in writing identifying the parts of the Work that the City contends are not substantially complete. If the City considers the Work is substantially complete, the City will accept a corresponding partial Certificate of Substantial Completion. There shall be attached to the Certificate a punch list of items to be completed or corrected before Final Completion and Final Payment.

Upon verification that the Work is substantially complete the Construction Manager shall prepare a Certificate of Substantial Completion and the Punch List. The Certificate shall establish the date of Substantial Completion and the responsibilities of the City and the Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, warranties as defined by the Contract Documents, and shall fix the time, not to exceed 30 days, within which the Contractor shall finish all items on the Punch List or remaining work or administrative requirements accompanying the Certificate. When the preceding provisions have been approved by both the City and the Contractor, they shall sign the Certificate to acknowledge their written acceptance of the responsibilities assigned to them in such Certificate.

12.13 Final Completion. When all the Work is fully completed, Contractor shall provide City with a Certificate of Final Completion and shall request final inspection in writing. Additionally, Contractor shall provide legally effective releases or waivers satisfactory to City of all stop payment notice and payment bond claim rights in connection with the Work. Within ten (10) calendar days of receipt of such completed request form, City shall make final inspection. If following final inspection City determines that the Work (including all punch list items) has been fully completed and performed in accordance with the Contract Documents, the City will accept the Work as finally complete. Acceptance of the Project for Final Completion requires formal acceptance by the City's Representative. If the City's Representative determines that the Work is not complete after receipt of certification, the Contractor shall be notified in writing of deficiencies. After the deficiencies have been corrected, the procedure for final inspection as set forth above shall again be initiated by Contractor.

12.13.1 Waiver of Claims at Final Payment. Acceptance of final payment by Contractor shall constitute a waiver of all claims by Contractor, except those previously made in writing and identified as unsettled at the time of final payment or those related to final payment or items of Work that are incomplete at the time of Final Completion.

12.14 Warranties and Bonds

12.14.1 The Contractor hereby agrees to make, at its sole expense, all repairs or replacements necessitated by defects in materials or workmanship, supplied under terms of the Contract Documents, and pay for any damage to other works resulting from such defects, which becomes evident within the warranty period. Unless otherwise provided in Contract Documents, the one (1) year warranty period is the shortest duration and such duration may be a longer period of time as may be prescribed by law or by the terms of any applicable special guarantee required by the Contract Documents. The Contractor further assumes responsibility for a similar guarantee for all work and materials provided by subcontractors or manufacturers of packaged equipment components. The Contractor also agrees to indemnify, defend, and hold the City harmless from liability of any kind arising from damage due to said defects.

12.14.2 The Contractor shall execute and submit a warranties for the Work, and any portion of the Work possessed in accordance with Article 6.4, CITY'S RIGHT TO USE AND OCCUPY. The warranties shall be submitted within five (5) days of Substantial Completion.

12.14.3 The Contractor shall, upon the receipt of notice in writing from the City, promptly make all repairs arising out of defective materials, workmanship, or equipment. The City is hereby authorized to make such repairs, and the Contractor and its Surety shall be liable for the cost thereof, if ten (10) days after the City giving of such notice to the Contractor, the Contractor has failed to make or undertake the repairs with due diligence. In case of emergency, where in the opinion of the City delay could cause serious loss or damage, repairs may be made without notice being sent to the Contractor, and the expense in connection therewith shall be charged to the Contractor, and/or its Surety shall be liable for the cost thereof.

12.14.4 Prior to the expiration of the warranty period, the City reserves the right to hold a meeting and require the attendance of the Contractor. The purpose of the meeting is to review warranties, bonds and maintenance requirements and determine required repair or replacement of defective items.

12.14.5 For the purpose of this paragraph, acceptance of the Work or a portion of the Work by the City, shall not extinguish any covenant or agreement on the part of the Contractor to be performed or fulfilled

under this Agreement which has not, in fact, been performed or fulfilled at the time of such acceptance. All covenants and agreements shall continue to be binding on the Contractor until they have been fulfilled.

12.14.6 The City and the Contractor agree that warranty on the parts of the Work possessed and used by the City in accordance with Article 6.4, CITY'S RIGHT TO USE OR OCCUPY, shall commence on the date that the City takes possession of such work and so notifies the Contractor in writing. The City and Contractor further agree that such possession, and use of the Work shall not be deemed the Work as receiving Final Acceptance.

12.14.7 If, after installation, the operation or use of the materials or equipment furnished under the Contract Documents proves to be unsatisfactory to the Construction Manager or the City, the City shall have the right to operate and use such materials or equipment until it can, without damage to the City, be taken out of service for correction or replacement. Such period of use of the defective materials or equipment pending correction or replacement shall in no way decrease the warranty period. The warranty period for equipment shall be extended by the number of days from the date the equipment is found by the City to be non-functional or defective to the date the Contractor repairs and makes fully operational the same equipment.

12.14.8 Nothing in the Contract Documents shall be construed to limit, relieve or release the Contractor's, subcontractor's and/or equipment supplier's liability to the City for damages sustained as the result of latent defects in the equipment furnished or work performed. Further, nothing in the Contract Documents shall be deemed to be a waiver by the City of any rights or remedies, or time limits in which to enforce such rights or remedies, that it may have against the Contractor, subcontractors, suppliers of the equipment and Work performed under the Contract Documents.

12.15 Audits and Access to Records. The Contractor must maintain all books, records, documents, and other evidence directly pertinent to the performance of the Work in accordance with generally accepted accounting principles and practices. The Contractor must also maintain all financial information and data used by the Contractor in the preparation or support of any cost submission, including the Contractor's estimate, any Change Order, Dispute, Claim, Pay Application, or other request for equitable adjustment. City and its representatives will have access upon five (5) business days advanced written notice, during normal business hours, to all Contractor's books, summary reports, records, accounts, estimates, documents, detailed financial information, certified payroll records, AIS records and all other information and documentation relevant to the Work for the purposes of inspection, audit, and copying. The Contractor will, at no cost to City, provide reasonable facilities for such access, and inspection purposes. The City will arrange for and pay all costs of copying.

The Contractor agrees to include and make the requirements of this article, applicable to all subcontractors listed in Exhibit E, DESIGNATION OF SUBCONTRACTORS.

Audits conducted pursuant to this article, will be in accordance with general accepted auditing standards and established procedures and guidelines of the reviewing or audit agency.

The Contractor agrees to provide requested information and reports resulting from access to records to City, subject to execution of an appropriate confidentiality order if requested.

Records must be maintained and made available during the performance of the Work and for four (4) years after Final Payment, and until final settlement of all Disputes or Claims, whichever occurs later.

The right of access provisions of this article, applies to all financial records pertaining to the Agreement:

A. To the extent the records pertain directly to Agreement performance;

B. To the extent required for verification of the costs incurred where such costs are the basis for billings pursuant to the Agreement including Change Orders;

C. To the extent there is credible evidence that Contractor has violated the federal False Claims Act and the California False Claims Act or that fraud, gross abuse, or corrupt practices may be involved; and

D. If the Agreement is terminated for default or convenience.

Access to records is not limited to the required retention periods. City's Authorized Representative or designee must be granted access to records at any reasonable time for as long as the records are required to be maintained.

In the event that City's audit determines that Contractor has billed for any costs that are ineligible for reimbursement or for any reason should not have been paid, or the Contractor's fee has been improperly applied or calculated, Contractor shall promptly refund all improper payments following receipt of City's written notice and explanation of the alleged overpayments or improper fee and shall be responsible to pay City for the City's reasonable costs to perform the audit unless the Contractor establishes that the overpayment or improper fee was the result of an unintentional, inadvertent clerical error.

12.16 Cash Flow Projection. A cash flow projection covering the entire construction period shall be prepared by the Contractor and submitted to the Construction Manager prior to commencement of the Work. Additional cash flow projections shall be submitted upon request by the Construction Manager if there is a material change in the scope of the Work or a material change in the duration of the Work or if the Construction Manager reasonably believes that the Contractor's financial status has materially changed.

12.17 False Claims Act. All claims for payment from the Contractor to the City shall in all respects be a true and correct representation of services rendered and/or materials delivered to the City pursuant to the California False Claims Act. The penalties under the Federal False Claims Act and the State of California False Claims Act are non-exclusive, and are in addition to any other remedies which the City may have either under contract or law.

12.18 Shared Savings. The Contractor shall be compensated for actual work completed based on the Cost of the Work and Fee up to the amount of the GMP. If the Contractor's actual total Cost of the Work and Fee is less than the GMP upon Final Completion, the Contractor shall receive forty percent (40%) of the GMP Savings. "GMP Savings" shall mean the positive difference, if any, when the Actual Total Cost of the Work is subtracted from the GMP; provided, however, that unused Allowance monies, if any, shall not be subject to shared savings.

ARTICLE 13 - INSURANCE AND INDEMNIFICATION

13.1 Insurance

Contractor shall maintain, at its own expense, all the insurance required by this article and submit coverage verification for approval by the City prior to the City's execution of this Agreement, which shall be included in Exhibit L, CONTRACTOR INSURANCE CERTIFICATES of this Agreement.

This Agreement will not be executed by the City, and the Contractor shall not commence Work, until such insurance has been approved by the City. Such insurance shall remain in full force and effect at all times during the prosecution of the Work and until the Final Completion thereof. In addition, the commercial general liability insurance shall be maintained for a minimum of three (3) years after Final Completion of the Work. The City's issuance of the Notice to Proceed does not relieve the Contractor of the duty to obtain such insurance as required herein.

The Contractor shall not allow any subcontractor to commence work on its subcontract until all similar insurance required of the subcontractor has been obtained and verified by the Contractor and submitted to the Construction Manager for the City's review and records. Subcontractors shall furnish original certificates and required endorsements as verification of insurance coverage. At a minimum amount of coverage, the

insurance liability limits specified in Article 13.1.1.a(2) herein, shall apply for all subcontractors who execute a subcontract with the Contractor for portions of the Work.

Insurance is to be placed with insurers with a current A.M. Best's rating of no less than A-:VII or equivalent and that are admitted to do business and in good standing in California, unless otherwise approved by the City. In the case of workers' compensation and employer's liability insurance, coverage provided by the California State Compensation Insurance Fund is acceptable.

Each insurance policy required by this Agreement shall be endorsed to state that coverage shall not be suspended, voided, canceled by either party, or reduced in coverage or in limits except after thirty (30) days prior written notice has been given to the City by the insurance carrier. Should the insurance carrier refuse to provide this notice, the Contractor shall be obligated to provide to the City thirty (30) days prior written notice of any insurance coverage being suspended, voided, reduced or canceled by either party, or any reduction in coverage or in limits.

The Contractor shall include all costs for insurance in its GMP.

Nothing contained in these insurance requirements is to be construed as limiting the extent of the Contractor's responsibility for payment of damages resulting from its operations under this Agreement. For any claims related to Contractor's Work, as opposed to work City has contracted to parties other than Contractor, the Contractor's insurance coverage shall be primary insurance as respects the City, Construction Manager, Engineer, Funding Agencies and their directors, officers, elected officials, employees, agents, and volunteers. For any claims related to Contractor's Work, any insurance or self-insurance maintained by the City, Construction Manager, Engineer, Funding Agencies and their directors, elected officials, officers, officials, employees, agents, consultants or volunteers shall be in excess of the Contractor's insurance and shall not contribute with it.

Any failure of the Contractor to comply with reporting or other provisions of the policies including breaches of warranties shall not affect coverage provided to the City, Construction Manager, Engineer, Funding Agencies and their directors, elected officials, officers, officials, employees, agents, consultants or volunteers.

The Contractor shall take out, pay for, and maintain throughout the duration of this Agreement and for such additional periods as more specifically required herein the following insurance against claims for injuries to persons or damages to property which may be caused by the performance of the Work hereunder by the Contractor, the Contractor's agents, representatives, employees or subcontractors, or from operations under this Agreement.

13.1.1 Commercial General Liability and Automobile Liability Insurance – This insurance shall protect the Contractor from claims for bodily injury, personal injury and property damage which may be caused by the performance of the Work hereunder by the Contractor, the Contractor's agents, representatives, employees or subcontractors, or from operations under this Agreement. The commercial general liability insurance shall be maintained for three (3) years after Final Completion of the Work and shall provide coverage on an occurrence basis.

A. Additional Insureds – The commercial general liability and automobile policies of insurance shall include as additional insureds or be endorsed to contain the following provisions: the City, Construction Manager, Engineer, Funding Agencies and their directors, elected officials, officers, officials, employees, agents, consultants and volunteers are to be covered as additional insureds as respects: liability arising out of activities performed by or on behalf of the Contractor; products and completed operations of the Contractor; premises owned, occupied or used by the Contractor and or automobiles owned, leased, hired or borrowed by the Contractor. The coverage shall contain no special limitation on the scope of protection afforded to the City, Construction Manager, Engineer, Funding Agency and their directors, elected officials, officers, officials, employees, agents or volunteers and coverage provided to such additional insured. This policy shall provide coverage to each of the said additional

insureds with respect to said work. Said policy shall provide primary coverage to the full limit of liability stated in the declarations.

B. Amount of Coverage (General Contractor) – The bodily injury, personal injury and property damage liability of the Commercial General Liability insurance shall provide coverage in the following minimum limits of liability: $5,000,000 on account of any one occurrence for bodily injury and property damage, $5,000,000 personal and advertising injury limit with an annual general aggregate limit of not less than $10,000,000, and $5,000,000 products and completed operations aggregate, combined single limit, with excess coverage of $10,000,000 per occurrence and in the aggregate. The Automobile Liability insurance policy shall provide minimum limits of $5,000,000 per accident as a combined single limit arising out of the ownership, maintenance, or use of any owned or non-owned vehicles, with excess coverage of $10,000,000 per occurrence and in the aggregate, including coverage for products and completed operation. Any deductibles or self-insured retentions must be declared to and approved by the City.

C. Minimum Amount of Coverage for all Listed Subcontractors included in Exhibit E - The bodily injury, personal injury and property damage liability of the Commercial General Liability insurance shall provide coverage in the following limits of liability: $5,000,000 on account of any one occurrence for bodily injury and property damage, $5,000,000 personal and advertising injury limit with an annual general aggregate limit of not less than $10,000,000, and $5,000,000 products and completed operations aggregate, combined single limit. The Automobile Liability insurance policy shall provide minimum limits of $5,000,000 per accident as a combined single limit arising out of the ownership, maintenance, or use of any owned or non-owned vehicles. These minimum amounts of insurance coverage do not preclude the Contractor from requiring higher limits or additional insurance coverage as it deems necessary.

1. Minimum Amount of Coverage for Subcontractors NOT included in Exhibit E - The bodily injury, personal injury and property damage liability of the Commercial General Liability insurance shall provide coverage in the following limits of liability: $2,000,000 on account of any one occurrence for bodily injury and property damage, $2,000,000 personal and advertising injury limit with an annual general aggregate limit of not less than $4,000,000, and $2,000,000 products and completed operations aggregate, combined single limit. The Automobile Liability insurance policy shall provide minimum limits of $1,000,000 per accident as a combined single limit arising out of the ownership, maintenance, or use of any owned or non-owned vehicles. These minimum amounts of insurance coverage do not preclude the Contractor from requiring higher limits or additional insurance coverage as it deems necessary.

D. Subcontractors – The bodily injury and property damage liability insurance shall not be deemed to require the Contractor to have its subcontractors named as additional insureds in the Contractor's policy, but the policy shall protect the Contractor from contingent liability which may arise from operations of its subcontractors.

E. Included Coverage – The above commercial general liability insurance shall also include the following coverages:

- Premises – Operations
- Independent Contractors
- Products - Completed Operations
- Personal Injury - False Arrest, Libel, Wrongful Eviction, etc.

- Advertising Injury
- Broad Form Property Damage - Including, Completed Operations
- Separation of Insureds/Cross-Liability Provision
- Duty to Defend all Insureds
- Deletion of any Limitation on Coverage for Bodily Injury or Property Damage Arising out of Subsidence or Soil or Earth Movement
- Separate Aggregate – A provision that the annual general aggregate shall apply separately to each project for which Contractor provides services away from premises owned by or rented to Contractor.
- XCU – Explosion, Collapse, Underground Damage
- Blanket Contractual Liability – Provisions or endorsements shall state that the insurance, subject to all of its other terms and conditions, applies to the liability assumed by the Contractor under this Agreement, including, without limitation, insurable liabilities set forth in the indemnity articles of this Agreement.

1. Umbrella Policy – The Contractor may use an umbrella or excess policy to meet the limits requirement of Article 13.1.1.B, and subcontractors may use an umbrella or excess policy to meet the limit of requirements of Article 13.1.1.C. However, any such umbrella/excess policy must be approved by the City and maintain an A.M. Best Rating of no less than A:VII.

13.1.2 Workers' Compensation Insurance – In accordance with the provisions of Article 5, Chapter 1, Part 7, Division 2 (commencing with Section 1860) and Chapter 4, Part 1, Division 4 (commencing with Section 3700) of the Labor Code of the State of California, the Contractor is required to secure the payment of compensation to its employees and for that purpose obtain and keep in effect adequate Workers' Compensation Insurance. In accordance with California Labor Code Section 1861, the Contractor shall sign and include Exhibit K, WORKER'S COMPENSATION INSURANCE CERTIFICATE with this Agreement. If the Contractor, in the sole discretion of the City, satisfies the City of its responsibility and capacity under the applicable Workers' Compensation Laws, if any, to act as self-insurer, the Contractor may so act, and in such case, the insurance required by this article need not be provided.

The Contractor is advised of the provisions of Section 3700 of the Labor Code, which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and shall comply with such provisions and have employers' liability limits of $1,000,000 per accident and per employee, and in the aggregate for injury by disease, before commencing the performance of the Work of this Agreement.

Before the Notice to Proceed with the Work under this Agreement is issued, the Contractor shall submit written evidence that the Contractor has obtained for the period of the contract workers' compensation and employer's liability insurance as required for all persons whom it employs or may employ in carrying out the Work under this Agreement. Such evidence of coverage shall be accompanied by an endorsement from the insurer agreeing to waive all rights of subrogation against the City, Construction Manager, Engineer, Funding Agencies and their directors, elected officials, officers, officials, employees, agents and volunteers which might arise by reason of any payment under the policy. This insurance shall be in accordance with the requirements of the most current and applicable State Workers' Compensation Insurance Laws.

13.1.3 Professional Liability Insurance – All submittals required of the Contractor which are to be prepared by a licensed California engineer shall be prepared only by a licensed engineer who is covered by a professional liability insurance policy issued by a California-admitted carrier or a carrier authorized to

do business in California with a Best's rating of A-:VII or better, with an limit per claim of at least $2,000,000, and a $4,000,000 in the aggregate for errors and omissions. Such insurance shall be maintained in effect by said engineer at all times while performing Work on the Project and for at least three (3) years after Final Completion of the Project. Contractor shall submit an insurance certificate for such engineer prior to beginning Work for approval by the City.

13.1.4 Builder's Risk Insurance – Contractor shall provide "Special Form" Builder's Risk Insurance on the replacement cost basis as listed below:

A. Amount of Coverage - Equal to the full replacement cost on a completed value basis, without deduction for depreciation and shall also provide coverage for "soft costs" such as but not limited to design and engineering fees and inspection costs caused by an insured peril, up to a maximum total for all soft costs of $350,000. The builder's risk insurance may contain sub-limits not less than the following:
   - Debris removal - $100,000.
   - Pollution Clean-up cost - $25,000.

B. Additional Insureds/Loss Payees - This insurance shall name the City, Engineer, Construction Manager, the Funding Agencies and Contractor as insureds/loss payees, as their interests may appear. Builder's risk insurance policies shall contain the following provisions:

   1) The City, Contractor and subcontractors of every tier shall be named as insureds.
   2) Each insured shall waive all rights of subrogation against each of the other insureds.

C. Included Coverage – The above builder's risk insurance shall include the following coverages:

   1) Including, but not by way of limitation, for all damages of loss to the Work and to appurtenances, to materials and equipment to be incorporated into the Project while the same are in transit, stored on or off the Site, to construction plant and temporary structures.
   2) Such insurance shall cover, but shall not be limited to, the perils of fire, lightning, windstorm, hail, explosion, riot, riot attending a strike, civil commotion, smoke damage, damage by aircraft or vehicles, vandalism and malicious mischief, theft, collapse, and flood.
   3) The policy shall cover the costs of debris removal, including demolition as may be made reasonably necessary by the application of any law, ordinance, or regulation.
   4) Start-up & testing, and machinery breakdown including electrical arching which are very important coverages and usually have to be requested.
   5) The policy shall provide the City the right to occupy the premises without termination of the policy until Final Completion of the Project.

D. Deductibles - Builder's risk insurance may have a deductible clause not to exceed the amounts below. Contractor shall be responsible for paying any and all deductible costs.

E. All Other Perils - $100,000.

F. Application of Loss Proceeds - In the event of a covered loss, proceeds of builder's risk insurance shall be applied first to reimburse actual costs of demolition, debris removal, reconstruction, and repair or replacement incurred in the discharge of the Contractor's obligations of repair or replacement under this Agreement. Insurance proceeds shall be deposited in a separate account in a local bank satisfactory to the City and shall be withdrawn only with the City's written approval to reimburse such actual costs as the builder's risk carrier has agreed to reimburse. The City shall have no liability for failure of the builder's risk carrier to pay for any particular cost of repairs. In the event of the termination of the Contractor for default, the Contractor shall forfeit all rights to builder's risk insurance proceeds and City may expend such proceeds to complete the Project as if they were unpaid contract monies.

13.1.5 Contractor's Pollution Liability Insurance. The Contractor shall obtain Pollution Liability Insurance. This insurance shall be written in comprehensive form either as a separate policy or as an endorsement to Contractor's general liability coverage and shall cover liability for bodily injury, property damage, and environmental damage resulting from pollution and related cleanup costs incurred, all arising out of any Work to be performed under the Agreement, including liability for and defense of lawsuits and regulatory actions. Coverage shall be provided for both Work performed on Site, as well as during the transport of hazardous materials. Coverage shall apply to sudden as well as gradual pollution conditions, including without limitation conditions resulting from the escape or release of smoke, vapors, fumes, acids, alkalis, toxic chemicals, liquids, or gases, natural gas, waste materials, or other irritants, contaminants, or pollutants, including asbestos. The liability limits shall be not less than:

- Combined Single Limit for each occurrence: $2,000,000.
- General Aggregate: $2,000,000.

If the coverage required is written on a claims-made coverage form:

- The retroactive date must be shown, and this date must be before the award date of the Agreement.
- Insurance must be maintained, and evidence of insurance must be provided for at least five (5) years after final payment.
- If coverage is canceled or non-renewed, and not replaced with another claims-made policy form with a retroactive date prior to the Agreement award date, the Contractor must purchase extended reporting period coverage for a minimum of five (5) years after Final Payment.
- A copy of the claims reporting requirements must be submitted to the City for review.

13.1.6 Proof of Coverage – Before execution this Agreement, the Contractor shall furnish the City with certificate(s) evidencing issuance of all insurance mentioned herein, copies of the policy declaration or information page(s) and additional insured endorsements, which shall be included as Exhibit L, CONTRACTOR'S INSURANCE CERTIFICATES. The certificate(s) and endorsements for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. The endorsements are to be on endorsement forms acceptable to the City. The certificate(s), policy declaration or information page(s), and endorsements are to be received and approved by the City before Work commences. Except for the waiver of subrogation rights endorsements, as required herein, no other endorsements are required for workers compensation or excess liability insurance. Such certificates of insurance shall provide that the insurance policy shall be endorsed to state that coverage shall not be suspended, voided, cancelled by either party, reduced in coverage or limits except after thirty (30) days prior written notice has been given to the City. The Contractor shall also provide certificate(s) evidencing renewals of all insurance required herein prior to the expiration date of any such insurance.

For all insurance policy renewals during the term of this Agreement, Contractor shall send insurance certificates reflecting the policy renewals directly to EBIX via email at roseville@ebix.com, or via fax to (770) 325-5727.

Any deductibles or self-insured retentions must be declared to and approved by the City. At the option of the City, either:

- The insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the City, Construction Manager, Engineer, Funding Agencies and their directors, elected officials, officers, officials, employees, agents and volunteers; or

- The Contractor shall procure a bond guaranteeing payment of losses and related investigations, claim administration and defense expenses.

In the event of the breach of any provision of this article, or in the event of any notices received which indicates any required insurance coverage will be diminished or canceled, City, at its option, may, notwithstanding any other provisions of this Agreement to the contrary, declare a material breach of this Agreement and suspend all further work pursuant to this Agreement until Contractor has provided evidence that its insurance coverage meets the requirements of the Contract Documents.

13.1.7 Third Party Insurance Requirements - The Work, as contemplated by the Contract Documents, does not specifically require an encroachment permit from other public agencies or utilities. However, in the event the Contractor chooses a means and method of construction that results in Work requiring an encroachment permit from a public utility, or any other local, state, federal or public agency, Contractor shall ensure that the insurance it obtains in accordance therewith complies with all requirements mandated by each permitting agency from whom permits shall be obtained for the Work and any other third parties from whom third party agreements are necessary to perform the Work (collectively, the "Third Party(ies)"). To the extent there is a conflict between the Third Party(ies)'s Insurance Requirements and those set forth by the City herein, the requirement(s) providing the more protective coverage for both the City and the Third Party(ies) shall control and be purchased and maintained by Contractor.

Contractor shall be responsible to determine what insurance requirements exist as a condition precedent to obtaining permit(s) for the Work, if any. Contractor shall be solely responsible for any delay(s) arising from its failure and/or its subcontractors' failure to timely obtain all required insurance.

All required third party insurance shall be submitted to the City at the same time Contractor submits all other contractually required insurance, which is no later than ten (10) days after Notice of Intent to Award, unless otherwise agreed to in writing by the City prior to this deadline.

13.1.8 Insurance During Guarantee Period - For all work the Contractor or its subcontractors perform during the guarantee period, workers compensation and commercial general liability insurance in the amounts and format required herein shall remain in force and be maintained for three (3) years after Final Completion of the Work.

The Contractor shall be responsible for paying any and all deductible costs for claims against its workers compensation and commercial general liability insurance.

13.2 General Indemnification Obligations

A. The Contractor shall indemnify, defend with counsel acceptable to City, and hold harmless to the full extent permitted by law, at the Contractor's expense, the City, and their directors, elected officials, officers, officials, employees, agents, consultants, design engineers, Funding Agencies and each of them (collectively the "Indemnified Parties"), from and against any and all liability, loss, damage, claims, actions, causes of action, expenses and costs (including, without limitation, reasonable City staff attorney fees and outside attorney fees, and costs and fees of litigation) (collectively, "Liability") of every nature to the extent caused by Contractor's negligent performance of the Work under this Agreement or its failure to comply with any of its obligations contained in this Agreement, except that such obligation to defend and indemnify does not apply to the extent such Liability was caused by the active negligence, sole negligence or willful misconduct of the Indemnified Parties. Such indemnification by the Contractor shall include, but not be limited to, the following:

    1. Liability or claims resulting directly or indirectly from the negligence or carelessness of the Contractor, its subcontractors, employees, or agents in the performance of the Work, or in guarding or maintaining the same, or from any improper materials, implements, or appliances used in its construction, or by or on account of any act or omission of the Contractor, its employees, or agents;

    2. Liability or claims arising directly or indirectly from Contractor's negligent acts that cause bodily injury, occupational sickness or disease, or death of the Contractor's, or supplier's own

employees, or agents engaged in the Work resulting in actions brought against the Indemnified Parties;

3. Liability or claims arising directly or indirectly from or based on the violation of any laws or regulations, whether by the Contractor, its subcontractors, employees, or agents;

4. Liability or claims arising directly or indirectly from the negligent or legally unauthorized use or manufacture by the Contractor, its subcontractors, employees, or agents in the performance of this Agreement of any copyrighted or uncopyrighted composition, secret process, patented or unpatented invention, article, or appliance, unless otherwise specified stipulated in this Agreement.

5. Liability or claims arising directly or indirectly from the breach of any warranties, whether express or implied, made to the City or any other parties by the Contractor, its subcontractors, employees, or agents;

6. Liability or claims arising directly or indirectly from the willful misconduct of the Contractor, its subcontractors, employees, or agents;

7. Liability or claims arising directly or indirectly from any breach of the obligations assumed in this Agreement by the Contractor;

8. Liability or claims arising directly or indirectly from, relating to, or resulting from a hazardous condition created by the Contractor, subcontractors, suppliers, or any of their employees or agents due to Contractor's negligence or breach of any obligation in this Agreement;

9. Liability or claims arising directly, or indirectly, or consequentially out of any action, legal or equitable, brought against the Indemnified Parties, their consultants, subconsultants, and the directors, officers, elected officials, employees, agents and volunteers of each or any of them, to the extent caused by the Contractor's negligent or improper use of any premises acquired by permits, rights of way, or easements, the Site, or any land or area contiguous hereto or its performance of the Work thereon;

10. Liability arising directly or indirectly from exposure to hazards in violation of the California Labor Code that may be asserted by any person or entity, including, but not limited to, the Contractor, arising out of or in connection with the negligent activities of the Contractor, its agents, employees or privities pursuant to this Agreement, whether or not there is concurrent negligence on the part of the Indemnified Parties;

11. Liability or claims arising directly or indirectly from the failure of the Contractor to comply with the Section 01 11 80, ENVIRONMENTAL CONDITIONS, Section 01 12 16, WORK SEQUENCE or Section 01 35 43, ENVIRONMENTAL PROCEDURES; and

12. Liability or claims arising out of the Contractor's performance of the Work.

B. The Contractor shall reimburse the Indemnified Parties for all costs and expenses, (including but not limited to reasonable fees and charges of engineers, architects, attorneys, and other consultants and professionals and court costs of appeal) incurred by said Indemnified Parties arising out of or in enforcing the provisions of this article.

C. The indemnification obligation under this Article 13.2 shall not be limited in any way by any limitation on the amount or type of insurance carried by Contractor or by the amount or type of damages, compensation, or benefits payable by or for the Contractor or any subcontractor or other person or organization under workers' compensation acts, disability benefit acts, or other employee benefit acts.

D. Pursuant to California Public Contract Code Section 9201, City shall timely notify Contractor of receipt of any third-party claim relating to this Agreement.

E. The Contractor's obligations pursuant to this provision will survive the expiration or earlier termination of this Agreement.

F. The Contractor hereby agrees at its expense promptly to assume the defense of and to defend, with counsel acceptable to the City, against any indemnified Claim, suit or other proceeding brought thereon, and promptly to pay any and all costs, charges, attorney's fees, and other expenses and any and all judgments that may be incurred against the City, and each elected officials, officers, representatives, agents, consultants, design engineers or employees, or any of them to the extent arising from any negligent act, error, or omission, or from any willful misconduct of the Contractor in the performance of the Contractor's obligations under this Agreement.

G. The only limitations on this provision shall be those imposed by Civil Code section 2782.

13.3 Hazardous Substance Indemnifications Obligations

Neither the Contractor nor its subcontractors or suppliers shall use, generate, manufacture, store or dispose of on, under or about the Site, or transport to, from, along or across the Site, any flammable, explosive radioactive material, toxic substance, hazardous waste, hazardous material, hazardous substance, or the equivalent, as those terms may now or in the future be defined by common practice or by any federal, state or local statute, ordinance or regulation or any governmental body or agency (hereinafter "Hazardous Substance").

A. Without limiting any remedies the City may have, in the event any disposal, release, discharge or spill of a Hazardous Substance or other contamination occurs within the Site at any time during, or as a result of, the Contractor's use of the Site, except such spills or contamination to the extent directly caused by the sole negligence or willful misconduct of the City, its contractors, officers, representatives, agents, consultants, design engineers or employees, the Contractor shall immediately notify City and take all action to mitigate the effects of such disposal, release, discharge, spill or contamination. The Contractor shall at the Contractor's own expense, unless otherwise directed by the City, remediate such disposal, release, discharge of spill or contamination in compliance with all applicable laws, rules and regulations. The City shall have the option to perform the remediation itself or through any contractor if the Contractor fails to do so. The Contractor shall cooperate with the City to complete the remediation and shall reimburse the City for all costs and expenses incurred in connection with the remediation.

B. In the event that the Contractor observes any material that the Contractor believes or has reason to believe may be a Hazardous Substance or encounters any unknown physical condition of any unusual nature within the Site, other than disposals, releases, discharges, spills or contamination covered in paragraph A, above, the Contractor shall, without disturbing the condition, immediately cease all use of the Site and notify the City. The City shall investigate the condition and take any clean-up or other remedial action City deems necessary in its sole discretion.

C. In the event the City or its contractor elects to perform remediation work, the Contractor shall upon notice from the City, cease use of the Site as directed in the notice. The City will notify the Contractor when the condition has been resolved, at which time, but not before, the Contractor may resume its use of the Site.

D. The Contractor agrees to assume liability for and to defend and hold harmless the Indemnified Parties from and against all injuries or death to any person and damage to any property, and all related expense, including without limitation attorneys' fees, investigators' fees, administrative charges, litigation expenses and any judgments, fines, penalties or other charges assessed against Indemnified Parties, resulting from the Contractor's failure to comply with this article and any laws,

rules or regulations concerning the subject matter hereof. The provisions of this article shall survive the expiration and termination of this Agreement.

The obligations and liabilities arising under the Article 13.3, HAZARDOUS SUBSTANCE INDEMNIFICATIONS OBLIGATIONS, shall be in addition to and independent of those obligations and/or liabilities arising under the other provisions of this Agreement and shall in no way limit, alter, reduce or eliminate the effect of such other provisions.

ARTICLE 14 - MISCELLANEOUS PROVISIONS

14.1 Governing Law. This Agreement and the Contract Documents shall be deemed to have been entered into in the County of Placer, State of California, and governed by California law (excluding choice of law rules).

14.2 Assignment. The Contractor will not assign any rights or delegate duties under this Agreement without the written consent of the City, which consent will not unreasonably be withheld, including, but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents. City has consented to Contractor's use of subcontractors listed in Exhibit E, DESIGNATION OF SUBCONTRACTORS.

14.3 Severability. If any provision of this Agreement is held to be inoperative or unenforceable as applied in any particular case because it conflicts with any other provision hereof or any constitution, statute, ordinance, rule of law or public policy, or for any other reason, such holding shall not have the effect of rendering the provision in question inoperative or unenforceable in any other case, or of rendering any other provision herein contained inoperative or unenforceable to any extent whatever. The invalidity of any one or more phrases, sentences, clauses or articles contained in this Agreement shall not affect the remaining portions of this Agreement or any part hereof, and they shall otherwise remain in full force and effect.

14.4 Contractor Licensing. For the duration of the Agreement, the Contractor shall possess a valid State of California Class A - General Engineering Contractor's License.

14.5 Permits and Licenses. For the duration of the Agreement, the Contractor shall have a local business license for the work contemplated. All subcontractors will be required to secure the appropriate local business license before they commence Work on the Project. The Contractor shall have all licenses, permits, City Business Operations Tax Certificate, qualifications, and approvals of whatsoever nature legally required for Contractor to practice its profession or provide any Work or services under this Agreement. Contractor shall, at its sole cost and expense, keep in effect or obtain at all times during the term of this Agreement any licenses, permits, and approvals that are legally required for Contractor to practice its profession or provide such Work or services.

14.6 Whole Agreement. This Agreement, the Exhibits hereto, and the other Contract Documents, Specifications and Drawings represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral, and no inducements, considerations, promises or other references shall be implied in this Agreement that are not expressly addressed herein.

14.7 Conflict of Interest. Contractor covenants that neither it, nor any officer or principal of its firm, has or shall acquire any interest, directly or indirectly, that would conflict in any manner with the interests of City or that would in any way hinder Contractor's performance of Work under this Agreement. Contractor further covenants that in the performance of this Agreement, no person having any such interest shall be employed by it as an officer, employee, agent or subcontractor, without the written consent of the City. Contractor agrees to avoid conflicts of interest or the appearance of any conflicts of interest with the interests of the City at all times during the performance of this Agreement. If Contractor is or employs a former officer or employee of the City, Contractor and any such employee(s) shall both immediately notify the City's

Representative and both shall comply with any City requests pertaining to appearances before the City Council or any City department, board, commission or committee.

14.8 Contractor Not Agent. Except as City may specify in writing, Contractor and Contractor's personnel shall have no authority, express or implied, to act on behalf of City in any capacity whatsoever as an agent. Contractor and Contractor's personnel shall have no authority, express or implied, to bind City to any obligations whatsoever.

14.9 No Waiver. Neither the inspection by City or its agents, nor any order or certificate for payment of money, nor payment for, nor acceptance of the whole or any part of the Work by City, nor any extensions of time, nor any position taken by City or its agents shall operate as a waiver of any provision of this Agreement or of any power herein reserved to City or any right to damages herein provided, nor shall any waiver of any breach of this Agreement be held to be a waiver of any other or subsequent breach.

14.10 Contractor Shall Assume Risks. Until the Final Completion by City of all Work under this Agreement, the Work shall be under Contractor's responsible care and charge. Contractor shall rebuild, repair, restore and make good all injuries, damages, corrections, and repairs occasioned or rendered necessary by accidental causes of any nature except earthquake or flood, to all or any portions of the Work, except as otherwise stipulated and/or as compensated by insurance.

14.11 General Liability of Contractor. Except as otherwise herein expressly stipulated, Contractor shall perform all the Work and furnish all the labor, materials, tools, power and light, and appliances, necessary or proper for performing and completing the Work herein required in the manner within the time herein specified. The mention of any specific duty or liability of Contractor shall not be construed as limitation or restriction of any general liability or duty of Contractor and, any reference to any specific duty or liability shall be construed to be the purpose of explanation.

14.12 Not Used.

14.13 Penalty for Collusion. If, at any time, it is found that the person, firm, or corporation to whom this Agreement has been awarded has, in presenting any proposal, bid or bids, colluded with any other party or parties, then this Agreement shall be null and void, and the Contractor and its sureties shall be liable for loss or damage which the City may suffer thereby.

14.14 Rights and Remedies. The duties and obligations imposed by the Contract Documents and the rights and remedies available thereunder shall be in addition to, and not a limitation of, any duties, obligations, rights, and remedies otherwise imposed or available by law.

No action or failure to act by the City, the Engineer, or the Construction Manager shall constitute a waiver of any right or duty afforded any of them under this Agreement, nor shall any such action or failure to act constitute an approval of or acquiescence in any breach thereunder, except as may be specifically agreed in writing.

14.15 Rights of Action. No right of action shall accrue upon or by reason of this Agreement to or for the use or benefit of anyone other than the parties to this Agreement, except where a third party is identified as an express intended beneficiary of the Contractor's obligations owed to City, including, but not limited to, the indemnification and additional insured requirements contained in the Contract Documents. The parties to this Agreement are the Contractor and the City.

14.16 Notices. Except as otherwise specified herein, all notices to be sent pursuant to this Agreement or the other Contract Documents shall be made in writing, and sent to the Parties at their respective addresses specified below or to such other address as a Party may designate by written notice delivered to the other parties in accordance with this article. All such notices shall be sent by:

A. Personal delivery, in which case notice is effective upon delivery;

B. Certified or registered mail, return receipt requested, in which case notice shall be deemed delivered on receipt if delivery is confirmed by a return receipt;

C. Nationally recognized overnight courier, with charges prepaid or charged to the sender's account, in which case notice is effective on delivery if delivery is confirmed by the delivery service; or

D. Facsimile transmission, in which case notice shall be deemed delivered upon transmittal, provided that (a) a duplicate copy of the notice is promptly delivered by first-class or certified mail or by overnight delivery, or (b) a transmission report is generated reflecting the accurate transmission thereof. Any notice given by facsimile shall be considered to have been received on the next business day if it is received after 5:00 p.m. recipient's time or on a non-business day.

IN WITNESS WHEREOF, the City of Roseville, a municipal corporation, has authorized the execution of this Agreement in duplicate by its City Manager and attested to by its City Clerk under the authority of Resolution No. 19-475, adopted by the Council of the City of Roseville on the 6th day of November, 2019, and CONTRACTOR is duly authorized and has caused this Agreement to be executed.

CONTRACTOR

Under penalty of perjury, I certify that the taxpayer identification number and all other information provided here are correct.

DATE October 10, 2019

BY _____

Anthony M. Mueller
Print Name

Asst. Vice President
Title

BY _____

Ruben Moreno, Jr.
Print Name

Secretary
Title

1000001448
DIR Registration #

77-0004110
Federal ID#

309-6519-8
State ID#

00841298
City of Roseville Business License Number (City will not award Agreement until Business License Number is obtained)

Type of Business Entity *(check one)*:

_____ Individual/Sole Proprietor
_____ Partnership
__x__ Corporation
_____ Limited Liability Company
_____ Other (*please specify:*_____)

If Contractor is an out-of-state corporation, Contractor warrants and represents that it possesses a valid certificate of qualification to transact business in the State of California issued by the California Secretary of State pursuant to Section 2105 of the California Corporations Code.

CITY OF ROSEVILLE
a municipal corporation

DATE: 11/7/19

BY _____
Dominick Casey, City Manager

Original Approved As To Form:

_____
Robert R. Schmitt, City Attorney

Attest:

_____
Sonia Orozco, City Clerk

Original Approved As To Substance:

_____
Richard D. Plecker, Director of Environmental Utilities

Notices to the Parties shall be given at the following addresses and fax numbers:

City:

City Clerk of City of Roseville
311 Vernon Street
Roseville, CA 95678
Fax Number: 916-786-9175

Contractor:
W. M. Lyles Co.
P. O. Box 4377
Fresno, CA 93744
Fax Number: (559) 487-7949

PAGE INTENTIONALLY LEFT BLANK

EXHIBIT A

CONTRACTOR'S SOPQ DATED APRIL 1, 2019
(excluding the financial statements and appendices)

Pleasant Grove Wastewater Treatment Plant Energy Recovery Project

STATEMENT OF PRE-QUALIFICATION

PLEASANT GROVE WASTEWATER TREATMENT PLANT EXPANSION PROJECT
AND/OR
PLEASANT GROVE WASTEWATER TREATMENT PLANT ENERGY RECOVERY PROJECT
AND/OR
BOTH ABOVE PROJECTS INDEPENDENTLY

CITY OF ROSEVILLE CALIFORNIA

W. M. LYLES CO.
CONTRACTOR
Since 1945
Progress Through Performance®

Strength Through Diversification, an integral part of the Lyles Construction Group
W. M. Lyles Co. - New England Sheet Metal and Mechanical Co. - American Paving Co.

W. M. LYLES CO.
CONTRACTOR
Since 1945
Progress Through Performance®
California Contractor's License No. 422390

Corporate Office
P.O. Box 4377
Fresno, CA 93744-4377
Telephone (559) 441-1900
Fax (559) 487-7958

www.wmlyles.com
An Equal Opportunity Employer

April 1, 2019

Tracie Mueller, P.E.
City of Roseville Environmental Utilities – Engineering
2005 Hilltop Circle
Roseville, CA 95747

Reference: Pleasant Grove Wastewater Treatment Plant Expansion Project
Pleasant Grove Wastewater Treatment Plant Energy Recovery Project

Dear Ms. Mueller,

W. M. Lyles Co. is pleased to provide the enclosed information in response to your Request for Statement of Pre-Qualification for the above referenced projects.

We are proud to be an integral part of the construction industry since our founding in 1945 and consider the professional relationships we have developed over the years to be stronger than those of our competitors. We currently operate five construction divisions throughout the State of California from Sacramento to Temecula. Our strategic locations provide our customers better service and outstanding centralized construction quality.

W. M. Lyles Co. is a member of Lyles Construction Group (LCG), which is comprised of W. M. Lyles Co., New England Sheet Metal and Mechanical Co., and American Paving Co. LCG is listed in ENR's Top 400 Contractors and Top 200 Environmental Firms and provides contracting services for individual projects up to $200 million. Over the past five years, LCG has averaged over 1 million craft manhours. The companies within LCG have the capacity to self-perform the following types of work: pipelines, earthwork, grading, paving, concrete flatwork, wet and dry utilities, structural concrete, mechanical and civil piping, HVAC, refrigeration, plumbing, and equipment installation.

W. M. Lyles Co. has the financial resources and risk management structure to successfully and responsibly complete major projects. Our bonding limits are $1 billion single project and $2 billion aggregate, and we have ample available bonding capacity to include new projects in our construction portfolio.

Safety is a priority and our experienced safety professionals provide the necessary training and inspection for our management staff and field crews to safely meet the varied demands of our industry. As a result of this commitment to safety we maintain an insurance modification rate of 0.78, which is well below the industry average.

W. M. LYLES CO.
CONTRACTOR
Since 1945
Progress Through Performance®
California Contractor's License No. 422390

Corporate Office
P.O. Box 4377
Fresno, CA 93744-4377
Telephone (559) 441-1900
Fax (559) 487-7958

www.wmlyles.com
An Equal Opportunity Employer

Thank you for considering W. M. Lyles Co. Please do not hesitate to contact me should you have any questions or need additional information.

Sincerely,

Joseph B. Lawrence
Asst. Vice President

W. M. LYLES CO.
CONTRACTOR
Since 1945
Progress Through Performance®

Table of Contents

STATEMENT OF PRE-QUALIFICATION
PLEASANT GROVE WASTEWATER TREATMENT PLANT EXPANSION PROJECT
AND/OR
PLEASANT GROVE WASTEWATER TREATMENT PLANT ENERGY RECOVERY PROJECT
AND/OR
BOTH ABOVE PROJECTS INDEPENDENTLY

	TAB
Addendum Acknowledgement	1
Statement of Pre-Qualification with Submittal Form	2
Part I - Essential Requirements for Pre-Qualification	3
Part II – Organization, History, Organizational Performance, Compliance with Civil and Criminal Laws	4
Part III – Recent Construction Projects Completed	5
Attachment A – Prospective Proposer's Certification	6
Conflict of Interest Statement	7
Letter of Intent to Insure	8
EMR Letter	9
Notarized Bonding Capacity Letter	10
Appendix A - F	11

W. M. LYLES CO.
CONTRACTOR
Since 1945
Progress Through Performance®

Tab 1

Addendum Acknowledgement

IMPORTANT

3/20/19

TO: Proposers

FROM: Tracie Mueller, Senior Engineer, Environmental Utilities Dept.

RE: 08-050 Contractor Statements of Pre-Qualification for the Pleasant Grove Wastewater Treatment Plant Expansion Project and/or Pleasant Grove Wastewater Treatment Plant Energy Recovery Project

***************ADDENDUM ONE ***************

- **Adding Mandatory Pre-SOPQ Meeting Agenda document for download from Public Purchase**
- **Adding Mandatory Pre-SOPQ Meeting Slide Deck for download from Public Purchase**
- **Adding Mandatory Pre-SOPQ Meeting Sign-In List for download from Public Purchase**

Please note the following revisions, which represent one attachment:

1. **REVISIONS TO TABLE OF CONTENTS, PAGE i**

   Revise the list of Appendices as shown below:

   APPENDIX A- PGWWTP EXPANSION PROJECT DESCRIPTION
   APPENDIX B- CONTRACTOR PRE-QUALIFICATION SCORING
   APPENDIX C- PGWWTP EXPANSION SITE PLAN
   APPENDIX D- BONDS AND INSURANCE
   APPENDIX E- PGWWTP ERP DESCRIPTION
   APPENDIX F- PGWWTP ERP SITE PLAN
   APPENDIX G – PROSPECTIVE PROPOSER'S CERTIFICATION

2. **REVISION SECTION 1.3, PAGE 3**

   Revise the text at the top of page 3 as shown below:

choose to submit qualifications for a specific branch /division, the scoring requirements for Part II B-CF of the SOPQ, as well as all other submitted information shall be branch/division specific. Financial statements should still be for the total company and parent company even if a Prospective Proposer submits the scoring requirements specific to a company branch or division.

3. REPLACEMENT PAGES FOR THE SOPQ SUBMITTAL FORM WITH SECTION 3

Replace pages 12, 13, 14, 15, 16 and 20 of the RFPQ with the corresponding attached Addendum 1 pages. The attached pages listed below shall be used in lieu of the original page 12, 23, 14, 15, 16 and 20 and included within the SOPQ Submittal package. Note that these pages have "Addendum 1 page #" included in the footer. The changes within the attached replacement sheets are summarized below:

- Addendum 1 page 12 – Within the first sentence on the top of page 12 for Part I stating "An answer of "No" to any of the Questions 1 through 9…" has been revised to remove question 9.
- Addendum 1 page 13 –
  - Within Part I, question 7 at the top of the page the "Date of finical statement must be 2018." has been revised to "Date of financial statement must be December 2017 or later."
  - Within Part 1, question 9 has been eliminated and replace with the text "NOT USED."
- Addendum 1 page 14 – PART I(A) second sentence from bottom of page stating "Prospective Proposer also certifies that Prospective Proposer self-performed at least 40% of the work and also self-performed all structural concrete on each of the projects listed in Part III, Item 39(A)" has been revise to remove the "and also self-performed all structural concrete".
- Addendum 1 page 15 – PART I(B) second sentence from bottom of page stating "Prospective Proposer also certifies that Prospective Proposer self-performed at least 40% of the work and also self-performed all structural concrete on each of the projects listed in Part III, Item 39(B)" has been revise to remove the "and also self-performed all structural concrete".
- Addendum 1 page 16 – PART I(C) second sentence from bottom of page stating "Prospective Proposer also certifies that Prospective Proposer self-performed at least 40% of the work and also self-performed all structural concrete on each of the projects listed in Part III, Item 39(B)" has been revise to remove the "and also self-performed all structural concrete".
- Addendum 1 page 20 - Part II, B, question 3 bold note that states "NOTE: All Prospective Proposers will be required to submit non-

collusion affidavits" has been revised to require Prospective Proposers to properly execute and submit the certification added as Appendix G within this addendum as Attachment A of the SOPQ Submittal.

4. ADD APPENDIX G, PROSPECTIVE PROPOSER'S CERTIFICATION AS PAGE 86

Add the attached Appendix G cover sheet and Prospective Proposer's Certification form attached as Appendix G to the RFPQ.

5. MANDATORY PRE-SOPQ SUBMITTAL MEETING STATEMENTS AND RESPONSES TO QUESTIONS

General statements made by the City after the City team's presentation, and questions presented at the March 18, 2019 Mandatory Pre-SOPQ Submittal Meeting with City responses are included below:

A. City Statement: A Prospective Proposer shall check all three boxes in the "Declaration of PGWWTP Project(s) SOPQ submission" to be considered for the possibility of being awarded both projects and they must fill out all of the three SOPQ options in the submission packet.

B. City Statement: The timeline for the financial statements will be revised as some contractors will not have their 2018 documents certified in time for the SOPQ Submittal.

C. Question: Has the SRF funding award been received?
Response: Not yet, but the PGWWTP projects moving into construction are not dependent on receiving these funds.

D. Question: What will the California Energy Commission requirements be?
Response: Those requirements are still being developed and will be included in the Request for Bid Proposals.

E. Question: On page 3 it states scoring requirements are for Part II B-F, but is there a D, E and F?
Response: No, this text will be revised via addendum as this was a revision that was not caught and is an error.

F. Question: Is May 13th 2019 a hard date for RFP to be posted?
Response: No, as stated in the RFPQ and presentation it is tentative.

G. Question: Is April 1, 2019 a hard submittal date for the SOPQ Submittal?
Response: Yes, April 1, 2019 by 3:00 PM is still the required SOPQ Submittal due date. The City does not see a reason at this time to extend this deadline.

H. Question: What will be required in the Request for Bid Proposals?
Response: Two envelopes will be required. The first will be the technical project approach which will include things like team description and safety pass/fail exhibits, etc. The second envelope will be for the commercial terms including a Guaranteed Maximum Price (GMP), markups for overhead and profit, proposed cost savings percentages, etc. Envelope 1 will be scored and recorded first and then envelope 2 will be opened and scored.

I. Question: How do we access the Public Purchase website?
Response: www.publicpurchase.com

J. Question: How much will the GMP count in the scoring?
Response: The scoring is still being developed and will be included in the Request for Bid Proposals, but the GMP itself (not including other scoring within the second envelope) will likely not be more than 50%.

K. Question: How complete are the design drawings?
Response: The designs are both at or close to complete and will be provided in the Request for Bid Proposals for Prospective Proposers to review and determine.

L. Does the City use this Design Assist process all the time?
Response: No, but we have used it in the past including most recently for our recent Dry Creek Wastewater Treatment Plant improvement projects that are currently under construction.

Please include a signed copy of the addendum with your proposal.

I acknowledge receipt of Addendum One

Name Joseph B. Lawrence, Asst. Vice President

Signature _____

Company W. M. Lyles Co. Date April 1, 2019

IMPORTANT

3/20/19

TO: Proposers

FROM: Tracie Mueller, Senior Engineer, Environmental Utilities Department

RE: 08-050 Contractor Statements of Pre-Qualification for the Pleasant Grove Wastewater Treatment Plant Expansion Project and/or Pleasant Grove Wastewater Treatment Plant Energy Recovery Project

***************ADDENDUM TWO**************

- **Attached are pages 12, 13, 14, 15, 16 and 20 which were inadvertently left out of Addendum 1**

Please include a signed copy of Addenda One and Two with your proposal.

I acknowledge receipt of Addendum Two

Name Joseph B. Lawrence, Asst. Vice President

Signature _____

Company W. M. Lyles Co. Date April 1, 2019

W. M. LYLES CO.
CONTRACTOR
Since 1945
Progress Through Performance®

Tab 2

Statement of Pre-Qualification with Submittal Form

SECTION 1

INSTRUCTIONS FOR PREPARATION AND SUBMISSION OF STATEMENT OF PRE-QUALIFICATION (SOPQ) PACKAGES

1.1 DEFINITIONS

For the purpose of this Statement of Pre-qualification (SOPQ) submittal, the following definitions shall apply:

Statement of Pre-qualification ("SOPQ") - The documents requested by the City and the information submitted by the Prospective Proposers that form the Pre-Qualification package for the PGWWTP Expansion and/or the PGWWTP ERP and/or both PGWWTP projects.

Prospective Proposer - Any individual, partnership, corporation, limited liability company, or other combination thereof who submits an SOPQ to the City for consideration of contract award for completing the PGWWTP Expansion and/or the PGWWTP ERP and/or both PGWWTP projects, acting directly or through an authorized representative.

City- The City of Roseville, employees acting either directly or through properly authorized agents, such agents acting within the scope of the particular duties entrusted to them.

Pleasant Grove Wastewater Treatment Plant Expansion Project ("PGWWTP Expansion") The project generally consists of construction of four new primary clarifiers with odor control facilities and an electrical building, a solids thickening building, sludge pumping systems, two anaerobic digesters and a digester control building, a ferric chloride dosage and storage facility, a waste gas burner, two boilers, conversion of two waste activated sludge holding tanks to a centrate storage and digested sludge holding tank, a centrate wet well and associated pump system and all other miscellaneous improvements in support of the project, including asset management, start up and testing to provide a complete and operational system in all respects. A more detailed description of the PGWWTP Expansion is included in Appendix A - PGWWTP Expansion Project Description. PGWWTP Expansion Site Plans are included in Appendix C.

Pleasant Grove Wastewater Treatment Plant Energy Recovery Project ("PGWWTP ERP") The completed PGWWTP ERP will provide compressed natural gas (CNG) to be utilized by City vehicles, generate heat and power for the plant, and receive trucked high strength waste materials from local industry. The project will be constructed on undeveloped City-Owned land adjacent to and immediately south of the existing PGWWTP. A new CNG fueling station will be installed to fuel the City's solid waste fleet. The facility includes all the compressors, dispensers, high pressure storage, and fuel management systems required for a fully operational fast-fill station. The CNG vehicle fuel will be derived from biomethane from a new biogas upgrading system. On an as-needed basis, pipeline natural gas may be utilized to supplement CNG demand. The new biogas upgrading system will treat the City's digester gas (from anaerobic digesters constructed as part of the PGWWTP Expansion) to meet CNG engine fuel quality requirements. A new microturbine cogeneration facility will use digester gas or a blend of biogas-upgrading tail gas and natural gas

to produce electricity and heat. A new high strength waste receiving station will allow for offloading of trucked material to be fed to the anaerobic digesters.

A more detailed description of the PGWWTP ERP is included in Appendix E - PGWWTP ERP Project Description. A PGWWTP ERP Site Plan is included in Appendix F.

1.2 DELIVERY OF SUBMITTAL

A total of four (4) bound hard copies of the SOPQ and one electronic (PDF) copy on a USB flash drive shall be submitted no later than **3:00 PM April 1, 2019** to:

City of Roseville
City Clerk Department
311 Vernon Street
Roseville, CA 95678
Re: Pleasant Grove Wastewater Treatment Plant Expansion Project
Pleasant Grove Wastewater Treatment Plant Energy Recovery Project

Attention: Tracie Mueller, P.E., Environmental Utilities- Engineering

SOPQ packages shall be submitted in sealed envelopes marked "Confidential" and shall include the following title on the front of the package, "Contractor SOPQ for the PGWWTP Expansion and/or the PGWWTP ERP and/or both PGWWTP projects".

1.3 PREPARATION OF SUBMITTAL

The bound copies of the SOPQ package shall be assembled in separate binders with a title page, table of contents, and section dividers. The SOPQ package submittal information shall be presented in the same order as in this RFPQ; submitting the whole document beginning with page 1. All pages shall be 3-hole punched and printing shall be arranged so that punching does not obliterate any data. Only one financial statement shall be submitted. A single hard copy of a reviewed or audited company financial statement shall also be provided in a separate sealed envelope with the original SOPQ package submittal.

It is mandatory that all Prospective Proposers who desire to submit a proposal for the PGWWTP Expansion or the PGWWTP ERP or both PGWWTP projects, fully complete the SOPQ questionnaire, provide all materials requested herein, and be approved by the City to be on the final pre-qualified contractors list for each or both PGWWTP projects. Proposals will be rejected from a Prospective Proposer that has failed to comply with these requirements.

The City recognizes that large construction companies (e.g. revenues in excess of $250 million per year) have multiple branches/divisions for geographic and/or type of construction coverages. In such cases, the Prospective Proposer may elect to submit a set of qualifications for a specific company branch or division which shall be clearly identified in a cover letter for the SOPQ package submittal. As such, should a Prospective Proposer

choose to submit qualifications for a specific branch /division, the scoring requirements for Part II B-F of the SOPQ, as well as all other submitted information shall be branch/division specific. Financial statements should still be for the total company and parent company even if a Prospective Proposer submits the scoring requirements specific to a company branch or division.

1.4 WITHDRAWAL OF SUBMITTAL

A SOPQ may be withdrawn by written request to Tracie Mueller, P.E., Environmental Utilities- Engineering, 2005 Hilltop Circle, Roseville, CA 95747 within five business days of submittal.

1.5 LATE SUBMITTAL

Any SOPQ stamped by the City Clerk's office after the scheduled receipt date and time will not be considered and will be returned to the Prospective Proposer unopened.

1.6 INTERPRETATION OF INFORMATION

This RFPQ includes a description of the scope of Pre-Qualification, qualification requirements, and instructions for submitting the SOPQ. Failure to follow these instructions may result in rejection of the Prospective Proposer's SOPQ.

The deadline for questions regarding the RFPQ is per Milestone Table in Notice to General Contractors Section.

No oral representations or interpretations will be made to any proposer as to the meaning of this RFPQ. Direct all inquiries regarding this RFPQ via https://www.publicpurchase.com/.

In the event that it becomes necessary to revise any part of this RFPQ, a written addenda will be issued. Any amendment to this RFPQ is valid only if it is in writing and issued by the Environmental Utilities Department via Public Purchase.

All addenda for this RFPQ will be distributed to Prospective Proposers who have registered with https://www.publicpurchase.com/ and who have downloaded the RFPQ. It is the Prospective Proposer's sole responsibility to monitor this website for possible addenda to this RFPQ. Failure of Prospective Proposer to retrieve addenda from this site shall not relieve the Prospective Proposer of the requirements contained therein. Additionally, failure of the Prospective Proposer to return a signed addendum, with the submittal, will be cause for rejection of the submittal.

1.7 DETERMINATION

Answers to questions contained in the attached questionnaire, information about current bonding capacity, notarized statement from surety, and the most recent reviewed or audited financial statements, with accompanying notes and supplemental information, are required. The City reserves the right to check other sources available. The City's decision will be based on objective evaluation criteria.

The City will determine the Pre-Qualification status of each Prospective Proposer based on the responses to the information requested in Section 3. The City shall be the sole judge as to the adequacy of each Prospective Proposer to perform work on the PGWWTP Expansion or the PGWWTP ERP or both PGWWTP projects, and City's decision shall be final.

The City reserves the right to waive minor irregularities and omissions in the information contained in the SOPQ submitted, and to make all final determinations.

The anticipated schedule for Prospective Proposer Pre-Qualification determination is provided in the Notice to Contractors.

Where a timely and completed application results in a rating below that which is required for Pre-Qualification, an appeal can be made. An appeal is begun by the Prospective Proposer delivering notice to the City Clerk of its appeal of the decision with respect to its Pre-Qualification rating, no later than five business days following notification of not being prequalified. Without a timely appeal, the Prospective Proposer waives any and all rights to challenge the decision of the City, whether by administrative process, judicial process or any other legal process or proceeding.

If the Prospective Proposer gives the required notice of appeal and requests a hearing, an appeals panel hearing shall be conducted. The hearing shall be an informal process conducted by a panel to hear such appeals. At/or prior to the hearing, the Prospective Proposer will be advised of the basis for the City's Pre-Qualification determination. The Prospective Proposer will be given the opportunity to present information and present reasons in opposition to the rating. Within five business days of the conclusion of the hearing, the appeals panel will render its decision.

The list of prequalified contractors will be posted to the City of Roseville's Public Purchase website at: https://www.publicpurchase.com/

Prospective Proposers opposing any other firms on the prequalified list, (based on potential for proposal collusion only), shall deliver written notice to the City within five business days of posting. The City will establish a review panel and conduct a hearing in the same process as identified above for the appeals process. Within five business days of the conclusion of the hearing, the review panel will render its decision.

The City reserves the right to adjust, increase, limit, suspend or rescind the Pre-Qualification rating based on subsequently learned information. Prospective Proposers whose rating decrease enough to disqualify them will be notified, and given an opportunity for a hearing consistent with the hearing procedures described above for appealing a Pre-Qualification rating.

1.8 EXCLUSION OF COST QUOTATIONS

The SOPQ submittal is a request for information, not a cost proposal. Prospective Proposers are advised that a formal or informal cost quotation for either PGWWTP project is not requested by the City and should not be included with the submittal. Any such information furnished will not be considered.

SECTION 2

SCOPE OF PRE-QUALIFICATION

2.1 INTENT

The Pre-Qualification procedure will be used to determine responsible Prospective Proposers for the PGWWTP Expansion, the PGWWTP ERP, and both PGWWTP projects. However, Pre-Qualification is not a conclusive determination of responsiveness and responsibility and a prequalified proposer may be rejected as nonresponsive or non-responsible by the City during the subsequent request for proposal process for each or both PGWWTP projects. In all cases, the Prospective Proposer ultimately awarded the contract shall comply with the requirements of the construction contract documents for each or both respective PGWWTP projects.

2.2 EXPERIENCE REQUIREMENT

The Pre-Qualification procedure involves the review and evaluation of information regarding the proven experience of the Prospective Proposers to construct each or both PGWWTP projects in a manner acceptable to the City. The experience of the Prospective Proposer will be evaluated on the basis of the SOPQ submittal and information gathered by the City from the references (provided by the Prospective Proposer) of related projects. Proven experience is defined as the actual performance of the Prospective Proposer on previous construction projects of a similar nature (see Part III of Section 3 for experience requirements) as corroborated by said references.

The City is not obligated to prequalify or accept a Prospective Proposer with no or un-satisfactory related experience.

2.3 CONFLICT OF INTEREST

The Prospective Proposer shall warrant that no official or employee of the City has an interest, has been employed or retained to solicit or aid in the procuring of the contract for either PGWWTP project contained in this RFPQ, nor that any such person will be employed in the performance of such contract without immediate divulgence of such fact to the City. Prospective Proposers submitting a SOPQ in response to this RFPQ must disclose any actual, apparent, direct, indirect, or potential conflicts of interest that may exist with respect to the Prospective Proposer or the Prospective Proposer's management or employees relative to the services to be provided to the City. Conflict of interest issues may require consultation with legal counsel. If a Prospective Proposer has no conflicts of interest, a statement to that effect must be included in the SOPQ submittal. Violation of this section shall disqualify the Prospective Proposer.

2.4 PROHIBITIONS AGAINST INTEREST IN MORE THAN ONE PROPOSAL ON A SINGLE PROJECT AND PROPOSER COLLUSION

A company, corporation, LLC, or other entity is not permitted to submit more than one proposal on a single project or have a financial interest in more than one proposal on a single project.

If a company, corporation, LLC, or other entity seeking to prequalify is a direct or indirect parent or subsidiary, or otherwise affiliated with another company, corporation or other entity also seeking to prequalify, neither is eligible to prequalify unless they prove to the satisfaction of the City that they satisfy the foregoing requirements by operating separately and independently from each other and that they do not currently, and will not in the future, have any direct interest in the other's proposal or performance of the contract. To so prove, each affiliated company, corporation, LLC, or other entity seeking to prequalify must provide the information required under Part II.B.3-4 and submit such additional documentation as is sufficient to prove to the satisfaction of the City that the foregoing requirements are satisfied. Affiliated companies not providing enough proof will be notified and will be allowed to rescind SOPQ submittal(s) to allow one of the affiliated firms to prequalify.

SECTION 3

SUBMITTAL INFORMATION

3.1 GENERAL

The SOPQ submittal prepared and delivered by a Prospective Proposer shall include as a minimum the information listed herein. Each Prospective Proposer shall review the requirements of this RFPQ Document and provide whatever additional information may be required to allow complete determination of conformance with the evaluation criteria utilized for the basis of determination (Section 4). Incomplete or unclear information may be grounds for rejection of a submittal as nonresponsive.

STATEMENT OF PRE-QUALIFICATION SUBMITTAL FORM	PAGE 9
PART I	PAGE 12
PART II	PAGE 17
PART III	PAGE 30

STATEMENT OF PRE-QUALIFICATION SUBMITTAL FORM

TO: Tracie Mueller, P.E.
City of Roseville Environmental Utilities- Engineering
2005 Hilltop Circle
Roseville, CA 95747

FOR: PLEASANT GROVE WASTEWATER TREATMENT PLANT EXPANSION PROJECT
and/or
PLEASANT GROVE WASTEWATER TREATMENT PLANT ENERGY RECOVERY PROJECT
and/or
BOTH ABOVE PROJECTS INDEPENDENTLY

STATEMENT OF PRE-QUALIFICATION FOR GENERAL CONTRACTORS

THE UNDERSIGNED PROSPECTIVE PROPOSER HEREBY AGREES AND DECLARES THAT:

DETERMINATION OF PRE-QUALIFICATION

Receipt of this submittal by the City does not constitute either a direct or implied guarantee to the Prospective Proposer that Pre-Qualification is or will be granted. The undersigned agrees to the procedures and conditions of the Pre-Qualification requirements described in the RFPQ.

COMPLETENESS AND ACCURACY

All Prospective Proposer statements and information contained in the SOPQ shall be complete and accurate. The submittal contains no false or deliberately misleading information.

DECLARATION OF PGWWTP PROJECT(S) SOPQ SUBMISSION

The undersigned Prospective Proposer is submitting the following SOPQ submission to the City. The Prospective Proposer may submit on Item 1, Item 2, Items 1 & 2, and also Items 1, 2 & 3.

1. SOPQ submission for PGWWTP Expansion by completing Part III, Item 39(A).

   ☒ Yes ☐ No

2. SOPQ submission for PGWWTP ERP by completing Part III, Item 39(B).

   ☒ Yes ☐ No

3. SOPQ submission for both above PGWWTP projects independently by completing Part III, Item 39(C).

☒ Yes ☐ No

Important Note to Prospective Proposer:

The City will evaluate received SOPQs for the PGWWTP Expansion and the PGWWTP ERP independently. After such independent evaluations, if (during the Request for Proposals and Award Phase), the City determines that the Proposals received from the same Contractor obtained the highest score for each project, the City can only award both projects to this Contractor if the Contractor marks "Yes" to item 3 above and was pre-qualified by the City for both projects. If a Prospective Proposer marks "No" to item 3 above, and submits a Proposal for each of the PGWWTP projects, the City can only award one of the two projects to this Contractor, even if the Contractor received the highest score on each project.

CLOSING STATEMENT

A. The undersigned is a legally authorized representative of the contractor.

Legal name of Prospective Proposer: W. M. Lyles Co.
(as it appears on license)

Contact: Joseph B. Lawrence

Phone: (559) 441-1900

Business address: 1210 W. Olive Avenue

Fresno, CA 93728

Fax: (559) 487-7949

E-Mail Address jlawrence@wmlylesco.com

Proposer's Valid California Contractor's License No. 422390

Classification(s) A, B

B. Addenda:

The undersigned acknowledges receipt of the following Addenda Nos.: 1, 2

Failure to acknowledge Addenda will result in the rejection of the Prospective Proposer's SOPQ submittal.

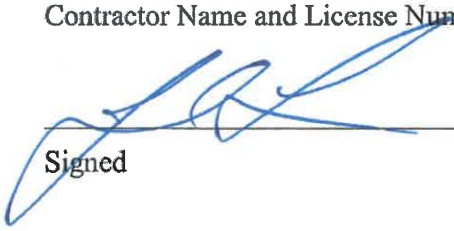
The submission of a SOPQ package shall constitute an acknowledgment upon which the City may rely that the Prospective Proposer has thoroughly examined and is familiar with the RFPQ and that the Prospective Proposer has waived any objections or contentions regarding the SOPQ document and/or the Pre-Qualification requirements set by the City to determine if a Prospective Proposer is approved to submit a proposal for either or both the PGWWTP projects.

By my signature below, I acknowledge receipt of this document and agree to be bound by its terms and agree to submit it as part of the SOPQ package submittal to the City.

I, the undersigned, certify and declare that I have read all of the answers to this SOPQ questionnaire and I know their contents. The matters stated in the questionnaire answers are true of my own knowledge and belief and I declare under penalty of perjury under the laws of the State of California, that the foregoing is correct.

W. M. Lyles Co., License No. 422390

Contractor Name and License Number



Signed

Joseph B. Lawrence

Printed Name

Asst. Vice President

Title

April 1, 2019

Date

****END OF FORM****

W. M. LYLES CO.
CONTRACTOR
Since 1945
Progress Through Performance®

Tab 3

Part I
Essential Requirements for Pre-Qualification

PART I. ESSENTIAL REQUIREMENTS FOR PRE-QUALIFICATION FOR PGWWTP EXPANSION and PGWWTP ERP and both PGWWTP projects

An answer of "No" to any of the Questions 1 through 8 will be rated a "Fail" and the Prospective Proposer will be immediately disqualified.

An answer of "Yes" to any of the Questions 10 through 13 will be rated a "Fail" and the Prospective Proposer will be immediately disqualified. If the answer to question 12 is "yes," and if debarment would be the sole reason for denial of Pre-Qualification, any Pre-Qualification issued will exclude the debarment period.

1. Prospective Proposer possesses a valid and current California Contractor's license (Class A, General Engineering Contractor) for the project for which it intends to submit a Proposal.

   [x] Yes [ ] No

2. Prospective Proposer is registered with the California Department of Industrial Relations pursuant to California Labor Code Section 1725.5.

   [x] Yes [ ] No

3. Prospective Proposer has not had a surety finish the work on any contract in the past five years:

   [x] Yes [ ] No

4. Prospective Proposer will comply with and provide all insurance as defined in **Appendix D, Bonds and Insurance.**

   See tab 8

   [x] Yes [ ] No

   Note: Prospective Proposer shall provide as part of its SOPQ package submittal a notarized statement, from the insurance carrier(s) or insurance broker that the Prospective Proposer will utilize on the PGWWTP project(s), certifying that the specified insurance requirements will be met. Please note that these are preliminary insurance requirements and are subject to change. The contractor will be required to provide insurance as provided for in the PGWWTP projects contract documents.

5. Prospective Proposer has current workers' compensation insurance policy as required by the Labor Code or is legally self-insured pursuant to Labor Code section 3700 et. seq.

   [x] Yes [ ] No

   [ ] Prospective Proposer is exempt from this requirement because it has no employees.

6. Prospective Proposer's Three-Year Average Experience Modification Rate (EMR) is less than or equal to 1.25 (125%) and Prospective Proposer has furnished a letter from its insurance carrier for verification of its three-year average EMR. See Part II- Item 32.

   [x] Yes [ ] No

   See tab 9

7. Has the Prospective Proposer attached the latest complete copy of a **reviewed** or **audited** financial statement with all accompanying notes and supplemental information? Date of financial statement must be December 2017 or later. If Prospective Proposer is a wholly owned subsidiary of another company, Prospective Proposer must also furnish a reviewed or audited financial statement of the parent company with accompanying notes and supplemental information.

See separate sealed envelope

[x] Yes [ ] No

NOTE: A financial statement that is not either reviewed or audited is not acceptable and reason for disqualification. A letter verifying availability of a line of credit may also be attached; however, it will be considered as supplemental information only, and is not a substitute for the required financial statement.

8. Has the Prospective Proposer attached a notarized statement from an admitted surety insurer (approved by the California Department of Insurance) and authorized to issue bonds in the State of California, which states: (a) that your current bonding capacity is sufficient for the project for which you seek Pre-Qualification, and (b) your current available bonding capacity?

See tab 10

[x] Yes [ ] No

NOTE: Notarized statement must be from the surety company, not an agent or broker.

9. **NOT USED.**

10. Has the Prospective Proposer's contractor's license been revoked at any time in the last five years?

[ ] Yes [x] No

11. Has a surety firm completed a contract on the Prospective Proposer's behalf, or paid for completion because the Prospective Proposer's firm was default terminated by the project owner within the last five years?

[ ] Yes [x] No

12. At the time of submitting this SOPQ, is your firm ineligible to bid on or be awarded a public works contract, or perform as a subcontractor on a public works contract, pursuant to either Labor Code section 1777.1 or Labor Code section 1777.7

[ ] Yes [x] No

If the answer is "Yes," state the beginning and ending dates of the period of debarment:

_____

13. At any time during the last five years, has your firm or any of its owners or officers been convicted of a crime involving the awarding of a contract of a government construction project, or the bidding or performance of a government contract?

☐ Yes ☒ No

PART I(A). ESSENTIAL REQUIREMENTS FOR PRE-QUALIFICATION FOR PGWWTP EXPANSION

Important Note to Contractor: Only answer this question and complete Part III, Item 39(A) if you are submitting an SOPQ for the PGWWTP Expansion.

An answer of "No" to any of the Question 1 will be rated a "Fail" and the Prospective Proposer will be immediately disqualified.

1. In accordance with Part III, Item 39(A), Prospective Proposer has listed no more than **six** projects completed since **January 1, 2009** with a combined **$150 million** in construction value on the following types of projects:

   a. Industrial and/or municipal water treatment plants where the structural concrete, excavation, backfill, mechanical and electrical were part of the contractor's contract; or

   b. Industrial and/or municipal wastewater treatment plants where the structural concrete, excavation, backfill, mechanical and electrical were part of the contractor's contract.

   The list of projects may include projects currently under construction, but only the total amount paid by the owner(s) as of **November 1, 2018** on uncompleted project(s) can be included in this summation of construction value. The Prospective Proposer is allowed to list no more than **six** projects of the types listed above, that combined, will add up to at least **$150 million** in completed value of work. In addition, one of the six projects must have a construction value of at least **$45 million.**

   Any projects listed in Part III, Item 39(A), which are not as defined above will not be considered by the City in meeting this pre-requisite experience requirement. For example, pipeline projects and pump station projects are not considered a treatment plant project and would not be eligible.

   Prospective Proposer also certifies that Prospective Proposer self-performed at least 40% of the work on each of the projects listed in Part III, Item 39(A). The City considers this level of past self-performance demonstrates a benefit to the Project in terms of better control of cost, schedule and safety.

   ☒ Yes ☐ No

PART I(B). ESSENTIAL REQUIREMENTS FOR PRE-QUALIFICATION FOR PGWWTP ERP

Important Note to Contractor: Only answer this question and complete Part III, Item 39(B) if you are submitting an SOPQ for the PGWWTP ERP.

An answer of "No" to any of the Question 1 will be rated a "Fail" and the Prospective Proposer will be immediately disqualified.

1. In accordance with Part III, Item 39(B), Prospective Proposer has listed no more than **six** projects completed since **January 1, 2009** with a combined **$80 million** in construction value on the following types of projects:

   a. Industrial and/or municipal water treatment plants where the structural concrete, excavation, backfill, mechanical and electrical were part of the contractor's contract; or

   b. Industrial and/or municipal wastewater treatment plants where the structural concrete, excavation, backfill, mechanical and electrical were part of the contractor's contract.

   The list of projects may include projects currently under construction, but only the total amount paid by the owner(s) as of **November 1, 2018** on uncompleted project(s) can be included in this summation of construction value. The Prospective Proposer is allowed to list no more than **six** projects of the types listed above, that combined, will add up to at least **$80 million** in completed value of work. In addition, one of the six projects must have a construction value of at least **$20 million.**

   Any projects listed in Part III, Item 39(B), which are not as defined above will not be considered by the City in meeting this pre-requisite experience requirement. For example, pipeline projects and pump station projects are not considered a treatment plant project and would not be eligible.

   Prospective Proposer also certifies that Prospective Proposer self-performed at least 40% of the work on each of the projects listed in Part III, Item 39(B). The City considers this level of past self-performance demonstrates a benefit to the Project in terms of better control of cost, schedule and safety.

   [x] Yes [ ] No

PART I(C). ESSENTIAL REQUIREMENTS FOR PRE-QUALIFICATION FOR BOTH THE PGWWTP EXPANSION PROJECT AND THE PGWWTP ENERGY RECOVERY PROJECT

Important Note to Contractor: Only answer this question and complete Part III, Item 39(C) if you are submitting an SOPQ for the both above PGWWTP projects.

An answer of "No" to any of the Question 1 will be rated a "Fail" and the Prospective Proposer will be immediately disqualified.

1. In accordance with Part III, Item 39(C), Prospective Proposer has listed no more than **six** projects completed since **January 1, 2009** with a combined **$200 million** in construction value on the following types of projects:

   a. Industrial and/or municipal water treatment plants where the structural concrete, excavation, backfill, mechanical and electrical were part of the contractor's contract; or

   b. Industrial and/or municipal wastewater treatment plants where the structural concrete, excavation, backfill, mechanical and electrical were part of the contractor's contract.

   The list of projects may include projects currently under construction, but only the total amount paid by the owner(s) as of **November 1, 2018** on uncompleted project(s) can be included in this summation of construction value. The Prospective Proposer is allowed to list no more than **six** projects of the types listed above, that combined, will add up to at least **$200 million** in completed value of work. In addition, one of the six projects must have a construction value of at least **$65 million.**

   Any projects listed in Part III, Item 39(C), which are not as defined above will not be considered by the City in meeting this pre-requisite experience requirement. For example, pipeline projects and pump station projects are not considered a treatment plant project and would not be eligible.

   Prospective Proposer also certifies that Prospective Proposer self-performed at least 40% of the work on each of the projects listed in Part III, Item 39(C). The City considers this level of past self-performance demonstrates a benefit to the Project in terms of better control of cost, schedule and safety.

   [X] Yes [ ] No

W. M. LYLES CO.
CONTRACTOR
Since 1945
Progress Through Performance®

Tab 4

Part II
Organization, History, Organizational Performance, Compliance with Civil and Criminal Laws

PART II. ORGANIZATION, HISTORY, ORGANIZATIONAL PERFORMANCE, COMPLIANCE WITH CIVIL AND CRIMINAL LAWS

A. Current Organization and Structure of the Business

For Prospective Proposers that are Corporations:

1a. Date incorporated: 5/6/1982

1b. Under the laws of what state: California

1c. Provide all the following information for each person who is either (a) an officer of the corporation (president, vice president, secretary, treasurer), or (b) the owner of at least ten percent of the corporation's stock.

Name	Position	Years with Co.	% Ownership
See attached			

1d. Identify every construction firm that any person listed above has been associated with (as owner, general partner, limited partner or officer) at any time during the last five years.

NOTE: For this question, "owner" and "partner" refer to ownership of ten percent or more of the business, or ten percent or more of its stock, if the business is a corporation.

Person's Name	Construction Firm	Dates of Person's Participation with Firm
N/A		

A. Current Organization and Structure of the Business
For Prospective Proposers that are Corporations:

1c. Provide all the following information for each person who is either (a) an officer of the corporation (president, vice president, secretary, treasurer), or (b) the owner of at least ten percent of the coporation's stock.

W. M. Lyles Co. List of Officers

Name	Position	Years with Co.	% Ownership
Stanley H. Simmons	President/CEO/ Treasurer (CFO)	26	0
Kenneth D. Strosnider	Executive Vice President	29	0
Robert P. Saleen	Senior Vice President	29	0
David H. O'Dear	Asst. Vice President/Asst. Secretary	23	0
Joseph B. Lawrence	Asst. Vice President	16	0
Kevin R. Shigematsu	Asst. Vice President	17	0
Anthony M. Mueller	Asst. Vice President	15	0
Ruben Moreno, Jr.	Secretary	12	0
Scott R. Fults	Asst. Secretary	13	0
Chanel L. Prince	Asst. Secretary	13	0

For Prospective Proposers that are Limited Liability Companies (LLC): N/A

1a. State the name of the LLC exactly as it appears on it appears on file with the California Secretary of State, including the entity ending (ex: "Jones & Company, LLC" or "Smith Construction, a Limited Liability Company").

LLC Name: _____

1b. Date LLC was formed: _____

1c. Under the laws of what state: _____

1d. State the tax classification of LLC by checking the appropriate box below:

☐- Single Entity LLC
☐- C Corporation LLC
☐- S Corporation LLC
☐- Partnership LLC

1e. Provide all the following information for each person who is either (a) an officer of the LLC (president, vice president, secretary, treasurer), or (b) partner of the LLC, or (c) the owner of at least ten percent of the LLC's stock.

Name	Position	Years with Co.	% Ownership

1f. If a Partnership LLC, provide the name of the Managing Partner.

Managing Partner's Full Name: _____

1g. Identify every construction firm that any person listed above has been associated with (as owner, general partner, limited partner or officer) at any time during the last five years.

NOTE: For this question, "owner" and "partner" refer to ownership of ten percent or more of the business, or ten percent or more of its stock, if the business is a corporation.

Person's Name	Construction Firm	Dates of Person's Participation with Firm

For Prospective Proposers that are Partnerships: N/A

1a. Date of formation: _____

1b. Under the laws of what state: _____

1c. Provide all the following information for each partner who owns ten percent or more of the firm.

Name	Position	Years with Co.	% Ownership

1d. Identify every construction company that any partner has been associated with (as owner, general partner, limited partner or officer) at any time during the last five years.

NOTE: For this question, "owner" and "partner" refer to ownership of ten percent or more of the business, or ten percent or more of its stock, if the business is a corporation.

Person's Name	Construction Company	Dates of Person's Participation with Company

For Prospective Proposers that are Sole Proprietorships: N/A

1a. Date of commencement of business. _____

1b. Identify every construction firm that the business owner has been associated with (as owner, general partner, limited partner or officer) at any time during the last 5 years.

NOTE: For this question, "owner" and "partner" refer to ownership of ten percent or more of the business, or ten percent or more of its stock, if the business is a corporation.

Person's Name	Construction Company	Dates of Person's Participation with Company

B. History of the Business and Organizational Performance

2. Has there been any change in ownership of the firm at any time during the last three years?

NOTE: A corporation whose shares are publicly traded is not required to answer this question.

☐ Yes ☒ No

If "yes," explain on a separate signed page.

3. Is the company, corporation, LLC, or other entity seeking to prequalify a parent, subsidiary, in a holding company relationship, or otherwise an affiliate of any other construction company, corporation, LLC, or other entity?

NOTE: All Prospective Proposers will be required to properly execute and submit the Prospective Proposer's Certification included in Appendix G as Attachment A to the SOPQ Submittal.

☒ Yes ☐ No See attached.

If "yes," on a separate signed page, please provide a complete corporate tree showing percentage of ownership. In addition, if any such affiliated company, corporation, LLC, or other entity is seeking to prequalify as well, identify such entity and submit proof satisfactory to the City that the requirements of Section 2.4 are satisfied.

B. History of the Business and Organizational Performance

3. Is the company, corporation, LLC or other entity seeking to prequalify a parent, subsidiary, in a holding company relationship, or otherwise an affiliate of any other construction company, corporation, LLC, or other entity?

Lyles Diversified, Inc. - Parent Company
W.M. Lyles Co., New England Sheet Metal and Mechanical Co., and American Paving Co. - Wholly owned, qualified Subchapter S Subsidiaries of Lyles Diversified, Inc.



Joseph B. Lawrence, Asst. Vice President

4. Are any of your directors, officers, partners or owners also an officer, director, partner or owner of another construction company, corporation, LLC, or other entity?

☐ Yes ☒ No

If "yes," on a separate signed page, please identify such person(s) and the other construction company involved. In addition, if such other construction company is seeking to prequalify as well, submit proof satisfactory to the City that the requirements of Section 2.4 are satisfied.

5. State your firm's gross revenues for each of the last three years:

$211,632,837	$229,996,064	$243,891,673
2018	2017	2016

6. How many years has your organization been in business as a contractor under your present business name and license number? 36 years

7. Is your firm currently the debtor in a bankruptcy case?

☐ Yes ☒ No

If "yes," please attach a copy of the bankruptcy petition, showing the case number, and the date on which the petition was filed.

8. Was your firm in bankruptcy at any time during the last five years? (This question refers only to a bankruptcy action that was not described in answer to question 7, above)

☐ Yes ☒ No

If "yes," please attach a copy of the bankruptcy petition, showing the case number and the date on which the petition was filed, and a copy of the Bankruptcy Court's discharge order, or of any other document that ended the case, if no discharge order was issued.

Licenses

9. List all California construction license numbers, classifications and expiration dates of the California contractor licenses held by your firm:

CSLB No. 422390 / Class A, B / Expiration 5/31/2020

10. If any of your firm's license(s) are held in the name of a corporation, LLC, or partnership, list below the names of the qualifying individual(s) listed on the CSLB records whom meet(s) the experience and examination requirements for each license.

Kenneth Strosnider, RMO

11. Has your firm changed names or license number in the past five years?

☐ Yes ☒ No

If "yes," explain on a separate signed page, including the reason for the change.

12. Has any owner, partner or (for corporations, LLC) officer of your firm operated a construction firm under any other name in the last five years?

☐ Yes ☒ No

If "yes," explain on a separate signed page, including the reason for the change.

13. Has any CSLB license held by your firm or its Responsible Managing Employee or Responsible Managing Officer been suspended within the last five years?

☐ Yes ☒ No

If "yes," please explain on a separate signed sheet.

Disputes

The City recognizes that large construction companies (e.g. revenues in excess of $250 million per year) have multiple branches/divisions for geographic and/or type of construction coverages. In such cases, the Prospective Proposer may elect to submit a set of qualifications for a specific company branch or division which shall be clearly identified in a cover letter to the SOPQ package submittal. As such, should a Prospective Proposer choose to submit qualifications for a specific branch /division, the scoring requirements for Part II B-C of the SOPQ, as well as all other submitted information shall be branch/division specific. Financial statements should still be for the total company and parent company even if a Prospective Proposer submits the scoring requirements specific to a company branch or division.

14. At any time in the last five years, has your firm been assessed and paid liquidated damages after completion of a project under a construction contract with either a public or private owner?

☐ Yes ☒ No

If yes, explain on a separate signed page, identifying all such projects by owner, owner's address, the date of completion of the project, amount of liquidated damages assessed and all other information necessary to fully explain the assessment of liquidated damages.

15. In the last five years has your firm, or any firm with which any of your company's owners, officers or partners was associated, been debarred, disqualified, removed or otherwise prevented from bidding on, or completing, any government agency or public works project for any reason?

NOTE: "Associated with" refers to another construction firm in which an owner, partner or officer of your firm held a similar position, and which is listed in response to question 1c or 1d on this form.

☐ Yes ☒ No

If "yes," explain on a separate signed page. State whether the firm involved was the firm applying for Pre-Qualification here or another firm. Identify by name of the company, the name of the person within your firm who was associated with that company, the year of the event, the owner of the project, the project and the basis for the action.

16. In the last 5 years has your firm been denied an award of a public works contract based on a finding by a public agency that your company was not a responsible bidder?

☐ Yes ☒ No

If "yes," explain on a separate signed page. Identify the year of the event, the owner, the project and the basis for the finding by the public agency.

* * * * *

NOTE: The following two questions refer only to disputes between your firm and the owner of a project. You need not include information about disputes between your firm and a supplier, another contractor, or subcontractor. You need not include information about "pass-through" disputes in which the actual dispute is between a sub-contractor and a project owner. Also, you may omit reference to all disputes about amounts of less than $50,000.

17. In the past five years has any claim **against** your firm concerning your firm's work on a construction project been **filed in court or arbitration?**

☒ Yes ☐ No See attached

If "yes," on separate signed sheets of paper identify the claim(s) by providing the project name, date of the claim, name of the claimant, a brief description of the nature of the claim, the court in which the case was filed and a brief description of the status of the claim (pending or, if resolved, a brief description of the resolution). See attached.

18. In the past five years has your firm made any claim against a project owner concerning work on a project or payment for a contract and **filed that claim in court or arbitration**?

☒ Yes ☐ No See attached.

If "yes," on separate signed sheets of paper identify the claim by providing the project name, date of the claim, name of the entity (or entities) against whom the claim was filed, a brief description of the nature of the claim, the court in which the case was filed and a brief description of the status of the claim (pending, or if resolved, a brief description of the resolution).

19. At any time during the past five years, has any surety company made any payments on your firm's behalf as a result of a default, to satisfy any claims made against a performance or payment bond issued on your firm's behalf, in connection with a construction project, either public or private?

☐ Yes ☒ No

If "yes," explain on a separate signed page the amount of each such claim, the name and telephone number of the claimant, the date of the claim, the grounds for the claim, the present status of the claim, the date of resolution of such claim if resolved, the method by which such was resolved if resolved, the nature of the resolution and the amount, if any, at which the claim was resolved.

20. In the last five years has any insurance carrier, for any form of insurance, refused to renew the insurance policy for your firm?

☐ Yes ☒ No

If "yes," explain on a separate signed page. Name the insurance carrier, the form of insurance and the year of the refusal.

Criminal Matters and Related Civil Suits

21. Has your firm or any of its owners, officers or partners ever been found liable in a civil suit or found guilty in a criminal action for making any false claim or material misrepresentation to any public agency or entity?

☐ Yes ☒ No

If "yes," explain on a separate signed page, including identifying who was involved, the name of the public agency, the date of the investigation and the grounds for the finding.

22. Has your firm or any of its owners, officers or partners ever been convicted of a crime involving any federal, state, or local law related to construction?

☐ Yes ☒ No

B. **History of the Business and Organizational Performance**

17 In the past five years has any claim against your firm concerning your firm's work on a construction project been filed in court or arbitration?

Project Name: Tulare Industrial Wastewater Treatment Plant Expansion completed 3/5/10

Completed: 3/5/2010
Date of Claim: 3/28/15

Claimant: City of Tulare vs. Xylem Water Solutions USA, Inc., FKA Sanitaire, W. M. Lyles Co., et al

Filed in Tulare County Superior Court
Claim Status: Settled

Brief:
City of Tulare claimed Breach of Contract, Breach of Warranty and Damages against the parties for failure of the diffuser system lock rings installed in the plant expansion project. Causation was not determined by the Plaintiff. W. M. Lyles Co. did not perform design, or choose the equipment system. Rather, W. M. Lyles Co. installed the equipment that was pre-selected/sole sourced by the Owner as directed and approved by the Manufacturer, and according to the Project specifications. This claim was dismissed as the Parties settled the matter in July 2016.

18 In the past five years has your firm made any claim against a project owner concerning work on a project or payment for a contract and filed that claim in court or arbitration?

Project Name: Tulare Industrial Wastewater Treatment Plant Expansion
Completed: 3/5/2010
Date of Claim: 11/2/2015
Cross Complainant: W. M. Lyles Co.. vs. City of Tulare, Xylem Water Solutions USA, Inc., FKA Sanitaire, et al
Court Filed: Tulare County Superior Court
Claim Status: Settled
Brief: See above.

There are no current claims against W. M. Lyles Co. that if we should lose the claim, would adversely affect our financial position, or our ability to meet our obligations if awarded the contract for this project.

W.M. Lyles Co.

Joseph B. Lawrence, Asst. Vice President

If "yes," explain on a separate signed page, including identifying who was involved, the name of the public agency, the date of the conviction and the grounds for the conviction.

23. Has your firm or any of its owners, officers or partners ever been convicted of a federal or state crime of fraud, theft, or any other act of dishonesty?

☐ Yes ☒ No

If "yes," identify on a separate signed page the person or persons convicted, the court (the county if a state court, the Agency or location of the federal court), the year and the criminal conduct.

Bonding

24. Bonding capacity: Provide documentation from your surety identifying the following:

Name of bonding company/surety: Liberty Mutual Insurance Company

Name of surety agent, address and telephone number:

Alliant Insurance Services, Inc., Steve Edwards, 9 E. Riverpark Place East, Suite 310, Fresno, CA 93720, (559)374-3560

25. If your firm was required to pay a premium of more than one percent for a performance and payment bond on any project(s) on which your firm worked at any time during the last three years, state the percentage that your firm was required to pay. You may provide an explanation for a percentage rate higher than one percent, if you wish to do so.

N/A

26. List all other sureties (name and full address) that have written bonds for your firm during the last five years, including the dates during which each wrote the bonds:

N/A

27. During the last five years, has your firm ever been denied bond coverage by a surety company, or has there ever been a period of time when your firm had no surety bond in place during a public construction project when one was required?

☐ Yes ☒ No

If yes, provide details on a separate signed sheet indicating the date when your firm was denied coverage and the name of the company or companies which denied coverage; and the period during which you had no surety bond in place.

C. Compliance with Occupational Safety and Health Laws and with Other Labor Legislation

28. Has CAL OSHA cited and assessed penalties against your firm for any "serious," "willful" or "repeat" violations of its safety or health regulations in the past five years?

NOTE: If you have filed an appeal of a citation, and the Occupational Safety and Health Appeals Board has not yet ruled on your appeal, you need not include information about it.

☐ Yes ☒ No

If "yes," attach a separate signed page describing the citations, including information about the dates of the citations, the nature of the violation, the project on which the citation(s) was or were issued, the amount of penalty paid, if any. If the citation was appealed to the Occupational Safety and Health Appeals Board and a decision has been issued, state the case number and the date of the decision.

29. Has the federal Occupational Safety and Health Administration cited and assessed penalties against your firm in the past five years?

NOTE: If you have filed an appeal of a citation and the Appeals Board has not yet ruled on your appeal, or if there is a court appeal pending, you need not include information about the citation.

☐ Yes ☒ No

If "yes," attach a separate signed page describing each citation.

30. Has the EPA or any Air Quality Management Agency or any Regional Water Quality Control Board cited and assessed penalties against either your firm or the owner of a project on which your firm was the contractor, in the past five years?

NOTE: If you have filed an appeal of a citation and the Appeals Board has not yet ruled on your appeal, or if there is a court appeal pending, you need not include information about the citation.

☒ Yes ☐ No

If "yes," attach a separate signed page describing each citation. See attached.

B. History of the Business and Organizational Performance

30 Has the EPA or any Air Quality Management District or any Regional Water Quality Control Board cited and assessed penalties against either your firm or the owner of a project on which your firm was the contractor, in the past five years?

On approximately 8/22/2018, W.M. Lyles Co. ("WML") received a Notice of Violation from the San Joaquin Valley Unified Air Pollution Control District ("SJVUAPCD") related to a Carryout and Trackout violation citing, "Failure to prevent carryout and trackout extending over 50 ft. or more from the nearest unpaved surface exit point of a site within an urban area. This was the first offense incurred by WML in its long seventy four (74) year history and the fine incurred was $1,200.00, which has been fully satisfied. No further sanctions and/or clouds have been placed upon WML's CSLB license in regard to this incident and it will have no impact whatsoever upon WML's ability to perform its current work or to provide future services.

Joseph B. Lawrence, Asst. Vice President

31. How often do you require documented safety meetings to be held for construction employees and field supervisors during the course of a project? weekly

32. Experience Modification Rate (EMR): Prospective Proposers shall obtain a letter from your insurance carrier (or state fund if applicable) with your interstate EMR's for the current year, previous year and year prior to previous year. If you do not have an interstate rating, obtain your intrastate EMR's. Attach the letter as part of this SOPQ Package Submittal. The Prospective Proposer shall list below the Experience Modification Rate for the current year, previous year and year prior to previous year as provided by your insurance carrier.

Year	EMR
Current year	2018: 0.78
Previous year	2017: 0.91
Year prior to previous year	2016: 1.02
Three Year Average	0.91

Are the above rates interstate or intrastate? intrastate

If intrastate, which state? California

NOTE: Any of the following methods of "obtaining a letter" are acceptable:

- Furnish a letter from your insurance agent, insurance carrier or state fund (on their letterhead) verifying the EMR data listed above; or See tab 9
- Furnish a Photostat of the applicable Experience Rating Calculation Sheets, which your insurance carrier should forward to you annually.

A Prospective Proposer will be immediately disqualified if its Three-Year Average EMR is greater than 1.25 (125%).

33. Within the last five years has there ever been a period when your firm had employees but was without workers' compensation insurance or state-approved self-insurance?

☐ Yes ☒ No

If "yes," please explain the reason for the absence of workers' compensation insurance on a separate signed page. If "No," please provide a statement by your current workers' compensation insurance carrier that verifies periods of workers' compensation insurance coverage for the last five years. (If your firm has been in the construction business for less than five years, provide a statement by your workers' compensation insurance carrier verifying continuous workers' compensation insurance coverage for the period that your firm has been in the construction business.)

Prevailing Wage and Apprenticeship Compliance Record

34. Has there been more than one occasion during the last five years in which your firm was required to pay either back wages or penalties for your own firm's failure to comply with the **state's** prevailing wage laws?

NOTE: This question refers only to your own firm's violation of prevailing wage laws, not to violations of the prevailing wage laws by a subcontractor.

☐ Yes ☒ No

If "yes," attach a separate signed page or pages, describing the nature of each violation, identifying the name of the project, the date of its completion, the public agency for which it was constructed; the number of employees who were initially underpaid and the amount of back wages and penalties that you were required to pay.

35. During the last five years, has there been more than one occasion in which your own firm has been penalized or required to pay back wages for failure to comply with the **federal** Davis-Bacon prevailing wage requirements?

☐ Yes ☒ No

If "yes," attach a separate signed page or pages describing the nature of the violation, identifying the name of the project, the date of its completion, the public agency for which it was constructed; the number of employees who were initially underpaid, the amount of back wages you were required to pay along with the amount of any penalty paid.

36. Provide the **name, address and telephone number** of the apprenticeship program (approved by the California Apprenticeship Council) from whom you intend to request the dispatch of apprentices to your company for use on any public work project for which you are awarded a contract by the Owner.

See attached.

37. If your firm operates its own State-approved apprenticeship program:

(a) Identify the craft or crafts in which your firm provided apprenticeship training in the past year.

(b) State the year in which each such apprenticeship program was approved, and attach evidence of the most recent California Apprenticeship Council approval(s) of your apprenticeship program(s).

Apprentice Program	Office Location and Phone Number
Northern California Carpenters	2350 Santa Rita Road Pleasanton, CA 94566 Phone: (925) 462-9640
Northern California Cement Masons	2350 Santa Rita Road Pleasanton, CA 94566 Phone: (925) 484-2271
Northern California Laborers	1001 Westside Drive San Ramon, CA 94583 Phone: (925) 556-0858
Northern California Operating Engineers	14738 Cantova Way Sloughhouse, CA 95683 Phone: (916) 354-2029

(c) State the number of individuals who were employed by your firm as apprentices at any time during the past three years in each apprenticeship and the number of persons who, during the past three years, completed apprenticeships in each craft while employed by your firm.

N/A

38. At any time during the last five years, has your firm been found to have violated any provision of California apprenticeship laws or regulations, or the laws pertaining to use of apprentices on public works?

☐ Yes ☒ No

If "yes," provide the date(s) of such findings, and attach copies of the Department's final decision(s).

W. M. LYLES CO.
CONTRACTOR
Since 1945
Progress Through Performance®

Tab 5

Part III
Recent Construction Projects Completed

PART III. RECENT CONSTRUCTION PROJECTS COMPLETED

Important Note to Contractor: Only complete Part III, Item 39(A) if you are submitting an SOPQ for the PGWWTP Expansion.

39(A) In accordance with Part I, Question 9, and the Prospective Proposer must demonstrate that it has performed at least **$150 million** in construction volume on no more than **six** projects completed since **January 1, 2009** on the following types of projects:

a. Industrial and/or municipal water treatment plants where the structural concrete, excavation, backfill, mechanical and electrical were part of the contractor's contract; or

b. Industrial and/or municipal wastewater treatment plants where structural concrete, excavation, backfill, mechanical and electrical were part of the contractor's contract.

The list of projects may include projects currently under construction, but only the total amount paid by the owner(s) as of **November 1, 2018** on uncompleted projects can be included in this summation of construction value. The Prospective Proposer is allowed to list no more than **six** projects of the types listed above, that combined, will add up to at least **$150 million** in completed value of work. **In addition, one of the six projects must have a construction value of at least $45 million.**

Any projects listed below, which are not as defined above, will not be considered by the City in meeting this pre-requisite experience requirement. For example, pipeline projects, and/or pump station projects are not considered an equivalent project.

An industrial and/or municipal water or wastewater treatment plant project is defined as a project that was engineered and constructed for an industrial or municipally owned and operated facility which is designed to remove contaminants, specific constituents, and/or particulates in water and/or wastewater as required by a State issued discharge permit.

Prospective Proposer also certifies that Prospective Proposer self-performed at least 40% of the Work on each of the projects listed below. The City considers this level of past self-performance demonstrates a benefit to the Project in terms of better control of cost, schedule, and safety.

Prospective Proposers are to complete this form and not attach their own form to their SOPQ submission.

Qualifying Project # 1 Name: Wastewater Treatment Plant Secondary and Tertiary Improvements Project

Prime Contractor: AECOM & WML, a Joint Venture

Project Manager: John Lunsford

Owner: City of Davis

Construction Cost: $ 32,619,341.00

Construction Time: 1,493 Calendar Days

Owner's Representative: Diana Jensen

Owner's Representative Telephone No.: (530) 757-5686

Engineer or On-Site Construction Mgr.: AECOM

Engineer or On-Site CM's Telephone No.: Scott Thibault (978) 905-3217

Date of Substantial Completion: September 28, 2018

Qualifying Project # 2 Name: Southeast Surface Water Treatment Facility - Phase Two

Prime Contractor: W. M. Lyles Co.

Project Manager: Tony Mueller

Owner: City of Fresno

Construction Cost: $ 162,089,360.00

Construction Time: 1,000 Calendar Days

Owner's Representative: Glenn Knapp

Owner's Representative Telephone No.: (559) 621-1624

Engineer or On-Site Construction Mgr.: Carollo Engineers

Engineer or On-Site CM's Telephone No.: Chris Johnson (208) 376-2288

Date of Substantial Completion: August 7, 2018

Qualifying Project # 3 Name: Water Conservation Plant Upgrades

Prime Contractor: W. M. Lyles Co.

Project Manager: Ruben Moreno, Jr.

Owner: City of Visalia

Construction Cost: $ 103,499,235.00

Construction Time: 1,607 Calendar Days

Owner's Representative: Jim Ross

Owner's Representative Telephone No.: (559) 713-4533

Engineer or On-Site Construction Mgr.: Parsons

Engineer or On-Site CM's Telephone No.: Satish Kamath (626) 440-3364

Date of Substantial Completion: March 31, 2017

Qualifying Project # 4 Name: Primary Treatment Renovations

Prime Contractor: W. M. Lyles Co.

Project Manager: John Lunsford

Owner: Central Contra Costa Sanitary District

Construction Cost: $ 11,441,946.00

Construction Time: 1,227 Calendar Days

Owner's Representative: Craig Mizutani

Owner's Representative Telephone No.: (925) 229-7361

Engineer or On-Site Construction Mgr.: Central Contra Costa Sanitary District

Engineer or On-Site CM's Telephone No.: Nathan Morales (925) 229-7126

Date of Substantial Completion: January 22, 2016

Qualifying Project # 5 Name: Wastewater Treatment Plant Upgrade and Expansion Project

Prime Contractor: W. M. Lyles Co. (formerly known as Kaweah Construction Co.)

Project Manager: Matt Cain

Owner: Linda County Water District

Construction Cost: $ 29,547,940.00

Construction Time: 247 Calendar Days

Owner's Representative: Brian Davis

Owner's Representative Telephone No.: (530) 743-2043

Engineer or On-Site Construction Mgr.: Kennedy Jenks Engineering

Engineer or On-Site CM's Telephone No.: Don Barraza (916) 858-2700

Date of Substantial Completion: May 23, 2012

Qualifying Project # 6 Name: Palmdale Water Reclamation Plant Stage 5 Plant Expansion, Phase 1

Prime Contractor: W. M. Lyles Co.

Project Manager: Grant Gourley

Owner: County Sanitation District No. 20 of Los Angeles County

Construction Cost: $ 116,079,180.00

Construction Time: 1,559 Calendar Days

Owner's Representative: Ted Brodeur

Owner's Representative Telephone No.: (626) 962-8605

Engineer or On-Site Construction Mgr.: Los Angeles County Sanitation District

Engineer or On-Site CM's Telephone No.: Jenny Hsu (562) 908-4288

Date of Substantial Completion: June 16, 2012

Total Construction Cost of listed Qualifying Project(s) above: $ 455,277,002.00

Important Note to Prospective Proposer: Only complete Part III, Item 39(B) if you are submitting an SOPQ for the PGWWTP ERP.

39(B) In accordance with Part I, Question 9, and the Prospective Proposer must demonstrate that it has performed at least **$80 million** in construction volume on no more than **six** projects completed since **January 1, 2009** on the following types of projects:

a. Industrial and/or municipal water treatment plants where the structural concrete, excavation, backfill, mechanical and electrical were part of the contractor's contract; or

b. Industrial and/or municipal wastewater treatment plants where structural concrete, excavation, backfill, mechanical and electrical were part of the contractor's contract.

The list of projects may include projects currently under construction, but only the total amount paid by the owner(s) as of **November 1, 2018** on uncompleted projects can be included in this summation of construction value. The Prospective Proposer is allowed to list no more than **six** projects of the types listed above, that combined, will add up to at least **$80 million** in completed value of work. **In addition, one of the six projects must have a construction value of at least $20 million.**

Any projects listed below, which are not as defined above, will not be considered by the City in meeting this pre-requisite experience requirement. For example, pipeline projects, and/or pump station projects are not considered an equivalent project.

An industrial and/or municipal water or wastewater treatment plant project is defined as a project that was engineered and constructed for an industrial or municipally owned and operated facility which is designed to remove contaminants, specific constituents, and/or particulates in water and/or wastewater as required by a State issued discharge permit.

Prospective Proposer also certifies that Prospective Proposer self-performed at least 40% of the Work on each of the projects listed below. The City considers this level of past self-performance demonstrates a benefit to the Project in terms of better control of cost, schedule, and safety.

Prospective Proposers are to complete this form and not attach their own form to their SOPQ submission.

Qualifying Project # 1 Name: CR&R Riverside County Environmental Center

Prime Contractor: W. M. Lyles Co.

Project Manager: Dave O'Dear

Owner: CR & R Incorporated

Construction Cost: $ 34,734,495.33

Construction Time: 1,387 Calendar Days

Owner's Representative: Michael J. Silva

Owner's Representative Telephone No.: (714) 826-9046

Engineer or On-Site Construction Mgr.: J.R. Miller & Associates

Engineer or On-Site CM's Telephone No.: Aric Vanderzee (714) 524-1870

Date of Substantial Completion: March 5, 2018

Qualifying Project # 2 Name: Southeast Surface Water Treatment Facility

Prime Contractor: W. M. Lyles Co.

Project Manager: Tony Mueller

Owner: City of Fresno

Construction Cost: $ 162,089,360

Construction Time: 1,000 Calendar Days

Owner's Representative: Glenn Knapp

Owner's Representative Telephone No.: (559) 621-1624

Engineer or On-Site Construction Mgr.: Carollo Engineers

Engineer or On-Site CM's Telephone No.: Chris Johnson (208) 376-2288

Date of Substantial Completion: August 7, 2018

Qualifying Project # 3 Name: Water Conservation Plant Upgrades

Prime Contractor: W. M. Lyles Co.

Project Manager: Ruben Moreno, Jr.

Owner: City of Visalia

Construction Cost: $ 103,499,235.00

Construction Time: 1,607 Calendar Days

Owner's Representative: Jim Ross

Owner's Representative Telephone No.: (559) 713-4533

Engineer or On-Site Construction Mgr.: Parsons

Engineer or On-Site CM's Telephone No.: Satish Kamath (626) 440-3364

Date of Substantial Completion: March 31, 2017

Qualifying Project # 4 Name: Wastewater Treatment Plant Upgrade Project

Prime Contractor: W. M. Lyles Co.

Project Manager: Jeff Mathiowetz

Owner: City of El Paso de Robles

Construction Cost: $ 38,051,687.00

Construction Time: 1,352 Calendar Days

Owner's Representative: Matt Thompson

Owner's Representative Telephone No.: (805) 227-7200

Engineer or On-Site Construction Mgr.: Black & Veatch

Engineer or On-Site CM's Telephone No.: Ashu Shirolkar (916) 851-0260

Date of Substantial Completion: April 12, 2016

Qualifying Project # 5 Name: Victor Valley Wastewater Plant Biogas Facility

Prime Contractor: W. M. Lyles Co.

Project Manager: Grant Gourley

Owner: Victor Valley Wastewater Reclamation Authority

Construction Cost: $ 2,029,315.17

Construction Time: 617 Calendar Days

Owner's Representative: Logan Olds

Owner's Representative Telephone No.: (760) 246-8638

Engineer or On-Site Construction Mgr.: Water Synergy, Inc.

Engineer or On-Site CM's Telephone No.: Don Bunts (760) 533-4086

Date of Substantial Completion: 7/31/2014

Qualifying Project # 6 Name: Moreno Valley RWRF Preliminary Treatment and Acid Phase Anaerobic Digestion

Prime Contractor: W. M. Lyles Co.

Project Manager: Tony Mueller

Owner: Eastern Municipal Water District

Construction Cost: $ 30,925,370.00

Construction Time: 1,233 Calendar Days

Owner's Representative: Bruce Mitzel

Owner's Representative Telephone No.: (951) 928-3777

Engineer or On-Site Construction Mgr.: Carollo Engineers

Engineer or On-Site CM's Telephone No.: Rick Doeve (909) 915-8405

Date of Substantial Completion: March 16, 2012

Total Construction Cost of listed Qualifying Project(s) above: $ 371,329,462.50

Important Note to Contractor: Only complete Part III, Item 39(C) if you are submitting an SOPQ for both the PGWWTP Expansion and PGWWTP ERP independently.

39(C) In accordance with Part I, Question 9, and the Prospective Proposer must demonstrate that it has performed at least **$200 million** in construction volume on no more than **six** projects completed since **January 1, 2009** on the following types of projects:

a. Industrial and/or municipal water treatment plants where the structural concrete, excavation, backfill, mechanical and electrical were part of the contractor's contract; or

b. Industrial and/or municipal wastewater treatment plants where structural concrete, excavation, backfill, mechanical and electrical were part of the contractor's contract.

The list of projects may include projects currently under construction, but only the total amount paid by the owner(s) as of **November 1, 2018** on uncompleted projects can be included in this summation of construction value. The Prospective Proposer is allowed to list no more than **six** projects of the types listed above, that combined, will add up to at least **$200 million** in completed value of work. **In addition, one of the six projects must have a construction value of at least $65 million.**

Any projects listed below, which are not as defined above, will not be considered by the City in meeting this pre-requisite experience requirement. For example, pipeline projects, and/or pump station projects are not considered an equivalent project.

An industrial and/or municipal water or wastewater treatment plant project is defined as a project that was engineered and constructed for an industrial or municipally owned and operated facility which is designed to remove contaminants, specific constituents, and/or particulates in water and/or wastewater as required by a State issued discharge permit.

Prospective Proposer also certifies that Prospective Proposer self-performed at least 40% of the Work on each of the projects listed below. The City considers this level of past self-performance demonstrates a benefit to the Project in terms of better control of cost, schedule, and safety.

Prospective Proposers are to complete this form and not attach their own form to their SOPQ submission.

Qualifying Project # 1 Name: CR&R Riverside County Environmental Center

Prime Contractor: W. M. Lyles Co.

Project Manager: Dave O'Dear

Owner: CR&R Incorporated

Construction Cost: $ 34,734,495.33

Construction Time: 1,387 Calendar Days

Owner's Representative: Michael J. Silva

Owner's Representative Telephone No.: (714) 826-9046

Engineer or On-Site Construction Mgr.: J. R. Miller & Associates

Engineer or On-Site CM's Telephone No.: Aric Vanderzee

Date of Substantial Completion: March 5, 2018

Qualifying Project # 2 Name: Wastewater Treatment Plant Secondary and Tertiary Improvements Project

Prime Contractor: AECOM & WML, a Joint Venture

Project Manager: John Lunsford

Owner: City of Davis

Construction Cost: $ 32,619,341.00

Construction Time: 1,493 Calendar Days

Owner's Representative: Diana Jensen

Owner's Representative Telephone No.: (530) 757-5686

Engineer or On-Site Construction Mgr.: AECOM

Engineer or On-Site CM's Telephone No.: Scott Thibault (978) 905-3217

Date of Substantial Completion: September 28, 2018

Qualifying Project # 3 Name: Southeast Surface Water Treatment Facility - Phase Two

Prime Contractor: W. M. Lyles Co.

Project Manager: Tony Mueller

Owner: City of Fresno

Construction Cost: $ 162,089,360.00

Construction Time: 1,000 Calendar Days

Owner's Representative: Glenn Knapp

Owner's Representative Telephone No.: (559) 621-1624

Engineer or On-Site Construction Mgr.: Carollo Engineers

Engineer or On-Site CM's Telephone No.: Chris Johnson (208) 376-2288

Date of Substantial Completion: September 28, 2018

Qualifying Project # 4 Name: Water Conservation Plant Upgrades

Prime Contractor: W. M. Lyles Co.

Project Manager: Ruben Moreno, Jr.

Owner: City of Visalia

Construction Cost: $ 103,499,235.00

Construction Time: 1,607 Calendar Days

Owner's Representative: Jim Ross

Owner's Representative Telephone No.: (559) 713-4533

Engineer or On-Site Construction Mgr.: Parson

Engineer or On-Site CM's Telephone No.: Satish Kamath (626) 440-3364

Date of Substantial Completion: March 31, 2017

Qualifying Project # 5 Name: Primary Treatment Renovations

Prime Contractor: W. M. Lyles Co.

Project Manager: John Lunsford

Owner: Central Contra Costa Sanitary District

Construction Cost: $ 11,441,946.00

Construction Time: 1,227 Calendar Days

Owner's Representative: Craig Mizutani

Owner's Representative Telephone No.: (925) 229-7361

Engineer or On-Site Construction Mgr.: Central Contra Costa Sanitary District

Engineer or On-Site CM's Telephone No.: Nathan Morales (925) 229-7126

Date of Substantial Completion: January 22, 2016

Qualifying Project # 6 Name: Wastewater Treatment Plant Upgrade and Expansion Project

Prime Contractor: W. M. Lyles Co.

Project Manager: Matt Cain

Owner: Linda County Water District

Construction Cost: $ 29,547,940.00

Construction Time: 247 Calendar Days

Owner's Representative: Brian Davis

Owner's Representative Telephone No.: (530) 743-2043

Engineer or On-Site Construction Mgr.: Kennedy Jenks Engineering

Engineer or On-Site CM's Telephone No.: Don Barraza (916) 858-2700

Date of Substantial Completion: May 23, 2012

Total Construction Cost of listed Qualifying Project(s) above: $ 373,932,317.33

SECTION 4

BASIS OF DETERMINATION

4.1 GENERAL

The determination of prequalified Prospective Proposers will be based on an evaluation of the SOPQ and information gathered by the City from the references of related projects. See Appendix B for scoring criteria. The categories that will be evaluated under the basis of determination are responsiveness and capability.

4.2 RESPONSIVENESS

Prospective Proposers must demonstrate they do not have a conflict of interest in the PGWWTP project(s) SOPQ submitted by Prospective Proposer, nor a direct relationship with another prequalifying firm.

Before evaluation of the Prospective Proposer's capability, the responsiveness of the Prospective Proposer will be assessed. The assessment of responsiveness will determine if adequate information or the minimum prerequisites have been submitted to permit an evaluation under the basis of determination. A SOPQ submittal will be rejected as nonresponsive for lack of adequate information due to incompleteness, illegibility, or disregard of the requested format.

4.3 CAPABILITY

The determination by the City of a Prospective Proposer's capability shall assess the Prospective Proposer's ability, capacity, and skill to construct the subject PGWWTP project(s) in a timely and satisfactory manner, based on the responses to the questions in Section 3 and the scoring system described in Appendix B.

W. M. LYLES CO.
CONTRACTOR
Since 1945
Progress Through Performance®

Tab 6

Attachment A
Prospective Proposer's Certification

PROSPECTIVE PROPOSER'S CERTIFICATION

I have carefully examined the Request for Statements of Pre-Qualification from Interested General Contractors (RFPQ) and any other documents accompanying or made a part of this Statement of Pre-Qualifications (SOPQ) packet. The information contained in this SOPQ packet is true and correct to the best of my knowledge and is signed under penalty of perjury under the laws of the State of California. I further certify that I am duly authorized to submit this SOPQ packet on behalf of the firm as its authorized agent and that the firm is ready, willing and able to perform if awarded the contract.

I further certify that this SOPQ packet is made without prior understanding, agreement, connection, discussion, or conspiracy with any other person, contractor or corporation submitting a SOPQ packet for the same service; that this SOPQ packet is fair and made without outside control, collusion, fraud or illegal action; that no officer, employee or agent of the City or any other proposer is financially interested in said SOPQ packet; that no undue influence or pressure was used against or in concert with any officer, employee or agent of the City in connection with the pre-qualification process for the Pleasant Grove Wastewater Treatment Plant projects that will be executed as a result of the Request for Bid Proposals; and that the undersigned executed this Prospective Proposer's Certification with full knowledge and understanding of the matters therein contained and was duly authorized to do so.

W. M. Lyles Co.
NAME OF GENERAL CONTRACTOR

SIGNATURE

Joseph B. Lawrence, Asst. Vice President
NAME & TITLE, TYPED OR PRINTED

1210 W. Olive Avenue, Fresno, CA 93728
MAILING ADDRESS

(559) 441-1900
TELEPHONE NUMBER

jlawrence@wmlylesco.com
EMAIL

Type of Organization:

____ Sole Proprietorship x Corporation CA State of Incorporation

____ Partnership ____ Limited Liability Company

W. M. LYLES CO.
CONTRACTOR
Since 1945
Progress Through Performance®

Tab 7

Conflict of Interest Statement

2.3 Conflict of Interest

We hereby warrant that no official or employee of the City has an interest, has been employed or retained to solicit or aid in the procuring of the contract for either PGWWTP Project, nor that any such person will be employed in the performance of such contract without immediate divulgence of such fact to the City.

W. M. Lyles Co.

Joseph B. Lawrence, Asst. Vice President

W. M. LYLES CO.
CONTRACTOR
Since 1945
Progress Through Performance®

Tab 8

Letter of Intent to Insure

March 22, 2019

Tracie Mueller, P.E.
City of Roseville
City Clerk Department
311 Vernon Street
Roseville, CA 95678

Re: Pleasant Grove Wastewater Treatment Plant Expansion Project
Pleasant Grove Wastewater Treatment Plant Energy Recovery Project

Dear Ms. Mueller,

W. M. Lyles Co. has submitted herewith a response to the request of Intent to Insure for the above referenced Statement of Prequalification.

The respective insurers are very familiar with W. M. Lyles Co.'s operations and qualifications. Accordingly, upon award of a contract for the above referenced project, based on our standard underwriting practices at that time, the respective insurers anticipate that they would provide the insurance coverages specified in Appendix D, Bonds and Insurance.

Alliant Insurance Services, Inc.
(Representing Old Republic Insurance Company, Allied World Assurance Company, Berkley Assurance Company & Allianz Global US Insurance Co)

Nick Bellasis
Sr. Vice President

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT

Civil Code § 1189

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California)
) ss
County of Fresno)

On March 22, 2019, before me, Bonnie Gonzalez, Notary Public, personally appeared Nick Bellasis, who proved to me on the basis of satisfactory evidence to be the person~~(s)~~ whose name~~(s)~~ is~~/are~~ subscribed to the within instrument and acknowledged to me that he/~~she/they~~ executed the same in his/~~her/their~~ authorized capacity~~(ies)~~, and that by his/~~her/their~~ signature~~(s)~~ on the instrument the person~~(s)~~, or the entity upon behalf of which the person~~(s)~~ acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

BONNIE GONZALEZ
NOTARY PUBLIC - CALIFORNIA
COMMISSION # 2202238
FRESNO COUNTY
My Comm. Exp. July 12, 2021

(Seal)

Signature: Bonnie Gonzalez

Bonnie Gonzalez, Notary Public

W. M. LYLES CO.
CONTRACTOR
Since 1945
Progress Through Performance®

Tab 9

EMR Letter

November 15, 2018

RE: W.M. Lyles Co.
2018 Workers' Compensation Experience Modification Rating

To Whom It May Concern,

Alliant Insurance Services, Inc. is the insurance broker handling all lines of coverage for the Lyles group of companies, which includes workers' compensation.

Included within that organization is W.M. Lyles Co. As an integral part of the larger organization, W.M. Lyles Co. shares in the combined experience modification rating promulgated by the State of California. Alliant produces and calculates an individual modification factor which is based solely on the experience of W.M. Lyles Co. using the identical State Factors and formula, as if there were a standalone entity. This individually calculated experience modification factor is much more reflective of their own safety performance as compared to the overall factor published by the State of CA for combined entities.

The most recent published combined experience modification rating effective 5-31-18 is 78%.

The prior published ratings are as follows:

2017 – Combined 91%/Individual 85%
2016 – Combined 102%/Individual 84%

Please advise if you require any further information.

Regards,

Lori Howard

Vice President, Claims Consultant

W. M. LYLES CO.
CONTRACTOR
Since 1945
Progress Through Performance®

Tab 10

Notarized Bonding Capacity Letter

Liberty Mutual Surety
SAFECO INSURANCE COMPANY OF AMERICA

1340 Treat Blvd., Suite 550
Walnut Creek, CA 94597
(925) 979-6730

March 8, 2019

Tracie Mueller, P.E.
City of Roseville
City Clerk Department
311 Vernon Street
Roseville, CA 95678

Re: Pleasant Grove Wastewater Treatment Plant Expansion Project
Pleasant Grove Wastewater Treatment Plant Energy Recovery Project

Ms. Mueller,

Liberty Mutual Company (Liberty), acts as surety for W.M. Lyles Co. in its contracting matters. Liberty is a major, national provider of contract surety bonds, is listed in the Federal Register as a surety acceptable for Federal projects, and is a licensed, admitted surety in all fifty United States. Liberty enjoys a Bests Guide rating of A (Excellent).

Alliant Insurance Service Inc. 9 E River Park Place East, Suite 310, Fresno, CA 93720 is the current agent. We currently extend to W.M. Lyles Co. bonding capacity in the $1,000,000,000 per project and $2,000,000,000 aggregate ranges. Current available capacity is $1,500,000,000. No claims have been made. Current rate is $4.00 per thousand.

Should you select W.M. Lyles Co. for the reference project, it is our present intention to provide the required performance and payment bonds, subject to our normal underwriting guidelines. This includes, but is not limited to a review of contract terms, conditions and bond forms.

Should you have any questions, please do not hesitate to contact our office.

Sincerely,
LIBERTY MUTUAL INSURANCE COMPANY

Steven P. Edwards
Attorney in Fact

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT

Civil Code § 1189

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California)
) ss
County of Fresno)

On March 8, 2019, before me, Bonnie Gonzalez, Notary Public, personally appeared Steven P. Edwards, who proved to me on the basis of satisfactory evidence to be the person~~(s)~~ whose name~~(s)~~ is~~/are~~ subscribed to the within instrument and acknowledged to me that he~~/she/they~~ executed the same in his~~/her/their~~ authorized capacity~~(ies)~~, and that by his~~/her/their~~ signature~~(s)~~ on the instrument the person~~(s)~~, or the entity upon behalf of which the person~~(s)~~ acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

BONNIE GONZALEZ
NOTARY PUBLIC - CALIFORNIA
COMMISSION # 2202238
FRESNO COUNTY
My Comm. Exp. July 12, 2021

(Seal)

Signature: Bonnie Gonzalez
Bonnie Gonzalez, Notary Public

Liberty Mutual SURETY

This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

Liberty Mutual Insurance Company
The Ohio Casualty Insurance Company
West American Insurance Company

Certificate No: 8198004-984971

POWER OF ATTORNEY

KNOWN ALL PERSONS BY THESE PRESENTS: That The Ohio Casualty Insurance Company is a corporation duly organized under the laws of the State of New Hampshire, that Liberty Mutual Insurance Company is a corporation duly organized under the laws of the State of Massachusetts, and West American Insurance Company is a corporation duly organized under the laws of the State of Indiana (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Cody Lyman, Ralph B Busch III, John C Day, Steven P Edwards, Lyn Genito, Bonnie Gonzalez

all of the city of Fresno state of California each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 20th day of November, 2018.

Liberty Mutual Insurance Company
The Ohio Casualty Insurance Company
West American Insurance Company

By: _____
David M Carey, Assistant Secretary

State of PENNSYLVANIA
County of MONTGOMERY ss

On this 20th day of November, 2018 before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of Liberty Mutual Insurance Company, The Ohio Casualty Company, and West American Insurance Company, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at King of Prussia, Pennsylvania, on the day and year first above written.

COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Teresa Pastella, Notary Public
Upper Merion Twp., Montgomery County
My Commission Expires March 28, 2021
Member, Pennsylvania Association of Notaries

By: _____
Teresa Pastella, Notary Public

This Power of Attorney is made and executed pursuant to and by authority of the following By-laws and Authorizations of The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company which resolutions are now in full force and effect reading as follows:

ARTICLE IV – OFFICERS: Section 12. Power of Attorney.
Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and execution of any such instruments and to attach thereto the seal of the Corporation. When so executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

ARTICLE XIII – Execution of Contracts: Section 5. Surety Bonds and Undertakings.
Any officer of the Company authorized for that purpose in writing by the chairman or the president, and subject to such limitations as the chairman or the president may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Company by their signature and execution of any such instruments and to attach thereto the seal of the Company. When so executed such instruments shall be as binding as if signed by the president and attested by the secretary.

Certificate of Designation – The President of the Company, acting pursuant to the Bylaws of the Company, authorizes David M. Carey, Assistant Secretary to appoint such attorneys-in-fact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

Authorization – By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

I, Renee C. Llewellyn, the undersigned, Assistant Secretary, The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 8 day of March 2019

By: _____
Renee C. Llewellyn, Assistant Secretary

LMS-12873 LMIC OCIC WAIC Multi Co_062018

Not valid for mortgage, note, loan, letter of credit, currency rate, interest rate or residual value guarantees.

To confirm the validity of this Power of Attorney call 1-610-832-8240 between 9:00 am and 4:30 pm EST on any business day.

EXHIBIT B

CONTRACTOR'S TECHNICAL BID PROPOSAL DATED JULY 29, 2019
(excluding Sections 7 through 11 and the appendices)

Pleasant Grove Wastewater Treatment Plant Energy Recovery Project



REQUEST FOR PROPOSAL

PLEASANT GROVE WASTEWATER TREATMENT PLANT ENERGY RECOVERY PROJECT

CITY OF ROSEVILLE

JULY 22, 2019

CITY OF ROSEVILLE CALIFORNIA

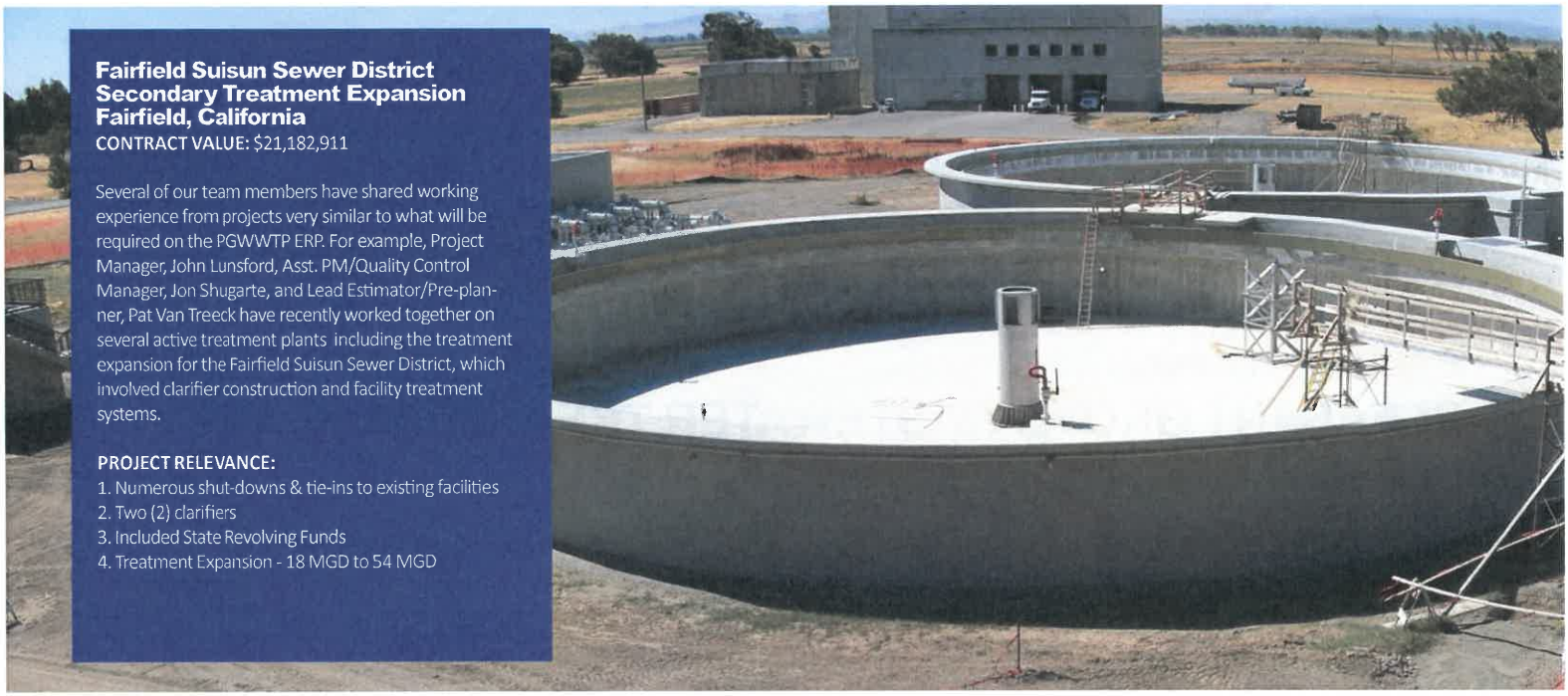
TABLE OF CONTENTS

VOLUME ONE - TECHNICAL PROPOSAL

Cover Letter
Acknowledgement of Addendums 1-6
Section 1 - Project Understanding
Section 2 - Approach to the Project's Scope of Work/Special Project Considerations
Section 3 - Project Cost Reduction Opportunities
Section 4 - Project Team Qualifications and Experience
Section 5 - Contractor's Quality Control Program
Section 6 - Contractor's Construction Scheduler Qualifications
Section 7 - Contractor's Safety Program
Section 8 - Contractor's Accounting System
Section 9 - Affidavit of Non-Collusion
Section 10 - Insurance
Section 11 - Proprietary Information
Section 12 - Iran Contracting Act Disclosure
Section 13 - Proposer Certifications and Signatures Proposal Form
Section 14 – SWRCB CWSRF Forms
Appendix A: Key Project Team Member Resumes
Appendix B: Quality Control Manager Resume
Appendix C: Baseline CPM Schedule
Appendix D: WML Overall Safety Program
Appendix E: Time and Materials Progress Billing

VOLUME TWO - PRICE PROPOSAL

GMP Cost Proposal



Fairfield Suisun Sewer District Secondary Treatment Expansion Fairfield, California
CONTRACT VALUE: $21,182,911

Several of our team members have shared working experience from projects very similar to what will be required on the PGWWTP ERP. For example, Project Manager, John Lunsford, Asst. PM/Quality Control Manager, Jon Shugarte, and Lead Estimator/Pre-planner, Pat Van Treeck have recently worked together on several active treatment plants including the treatment expansion for the Fairfield Suisun Sewer District, which involved clarifier construction and facility treatment systems.

PROJECT RELEVANCE:
1. Numerous shut-downs & tie-ins to existing facilities
2. Two (2) clarifiers
3. Included State Revolving Funds
4. Treatment Expansion - 18 MGD to 54 MGD

W. M. LYLES CO.
CONTRACTOR
Since 1945
Progress Through Performance
California Contractor's License No. 422390

Northern Division Office
3925 Progress Drive
Rocklin, CA, 95765
Telephone (916) 375-1833
Fax (916) 375-1848

www.wmlyles.com
An Equal Opportunity Employer

July 22, 2019

City of Roseville
City Clerk's Office
311 Vernon Street
Roseville, CA 95678
Attn: Tracie Mueller, P.E.
Environmental Utilities-Engineering

Re: Request for Bid Proposal (RFBP), For Design-Assist and Construction of Pleasant Grove Wastewater Treatment Plant Energy Recovery Project

Dear Ms. Mueller:

W. M. Lyles Co. (Lyles) is pleased to submit this response to the above referenced RFBP issued by the City of Roseville (City), Environmental Utilities-Engineering Department, as amended through Addendum No. 6. The Energy Recovery Project (ERP) is an integral part of the City's plan to beneficially utilize biogas that will be generated by the Pleasant Grove Wastewater Treatment Plant (PGWWTP) upon completion of the upcoming Expansion Project. In support of that plan, Lyles offers the following:

The Right Team: Lyles currently operates three construction divisions throughout the State of California. While our size provides us with the capacity and resources needed to build even the most challenging of projects, the real source of our strength lies within our people. To capitalize on this, we maintain offices in five strategic locations between Rocklin and Temecula that are staffed by local personnel who can provide the highest quality of service to our clients. The key personnel that will be assigned to the ERP: Joe Lawrence, John Lunsford, Jon Shugarte, and Tony Mueller; are all members of our Rocklin, CA office which is located less than 10 miles from the PGWWTP. They also live in the local community which means they will be invested in the ERP on both a professional and personal level. Please see Section Four for additional information regarding our team.

The Strongest Partners: At Lyles, we understand the importance of strong partnerships and the value that they bring to a project. We also understand the complexity inherent in the electrical and instrumentation scopes of work associated with modern wastewater treatment facilities. For these reasons, we have exclusively partnered with Wade Johnson and his team at San Joaquin Electric, Inc. to provide electrical services, and Tesco Controls, Inc. to provide integration services for the ERP. Our relationships with both Wade and Tesco are built on more than 20 years of shared success and we consider these relationships to be among our best.

The Best Value: Value is often defined as the "importance" of something. With respect to the ERP, the City has identified three goals as having "importance": budget, schedule, and stakeholders' needs. As construction professionals, we strive to excel in these areas on a daily

W. M. LYLES CO.
CONTRACTOR
Since 1945
Progress Through Performance
California Contractor's License No. 422390

Northern Division Office
3925 Progress Drive
Rocklin, CA. 95765
Telephone (916) 375-1833
Fax (916) 375-1848

www.wmlyles.com
An Equal Opportunity Employer

basis, but as ratepayers and members of the community, our goals will be uniquely and uniformly aligned with the City's for the ERP. This alignment will result in a "project first" mentality wherein collaboration and cooperation towards achieving the project goals will be given the highest priority, resulting in the greatest value for the City and the community at large.

We look forward to the opportunity to share more details about our team and our approach to this project. In the meantime, please contact us should you have any questions regarding the content provided. **On behalf of our entire team, we would like to thank you for the opportunity to present our Proposal for this exciting project.**

W. M. LYLES CO.

By:_____
Joseph B. Lawrence
Assistant Vice President, Division Manager

Acknowledgement of Addenda:
Addendum No. 1 – June 4, 2019
Addendum No. 2 – June 18, 2019
Addendum No. 3 – June 27, 2019
Addendum No. 4 – July 3, 2019
Addendum No. 5 – July 10, 2019
Addendum No. 6 – July 12, 2019

IMPORTANT

06/04/18

TO: Proposers

FROM: Tracie R. Mueller, Senior Engineer, Environmental Utilities Dept. TRM

RE: RFP 08-053 Design-Assist and Construction of Pleasant Grove Wastewater Treatment Plant Energy Recovery Project

***************ADDENDUM ONE*************

Please note the following revision:

1. **REVISIONS TO VOLUME 1 of 4: REQUEST FOR BID PROPOSAL (RFBP)**

   Replace the Pre-Qualified Contractor table included on Page 1 with the following:

Pre-Qualified Contractor	Contact Telephone	Contact Email Address
Auburn Constructors LLC	916-924-0344	dbaily@auburnconstructors.com
Balfour Beatty Infrastructure, Inc.	707-427-8900	ewr@balfourbeattyus.com
Kiewit Infrastructure West Company	707-439-7300	ncestimating@kiewit.com
Flatiron West, Inc.	707-742-6053	lisimon@flatironcorp.com
Gateway Pacific Contractors, Inc.	916-665-4100	bids@gatewaypacific.com
W.M. Lyles Company	559-441-1900	ndobids@wmlylesco.com
Myers and Sons Construction, LLC	916-283-9950	estimating@myers-sons.com
C. Overaa & Co	510-234-0926	bids@overaa.com
Western Water Constructors, Inc.	707-540-9640	bids@westernwater.com

Please include a signed copy of this addendum with your proposal.

I acknowledge receipt of Addendum One

Name Joseph B. Lawrence

Signature

Company W. M. Lyles Co. Date July 22, 2019

IMPORTANT

06/18/18

TO: Proposers

FROM: Tracie R. Mueller, Senior Engineer, Environmental Utilities Dept.

RE: RFP 08-053 Design-Assist and Construction of Pleasant Grove Wastewater Treatment Plant Energy Recovery Project

****************ADDENDUM TWO*************

Please note the following revisions:

1. **REVISION TO VOLUME 1 of 4: REQUEST FOR BID PROPOSAL (RFBP)**

   REPLACE the Pre-Qualified Contractor table included on Page 1 with the following:

Pre-Qualified Contractor	Contact Telephone	Contact Email Address
Auburn Constructors LLC	916-924-0344	dbail @auburnconstructors.com
Balfour Beatty Infrastructure, Inc.	707-427-8900	ewr@balfourbeattyus.com
Kiewit Infrastructure West Company	707-439-7300	ncestimating@kiewit.com
Flatiron West, Inc.	707-742-6053	lisimon@flatironcorp.com
W.M. Lyles Company	559-441-1900	ndobids@wmlylesco.com
C. Overaa & Co	510-234-0926	bids@overaa.com
Western Water Constructors, Inc.	707-540-9640	bids@westernwater.com

2. **REVISION TO VOLUME 1 of 4: REQUEST FOR BID PROPOSAL (RFBP)**

   Within the Evaluation Category Table included in Section II Paragraph H, on Page 10 MOVE THE FOLLOWING ROW WITHIN THE TABLE FROM PART ONE TO PART TWO as these forms have cost information included on them:

Section IV.D - Bid Proposal Forms Submitted within 4 Calendar Days after Deadline to Receive Bid Proposals	Pass/Fail

3. **REVISION TO VOLUME 1 of 4: REQUEST FOR BID PROPOSAL (RFBP)**

Revise the title of Section III.A on page 21 as shown in track changes below:

A. ~~SWCRB~~ SWRCB CWSRF PROGRAM REQUIREMENTS

4. **REVISION TO VOLUME 1 of 4: REQUEST FOR BID PROPOSAL (RFBP)**

REVISE Section IV.A fourth paragraph on page 29 as shown in track changes below:

The requirements for each part of the Bid Proposal are further described below. The Bid Proposal will be considered complete only if all of the Bid Proposal section items and Bid Proposal Forms found herein and other required attachment and appendices are included in the submittal and in the order requested. Proposers are required to order the sections and include the required attachments included in Section IV.C in the order described within Part 1 of the sealed Bid Proposal (Technical Proposal). The Bid Proposal Forms described and included in Section IV.D shall be submitted within four (4) calendar days of the deadline to receive Bid Proposals and shall be considered as Part ~~1~~ 2 of the Bid Proposal (~~Technical~~ GMP, Cost Information and Bid Proposal Guarantee). Proposers are required to include the Section IV.E pages including Attachments A, B and C located at the end of this RFBP within Part 2 of the sealed Bid Proposal (GMP, Cost Information and Bid Proposal Guarantee).

5. **REVISION TO VOLUME 1 of 4: REQUEST FOR BID PROPOSAL (RFBP)**

ADD the following paragraph to Section III.A.8 on page 23 as shown in track changes below:

8. Disadvantaged Business Enterprises (40 CFR Part 33).

   a. The Contractor is required to seek and encouraged to utilize Disadvantage Business Enterprise (DBE) businesses and to comply with related requirements included in Appendix B, GUIDELINES FOR CLEAN WATER STATE REVOLVING FUND PROGRAM DBE REQUIREMENTS.

   b. The Contractor shall comply with the requirements of USEPA's Program for Utilization of Small, Minority and Women's Business Enterprises. The DBE rule can be accessed at www.epa.gov/osbp.

   c. The Contractor shall comply with 40 CFR Section 33.301, and submit and retain and submit all records documenting compliance with the six good faith efforts.

   ~~c.~~ d. The Contractor shall create and maintain a Bidders List per the ADMINSTRATION REQUIREMENT section of APPENDIX B that lists all firms that bid or quote on the project including both DBEs and non-DBE business submit to the City within three calendar days of the Notice of Intent to Award. Refer to APPENDIX B for details related to the Bidders List.

   ~~d.~~ e. The Contractor shall provide the City the DBE utilization report (Form DBE UR-334 included in Appendix B) each year no later than October 1st.

   ~~e.~~ f. Refer to Appendix B for additional information on DBE Requirements, Section IV.C, BID PROPOSAL FORM ATTACHMENTS TO BE INCLUDED IN SEALED ENVELOPE ONE, and Section IV.D, BID PROPOSAL FORMS AND INFORMATION TO BE SUBMITTED WITHIN FOUR (4) CALENDAR DAYS AFTER DEADLINE TO RECEIVE PROPOSALS.

6. REVISIONS TO VOLUME 1 of 4: REQUEST FOR BID PROPOSAL (RFBP)

ADD the following text as Section III.B.3 to the bottom of page 27:

3. Budget Forms Requirements

a. The Contractor and any subcontractor which will performing more than $100,000 Work included in the City's CEC funding shall complete, update and submit the CEC Budget Forms as required throughout the duration of the Project (The CEC Budget Forms template is provided as Supplementary Information to the Agreement).

b. The Work requiring Budget Forms include any Work or supply of materials related to the Biogas upgrading, the CNG system including the gas compression system, heater, dryer, control panels, and the related electrical power distribution and motor control systems (collectively referred to as CEC Work).

c. As applicable, the Contractor and any applicable subcontractors should follow the worksheet instructions that are listed on both the Instructions tab and the individual form tabs in CEC's Budget Form Excel document. These Contractor and subcontractors shall fill out the Direct Labor tab with their maximum estimate for labor over the full construction period. When filling out the Direct Labor tab, titles and labor rates are much more important than names. Equipment provided for the CEC Work shall be included as equipment costs on the Equipment tab. Labor provided for the CEC Work shall be included on the Direct Labor tab.

d. The Budget Forms shall be complete and submitted to the City within 14 days of the Contract Award, and updated as requested by the City to meet CEC requirements.

7. REVISIONS TO VOLUME 1 of 4: REQUEST FOR BID PROPOSAL (RFBP)

Replace the existing text on page 73 under Section IV.E.1.a with the following:

"There are not any Mandatory City Required Allowances for this Project."

8. REVISIONS TO VOLUME 1 of 4: REQUEST FOR BID PROPOSAL (RFBP)

On page 79 within Section IV.E.4 CONTRACTOR'S SELF PERFORMANCE, REPLACE within the first sentence "thirty-five percent" with "thirty percent".

Note that replacement pages for Section IV.E will be provided in Addendum 3 as these pages have to be submitted within the Part 2 Sealed Bid Proposal.

9. REVISION TO VOLUME 2 of 4: AGREEMENT

Within ARTICLE 1 – DEFINTIONS on page 4, ADD the following bullet to the definition of "Contract Documents" as shown in the track changes below:

- Request for Bid Proposal (including appendices);
- Agreement (including exhibits A-L attached thereto);
- General Requirements (Division 1);
- Technical Specifications (Divisions 2 through 46);
- Appendices included with Technical Specifications;
- Contract Drawings, prepared by Engineer;
- Addenda issued during the RFBP period; and
- Permits from other agencies specifically required for the performance of the Work as may be required by law.
- City of Roseville's most current version (and Amendments to the current version) of Construction Standards and Design Standards
- Other Referenced Standard Specifications;
- Other Referenced Standard Plans

10. REVISION TO VOLUME 2 of 4: AGREEMENT

Within ARTICLE 1 – DEFINTIONS on page 9, EDIT the Exhibit reference within the definition of "Liquidated Damages" as shown in the track changes below:

Liquidated Damages. The amount of dollars assessed for each and every calendar day required to complete the Agreement in excess of the Contract Time. See Exhibit ~~D~~E, COMPLETION TIMES AND LIQUIDATED DAMAGES.

11. REVISION TO VOLUME 2 of 4: AGREEMENT

Within ARTICLE 4 – CONTRACTOR'S REPRESENATIONS on page 15, ADD the following bullet to the end of the list of Supplementary Information included in paragraph 4.2:

- California Energy Commission Budget Forms Template

12. REVISION TO VOLUME 2 of 4: AGREEMENT

Within ARTICLE 7 – CONTRACTOR on page 23, DELETE paragraph 7.5.4.1 related to Skilled and Trained Workforce Reporting in its entirety.

13. REVISION TO VOLUME 2 of 4: AGREEMENT

Within ARTICLE 12 – PAYMENT AND COMPLETION, paragraph 12.9.K on page 53, EDIT the text as shown in track changes below:

K. Provisions of law that enable or require the City to withhold such payments in whole or in part, including, but not limited to California Public Contract Code ~~section 2602 regarding skilled and trained workforce reporting~~.

14. REVISION TO VOLUME 2 of 4: AGREEMENT

Within ARTICLE 13 – INSURANCE AND INDEMNIFICATION, paragraph 13.1.1.G on page 59, EDIT the text as shown in track changes below:

F. Umbrella Policy – The Contractor may use an umbrella or excess policy to meet the limits requirement of Article ~~13.1.1.b(1)~~13.1.1.B. and subcontractors may use an umbrella or excess policy to meet the limit of requirements of Article 13.1.1.C. However, any such umbrella/excess policy must be approved by the City and maintain an A.M. Best Rating of no less than A:VII.

15. REVISIONS TO VOLUME 3 of 4: SPECIFICATIONS, Section 01 52 00

Remove Specification Section 01 52 00, CONSTRUCTION FACILITIES in its entirety from Volume 3 and remove the line for Section 01 52 00 from the Table of Contents (Section 00 00 01).

16. REVISION TO VOLUME 4 of 4: DRAWINGS, Sheet 00-C-005

Add Note 5 to STANDARD DETAIL C0013 PRECAST UTILITY TRENCH:

"THE CONCRETE COVER SHALL BE RATED FOR AASHTO H-20 LOADING."

17. REVISION TO VOLUME 4 of 4: DRAWINGS, Sheet 00-C-110

Add Key Note 1 to sheet cell D1. Add the following corresponding text for Key Note 1 in sheet cell C8:

"THE FINISH SURFACE OF THE AREA BETWEEN THE BIOGAS UPGRADING SYSTEM AND THE ENERGY RECOVERY BUILDING SHALL BE ASPHALT PAVEMENT PER DETAIL C0009."

Add Key Note 2 to sheet cell C1. Add the following corresponding text for Key Note 2 in sheet cell C8:

"THE AREA SURROUNDING THE CNG VEHICLE FUELING SLAB AND BOUNDED BY POINTS 411, 422, 423, AND 424 SHALL BE A 6" THICK CONCRETE SLAB REINFORCED WITH #6 REBAR AT 12", EW. THE

CONTRACTOR SHALL PROVIDE EXPANSION JOINTS BETWEEN THIS SLAB AND THE THICKER, ADJACENT CNG VEHICLE FUELING SLAB."

18. EXHIBIT 1 - PRE-PROPOSAL MEETING AND SITE WALK SIGN-IN SHEETS AND PRESENTATION SLIDES

The Pre-Proposal Meeting and Site Walk sign-in sheets and presentation slides are included as Exhibit 1.

19. PRE-PROPOSAL MEETING AND SITE WALK STATEMENTS AND RESPONSES TO QUESTIONS

General statements made by the City and questions from the Pre-Proposal Meeting and Site Walk with responses are included below:

Question 1: Do the grant agencies require two startups including one on natural gas and another on renewable gas?

Reply: For the Placer County Air Pollution Control District, the focus of the grant is on transferring the City's solid waste collections fleet from diesel to CNG, regardless of whether the CNG is derived from renewable sources or not. Pipeline natural gas operation satisfies the grant startup milestone. Renewable fuel startup is not applicable.

For the CWSRF funding's Green Project Reserve, the ERP project is getting a grant as it is considered a green energy project for the micro-turbine cogeneration system. The microturbines will not operate on 100% natural gas – only digester gas or a blend of tail gas and natural gas. Both operating scenarios are "renewable", and natural gas startup is not applicable.

For the CEC Renewable Fuels Infrastructure grant, the focus is on alternative fuels going into the digester and then upgrading to digester gas to renewable CNG. CEC allows the gases to be blended, but it requires that renewables be put into the system. The project milestones are based starting up first on natural gas (for City's fueling operation), and then on digester gas (rCNG) to satisfy the CEC grant.

Question 2: Is there a skilled and trained work force requirement?

Reply: Please refer to Section 7.5.4 of the Agreement.

Please include a signed copy of this addendum with your proposal.

I acknowledge receipt of Addendum Two

Name Joseph B. Lawrence, Asst. Vice President

Signature

Company W. M. Lyles Co. Date July 22, 2019

IMPORTANT

06/27/18

TO: **Proposers**

FROM: **Tracie R. Mueller, Senior Engineer, Environmental Utilities Dept.** TRM

RE: RFP 08-053 Design-Assist and Construction of Pleasant Grove Wastewater Treatment Plant Energy Recovery Project

***************ADDENDUM THREE*************

Please note the following revisions:

1. **REVISION TO VOLUME 1 of 4: REQUEST FOR BID PROPOSAL (RFBP)**

   Within the Pre-Qualified Contractors Table on page 1, REVISE Auburn Constructors LLC contact email address as shown below:

Pre-Qualified Contractor	Contact Telephone	Contact Email Address
Auburn Constructors LLC	916-924-0344	dbailey@auburnconstructors.com
Balfour Beatty Infrastructure, Inc.	707-427-8900	ewr@balfourbeattyus.com
Kiewit Infrastructure West Company	707-439-7300	ncestimating@kiewit.com
Flatiron West, Inc.	707-742-6053	lisimon@flatironcorp.com
W.M. Lyles Company	559-441-1900	ndobids@wmlylesco.com
C. Overaa & Co	510-234-0926	bids@overaa.com
Western Water Constructors, Inc.	707-540-9640	bids@westernwater.com

2. **REVISION TO VOLUME 1 of 4: REQUEST FOR BID PROPOSAL (RFBP)**

   REPLACE the Evaluation Category Part Two scoring formulas in Section II.H on pages 10 and 11 with the formulas shown below:

   The Part Two scoring will be based on the following formulas:

   - Total Proposed GMP Score =
     - Lowest GMP = 40 Points
     - GMP within 2% of Lowest GMP = 40 Points
     - GMP more than 2% and less than or equal to 4% of Lowest GMP = 30 points
     - GMP more than 4% and less than or equal to 6% of Lowest GMP = 20 points
     - GMP more than 6% and less than or equal to 8% of Lowest GMP = 10 points
     - GMP greater than 8% of Lowest GMP = 0 Points

- Total On-Site Management & Administration Positions Hourly Rate Score = Maximum Points x Lowest Average Hourly Rate / Proposer's Average Hourly Rate
- Proposed Total Fee Mark-Up for General Overhead & Profit Score = Maximum Points x Lowest Fee / Proposer's Fee
- Proposed Shared Savings = Maximum Points x Proposer's % to Owner / Highest % to Owner
- Self-Performance of Work Score = Maximum Points x Proposer's Self-Performance / Highest Self-Performance

3. REVISION TO VOLUME 1 of 4: REQUEST FOR BID PROPOSAL (RFBP)

REVISE Section II.H on page 11 within the first paragraph after the equations as shown below:

If City determines that a Proposer cannot be selected based solely on the Bid Proposals submitted, the top ranked Proposers submitting the most highly rated ~~technical~~ bid proposals may be invited for interviews with the selection committee. The Proposer's proposed Project Manager must be present at the interview; up to three others may attend at the discretion of the Proposer. After this process, the proposers will be ranked and notified. City staff will then enter into final negotiations with the highest ranked proposer. Following successful negotiations, a recommendation will be made to City Council to award the Agreement. In the event that negotiations are not successful, the City reserves the right to terminate negotiations and enter into negotiations with the next highest ranked Proposer.

4. REVISION TO VOLUME 1 of 4: REQUEST FOR BID PROPOSAL (RFBP)

REVISE the second paragraph of Section II.O, BID PROPOSAL SECURITY on page 13 as shown in track changes below:

The Bid Proposal guarantees of the ~~three~~ two highest ranked Proposers will be retained until the Agreement is signed, evidence of insurance provided, and satisfactory bonds furnished by one of the ~~two~~three highest ranked Proposers or other disposition made thereof. The Bid Proposal guarantees of all Proposers except the ~~two~~three highest ranked Bid Proposals will be returned within ~~three~~4 months after the Bid Proposals are due. If all Bid Proposals are rejected and no award is made, all Bid Proposal guarantees will be returned within ten (10) calendar days of the decision by the City not to award the Project.

5. REVISION TO VOLUME 1 of 4: REQUEST FOR BID PROPOSAL (RFBP)

At the end of Section III.A.1 on page 21 ADD subparagraphs "a." and "b." as shown below:

a. The Contractor shall comply with all record keeping and reporting requirements under the Clean Water Act, including any reports required

by a Federal agency or the Finance Authority such as performance indicators of program deliverables, information on costs, and project progress. As part of this requirement, the successful Contractor will be required to provide certifications and documentation for AIS compliance. A sample AIS Compliance Certification form is provided in Appendix D. AIS Compliance Certification forms shall be collected from suppliers, fabricators manufacturers and processors to certify that each step in the process was domestically performed, and included in product submittals to the City. AIS Compliance Certification forms and other related AIS documentation such as a De Minimis Waivers (See Appendix C), receipts and/or invoices shall be maintained by the Contractor on the Project Site and shall be shared with City, SWRCB and EPA staff if requested during an audit. Additional documentation may be needed from the Contractor if the Compliance Certification forms and other documents are lacking important information.

b. By submitting a sealed bid proposal, the Proposer acknowledges to and for the benefit of the City and the State of California that it understands the goods and services for this Project are likely being funded with monies made available by the Clean Water State Revolving Fund that have statutory requirements commonly known as "American Iron and Steel;" that requires all of the iron and steel products to be used in the Project to be produced in the United States ("AIS Requirement") including iron and steel products provided by the Contactor pursuant to this Agreement. The Proposer hereby represents and warrants to and for the benefit of the City and the State that (a) the Contractor has reviewed and understands the AIS Requirement, (b) all of the iron and steel products used in the Project will be and/or have been produced in the United States in a manner that complies with the AIS Requirement, unless a waiver of the requirement is approved, and (c) the Contractor will provide any further verified information, certification or assurance of compliance with this paragraph, or information necessary to support a waiver of the American Iron and Steel Requirement, as may be requested by the City or the State. Notwithstanding any other provision of the Project Agreement, any failure to comply with this paragraph by the Contractor shall permit the Purchaser or State to recover as damages against the Contractor any loss, expense, or cost (including without limitation attorney's fees) incurred by the City or State resulting from any such failure (including without limitation any impairment or loss of funding, whether in whole or in part, from the State or any damages owed to the State by the Purchaser).

6. REVISION TO VOLUME 1 of 4: REQUEST FOR BID PROPOSAL (RFBP)

REPLACE Section IV.E pages 73 through 82 with Addendum 2 pages 73 through 82 included in Exhibit 1 to this addendum. Changes to these pages are shown in track changes and include the Addendum 2 changes that were made to these pages.

7. REVISION TO VOLUME 1 of 4: REQUEST FOR BID PROPOSAL (RFBP)

Add the AIS Compliance Certification document included in Exhibit 2 of this addendum as Appendix D of the RFBP and add "D. AIS Compliance Certification" to the Volume 1 – Request for Bid proposal Table of Contents under Appendices on page ii.

8. REVISION TO VOLUME 2 of 4: AGREEMENT

Within ARTICLE 13 – INSURANCE AND INDEMNIFICATION, EDIT paragraph 13.1.1.C on page 58 and add subparagraph "1" as shown in track changes below:

C. Minimum Amount of Coverage for all Listed Subcontractors included in Exhibit E - The bodily injury, personal injury and property damage liability of the Commercial General Liability insurance shall provide coverage in the following limits of liability: $5,000,000 on account of any one occurrence for bodily injury and property damage, $5,000,000 personal and advertising injury limit with an annual general aggregate limit of not less than $10,000,000, and $5,000,000 products and completed operations aggregate, combined single limit. The Automobile Liability insurance policy shall provide minimum limits of $5,000,000 per accident as a combined single limit arising out of the ownership, maintenance, or use of any owned or non-owned vehicles. These minimum amounts of insurance coverage do not preclude the Contractor from requiring higher limits or additional insurance coverage as it deems necessary.

1. Minimum Amount of Coverage for Subcontractors NOT included in Exhibit E - The bodily injury, personal injury and property damage liability of the Commercial General Liability insurance shall provide coverage in the following limits of liability: $2,000,000 on account of any one occurrence for bodily injury and property damage, $5,000,000 personal and advertising injury limit with an annual general aggregate limit of not less than $10,000,000, and $5,000,000 products and completed operations aggregate, combined single limit. The Automobile Liability insurance policy shall provide minimum limits of $5,000,000 per accident as a combined single limit arising out of the ownership, maintenance, or use of any owned or non-owned vehicles. These minimum amounts of insurance coverage do not preclude the Contractor from requiring higher limits or additional insurance coverage as it deems necessary.

9. REVISION TO VOLUME 2 of 4: AGREEMENT

Within ARTICLE 13 – INSURANCE AND INDEMNIFICATION, paragraph 13.1.4.E on page 61, EDIT the text as shown in track changes below:

E. All Other Perils - ~~$25,000~~ $100,000

10. REVISION TO VOLUME 2 of 4: AGREEMENT

REPLACE Exhibit C to the Agreement with the revised Exhibit C included in Exhibit 3 of this addendum. The revisions are shown in track changes.

11. REVISIONS TO VOLUME 3 of 4: Specifications, Section 09 90 00

REPLACE all instances of "Hi Solids Polyurethane 100" with "Hi Solids Polyurethane 250" within Specification Section 09 90 00 PAINTING AND COATING.

12. REVISIONS TO VOLUME 3 of 4: Specifications, Section 33 05 16

ADD Specification Section 33 05 16 PRECAST CONCRETE UTILITY STRUCTURES included in Exhibit 4 of this addendum to Volume 3, SPECIFICATIONS. In addition, ADD a line for Section 33 05 16 PRECAST CONCRETE UTILITY STRUCTURES under the DIVISION 33 header in the Table of Contents (Section 00 00 01).

13. REVISIONS TO VOLUME 3 of 4: Specifications, Section 40 05 02.43

ADD "Sanitary Sewer Force Main" and its corresponding abbreviation, "SSFM," to the Process Service and Process Service Identifier Table at the beginning of Section 40 05 02.43 PRESSURIZED WASTEWATER AND DRAINAGE.

14. REVISIONS TO VOLUME 3 of 4: Specifications, Section 40 05 02.89

ADD "Drain" and its corresponding abbreviation, "D," to the Process Service and Process Service Identifier Table at the beginning of Section 40 05 02.89 BUILDING MECHANICAL DRAINAGE.

15. REVISIONS TO VOLUME 3 of 4: Specifications, Section 40 76 00

Within Section 40 76 00 PROCESS GAS ANALYTICAL MEASUREMENT REVISE the Instrument Specification Sheet for MHS in Section 3.03 on page 9 as follows:

Power Supply: ~~120 volts AC~~ **24 volts DC**, 60 hertz nominal

Product Requirements: Detector shall ~~be lead acetate tape type with rate of reaction sensing system to provide to two parts per billion sensitivity~~ **electrochemical cell sensor type with a monitoring range of 0 – 50 ppm.** A field adjustable alarm relay (SPDT) and a 4-20 MA transmission signal proportional to scheduled range shall be provided. Unit shall be provided in a ~~NEMA 12~~ **NEMA 4X** enclosure ~~and with a 1 year supply of lead acetate tape and 5 percent acetic acid~~. Detector shall be ~~Houston Atlas Model 722R~~ **MSA Model TS4000H, Drager Polytron 8100 EC**, or equal.

16. REVISIONS TO VOLUME 3 of 4: Specifications, Section 43 32 77

Within Specification Section 43 32 77 BIOGAS UPGRADING SYSTEM make the following changes:

In Section 2.02.A.1 (HYDROGEN SULFIDE REMOVAL SYSTEM Table) on page 11, REMOVE the bottom row of the table to delete the "Base" component and corresponding "Galvanized steel" material.

In Section 2.02.A.7 (GAS-TO-GAS HEAT EXCHANGER AND GAS-TO-GLYCOL HEAT EXCHANGER 2 Table) on page 12, REMOVE the bottom row of the table to delete the "Base" component and corresponding "Galvanized steel" material.

In Section 2.02.A.8 (SILOXANE REMOVAL SYSTEM Table) on page 12, REVISE the material for the "Base" component" as shown below:

~~Galvanized Steel~~ **Powder-coated steel**

In Section 2.02.A.10 (TAIL GAS COMPRESSORS Table) on page 13, REMOVE the bottom row of the table to delete the "Base" component and corresponding "Galvanized steel" material.

On page 14 REVISE the MIXED GAS BUFFER VESSEL Table to be Section 2.02.A.15 rather than 2.02.A.2, and REMOVE the bottom row of the table to delete the "Base" component and corresponding "Galvanized steel" material.

REVISE Section 2.07.A.6.a on page 22 (Siloxane Removal System – Features) as follows:

a. Top manway, each vessel:
    1) Type: ~~Flanged~~ **Pull-through**
    2) Size, inches, minimum: elliptical 11 x 15, minimum

In Section 2.04.H.3 on page 17, REVISE the text as follows:

Common steel base shall be ~~hot-dip galvanized~~ **powder-coated**.

In Section 2.11.G.3 on page 28, REVISE the text as follows:

Common steel base shall be ~~hot-dip galvanized~~ **powder-coated**.

17. REVISION TO VOLUME 4 of 4: Drawings, Sheet 00-C-112

On Drawing Sheet 00-C-112 make the following revisions:

REVISE the 6" SSFM to be scaled back (gray) north of N 48451.23

ADD a coupling symbol on the 6" SSFM at the connection point (N 48451.23) in Cell B7.

ADD a Key Note 2 symbol pointing to the 6" SSFM coupling symbol at the connection point.

ADD the following as Key Note 2:
"TIE-IN LOCATION AND DEPTH OF THE 6" SSFM CONNECTION SHALL BE COORDINATIONED BETWEEN THE ENERGY RECOVERY PROJECT CONTRACTOR AND EXPANSION PROJECT CONTRACTOR."

18. REVISION TO VOLUME 4 of 4: Drawings, Sheet 00-C-401

On Drawing Sheet 00-C-401, REVISE the callout on the left side of the 16" DG Profile (Cell C3) as follows:

CONNECT TO BIOGAS UPGRADING FACILITY, SEE DWG ~~88-M-110~~ 88-M-111

19. REVISION TO VOLUME 4 of 4: Drawings, Sheet 00-C-402

On Drawing Sheet 00-C-402, REVISE the vertical scale for both profiles from 1" = 2' to 1" = 4'.

20. REVISION TO VOLUME 4 of 4: Drawings, Sheet 00-C-403

On Drawing Sheet 00-C-403, REVISE the callout on the right site of the 4" SS Drain from Biogas Upgrading Facility Profile (Cell D4) as follows:

CONNECT TO BIOGAS UPGRADING FACILITY PIPING, SEE DWG ~~88-M-110~~ 88-M-111

21. REVISION TO VOLUME 4 of 4: Drawings, Sheet 00-I-010

On Drawing Sheet 00-I-010, REVISE the Key Note attached to the Zero Client in Energy Recovery Building (Cell C4) from Key Note 2 to Key Note 3.

Please include a signed copy of this addendum with your proposal.

I acknowledge receipt of Addendum Three.

Name Joseph B. Lawrence, Asst. Vice President

Signature

Company W. M. Lyles Co. Date July 22, 2019

IMPORTANT

07/03/19

TO: Proposers

FROM: Tracie R. Mueller, Senior Engineer, Environmental Utilities Dept. TRM

RE: RFP 08-053 Design-Assist and Construction of Pleasant Grove Wastewater Treatment Plant Energy Recovery Project

***************ADDENDUM FOUR *************

Please note the following revisions:

1. **REVISION TO ADDENDUM 1, 2 AND 3**

   The dated at the top (date of issue) of Addendum 1, Addendum 2 and Addendum 3 shall be revised from 06/04/18 to 06/04/19, 06/18/18 to 06/18/19, and 06/27/18 to 06/27/19, respectively.

2. **REVISION TO VOLUME 1 of 4: REQUEST FOR BID PROPOSAL (RFBP)**

   REVISE the second paragraph on page 2 of the RFBP as shown below:

A total of one (1) hard bound original and seven (7) bound hard copies and an electronic (PDF) copy on a USB flash drive (total of 2 flash drives) for both parts of the Bid Proposal shall be submitted no later than 3:00 PM on ~~July 12, 2019~~ July 17, 2019 to:

City of Roseville
City Clerk's Office
311 Vernon Street
Roseville, CA 95678
Re: Design-Assist and Construction of the
Pleasant Grove Wastewater Treatment Plant Energy Recovery Project
Attention: Tracie Mueller, P.E., Environmental Utilities-Engineering

3. REVISION TO VOLUME 1 of 4: REQUEST FOR BID PROPOSAL (RFBP)

REVISE the Procurement Schedule within Section II.A on page 5 as shown below:

Procurement Schedule

Event	Date
Request for GMP Construction Bid Proposals sent to Invited Contractors	6/1/2019
Mandatory Pre-Proposal Meeting and Site Walk at 1:30 p.m.	6/12/2019
Last Day to Submit Questions	7/1/2019
City Responses to Written Questions	~~7/8/19~~ 7/10/19
Last Addendum Posting Date (if necessary)	~~7/8/19~~ 7/10/19
Bid Proposal Due Date at 3:00 p.m.	~~7/12/2019~~ 7/17/19
Possible Interviews with Proposers who submitted responsive Proposals	8/22/2019 – 8/29/2019
Anticipated Notification of Intent to Award	10/30/2019
Anticipated Award of Agreement by City Council	11/6/2019

4. REVISION TO VOLUME 2 of 4: AGREEMENT

Within ARTICLE 4 – CONTRACTOR'S REPRESENTATIONS, add the following item to the bulleted list in paragraph 4.2 SUPPLEMENTARY INFORMATION on page 15. Note that a copy of the Topographic Survey prepared by KSN, Inc. was uploaded to Public Purchase with this addendum.

- Pleasant Grove Wastewater Treatment Plant Topographic Survey, dated December 2016, prepared by KSN, Inc.

5. REVISION TO VOLUME 2 of 4: AGREEMENT & ADDENDUM 3, ITEM 8

This addendum change shall replace Addendum 3, Item 8. Within ARTICLE 13 – INSURANCE AND INDEMNIFICATION, EDIT paragraph 13.1.1.C on page 58 and add subparagraph "1" as shown in track changes below:

C. Minimum Amount of Coverage for all Listed Subcontractors included in Exhibit E - The bodily injury, personal injury and property damage liability of the Commercial General Liability insurance shall provide coverage in the following limits of liability: $5,000,000 on account of any one occurrence for bodily injury and property damage, $5,000,000 personal and advertising injury limit with an annual general aggregate limit of not less than $10,000,000, and $5,000,000 products and completed operations aggregate, combined single limit. The Automobile Liability insurance policy shall provide minimum limits of $5,000,000 per accident as a combined single limit arising out of the ownership, maintenance, or use of any owned or non-owned vehicles. These minimum amounts of insurance coverage do not preclude the Contractor from requiring higher limits or additional insurance coverage as it deems necessary.

1. Minimum Amount of Coverage for Subcontractors NOT included in Exhibit E - The bodily injury, personal injury and property damage liability of the Commercial General Liability insurance shall provide coverage in the following limits of liability: $2,000,000 on account of any one occurrence for bodily injury and property damage, $2,000,000 personal and advertising injury limit with an annual general aggregate limit of not less than $4,000,000, and $2,000,000 products and completed operations aggregate, combined single limit. The Automobile Liability insurance policy shall provide minimum limits of $5,000,000 per accident as a combined single limit arising out of the ownership, maintenance, or use of any owned or non-owned vehicles. These minimum amounts of insurance coverage do not preclude the Contractor from requiring higher limits or additional insurance coverage as it deems necessary.

6. REVISIONS TO VOLUME 3 of 4: Specifications

In Specifications Section 03 30 00 CAST-IN-PLACE CONCRETE, REVISE Section 1.05.B on page 4 as follows:

B. ~~Quality Control By Contractor:~~ NOT USED

~~1. Where required to demonstrate conformance with the specified requirements for cast in place concrete, the Contractor shall provide the services of an independent testing laboratory which complies with the requirements of ASTM E329. The testing laboratory shall sample and test concrete materials as specified in this section. Costs of testing laboratory services shall be borne by the Contractor.~~

7. REVISIONS TO VOLUME 3 of 4: Specifications, Exhibit 1 – Section 40 06 51 CV09 DETAILED VALVE SPECIFICATION SHEET

Within Section 40 06 51 DETAILED VALVE SPECIFICATION SHEETS, ADD new Detailed Valve Specification Sheet CV09 included in Exhibit 1 of this addendum to the end of Section 40 06 51.

8. REVISIONS TO VOLUME 3 of 4: Specifications

In Section 40 41 13.13 ELECTRICAL RESISTANCE HEAT TRACING make the following revisions:

- **REVISE Section 2.01.A.1 on page 1 as follows:**

  a. Tracer tape shall consis: of self-limiting, parallel circuit construction with a continuous inner core of conductive material between two copper bus wires. The resistance and heating capacity of the heating material shall vary in response to piping temperature changes. Tape shall withstand continuous exposure to 150 degree F temperature. Tracer tape shall operate using ~~480 volt AC~~ **208 volt AC**, 3 phase, 60 Hz power.

- **REVISE Section 2.02.C.1.a on page 2 as follows:**

  b. Rating: 22 amperes at ~~480V AC~~ **208V AC**

- **REVISE Section 2.02.D.1.a on page 2 as follows:**

  a. Rating: 22 amperes at ~~480V AC~~ **208V AC**

9. REVISIONS TO VOLUME 3 of 4: Specifications

In Section 43 10 01 COMPRESSED NATURAL GAS FUELING SYSTEM, REVISE Section 2.11.B (Fast-Fill Dispenser - Specifications) on page 25 as follows:

B. Specifications

1. Dispensers shall be capable of delivering fills of 3600 PSIG temperature compensated to 70°F, based on control logic housed in the dispenser~~, except one hose shall provide 3000 PSIG fills~~. Dispensers shall include one MicroMotion CNG-050 meter, and mechanical vehicle pressure gauge for each hose at exterior of cabinet and shall have a backlit data display. All CNG tubing and fittings shall be minimum 3/4" x .095", grade 316 SS. Vent tubing shall be 3/8" x .049", grade 316 SS. A means of preventing the escape of CNG from the fast-fill system in case the dispenser is knocked off of its base shall be provided, such as a vibration switch connected to the ESD circuit. Dispenser-control valves shall be ball or solenoid valves with flow performance equal to ¾" tubing. Dispensers shall be provided with excess flow switches, pressure gauges that read 1.2 times the system pressure, and ¼ turn manual shut-off valves.

10. REVISIONS TO VOLUME 3 of 4: Specifications

In Section 43 23 80.11 SUBMERSIBLE WASTEWATER PUMPS - CONSTANT SPEED, SUMP PUMPS OR SMALL LIFT STATIONS, made the following revisions:

- **REVISE Section 1.01.A (Scope) on page 1 as follows:**

1. This section specifies submersible pumps suitable for pumping unscreened wastewater at constant speed. Pumps furnished under this specification shall have discharge nozzles from 2 through 4 inches in diameter and motors less than 7.5 horsepower.
2. Pumps ~~will~~ **shall** be installed in a wet-pit configuration **and shall be provided as a complete, packaged wet well pump station. The package shall include pumps, motors, discharge fittings, guide bar and brackets, chain and cable hooks, wet well basin and access hatch, conductivity level probes, discharge valve vault with check valves and isolation valves, and control panel.**

~~3. Pump units shall be complete with motor, discharge fitting, guide bar and brackets, chain and cable hooks and other accessories as specified. Each submersible pump will have a sump access frame, hatch and fall protection system as provided under Section 09 31 20.~~ **Not used.**

4. Manufacturers proposing to furnish equipment specified under this section shall hold current certification under ISO 9001-2001. Application for certification under ISO 9001 shall not be deemed as an acceptable substitute for current certification. Documentation attesting to current certification shall be signed by an officer of the manufacturer's corporation and shall be notarized.

- **ADD the following lines to the bottom of the table in Section 1.01.C (Equipment List) on page 1:**

Item	Equipment Number
Sanitary Sewer High High Level Switch	PG05-LSHH-00051
Sanitary Sewer LEL Detector	PG05-AITx-00052

- **ADD the following line to the list in Section 1.02.A (RELATED SECTIONS) on page 2:**

5. Section 33 05 16 Precast Concrete Utility Structures

- **REVISE Section 1.05.A.7 on page 3 as follows:**

Drawings showing general dimensions and confirming the size of pumps, motors, drives and specified appurtenances; piping connections; construction details of equipment (including bearings and bearing isolators); **pre-cast concrete structures; access hatches;** wiring diagrams; and weight of equipment.

- **ADD the following sub-sections to Section 2.06 (COMPONENTS) on page 9:**

J. Wet Well Basin
   1. The wet well basin shall be constructed from reinforced, pre-cast concrete and shall house the duplex pump assembly and associated components. The wet well shall be provided with an access hatch. Approved manufacturers for the wet well basin include Jensen Precast or equal.
   2. The minimum basin inner diameter shall be 60 inches, and the minimum basin depth shall be 132 inches.
   3. The interior of the wet well basin shall be coated with System EA-3 in conformance with Section 09 90 00.
   4. Access Hatch
      a. A single-leaf galvanized steel access hatch cover and frame shall be provided and shall be set within the concrete basin roof.
      b. The access hatch dimensions shall be minimum 48 inches by 30 inches.
      c. The access hatch shall be rated for AASHTO H-20 loading.

K. Discharge Valve Vault
   1. A valve vault shall be provided to house the discharge check valve and isolation valve for each pump.
   2. The valve vault shall comply with the requirements in Section 33 05 16.
   3. A discharge check valve and isolation valve shall be provided as part of this package for each pump.
   4. Check valves and isolation valves shall comply with the requirements in Sections 40 05 02.43 and 40 06 51.

L. LEL Detector
   1. Provide an LEL detector in the headspace of the wet well basin. The LEL device shall meet the requirements of Sections 40 06 70 and 40 76 00. This detector shall be used to monitor hazardous gas conditions in the wet well.

11. REVISIONS TO VOLUME 3 of 4: Specifications

In Section 43 32 77 BIOGAS UPGRADING SYSTEM, make the following revisions:

- **REVISE Section 1.05.A.19 as follows:**

~~Foundation recommendations and anchor~~ **Anchor** bolt sizing ~~for the vessels, and skids~~ signed and sealed by a California registered structural P.E.

- **ADD the following requirement to Section 1.05.A on page 10:**

27. Copies of Contract Document Structural drawings with check marks indicating no exceptions to the foundation design.

- REVISE Section 2.16.B.6 on pages 30 and 40 as follows:

6. Accessories – **NOT USED**
   ~~a. Resistive strip heaters.~~
   ~~b. Air conditioner.~~

- REVISE Section 2.16.B.7.a as follows:

7. Programable Logic Controllers (PLCs):
   a. Acceptable manufacturer: ~~Allen-Bradley Compactlogix,~~ **Modicon M340 or M580**

12. REVISIONS TO VOLUME 3 of 4: Specifications

In Section 43 42 21 WELDED STEEL PRESSURE VESSEL, make the following revisions:

- ADD the following to Section 1.02.C on page 2:

a. Welds shall have radiographic testing in accordance with RT3 markings per ASME Section VIII, Division 1.

- Revise the header for Section 1.03 follows on page 2:

1.03 ~~WELDS SHALL HAVE RADIOGRAPHIC TESTING IN ACCORDANCE WITH RT3 MARKINGS PER ASME SECTION VIII, DIVISION 1.~~ SUBMITTALS

- Revise Section 1.03.A.15 as follows on page 3:

~~Foundation recommendations for the vessels signed stamped by an engineer registered in the State of California.~~ **Copies of Contract Document structural drawings with check marks indicating no exceptions to the foundation design.**

13. REVISIONS TO VOLUME 4 of 4: Drawings

On Sheet 00-C-112, REMOVE the portion of the 6" SSFM line that extends north of N 48451.23 (past the coupling that was added in Addendum 3). Delete the stationing points and callouts associated with the removed pipeline.

14. REVISIONS TO VOLUME 4 of 4: Drawings

On Sheet 00-C-114, REMOVE all portions of the 6" SSFM line and the associated comments, callouts, and stationing points shown on sheet 00-C-114 (see Cells D4, and E4).

15. REVISIONS TO VOLUME 4 of 4: Drawings

On Sheet 00-C-402, make the following changes:

- Remove the note and corresponding arrow that states "WET WELL PUMPING STATION SEE DWG _/__" (Cell E2).
- End the 6" SSFM PROFILE at the stationing point 2+37. At the end point, add a callout and note that states:
  "TIE-IN LOCATION AND DPETH OF THE 6" SSFM CONNECTION SHALL BE COORDINATED BETWEEN THE ENERGY RECOVERY PROJECT CONTRACTOR AND THE EXPANSION PROJECT CONTRACTOR."
- Remove the second 6" SSFM PROFILE that is shown on the bottom half of the page.

16. REVISIONS TO VOLUME 4 of 4: Drawings

On Sheet 00-E-202, SHOW transformer (87-XFMR-005) mounted below the Heat Trace Control Panel (87-LCPx-005) in the Electrical Room (see Cell B8).

17. REVISIONS TO VOLUME 4 of 4: Drawings

On Sheet 88-E-101, ADD a callout box and corresponding panel number callout "87-XFMR-005" adjacent to and below the callout for the Heat Trace Control Panel (87-LCPx-005). See Cell C6/7.

Please include a signed copy of this addendum with your proposal.

I acknowledge receipt of Addendum Four.

Name Joseph B. Lawrence, Asst. Vice President

Signature _____

Company W. M. Lyles Co. Date July 22, 2019

IMPORTANT

07/10/19

TO: Proposers

FROM: Tracie R. Mueller, Senior Engineer, Environmental Utilities Dept. TRM

RE: RFP 08-053 Design-Assist and Construction of Pleasant Grove Wastewater Treatment Plant Energy Recovery Project

********** ADDENDUM FIVE **********

Please note the following revisions:

1. **REVISION TO VOLUME 2 of 4: AGREEMENT & ADDENDUM 4, ITEM 5**

   This addendum is a revision to text added as part of Addendum 4, Item 5. Within ARTICLE 13 – INSURANCE AND INDEMNIFICATION, EDIT paragraph 13.1.1.C.1 on page 58 as shown in track changes below:

   1. Minimum Amount of Coverage for Subcontractors NOT included in Exhibit E - The bodily injury, personal injury and property damage liability of the Commercial General Liability insurance shall provide coverage in the following limits of liability: $2,000,000 on account of any one occurrence for bodily injury and property damage, $2,000,000 personal and advertising injury limit with an annual general aggregate limit of not less than $4,000,000, and $2,000,000 products and completed operations aggregate, combined single limit. The Automobile Liability insurance policy shall provide minimum limits of ~~$5,000,000~~ $1,000,000 per accident as a combined single limit arising out of the ownership, maintenance, or use of any owned or non-owned vehicles. These minimum amounts of insurance coverage do not preclude the Contractor from requiring higher limits or additional insurance coverage as it deems necessary.

2. **REVISION TO VOLUME 2 of 4: AGREEMENT**

   Within ARTICLE 13 – INSURANCE AND INDEMNIFICATION, EDIT paragraph 13.1.4.C on page 60 as shown in track changes below:

C. Included Coverage – The above builder's risk insurance shall include the following coverages:

1) Including, but not by way of limitation, for all damages of loss to the Work and to appurtenances, to materials and equipment to be incorporated into the Project while the same are in transit, stored on or off the Site, to construction plant and temporary structures.
2) Such insurance shall cover, but shall not be limited to, the perils of fire, lightning, windstorm, hail, explosion, riot, riot attending a strike, civil commotion, smoke damage, damage by aircraft or vehicles, vandalism and malicious mischief, theft, collapse, and flood.
3) The policy shall cover the costs of debris removal, including demolition as may be made reasonably necessary by the application of any law, ordinance, or regulation.
4) Start-up & testing, and machinery breakdown including electrical arching which are very important coverages and usually have to be requested.
~~5) Consequential losses due to delay in completing the Work. The builder's risk insurance limit for consequential losses is $1,000,000.~~
6)5) The policy shall provide the City the right to occupy the premises without termination of the policy until Final Completion of the Project.

3. REVISIONS TO VOLUME 4 of 4: Drawings

On Sheet 00-E-010, ADD the following text to the end of Key Note 1:

THE EXISTING 480V SWITCHGEAR IS A CUTLER-HAMMER MAGNUM DS (SHOP ORDER # 98Y0745, G.O. # MSF01793, ITEM # 007).

Please include a signed copy of this addendum with your proposal.

I acknowledge receipt of Addendum Five.

Name Joseph B. Lawrence, Asst. Vice President

Signature _____

Company W. M. Lyles Co. Date July 22, 2019

IMPORTANT

07/12/19

TO: Proposers

FROM: Tracie R. Mueller, Senior Engineer, Environmental Utilities Dept. TRM

RE: RFP 08-053 Design-Assist and Construction of Pleasant Grove Wastewater Treatment Plant Energy Recovery Project

***************ADDENDUM SIX *************

Please note the following revisions:

1. **REVISION TO VOLUME 1 of 4: REQUEST FOR BID PROPOSAL (RFBP), and ADDENDUM 4, ITEM 2**

   REVISE the second paragraph on page 2 of the RFBP as shown below:

   A total of one (1) hard bound original and seven (7) bound hard copies and an electronic (PDF) copy on a USB flash drive (total of 2 flash drives) for both parts of the Bid Proposal shall be submitted no later than 3:00 PM on ~~July 12, 2019~~ ~~July 17, 2019~~ July 22, 2019 to:

   City of Roseville
   City Clerk's Office
   311 Vernon Street
   Roseville, CA 95678
   Re: Design-Assist and Construction of the
   Pleasant Grove Wastewater Treatment Plant Energy Recovery Project
   Attention: Tracie Mueller, P.E., Environmental Utilities-Engineering

2. **REVISION TO VOLUME 1 of 4: REQUEST FOR BID PROPOSAL (RFBP), and ADDENDUM 4, ITEM 3**

   REVISE the Procurement Schedule within Section II.A on page 5 as shown below:

Procurement Schedule

Event	Date
Request for GMP Construction Bid Proposals sent to Invited Contractors	6/1/2019
Mandatory Pre-Proposal Meeting and Site Walk at 1:30 p.m.	6/12/2019
Last Day to Submit Questions	7/1/2019
City Responses to Written Questions	~~7/8/19~~ 7/10/19
Last Addendum Posting Date (if necessary)	~~7/8/19~~ ~~7/10/19~~ 7/15/19
Bid Proposal Due Date at 3:00 p.m.	~~7/12/2019~~ ~~7/17/19~~ 7/22/19
Possible Interviews with Proposers who submitted responsive Proposals	8/22/2019 – 8/29/2019
Anticipated Notification of Intent to Award	10/30/2019
Anticipated Award of Agreement by City Council	11/6/2019

3. REVISIONS TO VOLUME 3 of 4: SPECIFICTIONS, EXHIBIT 1

REPLACE the Instrument List (pages 1 of 11 through 11 of 11) located at the end of Section 40 06 70 SCHEDULES FOR INSTRUMENTATION OF PROCESS SYSTEMS, with the Instrument Index (pages 1 of 12 through 12 of 12) that is included in Exhibit 1 of this addendum.

4. REVISIONS TO VOLUME 4 of 4: DRAWINGS

On Sheet 00-C-007, REVISE the fence fabric height from 8'-0" to 6'-0" in STANDARD DETAILS C0025 AND C0027.

5. REVISION TO VOLUME 4 OF 4: DRAWINGS

On Sheet 00-I-010 NETWORK BLOCK DIAGRAM, REPLACE Key Note 4 with "VIDEO CAMERA SHALL BE SONY MODEL SNC-DH180 OR EQUIVALENT SONY, AXIS, OR VIVATEK."

Please include a signed copy of this addendum with your proposal.

I acknowledge receipt of Addendum Six.

Name Joseph B. Lawrence, Asst. Vice President

Signature _____

Company W. M. Lyles Co. Date July 22, 2019



SECTION 1

PROJECT UNDERSTANDING

PROJECT UNDERSTANDING

DELIVERING A SUCCESSFUL PROJECT

The City of Roseville (City) has issued a Request for Bid Proposals (RFBP) to prequalified contractors for Design-Assist and Construction of the Pleasant Grove Wastewater Treatment Plant Energy Recovery Project (ERP or Project). A Best-Value selection process is being utilized by the City to emphasize its desire for a true partner in this Project; one that will provide the best overall benefit to the community.

The selected contractor will become an integral part of the Project Team which will include both the City and Brown & Caldwell (B&C). B&C will serve a dual role as both designer and construction manager. Additional stakeholders include those who will be involved in the Pleasant Grove Wastewater Treatment Plant Expansion Project, which will be constructed concurrent with the ERP; and the citizens of the City of Roseville.

PROJECT OVERVIEW

The City of Roseville is undertaking the task of expanding the Pleasant Grove Wastewater Treatment Plant (PGWWTP) to restore its original treatment capacity of 12 million gallons per day (MGD). In recent years, higher than anticipated organic loading has caused the facility to experience a decrease in its effective treatment capacity from 12 MGD to 9.5 MGD. As part of the Expansion Project, two new anaerobic digesters will be constructed which, once in operation, will generate biogas. It is the City's desire to utilize this biogas in an economically beneficial and environmentally sustainable way. This desire has led to the development of the Energy Recovery Project which will provide for construction of the following major improvements:

- High-Strength Waste Receiving Station consisting of screening equipment and storage tanks for the offloading and management of fats, oils, and greases.
- Odor Control Facility utilizing both activated carbon and biotrickling filter technologies to prevent foul odors from reaching sensitive receptors.
- Biogas Upgrading System for removing moisture, hydrogen sulfide, ammonia, siloxanes, carbon dioxide, and other undesirable elements from biogas as necessary to produce a product suitable for beneficial use.
- Compressed Natural Gas (CNG) Fueling Station consisting of compressors, storage vessels, a fuel management system, and dispensers for the fueling of CNG powered vehicles.
- Cogeneration Facility utilizing four packaged microturbine generators and a thermal recovery system for converting biogas into usable electrical power and heat.
- Civil, structural, mechanical, and electrical infrastructure as needed to support the aforementioned facilities.

These improvements will benefit the City by:

- Producing Renewable Compressed Natural Gas (rCNG) for use by the City's fleet of garbage collection vehicles.
- Reducing greenhouse gas emissions through the replacement of diesel powered garbage trucks with rCNG powered trucks.
- Providing a potential fuel source for other City owned fleet vehicles in the future.
- Converting excess biogas into electricity and heat for plant usage.
- Collecting high strength waste (fats, oils, and grease) generated by local businesses and feeding it directly into the anaerobic digesters thereby boosting gas and electricity production.
- Diverting organic waste that would otherwise be discharged into the sewer system or disposed of at a landfill.

PROJECT STRUCTURE

The selected contractor will enter into a Guaranteed Maximum Price Contract for the construction of the Energy Recovery Project. Payment will be based on actual costs plus a fee for all craft labor, equipment, subcontracted work, and materials. Management and supervision duties will be paid for at an hourly rate.

Throughout the life of the Project, the selected contractor will participate in the Design-Assist process wherein all stakeholders will collaborate to adjust, modify, and finalize the design documents for the greater benefit of the Project. The contractor's participation in this process is inclusive of, but not limited to, the following:

- Constructability review of the Final Design Drawings and Specifications
- Value engineering to identify and quantify cost and time savings opportunities
- Risk review to identify and mitigate potential project disruptors
- Evaluation of alternatives generated by all project stakeholders
- Coordination with the PGWWTP Expansion Project
- Compliance with funding agency requirements including SRF, CEC, and Placer County APCD
- Development and refinement of the Project Schedule for use in evaluation of the items listed above

The primary goal of the Design-Assist process is to increase the value of the Project through positive stakeholder relationships, improved constructability, mitigation of project risks, and reduction of the cost and time needed for construction. Our team has participated in more than 100 projects of similar nature whereby the constructor has participated prior to final design. We have seen cost savings of up to 20% of project cost by using this early participation. For example, our early involvement in the design of the Stockton Regional Wastewater Control Facility Modifications Progressive Design-Build Project provided the opportunity to establish a hydraulic grade line through the plant that reduced pumping of the liquid stream from 6 times to 3 times.

LYLES' APPROACH

Our company was founded on the principle of open dialogue based on trust, honesty, and integrity. These values shape our approach to business with our Clients, the Community, our Subcontractors, and our Suppliers. We manage projects through a proactive approach to problem-solving and by tightly controlling construction costs. As a general rule; we always have a plan, know how much it's going to cost, and quickly recognize if we need to modify our course.

We recognize that a commitment must be made to building relationships between all project stakeholders so that effective communication can be utilized to overcome any community, engineering, or constructability challenges that may arise. Our team has thoroughly reviewed and visited the site to acquaint ourselves with the local conditions, nature, and location of where the work will be performed. We have taken into account and addressed the challenges that have the potential to derail the project. Our solutions are reflected in our baseline CPM schedule for the Project, which can be found in Appendix C.

The Right Experience

Lyles constructed a new thickening and dewatering building and odor control system to replace the existing sludge handling systems for the OCSD 100 MGD Plant 1. Working in an existing plant can be challenging, but working within one of the largest plants in the U.S. can be dangerous if not coordinated correctly. Lyles orchestrated dozens of tie-ins to existing facilities with plant staff to accommodate daily operations and project safety which included a very detailed LOCK OUT/TAG OUT program.

Monthly executive meetings and project team workshops were also held to discuss the challenges associated with the mechanical, electrical and plumbing conflicts that existed on the drawings. Lyles used a combination of AutoCAD and Navisworks to graphically represent each mechanical system and interference to determine a solution prior to installation. This effort at the front end of the project resulted in a very smooth field installation effort. This is the same level of collaboration the City of Roseville can expect when partnering with Lyles on the ERP.

KEY ELEMENTS OF OUR APPROACH

Attention to Safety – Lyles' focus on safety behavior and safety requirements has led to **ZERO OSHA violations** and over the last 5 years our worker's compensation claims, or Total Recordable Injury Rate (TRIR), has routinely fallen well below the industry average both statewide and on a national scale. Scott McElwain will serve as the Safety Director for the PGWWTP ERP. Scott will visit the site weekly and when any critical activities are planned to occur. He will work with our construction team to build safety into our means and methods while considering constructability requirements. Scott will also coordinate any safety special training that is needed on the project. As requested, please find additional information on our safety program in Section 7.

Attention to Quality– This is a key driver for controlling both schedule and cost. During pre-construction, proposed Quality Control Manager, Jon Shugarte will work with the City of Roseville and project team to identify critical quality elements, develop the Quality Management Plan (QMP), and lead sub/supplier quality implementation. During construction, Jon will implement and monitor the QMP, coordinate the inspection and testing program, provide QMP training to subcontractors and suppliers, and coordinate City quality assurance as required.

Community Interaction – Lyles will look for ways to strike the right balance; to effectively address local concerns while also managing expectations. Ensuring community involvement with the City of Roseville, keeping total neutrality, promoting transparency; and developing an effective monitoring, evaluation, and reporting system are some of the actions that Lyles has taken on previous projects. Many of our key personnel live and work within Roseville and the surrounding areas. As members of the community and as ratepayers, we are uniquely invested in ensuring the success of this project.

Experienced Senior Staff – Top-level, experienced, senior staff will be involved and committed to the success of the ERP. This will ensure the Project is never short of the required leadership and know-how that will be necessary to construct the most successful project possible. Proposed Project Manager, John Lunsford, will be the primary point-of-contact for the City. His responsibility will be to ensure the highest standards are maintained with respect to safety, budget, and schedule. Assistant Project Manager, Jon Shugarte, will make sure all activities in the field are properly coordinated, all materials and manpower are available when needed, and all work complies with the quality standards established for the Project.

Risk Management – A risk register will be created by the Lyles staff to identify and address high risk items right away. This risk register will be shared with the entire project team for input and buy -in. It is critical that all stakeholders are involved in the process and have input in the decision making.

Value Engineering

Value engineering sessions will be conducted to provide cost reduction and schedule suggestions for the City of Roseville consideration. At the OCSD Plant 1 project WML suggested over $8M of innovative cost saving ideas. The Owner took advantage of over $6M of the innovative cost savings. See detailed spreadsheet below.

LOCATION	DESCRIPTIO N	VE COST SUBMITTED	VE COST ACCEPTED
PVC Liner Under Structure	Elimination of PVC liner under structures	$ 300,000.00	$ 270,000.00
Xypex in Concrete	$400K assuming OCSD Keeps Xypex in Conc.	$ 400,000.00	
Exterior Waterproofing	Elimination of exterior waterproofing on concrete	$ 30,000.00	
Drilled Piers	Change to displacement piles	$ 2,900,000.00	$ 2,687,985.00
Accoustical Panels	In basement and subbasement ceiling	$ 200,000.00	
Paint on Basement Deck	In basement and subbasement ceiling	$ 46,000.00	$ 41,400.00
Polymer Station	Elimination of Polymer Station except for 1/3 used.	$ 500,000.00	$ 450,000.00
Screen Wall	Elimination of Piles and Precast Wall.	$ 740,000.00	$ 180,000.00
Braced Frame Structure	No cost savings	$ -	
Flow Meter Elimination	Elimination of Flowmeters and valves in basement	$ 80,000.00	
Progressive Cavity Pumps	Spec 11309 Changes to Moyno or Netzsch	$ 900,000.00	$ 773,100.00
Cake Pumps	Spec 11250 changes to Piston Pumps	$ 1,600,000.00	$ 1,574,874.00
Elimination of DAFT UF to Wetwell	Elimination of pipe, manhole and vault	$ 82,000.00	
Elimination of Subbasement	Raises subbasement to elevation 4.5	$ 400,000.00	$ 361,178.00
	tals	$ 8,178,000.00	$ 6,338,537.00

Planning and Sequencing – Our team will proactively manage the entire schedule, with a sharp focus on the critical path. Our goal is to maximize efficiency which will result in an overall lower project cost. Our project team, led by experienced CPM Scheduler, Tony Mueller have taken into account and addressed the challenges that have the potential to derail the ERP. Our solutions are reflected in our baseline CPM schedule for the Project, which as requested can be found in Appendix C.

Tight Project Controls and Accounting – We utilize industry leading cost controls and accounting systems on all of our projects. Our experience in doing this as a standard will ensure that timely, accurate, and transparent cost information is available in a format that all project stakeholders can utilize. See Section 7, for further details on how Lyles will provide the City with personalized access to its accounting system.

Self-Performance – Lyles plans to self-perform over 65% of all work on the ERP. This will benefit the City of Roseville, by reducing projects risks associated with schedule, quality, safety and cost. This will enable us to achieve the target project milestones defined in the RFP. Our ability to self-perform the majority of the scope will provide the City with a proven team that has worked together to deliver similar projects, job after job, and will perform at the highest level possible.

Engage a Team of Proven, Qualified Subcontractors – We select subcontractors that have the qualifications and proven track record to be part of our team. Accountability and ownership are key attributes that we look for.

Because of the critical nature of the electrical and instrumentation scopes of work, those have been assigned to Wade Johnson with San Joaquin Electric (SJE) and Tesco Controls, respectively. The ERP will benefit from our proven partnership and their contributions to both the design and construction of the ERP.

The Right Experience

Lyles' work on the $92M Design-Bid-Build of a 22 MGD Water Recycling Treatment Plant for the City of Visalia included an odor control system for the existing headworks; modification of the existing primary sedimentations basins, a new septage receiving station, a new pump station with fine screens, modifications to the existing aeration system, replacement of the existing secondary and tertiary treatment process with a new GE supplied membrane bioreactor (MBR) system, and an Ozonia supplied ultra-violet (UV) disinfection system.

Lyles worked in partnership with the City of Visalia to overcome project challenges, maintain maximum access, and complete start-up and commissioning services well within the scheduled project completion date. Lyles and the City of Visalia worked closely during construction to provide seamless mechanical operational transfers and process tie-ins so that there were no impacts to the plant or their customers.

ACHIEVING THE CITY'S GOALS

BUDGET

Careful attention has been paid to the details of the ERP and an accurate GMP price has been developed. Utilizing an accurate budget in combination with timely cost reporting will ensure that we identify budgetary opportunities or issues while there is still time to address them. We are proactive with our budget management, not reactive. We employ an open-book approach and provide reporting tools that will give the City complete confidence that budgetary goals are being met and surprises avoided.

SCHEDULE

A detailed CPM schedule has been developed for this Project (Appendix C) which highlights the importance we place on achieving the milestones outlined in the RFP. We have analyzed and compared the project budget against the schedule to further verify that we are in alignment. ***We have a proven history of maintaining project schedule on very difficult and time sensitive projects and, in fact, have never been assessed liquidated damages for exceeding a project deadline.***

STAKEHOLDER NEEDS

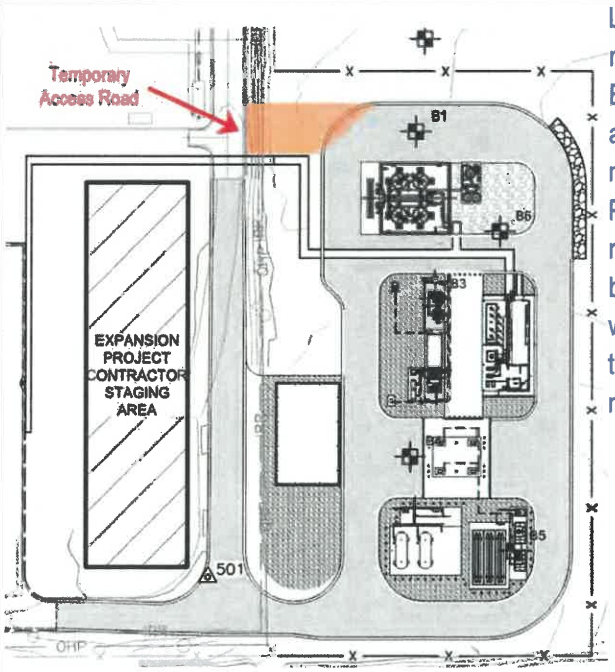
Along with maintaining the budget and schedule, the Project must serve the needs of all stakeholders; including the surrounding community. This is achieved by actively planning to minimize community concerns such as sound, traffic, dust, odors, and visual disturbances. At all times, it will be critical that the project site is maintained in a clean and organized fashion. In addition to the productivity and quality benefits, this will ensure that the City and the neighboring community experience a professionally managed project.

OVERCOMING CHALLENGES

Lyles is committed to identifying challenges and developing the most advantageous solutions for the City of Roseville from the very beginning of the project. To give some structure to a discussion of key challenges that we believe will require special consideration, we have developed the list below. Our strategies for mitigating these challenges have been provided as well.

Challenge 1: Startup, Commissioning, and Performance Testing of the Biogas Upgrading System (BUS) and the Cogeneration System	
Impact:	Section 01 12 16, Paragraph 4.02.G indicates that digester gas will be provided by the Expansion Project within 750 days of NTP. Substantial Completion of all work is required within 790 days of NTP. In order to achieve the Substantial Completion Milestone, commissioning and performance testing of the BUS and the Cogeneration System will have to be successfully completed within 40 calendar days. Based on the testing durations required in Sections 01 91 14 and 43 32 77, 40 calendar days may not be adequate. There is reasonable uncertainty regarding both the quantity and quality of biogas that will be generated by the new Digesters as they will introduce a biological process that does not currently exist at the PGWWTP. This uncertainty, coupled with the inherent complexity of the systems in question, makes it unlikely that the commissioning process will be fully completed within the 40 calendar days allowed. The potential for liquidated damages further complicates the issue.
Mitigation Measure:	It will be necessary to develop a comprehensive solution to ensure that expectations and challenges are well communicated and understood by all stakeholders. To that effort, Lyles will: • Participate early on in joint discussions with the City, the Engineer, and the BUS Supplier to identify potential barriers to success • Participate in the early development of a contingency plan that identifies possible solutions in the event that unforeseen circumstances occur • Prioritize development and submission of the BUS submittals and participate in submittal review meetings to achieve early release to fabrication • Require early and frequent communication between the BUS Supplier, San Joaquin Electric, and TESCO to ensure that all potential electrical and instrumentation items are well coordinated

Challenge 1 Continued...
Additional actions that the City might consider taking include: • Performing tests on the biogas produced at the Dry Creek Facility once the High Strength Waste Receiving Station is in steady-state operation to better characterize the likely raw gas conditions • Consider alternatives to the requirement to test the BUS system at maximum flowrates in the event that sufficient gas in unavailable • Consider an alternative milestone specific to the BUS and Cogeneration System that would allow for Substantial Completion to be attained prior to the completion of testing • Expedite construction of the expansion to allow for the delivery of biogas at an earlier date

Challenge 2: Site Logistics and Access	
Impact:	The ERP site is relatively small and will need to be accessed by numerous trades during construction. In addition, the Expansion Project Contractor will be occupying the available space just north of the ERP site which will increase traffic in the area. By design, access to the ERP site is limited to a single roadway at the northwest corner of the site. The congestion in this area will be further compounded once the CNG Fueling Station is being utilized by City vehicles. Congestion and traffic may lead to coordination issues, inefficiency, and lost production.
Mitigation Measure:	 Lyles will construct a temporary access roadway at the northeast corner of the ERP site to provide for two points of access and egress. Doing so will also reduce traffic near the Expansion Project Contractor's staging area. The road will consist of aggregate road base over imported fill material which will be removed and incorporated into the surrounding areas to be graded near the end of construction.



SECTION 2

APPROACH TO THE PROJECTS SCOPE OF WORK/SPECIAL PROJECT CONSIDERATIONS

APPROACH TO THE PROJECT'S SCOPE OF WORK / SPECIAL PROJECT CONSIDERATIONS

Our project approach began with developing an understanding of the project drivers, followed by identifying the greatest challenges and their potential solutions. We look forward to collaborating with the City of Roseville to combine these individual project elements into an overall scope of work and proposed plan to meet the City of Roseville's needs.

To outline our approach, we have broken the project into the following major components:

- Design-Assistance
- Pre-Planning & Site Logistics
- Site Preparation & Earthwork
- Underground Utilities
- Structural Concrete
- Electrical Building
- Site Concrete & Paving
- Electrical Panels & Controls
- Compressed Natural Gas Fueling Station
- High Strength Waste Receiving Station
- Cogeneration System
- Biogas Upgrading System
- Project Closeout

Our outlined approach is as follows:

TASK ONE: DESIGN-ASSISTANCE
TIMELINE: NTP THROUGH DAY 90 / DECEMBER 2019 THROUGH FEBRUARY 2020

Sub-task 1: Value Engineering

One of the benefits of the Design-Assist process is the intentional commitment of time to the development of value engineering ideas throughout the life of the project. In support of this process, we have already identified several potential opportunities which we believe will enhance the value and reduce the risks inherent in the ERP. These opportunities include revising the layout of some of the proposed equipment, leveraging existing plant assets to reduce life-cycle costs, and combining the ERP with the Expansion Project to take advantage of economies of scale. Please see Section 3 for a more detailed discussion.

Sub-task 2: Constructability Review

Lyles and its subcontractors are in a position to share the lessons-learned through the execution of hundreds of construction projects with the entire project team. This insight will be furnished to the benefit of the Project and will provide City

CITY OF ROSEVILLE CALIFORNIA + W.M. LYLES CO. CONTRACTOR Since 1945 *Progress Through Performance®*

A Committed and Integrated Team

Monthly Executive Meetings

We suggest holding monthly executive meetings where respective principals from the City of Roseville and Lyles can openly discuss the performance of their respective teams. This approach has worked well on other projects and has resulted in maximum collaboration, proactive problem solving of issues before they become project complications, organizational alignment, and "common goal" project execution.

stakeholders with an opportunity to evaluate construction methods and techniques that may not have been considered. Lyles also has real-time access to current material pricing and will be able to provide alternative options for aggregates, pipe materials, structural materials, and other commodities than can meet or exceed the project requirements at a lower overall cost. We expect this entire process to be collaborative, transparent, and focused on delivering added value to the ERP.

Sub-task 3: Contractor Furnished Design Elements

The Specifications require the Contractor to furnish a number of design elements which include, but are not limited to: piping supports, conduit supports, anchorage for electrical equipment, anchorage for process equipment, tanks, and storage vessels. Many of these elements have the potential to affect the final Construction Plans and Specifications. For example, preferential pipe routing identified during value engineering and constructability review would influence the number, size, and type of pipe supports required. Our goal will be to identify these elements early so that they are incorporated into the Plans and Specs at this stage, rather than having to update the drawings later through the submittal and record drawing processes. These actions will reduce the potential for construction errors and reduce the amount of effort required by the Engineer and the City.

History of Successful Partnering

The City of Roseville can trust that our Team will be proactive. With decades of experience working together on similar WWTP expansion and upgrade projects, the winning combination of W. M. Lyles Co., Wade Johnson and TESCO will provide the City with a collaborative, respectful, and trustworthy Design-Assist partner. A few of the projects we have collaborated on include:



City of Galt, Wastewater Treatment Plant Tertiary Filtration, UV Disinfection & Biosolids Improvements

CONTRACT VALUE: $11,828,000
% OF SELF-PERFORMANCE: 68 %
PROJECT RELEVANCE:
1. Numerous shut-downs & tie-ins to existing facilities
2. Included State Revolving Funds
3. Plant remained fully operational during construction
4. Biosolids Dewatering /Transfer Facilities



City of Davis, Wastewater Treatment Plant Secondary Treatment and Tertiary Improvements

CONTRACT VALUE: $72,202,131
% OF SELF-PERFORMANCE: 67 %
PROJECT RELEVANCE:
1. Numerous shut-downs & tie-ins to existing facilities
2. Included State Revolving Funds
3. Plant remained fully operational during construction



Hi-Desert Water District, Wastewater Reclamation Facility
CONTRACT VALUE: $30,003,509
% OF SELF-PERFORMANCE: 70 %
PROJECT RELEVANCE:
1. Numerous shut-downs & tie-ins to existing facilities
2. Included State Revolving Funds
3. Plant remained fully operational during construction



Water, Wastewater and Reuse Program, Tesoro Viejo Master Mutual Water Company
CONTRACT VALUE: $38,000,000
% OF SELF-PERFORMANCE: 69 %
PROJECT RELEVANCE:
1. Complex WWTP with extensive value engineering
2. Expansion

Task 1 Key Participants:

- Joe Lawrence – Project Sponsor – Value engineering, constructability review, and resource allocation
- John Lunsford – Sr. PM – Value engineering, constructability review, and subcontractor procurement
- Reece Berger – Pre-Plan Mgr. – Design- assist estimating support
- Pat Van Treeck – Pre-Plan Eng. – Design-assist estimating support
- Electrician – Value engineering and constructability review
- Integrator – Value engineering and constructability review

Task 1 Critical Components:

- Partnering and team building
- Implementation of value enhancing concepts and ideas
- Finalization of Construction Plans and Specifications

TASK 2: PRE-PLANNING & SITE LOGISTICS TIMELINE: DAY 45 THROUGH DAY 120 / JANUARY 2020 THROUGH MARCH 2020

Sub-task 1: Critical Path Management

Identification and management of the critical path is the first step in maintaining and expediting a project schedule (step two is managing risks and step three is managing near-critical activities). The critical path of the ERP flows through the early submittals, implementation of the SWPPP Plan, and into site preparation. It then continues through earthwork, the installation of underground utilities, and structural concrete. This is followed by construction of the electrical building, the installation of equipment, and finally, commissioning and testing of the facility.

Schedule risks exist that will need to be carefully monitored and mitigated throughout the life of the project. One such risk is the achievement of Milestone 4 – Roadway Connection. Based on the procurement schedule provided in the RFBP, we anticipate that a Notice to Proceed will be issued in December of 2019. Looking forward 420 days from December, the required completion date for Milestone 4 will occur in February of 2021. There are several challenges involved with paving during the winter months which means that the roadway work will need to be prioritized and performed in the fall in order to ensure that the quality of the paving remains high (See Task 3 for further discussion).

Sub-task 2: Procurement of Long Lead Items

Through coordination with our subcontractors and suppliers, we have identified all of the long-lead items and incorporated their procurement into the overall project schedule. Based on this effort, the CNG Fueling System, the Cogeneration System, and the Biogas Upgrading System submittals will need to be prioritized and expedited. To assist with the review and approval process, we will require our subcontractors and suppliers to participate in joint submittal review meetings which should include the City and the Engineer. The purpose of these meetings is to address any concerns and facilitate approvals to ensure that a release to fabrication can be provided upon completion of the first submittal review cycle. Mitigating the need for multiple review cycles will save the project both time and money.

Sub-task 3: Site Logistics

The site is not spacious and is congested. We have a well thought out site layout and staging plan which will be further developed and implemented. This will contribute to safe and efficient project performance. As discussed in Section 1, one of the actions we will take to improve logistics is to construct a temporary access road at the northeast corner of the site. Another action that we will take will be to carefully schedule "just-in-time" delivery of the major process equipment. By limiting the number of pieces that are onsite at any one time we will prevent double handling of the equipment and free up space for construction, as much of the process equipment is large, heavy, and will require a crane for installation.

Task 2 Key Participants:

- John Lunsford – PM – Overall project planning and coordination, and critical early submittal management
- Jon Shugarte – Asst. PM – QC plan development and SWPPP development
- Tony Mueller – Scheduler – CPM schedule
- development and refinement
- Reece Berger – Pre-Plan Mgr. – Civil and structural procurement
- Pat Van Treeck – Pre-Plan Eng. – Mechanical procurement
- Electrician – Electrical sequencing and schedule input

Task 2 Critical Components:

- Finalization of the CPM Schedule
- Procurement of major process equipment
- Development of an effective plan for site access, organization, and staging
- Partnering and team building
- Implementation of value enhancing concepts and ideas
- Finalization of Construction Plans and Specifications

TASK 3: SITE PREPARATION & EARTHWORK TIMELINE: DAY 120 THROUGH DAY 150 / APRIL 2020

Sub-task 1: Stormwater Management

The rainy season typically begins to wane near the end of March. Once fair weather is on the horizon, site preparation efforts will begin. The site is a little over three acres in size and, as such, will require coverage under the State Water Resources Control Board Construction General Permit. Development of a Stormwater Pollution Prevention Plan (SWPPP) will be performed by a Qualified SWPPP Developer and will occur during Task 2; implementation of the SWPPP will occur at the onset of Task 3.

Prior to disturbing the existing soils, we will furnish and install the Best Management Practices (BMPs) identified in the SWPPP. These BMPs will remain in place for the duration of construction and will be monitored to ensure effectiveness and compliance with the SWPPP. Upon completion of the project, the construction BMPs will be removed and any permanent BMPs identified in the Plans will be installed.

Sub-task 2: Fencing & Access

The ERP site is located outside of the PGWWTP's current fence line. In order to ensure continuous security and containment of the facility, we will install the new fencing which will enclose the ERP site prior to removal of the existing fencing. Once the new fencing is in place, the old fence will be demolished and removed from the site. With the existing fencing out of the way, we will proceed with constructing temporary access roads at both the northwest and northeast corners of the site, as proposed in Section 1- Overcoming Challenges, to provide for safe construction access and egress.

Sub-task 3: Earthwork and Subgrade Preparation

Earthwork efforts can begin in earnest once both security and access have been established. Based on the Plans, the site will require more cut than fill, resulting in a surplus of soil. It is assumed that the surplus soils generated by the ERP can be made available and incorporated into the Expansion Project as it will have a need for fill material at the new Primary Clarifier area.

Task 3 Key Participants:

- John Lunsford – PM – Overall project planning and coordination
- Jon Shugarte – Asst. PM – Underground utility preplanning and QC plan implementation
- Electrician – Underground utility coordination
- Fencing Sub – Site fencing installation

Task 3 Critical Components:

- Establishment of site perimeter and subgrade
- Implementation of SWPPP and QC Plans
- Continued preplanning for utility trench, underground piping, and electrical

TASK 4: UNDERGROUND UTILITIES
TIMELINE: DAY 130 THROUGH DAY 245 / APRIL 2020 THROUGH AUGUST 2020

Sub-task 1: Sanitary Sewer Pumping Station

The deepest element of the ERP is the new Sanitary Sewer Pumping Station. Therefore, excavation of the Pumping Station wetwell and installation of the precast concrete elements will take first priority in this Task.

Sub-task 2: Buried Piping and Underslab Electrical

There are numerous buried piping and electrical elements which are to be located beneath concrete slabs and/or asphalt paving. These elements include natural gas piping, digester gas piping, water piping, sewer piping, drain piping, and electrical conduit. Substantial effort will be spent coordinating all of the critical connection points associated with each of the major equipment packages to ensure that no rework is required after the concrete slabs have been placed.

Sub-task 3: Electrical Ductbanks

Power and control for the ERP originates in Electrical Building No. 1. The new electrical ductbanks that will be installed between these two facilities are currently designed to be routed around the east side of the HSW Receiving Area. Lyles recommends shifting the alignment eastward to a location just outside of the paved area but still within the fence, in order to better facilitate the construction and long term maintenance of the new ductbanks. This will reduce congestion near the HSW Receiving Area and keep the new utility vaults clear of any future surface drainage issues without increasing the quantity or cost of the ductbank. An additional benefit to this alternative alignment is that it will support Cost Reduction Opportunity No. 2, should the City decide to incorporate it into the Project (see Section 3 for details).

Sub-task 4: Precast Utility Trench

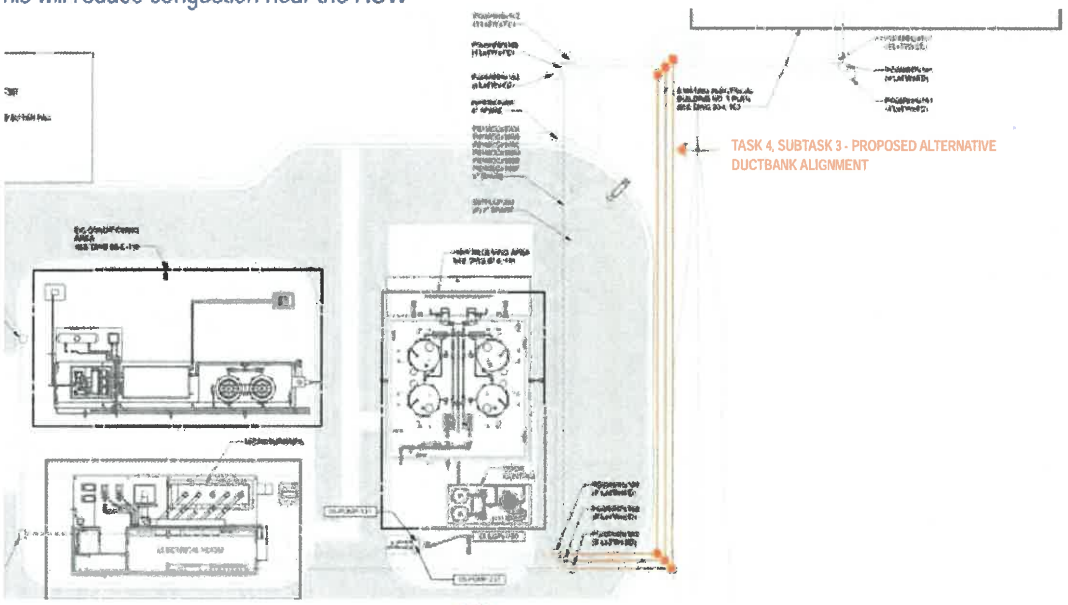
Installation of the Precast Utility Trench is on the critical path of Milestone 4 (Roadway Connection). We anticipate that the fabrication and delivery of the Precast Utility Trench will take between 12 and 14 weeks. In order to meet the installation schedule necessary to comply with Milestone 4, it will be imperative that the submittal for the Utility Trench gets furnished, reviewed, and approved near the beginning of Task 2. Lyles will prioritize this process and work with the City and the Engineer as needed to ensure that this timeframe is met.

Task 4 Key Participants:

- Pat Van Treeck – Pre-Plan Eng. – Mechanical procurement and support
- Electrician – Ductbank installation

Task 4 Critical Components:

- Fabrication and delivery of the Precast Utility Trench to support timely installation



TASK 4, SUBTASK 3 - PROPOSED ALTERNATIVE DUCTBANK ALIGNMENT

TASK 5: STRUCTURAL CONCRETE
TIMELINE: DAY 195 THROUGH DAY 255 / JUNE 2020 THROUGH AUGUST 2020

Sub-task 1: Electrical Building Foundation

Concrete construction will commence as soon as the underground and underslab utilities are complete. The foundation for the Electrical Building will be prioritized to allow subsequent construction of the Building to begin as soon as possible. This priority is based on weather, not the critical path. If the building is not constructed, closed in, and made weatherproof during the summer and fall of 2020 then it will have to be completed during the winter months as the following spring will be consumed by the installation of electrical and mechanical equipment. Working in the winter significantly increases the risk of cost impacts and scheduling issues as the building trade subcontractors become affected by weather delays.

Sub-task 2: CNG Fueling System Foundations

The second highest priority will be given to the CNG Fueling System Area. Work will begin at the gas compressor slab, followed by the high pressure and medium pressure storage tank slabs. The final slab to be placed in this area will be the driveway around the CNG Fueling Dispensers.

Sub-task 3: All Other Foundations

The balance of the concrete will be completed moving from west to east, beginning with the Biogas Upgrading System Area and finishing up at the High Strength Waste Receiving Area. Work closest to the Electrical Building will be completed first to reduce construction congestion in the area and maximize access for our Masonry subcontractor.

Task 5 Key Participants:

- John Lunsford – PM – Structural concrete planning and coordination
- Reece Berger – Pre-Plan Mgr. – Structural procurement and support
- Rebar Sub – Reinforcing steel installation

Task 5 Critical Components:

- Completion of the Electrical Building foundation to permit building construction to begin as early as possible
- Equipment anchorage coordination, layout, and installation

TASK 6: ELECTRICAL BUILDING
TIMELINE: DAY 255 THROUGH DAY 405 / AUGUST 2020 THROUGH JANUARY 2020

Sub-task 1: Structural Elements

The first order of business at the Electrical Building will be to construct the CMU walls. The CMU will be installed by our Masonry Subcontractor with the coordination and installation of door openings, window openings, and miscellaneous wall penetrations being performed by Lyles' craftspeople. Lyles will also be responsible for locating and installing all of the structural embeds necessary to support the roofing system.

Sub-task 2: Roofing

Completion of the roofing structure and installation of the single-ply membrane will not occur until late fall, based on the schedule. Lyles will install all of the structural roof columns, beams, and metal decking while the insulation and roofing membrane itself will be installed by a specialty subcontractor. This work will be expedited to ensure that there is adequate time to complete the work prior to the beginning of the rainy season. The weather forecast will be monitored and, if necessary, overtime will be utilized to achieve success.

Sub-task 3: Architectural Elements

Installation of the architectural elements can begin once the Building has been closed in and the roof is complete. These elements include the decorative metal cladding, doors, windows, and restroom finishes, among others. With the building dry, temporary climate controls can be provided as necessary to complete this work, including painting, during the winter months.

Task 6 Key Participants:

- John Lunsford – PM – Structural planning and coordination
- Reece Berger – Pre-Plan Mgr. – Structural procurement and support
- Masonry Sub – CMU installation
- Roofing Sub – Roofing membrane installation

Task 6 Critical Components:

- Completion of building roofing and weatherproofing elements prior to the rainy season

TASK 7: SITE CONCRETE & PAVING
TIMELINE: DAY 300 THROUGH DAY 360 / SEPTEMBER 2020 THROUGH NOVEMBER 2020

Sub-task 1: Subgrade Preparation

Similar to the Electrical Building, completion of the site concrete and paving is being planned to accommodate the potential for adverse weather, not the Contract Milestones. Although Milestone 4 requires the Roadway Connection to be complete within 420 days, this duration will expire at the end of January which is typically unsuitable for paving operations. Accordingly, our plan is to complete all of the site concrete and paving work by early November.

Once the CMU wall construction is complete at the Electrical Building, subgrade preparation and final grading around the perimeter of the Building will commence. Careful coordination will need to occur in the vicinity of the Building, however, as access to the Building must be maintained in order to support the balance of the Building's construction.

Sub-task 2: Curbs, Gutters, and Paving

When preparation and grading of the site is complete, Lyles will begin work on the site concrete including the curbs and gutters. Depending on weather forecast and/or site coordination, this work may also need to be expedited. It is possible that weekend work may also be utilized to avoid congestion of the site. Paving operations will commence upon completion of all site concrete. All other work at the site will be paused during paving operations to allow this work to be completed in a single operation, without interruption, to ensure that a high quality product is provided.

Sub-task 3: Site Finishes

Final site finish work will be performed after the completion of site concrete and paving operations. This work will consist of slope finishing, rip-rap installation, and vegetation restoration. All final BMPs will be completed in advance of the rainy season ensuring that any potential for erosion is mitigated.

Task 7 Key Participants:

- John Lunsford – PM – Site finishes planning and coordination
- Paving Sub – Asphalt paving installation

Task 7 Critical Components:

- Completion of paving work in compliance with Milestone 4 - Roadway Connection
- Completion of all site work in preparation for the rainy season

TASK 8: COMPRESSED NATURAL GAS (CNG) FUELING STATION
TIMELINE: DAY 375 THROUGH DAY 480 / DECEMBER 2020 THROUGH MARCH 2021

Sub-task 1: System Installation

Installation of the CNG Fueling System will require a coordinated joint effort between our CNG System Subcontractor, San Joaquin Electric, and Lyles. Equipment installation will be performed by the CNG System Sub and the process and electrical connections will be performed by Lyles and San Joaquin, respectively. Special attention will be given to testing of the piping and pressure vessels by Lyles, as part of our routine Quality Control duties, to ensure that the System's integrity and safety are 100% intact prior to commissioning.

Sub-task 2: Startup & Commissioning

Startup and commissioning of the CNG Fueling System is currently scheduled to occur in the spring of 2021. The system will be commissioned on pipeline gas provided by PG&E as biogas will not yet be available from the Expansion Project. Compliance with Milestone 5 will have been achieved and the system will be available for beneficial use by the City when commissioning is complete.

Based on this schedule, the CNG Fueling Facility will be ready nearly 2 months in advance of its Contract Milestone, and 8 months in advance of the Project Completion End Date identified in the Placer County Air Pollution Control District - Carl Moyer Grant Agreement.

Task 8 Key Participants:

- Jon Shugarte – Asst. PM – CNG Fueling System planning and coordination, QC plan implementation
- Pat Van Treeck – Pre-Plan Eng. – Mechanical procurement and support
- CNG Fueling System Sub – Installation of fueling system
- Electrician – System connection to power and controls
- Integrator – Interface with system controls and communication
- City of Roseville – O&M Staff – Receive training and prepare for full-time operation

Task 8 Critical Task Components:

- Completion of equipment installation
- Testing of tanks and piping

TASK 9: ELECTRICAL AND CONTROL SYSTEMS TIMELINE: DAY 405 THROUGH DAY 465 / FEBRUARY 2021 THROUGH MARCH 2021

Sub-task 1: Equipment Installation

The installation of the motor control center, variable frequency drives, PLC panels, and local control panels will commence once the interior finishes within the Electrical Building are complete. All of the electrical equipment will be factory tested prior to installation to ensure proper operation in the field.

Sub-task 2: Exposed Conduit and Wire Installation

Installation of the exposed conduit and wire within the building will commence once the electrical equipment is set. Similarly, the exposed electrical components for the CNG Fueling System will be installed as the CNG equipment installation nears completion. These two areas will be prioritized to support early startup and commissioning of the CNG Fueling System as discussed in Task 8. The balance of the exposed electrical components will be installed in coordination with the installation of the HSW, Cogeneration, and BUS system equipment.

Sub-task 3: Electrical System Testing and Validation

Testing and validation (loop checking) of the electrical systems will occur in a staged fashion to support the sequential startup of the each of the process mechanical systems. The CNG Fueling Facility electrical system will be tested first as described above.

Sub-task 4: 12kV Switchgear Modifications

The modifications to the 12kV Switchgear (MVSA) located in Electrical Building No. 1 will require careful coordination with Roseville Electric and Plant Operations Staff. Power to the facility will need to be interrupted for up to 8-hours to allow the MVSA to be de-energized so that the required protective relay and breaker modifications can be performed safely. During this outage, critical operations will need to be powered by the PGWWTP's existing standby generators to ensure that the facility's discharge requirements are met at all times. Fortunately, we have great flexibility with respect to the scheduling of this work and will coordinate with Plant Staff to perform the modifications during a dry-weather, low-flow period.

Task 9 Key Participants:

- John Lunsford – PM – Overall project planning and coordination
- Electrician – Installation of motor control centers, panelboards, conduit, and wiring
- Integrator – Instrumentation and controls testing and validation

Task 9 Critical Components:

- Installation and testing of all wiring and controls necessary to support operation of the CNG Fueling System
- Completion of lighting, outlets, and misc. building support systems

TASK 10: HIGH STRENGTH WASTE (HSW) RECEIVING STATION TIMELINE: DAY 465 THROUGH DAY 525 /MARCH 2021 THROUGH MAY 2021

Sub-task 1: System Installation

Installation of the HSW Receiving Station will be preferentially scheduled to occur after the successful commissioning and turnover of the CNG Fueling System. Completion of this work does not fall on the critical path of the project and will be coordinated accordingly.

Sub-task 2: Startup & Commissioning

Startup and commissioning of the HSW Receiving Station will occur upon completion of the mechanical and electrical installation. Final testing of the system will be contingent upon the availability of feedstock from the City and confirmation that the new Digesters being constructed by the Expansion Project are ready to receive the waste.

Task 10 Key Participants:

- Jon Shugarte – Asst. PM – HSW Receiving Station planning and coordination, QC plan implementation
- Pat Van Treeck – Pre-Plan Eng. – Mechanical procurement and support
- Electrician – System connection to power and controls
- Integrator – Interface with system controls and communication
- City of Roseville – O&M Staff – Receive training and prepare for full-time operation

Task 10 Critical Components:

- Identification of a High Strength Waste feedstock source
- Operational readiness at the new Digesters

TASK 11: COGENERATION SYSTEM TIMELINE: DAY 525 THROUGH DAY 790 / MAY 2021 THROUGH JANUARY 2022

Sub-task 1: System Installation

The Cogeneration System consists of four microturbines for the production of electrical power, and a heat exchanging system for the recovery of heat produced by the microturbines. Installation of this system will be preferentially scheduled to just preceed the availability of biogas, which is not expected occur until late in the project. This will be done to limit congestion on the site as discussed in Task 2 and, more importantly, to eliminate any potential for a gap in warranty coverage that could result from taking early delivery of the equipment.

Sub-task 2: Startup & Checkout

Mechanical and electrical startup of the Cogeneration System will be coordinated to occur just prior to the completion of Milestone 6. The system manufacturer will inspect all components for proper installation prior to functional testing.

Sub-task 3: Performance Testing

Commissioning and performance testing of the Cogeneration System will be dependent upon the ability of the digesters to produce an adequate amount of quality fuel (biogas). The digesters are being constructed as part of the Expansion Project and, as such, the ERP Project will be reliant upon their performance. Please reference the discussion on "Commissioning Challenges and Opportunities" for more details regarding the coordination that will be required during this Task.

Task 11 Key Participants:

- Jon Shugarte – Asst. PM – Cogeneration System planning and coordination, QC plan implementation
- Pat Van Treeck – Pre-Plan Eng. – Mechanical procurement and support
- Electrician – System connection to power and controls
- Integrator – Interface with system controls and communication
- City of Roseville – O&M Staff – Receive training and prepare for full-time operation

Task 11 Critical Components:

- Manufacturer's certification of installation
- Performance testing coordination with biogas availability

TASK 12: BIOGAS UPGRADING SYSTEM (BUS) TIMELINE: DAY 615 THROUGH DAY 790 / AUGUST 2021 THROUGH JANUARY 2022

Sub-task 1: System Installation

Installation of the BUS will occur later in the project. It will be preferentially scheduled to align with the availability of biogas from the Expansion Project, like the Cogeneration System. Once the equipment has been set, the manufacturer will be engaged to furnish and supervise the installation of the specialized media that will serve to remove contaminants from the biogas.

Sub-task 2: Startup & Checkout

Mechanical and electrical startup of the BUS will be coordinated to occur concurrently with the Cogeneration System, just prior to the completion of Milestone 6. The system manufacturer will inspect all components for proper installation prior to functional testing.

Sub-task 3: Performance Testing

Commissioning and performance testing of the BUS will be highly dependent upon the availability and quality of the biogas produced by the Expansion Project. Lyles has coordinated the requirements found in the Specifications for both Projects with the CPM Schedule and would like to draw attention to the following:

- Milestone 6 dictates that the ERP must be ready to receive biogas within 700 days, but ERP Specification Section 01 12 16 indicates that it may take up to 750 days for the Expansion Project to deliver. No guarantees are made regarding the quantity or quality of gas to be provided.
- Milestone 7 (Substantial Completion) is set at 790 days for the ERP. This Milestone includes successful commissioning and performance testing of the BUS and Cogeneration System. Based on this, only 40 days are guaranteed to be available to accomplish this goal. This poses a significant risk to the Project.
- Expansion Project Specification Section 01 12 16 indicates that as part of that Project's Milestone E, "Digester gas (biogas) shall be generated by the new Anaerobic Digestion system and conveyed to the Energy Recovery Project". No requirements are stated regarding the quantity or quality of gas to be delivered.

Lyles' experience with the startup of new digesters is extensive. In our experience, achieving steady state operation of a digester typically takes several weeks, but can take longer depending on various conditions (proper heating, time of year, sludge quality and biology, etc.). If the biogas, in terms of both quantity and quality, made available at the 750 day mark is not capable of supporting the full range of performance tests required by the ERP Specifications, Milestones 7 and 8 (Substantial and Final Completion, respectively) of the ERP will likely be delayed.

Lyles' plan to mitigate this delay currently includes all of the measures identified in Section 1 – Overcoming Challenges. It also includes the significant application of overtime and weekend work as needed to complete commissioning and performance testing of the BUS and Cogeneration System within the time allowed. Lyles has identified several alternative approaches to this issue and looks forward to developing a collaborative solution with the City.

Task 12 Key Participants:

- Jon Shugarte – Asst. PM – BUS planning and coordination, QC plan implementation
- Pat Van Treeck – Pre-Plan Eng. – Mechanical procurement and support Electrician – System connection to power and controls
- Integrator – Interface with system controls and communication
- City of Roseville – O&M Staff – Receive training and prepare for full-time operation

Task 12 Critical Components:

- Startup and check-out of all equipment in preparation for the delivery of biogas from the Expansion Project
- Testing of biogas in advance of commissioning and performance testing
- Completion of requirements in compliance with Milestone 7 – Substantial Completion

TASK 13: PROJECT CLOSEOUT
TIMELINE: DAY 700 THROUGH DAY 820 / OCTOBER 2021 THROUGH FEBRUARY 2022

Sub-task 1: Project Record Documents

The record documents will be maintained throughout the life of the ERP. Lyles will review all of the documents to ensure that they are accurate, up to date, complete, and in compliance with the project requirements.

Sub-task 2: Demobilization

Our final Task will be to demobilize from the project. Our project office, storage containers, and temporary utilities will all be disassembled and removed from the site, restoring the area to its previous condition.

Task 13 Key Participants:

- John Lunsford – PM – Overall planning and coordination
- Jon Shugarte – Asst. PM – Record document preparation and coordination
- Electrican – Record document preparation
- Integrator – Record document preparation

Task 13 Critical Components:

- Completion of requirements in compliance with Milestone 8 – Final Completion

TURNING A CHALLENGE INTO AN OPPORTUNITY

THE CHALLENGE:

Lyles has developed a full CPM Schedule for both the ERP and Expansion Projects. These actions allowed us to identify all of the critical coordination points between the two Projects and to develop the following unique observations:

- The longest path through the ERP Project is through the installation of the BUS and Cogeneration System equipment in preparation for the receipt of biogas. The minimum amount of time required to complete this work is significantly less than the 700 days allowed. However, the ERP Contractor has no inherent motivation to expedite the work due to the unavailability of biogas.
- The longest path through the Expansion Project is through construction of the new Digesters and their supporting systems. The Expansion Project Contractor has no inherent motivation to expedite this work, because 1) the time allowed for this work is sufficient, 2) there is no incentive to do so.
- Given the opportunity, the ERP Contractor would expedite the early delivery of biogas in order to mitigate the risks identified in Task 12 of this Section. Unfortunately, there is no mechanism for accomplishing this. Both Contractors will naturally consume the allotted time, resulting in the longest possible overall schedule with the fewest number of days allowed for commissioning and performance testing. This will (unnecessarily) increase the ERP Contractors' performance risk.
- If the delivery of biogas is delayed, the ERP will need to be extended. Extending the ERP will increase the risk to the ERP Contractor and the City, and extend job overhead and supervision costs.

In summary: 1) the ERP Contractor has no ability to beneficially expedite the delivery of biogas, 2) the Expansion Project Contractor has no inherent motivation to provide it early, and 3) the City will take on additional risk if it attempts to either expedite the Expansion Project or extend the ERP.

THE OPPORTUNITY:

Lyles has developed numerous lessons-learned through the delivery of over 100 Alternative Delivery projects. One of the most important lessons is related to the allocation of risk. Ideally, project risks are always assigned to the party in the best position to mitigate them. This is not the case in the challenge identified above unless the City capitalizes on an opportunity to have both projects delivered by a single Contractor, which Lyles can provide. Should the City elect to award both the ERP and the Expansion Project to Lyles, all of the identified challenges will be resolved before they have an opportunity to create problems. Lyles will have both the motivation and the control necessary to optimize the schedule for both Projects, thereby reducing risk and delivering the best possible value to the City of Roseville.



SECTION 3

PROJECT COST REDUCTION OPPORTUNITIES

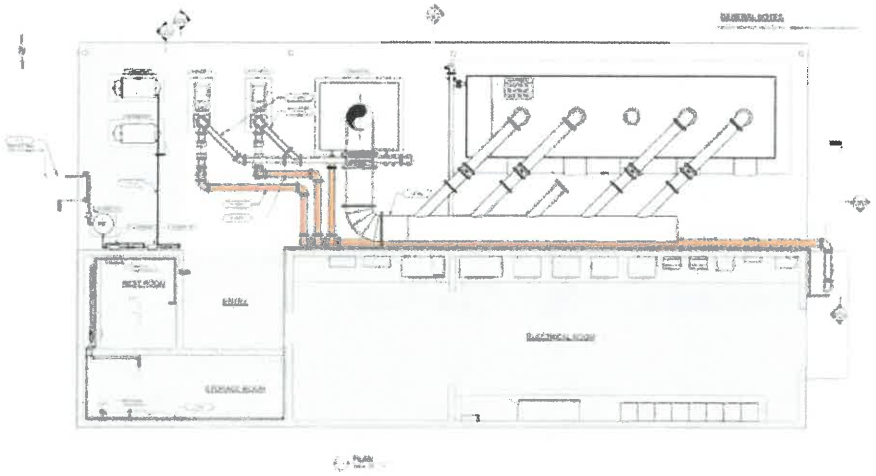
PROJECT COST REDUCTION OPPORTUNITIES

After thorough review of the ERP scope of work, we have identified key items we believe will enhance the existing plan for the new facilities and provide cost savings opportunities during construction. Below is a sample of proposed project cost reduction opportunities.

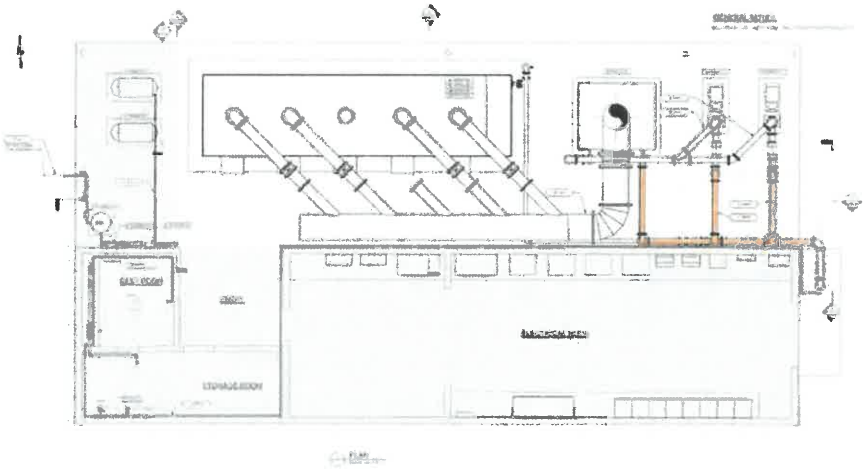
Opportunity No. 1: Optimize Cogeneration Equipment Layout

The current layout for the Cogeneration Area equipment from east to west is as follows: Microturbines, Exhaust Heat Exchanger, and then Hot Water Pumps. We suggest revising the layout to a mirror image of the current design in order to optimize pipe routing.

CURRENT



PROPOSED



Cost Reduction Ingredients: Approximately 100' less exposed HWR/HWS piping including insulation and supports

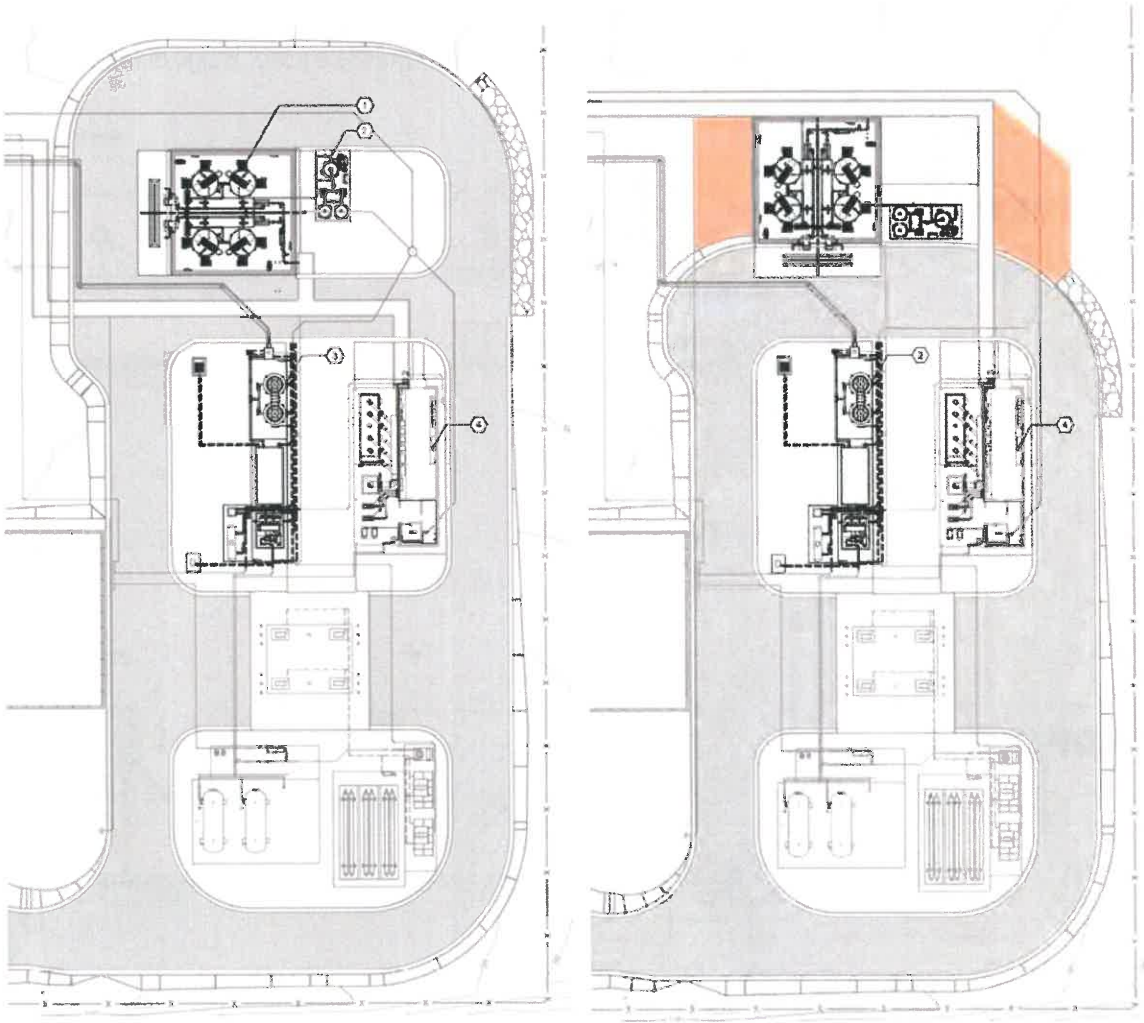
Additional Benefits: Reduced heat loss due to shorter piping runs

Opportunity No. 2: Optimize High Strength Waste Receiving Station Layout

The current layout for the High Strength Waste Receiving Station and related Odor Control Equipment includes paving on all four sides. We suggest revising the layout to include paved access on one side only with aggregate base roadway for maintenance access on two of the remaining three (3) sides.

CURRENT

PROPOSED

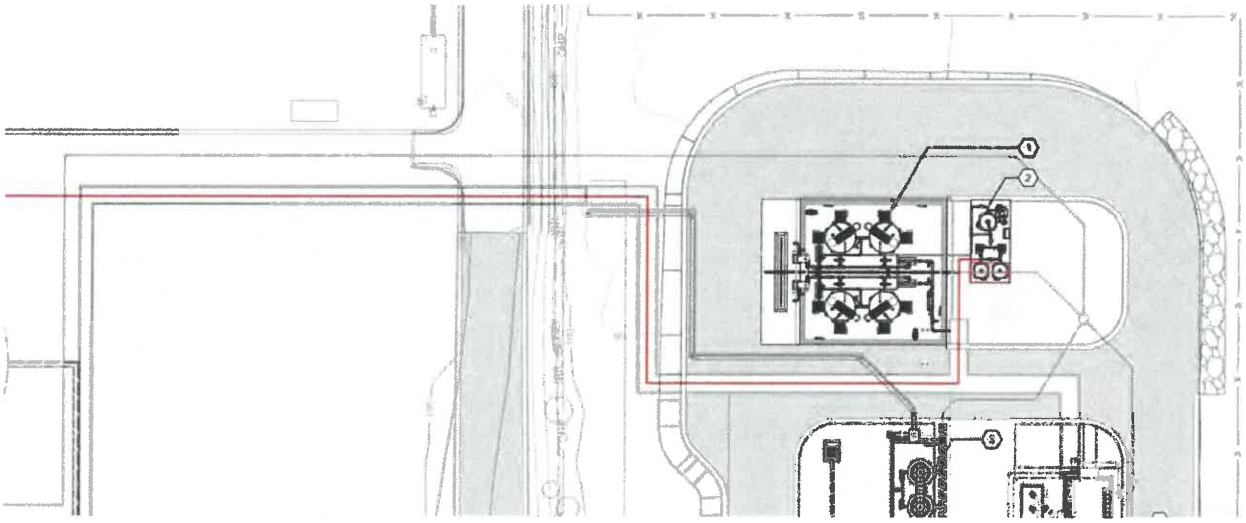


Cost Reduction Ingredients: Approximately 10,000 SF less paving

Additional Benefits:

- Reduced length of precast utility trench within the traffic zone
- Improved drainage within the paved area
- Fewer piping conflicts
- Improved construction schedule

Opportunity No. 3: Utilize Existing Biofilters In-Lieu of Carbon Vessels The Odor Control System being provided for the High Strength Waste Receiving Station includes one (1) BioTrickling Filter and two (2) Activated Carbon Odor Control Units. The media in the Activated Carbon Odor Control Units will require periodic replacement. We suggest routing the foul air from the outlet of the BioTrickling Filter, via the utility trench, to the existing Biofilters located south of the Dewatering Building.



Cost Reduction Ingredients:

- Replacement of the Activated Carbon Odor Control Units with PVC piping
- No periodic removal and replacement of media required

Additional Benefits:

- Fewer pieces of equipment to maintain

Opportunity No. 4: Combine the Energy Recovery and Expansion Projects The Energy Recovery Project and the Expansion Project will be constructed concurrently. We suggest the City consider the intrinsic value of having a single point of responsibility for both projects.

Cost Reduction Ingredients:

- Reduced job overhead costs through the avoidance of duplicate field offices, temporary utilities, etc.
- Reduced coordination effort for the Engineer, Construction Manager, and Plant Operations staff

Additional Benefits:

- Improved coordination between projects
- Reduced risk of delay and/or conflict between multiple contractors
- **Opportunity to mitigate start-up and commissioning risks identified in Section 2 'Commissioning Challenges and Opportunities'**



SECTION 4

PROJECT TEAM QUALIFICATIONS AND EXPERIENCE

PROJECT TEAM QUALIFICATIONS AND EXPERIENCE

CITY OF ROSEVILLE CALIFORNIA



STAN SIMMONS
Principal



JOE LAWRENCE
Project Sponsor



JOHN LUNSFORD
Senior Project Manager



SCOTT MCELWAIN
Safety Director



JON SHUGARTE
Assistant Project Manager/
Quality Control Manager

If Lyles were to receive award of both the ERP and the Expansion projects, we have the local manpower available to staff both projects as soon as the award is given.

Scheduling



TONY MUELLER
CPM Scheduler

Pre-Planning

REECE BERGER
Estimating/Scheduling

PAT VAN TREECK
Estimating/Scheduling

Subcontractors

SAN JOAQUIN ELECTRIC
Electrical and Instrumentation

TESCO CONTROLS
Control Systems Integrator

EFS WEST
CNG Fueling Station Subcontractor

CMC REBAR
Rebar Subcontractor

The organizational structure will effectively:

- Support the ERP during both phases with individuals having expertise in the complex planning and execution of construction work.
- Provide executive commitment to communication with the City to ensure all needed resources are provided to the team from Lyles' staff, craft and technical support divisions.

INCLUDED IN THE SIX (6) QUALIFYING PROJECTS IDENTIFIED IN OUR SOQ



STAN SIMMONS - Principal

Mr. Simmons has been involved with Alternative Delivery projects since 1981, including an integral role from the initial conceptual development stage through final construction of more than $1.5 Billion of Water and Wastewater Design-Build Projects, routinely serving as Pre-Construction Services Manager and Executive Sponsor for most of the 100 plus alternative delivery projects delivered at Lyles. This experience with similar projects will provide the City of Roseville with useful early cost and schedule certainty to ensure all information is provided in a timely manner to effectively make value based decisions.

AVAILABILITY: ON DEMAND AND WILL ATTEND MONTHLY EXECUTIVE MEETINGS

RELEVANT PROJECT EXPERIENCE

- City of Davis WWTP Secondary and Tertiary Improvements, DB, Executive Sponsor/Estimator, 2018, $71,558,825
- CR&R Anaerobic Digestion Facility, DB, 2017, Executive Sponsor/Chief Estimator, $33,000,000
- City of Fresno - SE Surface WTP, DBB, Executive Sponsor/Estimator, 2018, $162,089,360



JOE LAWRENCE - Project Sponsor

Joe has 17 years of industry experience in the construction of water and wastewater treatment facilities. During this time, he has overseen numerous Alternative Delivery construction projects with a total value in excess of $200 million. During pre-construction, Joe will channel his previous sponsorship experience to ensure that the project goals are achieved, commit resources to the project, and monitor team performance with the City of Roseville. During construction, he will serve as the first line of off-site management working with John to coordinate project resources and will meet with the City of Roseville on a scheduled basis to review status and performance. Joe will also lend his expertise to assist the team in identifying savings opportunities and avoiding constructability concerns.

AVAILABILITY: 25%

RELEVANT PROJECT EXPERIENCE

- City of Stockton Regional Wastewater Control Facilities Project , DB, Project Sponsor, In Progress +/- $190,000,000
- City of Davis WWTP Secondary and Tertiary Improvements, DB, Construction Manager/Project Sponsor, 2018, $71,558,825
- Linda County Water District – WWTP Upgrade & Expansion, DBB, Project Sponsor, 2012, $29,547,940



JOHN LUNSFORD - Senior Project Manager

John Lunsford has over 29 years of industry experience in the wastewater/water market. John's creative problem-solving capabilities combined with his extensive experience managing self-performed work will ensure that construction advances safely and efficiently. During pre-construction, John will serve as the primary point of contact with the City of Roseville, manage pre-construction services, lead the development of technical solutions and critical decisions. John will also track daily progress to ensure that both the cost report and the schedule have the most up-to-date information. During construction, John will serve as the on-site, primary point of contact with the City and have overall responsibility for team performance including safety, quality, cost, and schedule.

AVAILABILITY: 100%

RELEVANT PROJECT EXPERIENCE

- City of Davis WWTP Secondary and Tertiary Improvements, Sr. Project Manager, 2018, $71,558,825
- Central Contra Costa Sanitary District, Primary Treatment Renovations, Sr. Project Manager, 2001, $11,334,214
- Linda County Water District – WWTP Upgrade & Expansion, Sr. Project Manager, 2012, $29,547,940



JON SHUGARTE - Asst. PM / QC Manager

Jon is a safety-minded PM and Quality Control Manager with 14 years experience in the construction industry and extensive experience in wastewater treatment expansion projects. Working in existing plants has provided Jon the ability to collaborate with owners and project teams and plan work to minimize impacts to operations. During pre-construction, Jon will participate in design support task groups, constructability and value engineering workshops, and work planning and packaging. During construction, Jon will maintain overall responsibility for project quality, of field-worker safety, subcontract coordination, and process equipment installation.

AVAILABILITY: 100%

RELEVANT PROJECT EXPERIENCE

- Linda County Water District – WWTP Upgrade & Expansion, DBB, Project Engineer/QC Manager, 2012, $29,547,940
- Fairfield Suisun Sewer District Secondary Treatment Expansion, DBB, Project Manager, 2009 $21,182,911



SCOTT MCELWAIN - Safety Director
Scott McElwain will serve as the Safety Manager for the PGWWTP ERP. He will be responsible for the planning and implementation of site safety during all field operations of the project. Scott or a Lyles Safety Technician will visit the PGWWTP site weekly and when any critical activities are planned to occur. He will work with our construction team to build safety into our means and methods while considering constructability requirements. Scott is the Lyles Corporate Safety Director and has been involved in construction safety for almost 20 years, with ten of those years at Lyles. Under his leadership, the Lyles Construction Group has received numerous safety awards from various industry groups, and Scott will ensure that this project meets those award winning standards.

AVAILABILITY: 20%

INDUSTRY RECOGNITION

- Fresno Builders Exchange, 2006 Safety Leadership Award
- Cal OSHA Golden Gate Recognition, Calgren Pixley Ethanol Project, November 2007
- Cal OSHA Golden Gate Recognition, City of Tulare IWWTP Project, February 2009



TONY MUELLER - CPM Scheduler
Tony's involvement in the ERP will be in identifying major decision points that have the largest potential to impact the overall project cost and schedule. Over his 16 years of construction experience, he has developed the schedule for nearly every project he has been involved with. Tony will work closely with the City of Roseville and the Project Team to ensure that critical path activities are well identified so that they receive the focus that they deserve. He will also be responsible for updating the schedule to reflect the actual work performed, preparing monthly reports and narratives for distribution, and assisting with critical path analysis so that all parties understand the implications of schedule revisions and/or change order work.

AVAILABILITY: 20%

RELEVANT PROJECT EXPERIENCE

- City of Fresno - South East Surface WTP, Senior Project Manager,/CPM Scheduler 2018, $162,089,360
- Moreno Valley RWRF Preliminary Treatment and Acid Phase Anerobic Digestion, CPM Scheduler, 2012, $30,925,375
- Palmdale Water Reclamation Plant Stage Five Plant Expansion, CPM Scheduler, 2012, $116,079,181



REECE BERGER - Pre-plan Manager (Civil & Structural)
Reece will be responsible for the development and execution of purchase agreement and subcontracts, and will collaborate with the City of Roseville to prioritize and procure critical submittals and work packages. Reece will collaborate with City Stakeholders, and project team members to support the most efficient review of submittals, work plans, RFI's, as-built drawings, startup, testing and commissioning plans.

AVAILABILITY: 50%

RELEVANT PROJECT EXPERIENCE

- OCSD Plant 1, Sludge Dewatering and Odor Control, DBB, 2018, Project Manager, $137,944,211
- Western Riverside County Regional WW Authority 14 MGD Plant Expansion, DBB, Project Manager, 2016, $57,822,148
- Moreno Valley RWRF Preliminary Treatment and Acid Phase Anerobic Digestion, Estimator, 2012, $30,925,375



PAT VAN TREECK - Pre-plan Engineer (Mechanical & Equipment)
Pat will participate in constructability reviews; develop work plans, sequencing, and resources; and provide input for cost and schedule. As the Estimator on the WWTP Secondary and Tertiary Improvements Project for the City of Davis, Pat was responsible for preparing the GMP estimate for all piping and mechanical equipment based on a 60% design package. Pat's extensive knowledge and understanding of treatment plant processes and construction enabled a complete and accurate estimate from the 60% conceptual design. During construction, Pat worked closely with the Design team and Client to value engineer the piping systems, which resulted in significant project cost savings. This knowledge and experience will assist the City of Roseville in delivering a high-quality project that is on schedule and within budget.

AVAILABILITY: 50%

RELEVANT PROJECT EXPERIENCE

- City of Davis WWTP Secondary and Tertiary Improvements, Project Manager, 2018, $71,558,825
- OCSD Plant 1, Sludge Dewatering and Odor Control, DBB, 2018, Executive Sponsor/Estimator, $137,944,211
- Palmdale Water Reclamation Plant Stage Five Plant Expansion, CPM Scheduler, 2012, $116,079,181



WADE JOHNSON - Principal
San Joaquin Electric

His 30 years of experience in the industry has given him many insights into the electrical construction field. His experience in managing complex installations is second-to-none and includes: water and wastewater treatment plants, industrial projects, commercial buildings, food processing plants, agricultural installations, automation, PLC control systems, SCADA systems, process instrumentation, pneumatics, petro-chemical facilities, refineries, industrial lighting systems, lighting controls, fiber optics, and security systems. On this project, Wade will take the lead in identifying electrical challenges and opportunities during the design-phase, and ensuring that Fred Lozo, his project manager, has the resources needed to meet the City of Roseville's expectations during the construction phase.

AVAILABILITY: 50%

RELEVANT PROJECT EXPERIENCE

- City of Roseville - Dry Creek WWTP Secondary Clarifier Rehabilitation Project – Sr. Project Manager
- City of Roseville - Pleasant Grove WWTP Ultra-Violet Disinfection Project, Design-Assist – Sr. Project Manager
- City of Roseville - Dry Creek WWTP Cooling Towers Project, Design-Build – Sr. Project Manager



JOSH OAKS - Project Manager
TESCO

With over 20 years of experience in automation systems, Mr. Oaks is an accomplished automation professional who possesses the skills, tact, and experience to lead a project to successful completion. His direct experience in system installation enables him to relate with field implementation teams on project needs, allowing him to efficiently navigate the needs of a project and its deliverables in the most proficient manner. He communicates and coordinates resources while managing contractual obligations and project schedules.

AVAILABILITY: 50%

RELEVANT PROJECT EXPERIENCE

- City of Roseville – SCADA System Replacement Project, Project Manager - experience with the City's automation, SCADA, and PLC standards.
- San Francisco Public Utilities Commission (SFPUC), WW-613 Southeast WPCP SEP 521/522 & Disinfection Upgrades - Project Manager
- San Jose -Santa Clara Regional Wastewater Authority Digesters and Thickener Facilities Upgrade Project - Project Manager

San Joaquin Electric

Wade Johnson has successfully completed three large Design-Assist projects for the city of Roseville along with many hard bid jobs. His extensive knowledge of the City`s electrical and instrumentation specifications and standards make him a valuable asset to the ERP. Wade has 15 years of experience coordinating with the City`s I&C department and Roseville Electric with great success. Wade and his project management team are proactive in discovering potential problems long before they become significant issues and can provide timely and cost effective solutions that prevent schedule delays.

San Joaquin Electric (SJE) has been a leader in the commercial electric contracting market since 1980. They have specific expertise in PLC control systems, SCADA systems, process instrumentation, pneumatics, lighting controls, fiber optics, and security systems, all of which are applicable to the ERP. Overall, SJE and its leadership set an example of dedication, diligence, and fine workmanship that makes them successful industry professionals.

Tesco Controls Inc.

TESCO has a longstanding relationship with the City of Roseville and has successfully completed numerous projects for the City since 2003. Over the last 15+ years, TESCO has provided the City with control system planning, design, equipment builds, and implementation; including the design, manufacture, assembly, and integration of Industrial Control Panels, Motor Control Centers, and switchgear. These services have been provided by TESCO for all of the City's treatment plants, including Barton Water Treatment Plant, Dry Creek Wastewater Treatment Plant, and Pleasant Grove Wastewater Treatment Plant.

Most recently, TESCO completed a multi-million-dollar design-assist project for the City that involved all of the City's treatment plants. TESCO worked collaboratively with Roseville Environmental Utilities Department (EUD) to bring this project to successful completion. Additionally, TESCO assisted the City in developing their automation standards, including hardware assets such as Motor Control Centers, pump controls, and automation systems. TESCO's history of working collaboratively with the City coupled with their intimate knowledge of the City's system integration requirements makes TESCO the ideal system integrator for this project.

CMC REBAR - Rebar Subcontractor

For over 60 years, CMC Rebar has fabricated, furnished, and installed rebar and accessories for all construction markets. They operate state-of-the-art fabrication facilities in over 90 locations throughout the U.S. With almost 2.5 million tons of fabricating capacity, they have the national presence and capacity to serve all of our rebar needs with the same consistent level of customer service, no matter where the project is located.

CMC Rebar has provided reinforcing steel to many of America's largest landmark construction projects. At each of their facilities, CMC has the estimating, detailing and fabricating experience to manage any project, no matter what the size or schedule demands may be. For the Pleasant Grove Wastewater Treatment Plant Energy Recovery Project, this means that Lyles will have a proven performance partner with the experience that is required in today's demanding construction environment.

EFS WEST - CNG Fueling Station Subcontractor

EFS West is a design-build construction firm specializing in the construction of CNG, LNG, and conventional fuel facilities for commercial and government customers. These customers include Federal and State governments, municipalities, transit agencies, trucking firms, waste haulers, retail gasoline, ports and airports. They combine their design expertise with field construction capabilities to provide comprehensive, turnkey services for design-build fuel system projects. In business since 1993, EFS West is headquartered in Santa Clarita, California. Their management and construction staff includes over 50 construction professionals with experience in all aspects of alternative and conventional fuel system planning, design, permitting, and construction. They can field multiple construction crews capable of ground-up fuel system construction. This capacity allows them to meet the requirement of many of their customers for work at multiple sites concurrently. Their long and successful history is due to very simple concepts: Provide quality work, meet deadlines, and perpetuate their business through satisfied customers. With extensive experience in fuel system projects combined with the long list of repeat business advocates, EFS West was an easy choice to partner with for this project.

ATTACHMENT 1

PROPOSER'S CERTIFICATION OF PROJECT MANAGER EXPERIENCE
PLEASANT GROVE WASTEWATER TREATMENT PLANT ERP
To be submitted with Sealed Bid Proposal

The Proposer shall name below their chosen Project Manager who will be assigned to this Project and will be personally present on-site full-time during construction. This named Project Manager must have completed three (3) water and/or wastewater projects since January 1, 2009. One of the listed water and/or wastewater projects must have a contract amount greater than or equal to $20 million. The Project Manager's demonstrated project experience must be on one or more of the following types of projects:

a. Industrial and/or Municipal Water Treatment Plants where the earthwork, structural concrete, mechanical, electrical, and instrumentation systems were part of the Contractor's contract; or

b. Industrial and/or Municipal Wastewater Treatment Plants where the earthwork, structural concrete, mechanical, electrical, and instrumentation systems were part of the Contractor's contract.

Any projects listed below, which are not as defined above, will not be considered by the City in meeting this pre-requisite experience requirement. For example, pipeline projects, and/or pump station projects are not considered an equivalent project.

An industrial and/or municipal water or wastewater treatment plant project is defined as a project that was engineered and constructed for an industrial or municipally owned and operated facility which is designed to remove contaminants, specific constituents, and/or particulates in water and/or wastewater as required by a State issued discharge permit.

Name of Project Manager: John Lunsford

Number of Years of Total Construction experience as a Project Manager assigned to the types of projects as defined above: 29 years

Number of Years as a Project Manager for your Company: 29 years

List three (3) completed water and/or wastewater treatment plant projects as defined above where the individual named above held the position of Project Manager. One of the projects must have a contract value greater than or equal to $20 million.

Project #1 Name: Wastewater Treatment Plant Secondary and Tertiary Improvements Project

Owner: City of Davis

Construction Cost: $ 32,619,341

Construction Time: 1,493 calendar days

Owner's Representative: Diana Jensen

Owner's Representative Telephone No.: (530) 757-5686

Engineer or On-Site Construction Mgr.: AECOM

Engineer or On-Site CM's Telephone No.: Scott Thibault (978) 905-3217

Date of Substantial Completion (must be on or before Jan. 1, 2009): September 28, 2018

Duration of Project (in months) 49

Project #2 Name: Primary Treatment Renovations

Owner: Central Contra Costa Sanitary District

Construction Cost: $ 11,441,946

Construction Time: 1,229 calendar days

Owner's Representative: Craig Mizutani

Owner's Representative Telephone No.: (925) 229-7361

Engineer or On-Site Construction Mgr.: Central Contra Costa Sanitary District

Engineer or On-Site CM's Telephone No.: Nathan Morales (925) 229-7125

Date of Substantial Completion (must be on or before Jan. 1, 2009): January 22, 2016

Duration of Project (in months) 41

Project #3 Name: Linda County Wastewater Treatment Plant Upgrade

Owner: Linda County Water District

Construction Cost: $ 29,547,940

Construction Time: 335 calendar days

Owner's Representative: Brian Davis

Owner's Representative Telephone No.: (530) 743-2043

Engineer or On-Site Construction Mgr.: Kennedy Jenks Engineering

Engineer or On-Site CM's Telephone No.: Don Barraza (916) 858-2700

Date of Substantial Completion(must be on or before Jan. 1, 2009) : May 23, 2012

Duration of Project (in months) 12

This form shall be fully completed and submitted by the Proposer with the Technical Proposal (Part 1). Proposer is not allowed to provide a substitute form of similar information.

The City may check project references listed above to verify the Project Manager's project experience information provided. The City may also discuss the Project Manager's performance with project references provided above.

It is very important that the Proposer verify that all contact information is current for each name listed above. Failure of the Proposer to provide current and valid project contact information and/or all information required by this certification may be grounds for the City to determine the Proposer to be non-responsive and/or non-responsible and therefore ineligible for consideration of Project award.

PAGE INTENTIONALLY LEFT BLANK

ATTACHMENT 2

PROPOSER'S STATEMENT OF SUBCONTRACTORS
PLEASANT GROVE WASTEWATER TREATMENT PLANT ERP
To be submitted with Sealed Technical Proposal (Part 1)

The undersigned Proposer submits herewith a list of subcontractors the Contractor proposes to employ on the Work. Said subcontractors will each perform Work in an amount greater than one half of one percent (0.5%) of the Total GMP submitted in their Cost Proposal (Part 2). This list shall include the proper firm name, their license number and class, city and state of each subcontractor, and the portion of the Work to be done by each subcontractor with the understanding that failure to name such subcontractors shall be witness that the Contractor shall have agreed to perform such portion of the Work; and that the Contractor shall not subcontract said portion of the Work; and if a subcontractor is listed, there shall be no substitution of that subcontractor without first obtaining written permission of City Council pursuant to the provisions of Section 4107 of the Public Contract Code. The Contractor shall list only one subcontractor for each portion of the Work to be done as defined by the Contract Documents.

The Proposer's attention is directed to the provisions found in Section IV.B, Section 4 - PROJECT TEAM QUALIFICATIONS AND EXPERIENCE, which stipulates the percent of the Work to be performed with the Proposer's own forces. The City will determine the percentage of the Work self-performed by the Proposer, by subtracting the total percentage of below listed subcontractors work from 100%.

Work to be done by Subcontractor	Percent of Total GMP	Name of Subcontractor	Place of Business (City and State)	CSLB Contractor License Number	DIR Registration Number, and Expiration Date
Asphalt Paving	0.8%	Martin Brothers Construction	Sacramento, CA	726454	10000000174 Exp. 6/30/2022
Reinforcing Steel	0.8%	CMC Rebar West	Tracy, CA	778010	1000000298 Exp. 6/30/2022
Masonry	1.0%	Townsend & Schmidt Masonry	Sacramento, CA	186559	1000000879 Exp. 6/30/2020
Painting & Coatings	0.8%	Mason Painting, Inc.	Orangevale, CA	819987	1000008947 Exp. 6/30/2020
CNG Fueling System	14.3%	EFS West	Valencia, CA	826003	1000011646 Exp. 6/30/2020
HVAC	0.5%	Blocka Construction, Inc.	Fremont, CA	679326	1000000447 Exp. 6/30/2022
Pipe Insulation, Sheet Metal Framing, & Gypsum Board	1.6%	Performance Contracting, Inc.	North Highlands, CA	474795	1000004922 Exp. 6/30/2022

Work to be done by Subcontractor	Percent of Total GMP	Name of Subcontractor	Place of Business (City and State)	CSLB Contractor License Number	DIR Registration Number, and Expiration Date
Electrical & Instrumentation	13.0%	San Joaquin Electric, Inc.	Sacramento, CA	410103	1000002857 Exp. 6/30/2020

Add additional sheets, if necessary.

ATTACHMENT 3

PROPOSER'S SCHEDULE OF MAJOR EQUIPMENT AND MATERIAL SUPPLIERS
PLEASANT GROVE WASTEWATER TREATMENT PLANT ERP
To be submitted with Sealed Bid Proposal

1. The undersigned Proposer represents that, if awarded the Agreement, the items of major equipment and materials specified below will be supplied by the manufacturers or suppliers specified below. By so indicating, Proposer warrants that the equipment and materials manufactured and/or supplied by the named manufacturer or supplier will be provided on the Project unless review of submittal information or performance tests reveal that the equipment or material does not meet Contract Document requirements or the manufacturer or supplier is unable to meet the delivery requirements necessary to maintain progress of the Project based upon the accepted baseline CPM construction schedule. Failure to indicate a manufacturer or supplier listed in the following schedule may render the Bid Proposal non-responsive and may be the basis for rejection of the Bid Proposal.

2. All major Equipment shall be included in the bid proposal according to the following:

(a) Not used.

(b) The following Major Equipment Schedule Table designates major equipment items to be provided. All costs for providing these equipment items shall be included in the Bid Proposal (Part 2). The Proposer shall indicate which Manufacturer/Supplier of equipment they propose to provide, by checking ONE of the named, listed items and, if the Proposer desires to propose an "or equal" equipment item, by writing in a proposed "or equal." If the Proposer writes in a proposed "or equal," the Proposer shall also check one of the named, listed items. It is the Proposer's responsibility that all equipment to be provided, either checked or proposed "or equal" write-in, meet the requirements of the Specifications.

(c) The opinion of the City's Representative will be the final determination of whether a write-in "or-equal" meets the design intent. In the event that the City's Representative allows the Proposer's proposed "or equal" material or equipment item for use as an "or equal", the proposed "or equal" material or equipment item shall be provided for the amount included in the GMP with NO change in GMP. Should the write-in proposed "or equal" item be determined "not equal" by the City's Representative, then the Proposer hereby agrees to provide the checked Manufacturer/Supplier item for the amount included in the Proposer's GMP. Should a Proposer fail to indicate which named manufacturer or supplier the Proposer's GMP is based on, or checks more than one named Manufacturer/Supplier per listed equipment item, the Proposer hereby agrees to provide the Manufacturer/Supplier item noted as "A" for the amount included in the Proposer's GMP with NO change in the GMP.

(d) Allowances of proposed "or equal" equipment does not constitute a waiver of the Specifications. Proposed "or equal" equipment is defined as equipment proposed and named by the Proposer under the Manufacturer/Supplier column in the Major Equipment Schedule Table as equal and equivalent to the specified equipment.

(e) Proposed "or equal" equipment will only be considered after award and execution of Agreement by the City Council. For each "or equal" (write-in) equipment item, Contractor shall submit a properly completed, MATERIAL/PRODUCT SUBSTITUTION REQUEST FORM (PER SECTION 01 60 00.01) within thirty-five (35) calendar days after the date of the Notice to Proceed. Proposed "Or Equal" Substitution Form must be completely filled out, certified and include all required supporting documentation to allow the City's Representative and Engineer to assess the "or equal" acceptability of the product or system. Failure to submit all the required information within the established time limit shall be grounds for determination that the proposed "or equal" major equipment item is "not equal" to the named, listed Manufacturer/Supplier equipment item.

(f) Within 30 calendar days after receiving the proposed "or equal" major equipment submittals, the City's Representative will notify Contractor, in writing, as to whether or not the submitted proposed "or equal" equipment, if any, are accepted as meeting the general specification requirements. The consideration of this equipment shall not be construed to indicate final acceptance by the City, nor relieve the Contractor and/or Manufacturer/Supplier of the equipment from providing the post-Agreement award submittal information.

(g) To be deemed equal, the proposed "or equal" equipment shall be the same or better than the specified named product with respect to features, materials of construction, function, performance, reliability, quality, general dimensional configuration, operations and maintenance access and costs, and static and dynamic loads. Determination of equality in reference to the project design requirements will be made by the City's Representative.

(h) No proposed "or equal" major equipment will be considered unless, in the opinion of the City's Representative and Engineer, it conforms to the Contract Drawings and Specifications in all respects, except for make and manufacturer and minor details.

(i) Design of this Project is based upon the Manufacturer/Supplier equipment item noted as the "A" item in the Major Equipment Schedule Table. When a "B," "C," or "D" named item is named in the Major Equipment Schedule Table, the equipment or product of this "B," "C," or "D" named manufacturer or supplier is deemed "or equal" in quality; however, should a Proposer propose providing a "B," "C," or "D" named item, or proposed "or equal" (write-in) equipment, the Proposer shall comply with the following:

1) The Proposer shall include in the GMP all additional costs (including all general construction, process mechanical, HVAC, plumbing, electrical, and instrumentation and control work), required to accommodate, furnish, and install the proposed equipment or material, training, and spare parts.

(2) Contractor shall reimburse the City for Engineer's time and expense charges associated with the review of proposed "or equal" Major Equipment or System submittals, subsequent notification to Contractor of disposition, and any associated modifications to the Drawings.

MAJOR EQUIPMENT OR MATERIAL SCHEDULE
SUPPLIED BY CONSTRUCTION CONTRACTOR
For the PGWWTP ERP

SECTION	EQUIPMENT OR MATERIAL	NAME OF EQUIPMENT OR MATERIAL SELECTED Indicate with a check mark within the ( )
26 12 19	Medium Voltage Transformers	A. (X) Eaton Cooper Power Systems B. ( ) ABB C. ( ) Schneider Electric D. ( ) Square D E. ( )_____ "or equal" write-in
26 24 19	Motor Control Centers	A. (X) Eaton B. ( ) General Electric C. ( ) Square D D. ( ) _____ "or equal" write-in
43 10 01	CNG Fueling System	A. ( ) ANGI Energy Systems B. (X) J.W. Operating Company C. ( ) _____ "or equal" write-in

SECTION	EQUIPMENT OR MATERIAL	NAME OF EQUIPMENT OR MATERIAL SELECTED Indicate with a check mark within the ( )
43 24 51	Progressing Cavity Pumps	A. (X) Moyno, no equals
43 24 72	Chopper Pumps	A. (X) Vaughan, no equals
43 32 77	Biogas Upgrading System	A. (X) Unison Solutions B. ( ) _____ "or equal" write-in
43 41 32	High Strength Waste Tanks	A. (X) Central Valley Tank Write-in
43 42 21	Welded Steel Pressure Vessels	A. ( ) Manchester Tanks B. ( ) Highland Tanks C. (X) NJ McCutchen D. (X) Modern Custom Fab "or equal" write-in
44 31 16	Activated Carbon Odor Control Equipment	A. ( ) ECS B. (X) Evoqua Water Technologies C. ( ) Daniel Mechanical D. ( ) _____ "or equal" write-in
44 31 21	Biotrickling Filter Odor Control Equipment	A. ( ) BioAir B. (X) Evoqua Water Technologies C. ( ) Daniel Mechanical/GES D. ( ) Biorem E. ( ) _____ "or equal" write-in
48 31 16	Microturbine Combined Heat and Power Generation	A. (X) Capstone B. ( ) _____ "or equal" write-in

END OF SCHEDULE OF MAJOR EQUIPMENT AND MATERIAL SUPPLIER

PAGE INTENTIONALLY LEFT BLANK



SECTION 5

CONTRACTOR'S QUALITY CONTROL PROGRAM

CONTRACTOR'S QUALITY CONTROL PROGRAM

OVERVIEW

In construction, a Quality Control Program (QCP) can be defined simply as "a systematic Program employed by a Contractor to fulfill a project's requirements for quality as defined by the Contract Documents". At W.M. Lyles Co., (Lyles) we believe that the Contractor always has complete responsibility for the quality of the work and our experience has taught us that in order for a QCP to be successful, it must include the following ingredients:

Program Organization - Identification of the personnel responsible for implementation of the QCP, their individual responsibilities, and the requirements for communication between project stakeholders

Program Standards - Identification and definition of the specific quality standards to be met

Preparatory Controls - Description of the proactive actions that will be taken to ensure that the Program Standards are met

Confirmation Procedures – Description of the specific actions that will be taken to inspect the work and document activities affecting quality

Corrective Controls - Description of the corrective actions that will be taken in the event that the Program Standards are not met

Based on this, the following QCP outline has been developed specifically for the ERP. This outline describes both the methodology and procedures that will be utilized by Lyles to ensure that our finished product complies with all of the Project's quality standards.

QUALITY CONTROL PROGRAM

I. Program Organization

A. Authority and Responsibilities of QC Manager

1. Establishment of the QCP

a. Develop the procedures and controls needed to assure optimum quality throughout all phases of the Project.

b. Assign responsibility for the execution of various QC functions to members of the Project Team.

c. Develop the checklists and forms necessary to document verification that the Work is in compliance with the Contract Documents.

d. Develop the reports and documentation necessary to record the enforcement and effectiveness of the QCP.

2. Implementation and enforcement of the QCP

a. Conduct Pre-Installation Conferences prior to the start of each Division, Section, or major item of Work.

b. Supervise the execution of the various QC functions by members of the Project Team.

c. Verify that all materials, equipment, and procedures utilized in the execution of the work are in conformance with the Program Standards

d. Perform initial, in-process, and final inspections on each segment of work.

e. Identify, report, and reject defective and/or non-conforming work and identify and monitor corrective actions.

f. Generate Monthly QC Report.

II. Program Standards

A. Contract Documents

1. Prescriptive and/or performance based requirements identified in the Specifications

2. Prescriptive and/or performance based requirements identified in the City of Roseville Standard Drawings

3. Prescriptive and/or performance based requirements identified in applicable Building Codes

B. Stakeholder Requirements

1. Quality outcomes desired by the City and its Operations and Maintenance Staff

2. Quality outcomes desired by the Neighborhood and the Community at large

3. Quality outcomes desired by the Engineer

4. Quality outcomes desired by Lyles and its sub-

contractors and suppliers

III. Preparatory Controls

A. Submittal Control

1. Under the supervision of the QC Manager, the Project Team will review all Submittals prior to them being forwarded to the Engineer for approval. This review will consist of verifying that the Submittals are complete, that they are in conformance with the Contract Documents, and that they have been coordinated with any related and/or affected work.

B. Off-site Quality Control, Inspection, and Material Certification

1. When required by the Contract Documents, Source Quality Control Programs and/or Material Certifications will be furnished by various suppliers. These items, as well as other required qualifications, certifications and test results will be furnished to the Engineer via Submittals under separate cover.

2. When deemed necessary by the QC Manager due to the identification of poor quality material or equipment, copies of a manufacturer's Quality Control Program(s) and/or visits to their off-site facilities may be required.

C. Pre-Work Activities

1. Completion of a Pre-Installation Conference to ensure that the required preparations for the execution of upcoming work have been performed.

2. Review of all relevant Contract Documents, Submittals, RFI's, Change Orders, and the CPM Schedule.

3. Review of all relevant QC procedures, testing and/or inspection requirements, and notification requirements.

4. Verification that all preceding work has been properly completed and accepted by the QC Manager and/or the City's Representative.

5. Physical review to confirm that all materials and equipment needed to execute the work to be performed is on-site, available, and ready to be incorporated.

IV. Confirmation Procedures

A. Initial Inspection

1. Prior to proceeding with additional work of the affected scope, the Initial Inspection must be successfully completed and any related QC Field Observation Memos must be signed-off by the QC Manager

B. In-Process Inspection

1. Once a specific item of work has successfully passed its initial inspection, work may continue to completion. During execution of the work additional reviews will be performed to assure that the quality present during the accepted Initial Inspections is maintained.

2. Noted deficiencies which are repetitive in nature will be brought to the attention of the responsible party for immediate correction via a Field Observation Memo. The QC Team will suspend the work in question until a plan for correction, including a recovery schedule, is submitted and approved by the QC Manager.

C. Final Inspection

1. Once the work of a specific scope has been completed, Final Inspection will be called for by the installing party. The scheduling of this inspection will be accomplished by the installing party's completion of a Final Inspection Request (FIR) which is to be submitted to the QC Manager. Upon receipt of this FIR and prior to performance of the final inspection, the QC Team will verify that all previously issued Field Observation Memos have been cleared and that any required testing has been performed.

2. During the Final inspection, all deficiencies will be recorded on a follow-up Field Observation Memo which will be returned to the responsible party for immediate implementation of any required corrections.

D. Confirmation Tests

1. All confirmation tests required to be performed by the Contractor will be done in accordance with the requirements of the Contract Documents and the applicable Program Standards.

2. All confirmation tests required to be performed by the City will be coordinated and scheduled with the City Representative.

E. Documentation Procedures

1. Upon completion of each inspection and/or test, a record (checklist, form, Field Observation Memo, etc.) will be generated in accordance with the QCP.

V. Corrective Controls

A. Identification and Documentation

1. Deficiencies identified during each phase of the project will be documented through the use of Submittal Review Forms, Daily Inspection Logs, Testing Records, and Field Observation Memos, as applicable.

B. Notification

1. Immediately following the identification and documentation of a deficiency, all responsible parties will be notified and a copy of all relative documentation will be provided.

C. Execution

1. Upon notification, the responsible parties will coordinate with the QC Manager to identify the corrective actions to be taken. Corrective work will not commence without the approval of the QC Manager. All corrective work will be subject to the Confirmation Procedures outlined above.

D. Recurrence Prevention

1. Recurrence of deficiencies is to be avoided at all cost. At the discretion of the QC Manager, parties responsible for repetitive deficiencies may be required to perform more significant corrective actions including, but not limited to, the following:

a. Create modified and/or specialized Quality Control Plans outlining revised techniques for preventing the subject deficiencies.

b. Replace the specific individuals responsible for the deficiencies with qualified staff (includes both craft and management).

c. Have the work performed by a 3rd party at the responsible party's expense.

The Right Experience

Linda County Water District – WWTP Upgrade & Expansion

CONTRACT VALUE: $29,547,940

% OF SELF-PERFORMANCE: 65 %

PROJECT RELEVANCE:

1. Numerous shut-downs & tie-ins to existing facilities
2. Included State Revolving Funds
3. Plant remained fully operational during construction
4. Clarifiers



Upgrade and expansion of the existing 1 MGD wastewater plant to a 5 MGD Title 22 Reclaimed Water Facility on a 27 acre site. Work included conversion of an existing clarifier to a storage tank, new Influent Diversion Structure, Headworks, Primary Clarifiers, Activated Sludge Basins, Secondary Clarifiers, Filter Feed Pump Station, Tertiary Filters, Control / Blower / Laboratory Building, Sludge Drying Beds, HDPE-lined and concrete-lined Sludge Lagoons, Stormwater Detention Basins, Sludge Thickening Facility, electrical and instrumentation with SCADA integration, site grading, paving and yard piping.

Proposed Quality Control Manager for the ERP, Jon Shugarte was responsible for ensuring the highest quality standards were met with respect to safety, budget and schedule. John worked in collaboration with Linda County Water District to get the project up and running, on-time and under budget. We perform all Quality Control on many projects especially for our many private clients. This approach has further enhanced our ability of our field forces to deliver unparalled quality with limited oversight. In addition, we work for clients on the other end of the spectrum that have extremely rigid inspection. The combination of these experiences has resulted in the best quality in the business delivered by a "do it right the first time" mentality.



SECTION 6

CONTRACTOR'S CONSTRUCTION SCHEDULER QUALIFICATIONS



FIRM/TITLE
W. M. Lyles Co.

TENURE WITH FIRM
16 years

EDUCATION
- Bachelor of Science, Construction Management, Northern Arizona University, 2003

BUSINESS EXPERIENCE
- W. M. Lyles Co., Southern Division, Assistant Vice President, 2003 to Present

RESPONSIBILITIES
- Prepares iterative schedules as part of GMP
- Works with project team on logic, duration, resources
- Develops and maintains pre-construction schedule
- Prepares Project Schedule updates
- Evaluates re-sequence options, schedule savings

TONY MUELLER
CPM Scheduler

16 Years Experience

Anthony (Tony) Mueller is W. M. Lyles Co.'s (WML) proposed CPM Scheduler for the Pleasant Grove WWTP Energy Recover Project. He brings over 16 year of construction experience and has been responsible for developing the schedule on near every project that he has managed. As both Project Manager and CPM Scheduler on this Project, Tony will work closely with both City Staff and the Project Team to ensure that critical path activities are well identified so that they receive the focus that the deserve. He will also be responsible for updating the schedule to reflect actual work performed, preparing monthly reports and narratives for distribution, and assisting with critical path analysis so that all parties understand the implications of schedule revisions and/or change order work.

One great example of Tony's scheduling capability can be found in Appendix C – Baseline CPM Schedule. The sample CPM schedule included in the Appendix is, in fact, a preliminary schedule for the Energy Recover Project as developed by Tony.

WHY TONY?
- Proven experience developing CPM schedules for many of Lyles qualifying projects, including; City of Fresno, SE Surface Water Treatment Facility, and the Moreno Valley Regional Water Reclamation Plant
- 16 years of CPM scheduling experience dealing exclusively in the wastewater market
- Lives and works local to the City of Roseville, so he is invested in the successful completion of the ERP Project

RELEVANT PROJECT EXPERIENCE

City of Fresno - SE Surface Water Treatment Facility, DBB, 2018, $162,089,360 Project Executive
Project Relevance:
- CPM Schedule created by Tony
- Two (2) secondary clarifiers
- Included State Revolving Funds

Construction of a complete and operable 80 MGD surface water treatment facility to produce potable drinking water that meets the requirements of California Administrative Code, Title 22 for potable drinking water including; construction of temporary construction facilities, construction of 72" raw water and treated water transmission piping, two conventional flocculation/ sedimentation pretreatment basins with inclined plate settlers, two concrete intermediate ozone contact basins and an ozone generation facility, eight dual media GAC filters, 8 million gallon treated water reservoir, treated water pump station, chemical building, maintenance building, wash water recovery and solids handling lagoons, wash water recovery pump station, standby generators, electrical substation, site grading and paving, process and utility piping, and site fencing and landscaping. Created and maintained a 3800 activity P6 scheduling for an accelerated 33 month construction schedule. This schedule was cost and

resource loaded.

Moreno Valley Regional Water Reclamation Plant, DBB, 2012, $29,761,402, Senior Project Manager/CPM Scheduler
Project Relevance:
- Plant Expansion
- Odor control facility
- Anerobic digesters

Upgrade of existing 15.8MGD water reclamation plant to 18.5MGD, including yard structures, headworks, influent pump station, grit basins, power and blower buildings, chemical scrubber odor control facility, secondary effluent pump station, tertiary effluent/utility water pump station, tertiary effluent meter vault, acid-phase digester and flare, methane-phase digester, digested sludge storage tanks, low pressure digester gas holder, 15KW generator, boiler facility, electrical buildings, and related appurtenances.

Palmdale Water Reclamation Plant Stage Five Plant Expansion, Phase I, DBB, 2012, $114,116,000, Project Manager
Project Relevance:
- Plant Expansion Upgrade
- Diegesters
- Included State Revolving Funds
- Plant remained fully operational during construction

Expansion of existing 9MGD water reclamation plant to 15MGD, including final sedimentation tanks, aeration tanks, chlorine contact tank, digester, digester cleaning bed, Title 22 tertiary cloth disk filters, dissolved air flotation units, RAS pump station, digester transfer and sludge recirculation pump station, chemical facilities, generator and air compressor buildings, boiler house, switchboard building, operations and lab building, and associated pipelines.

Linda County Water District – Wastewater Treatment Plant Upgrade & Expansion, DBB, 2012, Executive Sponsor, $29,149,127
Project Relevance:
- Two (2) primary clarifiers
- Two (2) secondary clarifiers
- Electrical & Instrumentation systems
- WWTP upgrade and expansion

Construction of a new 5MGD Wastewater Treatment Plant on a 27 acre site adjacent to an existing treatment plant. New facilities include a headworks, two primary clarifiers, four activated sludge basins, two secondary clarifiers, filter pump station, six effluent filters, sludge thickening system, sludge drying beds, sludge lagoons, site grading, and associated piping, electrical, and instrumentation systems. Upgrades to the existing plant include the demolition of existing facilities and modifications to the existing effluent pump station.

City of Galt WWTP – Tertiary Filtration, UV Disinfection, & Biosolids Improvements, DBB, Estimator, 2010, $11,732,000
Project Relevance:
- Numerous shut-downs & tie-ins to existing facilities
- WWTP expansion
- Included State Revolving Funds
- Plant remained fully operational during construction
- Key Personnel: Stan Simmons, Joe Lawrence, John Lunsford, Jon Shugarte, Tony Mueller, Wade Johnson and TESCO

Expansion of an existing Wastewater Treatment Plant to 6MGD including tertiary filtration and ultraviolet disinfection capabilities, a biosolids dewatering facility, biosolids storage and transfer facilities, operations and electrical building, pump stations, backup power generation, and additional infrastructure. American Public Works Association (APWA) Project of the Year 2010. Expedited delivery: 12 month contract time.



SECTION 12

IRAN CONTRACTING ACT DISCLOSURE

ATTACHMENT 6

IRAN CONTRACTING ACT DISCLOSURE FORM
To be submitted with Sealed Technical Proposal (Part 1)

GENERAL

GENERAL REQUIREMENTS

PURSUANT TO THE IRAN CONTRACT ACT OF 2010 (CALIFORNIA PUBLIC CONTRACT CODE, SECTIONS 2202-2208), PROPOSERS ARE INELIGIBLE TO PROPOSE ON PROJECTS WITH A PUBLIC ENTITY FOR GOODS OR SERVICES OF ONE MILLION DOLLARS ($1,000,000) OR MORE IF THE PROPOSER ENGAGES IN INVESTMENT ACTIVITIES IN IRAN.

PROPOSERS MUST PROVIDE THE BELOW DISCLOSURE FORM AS A MANDATORY SUBMITTAL FOR ALL PROJECTS IN EXCESS OF $1,000,000. THE IRAN CONTRACTING ACT DISCLOSURE FORM SHALL BE SUBMITTED BY ALL PROPOSERS AS A MANDATORY SUBMITTAL.

(California Public Contract, Sections 2202-2208)

When responding to a bid or proposal or executing a contract or renewal for a City contract for goods or services of $1,000,000 or more, a vendor must either: a) certify it is **not** on the current list of persons engaged in investment activities in Iran created by the California Department of General Services ("DGS") pursuant to Public Contract Code section 2203(b) and is not a financial institution extending twenty million dollars ($20,000,000) or more in credit to another person, for 45 days or more, if that other person will use the credit to provide goods or services in the energy sector in Iran and is identified on the current list of persons engaged in investment activities in Iran created by DGS; or b) demonstrate it has been exempted from the certification requirement for that solicitation or contract pursuant to Public Contract Code Section 2203(c) or (d).

To comply with this requirement, please provide your vendor or financial institution name and complete **one** of the options on the following page. Please note: California law establishes penalties for providing false certifications, including civil penalties equal to the greater of $250,000 or twice the amount of the contract for which the false certification was made; contract termination; and three-year ineligibility to bid on contracts. (Public Contract Code section 2205.)

OPTION #1 – CERTIFICATION

I, the official named below, certify I am duly authorized to execute this certification on behalf of the vendor/financial institution identified below, and the vendor/financial institution identified below is **not** on the current list of persons engaged in investment activities in Iran created by DGS and is not a financial institution extending twenty million ($20,000,000) or more in credit to another person/vendor, for 45 days or more, if that other person/vendor will use the credit to provide goods or services in the energy sector in Iran and is identified on the current list of persons engaged in investment activities in Iran created by DGS.

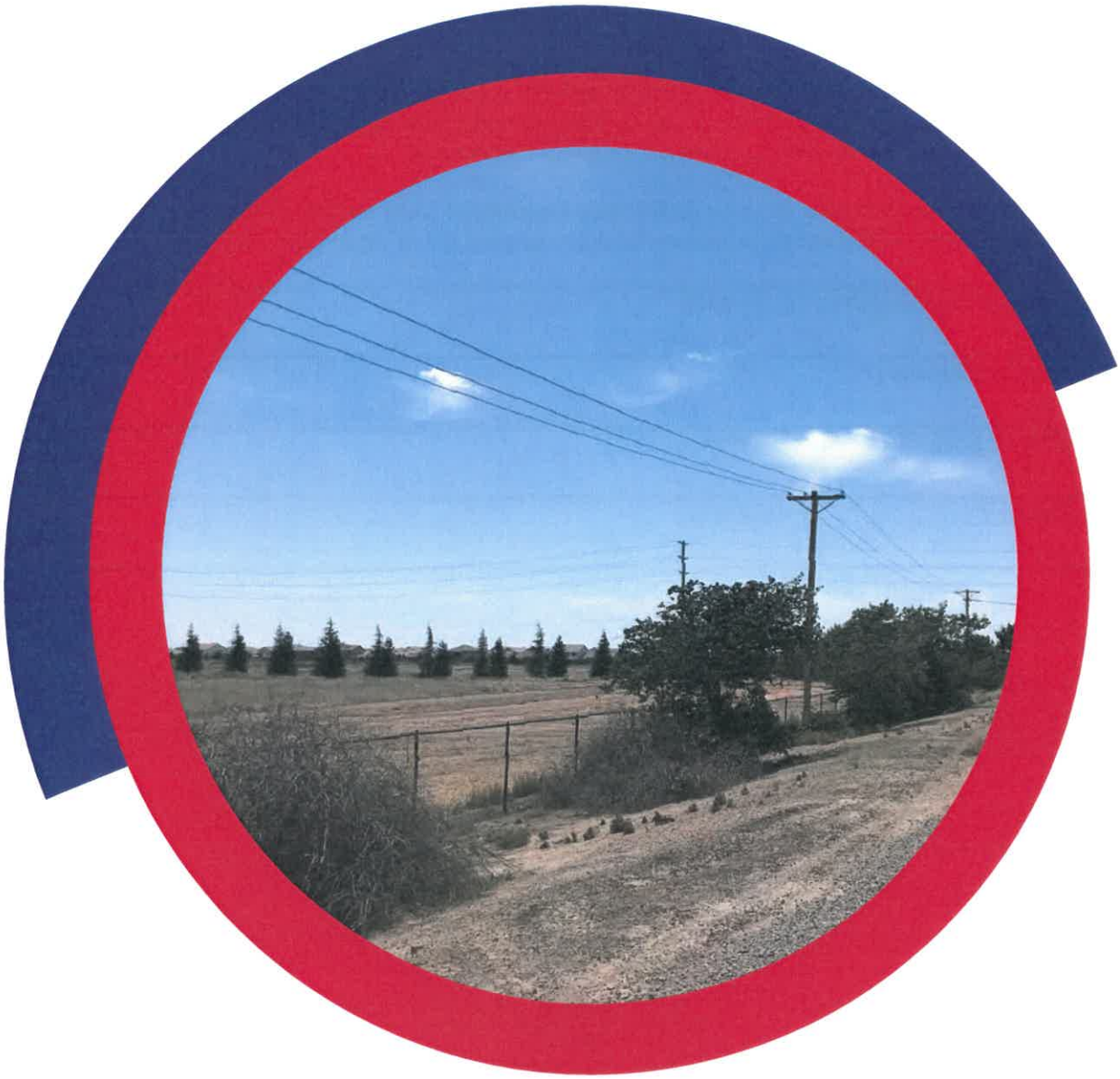
Vendor Name/Financial Institution (Printed) W. M. Lyles Co.	
By (Authorized Signature)	
Printed Name and Title of Person Signing Joseph E. Lawrence, Asst. Vice President	
Date Executed 7/22/2019	*Executed in* Rocklin, CA

OPTION #2 – EXEMPTION

Pursuant to Public Contract Code sections 2203(c) and (d), a public entity may permit a vendor/financial institution engaged in investment activities in Iran, on a case-by-case basis, to be eligible for, or to bid on, submit a proposal for, or enters into or renews, a contract for goods and services.

If you have obtained an exemption from the certification requirement under the Iran Contracting Act, please fill out the information below, and attach documentation demonstrating the exemption approval.

Vendor Name/Financial Institution (Printed)	
By (Authorized Signature)	
Printed Name and Title of Person Signing	
Date Executed	*Executed in*



SECTION 13

PROPOSER CERTIFICATIONS AND SIGNATURES PROPOSAL FORM

ATTACHMENT 7

PROPOSER'S CERTIFICATIONS AND SIGNATURES
PLEASANT GROVE WASTEWATER TREATMENT PLANT ERP
To be submitted with Sealed Technical Proposal (Part 1)

In response to the Request for Bid Proposals (RFBP), Section I, dated June 3, 2019 and in accordance with the accompanying SELECTION PROCESS AND INSTRUCTIONS TO PROPOSERS, Section II, the undersigned hereby proposes to City to furnish all plant, labor, technical and professional services, supervision, materials, and equipment (other than materials and equipment specified as furnished by City), and to perform all operations necessary and required for construction of the Pleasant Grove Wastewater Treatment Plant Energy Recovery Project, in accordance with the Contract Documents, and any Addenda thereto, for the Total Guaranteed Maximum Price (GMP) and all other terms submitted in the Bid Proposal.

This Bid Proposal constitutes a firm offer to City, which cannot be withdrawn for 120 days from and after the date set for receiving Bid Proposals, or until the Agreement is fully executed by City, whichever is earlier.

The undersigned Proposer hereby certifies that it has examined and is fully familiar with all of the provisions of the Contract Documents; has carefully checked all of the words and figures shown on its Bid Proposal; has carefully reviewed the accuracy of all statements in this Bid Proposal and attachments hereto; and understands and agrees that City will not be responsible for any errors or omissions on the part of the undersigned in preparing this Bid Proposal.

The undersigned Proposer has, by careful examination of the Contract Documents, and by examination of the actual Site conditions, satisfied itself as to the nature and location of all Work, the general and local conditions to be encountered in the performance of any Work, the requirements of the Contract Documents, and all other matters that can in any way affect the Work or the cost thereof.

The undersigned agrees to execute the Agreement and provide City the executed Agreement, the required insurance certificates, endorsements, and waivers of subrogation, and the required surety bonds within fifteen (15) calendar days after the undersigned's receipt of the City's notice that the undersigned will be recommended for Project award and prior to award of the Agreement by the City Council.

The undersigned Proposer certifies that it is now licensed in accordance with the provisions of the Contractor's License Law of the State of California, and the number of said license is 422390 and the classification of said license is A, B, and the said license expires 5/31/2020.

The undersigned Proposer certifies that it is now registered with the Department of Industrial Relations (DIR) to do public work pursuant to California Labor Code Section 1725.5. The number of said registration is 1000001448, and the said registration expires 6/30/2022.

The undersigned Proposer certifies that no official or employee of the City has an interest, has been employed or retained to solicit or aid in the procuring of the resulting agreement, nor that any such person will be employed in the performance of such work without immediate divulgence of such fact to the City. Proposers submitting a Bid Proposal in response to this RFBP must disclose any actual, apparent, direct, indirect, or potential conflicts of interest that may exist with respect to the Proposer or the Proposer's management or employees relative to the services to be provided to the City. Conflict of interest issues may require consultation with legal counsel. **If a Proposer has no conflicts of interest, a statement to that effect must be added to this ATTACHMENT 7.** Violation of this section shall be a material breach of the Agreement entitling the City to any and all remedies by law or in equity.

The undersigned Proposer certifies that no undue influence or pressure is used against or in concert with any officer or employee of the City in connection with the award or terms of the Agreement that will be executed as a result of this RFBP, including any method of coercion, confidential financial arrangement or financial

inducement. No officer or employee of the City shall receive compensation, directly or indirectly, from the Proposer, or from any officer, employee or agent of the Proposer, in connection with the award of the Agreement or any Work to be conducted as a result of this RFBP. Violation of these requirements shall be a material breach of the contract entitling the City to any and all remedies by law or in equity.

The undersigned Proposer certifies that the designated project team, including subcontractors, will be used for this Project. Departure or reassignment of, or substitution for, any member of the designated project team or subcontractors shall not be made without the prior written approval of the City.

The undersigned Proposer acknowledges receipt, understanding, and full consideration of the following Addenda:

Addendum Number	Addendum Date	Signature of Proposer
1	06/04/19	
2	06/18/19	
3	06/27/19	
4	07/03/19	
5	07/10/19	
6	07/12/19	

IF PROPOSER IS:
An Individual

Name (typed or printed): N/A

By: _____
(Individual's signature)

Doing business as: _____

Business Address: _____

Phone Number: ( ) _____ FAX Number: ( ) _____

Email Address of Authorized Representative: _____

A Partnership

Partnership Name (typed or printed): N/A

By: _____
(Signature of general partner- attach evidence of authority to sign)

Name (typed or printed): _____

Business Address: _____

Phone Number: ( ) _____ FAX Number: ( ) _____

Email Address of Authorized Representative: _____

A Corporation

Corporation Name (typed or printed): W. M. Lyles Co.

State of Incorporation: California

By: _____ (SEAL)
(Signature - attach evidence of authority to sign)

Name (typed or printed): Joseph B. Lawrence

Title: Asst. Vice President

(CORPORATE SEAL)

Attest: _____
(Signature of Corporate Secretary)

Name (typed or printed): Ruben Moreno, Jr.

Date of Qualification to do business is: 5/19/1982

Business Address: 1210 W. Olive Ave., Fresno, CA 93728

Phone Number: (559) 441-1900 FAX Number: (559) 487-7949

Email Address of Authorized Representative: jlawrence@wmlylesco.com

If person executing on behalf of a Corporation is not the President or Vice President, evidence of authority to sign on behalf of Corporation must be attached.

A Limited Liability Company

Limited Liability Company Name: N/A

By: _____

(Signature of Managing Partner or Officer - attach evidence of authority to bind the LLC under the LLC's articles of organization)

Name (typed or printed): _____

Title: _____

Business Address: _____

Phone Number: ( ) _____ FAX Number: ( ) _____

Email Address of Authorized Representative: _____

CERTIFICATION

This is to certify that I, Ruben Moreno, Jr., am the Secretary of W. M. Lyles Co., that W. M. Lyles Co. (formerly known as Pac-Nine Construction), is a California Corporation incorporated May 6, 1982, and that the attached Sections 7, 8, 9, and 10 from Article IV of the Bylaws are true and accurate copies, and that said Bylaws were duly adopted by the Board of Directors of the Corporation at its meeting on December 14, 1983, and Sections 7, 8, 9, and 10 of Article IV have not been amended to this date.

I further certify that at various duly called meetings of the Board of Directors of W. M. Lyles Co. held on October 4, 2010, October 11, 2012, June 17, 2013, October 1, 2013, May 19, 2017, March 29, 2018, and October 1, 2018, the following officers were elected:

Stanley H. Simmons – President/CEO/Treasurer (CFO)
Kenneth D. Strosnider – Executive Vice President
Robert P. Saleen – Senior Vice President
David H. O'Dear – Assistant Vice President/Assistant Secretary
Joseph B. Lawrence – Assistant Vice President
Kevin R. Shigematsu – Assistant Vice President
Anthony M. Mueller – Assistant Vice President
Ruben Moreno, Jr. - Secretary
Scott R. Fults – Assistant Secretary
Chanel L. Prince – Assistant Secretary

I also certify as of the date of this certification no changes have occurred.

DATED: July 22, 2019

Ruben Moreno, Jr.
Secretary

all members of the Board shall individually or collectively consent in writing to such action. Such written consent or consents shall be filed with the minutes of the proceedings of the Board.

ARTICLE IV

OFFICERS

Section 1. OFFICERS. The officers of the corporation shall be a Chief Executive Officer, a President, a Secretary and a Chief Financial Officer. The corporation may also have, at the discretion of the Board of Directors, a Chairman of the Board, one or more vice presidents, and one or more assistant secretaries or treasurers and such other officers as may be appointed in accordance with the provisions of Section 3 of this Article. Officers other than the Chairman of the Board need not be directors. One person may hold two or more offices.

Section 2. ELECTION. The officers of the corporation, except such officers as may be appointed in accordance with the provisions of Section 3 or Section 5 of this Article, shall be chosen annually by the Board of Directors, and each shall hold his office until he shall resign or shall be removed or otherwise disqualified to serve, or his successor shall be elected and qualified. Officers need not be shareholders of the corporation.

Section 3. SUBORDINATE OFFICERS, ETC. The Board of Directors may appoint such other officers as the business of the corporation may require, each of whom shall hold office for such period, have such authority and perform such duties as are provided in the By-laws or as the Board of Directors may from time to time determine.

Section 4. REMOVAL AND RESIGNATION. Any officer may be removed, either with or without cause, by a majority of the directors at the time in office, at any regular or special meeting of the Board or by any officer upon whom such power of removal may be conferred by the Board of Directors.

Any officer may resign at any time by giving written notice to the Board of Directors or to the Chief Executive Officer or to the Secretary of the corporation. Any such resignation shall take effect at the date of the receipt of such notice or at any later time specified therein; and, unless otherwise specified therein, the acceptance of such resignation shall not be necessary to make it effective.

Section 5. VACANCIES. A vacancy in any office because of death, removal, resignation, disqualification or any other cause shall be filled in the manner prescribed in the By-laws for regular appointments to such office.

Section 6. CHAIRMAN OF THE BOARD. The Chairman of the Board, if there shall be such an officer, shall, if present, preside at all meetings of the Board of Directors and exercise and perform such other powers and duties as may be from time to time assigned to him by the Board of Directors or prescribed by the By-laws.

Section 7. CHIEF EXECUTIVE OFFICER. Subject to such supervisory powers, if any, as may be given by the Board of Directors to the Chairman of the Board, if there be such an officer, the Chief Executive Officer shall, subject to the control of the Board of Directors, have general supervision, direction and control of the business and officers of the corporation. He shall preside at all meetings of the shareholders and, in the absence of the Chairman of the Board, or if there be none, at all meetings of the Board of Directors. He shall be ex officio a member of all the standing committees, including the Executive Committee, if any, and shall have the general powers and duties of management usually vested in the office of president of a corporation and shall have such other powers and duties as may be prescribed by the Board of Directors or the By-laws.

Section 8. PRESIDENT. In the absence or disability of the Chief Executive Officer, the President shall perform all of the duties of the Chief Executive Officer and when so acting shall have all of the powers of and be subject to all of the restrictions on the Chief Executive Officer. The President shall have such other powers and perform such other duties as from time to time may be prescribed by the Chief Executive Officer, the Board of Directors or the By-Laws.

Section 9. VICE PRESIDENT. In the absence or disability of the President, the vice presidents in order of their rank as fixed by the Board of Directors or, if not ranked, the Vice President designated by the Board of Directors, shall perform all the duties of the President, and when so acting shall have all the powers of and be subject to all the restrictions upon the President. The vice presidents shall have such other powers and perform such other duties as from time to time may be prescribed for them, respectively, by the Board of Directors or the By-laws.

Section 10. SECRETARY. The Secretary shall keep, or cause to be kept, a book of minutes at the principal

office or such other place as the Board of Directors may order of all meetings of directors and shareholders, with the time and place of holding, whether regular or special, and, if special, how authorized, the notice thereof given, the names of those present at directors' meetings, the number of shares present or represented at shareholders' meetings and the proceedings thereof.

The Secretary shall keep, or cause to be kept, at the principal office or at the office of the corporation's transfer agent a share register or a duplicate share register showing the names of the shareholders and their addresses, the number and classes of shares held by each, the number and date of certificates issued for the same, and the number and date of cancellation of every certificate surrendered for cancellation.

The Secretary shall give, or cause to be given, notice of all meetings of the shareholders and of the Board of Directors required by law or by the By-laws to be given, and he shall keep the seal of the corporation in safe custody and shall have such other powers and perform such other duties as may be prescribed by the Board of Directors or the By-laws.

Section 11. CHIEF FINANCIAL OFFICER. The Chief Financial Officer shall keep and maintain, or cause to be kept and maintained, adequate and correct accounts of the properties and business transactions of the corporation, including accounts of its assets, liabilities, receipts, disbursements, gains, losses, capital, surplus and shares. Any surplus, including earned surplus, paid-in surplus and surplus arising from a reduction of stated capital, shall be classified according to source and shown in a separate account. The books of account shall at all times be open to inspection by any director.

The Chief Financial Officer shall deposit all moneys and other valuables in the name and to the credit of the corporation with such depositaries as may be designated by the Board of Directors. He shall disburse the funds of the corporation as may be ordered by the Board of Directors, shall render to the Chief Executive Officer and directors, whenever they request it, an account of all of his transactions as Chief Financial Officer and of the financial condition of the corporation and have such other powers and perform such other duties as may be prescribed by the Board of Directors or by the By-laws.

Attachment 7

Conflict of Interest

We hereby certify that no official or employee of the City has an interest, has been employed or retained to solicit or aid in the procuring of the resulting agreement, nor that any such person will be employed in the performance of such without immediate divulgence of such fact to the City.

W. M. Lyles Co.



Joseph B. Lawrence, Asst. Vice President



SECTION 14

SWRCB CWSRF FORMS

ATTACHMENT 8

Disadvantaged Business Enterprise (DBE) Program DBE Subcontractor Performance Form

This form is intended to capture the DBE[1] subcontractor's[2] description of work to be performed and the price of the work submitted to the prime contractor. A Financial Assistance Agreement Recipient must require its prime contractor to have its DBE subcontractors complete this form and include all completed forms in the prime contractor's bid or proposal package.

Subcontractor Name: Blocka Construction, Inc.		Project Name: Pleasant Grove WWTP Energy Recovery Project
Bid / Proposal No.: 9061	Assistance Agreement ID No. (if known):	Point of Contact: Lori Magruder
Address: 4455 Enterprise Street, Fremont, CA 94538		
Telephone No.: 510-657-3686		Email Address: bids@blockainc.com
Prime Contractor Name: W. M. Lyles Co.		Issuing/Funding Entity: CWSRF

Contract Item Number	Description of Work Submitted from the Prime Contractor Involving Construction, Services, Equipment or Supplies	Price of Work Submitted to the Prime Contractor
	HVAC	$ 106,450.00

DBE Certified By: DOT ✓ SBA ✓ Other: Supplier Clearinghouse

Meets/exceeds EPA certification standards? YES NO (Unknown)

[1] A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.2015 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.

[2] Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an award of financial assistance.

FORM 4500-3 (DBE Subcontractor Performance Form)

I certify under penalty of perjury that the forgoing statements are true and correct. Signing this form does not signify a commitment to utilize the subcontractors above. I am aware that in the event of a replacement of a subcontractor, I will adhere to the replacement requirements set forth in 40 CFR Part 33 Section 33.302 (c).

Prime Contractor Signature	Print Name
	Joseph B. Lawrence
Title	**Date**
Asst. Vice President	June 22, 2019

Subcontractor Signature	Print Name
	Patricia Jean Blocka
Title	**Date**
CFO/COO	7/17/19

The public reporting and record keeping burden for this collection of information is estimated to average three (3) hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Do not send the completed form to this address.

FORM 4500-3 (DBE Subcontractor Performance Form)

ATTACHMENT 8

Disadvantaged Business Enterprise (DBE) Program DBE
Subcontractor Performance Form

This form is intended to capture the DBE[1] subcontractor's[2] description of work to be performed and the price of the work submitted to the prime contractor. A Financial Assistance Agreement Recipient must require its prime contractor to have its DBE subcontractors complete this form and include all completed forms in the prime contractor's bid or proposal package.

Subcontractor Name **Martin Brothers Construction**		Project Name Pleasant Grove WWTP Energy Recovery Project
Bid / Proposal No.	Assistance Agreement ID No. (if known)	Point of Contact **Nick Rutherford, Estimator**
Address **8801 Folsom Blvd Suite 260 Sacramento, CA 95826**		
Telephone No. **916-381-0911**		Email Address **estimating@martinbrothers.net**
Prime Contractor Name W. M. Lyles Co.		Issuing/Funding Entity Clean Water State Revolving Fund

Contract Item Number	Description of Work Submitted from the Prime Contractor Involving Construction, Services, Equipment or Supplies	Price of Work Submitted to the Prime Contractor
--	**Asphalt Site Paving**	**$179,417.25**

DBE Certified By: N/A DOT N/A SBA
Other: * See Below

Meets/exceeds EPA certification standards?
YES NO (Unknown)

*** Martin Brothers Construction is currently only certified as a MBE under the Supplier Clearinghouse for the Utility Supplier Diversity Program of the California Public Utilities Commision**

[1] A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.2015 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.
[2] Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor
to provide services pursuant to an award of financial assistance.

FORM 4500-3 (DBE Subcontractor Performance Form)

I certify under penalty of perjury that the forgoing statements are true and correct. Signing this form does not signify a commitment to utilize the subcontractors above. I am aware that in the event of a replacement of a subcontractor, I will adhere to the replacement requirements set forth in 40 CFR Part 33 Section 33.302 (c).

Prime Contractor Signature	Print Name
	Joseph B. Lawrence
Title	Date
Asst. Vice President	June 22, 2019

Subcontractor Signature	Print Name
	Nick Rutherford
Title	Date
Estimator	**July 16, 2019**

The public reporting and record keeping burden for this collection of information is estimated to average three (3) hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Do not send the completed form to this address.

FORM 4500-3 (DBE Subcontractor Performance Form)

ATTACHMENT 8

Water Boards

Disadvantaged Business Enterprise (DBE) Program DBE Subcontractor Performance Form

This form is intended to capture the DBE[1] subcontractor's[2] description of work to be performed and the price of the work submitted to the prime contractor. A Financial Assistance Agreement Recipient must require its prime contractor to have its DBE subcontractors complete this form and include all completed forms in the prime contractor's bid or proposal package.

Subcontractor Name: Mason Painting		Project Name: PGWTP Energy Recovery Project
Bid / Proposal No.	Assistance Agreement ID No. (if known): 55943	Point of Contact: Gus Kelley
Address: P.O. Box 1115 Orangevale CA 95662		
Telephone No.: (916) 852-8060		Email Address: guskelley masonpainting@gmail.com
Prime Contractor Name: W. M. Lyles Co.		Issuing/Funding Entity: Clean Water State Revolving Fund

Contract Item Number	Description of Work Submitted from the Prime Contractor Involving Construction, Services, Equipment or Supplies	Price of Work Submitted to the Prime Contractor
	Painting & Coatings	$197,156

DBE Certified By: DOT ___ SBA ___ Other: CA Department of General Services	Meets/exceeds EPA certification standards? YES NO (Unknown)

[1] A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.2015 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.

[2] Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an award of financial assistance.

FORM 4500-3 (DBE Subcontractor Performance Form)

I certify under penalty of perjury that the forgoing statements are true and correct. Signing this form does not signify a commitment to utilize the subcontractors above. I am aware that in the event of a replacement of a subcontractor, I will adhere to the replacement requirements set forth in 40 CFR Part 33 Section 33.302 (c).

Prime Contractor Signature	Print Name
	Joseph B. Lawrence
Title	Date
Asst. Vice President	June 22, 2019

Subcontractor Signature	Print Name
	Scott Dorn
Title	Date
Treasurer	7/22/19

The public reporting and record keeping burden for this collection of information is estimated to average three (3) hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Do not send the completed form to this address.

FORM 4500-3 (DBE Subcontractor Performance Form)

ATTACHMENT 9

Disadvantaged Business Enterprise (DBE) Program DBE Subcontractor Utilization Form

This form is intended to capture the prime contractor's actual and/or anticipated use of identified certified DBE[1] subcontractor's[2] and the estimated dollar amount of each subcontract. A Financial Assistance Agreement Recipient must require its prime contractors to complete this form and include it in the bid or proposal package. Prime contractors should also maintain a copy of this form on file.

Prime Contractor Name W. M. Lyles Co.		Project Name Pleasant Grove WWTP Energy Recovery Project
Bid / Proposal No.	Assistance Agreement ID No. (if known)	Point of Contact Joseph B. Lawrence
Address 1210 W. Olive Avenue, Fresno, CA 93728		
Telephone No. (559) 441-1900		Email Address jlawrence@wmlylesco.com
Issuing/Funding Entity Clean Water State Revolving Fund		

I have identified potential DBE certified subcontractors. YES X NO ___

If *yes*, please complete the table below. If *no*, please explain:

Subcontractor Name/ Company Name	Company Address / Phone / Email	Estimated Dollar Amount	Currently DBE Certified?
Blocka Construction, Inc.	4455 Enterprise Street, Fremont, CA 94538 Phone: (510) 657-3686 Email: ahollander@blockainc.com	$106,450.00	Yes
Martin Brothers Construction	8801 Folsom Blvd., Suite 260, Sacramento, CA 95826 Phone: (916) 381-0911 Ext. 131 Email: cdennis@martinbrothers.net	$179,417.25	Yes
Mason Painting, Inc.	P.O. Box 1115, Orangevale, CA 95662 Phone: (916) 852-8060 Email: guskelleymasonpaint@gmail.com	$197,156.00	Yes

--Continue on back if needed--

[1] A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.2015 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.

[2] Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an award of financial assistance.

FORM 4500-4 (DBE Subcontractor Utilization Form)

I certify under penalty of perjury that the forgoing statements are true and correct. Signing this form does not signify a commitment to utilize the subcontractors above. I am aware that in the event of a replacement of a subcontractor, I will adhere to the replacement requirements set forth in 40 CFR Part 33 Section 33.302 (c).

Prime Contractor Signature	Print Name
	Joseph B. Lawrence
Title	Date
Asst. Vice President	July 22, 2019

The public reporting and record keeping burden for this collection of information is estimated to average three (3) hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Do not send the completed form to this address.

FORM 4500-4 (DBE Subcontractor Utilization Form)

ATTACHMENT 10

CONSOLIDATED APPROPRIATIONS ACT
BUY AMERICAN IRON AND STEEL CERTIFICATION

Project: PLEASANT GROVE WASTEWATER TREATMENT PLANT ERP

1. Identification of American-made Iron, Steel, and Manufactured Goods: Consistent with the terms of the Purchaser's bid solicitation and provisions of Section 436 of the Consolidated Appropriations Act of 2014, the Proposer certifies that this Bid Proposal reflects the Proposer's best, good faith effort to identify domestic sources of iron, steel, and manufactured goods for every component contained in the bid solicitation where such American-made components are available on the schedule and consistent with deadlines prescribed in or required by the bid solicitation.

2. Verification of U.S. Production: The Proposer certifies that all components contained in the bid solicitation that are American-made have been so identified, and if this bid is accepted, the Bidder agrees that it will provide reasonable, sufficient, and timely verification to the Purchaser of the U.S. production of each component so identified.

3. Documentation Regarding Non-American-made Iron, Steel, or Manufactured Goods: The Proposer certifies that for any component or components that are not American-made and are so identified in this Bid Proposal, the Proposer has included in or attached to this Bid Proposal one or both of the following, as applicable:

    a. Identification of and citation to a categorical waiver published by the U.S. Environmental protection Agency in the Federal Register that is applicable to such component or components, and an analysis that supports its applicability to the component or components;

    b. Verifiable documentation sufficient to the Purchaser, as required in the bid solicitation or otherwise, that the Proposer has sought to secure American-made components but has determined that such components are not available on the schedule and consistent with the deadlines prescribed in the bid solicitation, with assurance adequate for the Proposer under the applicable conditions stated in the bid solicitation or otherwise.

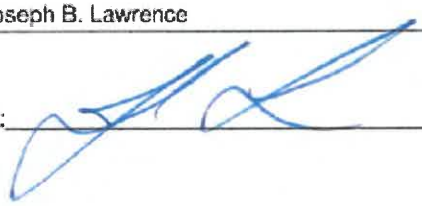
- Information and Detailed Justification Regarding Non-American-made Iron, Steel, or Manufactured Goods: The Proposer certifies that for any such component or components that are not so available, the Proposer has also provided in or attached to this bid information, including but not limited to the verifiable documentation and a full description of the bidder's effort to secure any such American-made component or components, that the Bidder believes are sufficient to provide and as far as possible constitute the detailed justification required for a waiver under section 1605 with respect to such component or components. The Bidder further agrees that, if this bid is accepted, it will assist the Purchaser in amending, supplementing, or further supporting such information as required by the Purchaser to request and, as applicable, implement the terms of a waiver with respect to any such component or components.

THE UNDERSIGNED CERTIFIES THAT THE CONTRACTOR WILL COMPLY WITH THE ABOVE REQUIREMENTS.

CONTRACTOR OR
SUBCONTRACTOR NAME: W. M. Lyles Co.

CERTIFIED BY:

NAME: Joseph B. Lawrence TITLE: Asst. Vice President

SIGNATURE:  DATE: July 22, 2019

END OF ATTACHMENT 10

END OF ENVELOPE ONE, SEALED TECHNICAL PROPOSAL (PART 1)

ATTACHMENT 10

CONSOLIDATED APPROPRIATIONS ACT
BUY AMERICAN IRON AND STEEL CERTIFICATION

Project: PLEASANT GROVE WASTEWATER TREATMENT PLANT ERP

1. Identification of American-made Iron, Steel, and Manufactured Goods: Consistent with the terms of the Purchaser's bid solicitation and provisions of Section 436 of the Consolidated Appropriations Act of 2014, the Proposer certifies that this Bid Proposal reflects the Proposer's best, good faith effort to identify domestic sources of iron, steel, and manufactured goods for every component contained in the bid solicitation where such American-made components are available on the schedule and consistent with deadlines prescribed in or required by the bid solicitation.

2. Verification of U.S. Production: The Proposer certifies that all components contained in the bid solicitation that are American-made have been so identified, and if this bid is accepted, the Bidder agrees that it will provide reasonable, sufficient, and timely verification to the Purchaser of the U.S. production of each component so identified.

3. Documentation Regarding Non-American-made Iron, Steel, or Manufactured Goods: The Proposer certifies that for any component or components that are not American-made and are so identified in this Bid Proposal, the Proposer has included in or attached to this Bid Proposal one or both of the following, as applicable:

    a. Identification of and citation to a categorical waiver published by the U.S. Environmental protection Agency in the Federal Register that is applicable to such component or components, and an analysis that supports its applicability to the component or components;

    b. Verifiable documentation sufficient to the Purchaser, as required in the bid solicitation or otherwise, that the Proposer has sought to secure American-made components but has determined that such components are not available on the schedule and consistent with the deadlines prescribed in the bid solicitation, with assurance adequate for the Proposer under the applicable conditions stated in the bid solicitation or otherwise.

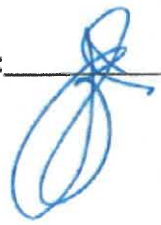
- Information and Detailed Justification Regarding Non-American-made Iron, Steel, or Manufactured Goods: The Proposer certifies that for any such component or components that are not so available, the Proposer has also provided in or attached to this bid information, including but not limited to the verifiable documentation and a full description of the bidder's effort to secure any such American-made component or components, that the Bidder believes are sufficient to provide and as far as possible constitute the detailed justification required for a waiver under section 1605 with respect to such component or components. The Bidder further agrees that, if this bid is accepted, it will assist the Purchaser in amending, supplementing, or further supporting such information as required by the Purchaser to request and, as applicable, implement the terms of a waiver with respect to any such component or components.

THE UNDERSIGNED CERTIFIES THAT THE CONTRACTOR WILL COMPLY WITH THE ABOVE REQUIREMENTS.

CONTRACTOR OR
SUBCONTRACTOR NAME: Blocka Construction, Inc.

CERTIFIED BY:

NAME: Patricia Jean Blocka TITLE: CFO/COO

SIGNATURE:  DATE: 7/17/19

END OF ATTACHMENT 10

END OF ENVELOPE ONE, SEALED TECHNICAL PROPOSAL (PART 1)

ATTACHMENT 10

CONSOLIDATED APPROPRIATIONS ACT
BUY AMERICAN IRON AND STEEL CERTIFICATION

Project: PLEASANT GROVE WASTEWATER TREATMENT PLANT ERP

1. Identification of American-made Iron, Steel, and Manufactured Goods: Consistent with the terms of the Purchaser's bid solicitation and provisions of Section 436 of the Consolidated Appropriations Act of 2014, the Proposer certifies that this Bid Proposal reflects the Proposer's best, good faith effort to identify domestic sources of iron, steel, and manufactured goods for every component contained in the bid solicitation where such American-made components are available on the schedule and consistent with deadlines prescribed in or required by the bid solicitation.

2. Verification of U.S. Production: The Proposer certifies that all components contained in the bid solicitation that are American-made have been so identified, and if this bid is accepted, the Bidder agrees that it will provide reasonable, sufficient, and timely verification to the Purchaser of the U.S. production of each component so identified.

3. Documentation Regarding Non-American-made Iron, Steel, or Manufactured Goods: The Proposer certifies that for any component or components that are not American-made and are so identified in this Bid Proposal, the Proposer has included in or attached to this Bid Proposal one or both of the following, as applicable:

    a. Identification of and citation to a categorical waiver published by the U.S. Environmental protection Agency in the Federal Register that is applicable to such component or components, and an analysis that supports its applicability to the component or components;

    b. Verifiable documentation sufficient to the Purchaser, as required in the bid solicitation or otherwise, that the Proposer has sought to secure American-made components but has determined that such components are not available on the schedule and consistent with the deadlines prescribed in the bid solicitation, with assurance adequate for the Proposer under the applicable conditions stated in the bid solicitation or otherwise.

- Information and Detailed Justification Regarding Non-American-made Iron, Steel, or Manufactured Goods: The Proposer certifies that for any such component or components that are not so available, the Proposer has also provided in or attached to this bid information, including but not limited to the verifiable documentation and a full description of the bidder's effort to secure any such American-made component or components, that the Bidder believes are sufficient to provide and as far as possible constitute the detailed justification required for a waiver under section 1605 with respect to such component or components. The Bidder further agrees that, if this bid is accepted, it will assist the Purchaser in amending, supplementing, or further supporting such information as required by the Purchaser to request and, as applicable, implement the terms of a waiver with respect to any such component or components.

THE UNDERSIGNED CERTIFIES THAT THE CONTRACTOR WILL COMPLY WITH THE ABOVE REQUIREMENTS.

CONTRACTOR OR
SUBCONTRACTOR NAME: CMC Rebar West

CERTIFIED BY:

NAME: Andy Wulff TITLE: Regional Sales Manager

SIGNATURE:  DATE: 7/22/19

END OF ATTACHMENT 10

END OF ENVELOPE ONE, SEALED TECHNICAL PROPOSAL (PART 1)

ATTACHMENT 10

CONSOLIDATED APPROPRIATIONS ACT
BUY AMERICAN IRON AND STEEL CERTIFICATION

Project: PLEASANT GROVE WASTEWATER TREATMENT PLANT ERP

1. Identification of American-made Iron, Steel, and Manufactured Goods: Consistent with the terms of the Purchaser's bid solicitation and provisions of Section 436 of the Consolidated Appropriations Act of 2014, the Proposer certifies that this Bid Proposal reflects the Proposer's best, good faith effort to identify domestic sources of iron, steel, and manufactured goods for every component contained in the bid solicitation where such American-made components are available on the schedule and consistent with deadlines prescribed in or required by the bid solicitation.

2. Verification of U.S. Production: The Proposer certifies that all components contained in the bid solicitation that are American-made have been so identified, and if this bid is accepted, the Bidder agrees that it will provide reasonable, sufficient, and timely verification to the Purchaser of the U.S. production of each component so identified.

3. Documentation Regarding Non-American-made Iron, Steel, or Manufactured Goods: The Proposer certifies that for any component or components that are not American-made and are so identified in this Bid Proposal, the Proposer has included in or attached to this Bid Proposal one or both of the following, as applicable:

    a. Identification of and citation to a categorical waiver published by the U.S. Environmental protection Agency in the Federal Register that is applicable to such component or components, and an analysis that supports its applicability to the component or components;

    b. Verifiable documentation sufficient to the Purchaser, as required in the bid solicitation or otherwise, that the Proposer has sought to secure American-made components but has determined that such components are not available on the schedule and consistent with the deadlines prescribed in the bid solicitation, with assurance adequate for the Proposer under the applicable conditions stated in the bid solicitation or otherwise.

- Information and Detailed Justification Regarding Non-American-made Iron, Steel, or Manufactured Goods: The Proposer certifies that for any such component or components that are not so available, the Proposer has also provided in or attached to this bid information, including but not limited to the verifiable documentation and a full description of the bidder's effort to secure any such American-made component or components, that the Bidder believes are sufficient to provide and as far as possible constitute the detailed justification required for a waiver under section 1605 with respect to such component or components. The Bidder further agrees that, if this bid is accepted, it will assist the Purchaser in amending, supplementing, or further supporting such information as required by the Purchaser to request and, as applicable, implement the terms of a waiver with respect to any such component or components.

THE UNDERSIGNED CERTIFIES THAT THE CONTRACTOR WILL COMPLY WITH THE ABOVE REQUIREMENTS.

CONTRACTOR OR SUBCONTRACTOR NAME: EFS WEST INC.

CERTIFIED BY:

NAME: ART BABCOCK TITLE: PRESIDENT

SIGNATURE: [signature] DATE: 7-22-19

END OF ATTACHMENT 10

END OF ENVELOPE ONE, SEALED TECHNICAL PROPOSAL (PART 1)

ATTACHMENT 10

CONSOLIDATED APPROPRIATIONS ACT
BUY AMERICAN IRON AND STEEL CERTIFICATION

Project: PLEASANT GROVE WASTEWATER TREATMENT PLANT ERP

1. Identification of American-made Iron, Steel, and Manufactured Goods: Consistent with the terms of the Purchaser's bid solicitation and provisions of Section 436 of the Consolidated Appropriations Act of 2014, the Proposer certifies that this Bid Proposal reflects the Proposer's best, good faith effort to identify domestic sources of iron, steel, and manufactured goods for every component contained in the bid solicitation where such American-made components are available on the schedule and consistent with deadlines prescribed in or required by the bid solicitation.

2. Verification of U.S. Production: The Proposer certifies that all components contained in the bid solicitation that are American-made have been so identified, and if this bid is accepted, the Bidder agrees that it will provide reasonable, sufficient, and timely verification to the Purchaser of the U.S. production of each component so identified.

3. Documentation Regarding Non-American-made Iron, Steel, or Manufactured Goods: The Proposer certifies that for any component or components that are not American-made and are so identified in this Bid Proposal, the Proposer has included in or attached to this Bid Proposal one or both of the following, as applicable:

    a. Identification of and citation to a categorical waiver published by the U.S. Environmental protection Agency in the Federal Register that is applicable to such component or components, and an analysis that supports its applicability to the component or components;

    b. Verifiable documentation sufficient to the Purchaser, as required in the bid solicitation or otherwise, that the Proposer has sought to secure American-made components but has determined that such components are not available on the schedule and consistent with the deadlines prescribed in the bid solicitation, with assurance adequate for the Proposer under the applicable conditions stated in the bid solicitation or otherwise.

- Information and Detailed Justification Regarding Non-American-made Iron, Steel, or Manufactured Goods: The Proposer certifies that for any such component or components that are not so available, the Proposer has also provided in or attached to this bid information, including but not limited to the verifiable documentation and a full description of the bidder's effort to secure any such American-made component or components, that the Bidder believes are sufficient to provide and as far as possible constitute the detailed justification required for a waiver under section 1605 with respect to such component or components. The Bidder further agrees that, if this bid is accepted, it will assist the Purchaser in amending, supplementing, or further supporting such information as required by the Purchaser to request and, as applicable, implement the terms of a waiver with respect to any such component or components.

THE UNDERSIGNED CERTIFIES THAT THE CONTRACTOR WILL COMPLY WITH THE ABOVE REQUIREMENTS.

CONTRACTOR OR SUBCONTRACTOR NAME: Mason Painting Inc

CERTIFIED BY:

NAME: Scott Dorn TITLE: Treasurer

SIGNATURE: DATE: 7/22/19

END OF ATTACHMENT 10

END OF ENVELOPE ONE, SEALED TECHNICAL PROPOSAL (PART 1)

ATTACHMENT 10

CONSOLIDATED APPROPRIATIONS ACT
BUY AMERICAN IRON AND STEEL CERTIFICATION

Project: PLEASANT GROVE WASTEWATER TREATMENT PLANT ERP

1. Identification of American-made Iron, Steel, and Manufactured Goods: Consistent with the terms of the Purchaser's bid solicitation and provisions of Section 436 of the Consolidated Appropriations Act of 2014, the Proposer certifies that this Bid Proposal reflects the Proposer's best, good faith effort to identify domestic sources of iron, steel, and manufactured goods for every component contained in the bid solicitation where such American-made components are available on the schedule and consistent with deadlines prescribed in or required by the bid solicitation.

2. Verification of U.S. Production: The Proposer certifies that all components contained in the bid solicitation that are American-made have been so identified, and if this bid is accepted, the Bidder agrees that it will provide reasonable, sufficient, and timely verification to the Purchaser of the U.S. production of each component so identified.

3. Documentation Regarding Non-American-made Iron, Steel, or Manufactured Goods: The Proposer certifies that for any component or components that are not American-made and are so identified in this Bid Proposal, the Proposer has included in or attached to this Bid Proposal one or both of the following, as applicable:

N/A

   a. Identification of and citation to a categorical waiver published by the U.S. Environmental protection Agency in the Federal Register that is applicable to such component or components, and an analysis that supports its applicability to the component or components;

   b. Verifiable documentation sufficient to the Purchaser, as required in the bid solicitation or otherwise, that the Proposer has sought to secure American-made components but has determined that such components are not available on the schedule and consistent with the deadlines prescribed in the bid solicitation, with assurance adequate for the Proposer under the applicable conditions stated in the bid solicitation or otherwise.

- Information and Detailed Justification Regarding Non-American-made Iron, Steel, or Manufactured Goods: The Proposer certifies that for any such component or components that are not so available, the Proposer has also provided in or attached to this bid information, including but not limited to the verifiable documentation and a full description of the bidder's effort to secure any such American-made component or components, that the Bidder believes are sufficient to provide and as far as possible constitute the detailed justification required for a waiver under section 1605 with respect to such component or components. The Bidder further agrees that, if this bid is accepted, it will assist the Purchaser in amending, supplementing, or further supporting such information as required by the Purchaser to request and, as applicable, implement the terms of a waiver with respect to any such component or components.

THE UNDERSIGNED CERTIFIES THAT THE CONTRACTOR WILL COMPLY WITH THE ABOVE REQUIREMENTS.

CONTRACTOR OR SUBCONTRACTOR NAME: Martin Brothers Construction

CERTIFIED BY:

NAME: Nick Rutherford TITLE: Estimator

SIGNATURE:  DATE: July 16, 2019

END OF ATTACHMENT 10

END OF ENVELOPE ONE, SEALED TECHNICAL PROPOSAL (PART 1)

ATTACHMENT 10

CONSOLIDATED APPROPRIATIONS ACT
BUY AMERICAN IRON AND STEEL CERTIFICATION

Project: PLEASANT GROVE WASTEWATER TREATMENT PLANT ERP

1. Identification of American-made Iron, Steel, and Manufactured Goods: Consistent with the terms of the Purchaser's bid solicitation and provisions of Section 436 of the Consolidated Appropriations Act of 2014, the Proposer certifies that this Bid Proposal reflects the Proposer's best, good faith effort to identify domestic sources of iron, steel, and manufactured goods for every component contained in the bid solicitation where such American-made components are available on the schedule and consistent with deadlines prescribed in or required by the bid solicitation.

2. Verification of U.S. Production: The Proposer certifies that all components contained in the bid solicitation that are American-made have been so identified, and if this bid is accepted, the Bidder agrees that it will provide reasonable, sufficient, and timely verification to the Purchaser of the U.S. production of each component so identified.

3. Documentation Regarding Non-American-made Iron, Steel, or Manufactured Goods: The Proposer certifies that for any component or components that are not American-made and are so identified in this Bid Proposal, the Proposer has included in or attached to this Bid Proposal one or both of the following, as applicable:

    a. Identification of and citation to a categorical waiver published by the U.S. Environmental protection Agency in the Federal Register that is applicable to such component or components, and an analysis that supports its applicability to the component or components;

    b. Verifiable documentation sufficient to the Purchaser, as required in the bid solicitation or otherwise, that the Proposer has sought to secure American-made components but has determined that such components are not available on the schedule and consistent with the deadlines prescribed in the bid solicitation, with assurance adequate for the Proposer under the applicable conditions stated in the bid solicitation or otherwise.

- Information and Detailed Justification Regarding Non-American-made Iron, Steel, or Manufactured Goods: The Proposer certifies that for any such component or components that are not so available, the Proposer has also provided in or attached to this bid information, including but not limited to the verifiable documentation and a full description of the bidder's effort to secure any such American-made component or components, that the Bidder believes are sufficient to provide and as far as possible constitute the detailed justification required for a waiver under section 1605 with respect to such component or components. The Bidder further agrees that, if this bid is accepted, it will assist the Purchaser in amending, supplementing, or further supporting such information as required by the Purchaser to request and, as applicable, implement the terms of a waiver with respect to any such component or components.

THE UNDERSIGNED CERTIFIES THAT THE CONTRACTOR WILL COMPLY WITH THE ABOVE REQUIREMENTS.

CONTRACTOR OR SUBCONTRACTOR NAME: Performance Contracting Inc.

CERTIFIED BY:

NAME: Dan Sexton TITLE: Estimator / Project Engineer

SIGNATURE: Dan S DATE: 7/22/19

END OF ATTACHMENT 10

END OF ENVELOPE ONE, SEALED TECHNICAL PROPOSAL (PART 1)

ATTACHMENT 10

CONSOLIDATED APPROPRIATIONS ACT
BUY AMERICAN IRON AND STEEL CERTIFICATION

Project: PLEASANT GROVE WASTEWATER TREATMENT PLANT ERP

1. Identification of American-made Iron, Steel, and Manufactured Goods: Consistent with the terms of the Purchaser's bid solicitation and provisions of Section 436 of the Consolidated Appropriations Act of 2014, the Proposer certifies that this Bid Proposal reflects the Proposer's best, good faith effort to identify domestic sources of iron, steel, and manufactured goods for every component contained in the bid solicitation where such American-made components are available on the schedule and consistent with deadlines prescribed in or required by the bid solicitation.

2. Verification of U.S. Production: The Proposer certifies that all components contained in the bid solicitation that are American-made have been so identified, and if this bid is accepted, the Bidder agrees that it will provide reasonable, sufficient, and timely verification to the Purchaser of the U.S. production of each component so identified.

3. Documentation Regarding Non-American-made Iron, Steel, or Manufactured Goods: The Proposer certifies that for any component or components that are not American-made and are so identified in this Bid Proposal, the Proposer has included in or attached to this Bid Proposal one or both of the following, as applicable:

    a. Identification of and citation to a categorical waiver published by the U.S. Environmental protection Agency in the Federal Register that is applicable to such component or components, and an analysis that supports its applicability to the component or components;

    b. Verifiable documentation sufficient to the Purchaser, as required in the bid solicitation or otherwise, that the Proposer has sought to secure American-made components but has determined that such components are not available on the schedule and consistent with the deadlines prescribed in the bid solicitation, with assurance adequate for the Proposer under the applicable conditions stated in the bid solicitation or otherwise.

- Information and Detailed Justification Regarding Non-American-made Iron, Steel, or Manufactured Goods: The Proposer certifies that for any such component or components that are not so available, the Proposer has also provided in or attached to this bid information, including but not limited to the verifiable documentation and a full description of the bidder's effort to secure any such American-made component or components, that the Bidder believes are sufficient to provide and as far as possible constitute the detailed justification required for a waiver under section 1605 with respect to such component or components. The Bidder further agrees that, if this bid is accepted, it will assist the Purchaser in amending, supplementing, or further supporting such information as required by the Purchaser to request and, as applicable, implement the terms of a waiver with respect to any such component or components.

THE UNDERSIGNED CERTIFIES THAT THE CONTRACTOR WILL COMPLY WITH THE ABOVE REQUIREMENTS.

CONTRACTOR OR
SUBCONTRACTOR NAME: San Joaquin Electric

CERTIFIED BY:

NAME: Wade Johnson TITLE: Vice President

SIGNATURE: Wade Johnson DATE: 7-22-19

END OF ATTACHMENT 10

END OF ENVELOPE ONE, SEALED TECHNICAL PROPOSAL (PART 1)

ATTACHMENT 10

CONSOLIDATED APPROPRIATIONS ACT
BUY AMERICAN IRON AND STEEL CERTIFICATION

Project: PLEASANT GROVE WASTEWATER TREATMENT PLANT ERP

1. Identification of American-made Iron, Steel, and Manufactured Goods: Consistent with the terms of the Purchaser's bid solicitation and provisions of Section 436 of the Consolidated Appropriations Act of 2014, the Proposer certifies that this Bid Proposal reflects the Proposer's best, good faith effort to identify domestic sources of iron, steel, and manufactured goods for every component contained in the bid solicitation where such American-made components are available on the schedule and consistent with deadlines prescribed in or required by the bid solicitation.

2. Verification of U.S. Production: The Proposer certifies that all components contained in the bid solicitation that are American-made have been so identified, and if this bid is accepted, the Bidder agrees that it will provide reasonable, sufficient, and timely verification to the Purchaser of the U.S. production of each component so identified.

3. Documentation Regarding Non-American-made Iron, Steel, or Manufactured Goods: The Proposer certifies that for any component or components that are not American-made and are so identified in this Bid Proposal, the Proposer has included in or attached to this Bid Proposal one or both of the following, as applicable:

    a. Identification of and citation to a categorical waiver published by the U.S. Environmental protection Agency in the Federal Register that is applicable to such component or components, and an analysis that supports its applicability to the component or components;

    b. Verifiable documentation sufficient to the Purchaser, as required in the bid solicitation or otherwise, that the Proposer has sought to secure American-made components but has determined that such components are not available on the schedule and consistent with the deadlines prescribed in the bid solicitation, with assurance adequate for the Proposer under the applicable conditions stated in the bid solicitation or otherwise.

- Information and Detailed Justification Regarding Non-American-made Iron, Steel, or Manufactured Goods: The Proposer certifies that for any such component or components that are not so available, the Proposer has also provided in or attached to this bid information, including but not limited to the verifiable documentation and a full description of the bidder's effort to secure any such American-made component or components, that the Bidder believes are sufficient to provide and as far as possible constitute the detailed justification required for a waiver under section 1605 with respect to such component or components. The Bidder further agrees that, if this bid is accepted, it will assist the Purchaser in amending, supplementing, or further supporting such information as required by the Purchaser to request and, as applicable, implement the terms of a waiver with respect to any such component or components.

THE UNDERSIGNED CERTIFIES THAT THE CONTRACTOR WILL COMPLY WITH THE ABOVE REQUIREMENTS.

CONTRACTOR OR
SUBCONTRACTOR NAME: TOWNSEND & SCHMIDT MASONRY

CERTIFIED BY:

NAME: TROY D. BREWER, TITLE: VICE PRESIDENT

SIGNATURE: T D.B DATE: JULY 19, 2019

END OF ATTACHMENT 10

END OF ENVELOPE ONE, SEALED TECHNICAL PROPOSAL (PART 1)

CITY OF ROSEVILLE CALIFORNIA

POINT-OF-CONTACT:
Joe Lawrence
(916) 375-1833
jlawrence wmlylesco.com



EXHIBIT C

GUARANTEED MAXIMUM PRICE, COST OF WORK AND FEES

Pleasant Grove Wastewater Treatment Plant Energy Recovery Project

EXHIBIT C

GUARANTEED MAXIMUM PRICE, COST OF WORK AND FEE

Pleasant Grove Wastewater Treatment Plant Energy Recovery Project

A. GUARANTEED MAXIMUM PRICE: The **Guaranteed Maximum Price ("GMP")** as of the date of execution of this Agreement is twenty-three million, three hundred forty-nine thousand, seven hundred twenty-nine dollars ($23,349,729.00). Subject to the provisions of this Agreement, the costs and expenses which the Contractor may include in the Cost of Work for purposes of determining that aspect of the Contractor's compensation are as set forth in this Exhibit C. The Contractor's total compensation, including Fee and allowable mark-ups, shall not exceed the GMP. The GMP may be adjusted by Change Order in accordance with this Agreement.

Included in the GMP is the following total amount for worker protection pursuant to California Labor Code Section 6707:

$ 10,000

B. ALLOWANCES: Allowances and Allowance Amounts are listed in Exhibit D.

C. COST OF THE WORK: The term "Cost of Work" means the sum of all costs necessarily incurred and paid by the Contractor for labor, materials, equipment, subcontractors, special services, bonds, liability, workers' compensation and errors and omissions insurance, direct job overhead expenses, taxes and other necessary expenses incurred in the performance of the Work, that do not exceed the GMP. The following are categories of cost and expense to be paid by City to Contractor as Cost of the Work:

1. **Hourly Field Labor:** The cost of all labor employed by Contractor in performing the Work will be calculated at the Initial Hourly Field Labor Rates set forth below. Those rates include wages, fringe benefits, government mandated payments (workers compensation insurance and SSI), travel and subsistence.

   The Hourly Field Labor Rates will be adjusted during the Project whenever the prevailing wage rate determined by the Department of Industrial Relations for a worker classification changes (Note that this does not apply to any changes to labor rates required to be paid per the Davis Bacon wage determination) or in accordance with an Industry Master Labor Agreement, if the Contractor is signatory to any such agreement. All changes to the prevailing wage rates must be submitted by the Contractor and approved by the City.

   For labor not covered by a rate set forth below, the cost of labor is defined as follows:

   The cost of hourly field craft labor for workers (including forepersons when authorized by the Construction Manager) used in actual and direct performance of the Work by the Contractor will be the sum of the following:

   - The actual wages paid plus any employer payments to, or on behalf of workers for fringe benefits including health and welfare, pension, vacation and similar purposes.
   - All payments imposed by State and Federal Laws including, but not limited to, workers' compensation insurance, and social security payments. The rates used for workers' compensation insurance shall be actual rates paid by the Contractor for each specific craft and broken down by wage rate if applicable to that craft.

Actual General Liability insurance burden, if it is applied to Contractor's payroll. Contractor shall provide adequate backup information to Construction Manager to verify this burden rate is indicative of the actual rates paid by the Contractor as a percent of labor.

Except as otherwise may be agreed to, in writing by the City, the actual wages and benefits paid for manual classifications of Contractor's on-site workers will not, in the aggregate, be less than the current applicable wage for each classification as established by the greater of the two wage rates between the State of California Director of Industrial Relations and the Davis Bacon Wage Determination (APPENDIX A-2 of the Request for Bid Proposal).

Specifically prohibited from the labor costs are other payroll burden factors such as small tools (as defined in Construction Equipment below), bonuses of any kind and safety incentives.

Contractor shall include the actual travel and/or subsistence costs, if any, as a separate line item under the labor cost category when submitting progress billings to the City. Except as otherwise may be agreed to in writing by the City, the actual travel and/or subsistence costs will not be more than established in an applicable Master Labor Agreement or the State of California Director of Industrial Relations.

2. **On-Site Management and Administrative Labor:** Wages and Salaries of Contractor's management and administrative personnel assigned to this Project to directly manage and administer the Work on-site are included in the table below. These positions may include a Principal-in-Charge or Project Director, On-site Project Manager, On-site Project Engineer, On-site Field Engineer, On-site Superintendents listed by trade or title, General Foreman, On-site Office Manager, Yardman/Delivery Driver and On-site Administrative Assistant. These positions will be paid in accordance with the following table for entire duration of the Project and include all labor burden, overhead and profit mark-ups. The Principal-in-Charge or Project Director can only charge for hours worked at the Site for this Project and can also charge for attendance of on-site Project Meetings. Any off-site Principal-in-Charge time spent on this Project shall be included in the Contractor's Fee Schedule for the Project under the Contractor's Fee subsection below.

On-Site Management & Administrative Positions Hourly Rate Table

On-Site Management & Administrative Position	Hourly Rate
Principal-in-Charge	$ 125.00
Project Manager	$ 115.00
Assistant Project Manager	$ 105.00
Project Engineer	$ 75.00
Administrative Assistant	$ 40.00

Contractor is allowed to charge up to a maximum of 50 hours per week to the City for each full-time assigned management and administrative personnel even if an employee works more than 50 hours in a week (this maximum hour limit is for employee's total hours for both Pleasant Grove Wastewater Treatment Plant projects). The Contractor can only charge for supervisory management and administrative hours if they also pay those same hours to the employee that worked up to 50 hours in any given week. The Contractor is not allowed to charge for any supervisory management and administrative personnel hours not paid to any employee.

Other company personnel such as Corporate Officers, Division/Area Managers, or Operations Managers (unless either are designated as the Principle-in-Charge), Quality Control Managers, Safety Officers, Project Schedulers, Project Coordinators, Estimators,

Business Supervisors, Human Resources and Accountants are not allowed to charge any hours to the Project. The anticipated cost of such personnel shall be included in the Contractor's Fee Mark-up Schedule for the Project under the Contractor's Fee Mark-up subsection below.

3. **Materials:** The cost of all materials, including all factory testing, freight and delivery costs of materials, used in performing the Work will be the cost to the Contractor from the supplier thereof. All discounts for early payment shall accrue to the Contractor unless the City's payment to Contractor is paid to Contractor before discount payment is due in which case discount savings will be fully credited to City on next progress billing. All rebates and all returns from the sale of surplus materials shall be credited to the Cost of the Work.

4. **Construction Equipment:** The initial Contractor Owned Equipment Rates approved for billing to the City are found at the end of this exhibit. All changes to these Contractor Owned Equipment Rates must be submitted by the Contractor and approved by the City prior to billing City for Work performed. Approved changes to equipment rates is not an allowable increase in the GMP. The rates found in this table for equipment owned by the Contractor will, in all cases, be understood to cover all fuel, supplies, repairs, maintenance, insurance, ownership, and incidental costs and no further allowances will be made for those items, unless specifically approved in writing by the City. Equipment owned by Contractor will only be paid for the actual time equipment is used in performing Work and will be rounded to the closest full hour if paid by an hourly rate. Compensation for idle time of equipment through delays caused by the City will be made consistent with Section 8-1.09, Right of Way Delays, of the Caltrans Standard Specifications, provided, however, that the Contractor Owned Equipment Rates set forth below will apply.

   Equipment not owned by Contractor which is rented by Contractor and used in performing Work will be paid by City based on actual invoiced cost to Contractor, plus actual fuel/lube costs, provided the rental rate is not in excess of rental rates established by distributors or equipment rental companies in the local area. City-operated equipment will also be paid by City based on actual invoiced cost to Contractor provided the City does not deem any charges excessive. All transportation costs to move equipment on and off the Work will be paid by City up to a maximum of four (4) hours total travel time each way.

   Equipment with a value less than $500.00: The Contractor will be paid an amount of three percent (3.0%) of total hourly field labor costs as defined above to cover the cost of small tools and safety supplies for Work directly performed at the Site.

5. **Subcontractors and SubTier Subcontractors:** The Contractor will be paid for all Work performed by Subcontractor at the actual invoiced amount. Should a Subcontractor be required to perform extra work caused by a contract change order, the Subcontractor will be allowed a mark-up as provided for in Section 01260, CONTRACT MODIFICATIONS.

6. **Special Services:** Special work or services are defined as that work not included in this Agreement and characterized by extraordinary complexity, sophistication, or innovation or a combination of the foregoing attributes which are unique to the construction industry. These special services may include such services as registered land surveyor, licensed geotechnical engineer, licensed structural engineer, special testing or laboratory work. The special services may also include reasonable attorney's fees incurred in connection with preparation or negotiation of this Agreement with the City and subcontracts for the Work. The Contractor will be paid for special services in accordance with Article 12, PAYMENT AND COMPLETION, and based on actual invoiced cost, provided the City does not determine any special services costs to be excessive.

EXHIBIT C-3

GMP, COST OF WORK AND FEE

7. **Bonds and Insurance:** The Contractor will be paid the actual cost for the required bonds, as well as the cost of all insurance costs required for the Work (such costs are deemed a Cost of Work and are therefore contained within the GMP).

8. **Direct Job Overhead Expenses:** The Contractor will be paid for the actual cost of job overhead expenses which may include such expenses as office trailers, storage vans, temporary fencing/security, toilets, dumpsters, waste removal, water, utility power, jobsite landline telephone costs, jobsite internet provider costs, reasonable room and board subsistence for employees who live farther than 40 miles from the Site or as required by California prevailing wage laws, copy machine, water cooler and any office furniture required for the Work needs, and as required in the Specifications, including mobilization and demobilization of same. There will be no warranty reserve.

9. **Taxes:** The Contractor acknowledges it will be liable for all sales, use, gross receipts or other taxes, tariffs or duties related to the Work and that these taxes and tariffs are included in the GMP. All invoices to City will include the applicable taxes and tariffs that are the Contractor's responsibility and will not be shown as a separate line item on the Contractor's invoice.

10. **Preconstruction Services:** The Cost of Work will include all Design Assist Services including preplanning and preconstruction service costs incurred by Contractor prior to beginning of construction, and other Design Assist Services required throughout the construction period.

11. **Builder's Risk Policy Deductible**: The Contractor will be paid up to a maximum amount equal to the Builder's Risk Policy Deductible amount (not to exceed $100,000), for construction costs sustained by the Contractor as a result of a loss covered by the Contractor's Builder's Risk Policy and approved for coverage compensation by the Builder's Risk insurance carrier. The Contractor will not be paid for any Builder's Risk losses that resulted from the negligence of Contractor, any subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable.

D. ITEMS NOT INCLUDED IN THE COST OF WORK:

1. Salaries and other compensation of Contractor's personnel stationed at Contractor's principal office or offices other than the Site, except as specifically provided above.

2. Expenses of Contractor's principal office and offices, other than the Site office.

3. Contractor's General Overhead and Expenses, except as specifically provided for in the Contract Documents.

4. The capital expenses of Contractor, including interest on capital employed for the Work and charges to Contractor for delinquent payments.

5. Hours in excess of 50 hours per week for each full-time assigned management and administrative personnel even if a management or administrative employee works more than 50 hours in a week.

6. Costs due to correction of Defective Work, disposal of materials or equipment wrongfully supplied, and making good any damage to property.

7. Costs that would cause the GMP to be exceeded.

8. Any costs incurred after City's Final Acceptance of the Project.

E. CONTRACTOR's MARK-UP FEES: The Contractor's mark-up fees for general overhead and profit shall be paid by the City in accordance with the table below.

Contractor's Fee Mark-up Schedule for the Project

Item d.1	Hourly Field Labor	23.0 %
Item d.2	Management and Administrative Labor	Included in hourly rates
Item d.3	Materials	7.0 %
Item d.4	Construction Equipment	23.0 %
Item d.5	Subcontractors and Sub-Tier Subcontractors	7 %
Item d.6	Special Services	7 %
Item d.7	Bonds and Insurance	7 %
Item d.8	Direct Job Overhead Expenses	7 %

Lyles
Pleasant Grove Wastewater Treatment Plant Energy Recovery Project
Hourly Field Labor Rates

Craft	Classification	Base Wage	Fringes Plus Vacation	P/R Tax & Insurance	Straight Time Hourly Rate	OVERTIME RATES	
						Daily/Saturday Rate (1-1/2 X)	Sunday/Holiday Rate (2 X)
Carpenter (Area 3 thru 6/30/20)	Foreman	49.08	30.49	11.36	90.93	120.62	150.32
	Journeyman	44.62	30.49	10.42	85.53	112.53	139.52
Millwright (Area 3 thru 6/30/20)	Foreman	51.62	32.09	11.91	95.62	126.85	158.08
	Journeyman	47.12	32.09	10.97	90.18	118.69	147.20
Operator (Area 1 thru 6/30/20)	Foreman	49.14	31.13	11.29	91.56	121.29	151.02
	Group 2A	48.14	31.13	11.08	90.35	119.47	148.60
	Group 3	46.01	31.13	10.63	87.77	115.61	143.44
	Group 3A	46.40	31.13	10.71	88.24	116.31	144.38
	Group 4	44.63	31.13	10.34	86.10	113.10	140.10
Laborer (Area 2 thru 6/30/20)	Foreman - Specialist	33.99	24.85	7.78	66.62	87.18	107.75
	Journeyman - Specialist	31.49	24.85	7.25	63.59	82.64	101.69
Cement Mason (thru 6/30/20)	Foreman	41.55	26.31	9.97	77.83	102.97	128.11
	Journeyman	37.10	26.31	9.03	72.44	94.89	117.33
Laborer GF (Varnes)	Lab FM	48.00	24.85	10.72	83.57	112.61	141.65
Carp GF (Flannigan)	Carp GF	52.00	30.49	11.97	94.46	125.92	157.38
Carp Super (Larson)	Carp Superintendent	63.10	30.49	14.31	107.90	146.07	184.25

EXHIBIT C-6

GMP, COST OF WORK AND FEE

Lyles
Pleasant Grove Wastewater Treatment Plant Energy Recovery Project
Contractor Owned Equipment Rates

EQUIPMENT DESCRIPTION	Hourly Rate	Daily Rate
Passenger Car	10.50	
SUV	10.50	
Boom Truck	54.10	
Dump Truck - T370	23.70	
Maintenance Truck	19.30	
Water Truck	34.20	
Gang Truck	14.10	
Flatbed Truck - 24'	15.70	
1/2 Ton Pickup Truck	10.50	
Mid-size Pickup Truck	10.50	
3/4 Ton Pickup Truck	12.60	
1 Ton Pickup Truck	12.60	
Excavator - 349	149.10	
Excavator - 336	109.80	
Forklift	12.10	
Loader Backhoe - 430	47.80	
Loader Backhoe - 410	42.00	
Loader Backhoe - 310	42.00	
Hydro Crane - 30ton	59.90	
Hydro Crane - 50ton	72.00	
Hydro Crane - 60ton	72.00	
Hydro Crane - 65ton	86.10	
Hydro Crane - 80ton	140.00	
Lattice Crane - 110ton	110.00	
Reachlift	31.00	
Motor Grader - 14	93.00	

EXHIBIT C-7

GMP, COST OF WORK AND FEE

EQUIPMENT DESCRIPTION	Hourly Rate	Daily Rate
Skip Loader	24.00	
Wheel Loader - IT-28	49.40	
Wheel Loader - 950	59.90	
Wheel Loader - 962	65.10	
Skid Steer - 246	30.00	
Air Compressor	15.80	
Compactor - MVH-408	18.00	
Street Sweeper - VT651	33.72	
Street Sweeper - Lay-mor 8H	17.90	
Welder - 300	7.10	
Generator - 160	35.00	
Pipe Threader	31.50	
Scissor Lift	5.30	
Boom Lift	42.20	
Dump Trailer - 6'x10'	3.70	
Flatbed Trailer - up to 4-1/2ton	6.80	
Utility Trailer - 6'x12'	6.80	
Fuel/Lube Trailer	24.20	
Traffic Trailer	73.00	
Light Tower	10.50	
Water Tower - 10,000gal	5.95	
Water Trailer - 500gal	3.30	

*****END OF EXHIBIT C*****

EXHIBIT C-8

GMP, COST OF WORK AND FEE

EXHIBIT D

ALLOWANCES AND ALLOWANCE AMOUNTS

Pleasant Grove Wastewater Treatment Plant Energy Recovery Project

Not applicable to this Agreement

EXHIBIT D

ALLOWANCES AND ALLOWANCE AMOUNTS

Pleasant Grove Wastewater Treatment Plant Energy Recovery Project

The following cost allowances and allowance amounts are included in the GMP as part of the Agreement:

Item #	Allowance Description	Allowance Amount
1		
2		
3		
4		
5		
6.		

DUTIES OF CONTRACTOR

A. Plan allowance Work collaboratively with the Construction Manager and City's Representative to control allowance costs and avoid impacts to the Progress Schedule.

B. Advise Construction Manager at least fifteen (15) days in advance of the need to purchase materials to avoid impacts to Progress Schedule.

C. Obtain competitive proposals from material suppliers, including:
   1. Quantity.
   2. Complete description of product and services provided under allowance.
   3. Unit cost.
   4. Total amount of purchase.
   5. Taxes and delivery charges.

D. On notification of selection, enter into purchase agreement with designated supplier.

E. Arrange for delivery and unloading.

F. Install products in accordance with Contract Documents.

G. Maintain accurate cost records, separate from the cost categories for the balance of the Work, which depict the total cost incurred for each allowance item.

H. Monitor each allowance item total costs to date and immediately report to the Construction Manager should the total cost to date reach 80% of the total allowance amount of any allowance item amount shown in above table. Should the total cost of any allowance item reach 80% of the total allowance amount budgeted, the Contractor shall quantify and forecast the cost to complete the remaining known allowance item tasks and submit this forecasted quantity and completion cost to the Construction Manager.

DUTIES OF CONSTRUCTION MANAGER

A. Consult with Contractor and City in consideration of equipment or material and suppliers.

B. Provide Contractor with all required product, technical or design related information as it pertains to the allowance items.

C. Make equipment, supplier or system selection and request proposal from Contractor for these items covered by each allowance.

D. Notify Contractor of final equipment, supplier or system selection to allow Contractor to begin submittal and procurement.

E. Review cost to date information submitted by the Contractor and prepare Change Orders as required for City approval.

ADJUSTMENT OF COSTS

A. The Contractor shall not exceed the allowance amounts shown in above table without the written approval of the City. Should the Contractor exceed the allowance amounts without the written approval of the City, the Contractor will be responsible for all costs greater than the allowance amounts shown in above table.

B. Contractor will be paid the actual total cost of each allowance item as a Cost of the Work. When actual total cost is more or less than amount of allowance, the GMP will be adjusted by Change Order.

*****END OF EXHIBIT D*****

EXHIBIT D-2
ALLOWANCES AND ALLOWANCE AMOUNTS

EXHIBIT E

DESIGNATION OF SUBCONTRACTORS

Pleasant Grove Wastewater Treatment Plant Energy Recovery Project

EXHIBIT E

DESIGNATION OF SUBCONTRACTORS

Pleasant Grove Wastewater Treatment Plant Energy Recovery Project

In accordance with California Public Contracting Code Section 4100, et seq., the Contractor certifies that the following licensed subcontractors will perform work or labor or render service to Contractor in or about the construction of the Work, or will specifically fabricate and install a portion of the Work according to Drawings contained in the Contract Documents, in an amount in excess of one-half of one percent (0.5%) of the GMP.

Work to be Performed	Subcontractor's License Number and Classification(s) and DIR Registration Number	Subcontractor's Name and Complete Street Address
Asphalt Paving	License: 726454 Classification: A DIR: 1000000017	Martin Brothers Construction 8801 Folsom Blvd, Suite 260 Sacramento, CA 95826
Reinforcing Steel	License: 778010 Classification: C50 DIR: 1000000114	CMC Rebar 12451 Arrow Route Etiwanda, CA 91739
Masonry	License: 186559 Classification: C29 DIR: 1000000879	Townsend & Schmidt Masonry 8788 Elder Creek Rd Sacramento, CA 95828
Painting and Coating	License: 819987 Classification: C33 DIR: 1000008947	Mason Painting, Inc. 3242 Luyung Dr Rancho Cordova, CA 95742
CNG Fueling System	License: 826003 Classification: A, B, C10, HAZ Certification DIR: 1000011646	EFS West 28472 Constellation Rd Valencia, CA 91355
HVAC	License: 679326 Classification: C20, A, C10, B DIR: 1000000447	Blocka Construction, Inc. 4455 Enterprise St. Fremont, CA 94538
Pipe Insulation, Sheet Metal Framing, & Gypsum Board	License: 474795 Classification: B, C2, C9, C33, C35, C61, C10, C23 DIR: 1000004922	Performance Contracting, Inc. 3030 Orange Grove Ave. North Highlands, CA 95660
Electrical & Instrumentation	License: 410103 Classification: C10 DIR: 1000002857	San Joaquin Electric, Inc. 2342 Teepee Dr Stockton, CA 95205

END OF EXHIBIT E

EXHIBIT E-1

DESIGNATION OF SUBCONTRACTORS

EXHIBIT F

COMPLETION TIMES AND LIQUIDATED DAMAGES

Pleasant Grove Wastewater Treatment Plant Energy Recover Project

EXHIBIT F

COMPLETION TIMES AND LIQUIDATED DAMAGES

Pleasant Grove Wastewater Treatment Plant Energy Recovery Project

Times Allowed for Completion

In accordance with the provisions of Article 9.2, **Contract Time**, the following milestone completions, completion periods, substantial completion and final completion contract times shall be completed within the number of consecutive calendar days from the date established in the Notice to Proceed for the commencement of Contract Time:

Contractual Completion Event	Completion Time (# of calendar days from Notice to Proceed date)
Substantial Completion Milestone 2: Natural Gas Line for Boiler Service	360
Substantial Completion Milestone 3: Potable Water, Utility Water, and Sanitary Sewer Yard Piping	390
Substantial Completion Milestone 4: Roadway Connection	420
Substantial Completion Milestone 5: Vehicle Fueling Facility	540
Substantial Completion Milestone 6: Digester Gas Availability	700
Substantial Completion Milestone 7: All Work	790
Milestone 8: Final Completion of all Work	820

The requirements for Substantial Completion are set forth in Article 12.12 of the Agreement. See Section 01 12 16 – WORK SEQUENCE for a complete listing and description of the Project milestones.

Damages for Delays

In accordance with the provisions of Article 9.5, **Liquidated Damages**, for the period of time that any portion of the Work remains unfinished after the time fixed in above **Times Allowed for Completion**, as modified by extensions of time granted by the Owner, it is understood and agreed by the Contractor and the Owner that the Contractor shall pay the Owner the liquidated damages listed below.

Contractual Completion Event	Daily Liquidated Damages
Substantial Completion Milestone 2: Natural Gas Line for Boiler Service	$2,500.00
Substantial Completion Milestone 3: Potable Water, Utility Water, and Sanitary Sewer Yard Piping	$1,000.00
Substantial Completion Milestone 4: Roadway Connection	$1,000.00
Substantial Completion Milestone 5: Vehicle Fueling Facility	$1,000.00
Substantial Completion Milestone 6: Digester Gas Availability	$2,00.00

Contractual Completion Event	Daily Liquidated Damages
Substantial Completion Milestone 7: All Work	$3,500.00
Milestone 8: Final Completion of all Work	$1,600.00

Weather Days

In accordance with the provisions of Article 9.4.2.C, Weather Delays, an allowance of twenty (20) working days of weather caused delay have been included in the time allowed for completion. This allowance represents a reasonable assessment of anticipated lost working days based on historical weather patterns. These weather days shall be included in the Contractor's schedule as specified in Section 01 32 16 - 1.08, PROGRESS SCHEDULES AND REPORTS.

*****END OF EXHIBIT F*****

EXHIBIT G

FAITHFUL PERFORMANCE BOND

Pleasant Grove Wastewater Treatment Plant Energy Recovery Project

Bond No. 070210386
Premium $ 95,267.00

PERFORMANCE BOND

This Performance Bond ("Performance Bond"), dated October 2, 2019, is in the penal sum of Twenty Three Million, Three Hundred Forty Nine Thousand, Seven Hundred Twenty Nine Dollars and 00/100 Dollars ($ 23,349,729.00), which is an amount not less than one hundred percent (100%) of the Total Contract Price, and is entered into by and between the undersigned W.M. Lyles Co. ("Principal" or "Contractor") and the undersigned Liberty Mutual Insurance Company ("Surety") to ensure the Principal's faithful performance of the Agreement for the Design-Assist and Construction of the Pleasant Grove Wastewater Treatment Plant Energy Recovery Project ("Design Assist Contract"). This Performance Bond consists of this page and the following Performance Bond Terms and Conditions, Paragraphs 1 through 10. Any singular reference to the Principal, the Surety, the City of Roseville, California ("City") or other party shall be considered plural where applicable.

BOND TERMS AND CONDITIONS

1. The Principal and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the City for the complete and proper performance of the Design Assist Contract, which is incorporated herein by reference.

2. If the Principal completely and properly performs all of its obligations under the Design Assist Contract, the Surety and the Principal shall have no further obligation under this Performance Bond, except as provided below.

3. If there is no City Default, the Surety's obligations under this Performance Bond shall only arise in accordance with the provisions of the Design Assist Contract. Similarly, any obligations to be performed by Surety are detailed in the Design Assist Contract.

4. If the Surety does not proceed as provided in the Design Assist Contract, then the Surety shall be deemed to be in default on this Performance Bond ten (10) calendar days after receipt of an additional written notice from City to the Surety demanding that the Surety perform its obligations under this Performance Bond. At all times the City shall be entitled to enforce any remedy available to the City at law or under the Design Assist Contract including, without limitation, and by way of example only, rights to perform work, protect work, mitigate damages, or coordinate work with other consultants or contractors at Surety's sole expense.

5. The Surety's monetary obligation under this Performance Bond is limited by the amount of this Performance Bond. Subject to these limits, the Surety's obligations under this

Bond are commensurate with the obligations of the Contractor under the Design Assist Contract. The Surety's obligations shall include, but are not limited to:

5.1 The responsibilities of the Contractor under the Design Assist Contract for completion of the Design Assist Contract and correction of defective work;

5.2 The responsibilities of the Contractor under the Design Assist Contract to pay liquidated damages, and damages for which no liquidated damages are specified in the Design Assist Contract, including but not limited to, all valid and proper back charges, offsets, payments, indemnities, defense costs or other damages; and

5.3 Additional legal, design professional and delay costs resulting from the Contractor Default or resulting from the actions or failure to act of the Surety under Paragraphs 3 or 4, above.

6. The Surety shall not be liable to the City or others for the obligations of the Contractor that are unrelated to the Design Assist Contract, and the Balance of the Total Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Performance Bond to any person or entity other than the City or its heirs, executors, administrators, or successors.

7. The Surety hereby waives notice of any change, alteration or addition to the Design Assist Contract or to related subcontracts, purchase orders and other obligations, including but not limited to changes of time. The Surety consents to all terms of the Design Assist Contract, including provisions on changes to the Contract Documents. No extension of time, Change Order, alteration, Modification, deletion, or addition to the Contract Documents, or of the work required thereunder, shall release or exonerate Surety on this Performance Bond or in any way affect the obligations of Surety on this Performance Bond.

8. Any proceeding, legal or equitable, under this Performance Bond shall be instituted in any court of competent jurisdiction in Placer County, California within two (2) years after the Contractor Default or within two (2) years after the Contractor ceased working or within two (2) years after the Surety refuses or fails to perform its obligations under this Performance Bond, whichever occurs first. If the provisions of this Paragraph 8 are void or prohibited by law, the minimum period of limitation available to sureties as a defense in Placer County shall be applicable.

9. Notice to the Surety or the Principal shall be mailed or delivered to the address shown on the signature pages. Notice to City shall be delivered to:

City Clerk of City of Roseville
311 Vernon Street
Roseville, CA 95678

EXHIBIT G

PERFORMANCE BOND

Pleasant Grove Wastewater Treatment Plant Energy Recovery Project

10. Any provision in this Performance Bond conflicting with any statutory or regulatory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein. The intent is that this Performance Bond shall be construed as a statutory bond and not as a common law bond.

[SIGNATURES ON FOLLOWING PAGE]

IN WITNESS WHEREOF, the undersigned obligated parties have executed this instrument.

(Corp. Seal)

Principal: W. M. Lyles Co.

Signature:

Name & Title: Anthony M. Mueller, Asst. Vice President

Address: P.O. Box 4377, Fresno, CA 93744

(Corp. Seal)

Surety: Liberty Mutual Insurance Company

Signature:

Name & Title: Bonnie Gonzalez Attorney In Fact

Address: 1340 Treat Blvd., Ste 400 Walnut Creek, CA 94597

Attorney in Fact: Bonnie Gonzalez

Surety shall submit the following documents along with this Performance Bond:

1. Verification that Surety is admitted to transact surety business in the State of California;

and

2. Copy of Surety's Certificate of Authority, issued by the Insurance Commissioner of the State of California, along with a statement that said Certificate has not been surrendered, revoked, cancelled, annulled or suspended.

Approved: _____, City Attorney

END OF DOCUMENT

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT **CIVIL CODE § 1189**

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California)
County of Placer)

On October 2, 2019 before me, Sonja Brenda Ferris, Notary Public,
Date *Here Insert Name and Title of the Officer*

personally appeared Anthony M. Mueller
Name(s) of Signer(s)

,

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

SONJA BRENDA FERRIS
Notary Public – California
Yolo County
Commission # 2189437
My Comm. Expires Apr 2, 2021

Signature Sonja Brenda Ferris
Signature of Notary Public

Place Notary Seal Above

OPTIONAL

Though this section is optional, completing this information can deter alteration of the document or fraudulent reattachment of this form to an unintended document.

Description of Attached Document

Title or Type of Document: Performance Bond
Document Date: October 2, 2019 Number of Pages: 4
Signer(s) Other Than Named Above: _____

Capacity(ies) Claimed by Signer(s)

Signer's Name: Anthony M. Mueller	Signer's Name: _____
☑ Corporate Officer — Title(s): Asst. VP	☐ Corporate Officer — Title(s): _____
☐ Partner — ☐ Limited ☐ General	☐ Partner — ☐ Limited ☐ General
☐ Individual ☐ Attorney in Fact	☐ Individual ☐ Attorney in Fact
☐ Trustee ☐ Guardian or Conservator	☐ Trustee ☐ Guardian or Conservator
☐ Other: _____	☐ Other: _____
Signer Is Representing: W. M. Lyles Co.	Signer Is Representing: _____

©2015 National Notary Association • www.NationalNotary.org • 1-800-US NOTARY (1-800-876-6827) Item #5907

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT — Civil Code § 1189

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California)
) ss
County of Fresno)

On October 2, 2019, before me, L. Genito, Notary Public, personally appeared Bonnie Gonzalez, who proved to me on the basis of satisfactory evidence to be the person~~(s)~~ whose name~~(s)~~ is~~/are~~ subscribed to the within instrument and acknowledged to me that ~~he~~/she/~~they~~ executed the same in ~~his~~/her/~~their~~ authorized capacity~~(ies)~~, and that by ~~his~~/her/~~their~~ signature~~(s)~~ on the instrument the person~~(s)~~, or the entity upon behalf of which the person~~(s)~~ acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

(Seal)

L. GENITO
Notary Public - California
Fresno County
Commission # 2272000
My Comm. Expires Jan 16, 2023

Signature: _____
L. Genito, Notary Public

CALIFORNIA DEPARTMENT OF INSURANCE

Company Profile
- Company Search
- Company Search Results
- Company Information
- Old Company Names
- Agent for Service
- Reference Information
- NAIC Group List
- Lines of Business
- Workers' Compensation Complaint and Request for Action/Appeals Contact Information

Financial Statements PDF's
- Annual Statements
- Quarterly Statements

Company Complaint
- Company Performance & Comparison Data
- Company Enforcement Action
- Composite Complaints Studies

Additional Info
- Find A Company Representative In Your Area
- View Financial Disclaimer

COMPANY PROFILE

Company Information

LIBERTY MUTUAL INSURANCE COMPANY

175 BERKELEY ST
BOSTON, MA 02116
800-526-1547

Old Company Names **Effective Date**

Agent For Service

Melissa DeKoven
2710 Gateway Oaks Drive, Suite 150N
Sacramento CA 95833-3505

Reference Information

NAIC #:	23043
California Company ID #:	1022-3
Date Authorized in California:	08/30/1929
License Status:	UNLIMITED-NORMAL
Company Type:	Property & Casualty
State of Domicile:	MASSACHUSETTS

back to top

NAIC Group List

NAIC Group #: 0111 LIBERTY MUT GRP

Lines Of Business

The company is authorized to transact business within these lines of insurance.
For an explanation of any of these terms, please refer to the glossary.

AIRCRAFT
AUTOMOBILE
BOILER AND MACHINERY
BURGLARY
COMMON CARRIER LIABILITY
CREDIT
DISABILITY
FIRE
LIABILITY
MARINE
MISCELLANEOUS
PLATE GLASS
SPRINKLER

SURETY

TEAM AND VEHICLE

WORKERS' COMPENSATION

back to top

© 2008 California Department of Insurance

EXHIBIT H

LABOR AND MATERIALS PAYMENT BOND

Pleasant Grove Wastewater Treatment Plant Energy Recovery Project

EXHIBIT H

LABOR AND MATERIAL BOND

Pleasant Grove Wastewater Treatment Plant Energy Recovery Project

Bond No. 070210386
Premium $ Included in Performance

LABOR AND MATERIAL BOND

This Labor and Material Bond ("Labor and Material Bond") dated October 2, 20 19, is in the penal sum of Twenty Three Million, Three Hundred Forty Nine Thousand, Seven Hundred Twenty Nine Dollars and 00/100 Dollars ($ 23,349,729.00), which is an amount not less than one hundred percent (100%) of the Total Contract Price, and is entered into by and between the undersigned W.M. Lyles Co. ("Principal" or "Contractor") and the undersigned Liberty Mutual Insurance Company ("Surety") to ensure the Principal's payment of claimants pursuant to the Agreement for the Design-Assist and Construction of the Pleasant Grove Wastewater Treatment Plant Energy Recovery Project ("Design Assist Contract"). This Labor and Material Bond consists of this page and the following Labor and Material Bond Terms and Conditions, Paragraphs 1 through 14. Any singular reference to the Principal, the Surety, the City of Roseville, California ("City") or other party shall be considered plural where applicable.

BOND TERMS AND CONDITIONS

1. The Principal and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the City and to Claimants, to pay for labor, materials, Equipment furnished and Services provided in the performance of the Design Assist Contract, which is incorporated herein by reference.

2. With respect to the City, this obligation shall become null and void if and when the Principal:

   2.1 Promptly and fully makes payment, directly or indirectly, for all sums due Claimants, and

   2.2 Fully defends, indemnifies and holds harmless the City from all claims, demands, liens or suits by any person or entity who furnished labor, materials or equipment for use in the performance of the Design Assist Contact, provided the City has promptly notified the Principal and the Surety (at the address described in Paragraph 12 below) of any claims, demands, liens or suits and has tendered defense of such claims, demands, liens or suits to the Principal and the Surety, and provided there is no City Default. Otherwise, this Labor and Material Bond shall be, and remain, in full force and effect.

3. With respect to Claimants, this obligation shall become null and void if and when the Principal promptly and fully makes payment, directly or indirectly through its Subcontractors, for all sums due Claimants; otherwise, this Labor and Material Bond shall be, and remain, in full force and effect.

LABOR AND MATERIAL BOND

EXHIBIT H

LABOR AND MATERIAL BOND

Pleasant Grove Wastewater Treatment Plant Energy Recovery Project

4. The Surety shall have no obligation to Claimants under this Labor and Material Bond until:

   4.1 Claimants who are employed by or have a direct contract with the Contractor have given notice to the Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to the City, stating that a claim is being made under this Labor and Material Bond and, with substantial accuracy, the amount of the claim.

   4.2 Claimants who do not have a direct contract with the Contractor:

      4.2.1 Have furnished written notice to the Contractor and sent a copy, or notice thereof, to the City, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials were furnished or supplied or for whom the labor was done or performed; and

      4.2.2 Have either received a rejection in whole or in part from the Contractor, or have not received within thirty (30) days of furnishing the above notice any communication from the Contractor by which the Contractor has indicated the claim will be paid directly or indirectly; and

      4.3.3 Not having been paid within the above thirty (30) days, have sent a written notice to the Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to the City, stating that a claim is being made under this Labor and Material Bond and enclosing a copy of the previous written notice furnished to the Contractor.

5. If a notice required by Paragraph 4 above is given by the City to the Contractor or to the Surety, that shall be considered sufficient compliance.

6. When the Claimant has satisfied the conditions of Paragraph 4, the Surety shall promptly and at the Surety's expense take the following actions:

   6.1 Send an answer to the Claimant, with a copy to the City, within forty-five (45) days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed.

   6.2 Pay or arrange for payment of any undisputed amounts.

7. The Surety's total obligation shall not exceed the amount of this Labor and Material Bond, and the amount of this Labor and Material Bond shall be credited for any payments made in good faith by the Surety under this Labor and Material Bond.

EXHIBIT H-2

LABOR AND MATERIAL BOND

8. Amounts due the Contractor under the Design Assist Contract shall be applied to satisfy claims, if any, under this Labor and Material Bond.

9. The Surety shall not be liable to the City, Claimants or others for obligations of the Contractor that are unrelated to the Design Assist Contract. The City shall not be liable for payment of any costs, expenses, or attorney's fees of any Claimant under this Labor and Material Bond, and shall have no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Labor and Material Bond.

10. The Surety hereby waives notice of any change, alteration or addition to the Design Assist Contract or to related subcontracts, purchase orders and other obligations, including but not limited to changes of time. The Surety consents to all terms of the Design Assist Contract, including provisions on changes to the Contract Documents. No extension of time, Change Order, alteration, modification, deletion, or addition to the Contract Documents, or of the work required thereunder, shall release or exonerate Surety on this Labor and Material Bond or in any way affect the obligations of Surety on this Labor and Material Bond.

11. Any proceeding, legal or equitable, under this Labor and Material Bond shall be instituted in any court of competent jurisdiction in Placer County, California within one (1) year from the date on which (i) the Claimant gave the notice required by Paragraph 4.1 or Paragraph 4.3.3, or (ii) the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Design Assist Contract, whichever of (i) or (ii) first occurs. If the provisions of this Paragraph 11 are void or prohibited by law, the minimum period of limitation available to sureties as a defense in Placer County shall be applicable.

12. Notice to the Surety or the Principal shall be mailed or delivered to the address shown on the signature page below. Actual receipt of notice by the Surety, the City or the Principal, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page below. Notice to City shall be delivered to:

    City Clerk of City of Roseville
    311 Vernon Street
    Roseville, CA 95678

13. Any provision in this Labor and Material Bond conflicting with any statutory or regulatory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein.

    The intent is that this Labor and Material Bond shall be construed as a statutory bond and not as a common law bond.

EXHIBIT H

LABOR AND MATERIAL BOND

Pleasant Grove Wastewater Treatment Plant Energy Recovery Project

14. Upon request by any person or entity appearing to be a potential beneficiary of this Labor and Material Bond, the Principal shall promptly furnish a copy of this Labor and Material Bond or shall permit a copy to be made.

[SIGNATURES ON FOLLOWING PAGE]

IN WITNESS WHEREOF, the undersigned obligated parties have executed this security instrument.

(Corp. Seal)

Principal: W. M. Lyles Co.

Signature:

Name & Title: Anthony M. Mueller, Asst. Vice President

Address: P.O. Box 4377, Fresno, CA 93744

(Corp. Seal)

Surety: Liberty Mutual Insurance Company

Signature:

Name & Title: Bonnie Gonzalez Attorney In Fact

Address: 1340 Treat Blvd. Suite 400 Walnut Creek, CA 94597

EXHIBIT H-4

LABOR AND MATERIAL BOND

EXHIBIT H

LABOR AND MATERIAL BOND

Pleasant Grove Wastewater Treatment Plant Energy Recovery Project

Attorney in Fact: Bonnie Gonzalez

Surety shall submit the following documents along with this Labor and Material Bond:

1. Verification that Surety is admitted to transact surety business in the State of California; and

2. Copy of Surety's Certificate of Authority, issued by the Insurance Commissioner of the State of California, along with a statement that said Certificate has not been surrendered, revoked, cancelled, annulled or suspended.

Approved: Robert R Schmidt, City Attorney

END OF DOCUMENT

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT **CIVIL CODE § 1189**

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California)
County of Placer)

On October 2, 2019 before me, Sonja Brenda Ferris, Notary Public,
Date *Here Insert Name and Title of the Officer*

personally appeared Anthony M. Mueller
Name(s) of Signer(s)

,

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

SONJA BRENDA FERRIS
Notary Public – California
Yolo County
Commission # 2189437
My Comm. Expires Apr 2, 2021

Signature Sonja Brenda Ferris
Signature of Notary Public

Place Notary Seal Above

OPTIONAL

Though this section is optional, completing this information can deter alteration of the document or fraudulent reattachment of this form to an unintended document.

Description of Attached Document
Title or Type of Document: Labor and Material Bond
Document Date: October 2, 2019 Number of Pages: 4
Signer(s) Other Than Named Above: _____

Capacity(ies) Claimed by Signer(s)

Signer's Name: Anthony M. Mueller	Signer's Name: _____
☑ Corporate Officer — Title(s): Asst. VP	☐ Corporate Officer — Title(s): _____
☐ Partner — ☐ Limited ☐ General	☐ Partner — ☐ Limited ☐ General
☐ Individual ☐ Attorney in Fact	☐ Individual ☐ Attorney in Fact
☐ Trustee ☐ Guardian or Conservator	☐ Trustee ☐ Guardian or Conservator
☐ Other: _____	☐ Other: _____
Signer Is Representing: W. M. Lyles Co.	Signer Is Representing: _____

©2015 National Notary Association • www.NationalNotary.org • 1-800-US NOTARY (1-800-876-6827) Item #5907

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT **Civil Code § 1189**

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California)
) ss
County of Fresno)

On October 2 2019, before me, L. Genito, Notary Public, personally appeared Bonnie Gonzalez, who proved to me on the basis of satisfactory evidence to be the person~~(s)~~ whose name~~(s)~~ is~~/are~~ subscribed to the within instrument and acknowledged to me that ~~he~~/she/~~they~~ executed the same in ~~his~~/her/~~their~~ authorized capacity~~(ies)~~, and that by ~~his~~/her/~~their~~ signature~~(s)~~ on the instrument the person~~(s)~~, or the entity upon behalf of which the person~~(s)~~ acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

L. GENITO
Notary Public - California
Fresno County
Commission # 2272000
My Comm. Expires Jan 16, 2023

(Seal)

Signature: _____
L. Genito, Notary Public

This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

Liberty Mutual Insurance Company
The Ohio Casualty Insurance Company
West American Insurance Company

Certificate No: **8198004-984971**

POWER OF ATTORNEY

KNOWN ALL PERSONS BY THESE PRESENTS: That The Ohio Casualty Insurance Company is a corporation duly organized under the laws of the State of New Hampshire, that Liberty Mutual Insurance Company is a corporation duly organized under the laws of the State of Massachusetts, and West American Insurance Company is a corporation duly organized under the laws of the State of Indiana (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Cody Lyman, Ralph B. Busch III, John C. Day, Steven P. Edwards, Lyn Genito, Bonnie Gonzalez

all of the city of Fresno state of California each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 20th day of November, 2018.

Liberty Mutual Insurance Company
The Ohio Casualty Insurance Company
West American Insurance Company

By: _____
David M. Carey, Assistant Secretary

State of PENNSYLVANIA
County of MONTGOMERY ss

On this 20th day of November, 2018 before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of Liberty Mutual Insurance Company, The Ohio Casualty Company, and West American Insurance Company, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at King of Prussia, Pennsylvania, on the day and year first above written.

COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Teresa Pastella, Notary Public
Upper Merion Twp., Montgomery County
My Commission Expires March 28, 2021
Member, Pennsylvania Association of Notaries

By: _____
Teresa Pastella, Notary Public

This Power of Attorney is made and executed pursuant to and by authority of the following By-laws and Authorizations of The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company which resolutions are now in full force and effect reading as follows:

ARTICLE IV – OFFICERS: Section 12. Power of Attorney.
Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and execution of any such instruments and to attach thereto the seal of the Corporation. When so executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

ARTICLE XIII – Execution of Contracts: Section 5. Surety Bonds and Undertakings.
Any officer of the Company authorized for that purpose in writing by the chairman or the president, and subject to such limitations as the chairman or the president may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Company by their signature and execution of any such instruments and to attach thereto the seal of the Company. When so executed such instruments shall be as binding as if signed by the president and attested by the secretary.

Certificate of Designation – The President of the Company, acting pursuant to the Bylaws of the Company, authorizes David M. Carey, Assistant Secretary to appoint such attorneys-in-fact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

Authorization – By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

I, Renee C. Llewellyn, the undersigned, Assistant Secretary, The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 2 day of October 2019

By: _____
Renee C. Llewellyn, Assistant Secretary

Not valid for mortgage, note, loan, letter of credit, currency rate, interest rate or residual value guarantees.

To confirm the validity of this Power of Attorney call 1-610-832-8240 between 9:00 am and 4:30 pm EST on any business day.

CALIFORNIA DEPARTMENT OF INSURANCE

- Company Profile
  - Company Search
  - Company Search Results
  - Company Information
  - Old Company Names
  - Agent for Service
  - Reference Information
  - NAIC Group List
  - Lines of Business
  - Workers' Compensation Complaint and Request for Action/Appeals Contact Information
- Financial Statements PDF's
  - Annual Statements
  - Quarterly Statements
- Company Complaint
  - Company Performance & Comparison Data
  - Company Enforcement Action
  - Composite Complaints Studies
- Additional Info
  - Find A Company Representative In Your Area
  - View Financial Disclaimer

COMPANY PROFILE

Company Information

LIBERTY MUTUAL INSURANCE COMPANY

175 BERKELEY ST
BOSTON, MA 02116
800-526-1547

Old Company Names **Effective Date**

Agent For Service

Melissa DeKoven
2710 Gateway Oaks Drive, Suite 150N
Sacramento CA 95833-3505

Reference Information

NAIC #:	23043
California Company ID #:	1022-3
Date Authorized in California:	08/30/1929
License Status:	UNLIMITED-NORMAL
Company Type:	Property & Casualty
State of Domicile:	MASSACHUSETTS

back to top

NAIC Group List

NAIC Group #: 0111 LIBERTY MUT GRP

Lines Of Business

The company is authorized to transact business within these lines of insurance.
For an explanation of any of these terms, please refer to the glossary.

AIRCRAFT
AUTOMOBILE
BOILER AND MACHINERY
BURGLARY
COMMON CARRIER LIABILITY
CREDIT
DISABILITY
FIRE
LIABILITY
MARINE
MISCELLANEOUS
PLATE GLASS
SPRINKLER

SURETY

TEAM AND VEHICLE

WORKERS' COMPENSATION

back to top

© 2008 California Department of Insurance

EXHIBIT I

WARRANTY BOND
(This document shall be executed by Contractor before all Work has been Substantially Complete)

Pleasant Grove Wastewater Treatment Plant Energy Recovery Project

EXHIBIT I

WARRANTY BOND

Pleasant Grove Wastewater Treatment Plant Energy Recovery Project

Bond No. _____
Premium $_____

WARRANTY BOND

This Warranty Bond ("Warranty Bond"), dated _____, 20___, is in the penal sum of _____ for the Agreement for the Design-Assist and Construction of the Pleasant Grove Wastewater Treatment Plant Energy Recovery Project ("Design Assist Contract"), and is entered into by and between the undersigned _____ ("Principal" or "Contractor") and the undersigned _____ ("Surety") to guaranty that all Equipment and Services provided by Contractor under the above-mentioned Design Assist Contract will fulfill the requirements of Contractor's warranties and guarantees included in the Design Assist Contract. This Warranty Bond consists of this page and the following Warranty Bond Terms and Conditions, Paragraphs 1 through 7. Any singular reference to the Principal/Contactor, the Surety, the City of Roseville, California ("City") or other party shall be considered plural where applicable.

BOND TERMS AND CONDITIONS

1. The Principal and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the City for a period of one (1) year following the date of Final Completion, or such longer period specified in the Design Assist Contract, its unconditional warranty of the quality and adequacy of all of the work including, without limitation, all equipment and work provided by Contractor and its subcontractors and subvendors of all tiers in connection with the Design Assist Contract.

2. Neither final payment nor use or occupancy of the Equipment or Services performed by the Contractor shall constitute an acceptance of such Equipment or Services not done in accordance with this Warranty Bond or relieve Contractor of liability in respect to any express guarantees, warranties or responsibilities for faulty materials or workmanship, ordinary wear and tear excepted. If within one (1) year after the date of Final Completion, or such longer period of time as may be prescribed the terms of the Contract Documents, any Equipment or Services is found to be defective, Contractor and Surety shall promptly, without cost to City and in accordance with City's written instructions, correct such defective Equipment or Services. Contractor and Surety shall remove any defective Equipment rejected by City and replace it with Equipment that is not defective. If Contractor or Surety fails to promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, City may have the defective Equipment or Services corrected or removed and replaced. Contractor and Surety shall pay for all claims, costs, losses and damages caused by or resulting from such removal and replacement. Where Contractor and Surety fail to correct defective Equipment or Services, or defects are discovered outside the correction period, City shall have all rights and remedies granted by law.

3. As part of the obligation secured hereby and in addition to the face amount specified therefor, there shall be included costs and reasonable expenses and fees, including reasonable attorney's fees, incurred by City.

4. The Surety hereby waives notice of any change, alteration or addition to the Design Assist Contract or to related subcontracts, purchase orders and other obligations, including but not limited to changes of time. The Surety consents to all terms of the Design Assist Contract, including provisions on changes to the Contract Documents. No extension of time, Change Order, alteration, Modification, deletion, or addition to the Contract Documents, or of the work required thereunder, shall release or exonerate Surety on this Warranty Bond or in any way affect the obligations of Surety on this Warranty Bond.

5. If the Surety does not proceed as provided in Paragraph 2 above, then the Surety shall be deemed to be in default on this Warranty Bond ten (10) calendar days after receipt of an additional written notice from City to the Surety demanding that the Surety perform its obligations under this Warranty Bond. At all times the City shall be entitled to enforce any remedy available to the City at law or under the Design Assist Contract including, without limitation, and by way of example only, rights to perform work as Surety's expense, protect work, mitigate damages, or coordinate work with other consultants or contractors.

6. All abbreviations and definitions of terms used in this Warranty Bond shall have the meanings set forth in the Contract Documents, including, without means of limitation, the Design Assist Contract.

7. The foregoing Warranty Bond is in addition to any other guarantees and warranties of Contractor contained in the Contract Documents, and not in lieu of, any and all other liability imposed on Contractor under the Contract Documents and at law with respect to Contractor's duties, obligations, and performance under the Design Assist Contract. In the event of any conflict or inconsistency between the terms of this Warranty Bond and any guaranty, warranty or obligation of the Seller under the Design Assist Contract or at law, such inconsistency or conflict shall be resolved in favor of the higher level of obligation of the Contractor and Surety.

8. Notice to the Surety or the Principal shall be mailed or delivered to the address shown on the signature page below. Actual receipt of notice by the Surety, the City or the Principal, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page below. Notice to City shall be delivered to:

City Clerk of City of Roseville
311 Vernon Street
Roseville, CA 95678

[SIGNATURES ON FOLLOWING PAGE]

EXHIBIT I

WARRANTY BOND

Pleasant Grove Wastewater Treatment Plant Energy Recovery Project

IN WITNESS WHEREOF, the undersigned obligated parties have executed this instrument.

(Corp. Seal)

Principal: _____

Signature: _____

Name & Title:

Address:

(Corp. Seal)

Surety: _____

Signature: _____

Name & Title:

Address:

Attorney in Fact: _____

Surety shall submit the following documents along with this Warranty Bond:

EXHIBIT I

WARRANTY BOND

Pleasant Grove Wastewater Treatment Plant Energy Recovery Project

1. Verification that Surety is admitted to transact surety business in the State of California; and
2. Copy of Surety's Certificate of Authority, issued by the Insurance Commissioner of the State of California, along with a statement that said Certificate has not been surrendered, revoked, cancelled, annulled or suspended.

Approved: _____, City Attorney

END OF DOCUMENT

EXHIBIT J

ESCROW AGREEMENT FOR SECURITY DEPOSITS IN LIEU OF RETENTION

Pleasant Grove Wastewater Treatment Plant Energy Recovery Project

EXHIBIT J

ESCROW No. 1669

ESCROW AGREEMENT FOR SECURITY DEPOSITS IN LIEU OF RETENTION

(Project: PGWWTP Energy Recovery)

THIS ESCROW AGREEMENT is made and entered into on this 11th day of October, 2019 by and between the:

City of Roseville, whose address is:

311 Vernon Street
Roseville, CA 95678

(hereinafter called "CITY"); and

W. M. Lyles Co., whose address is:
1210 W. Olive Ave., Fresno, CA 93728
PO Box 4438, Fresno, CA 93744

(hereinafter called "CONTRACTOR"); and

Banner Bank, whose address is:
5901 Priestly Dr.,Suite 160
Carlsbad, CA 92008

(hereinafter called "ESCROW AGENT").

For the consideration hereinafter set forth, CITY, CONTRACTOR, and ESCROW AGENT agree as follows:

1. Pursuant to Section 22300 of the Public Contract Code of the State of California, CONTRACTOR has the option to deposit securities, subject to prior approval of CITY, with ESCROW AGENT, as a substitute for retention earnings required to be withheld by CITY pursuant to the contract for public works entered into between the CITY and CONTRACTOR for the Project in the amount of Twenty Three Million, Three Hundred Forty Nine Thousand, Seven Hundred Twenty Nine dollars ($23,349,729.09) dated November 6, 2019, (hereinafter

referred to as the "Contract"). Alternatively, on written request of CONTRACTOR, CITY shall make payments of the retention earnings directly to the ESCROW AGENT.

When CONTRACTOR deposits the securities as a substitute for Contract earnings, the ESCROW AGENT shall notify CITY within ten (10) days of the deposit. The market value of the securities at the time of the substitution shall be at least equal to the cash amount then required to be withheld as retention under the terms of the Contract between CITY and CONTRACTOR. Securities shall be held in the name of ESCROW AGENT, and shall designate CONTRACTOR as the beneficial owner, and shall be limited to those types of acceptable securities as described in Public Contract Code Section 22300.

2. CITY shall make progress payments to CONTRACTOR for those funds which otherwise would be withheld from progress payments pursuant to the Contract provisions, provided that ESCROW AGENT holds securities in the form and amount specified above.

3. When CITY makes payment of retentions earned directly to ESCROW AGENT, ESCROW AGENT shall hold them for the benefit of CONTRACTOR until the time that the escrow created under this Agreement is terminated. CONTRACTOR may direct the investment of the payments into securities. All terms and conditions of this Agreement and the rights and responsibilities of the parties shall be equally applicable and binding when CITY pays ESCROW AGENT directly.

4. CONTRACTOR shall be responsible for paying all fees for the expenses incurred by ESCROW AGENT in administering the Escrow Account and all expenses of CITY. These expenses and payment terms shall be determined by CITY, CONTRACTOR, and ESCROW AGENT.

5. The interest earned on the securities or the money market accounts held in escrow and all interest earning on that interest shall be for the sole account of CONTRACTOR and shall

be subject to withdrawal by CONTRACTOR at any time and from time to time without notice to CITY.

6. CONTRACTOR shall have the right to withdraw all or any part of the principal in the Escrow Account only by written notice to ESCROW AGENT accompanied by written authorization from CITY to ESCROW AGENT that CITY consents to the withdrawal of the amount sought to be withdrawn by CONTRACTOR.

7. CITY shall have a right to draw upon the securities in the event of default by CONTRACTOR. Upon seven (7) days' written notice to ESCROW AGENT from CITY of the default, ESCROW AGENT shall immediately convert the securities to cash and shall distribute the cash as instructed by CITY.

8. Only upon receipt of written notification from CITY certifying that the Contract is final and complete, and that CONTRACTOR has complied with all requirements and procedures applicable to the Contract, ESCROW AGENT shall release to CONTRACTOR all securities and interest on deposit less escrow fees and charges of the Escrow Account. The escrow shall be closed immediately upon disbursement of all moneys and securities on deposit and payments of fees and charges.

9. ESCROW AGENT shall rely on the written notifications from CITY and CONTRACTOR pursuant to Sections (5) to (8), inclusive, of this Agreement and CONTRACTOR shall hold ESCROW AGENT harmless from ESCROW AGENT's release and disbursement of the securities and interest as set forth above.

10. The parties hereto mutually agree that this Agreement is substantially similar to the form under Public Contracts Code Section 22300.

11. The names of the persons who are authorized to give written notice or to receive written notice on behalf of CITY and on behalf of CONTRACTOR in connection with the foregoing, and exemplars of their respective signatures are as follows:

On behalf of CITY:

Environmental Utilities Director
Title

Richard D. Plecker
Name

Signature

311 Vernon Street, Roseville, CA 95678
Address

On behalf of CONTRACTOR:

Assistant Vice President
Title

Anthony M. Mueller
Name

Signature

PO Box 4438, Fresno, Ca 93744
Address

On behalf of ESCROW AGENT:

Escrow Administrator
Title

Francisca Pardo
Name

Signature

5901 Priestly, Dr, Suite 160, Carlsbad, CA 92008
Address

12. At the time the Escrow Account is opened, CITY and CONTRACTOR shall deliver to ESCROW AGENT a fully executed counterpart of this Agreement.

IN WITNESS WHEREOF, the City of Roseville, a municipal corporation, has authorized the execution of this Agreement by its City Manager and attestation by its City Clerk under the authority of Resolution No. 87-141, adopted by the Council of the City of Roseville on the 5th

day of August, 1987, and CONTRACTOR and ESCROW AGENT have authorized the execution of this Agreement.

CITY OF ROSEVILLE, a municipal corporation:

BY: _____
DOMINICK CASEY
City Manager

ATTEST:

BY: _____
for SONIA OROZCO
City Clerk

APPROVED AS TO FORM:

BY: _____
ROBERT R. SCHMITT
City Attorney

APPROVED AS TO SUBSTANCE:

BY: _____
DENNIS KAUFFMAN
Chief Financial Officer

CONTRACTOR:

W. M. Lyles Co., a California Corporation

BY: _____

its: Anthony M. Mueller, Asst Vice President

and

BY: _____

its: Ruben Moreno, Jr. Secretary

ESCROW AGENT:

BY: _____

its: Francisca Pardo, Escrow Administrator

and

BY: _____

its: _____

ACKNOWLEDGED BY ADMINISTERING DEPARTMENT:

BY: _____
RICHARD D. PLECKER
Environmental Utilities Director

[E:\agreement\form agreements\Escrow Agreement.docx; 1/24/2019]

EXHIBIT K

WORKER'S COMPENSATION INSURANCE CERTIFICATION

Pleasant Grove Wastewater Treatment Plant Energy Recovery Project

EXHIBIT K

WORKER'S COMPENSATION INSURANCE CERTIFICATION

Pleasant Grove Wastewater Treatment Plant Energy Recovery Project

In accordance with California Labor Code Section 1861, prior to commencement of any Work, the Contractor shall sign and file with the City the following certification:

> "I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the Work of this Agreement."

By: _____

Title: Anthony M. Mueller, Asst. Vice President

Contractor: W. M. Lyles Co.

Date: October 10, 2019

*****END OF EXHIBIT K*****

EXHIBIT K-1

WORKER'S COMPENSATION INSURANCE CERTIFICATE

THIS PAGE LEFT BLANK INTENTIONALLY

EXHIBIT K-2

WORKER'S COMPENSATION INSURANCE CERTIFICATE

EXHIBIT L

CONTRACTOR INSURANCE CERTIFICATES

Pleasant Grove Wastewater Treatment Plant Energy Recovery Project

LYLEDIR-01 NLIMON

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY) 10/8/2019

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME:	
Fresno CSG-Alliant Insurance Services, Inc. 9 E River Park Place East Ste 310 Fresno, CA 93720	PHONE (A/C, No, Ext): (559) 374-3560	FAX (A/C, No):
	E-MAIL ADDRESS:	

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A : Old Republic Insurance Company	24147
INSURER B : Allied World Assurance Company (U.S.) Inc	19489
INSURER C : Berkley Assurance Company	39462
INSURER D :	
INSURER E :	
INSURER F :	

INSURED

W.M. Lyles Co
P.O. Box 4377
Fresno, CA 93744-4377

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X COMMERCIAL GENERAL LIABILITY [ ] CLAIMS-MADE [X] OCCUR X XCU Included GEN'L AGGREGATE LIMIT APPLIES PER: [ ] POLICY [X] PRO-JECT [ ] LOC X OTHER: Self-Insured Retention: $10,000	X	X	MWZY31334219	5/31/2019	5/31/2020	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG EBL Each Employ	$ 2,000,000 $ 750,000 $ 10,000 $ 2,000,000 $ 4,000,000 $ 4,000,000 $ 2,000,000
A	AUTOMOBILE LIABILITY X ANY AUTO [ ] OWNED AUTOS ONLY [ ] SCHEDULED AUTOS X HIRED AUTOS ONLY X NON-OWNED AUTOS ONLY X 1,000 Comp Ded X 1,000 Coll Ded	X	X	MWTB31334319	5/31/2019	5/31/2020	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident)	$ 2,000,000 $ $ $
B	X UMBRELLA LIAB X OCCUR EXCESS LIAB [ ] CLAIMS-MADE [ ] DED X RETENTION $ 10,000	X	X	0308-3900	5/31/2019	5/31/2020	EACH OCCURRENCE AGGREGATE	$ 8,000,000 $ 8,000,000 $
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) Y/N [ ] If yes, describe under DESCRIPTION OF OPERATIONS below	N/A	X	MWC31334119	5/31/2019	5/31/2020	X PER STATUTE [ ] OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	$ 1,000,000 $ 1,000,000 $ 1,000,000
C	Contractor Pollution			PCADB-5008741-0519	5/31/2019	5/31/2020	$2M Each/Aggregate	2,000,000
C	Contractors Professi			PCADB-5008741-0519	5/31/2019	5/31/2020	$2M Each/Aggregate	4,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)
Re: Pleasant Grove Wastewater Treatment Plant Energy Recovery Project, 5051 Westpark Dr., Roseville, CA 95747.
City of Roseville, Construction Manager, Engineer, Funding Agencies and their directors, elected officials, officers, officials, employees, agents, consultants and volunteers are included as Additional Insureds on primary and non-contributory basis, per project aggregate applies, waiver of subrogation applies.

Endorsement(s) Attached:
General Liability Additional Insured
General Liability Additional Insured - Completed Operations
SEE ATTACHED ACORD 101

CERTIFICATE HOLDER

City of Roseville
311 Vernon Street
Roseville, CA 95678

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

Nicolette Limon

© 1988-2015 ACORD CORPORATION. All rights reserved.
The ACORD name and logo are registered marks of ACORD

AGENCY CUSTOMER ID: LYLEDIR-01 NLIMON

LOC #: 1

ADDITIONAL REMARKS SCHEDULE

AGENCY		NAMED INSURED
Fresno CSG-Alliant Insurance Services, Inc.		W.M. Lyles Co P.O. Box 4377 Fresno, CA 93744-4377
POLICY NUMBER SEE PAGE 1		
CARRIER SEE PAGE 1	NAIC CODE SEE P 1	EFFECTIVE DATE: SEE PAGE 1

ADDITIONAL REMARKS

THIS ADDITIONAL REMARKS FORM IS A SCHEDULE TO ACORD FORM,

FORM NUMBER: ACORD 25 FORM TITLE: Certificate of Liability Insurance

Description of Operations/Locations/Vehicles:
General Liability Primary and Non-Contributory
General Liability Per project aggregate
General Liability Waiver of Subrogation
Automobile Liability Additional Insured
Automobile Liability Primary and Non-Contributory
Automobile Liability Waiver of Subrogation
Workers' Compensation Waiver of Subrogation
Cancellation Provisions

© 2008 ACORD CORPORATION. All rights reserved.

The ACORD name and logo are registered marks of ACORD

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

ADDITIONAL INSURED – OWNERS, LESSEES OR CONTRACTORS – SCHEDULED PERSON OR ORGANIZATION

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART

SCHEDULE

Name Of Additional Insured Person(s) Or Organization(s)	Location(s) Of Covered Operations
Any person or organization contractually requiring status as an additional insured for ongoing operations that you perform for them	The locations as specified in the written contracts or agreements
Information required to complete this Schedule, if not shown above, will be shown in the Declarations.	

A. Section II – Who Is An Insured is amended to include as an additional insured the person(s) or organization(s) shown in the Schedule, but only with respect to liability for "bodily injury", "property damage" or "personal and advertising injury" caused, in whole or in part, by:

1. Your acts or omissions; or
2. The acts or omissions of those acting on your behalf;

in the performance of your ongoing operations for the additional insured(s) at the location(s) designated above.

However:

1. The insurance afforded to such additional insured only applies to the extent permitted by law; and
2. If coverage provided to the additional insured is required by a contract or agreement, the insurance afforded to such additional insured will not be broader than that which you are required by the contract or agreement to provide for such additional insured.

B. With respect to the insurance afforded to these additional insureds, the following additional exclusions apply:

This insurance does not apply to "bodily injury" or "property damage" occurring after:

1. All work, including materials, parts or equipment furnished in connection with such work, on the project (other than service, maintenance or repairs) to be performed by or on behalf of the additional insured(s) at the location of the covered operations has been completed; or
2. That portion of "your work" out of which the injury or damage arises has been put to its intended use by any person or organization other than another contractor or subcontractor engaged in performing operations for a principal as a part of the same project.

© Insurance Services Office, Inc., 2012

C. With respect to the insurance afforded to these additional insureds, the following is added to **Section III – Limits Of Insurance:**

If coverage provided to the additional insured is required by a contract or agreement, the most we will pay on behalf of the additional insured is the amount of insurance:

1. Required by the contract or agreement; or
2. Available under the applicable Limits of Insurance shown in the Declarations;

whichever is less.

This endorsement shall not increase the applicable Limits of Insurance shown in the Declarations.

© Insurance Services Office, Inc., 2012

POLICY NUMBER: MWZY31334219

COMMERCIAL GENERAL LIABILITY
CG 20 37 04 13

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

ADDITIONAL INSURED – OWNERS, LESSEES OR CONTRACTORS – COMPLETED OPERATIONS

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART
PRODUCTS/COMPLETED OPERATIONS LIABILITY COVERAGE PART

SCHEDULE

Name Of Additional Insured Person(s) Or Organization(s)	Location And Description Of Completed Operations
As required by written contract or agreement	The locations as specified in the written contracts or agreements
Information required to complete this Schedule, if not shown above, will be shown in the Declarations.	

A. **Section II – Who Is An Insured** is amended to include as an additional insured the person(s) or organization(s) shown in the Schedule, but only with respect to liability for "bodily injury" or "property damage" caused, in whole or in part, by "your work" at the location designated and described in the Schedule of this endorsement performed for that additional insured and included in the "products-completed operations hazard".

However:

1. The insurance afforded to such additional insured only applies to the extent permitted by law; and
2. If coverage provided to the additional insured is required by a contract or agreement, the insurance afforded to such additional insured will not be broader than that which you are required by the contract or agreement to provide for such additional insured.

B. With respect to the insurance afforded to these additional insureds, the following is added to **Section III – Limits Of Insurance:**

If coverage provided to the additional insured is required by a contract or agreement, the most we will pay on behalf of the additional insured is the amount of insurance:

1. Required by the contract or agreement; or
2. Available under the applicable Limits of Insurance shown in the Declarations;

whichever is less.

This endorsement shall not increase the applicable Limits of Insurance shown in the Declarations.

© Insurance Services Office, Inc., 2012

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

PRIMARY AND NONCONTRIBUTORY – OTHER INSURANCE CONDITION

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART
PRODUCTS/COMPLETED OPERATIONS LIABILITY COVERAGE PART

The following is added to the **Other Insurance** Condition and supersedes any provision to the contrary:

Primary And Noncontributory Insurance

This insurance is primary to and will not seek contribution from any other insurance available to an additional insured under your policy provided that:

(1) The additional insured is a Named Insured under such other insurance; and

(2) You have agreed in writing in a contract or agreement that this insurance would be primary and would not seek contribution from any other insurance available to the additional insured.

 © Insurance Services Office, Inc., 2012

POLICY NUMBER: MWZY31334219

COMMERCIAL GENERAL LIABILITY
CG 25 03 05 09

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

DESIGNATED CONSTRUCTION PROJECT(S) GENERAL AGGREGATE LIMIT

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART

SCHEDULE

Designated Construction Project(s):
The projects as specified in the written contracts or agreements
Information required to complete this Schedule, if not shown above, will be shown in the Declarations.

A. For all sums which the insured becomes legally obligated to pay as damages caused by "occurrences" under Section I – Coverage A, and for all medical expenses caused by accidents under Section I – Coverage C, which can be attributed only to ongoing operations at a single designated construction project shown in the Schedule above:

1. A separate Designated Construction Project General Aggregate Limit applies to each designated construction project, and that limit is equal to the amount of the General Aggregate Limit shown in the Declarations.
2. The Designated Construction Project General Aggregate Limit is the most we will pay for the sum of all damages under Coverage A, except damages because of "bodily injury" or "property damage" included in the "products-completed operations hazard", and for medical expenses under Coverage C regardless of the number of:
   a. Insureds;
   b. Claims made or "suits" brought; or
   c. Persons or organizations making claims or bringing "suits".
3. Any payments made under Coverage A for damages or under Coverage C for medical expenses shall reduce the Designated Construction Project General Aggregate Limit for that designated construction project. Such payments shall not reduce the General Aggregate Limit shown in the Declarations nor shall they reduce any other Designated Construction Project General Aggregate Limit for any other designated construction project shown in the Schedule above.
4. The limits shown in the Declarations for Each Occurrence, Damage To Premises Rented To You and Medical Expense continue to apply. However, instead of being subject to the General Aggregate Limit shown in the Declarations, such limits will be subject to the applicable Designated Construction Project General Aggregate Limit.

© Insurance Services Office, Inc., 2008

POLICY NUMBER: MWZY31334219

COMMERCIAL GENERAL LIABILITY
CG 24 04 05 09

WAIVER OF TRANSFER OF RIGHTS OF RECOVERY AGAINST OTHERS TO US

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART
PRODUCTS/COMPLETED OPERATIONS LIABILITY COVERAGE PART

SCHEDULE

Name Of Person Or Organization:
Any persons or organizations requiring a waiver of transfer of rights of recovery pursuant to the terms of any contract or agreement you enter into with such person or organization
Information required to complete this Schedule, if not shown above, will be shown in the Declarations.

The following is added to Paragraph **8. Transfer Of Rights Of Recovery Against Others To Us** of **Section IV – Conditions:**

We waive any right of recovery we may have against the person or organization shown in the Schedule above because of payments we make for injury or damage arising out of your ongoing operations or "your work" done under a contract with that person or organization and included in the "products-completed operations hazard". This waiver applies only to the person or organization shown in the Schedule above.

© Insurance Services Office, Inc., 2008

IL 02 70 09 12

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

CALIFORNIA CHANGES – CANCELLATION AND NONRENEWAL

This endorsement modifies insurance provided under the following:

CAPITAL ASSETS PROGRAM (OUTPUT POLICY) COVERAGE PART
COMMERCIAL AUTOMOBILE COVERAGE PART
COMMERCIAL GENERAL LIABILITY COVERAGE PART
COMMERCIAL INLAND MARINE COVERAGE PART
COMMERCIAL PROPERTY COVERAGE PART
CRIME AND FIDELITY COVERAGE PART
EMPLOYMENT-RELATED PRACTICES LIABILITY COVERAGE PART
EQUIPMENT BREAKDOWN COVERAGE PART
FARM COVERAGE PART
LIQUOR LIABILITY COVERAGE PART
MEDICAL PROFESSIONAL LIABILITY COVERAGE PART
POLLUTION LIABILITY COVERAGE PART
PRODUCTS/COMPLETED OPERATIONS LIABILITY COVERAGE PART

A. Paragraphs **2.** and **3.** of the **Cancellation** Common Policy Condition are replaced by the following:

2. All Policies In Effect For 60 Days Or Less

If this policy has been in effect for 60 days or less, and is not a renewal of a policy we have previously issued, we may cancel this policy by mailing or delivering to the first Named Insured, at the mailing address shown in the policy, and to the producer of record, advance written notice of cancellation, stating the reason for cancellation, at least:

a. 10 days before the effective date of cancellation if we cancel for:

(1) Nonpayment of premium; or

(2) Discovery of fraud by:

(a) Any insured or his or her representative in obtaining this insurance; or

(b) You or your representative in pursuing a claim under this policy.

b. 30 days before the effective date of cancellation if we cancel for any other reason.

3. All Policies In Effect For More Than 60 Days

a. If this policy has been in effect for more than 60 days, or is a renewal of a policy we issued, we may cancel this policy only upon the occurrence, after the effective date of the policy, of one or more of the following:

(1) Nonpayment of premium, including payment due on a prior policy we issued and due during the current policy term covering the same risks.

(2) Discovery of fraud or material misrepresentation by:

(a) Any insured or his or her representative in obtaining this insurance; or

(b) You or your representative in pursuing a claim under this policy.

(3) A judgment by a court or an administrative tribunal that you have violated a California or Federal law, having as one of its necessary elements an act which materially increases any of the risks insured against.

© Insurance Services Office, Inc., 2012

(4) Discovery of willful or grossly negligent acts or omissions, or of any violations of state laws or regulations establishing safety standards, by you or your representative, which materially increase any of the risks insured against.

(5) Failure by you or your representative to implement reasonable loss control requirements, agreed to by you as a condition of policy issuance, or which were conditions precedent to our use of a particular rate or rating plan, if that failure materially increases any of the risks insured against.

(6) A determination by the Commissioner of Insurance that the:

(a) Loss of, or changes in, our reinsurance covering all or part of the risk would threaten our financial integrity or solvency; or

(b) Continuation of the policy coverage would:

(i) Place us in violation of California law or the laws of the state where we are domiciled; or

(ii) Threaten our solvency.

(7) A change by you or your representative in the activities or property of the commercial or industrial enterprise, which results in a materially added, increased or changed risk, unless the added, increased or changed risk is included in the policy.

b. We will mail or deliver advance written notice of cancellation, stating the reason for cancellation, to the first Named Insured, at the mailing address shown in the policy, and to the producer of record, at least:

(1) 10 days before the effective date of cancellation if we cancel for nonpayment of premium or discovery of fraud; or

(2) 30 days before the effective date of cancellation if we cancel for any other reason listed in Paragraph **3.a.**

B. The following provision is added to the **Cancellation** Common Policy Condition:

7. Residential Property

This provision applies to coverage on real property which is used predominantly for residential purposes and consisting of not more than four dwelling units, and to coverage on tenants' household personal property in a residential unit, if such coverage is written under one of the following:

Commercial Property Coverage Part

Farm Coverage Part – Farm Property – Farm Dwellings, Appurtenant Structures And Household Personal Property Coverage Form

a. If such coverage has been in effect for 60 days or less, and is not a renewal of coverage we previously issued, we may cancel this coverage for any reason, except as provided in **b.** and **c.** below.

b. We may not cancel this policy solely because the first Named Insured has:

(1) Accepted an offer of earthquake coverage; or

(2) Cancelled or did not renew a policy issued by the California Earthquake Authority (CEA) that included an earthquake policy premium surcharge.

However, we shall cancel this policy if the first Named Insured has accepted a new or renewal policy issued by the CEA that includes an earthquake policy premium surcharge but fails to pay the earthquake policy premium surcharge authorized by the CEA.

c. We may not cancel such coverage solely because corrosive soil conditions exist on the premises. This restriction **(c.)** applies only if coverage is subject to one of the following, which exclude loss or damage caused by or resulting from corrosive soil conditions:

(1) Commercial Property Coverage Part – Causes Of Loss – Special Form; or

(2) Farm Coverage Part – Causes Of Loss Form – Farm Property, Paragraph **D.** Covered Causes Of Loss – Special.

© Insurance Services Office, Inc., 2012

C. The following is added and supersedes any provisions to the contrary:

Nonrenewal

1. Subject to the provisions of Paragraphs **C.2.** and **C.3.** below, if we elect not to renew this policy, we will mail or deliver written notice, stating the reason for nonrenewal, to the first Named Insured shown in the Declarations, and to the producer of record, at least 60 days, but not more than 120 days, before the expiration or anniversary date.

   We will mail or deliver our notice to the first Named Insured, and to the producer of record, at the mailing address shown in the policy.

2. **Residential Property**

   This provision applies to coverage on real property used predominantly for residential purposes and consisting of not more than four dwelling units, and to coverage on tenants' household property contained in a residential unit, if such coverage is written under one of the following:

   Commercial Property Coverage Part

   Farm Coverage Part – Farm Property – Farm Dwellings, Appurtenant Structures And Household Personal Property Coverage Form

   a. We may elect not to renew such coverage for any reason, except as provided in **b.**, **c.** and **d.** below.

   b. We will not refuse to renew such coverage solely because the first Named Insured has accepted an offer of earthquake coverage.

      However, the following applies only to insurers who are associate participating insurers as established by Cal. Ins. Code Section 10089.16. We may elect not to renew such coverage after the first Named Insured has accepted an offer of earthquake coverage, if one or more of the following reasons applies:

      (1) The nonrenewal is based on sound underwriting principles that relate to the coverages provided by this policy and that are consistent with the approved rating plan and related documents filed with the Department of Insurance as required by existing law;

      (2) The Commissioner of Insurance finds that the exposure to potential losses will threaten our solvency or place us in a hazardous condition. A hazardous condition includes, but is not limited to, a condition in which we make claims payments for losses resulting from an earthquake that occurred within the preceding two years and that required a reduction in policyholder surplus of at least 25% for payment of those claims; or

      (3) We have:

         (a) Lost or experienced a substantial reduction in the availability or scope of reinsurance coverage; or

         (b) Experienced a substantial increase in the premium charged for reinsurance coverage of our residential property insurance policies; and

      the Commissioner has approved a plan for the nonrenewals that is fair and equitable, and that is responsive to the changes in our reinsurance position.

   c. We will not refuse to renew such coverage solely because the first Named Insured has cancelled or did not renew a policy, issued by the California Earthquake Authority, that included an earthquake policy premium surcharge.

   d. We will not refuse to renew such coverage solely because corrosive soil conditions exist on the premises. This restriction **(d.)** applies only if coverage is subject to one of the following, which exclude loss or damage caused by or resulting from corrosive soil conditions:

      (1) Commercial Property Coverage Part – Causes Of Loss – Special Form; or

      (2) Farm Coverage Part – Causes Of Loss Form – Farm Property, Paragraph **D.** Covered Causes Of Loss – Special.

3. We are not required to send notice of nonrenewal in the following situations:

   a. If the transfer or renewal of a policy, without any changes in terms, conditions or rates, is between us and a member of our insurance group.

© Insurance Services Office, Inc., 2012

b. If the policy has been extended for 90 days or less, provided that notice has been given in accordance with Paragraph **C.1.**

c. If you have obtained replacement coverage, or if the first Named Insured has agreed, in writing, within 60 days of the termination of the policy, to obtain that coverage.

d. If the policy is for a period of no more than 60 days and you are notified at the time of issuance that it will not be renewed.

e. If the first Named Insured requests a change in the terms or conditions or risks covered by the policy within 60 days of the end of the policy period.

f. If we have made a written offer to the first Named Insured, in accordance with the timeframes shown in Paragraph **C.1.**, to renew the policy under changed terms or conditions or at an increased premium rate, when the increase exceeds 25%.

© Insurance Services Office, Inc., 2012

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

DESIGNATED INSURED FOR COVERED AUTOS LIABILITY COVERAGE

This endorsement modifies insurance provided under the following:

AUTO DEALERS COVERAGE FORM
BUSINESS AUTO COVERAGE FORM
MOTOR CARRIER COVERAGE FORM

With respect to coverage provided by this endorsement, the provisions of the Coverage Form apply unless modified by this endorsement.

This endorsement identifies person(s) or organization(s) who are "insureds" for Covered Autos Liability Coverage under the Who Is An Insured provision of the Coverage Form. This endorsement does not alter coverage provided in the Coverage Form.

This endorsement changes the policy effective on the inception date of the policy unless another date is indicated below.

Named Insured: W.M. Lyles Co.

Endorsement Effective Date: 05/31/2019

SCHEDULE

Name Of Person(s) Or Organization(s):
All Persons or organizations as required by contract or agreement
Information required to complete this Schedule, if not shown above, will be shown in the Declarations.

Each person or organization shown in the Schedule is an "insured" for Covered Autos Liability Coverage, but only to the extent that person or organization qualifies as an "insured" under the Who Is An Insured provision contained in Paragraph **A.1.** of Section II – Covered Autos Liability Coverage in the Business Auto and Motor Carrier Coverage Forms and Paragraph **D.2.** of Section I – Covered Autos Coverages of the Auto Dealers Coverage Form.

© Insurance Services Office, Inc., 2011

POLICY NUMBER: MWTB31334319

COMMERCIAL AUTO
CA0001 03 10

INSURED: W.M. LYLES Co

EFFECTIVE: 5/31/2019

COMPANY: OLD REPUBLIC INSURANCE COMPANY

BUSINESS AUTO COVERAGE FORM

5. Other Insurance

a. For any covered "auto" you own this Coverage Form provides primary insurance For any covered "auto" you don't own the insurance provided by this Coverage Form is excess over any other collectible insurance However while a covered "auto" which is a "trailer" is connected to another vehicle the Covered Autos Liability Coverage this Coverage Form provides for the "trailer" is

(1) Excess while it is connected to a motor vehicle you do not own or

(2) Primary while it is connected to a covered "auto" you own

b. For Hired Auto Physical Damage Coverage any covered "auto" you lease hire rent or borrow is deemed to be a covered "auto" you own However any "auto" that is leased hired rented or borrowed with a driver is not a covered "auto"

c. Regardless of the provisions of Paragraph

a. above this Coverage Form's Covered Autos Liability Coverage is primary for any liability assumed under an "insured contract"

d. When this Coverage Form and any other Coverage Form or policy covers on the same basis either excess or primary we will pay only our share Our share is the proportion that the Limit of Insurance of our Coverage Form bears to the total of the limits of all the Coverage Forms and policies covering on the same basis

4. **Loss Payment – Physical Damage Coverages**

   At our option, we may:

   a. Pay for, repair or replace damaged or stolen property;

   b. Return the stolen property, at our expense. We will pay for any damage that results to the "auto" from the theft; or

   c. Take all or any part of the damaged or stolen property at an agreed or appraised value.

   If we pay for the "loss", our payment will include the applicable sales tax for the damaged or stolen property.

5. **Transfer Of Rights Of Recovery Against Others To Us**

   If any person or organization to or for whom we make payment under this Coverage Form has rights to recover damages from another, those rights are transferred to us. That person or organization must do everything necessary to secure our rights and must do nothing after "accident" or "loss" to impair them.

B. General Conditions

1. **Bankruptcy**

   Bankruptcy or insolvency of the "insured" or the "insured's" estate will not relieve us of any obligations under this Coverage Form.

2. **Concealment, Misrepresentation Or Fraud**

   This Coverage Form is void in any case of fraud by you at any time as it relates to this Coverage Form. It is also void if you or any other "insured", at any time, intentionally conceals or misrepresents a material fact concerning:

   a. This Coverage Form;

   b. The covered "auto";

   c. Your interest in the covered "auto"; or

   d. A claim under this Coverage Form.

3. **Liberalization**

   If we revise this Coverage Form to provide more coverage without additional premium charge, your policy will automatically provide the additional coverage as of the day the revision is effective in your state.

4. **No Benefit To Bailee – Physical Damage Coverages**

   We will not recognize any assignment or grant any coverage for the benefit of any person or organization holding, storing or transporting property for a fee regardless of any other provision of this Coverage Form.

5. **Other Insurance**

   a. For any covered "auto" you own, this Coverage Form provides primary insurance. For any covered "auto" you don't own, the insurance provided by this Coverage Form is excess over any other collectible insurance. However, while a covered "auto" which is a "trailer" is connected to another vehicle, the Covered Autos Liability Coverage this Coverage Form provides for the "trailer" is:

      (1) Excess while it is connected to a motor vehicle you do not own; or

      (2) Primary while it is connected to a covered "auto" you own.

   b. For Hired Auto Physical Damage Coverage, any covered "auto" you lease, hire, rent or borrow is deemed to be a covered "auto" you own. However, any "auto" that is leased, hired, rented or borrowed with a driver is not a covered "auto".

   c. Regardless of the provisions of Paragraph a. above, this Coverage Form's Covered Autos Liability Coverage is primary for any liability assumed under an "insured contract".

   d. When this Coverage Form and any other Coverage Form or policy covers on the same basis, either excess or primary, we will pay only our share. Our share is the proportion that the Limit of Insurance of our Coverage Form bears to the total of the limits of all the Coverage Forms and policies covering on the same basis.

6. **Premium Audit**

   a. The estimated premium for this Coverage Form is based on the exposures you told us you would have when this policy began. We will compute the final premium due when we determine your actual exposures. The estimated total premium will be credited against the final premium due and the first Named Insured will be billed for the balance, if any. The due date for the final premium or retrospective premium is the date shown as the due date on the bill. If the estimated total premium exceeds the final premium due, the first Named Insured will get a refund.

   b. If this policy is issued for more than one year, the premium for this Coverage Form will be computed annually based on our rates or premiums in effect at the beginning of each year of the policy.

POLICY NUMBER: MWTB31334319
POLICY TERM: 5/31/2019 - 5/31/2020

IL 10 (12/06) OLD REPUBLIC INSURANCE COMPANY

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

WAIVER OF TRANSFER OF RIGHTS OF RECOVERY AGAINST OTHERS TO US

This endorsement modifies insurance provided under the following:

AUTO DEALERS COVERAGE FORM
BUSINESS AUTO COVERAGE FORM
MOTOR CARRIER COVERAGE FORM

SCHEDULE

Name of Person or Organization:
All persons or organizations as required by contract or agreement

(If no entry appears above, information required to complete this endorsement will be shown in the Declarations as applicable to this endorsement.)

The **Transfer Of Rights Of Recovery Against Others To Us** Condition is changed by adding the following:

We waive any right of recovery we may have against the person(s) or organization(s) shown in the Schedule because of payments we make for injury or damage. This waiver applies only to the person or organization shown in the Schedule.

IL 02 70 09 12

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

CALIFORNIA CHANGES – CANCELLATION AND NONRENEWAL

This endorsement modifies insurance provided under the following:

CAPITAL ASSETS PROGRAM (OUTPUT POLICY) COVERAGE PART
COMMERCIAL AUTOMOBILE COVERAGE PART
COMMERCIAL GENERAL LIABILITY COVERAGE PART
COMMERCIAL INLAND MARINE COVERAGE PART
COMMERCIAL PROPERTY COVERAGE PART
CRIME AND FIDELITY COVERAGE PART
EMPLOYMENT-RELATED PRACTICES LIABILITY COVERAGE PART
EQUIPMENT BREAKDOWN COVERAGE PART
FARM COVERAGE PART
LIQUOR LIABILITY COVERAGE PART
MEDICAL PROFESSIONAL LIABILITY COVERAGE PART
POLLUTION LIABILITY COVERAGE PART
PRODUCTS/COMPLETED OPERATIONS LIABILITY COVERAGE PART

A. Paragraphs **2.** and **3.** of the **Cancellation** Common Policy Condition are replaced by the following:

2. All Policies In Effect For 60 Days Or Less

If this policy has been in effect for 60 days or less, and is not a renewal of a policy we have previously issued, we may cancel this policy by mailing or delivering to the first Named Insured, at the mailing address shown in the policy, and to the producer of record, advance written notice of cancellation, stating the reason for cancellation, at least:

a. 10 days before the effective date of cancellation if we cancel for:

(1) Nonpayment of premium; or

(2) Discovery of fraud by:

(a) Any insured or his or her representative in obtaining this insurance; or

(b) You or your representative in pursuing a claim under this policy.

b. 30 days before the effective date of cancellation if we cancel for any other reason.

3. All Policies In Effect For More Than 60 Days

a. If this policy has been in effect for more than 60 days, or is a renewal of a policy we issued, we may cancel this policy only upon the occurrence, after the effective date of the policy, of one or more of the following:

(1) Nonpayment of premium, including payment due on a prior policy we issued and due during the current policy term covering the same risks.

(2) Discovery of fraud or material misrepresentation by:

(a) Any insured or his or her representative in obtaining this insurance; or

(b) You or your representative in pursuing a claim under this policy.

(3) A judgment by a court or an administrative tribunal that you have violated a California or Federal law, having as one of its necessary elements an act which materially increases any of the risks insured against.

© Insurance Services Office, Inc., 2012

(4) Discovery of willful or grossly negligent acts or omissions, or of any violations of state laws or regulations establishing safety standards, by you or your representative, which materially increase any of the risks insured against.

(5) Failure by you or your representative to implement reasonable loss control requirements, agreed to by you as a condition of policy issuance, or which were conditions precedent to our use of a particular rate or rating plan, if that failure materially increases any of the risks insured against.

(6) A determination by the Commissioner of Insurance that the:

(a) Loss of, or changes in, our reinsurance covering all or part of the risk would threaten our financial integrity or solvency; or

(b) Continuation of the policy coverage would:

(i) Place us in violation of California law or the laws of the state where we are domiciled; or

(ii) Threaten our solvency.

(7) A change by you or your representative in the activities or property of the commercial or industrial enterprise, which results in a materially added, increased or changed risk, unless the added, increased or changed risk is included in the policy.

b. We will mail or deliver advance written notice of cancellation, stating the reason for cancellation, to the first Named Insured, at the mailing address shown in the policy, and to the producer of record, at least:

(1) 10 days before the effective date of cancellation if we cancel for nonpayment of premium or discovery of fraud; or

(2) 30 days before the effective date of cancellation if we cancel for any other reason listed in Paragraph **3.a.**

B. The following provision is added to the **Cancellation** Common Policy Condition:

7. Residential Property

This provision applies to coverage on real property which is used predominantly for residential purposes and consisting of not more than four dwelling units, and to coverage on tenants' household personal property in a residential unit, if such coverage is written under one of the following:

Commercial Property Coverage Part

Farm Coverage Part – Farm Property – Farm Dwellings, Appurtenant Structures And Household Personal Property Coverage Form

a. If such coverage has been in effect for 60 days or less, and is not a renewal of coverage we previously issued, we may cancel this coverage for any reason, except as provided in **b.** and **c.** below.

b. We may not cancel this policy solely because the first Named Insured has:

(1) Accepted an offer of earthquake coverage; or

(2) Cancelled or did not renew a policy issued by the California Earthquake Authority (CEA) that included an earthquake policy premium surcharge.

However, we shall cancel this policy if the first Named Insured has accepted a new or renewal policy issued by the CEA that includes an earthquake policy premium surcharge but fails to pay the earthquake policy premium surcharge authorized by the CEA.

c. We may not cancel such coverage solely because corrosive soil conditions exist on the premises. This restriction **(c.)** applies only if coverage is subject to one of the following, which exclude loss or damage caused by or resulting from corrosive soil conditions:

(1) Commercial Property Coverage Part – Causes Of Loss – Special Form; or

(2) Farm Coverage Part – Causes Of Loss Form – Farm Property, Paragraph **D.** Covered Causes Of Loss – Special.

© Insurance Services Office, Inc., 2012

C. The following is added and supersedes any provisions to the contrary:

Nonrenewal

1. Subject to the provisions of Paragraphs C.2. and C.3. below, if we elect not to renew this policy, we will mail or deliver written notice, stating the reason for nonrenewal, to the first Named Insured shown in the Declarations, and to the producer of record, at least 60 days, but not more than 120 days, before the expiration or anniversary date.

   We will mail or deliver our notice to the first Named Insured, and to the producer of record, at the mailing address shown in the policy.

2. **Residential Property**

   This provision applies to coverage on real property used predominantly for residential purposes and consisting of not more than four dwelling units, and to coverage on tenants' household property contained in a residential unit, if such coverage is written under one of the following:

   Commercial Property Coverage Part

   Farm Coverage Part – Farm Property – Farm Dwellings, Appurtenant Structures And Household Personal Property Coverage Form

   a. We may elect not to renew such coverage for any reason, except as provided in b., c. and d. below.

   b. We will not refuse to renew such coverage solely because the first Named Insured has accepted an offer of earthquake coverage.

      However, the following applies only to insurers who are associate participating insurers as established by Cal. Ins. Code Section 10089.16. We may elect not to renew such coverage after the first Named Insured has accepted an offer of earthquake coverage, if one or more of the following reasons applies:

      (1) The nonrenewal is based on sound underwriting principles that relate to the coverages provided by this policy and that are consistent with the approved rating plan and related documents filed with the Department of Insurance as required by existing law;

      (2) The Commissioner of Insurance finds that the exposure to potential losses will threaten our solvency or place us in a hazardous condition. A hazardous condition includes, but is not limited to, a condition in which we make claims payments for losses resulting from an earthquake that occurred within the preceding two years and that required a reduction in policyholder surplus of at least 25% for payment of those claims; or

      (3) We have:

         (a) Lost or experienced a substantial reduction in the availability or scope of reinsurance coverage; or

         (b) Experienced a substantial increase in the premium charged for reinsurance coverage of our residential property insurance policies; and

      the Commissioner has approved a plan for the nonrenewals that is fair and equitable, and that is responsive to the changes in our reinsurance position.

   c. We will not refuse to renew such coverage solely because the first Named Insured has cancelled or did not renew a policy, issued by the California Earthquake Authority, that included an earthquake policy premium surcharge.

   d. We will not refuse to renew such coverage solely because corrosive soil conditions exist on the premises. This restriction (d.) applies only if coverage is subject to one of the following, which exclude loss or damage caused by or resulting from corrosive soil conditions:

      (1) Commercial Property Coverage Part – Causes Of Loss – Special Form; or

      (2) Farm Coverage Part – Causes Of Loss Form – Farm Property, Paragraph D. Covered Causes Of Loss – Special.

3. We are not required to send notice of nonrenewal in the following situations:

   a. If the transfer or renewal of a policy, without any changes in terms, conditions or rates, is between us and a member of our insurance group.

© Insurance Services Office, Inc., 2012

b. If the policy has been extended for 90 days or less, provided that notice has been given in accordance with Paragraph **C.1.**

c. If you have obtained replacement coverage, or if the first Named Insured has agreed, in writing, within 60 days of the termination of the policy, to obtain that coverage.

d. If the policy is for a period of no more than 60 days and you are notified at the time of issuance that it will not be renewed.

e. If the first Named Insured requests a change in the terms or conditions or risks covered by the policy within 60 days of the end of the policy period.

f. If we have made a written offer to the first Named Insured, in accordance with the timeframes shown in Paragraph **C.1.**, to renew the policy under changed terms or conditions or at an increased premium rate, when the increase exceeds 25%.

© Insurance Services Office, Inc., 2012

POLICY NUMBER: MWC31334119

WAIVER OF OUR RIGHT TO RECOVER FROM OTHERS ENDORSEMENT - CALIFORNIA

We have the right to recover our payments from anyone liable for an injury covered by this policy. We will not enforce our right against the person or organization named in the Schedule. (This agreement applies only to the extent that you perform work under a written contract that requires you to obtain this agreement from us.)

You must maintain payroll records accurately segregating the remuneration of your employees while engaged in the work described in the Schedule.

The additional premium for this endorsement shall be 0 % of the California workers' compensation premium otherwise due on such remuneration.

SCHEDULE

PERSON OR ORGANIZATION	JOB DESCRIPTION
BLANKET COVERAGE AS REQUIRED BY WRITTEN CONTRACT	

DATE OF ISSUE: 5/31/2019

© 1998 by the Workers' Compensation Insurance Rating Bureau of California. All rights reserved.
From the WCIRB's California Workers' Compensation Insurance Forms Manual © 1999.

INSURED COPY

CALIFORNIA CANCELATION ENDORSEMENT

This endorsement applies only to the insurance provided by the policy because California is shown in Item 3.A. of the INFORMATION PAGE.

The cancelation condition in Part Six (Conditions) of the policy is replaced by these conditions:

CANCELATION

1. You may cancel this policy. You must mail or deliver advance written notice to us stating when the cancelation is to take effect.

2. We may cancel this policy for one or more of the following reasons:

   a. Non-payment of premium;

   b. Failure to report payroll;

   c. Failure to permit us to audit payroll as required by the terms of this policy or of a previous policy issued by us;

   d. Failure to pay any additional premium resulting from an audit of payroll required by the terms of this policy or any previous policy issued by us;

   e. Material misrepresentation made by you or your agent;

   f. Failure to cooperate with us in the investigation of a claim;

   g. Failure to comply with Federal or State safety orders;

   h. Failure to comply with written recommendations of our designated loss control representatives;

   i. The occurrence of a material change in the ownership of your business;

   j. The occurrence of any change in your business or operations that materially increases the hazard for frequency or severity of loss;

   k. The occurrence of any change in your business or operation that requires additional or different classification for premium calculation;

Copyright 1998by The Workers' Compensation Insurance Rating Bureau of California. All rights reserved.
From the WCIRB's California Workers' Compensation Insurance Forms Manual Copyright 1999.

INSURED COPY

l. The occurrence of any change in your business or operation which contemplates an activity excluded by our reinsurance treaties.

3 If we cancel your policy for any of the reasons listed in (a) through (f), we will give you 10 days advance written notice, stating when the cancelation is to take effect. Mailing that notice to you at your mailing address shown in Item 1 of the Information Page will be sufficient to prove notice. If we cancel your policy for any of the reasons listed in Items (g) through (l), we will give you 30 days advance written notice; however, we agree that in the event of cancelation and reissuance of a policy effective upon a material change in ownership or operations, notice will not be provided.

4. The policy period will end on the day and hour stated in the cancelation notice.

Copyright 1998by The Workers' Compensation Insurance Rating Bureau of California. All rights reserved.
From the WCIRB's California Workers' Compensation Insurance Forms Manual Copyright 1999.

INSURED COPY

No action shall be taken against us with respect to Coverage A unless, as a condition precedent thereto, you shall have fully complied with all the terms of this Policy, and until the amount the **Responsible Entity** is legally obligated to pay shall have been finally determined either by judgment after actual contested trial or arbitration, or other method of dispute resolution for which we have given prior written approval.

No action shall be taken against us with respect to Coverage B, C, D or E unless, as a condition precedent thereto, you shall have fully complied with all the terms of this Policy, and until the amount you are legally obligated to pay shall have been finally determined either by judgment after actual contested trial or arbitration, or other method of dispute resolution for which we have given prior written approval.

No person or organization shall have any right under this Policy to join us in any action against you. No **Responsible Entity** shall be an **Insured** under this Policy.

F. Assignment of Interest

It is agreed that the insurance provided herein and your interests hereunder cannot be transferred or assigned to another party without our express written consent.

G. Cancellation and Termination

1. The premium paid for this Policy shall be fully earned in the first twelve months of the **Policy Period**.

2. This Policy may only be cancelled by us for one or more of the following reasons:

   a. non-payment of premium; or
   b. a material misrepresentation or concealment of facts; or
   c. a material breach of any provision of this Policy.

   If this Policy is cancelled by us, notice of cancellation will be sent in writing to you, at the address indicated on the Declarations. We will provide such written notice at least ninety (90) days prior to the date such cancellation is to take effect; except that, in the event of cancellation for non-payment of premium, we will provide only fifteen (15) days written notice. If the premium is paid by a premium financing company and the premium financing company, acting under a valid premium finance agreement with you, requests cancellation of the Policy due to non-payment of premium from you in the first twelve (12) months of the **Policy Period**, the earned premium shall be computed short-rate of the twelve-month earned policy term premium and returned to the premium finance company.

   The effective date and hour of cancellation will be stated in such notice. Cancellation by us also cancels the Automatic Extended Reporting Period and any Optional Extended Reporting Period; the **Policy Period**, the Automatic Extended Reporting Period, and any Optional Extended Reporting Period will end on that date. If we cancel for the reason specified in Subparagraph (a), there shall be no return premium. If we cancel for reasons stated in Subparagraphs (b) or (c) in the first twelve (12) months of the **Policy Period**, the earned premium shall be computed pro-rata of the twelve-month earned policy term premium. Payment of any return premium shall not be a condition of cancellation.

3. This Policy may be cancelled by the first **Named Insured** for any reason. In the event that the first **Named Insured** cancels the Policy, the earned premium shall be computed under the customary short rate table and procedure as a percentage of the total Policy premium stated in the Declarations, and we will return the earned premium to the first **Named Insured**. Cancellation by the first Named Insured shall also cancel the Automatic Extended Reporting Period and any Optional Extended Reporting Period on the date of cancellation.

4. Notwithstanding the foregoing, if you report a **Claim** or **First Party Claim** to us prior to the

NLIMON

EVIDENCE OF PROPERTY INSURANCE

DATE (MM/DD/YYYY): 10/14/2019

THIS EVIDENCE OF PROPERTY INSURANCE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE ADDITIONAL INTEREST NAMED BELOW. THIS EVIDENCE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS EVIDENCE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE ADDITIONAL INTEREST.

AGENCY	PHONE (A/C, No, Ext): (559) 374-3560	COMPANY
Fresno CSG-Alliant Insurance Services, Inc. 9 E River Park Place East Ste 310 Fresno, CA 93720		Allianz Global Risks US Insurance Company 2350 Empire Avenue Burbank, CA 91504
FAX (A/C, No):	E-MAIL ADDRESS:	
CODE:	SUB CODE:	
AGENCY CUSTOMER ID #: LYLEDIR-01		

INSURED	LOAN NUMBER	POLICY NUMBER
W.M. Lyles Co P.O. Box 4377 Fresno, CA 93744		USE000243180016/ ENDT 14
	EFFECTIVE DATE: 2/28/2020 — EXPIRATION DATE: 2/28/2021 — ☐ CONTINUED UNTIL TERMINATED IF CHECKED	
	THIS REPLACES PRIOR EVIDENCE DATED:	

PROPERTY INFORMATION

LOCATION/DESCRIPTION

THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS EVIDENCE OF PROPERTY INSURANCE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

COVERAGE INFORMATION

PERILS INSURED: ☐ BASIC ☐ BROAD ☐ SPECIAL

COVERAGE / PERILS / FORMS	AMOUNT OF INSURANCE	DEDUCTIBLE
Builders Risk AOP Limit	$23,349,729	10,000
Flood Limit	$23,349,729	100,000
Soft Costs	$350,000	

REMARKS (Including Special Conditions)

Special Conditions:
RE: Pleasant Grove Wastewater Treatment Plant Energy Recovery Project, 5051 Westpark Dr., Roseville, CA 95747.
City of Roseville, Construction Manager, Funding Agencies and their directors, elected officials, officers, officials, employees, agents, consultants and volunteers are included as Additional Insureds and Loss Payee as their interests may appear

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

ADDITIONAL INTEREST

NAME AND ADDRESS					
City of Roseville 311 Vernon Street Roseville, CA 95678	X	ADDITIONAL INSURED	☐	LENDER'S LOSS PAYABLE	X LOSS PAYEE
	☐	MORTGAGEE			
	LOAN #				
	AUTHORIZED REPRESENTATIVE: Nicoletta Limon				

© 1993-2015 ACORD CORPORATION. All rights reserved.
The ACORD name and logo are registered marks of ACORD

THIS PAGE LEFT BLANK INTENTIONALLY

EXHIBIT L
CONTRACTOR INSURANCE CERTIFICATES

RESOLUTION NO. 19-475

APPROVING AN AGREEMENT FOR THE DESIGN-ASSIST AND CONSTRUCTION OF THE PLEASANT GROVE WASTEWATER TREATMENT PLANT ENERGY RECOVERY PROJECT, BY AND BETWEEN W.M. LYLES CO. AND THE CITY OF ROSEVILLE, AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE

WHEREAS, an agreement for the design-assist and construction of the Pleasant Grove Wastewater Treatment Plant Energy Recovery project, by and between W.M. Lyles Co. and the City of Roseville, has been reviewed by the City Council; and

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Roseville that said agreement is hereby approved.

BE IT FURTHER RESOLVED that the Environmental Utilities Director or his designee is authorized to approve change orders for the project, consistent with the contract terms, provided that the net cost of all change orders shall not exceed five percent (5%) of the contract price.

PASSED AND ADOPTED by the Council of the City of Roseville this 6th day of November, 2019, by the following vote on roll call:

AYES	COUNCILMEMBERS:	Bernasconi, Alvord, Roccucci, Houdesheldt, Allard
NOES	COUNCILMEMBERS:	None
ABSENT	COUNCILMEMBERS:	None

MAYOR

ATTEST:

City Clerk

The foregoing instrument is a correct copy of the original on file in the City Clerks Department.

ATTEST: _____
City Clerk of the City of Roseville, California

DEPUTY CLERK

COUNCIL COMMUNICATION

CC #: 1527
File #: 0800-04 & 0201-01

Title:	Local Road Safety Plan - Professional Services Agreement Amendment and Budget Adjustment
Contact:	Heather Chan 916-746-1300 hcchan@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 7.29.

RECOMMENDATION TO COUNCIL

Staff recommends the City Council:

1) Adopt a resolution to authorize the City Manager to execute the First Amendment to Professional Services Agreement with Kimley-Horn and Associates for continued development of the Local Road Safety Plan, and
2) Adopt an ordinance to approve a budget adjustment in the amount of $61,000 for the continuing development of a Local Road Safety Plan for the City of Roseville.

BACKGROUND

In the April 15, 2020 meeting, Council approved a budget adjustment for the initial development of the Local Road Safety Plan (LRSP). Subsequently, Caltrans allocated additional funding for LRSP development to the City based on a revised grant criteria associated with the City's total lane miles. Staff was successful in obtaining $47,700 in additional grant funding for the continued development of the City's LRSP through the Highway Safety Improvement Program (HSIP).

The LRSP will provide the framework for local stakeholders to identify, analyze, and prioritize roadway safety improvements within the City. The plan will identify goals, objectives, and strategies to reduce collisions focusing most importantly on reducing fatalities and the most serious injury collisions. In addition, the LRSP will soon be a requirement for several state and federal transportation safety grant applications the City may want to pursue for various transportation projects in the future.

The recommended budget adjustment is needed to budget the $47,700 additional state grant funds for the project and to provide $13,300 in matching funds from the Highway User Tax Fund.

In the August 5, 2020 meeting, Council approved a Professional Services Agreement with Kimley-Horn and Associates for the initial development of the LRSP. With the additional funding received, staff identified additional and/or expanded scope of work to address within the City's

LRSP including preparation of additional diagrams, additional crash data analysis, project development and grant identification and application assistance. The revised scope of work for Kimley-Horn necessitates a contract amendment in an amount not to exceed $52,684.66, bringing their total compensation for the LRSP to $132,566.95.

FISCAL IMPACT

The City's Local Road Safety Plan project is estimated to cost $151,000 in staff time and professional services. At the April 15, 2020 meeting, Council approved a budget adjustment for $90,000 ($72,000 of which was grant funding, and $18,000 of which was Highway User Tax funding). The recommended budget adjustment will appropriate an additional $61,000 to the project, with $47,700 of grant funds and $13,300 of Highway User Tax funding. No General Fund resources will be used for the project.

ENVIRONMENTAL REVIEW

The California Environmental Quality Act (CEQA) does not apply to activities that will not result in a direct or reasonably foreseeable indirect physical change in the environment, or is otherwise not considered a project as defined by CEQA Statute §21065 and CEQA State Guidelines §15060(c)(3) and §15378. Approval of the City's Local Road Safety Plan and budget adjustment meets the above criteria and is not subject to CEQA. No additional environmental review is required.

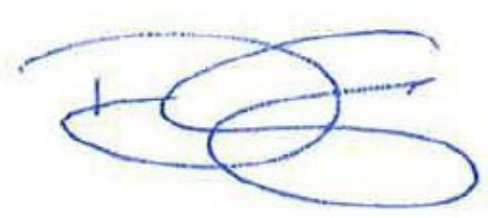
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Goal C - Maintain a safe and healthy community
Goal E - Deliver exceptional city services
Goal F - Invest in well-planned infrastructure and growth

Respectfully Submitted,

Heather Chan, Junior Engineer

Jason Shykowski, Public Works Director



_____
Dominick Casey, City Manager

ATTACHMENTS:

Description

Resolution 21-262

Amendment to Professional Services Agreement

Ordinance 6374

Budget Adjustment

RESOLUTION NO. 21-262

APPROVING A FIRST AMENDMENT TO PROFESSIONAL SERVICES AGREEMENT, BY AND BETWEEN THE CITY OF ROSEVILLE AND KIMLEY-HORN AND ASSOCIATES, INC., AND AUTHORIZING THE CITY MANAGER TO EXECUTE IT ON BEHALF OF THE CITY OF ROSEVILLE

WHEREAS, a first amendment to professional services agreement for continuing the development of a Local Road Safety Plan, by and between the City of Roseville and Kimley-Horn and Associates, Inc., has been reviewed by the City Council; and

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Roseville that said first amendment is hereby approved and that the City Manager is authorized to execute it on behalf of the City of Roseville.

PASSED AND ADOPTED by the Council of the City of Roseville this____day of _____, 20_, by the following vote on roll call:

AYES COUNCILMEMBERS:

NOES COUNCILMEMBERS:

ABSENT COUNCILMEMBERS:

_____
MAYOR

ATTEST:

_____
City Clerk

FIRST AMENDMENT TO

PROFESSIONAL SERVICES AGREEMENT

Local Road Safety Plan

THIS FIRST AMENDMENT TO AGREEMENT is made and entered into this ___ day of _____, 20__, by and between the City of Roseville, a municipal corporation ("CITY"), and Kimley-Horn and Associates, Inc., a North Carolina corporation ("CONSULTANT"); and

W I T N E S S E T H:

WHEREAS, CITY and CONSULTANT previously entered into a Professional Services Agreement dated August 5, 2020 ("Agreement") regarding a local road safety plan for the City of Roseville ("Project"); and

WHEREAS, CITY desires to amend the Agreement to include additional services as described in CONSULTANT's letter/proposal, which is attached hereto as Exhibit "A" and incorporated herein by reference; and

WHEREAS, CONSULTANT is willing and able to provide such additional services.

NOW, THEREFORE, the parties agree as follows:

1. CONSULTANT shall provide additional services as described in Exhibit "A" of this First Amendment to Agreement.

2. Section 2 of the Agreement is amended by adding an additional paragraph to read as follows:

"CITY shall pay fifty-two thousand, six hundred eighty-four dollars, and sixty-six cents ($52,684.66), in consideration of the additional services as set forth in Exhibit "A" to the First Amendment to Agreement. This brings the total not to exceed contract amount to one hundred thirty-two thousand, five hundred sixty-six dollars, and ninety-five cents ($132,566.95)."

3. All other provisions of the Agreement shall remain unchanged and in full force and effect.

IN WITNESS WHEREOF, the City of Roseville, a municipal corporation, has authorized the execution of this First Amendment to Agreement in duplicate by its City Manager and attested to by its City Clerk under the authority of Resolution No. _____, adopted by the Council of the City of Roseville on the ___ day of _____, 20__, and CONSULTANT has caused this First Amendment to Agreement to be executed.

CITY OF ROSEVILLE, a
municipal corporation

BY: _____
DOMINICK CASEY
City Manager

ATTEST:

BY: _____
SONIA OROZCO
City Clerk

KIMLEY-HORN AND ASSOCIATES,
a, North Carolina corporation

BY: _____

its: Vice President

and

BY: _____

its: Assistant Secretary

[SIGNATURES CONTINUED ON FOLLOWING PAGE]

APPROVED AS TO FORM:

BY: _____
MICHELLE SHEIDENBERGER
City Attorney

APPROVED AS TO SUBSTANCE:

BY: _____ for
JASON SHYKOWSKI
Public Works Director

EXHIBIT "A"

Roseville LRSP Amendment #1

Background

In late 2020, Caltrans modified the amount of grant funding that agencies could receive to complete their LRSP. The City of Roseville applied for and received additional funding from Caltrans for their LRSP as a result of the new funding requirements established. The purpose of this Amendment is to increase the scope of the LRSP for Roseville to account for the additional funding received.

Task 11.0 Project Management

This task includes general project administration, including management of project staff and accounting over the extended duration of the project. This task also includes additional ongoing coordination with the City to discuss project progress and key milestones.

Task 12.0 Field Review

Kimley-Horn will conduct the field review at an additional five locations for a total of ten locations. Notes will be prepared at the additional five locations, and Kimley-Horn will work with Roseville to narrow the list of projects down to seven. (Previous scope included five.)

Task 13.0 Collision Diagrams

Kimley-Horn will prepare collision diagrams for up to seven locations. The locations will be determined in coordination with the City.

Task 14.0 Additional Crash Data Analysis

Kimley-Horn will conduct crash data analysis in addition to the crash data analysis conducted and included in the Roseville LRSP Safety Analysis Technical Memorandum (dated January 2021). Additional crash data analysis could include additional maps, tables, collision diagrams, answering specific questions on crashes at specific intersections, etc. Twenty-five hours are included under this task.

Task 15.0 Develop Projects

Kimley-Horn will develop two additional projects for up to seven total projects (this includes the five projects from the base scope). Kimley-Horn will also look at the intersection of Vernon and Atlantic to determine if a project should be identified at this location. Kimley-Horn will review the previous HSIP application for this location.

Task 16.0 Incorporate Additional Findings into LRSP

The additional information will be incorporated into the LRSP prepared under the base scope of services.

Task 17.0 HSIP Grant Application Information

HSIP Cycle 11 is expected to be released in 2022, and the application is not currently available. Kimley-Horn will utilize the previous HSIP Cycle 10 application to prepare materials in support of a future grant application to be completed by the City after the LRSP is completed. Kimley-Horn will work with the City to determine which project will receive documentation for a future grant application. The following

information will be included in the documentation provided to the City for use in the HSIP Cycle 11 application:

- Project Identification (5,000 characters or less)
- Prior Attempts to Address the Safety Issues (5,000 characters or less)
- Other Comments (5,000 characters or less)
- Engineer's Checklist
- Vicinity Map/Location Map
- Project Map Showing Existing and Proposed Conditions (Planning Level)
- Pictures of Existing Condition
- HSIP Analyzer
- Collision Diagram
- Collision List

If the selected location includes work on the State Highway System, the City will be responsible for coordination with Caltrans or other required parties.

CITY OF ROSEVILLE
Local Road Safety Plan

		Kimley-Horn and Associates, Inc.									
	Name	Matt Weir	Molly O'Brien	Robert Paderna	Sr. Professional	Professional	Analyst	Sr. Project Support	Project Support		
	Category/Title	Principal In Charge	Project Manager	QA/QC							
	Billing Rate	$252.11	$206.93	$209.26	$190.66	$153.47	$117.12	$135.57	$81.20	Total Hours	Total Cost
Task 11	**Project Management**	**0**	**10**	**4**	**0**	**0**	**0**	**0**	**6**	**20**	**$ 3,393.61**
11.1	Contract Modifications		2						2	4	$ 576.27
11.2	Invoicing		4						4	8	$ 1,152.54
11.3	Ongoing Coordination		4	4						8	$ 1,664.80
Task 12	**Field Review**	**0**	**6**	**5**	**0**	**10**	**0**	**0**	**0**	**21**	**$ 3,822.63**
12.1	Additional Five locations (preparation, review, notes)		6	5		10				21	$ 3,822.63
Task 13	**Collision Diagrams (7)**	**0**	**4**	**8**	**0**	**34**	**2**	**0**	**0**	**48**	**$ 7,954.08**
13.1	Coordination on Locations		1	1			2			4	$ 650.45
13.2	Develop Collision Diagrams					28				28	$ 4,297.15
13.3	Internal QA/QC		3	7						10	$ 2,085.66
13.4	Address Comments					6				6	$ 920.82
Task 14	**Additional Crash Data Analysis**	**1**	**3**	**6**	**0**	**5**	**10**	**0**	**0**	**25**	**$ 4,067.11**
14.1	Additional crash data analysis	1	3	6		5	10			25	$ 4,067.11
Task 15	**Develop Projects**	**0**	**6**	**7**	**2**	**15**	**23**	**0**	**0**	**53**	**$ 8,083.69**
15.1	Coordination on Locations		1	1						2	$ 416.20
15.2	Benefit/Cost Analysis (2)				1	3	14			18	$ 2,290.81
15.3	Draft Project Sheets (2)		2	2	1	4	6			15	$ 2,339.68
15.4	Final Project Sheets (2)			1		2	3			6	$ 867.58
15.5	Vernon and Atlantic - consider for a project		1	1		2				4	$ 723.14
15.6	Vernon and Atlantic - review previous HSIP application		2	2		4				8	$ 1,446.28
Task 16	**Incorporate Additional Findings into LRSP**	**1**	**4**	**5**	**0**	**7**	**11**	**0**	**0**	**28**	**$ 4,488.84**
16.1	Incorporate additional findings into LRSP		1	2		2	6			11	$ 1,635.15
16.2	Internal QA/QC	1	2							3	$ 665.98
16.3	Address internal QA/QC Comments			2		2	2			6	$ 959.72
16.4	Address Roseville Comments		1	1		3	3			8	$ 1,227.98
Task 17	**HSIP Grant Application Information**	**4**	**10**	**17**	**0**	**41**	**34**	**0**	**0**	**106**	**$ 16,909.81**
17.1	Coordination on Location	1	2	2		4	6			15	$ 2,401.14
17.2	Project Identification	1	1	4		8				14	$ 2,523.87
17.3	Prior Attempts to Address the Safety Issues		1	2		6				9	$ 1,546.28
17.4	Other Comments		1	2		8				11	$ 1,853.22
17.5	Engineer's Checklist		1			2				3	$ 513.87
17.6	Vicinity Map/Location Map						2			2	$ 234.25
17.7	Project Map Showing Existing and Proposed Conditions (Planning Level)			2			6			8	$ 1,121.28
17.8	Pictures of Existing Condition						3			3	$ 351.37
17.9	HSIP Analyzer					5				5	$ 767.35
17.10	Collision Diagram					2				2	$ 306.94
17.11	Collision List						5			5	$ 585.62
17.12	Internal QA/QC	1	2	3						6	$ 1,293.78
17.13	Address Comments					3	6			9	$ 1,163.16
17.14	Address One Round of City Comments	1	2	2		3	6			14	$ 2,247.67
	TOTAL HOURS	**6**	**43**	**52**	**2**	**112**	**80**	**0**	**6**	**301**	
	Subtotal Labor:	**$ 1,512.69**	**$ 8,898.20**	**$ 10,881.78**	**$ 381.31**	**$ 17,188.60**	**$ 9,370.00**	**$ -**	**$ 487.21**		**$ 48,719.77**
	Other Direct Costs										**$ 3,964.88**
	Labor Escalation										$ 3,714.88
	Mileage										$ 150.00
	Fed-Ex/Courier										$ 100.00
	TOTAL COST:										**$ 52,684.66**

ORDINANCE NO. 6374

ORDINANCE OF THE COUNCIL OF THE CITY OF ROSEVILLE AUTHORIZING CERTAIN AMENDMENTS TO THE FISCAL YEAR 2020-21 BUDGET AND DECLARING THIS ORDINANCE TO BE IMMEDIATELY EFFECTIVE AS AN APPROPRIATION MEASURE

THE CITY OF ROSEVILLE ORDAINS:

SECTION 1. The City of Roseville Annual Budget, Fiscal Year 2020-21, is hereby amended as listed on the attached budget adjustment for continuing the development of a Local Road Safety Plan.

SECTION 2. This ordinance is hereby declared to be an appropriation measure, immediately effective pursuant to the provisions of Section 5.03 of the Charter.

SECTION 3. The City Clerk is hereby authorized and directed to post a true copy of the foregoing ordinance in each of three (3) conspicuous locations in the City and she shall immediately after such posting enter in the ordinance book, under the record of the ordinance, a certificate under her hand stating the time and place of such publication by posting.

PASSED AND ADOPTED by the Council of the City of Roseville, this _____ day of _____, 2021, by the following vote on roll call:

AYES COUNCILMEMBERS:

NOES COUNCILMEMBERS:

ABSENT COUNCILMEMBERS:

_____
MAYOR

ATTEST:

_____
City Clerk

REQUEST FOR BUDGET ADJUSTMENT

REQUESTER NAME & TITLE: Heather Chan, Junior Engineer
FISCAL YEAR: 2021
PREPARER NAME & TITLE: Heather Chan, Junior Engineer
COUNCIL DATE (if applicable): 6/16/2021
DEPARTMENT/DIVISION: Public Works/Engineering
ORDINANCE:

EXPENDITURES/EXPENSES/TRANSFERS OUT **Use of Funds**

ACCOUNT STRING				BUDGET ($)	DESCRIPTION
Fund	Account	Center	Project	Adjustment	
2305	5301	84001	700015	53,000	Professional Services
2305	5080	84001	700015	8,000	Staff Time
			TOTAL	61,000	

REVENUES/TRANSFERS IN **Source of Funds**

ACCOUNT STRING				BUDGET ($)	DESCRIPTION
Fund	Account	Center	Project	Adjustment	
2305	4410	84001	700015	47,700	Grant Reimbursement
			TOTAL	47,700	

NET ADJUSTMENT	13,300	

FUND BALANCE

ACCOUNT STRING				BUDGET ($)	DESCRIPTION
Fund	Account	Center	Project	Adjustment	
2305	3601	00000	000000	(13,300)	Reduce Highway User Tax Fund Balance
			TOTAL	(13,300)	

Justification for Budget Adjustment:

This $61,000 budget adjustment is requested to continue the development of a Local Road Safety Plan (LRSP) which will soon be a requirement by Caltrans to apply for transportation safety grants. A previous budget adjustment (in the amount of $90,000) was approved in April 2020 for the initial development of the LRSP. Caltrans has allocated additional funding to the City of Roseville based on a revised criteria for the Grant; $47,700 is reimbursable from a Caltrans Grant and the remaining $13,300 will come from Highway Users Tax (HUT) fund balance.

REQUIRED APPROVALS:

Jason Shykowski Digitally signed by Jason Shykowski Date: 2021.05.18 10:07:52 -07'00'

REQUESTING DEPARTMENT HEAD / DESIGNEE	DATE	BUDGET MANAGER / DESIGNEE	DATE
CHIEF FINANCIAL OFFICER / DESIGNEE	DATE	CITY MANAGER / DESIGNEE	DATE

BUDGET DEPARTMENT USE ONLY:

POSTED BY	DATE

Revised: June 24, 2019

DEPARTMENT OF TRANSPORTATION

FINANCE LETTER

Date: 05/20/2021 EA No:
D_CO_RT: 03-PLA-0-RSV
Project No: LRSPL-5182(080)
Adv Project Id: 0320000107
Project End Date:

To: City of Roseville

FINANCE ITEMS	PRO RATA OR LUMP SUM	TOTAL COST OF WORK	PART. COST	STATE - LRSP	LOCAL
Agency Preliminary Engineering		$133,000.00	$133,000.00	$119,700.00	$13,300.00
Totals:		**$133,000.00**	**$133,000.00**	**$119,700.00**	**$13,300.00**

Participation Ratio: 100.00%

This Finance Letter was created based on specific financial information provided by the responsible local agency. The following encumbrance history is prepared by Local Assistance Accounting Office and is provided here for local agency's information and action.

Signature: Adam Ambrosini

Title: HQ Sr. Area Engineer

For questions regarding finance letter, contact:

Printed Name : Adam Ambrosini

Telephone No: (916) 653-3840

Remarks: State-only LRSP Allocation. PECT: 20.30.010.555

ACCOUNTING INFORMATION

LRSPL-5182(080)

ADV. PROJECT ID	APPROP. UNIT	STATE PROG.	FED/STATE	ENCUMBRANCE AMOUNT	APPROP YEAR	EXPENDITURE AMOUNT	ENCUMBRANCE BALANCE	REVERSION DATE	Cooperative Work Agreement APPROVED AMOUNT	Cooperative Work Agreement EXPIRATION DATE
0320000107	20102	2030010555		$47,700.00	1920	$0.00	$47,700.00	06/30/25		
0320000107	19102	2030010555		$72,000.00	1819	$6,013.06	$65,986.94	06/30/24		

COUNCIL COMMUNICATION

CC #: 1516
File #: 0900-02-02-1 & 0201-01

Title:	Dry Creek Wastewater Treatment Plant Cogeneration Project - Budget Adjustment
Contact:	Todd Jordan 916-746-1829 tjordan@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 7.30.

RECOMMENDATION TO COUNCIL

Staff recommends that the City Council adopt an ordinance approving the attached budget adjustment to cover costs for City staff labor on the Dry Creek Wastewater Treatment Plant Cogeneration Project.

BACKGROUND

The Dry Creek Wastewater Treatment Plant Cogeneration Project (400109) is complete but currently has a balance of $239,367.32 due to higher than anticipated City staff labor expenses. Staff utilized the design-assist project delivery method which promotes collaboration between project contractors and City staff. Environmental Utilities staff completed the construction of pipeline improvements and associated asphalt repairs due to such construction. These improvements were a result of plant staff collaborating with the contractor on repairing unforeseen issues with pipeline conflicts on the project.

In order to close the project by the end of FY2021, staff recommends increasing the project budget by $239,368.

FISCAL IMPACT

Approval of the attached budget adjustment authorizes an additional $239,368 in funding from the Wastewater Rehabilitation Fund (reducing that fund's available resources), increasing the total project budget to $10,143,725.

ENVIRONMENTAL REVIEW

The California Environmental Quality Act (CEQA) does not apply to activities that will not result in a direct or reasonably foreseeable indirect physical change in the environment, or is otherwise not considered a project as defined by CEQA Statute §21065 and CEQA State Guidelines

§15060(c)(3) and §15378. Approval of a budget adjustment meets the above criteria and is not subject to CEQA. No additional environmental review is required.

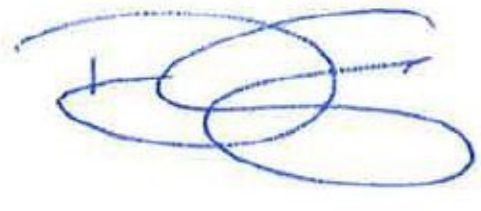
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Goal F - Invest in well-planned infrastructure and growth

Respectfully Submitted,

Todd Jordan, Environmental Utilities Process Engineer

Richard Plecker, Environmental Utilities Director



_____

Dominick Casey, City Manager

ATTACHMENTS:

Description

Ordinance 6373

Budget Adjustment

ORDINANCE NO. 6373

ORDINANCE OF THE COUNCIL OF THE CITY OF ROSEVILLE AUTHORIZING CERTAIN AMENDMENTS TO THE FISCAL YEAR 2020-21 BUDGET AND DECLARING THIS ORDINANCE TO BE IMMEDIATELY EFFECTIVE AS AN APPROPRIATION MEASURE

THE CITY OF ROSEVILLE ORDAINS:

SECTION 1. The City of Roseville Annual Budget, Fiscal Year 2020-21, is hereby amended as listed on the attached budget adjustment for the Dry Creek Wastewater Treatment Plant Cogeneration Project.

SECTION 2. This ordinance is hereby declared to be an appropriation measure, immediately effective pursuant to the provisions of Section 5.03 of the Charter.

SECTION 3. The City Clerk is hereby authorized and directed to post a true copy of the foregoing ordinance in each of three (3) conspicuous locations in the City and she shall immediately after such posting enter in the ordinance book, under the record of the ordinance, a certificate under her hand stating the time and place of such publication by posting.

PASSED AND ADOPTED by the Council of the City of Roseville, this _____ day of _____, 2021, by the following vote on roll call:

AYES COUNCILMEMBERS:

NOES COUNCILMEMBERS:

ABSENT COUNCILMEMBERS:

_____
MAYOR

ATTEST:

_____
City Clerk

REQUEST FOR BUDGET ADJUSTMENT

REQUESTER NAME & TITLE:	Todd Jordan, Process Engineer	FISCAL YEAR:	2021
PREPARER NAME & TITLE:	Lisa Saunders, EU Business Analyst	COUNCIL DATE (if applicable):	6/16/21
DEPARTMENT/DIVISION:	EU/Wastewater	ORDINANCE:	

EXPENDITURES/EXPENSES/TRANSFERS OUT

ACCOUNT STRING				BUDGET ($)	DESCRIPTION
Fund	Account	Center	Project	Adjustment	
6230	5080	84001	400109	239,368	Secondary labor charged to project #400109
			TOTAL	239,368	

REVENUES/TRANSFERS IN

ACCOUNT STRING				BUDGET ($)	DESCRIPTION
Fund	Account	Center	Project	Adjustment	
			TOTAL	-	

	NET ADJUSTMENT	239,368

FUND BALANCE

ACCOUNT STRING				BUDGET ($)	DESCRIPTION
Fund	Account	Center	Project	Adjustment	
6230	3601	00000		(239,368)	Decrease available resources in Wastewater Rehab Fund
			TOTAL	(239,368)	

Justification for Budget Adjustment:

The Dry Creek Wastewater Treatment Plant Cogeneration project (#400109) is complete but currently has a balance of ($239,367.32) due to higher than anticipated secondary labor expenses. The offset for secondary labor was already budgeted and does not require an adjustment. In order to close the project by 6/30/21, staff recommends increasing the budget by $239,368.

REQUIRED APPROVALS:

Richard D. Pankey	5/19/21		
REQUESTING DEPARTMENT HEAD / DESIGNEE	DATE	BUDGET MANAGER / DESIGNEE	DATE
CHIEF FINANCIAL OFFICER / DESIGNEE	DATE	CITY MANAGER / DESIGNEE	DATE

BUDGET DEPARTMENT USE ONLY:

POSTED BY	DATE

Revised: June 24, 2019

COUNCIL COMMUNICATION

CC #: 1557
File #: 0324

Title:	Second Reading - Roseville Municipal Code Amendment to Rate Assistance Program
Contact:	Eric Campbell 916-774-5626 ecampbell@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 7.31.

RECOMMENDATION TO COUNCIL

ORDINANCE NO. 6376 OF THE COUNCIL OF THE CITY OF ROSEVILLE AMENDING SECTION 14.24.079 OF CHAPTER 14.24 OF TITLE 14 OF THE ROSEVILLE MUNICIPAL CODE REGARDING LOW INCOME RATE REDUCTION, for second reading and adoption.

BACKGROUND

Not applicable.

FISCAL IMPACT

Not applicable.

ENVIRONMENTAL REVIEW

Not applicable.

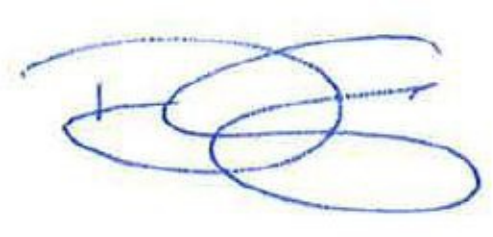
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Goal A - Remain fiscally responsible in a changing world

Respectfully Submitted,

Eric Campbell, Electric Utility Finance Administrator

Michelle Bertolino, Electric Utility Director



Dominick Casey, City Manager

ATTACHMENTS:

Description

Ordinance 6376

ORDINANCE NO. 6376

ORDINANCE OF THE COUNCIL OF THE CITY OF ROSEVILLE AMENDING SECTION 14.24.079 OF CHAPTER 14.24 OF TITLE 14 OF THE ROSEVILLE MUNICIPAL CODE REGARDING LOW INCOME RATE REDUCTION

THE CITY OF ROSEVILLE ORDAINS:

SECTION 1. Section 14.24.079 of Chapter 14.24 of Title 14 of the Roseville Municipal Code is hereby amended to read as follows:

14.24.079 Low-income rate reduction.

A. Effective July 1, 1998, any household with a total income no greater than 200% of the Federal Poverty Level (FPL) issued by the Department of Health and Human Services (HHS) may apply for a 15 percent rate reduction of all charges in the standard residential rate. Applications for reduced rates shall be on forms supplied by the city. All information required to be given on such forms shall be supplied by the applicant on behalf of the household under penalty of perjury.

B. Reduced rates shall be granted to qualifying household which file applications with the director of finance. A change of address terminates the special rate provided in this section, but a new application at a new address may be made and the reduced rate shall be allowed, if the requirements set out in this section are satisfied.

C. For the purposes of this section, a "qualifying household" is defined as any household with a verifiable gross household income no greater than 200% of the Federal Poverty Level (FPL) issued by the Department of Health and Human Services (HHS).

D. This rate reduction replaces the senior citizen rate reduction, Municipal Code Section 14.24.075, for new applicants. Current senior citizen rate reduction participants may choose to remain on the existing senior reduced rate or apply for the low-income rate reduction.

E. No household may participate in more than one city electric rate reduction program concurrently.

SECTION 2. This ordinance shall be effective at the expiration of thirty (30) days from the date of adoption.

SECTION 3. The City Clerk is hereby directed to cause this ordinance to be published in full at least once within fourteen (14) days after it is adopted in a newspaper of general circulation in the City, or shall within fourteen (14) days after its adoption cause this ordinance to be posted in full in at least three (3) public places in the City and enter in the Ordinance Book a certificate stating the time and place of said publication by posting.

PASSED AND ADOPTED by the Council of the City of Roseville this ___ day of _____, 20__, by the following vote on roll call:

AYES COUNCILMEMBERS:

NOES COUNCILMEMBERS:

ABSENT COUNCILMEMBERS:

_____
MAYOR

ATTEST:

_____
City Clerk

COUNCIL COMMUNICATION

CC #: 1523
File #: 0202

Title:	Annual City of Roseville Interest Rate Swaps Report for Fiscal Year 2019-20
Contact:	Nick Rosas 916-774-5314 nrosas@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 7.32.

RECOMMENDATION TO COUNCIL

Staff recommends that Council accept the following informational report on the performance of the City's outstanding interest rate swaps for the Electric Department system debt.

BACKGROUND

In accordance with the City of Roseville Swap Policy, a written report detailing the status of all swaps entered into by the City shall be provided to the City Council on an annual basis.

Starting in 2002, Electric began to diversity its debt portfolio with the use of interest rate swaps. The purpose of these swaps was to reduce debt service cost over fixed rate debt while limiting the unpredictability of variable rate debt. Swaps reduce debt service by taking on additional risks (e.g. basis risk, liquidity renewal risk, and counterparty risk). These instruments are not executed for speculative reasons.

The City makes fixed interest payments to Morgan Stanley in exchange for floating rate interest payments based on the notional amount of the 2008A Electric bonds. In 2012, the 2008A Electric bonds were refunded by the 2012 Electric bonds and the 2012 Electric bonds were purchased by U.S. Bank through a direct purchase agreement. The direct purchase option removed the liquidity banking trading risk, remarketing risk, and any London Inter-Bank Offered Rate (LIBOR) manipulation. In November 2019, the interest rate swap agreement with the Bank of America Merrill Lynch was terminated with a termination payment of $7,176,500, the 2012 Certificates of Participation were paid down $36,000,000, and U.S. Bank renewed the terms of the direct purchase agreement on the remaining balance for another 3.5 year term based on 80% of one-month LIBOR plus 60 basis points (bps).

FISCAL IMPACT

This is an informational item only. As such, there is no fiscal impact.

ENVIRONMENTAL REVIEW

The California Environmental Quality Act (CEQA) does not apply to activities that will not result in a direct or reasonably foreseeable indirect physical change in the environment, or is otherwise not considered a project as defined by CEQA Statute §21065 and CEQA State Guidelines §15060(c)(3) and §15378. The informational report meets the above criteria and is not subject to CEQA. No additional environmental review is required.

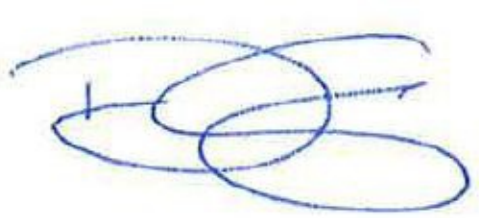
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Goal A - Remain fiscally responsible in a changing world

Respectfully Submitted,

Nick Rosas, Accounting Manager

Dennis Kauffman, Assistant City Manager/Chief Financial Officer



_____

Dominick Casey, City Manager

ATTACHMENTS:

Description

Interest Rate Swap Report FY 2020



INTEREST RATE SWAPS REPORT

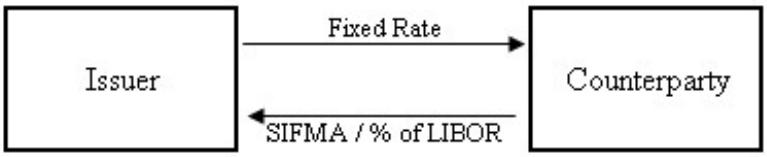
For the Year Ended June 30, 2020

Prepared by
Nick Rosas
Accounting Manager
City of Roseville

General Information – Interest Rate Swaps

An interest rate swap is a contract between two parties to exchange certain cash flows for a defined period of time related to an underlying asset or liability without actually exchanging the underlying principal amount. The computational base on which the swapped payments are calculated is referred to as the "notional amount." Interest rate swaps are used to convert one interest rate basis to a different basis (e.g., from floating to fixed or fixed to floating) and enable bond issuers to accomplish financial goals such as hedging variable rate exposure, improving asset/liability matches or reducing borrowing costs.

In the municipal marketplace, the two parties to a swap are called "counterparties" and consist of an agency, such as the City of Roseville, and a financial institution. The counterparties exchange interest payments on specific dates according to a predetermined formula. Only the net payment amount is exchanged. The floating rate resets are generally based on the LIBOR[1] or SIFMA[2] index.



Swap Risks

1. Basis Risk: (1) the degree to which the difference between two prices fluctuates; (2) the residual risk that remains after a hedge has been placed; (3) the risk from receiving one floating rate, such as SIFMA and paying another, such as the interest rate on your own obligations.

2. Counterparty Risk: The risk that the party on the other side of a swap transaction does not fulfill its obligations under the swap.

3. Rollover Risk: Rollover risk occurs when the term of the swap does not match the term of the asset or liability that the swap is intended to hedge.

4. Tax Risk: Tax risk arises since SIFMA is a tax-exempt index whereas LIBOR is a taxable index, implying that the ratio of SIFMA to LIBOR should approximately be 1-Marginal tax rate. As tax rates increase, SIFMA as a percent of LIBOR should decrease, whereas if tax rates decrease, the reverse would theoretically hold true. Historically the ratio has averaged at approximately 67% of 1-Month LIBOR. Simply stated, basis/tax law risk is the risk of a change in the SIFMA/LIBOR ratio.

5. Termination Risk: During the term of the swap either party may decide to terminate the swap or some contractual provisions may require the swap to be terminated. Unless the swap is at the market, upon termination one of the parties will need to make a termination payment depending upon market interest rates relative to the swap fixed rate. If market rates are higher than the swap fixed rate the party receiving the fixed rate will need to make the termination payment and vice versa.

[1] London Interbank Offered Rate (LIBOR) is a daily reference rate based on the interest rates at which banks offer to lend unsecured funds to other banks. LIBOR is currently scheduled to be phased out of use by the end of 2021. An interest rate swap that relies on LIBOR as a basis for rate calculation will need to seek a replacement rate index in accordance with the swap agreement.
[2] The Securities Industry and Financial Markets Association (SIFMA) Municipal Swap Index is a 7-day high-grade market index comprised of tax-exempt VRDOs.

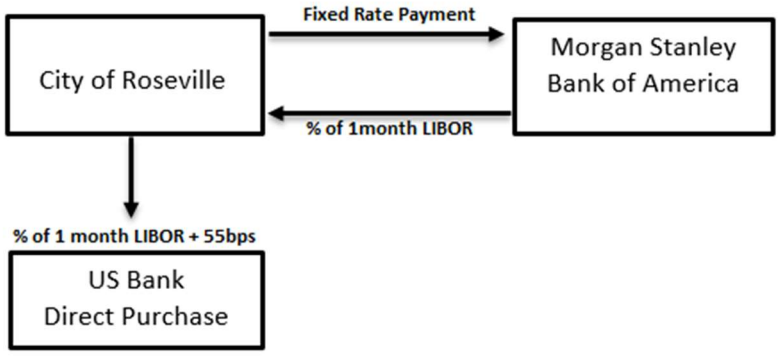
City of Roseville Interest Rate Swaps

The City's exposure to Electric System variable rate debt has been hedged through an interest rate swap.

Structure of the City's Interest Rate Swaps Related to the 2012 Electric System Revenue Refunding Certificates of Participation

The City has an interest rate swap with Morgan (counterparty) that is structured as a *floating-to-fixed rate* swap. These swaps are based on the notional amount of the 2008A Electric System Revenue Refunding COPs (2008A COPs). The City makes fixed interest payments to the counterparties in exchange for floating rate interest payments (SIFMA or percent of LIBOR) made by the counterparties. A floating-to-fixed rate swap enables the City to structure a synthetic fixed rate liability.

The 2008A COPs were refunded by the 2012 Electric System Revenue Refunding Certificates of Participation (2012 COPs) and the 2012 COPs were purchased by U.S. Bank through a direct purchase agreement.



Background

Due to the liquidity crunch in early 2008, the auction-rate market began to fail. The City took quick action to resolve the high reset rates and downgrade of the bond insurer (FGIC) by terminating the 2005 Electric swap and refunding the outstanding par. On May 13, 2008 the City issued the 2008 Electric System Revenue Certificates of Participation Series A (2008A COPs) and Series B (2008B COPs) in the original principal amounts of $90,000,000 and $64,500,000 respectively, to defease the 2005 Electric COPs Series B and C.

The 2008A COPs were issued as variable rate securities (VRDOs) with interest calculated weekly. The rate fluctuated according to the market conditions but was capped at 12%. The City entered into a 27-year interest rate swap agreement with Morgan Stanley (60%) and Bank of America (40%) for the entire amount of the 2008A COPs. The combination of the variable rate 2008A COPs and a floating-to-fixed rate swap creates a synthetic fixed rate debt for the City.

In November 2012 the 2008A COPs were refunded by the 2012 Electric System Revenue Refunding Certificates of Participation (2012 COPs) and the 2012 COPs were purchased by U.S. Bank through a direct purchase agreement. The direct purchase agreement acts similar to a loan and was analyzed as the most cost effective option regarding the refunding of the 2008A COPs. The direct purchase option removed the liquidity bank trading risk, remarketing risk, and any LIBOR manipulation. Risks associated with the viability of a Letter of Credit provider are essentially removed. U.S. Bank offered a 3.5 year term based on 70.5% of one-month LIBOR plus 62.5 basis points (bps).

In May 2016 U.S. Bank renewed the terms of the direct purchase agreement with a 3.5 year term based on 70.5% of one-month LIBOR plus 55 bps.

On November 1, 2019 the City paid down $36,000,000 of the outstanding 2012 COPs, terminated the interest rate swap agreement with Bank of America for a cost of $7,176,500, and renewed the U.S. Bank direct placement for the remaining $54,000,000 at an interest rate of 80% of one-month LIBOR plus 60 basis points. The Morgan Stanley interest rate swap agreement remains in effect.

Interest Rate Swaps Related to the 2012 Electric System Revenue Refunding Certificates of Participation

Annual Reporting Requirements

Description	
Original notional amount - Total	$90,000,000
Original notional amount – Morgan Stanley	$54,000,000
Original notional amount – Bank of America	$36,000,000
Type of swap	Variable-to-fixed rate swap
Variable rate debt type	Variable rate demand obligation (VRDOs)

Payment and Swap Terms	
Interest Rate Swaps with Morgan Stanley and Bank of America	
Fixed swap rate – Morgan Stanley	3.321%
Fixed swap rate – Bank of America	3.364%
Floating swap rate – Morgan Stanley and Bank of America	70.5% of one-month LIBOR[1]
Pricing frequency of swap rate	Weekly
Payment frequency of swap agreement	Monthly
Average life of outstanding swap	9.16 years
Effective date of outstanding swap	May 13, 2008
Maturity of outstanding swap	February 1, 2035
U.S. Bank Direct Purchase of 2012 COPs	
Interest rate	80% of one-month LIBOR + 60 basis points
Payment frequency	Monthly
Term of U.S. Bank direct purchase agreement	3.5 years
Maturity of U.S. Bank direct purchase agreement	May 1, 2023

Details for the Year Ended June 30, 2020	
Notional amount as of June 30, 2020 - Total	$54,000,000
Notional amount as of June 30, 2020 – Morgan Stanley	$54,000,000
Notional amount as of June 30, 2020 – Bank of America	$0
Notional amount retired FY20	$36,000,000
Average floating rate received from counterparties	1.046%
Average interest rate paid to U.S. Bank for direct purchase	1.911%
Synthetic fixed rate for FY20	4.191%

Swap Counterparties Information	
Morgan Stanley credit rating[1]	A+
Bank of America credit rating[1]	A+
Fair value of swap as of June 30, 2020 – Morgan Stanley	($13,691,174)
Material changes to report for FY20	None
Defaults (City or counterparty) to report for FY20	None

[1] Credit rating by Standard & Poor's Agency

Interest Rate Swap Related to the 2012 Electric System Revenue Refunding Certificates of Participation

Amortization Schedule of Interest Rate Swap Notional Amounts

From (and including)	To (but excluding)	Morgan Stanley Notional Amounts
2/1/2018	2/1/2019	54,000,000
2/1/2019	2/1/2020	54,000,000
2/1/2020	2/1/2021	54,000,000
2/1/2021	2/1/2022	54,000,000
2/1/2022	2/1/2023	54,000,000
2/1/2023	2/1/2024	51,075,000
2/1/2024	2/1/2025	47,655,000
2/1/2025	2/1/2026	44,100,000
2/1/2026	2/1/2027	40,410,000
2/1/2027	2/1/2028	36,570,000
2/1/2028	2/1/2029	32,595,000
2/1/2029	2/1/2030	28,455,000
2/1/2030	2/1/2031	24,150,000
2/1/2031	2/1/2032	19,680,000
2/1/2032	2/1/2033	15,045,000
2/1/2033	2/1/2034	10,215,000
2/1/2034	2/1/2035	5,205,000

Summary of Payments

2012 Electric Swaps and related U.S. Bank Direct Purchase Agreement
$90,000,000 Swap: 60% Morgan Stanley - 40% Bank of America

		MORGAN STANLEY			BANK OF AMERICA[4]			U.S. BANK	
		$54,000,000 Notional Amount			$36,000,000 Notional Amount			$90,000,000 Principal Amount	
Month	Due	3.321% Fixed Rate Amount	70.5% of 1-Month LIBOR Floating Rate Amount	Net Swap Payment	3.364% Fixed Rate Amount	70.5% of 1-Month LIBOR Floating Rate Amount	Net Swap Payment	Direct Purchase Agreement 70.5% of 1-Month LIBOR + 55 bps	TOTAL PAYMENTS
Jul-19	8/1/2019	$ 149,445	$ (76,482)	$ 72,963	$ 100,920	$ (50,988)	$ 49,932	$ 173,910	$ 296,805
Aug-19	9/1/2019	159,408	(76,411)	82,997	107,648	(50,941)	56,707	164,455	304,159
Sep-19	10/1/2019	139,482	(60,631)	78,851	94,192	(40,421)	53,771	152,325	284,947
Oct-19	11/1/2019	149,445	(62,484)	86,961	-	-	-	153,683	240,644
Nov-19	12/1/2019	154,427	(57,317)	97,110	-	-	-	91,170	188,280
Dec-19	1/1/2020	149,445	(56,998)	92,447	-	-	-	90,815	183,262
Jan-20	2/1/2020	154,427	(57,054)	97,373	-	-	-	94,163	191,536
Feb-20	3/1/2020	144,464	(48,807)	95,657	-	-	-	83,694	179,351
Mar-20	4/1/2020	144,464	(29,687)	114,777	-	-	-	86,722	201,499
Apr-20	5/1/2020	149,445	(25,421)	124,024	-	-	-	62,460	186,484
May-20	6/1/2020	149,445	(7,576)	141,869	-	-	-	41,711	183,580
Jun-20	7/1/2020	149,445	(5,794)	143,651	-	-	-	33,255	176,906
	3	**$ 1,793,342**	**$ (564,662)**	**$ 1,228,680**	**$ 302,760**	**$ (142,350)**	**$ 160,410**	**$ 1,228,363**	**$ 2,617,453**

Total Floating Rate Amounts[1]	**$ (707,012)**
Total Variable Rate Amounts[2]	**1,228,363**
Net Variable Rate Amounts	**$ 521,351**
Fixed Rate Amounts[3]	**$ 2,096,102**
Total Net Variable Rate + Fixed Rate Amounts	**$ 2,617,453**

[1]Amount due from swap counterparties to the City

[2]Amount due from the City to U.S. Bank as bondholder of the 2012 Electric System Revenue Refunding COPs

[3]Amounts due from the City to the swap counterparties

[4] This swap was terminated on November 1, 2019. The last payment made under this agreement was on October 1, 2019.

Interest Rate Swaps Related to the 2012 Electric System Revenue Refunding Certificates of Participation

Fiscal Impact

The following chart details the 2008A COPs and 2012 Direct Purchase Bonds savings when compared to a conventional fixed rate issue. For the year ended June 30, 2020 the 2008A/2012 bonds had savings of $544,682 and have achieved total savings of over $12.5 million compared to a conventional fixed rate issue.

June 30th	Planned 2008 Debt Service	Conventional Fixed Debt Service	Planned Savings	Actual 2008 Debt Service	Actual Savings
2006	$ 3,217,723	$ 4,098,280	$ 880,557	$ 3,082,768	$ 1,015,512
2007	3,480,935	4,457,344	976,409	3,033,424	1,423,920
2008	3,439,643	4,321,714	882,072	4,206,828	114,887
2009	3,557,232	4,517,335	960,103	4,604,131	(86,796)
2010	3,628,393	4,517,335	888,942	3,774,816	742,519
2011	3,628,393	4,517,335	888,942	3,782,223	735,112
2012	3,629,892	4,517,335	887,443	3,924,644	592,691
2013	3,628,374	4,517,335	888,961	3,277,866	1,239,469
2014	3,628,393	4,517,335	888,942	3,574,621	942,714
2015	3,628,393	4,517,335	977,044	3,422,447	1,094,888
2016	3,629,892	4,517,335	972,599	3,425,498	1,091,837
2017	3,628,374	4,517,335	977,679	3,483,903	1,033,432
2018	3,628,393	4,517,335	976,409	3,485,797	1,031,538
2019	3,628,393	4,517,335	977,044	3,499,961	1,017,374
2020	2,177,935	2,710,401	532,466	2,617,453	92,948
	$ 52,160,359	**$ 65,278,424**	**$ 13,555,610**	**$ 53,196,379**	**$ 12,082,045**

Actual savings to date	**$ 12,082,045**
Actual versus planned savings variance to date	**$ (1,036,021)**
Actual versus planned savings - percent of savings	**89.13%**

Notes

- Savings carried over from 2005 bond issue
- Price date of 5/13/2008
- Fixed swap rate of 3.321% ($54M) and 3.364% ($36M) (70.5% of 1-month LIBOR)
- Assumption that Electric variable rate securities trade at 70.5% of LIBOR (no trading differential)
- Conventional fixed rate estimated as of 5/13/2008 (arbitrage yield of 4.80%)

COUNCIL COMMUNICATION

CC #: 1529
File #: 0721-05

Title:	Mahany Park Open Space Multi-Use Trail Feasibility Study
Contact:	Jeannie Gandler 916-746-1289 jgandler@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 7.33.

RECOMMENDATION TO COUNCIL

The Transportation Commission recommends that the City Council:

1. Accept the Mahany Open Space Multi-Use Trail Feasibility Study; and,
2. Direct staff to pursue funding for environmental review, project engineering and trail construction.

BACKGROUND

The Mahany Park Open Space Multi-Use Trail Feasibility Study has been prepared to evaluate the feasibility for paved Class I trails in the approximately 133-acre Mahany Park Open Space Study Area that is located in western Roseville between Fiddyment Road and Woodcreek Oaks Boulevard, south of Pleasant Grove Boulevard. The study area is adjacent to Mahany Park, the Roseville Aquatics Complex, and Woodcreek High School on the east and bounded by residential development on the north and south.

Paved trails are planned for the Study Area in the General Plan, the Roseville Open Space Overarching Management Plan (OSOMP), the City of Roseville Bicycle Master Plan (BMP) and adjacent Specific Plans. This study refines the trail alignments previously identified in the above documents. Please see the attached Transportation Commission staff report for more background information.

Public Engagement
A robust public engagement process was developed to inform the public about the study. Consistent with COVID-19 precautions and public health guidelines, the public engagement process included:

- A project website created and updated frequently by City staff.
- An informational video about the project.
- Two interactive online surveys (instead of in-person workshops).
    - The first survey informed the public about the study and gathered information about how people currently use the open space, and how they would like to use the open space. The survey results contributed to development of trail alignment options.

- The second survey presented and requested public feedback on trail alignment alternatives.

The above engagement opportunities were shared with the public using a variety of outreach methods as described in the Transportation Commission staff report.

Trail Alignment Options
The planning process started with a thorough existing conditions assessment and opportunities and constraints analysis. This process included reviewing existing planning documents, field walks, a Biological Constraints Report, consultation with utilities and regulatory agencies, phone interviews with stakeholders including Woodcreek High School biology and extra-curricular program teachers, and comments obtained through the first online survey.

The project team then developed trail alignment options for the study area. To simplify the presentation of the trail alignment options, the Study Area was split into east and west sections. Three trail alignment options were developed for the western half of the Study Area and two trail alignment options were developed for the eastern half of the Study Area. Any of the western trail alignment options would connect with either of the eastern trail alignments. The trail alignment options were presented to the public as part of the second online survey.

Recommended Trail Alignment
After reviewing the project goals and the results of the second online survey, the project team developed a recommended trail alignment. The recommended alignment proposes approximately 2.4 miles of new trail through the Study Area that would:

- Close gaps in the Class I trail and bikeway system resulting in connections to surrounding neighborhoods, schools, parks, transit stops, roads and businesses, for safe use by people of all ages, abilities and incomes;
- Provide permanent, all-weather crossings of creeks in the Study Area to allow safe use year-round;
- Provide varying lengths of recreational loop opportunities;
- Protect natural resources, including vernal pool habitat;
- Maintain required access for existing utilities; and
- Include a variety of amenities along the trail.

The preliminary cost to construct the trail, including a mid-block crossing on Fiddyment Road, ranges from $4.3 million, using standard paving materials, to $6.7 million if permeable materials are used throughout. This cost estimate includes all of the remaining steps to complete the project, which include traffic studies for a potential mid-block crossing of Fiddyment Road, geotechnical studies, additional studies required by regulatory agencies, preliminary engineering, environmental reviews, permitting, final design, and construction.

Parks, Recreation & Libraries Commission and Transportation Commission Review
The study, including the recommended trail alignment, was presented to the Parks, Recreation and Libraries Commission and the Transportation Commission at their May 3, 2021 and May 18, 2021 meetings, respectively. No formal action was sought from the Parks, Recreation and Library Commission, and commissioners commented that the study is well-considered and responsive to the public's needs. The Transportation Commission unanimously recommended the City Council accept the study. Notice of the meetings was provided to the project email list (approximately 1,000 interested persons), the City's Trail Alert email service (approximately 7,000 recipients), the City News email service (approximately 48,000 recipients), the City website and other online and social media platforms. No public comment was received at either meeting.

FISCAL IMPACT

Funding for the next steps of this project have not been identified. At City Council direction, staff will pursue funding through various federal, state, and local sources over the next several years to complete the project. General Fund resources were not used for this study and are not used for multi-use trail construction.

ENVIRONMENTAL REVIEW

The California Environmental Quality Act (CEQA) does not apply to feasibility and planning studies for possible future actions which the agency has not approved or funded (CEQA Guidelines §15262). Because the Mahany Park Open Space Multi-Use Trail Feasibility Study only authorizes feasibility and planning studies it is statutorily exempt from CEQA review. Following completion of these studies the City and/or participating entities will refine the project proposal and conduct CEQA review prior to project approval.

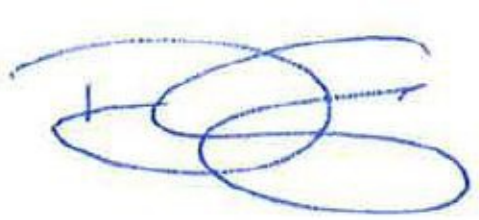
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Goal A - Remain fiscally responsible in a changing world
Goal C - Maintain a safe and healthy community
Goal E - Deliver exceptional city services

Respectfully Submitted,

Jeannie Gandler, Administrative Analyst

Jason Shykowski, Public Works Director



_____
Dominick Casey, City Manager

ATTACHMENTS:

Description

Mahany Open Space Multi-Use Trail Feasibility Study

Appendix A Existing Conditions Report

Appendix B Biological Constraints Report

Appendix C Summary of Regulatory Agency Coordination

Appendix D Summary of Second Survey Results

Appendix E Grading Constraints

May18, 2021 Transportation Commission Mtg Staff Report

Mahany Park
Open Space Multi-Use Trail

Feasibility Study

April 2021 | CRS-03

HELIX Environmental Planning



Prepared for:

City of Roseville

311 Vernon Street

Roseville, CA 95678

Prepared by:

HELIX Environmental Planning, Inc.

1677 Eureka Road, Suite 100

Roseville, CA 95661

Mahany Park
Open Space Multi-Use Trail

Feasibility Study

Prepared for:

City of Roseville
311 Vernon Street
Roseville, CA 95678

Prepared by:

HELIX Environmental Planning, Inc.
1677 Eureka Road, Suite 100
Roseville, CA 95661

April 2021 | CRS-03

This page intentionally left blank

ACKNOWLEDGMENTS

Roseville City Council
Mayor Krista Bernasconi
Vice Mayor Bruce Houdesheldt
Councilmember Scott Alvord
Councilmember Pauline Roccucci
Councilmember Tracy Mendonsa

City of Roseville Staff
Dominick Casey, City Manager
Jason Shykowski, Public Works Director
Mike Dour, Public Works/Alternative Transportation Manager

Project Development Team
Jeannie Gandler, Project Manager, Alternative Transportation Analyst II/Bikeways
Helen Dyda, Public Information Officer
Terri Shirhall, Environmental Coordinator
Jana Cervantes, Senior Engineer, Traffic Engineering – Public Works
Noah Siviglia, Senior Engineer, City Projects – Public Works
Catherine Gosalvez, Assistant Engineer, City Projects – Public Works
Brian Walker, Senior Engineer, Flood Plain Management – Public Works
Jerry Dankbar, Street Maintenance Supervisor – Public Works
Tara Gee, Park Planning & Development Superintendent
Brian Castelluccio, Open Space Manager
Eric Dexter, Parks Superintendent
Eric Dubovik, Parks Supervisor
Sean Bigley, Assistant Director Environmental Utilities
Ken Glotzbach, Wastewater Utilities Manager – Environmental Utilities
Michael Simi, Water Distribution Superintendent – Environmental Utilities
Matt Ocko, Environmental Compliance Specialist II – Environmental Utilities
Rachel Tooker, Interpretive Services Supervisor – Environmental Utilities
Trevor Joseph, Hydrogeologist – Environmental Utilities
Todd Jordan, Electric Line Technician - Roseville Utilities
David Buelow, Police Sargent – Roseville Police Department
Jason Rizzi, Fire Division Chief – Roseville Fire Department

Consulting Team
HELIX Environmental Planning, Inc.
- Patrick Britton, Principal
- Meredith Branstad, PLA, Project Manager
- Jessamyn Lett, PLA, Assistant Project Manager
- Carolyn Hagele, Landscape Designer
- Daniel Blair, Landscape Designer
- Marisa Brilts, Biologist
- Charlotte Marks, Arborist

ACKNOWLEDGMENTS (cont.)

Consulting Team (cont.)

AIM Consulting

Gladys Cornell, Outreach Oversight
Elise Brockett, Senior Project Coordinator

Fehr and Peers

Adrian B. Engel, PE, CASp, Senior Associate
Sadie Sabol, Project Coordinator

TABLE OF CONTENTS

Section **Page**

EXECUTIVE SUMMARY ES-1

1.0 INTRODUCTION 1

2.0 BACKGROUND 4

2.1 Existing Conditions Report 4
2.1.1 Existing Documents 5
2.1.2 Opportunities and Constraints 6
2.1.3 Design Guidelines 10
2.2 Regulatory Agency Coordination 10
2.3 Public Engagement 11
2.3.1 First Online Survey 11
2.3.2 Second Online Survey 13

3.0 RECOMMENDED PROJECT 20

3.1 Alignment 20
3.1.1 Recommended Western Alignment 22
3.1.2 Recommended Eastern Alignment 24
3.2 Trail Design 25
3.2.1 Pavement Materials 27
3.2.2 Creek and Swale Crossings 28
3.2.3 Connections to Existing and Planned Bikeway System 28
3.2.4 Restoration 30
3.3 Trail Amenities 30
3.3.1 Benches 31
3.3.2 Trash Stations 31
3.3.3 Signage 31
3.3.4 Trees and Shaded Trails 33
3.3.5 Lighting 33
3.3.6 Parking 34

4.0 NEXT STEPS 35

4.1 Technical Studies 35
4.2 Preliminary Engineering 36
4.3 Environmental Review 36
4.4 Regulatory Permits 36
4.5 Final Design 37
4.6 Construction 37
4.7 Funding 39

5.0 REFERENCES 41

TABLE OF CONTENTS (cont.)

LIST OF APPENDICES

A Existing Conditions Report
B Biological Constraints Report
C Summary of Regulatory Agency Coordination
D Summary of Second Survey Results
E Grading Constraints

LIST OF FIGURES

No.	Title	Page
1	Site Location and Land Use	1
2	City Bikeway Network	3
3	Existing Conditions	4
4	Opportunities and Constraints	9
5	Study Area Sections	13
6	Western Option A	14
7	Western Option B	15
8	Western Option C	16
9	Eastern Option A	17
10	Eastern Option B	18
11	Recommended Trail Alignment	21
12	Recommended Western Alignment	22
13	Recommended Eastern Alignment	24
14	Typical Trail Sections	26
15	Next Steps	35

LIST OF TABLES

No.	Title	Page
1	Pavement Materials Options	27
2	Construction Cost Estimate	38
3	Implementation Cost Estimate	39

ACRONYMS AND ABBREVIATIONS

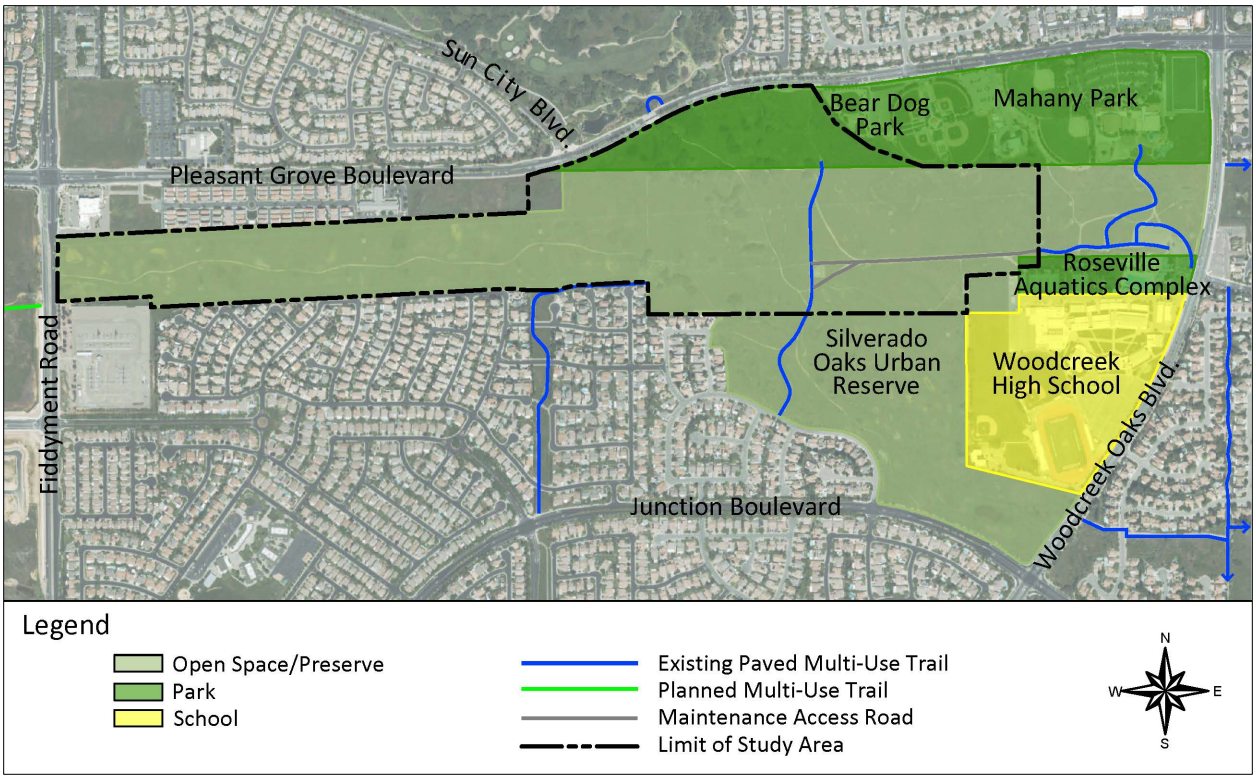
ATP	Active Transportation Program
BMP	City of Roseville Bicycle Master Plan
Caltrans	California Department Transportation
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
City Standards	City of Roseville Design and Construction Standards
CMAQ	Congestion Mitigation and Air Quality
EA	Each
Existing Conditions Report	Mahany Park Open Space Trail Existing Conditions Report
FHWA	Federal Highway Administration
Flood Ordinance	City of Roseville Flood Damage Prevention Ordinance
General Plan	City of Roseville General Plan
HELIX	HELIX Environmental Planning, Inc.
LF	linear foot
LSAA	Lake and Streambed Alteration Agreement
mph	miles per hour
NEPA	National Environmental Quality Act
OSPOMP	Open Space Preserve Overarching Management Plan
PCTPA	Placer County Transportation Planning Agency
PG&E	Pacific Gas and Electric
Roseville Electric	City of Roseville Electric Utility Department
RTP	Recreation Trail Program
RWQCB	Regional Water Quality Control Board
SACOG	Sacramento Area Council of Governments
SMUD	Sacramento Municipal Utility District
Study Area	Mahany Park Open Space Multi-Use Trail Study Area
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
WAPA	Western Area Power Administration

This page intentionally left blank

EXECUTIVE SUMMARY

The Mahany Park Open Space Multi-Use Trail Feasibility Study evaluates current conditions and recommends an alignment and cost estimate for a paved, multi-use trail in the Mahany Park open space (see Study Area Map below). A connected, paved trail system would mitigate impacts of current use on sensitive habitats and provide safe, convenient access to the City's multi-use trail network for people of all ages, abilities, and incomes through the study area.

STUDY AREA MAP



The consulting team documented existing conditions in the study area through site surveys, field walks, trail user counts, review of existing documents, meetings with regulatory agency and utility representatives, and used this information to assess opportunities and constraints. A project development team composed of City of Roseville staff and the consulting team was established and met monthly to review and discuss field and technical reports, project updates, existing conditions, public engagement, and potential trail alignments. Technical teams were established as needed to address specific issues, such as educational opportunities, utility access requirements, and regulatory coordination.

A robust public engagement process was developed to inform the public about current conditions and trail user preferences, however, due to COVID-19 precautions and public health guidelines, public engagement components of the study had to be adjusted. A project website (www.roseville.ca.us/mahanytrail) was created, updated frequently by City staff, and includes an informational video. Due to the COVID-19 pandemic, face-to-face workshops were replaced with two interactive online surveys to learn trail user preferences and to present project alignment alternatives

leading to the final recommendation. Communication to encourage public participation included: direct mailers, a feature story on ABC 10, email newsletters, Facebook, Twitter, Instagram, Nextdoor, and signage in the project area.

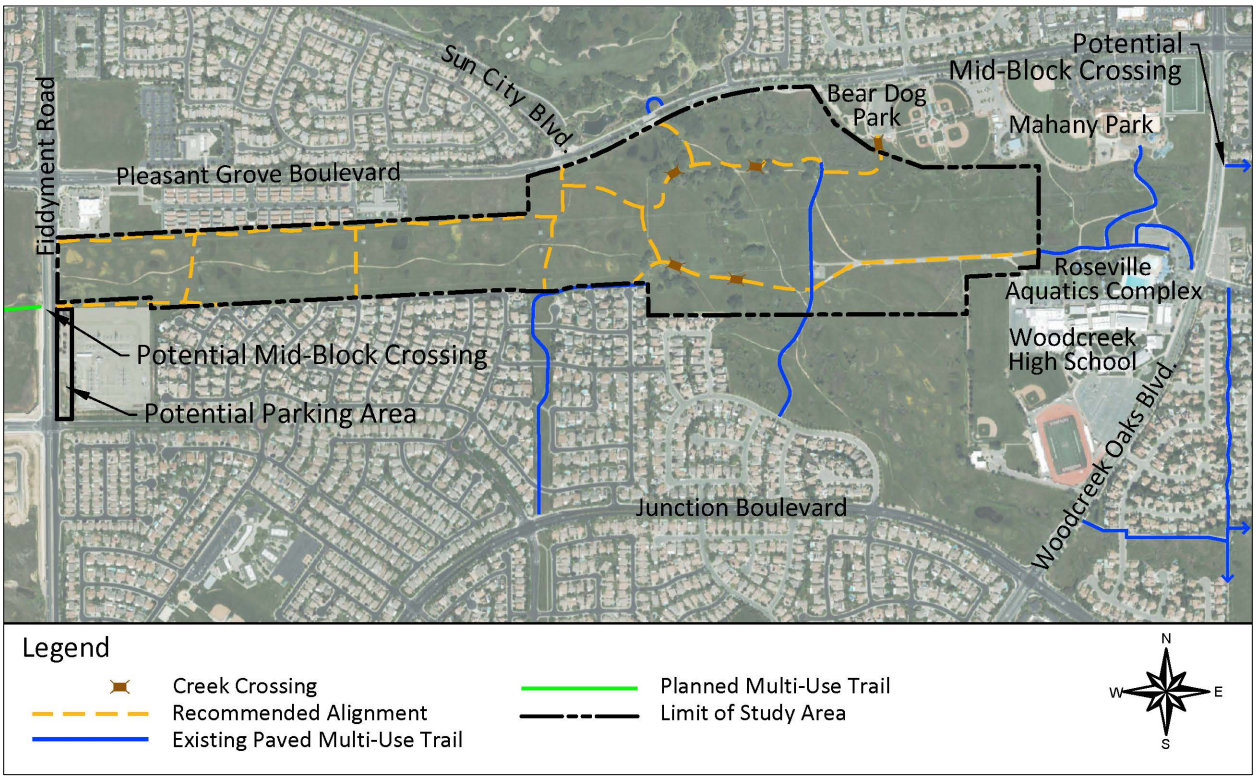


Constructed vernal pool in the Study Area.

Early in the study process, the consulting team met with regulatory agencies who oversee mitigation measures established when residential construction projects were approved along the southern border of the study area in the early 1990s. At that time, the west half of the Mahany Park Open Space was established as a preserve, and approximately 10 acres of vernal pools were created interspersed with naturally occurring vernal pools. Due to the regulatory history, the presence of these vernal pools and other sensitive resources, including seasonal wetlands, seasonal and perennial creeks, riparian and oak woodland habitat, and the potential for a number of protected species to occur on the site, coordination with the U.S. Fish and Wildlife Service, California Department of Fish and Wildlife, and U.S. Army Corps of Engineers was an important component of this study. Each agency confirmed that the conceptual alignment would be feasible with the appropriate standard permits and agreements.

Analysis of existing planning documents, meetings with technical staff, utility companies, regulatory agencies, nearby schools, the Utility Exploration Center, and results from the public engagement components, including two interactive online surveys, led to the recommended alignment shown below. The proposed alignment would result in 2.4 miles of paved trail which provides recreational loops and connects users to all existing and planned trails surrounding the Mahany Park open space.

RECOMMENDED TRAIL ALIGNMENT



When constructed, the proposed trail will allow for year-round use of the area and provide important transportation connections north to south and east to west through the open space by closing gaps in the trail and bikeway system. Adding educational components identifying vernal pools, native plants, and species may help alleviate the impact current usage has had on sensitive habitats and help users understand the importance of staying on paved trails to preserve the protected natural resources in the study area.

The preliminary estimated cost to construct the trail, including a mid-block crossing, on Fiddyment Road, ranges from 4.3 million dollars using standard paving materials to 6.7 million dollars if permeable materials are used throughout. This cost estimate includes all of the remaining steps to complete the project, which include additional traffic studies for a proposed mid-block crossing of Fiddyment Road, geotechnical studies, additional studies required by regulatory agencies, preliminary engineering, environmental reviews, permitting, final design, and construction (see Table 3 in Section 4.7).



User-created dirt paths impact natural resources like this seasonal stream.

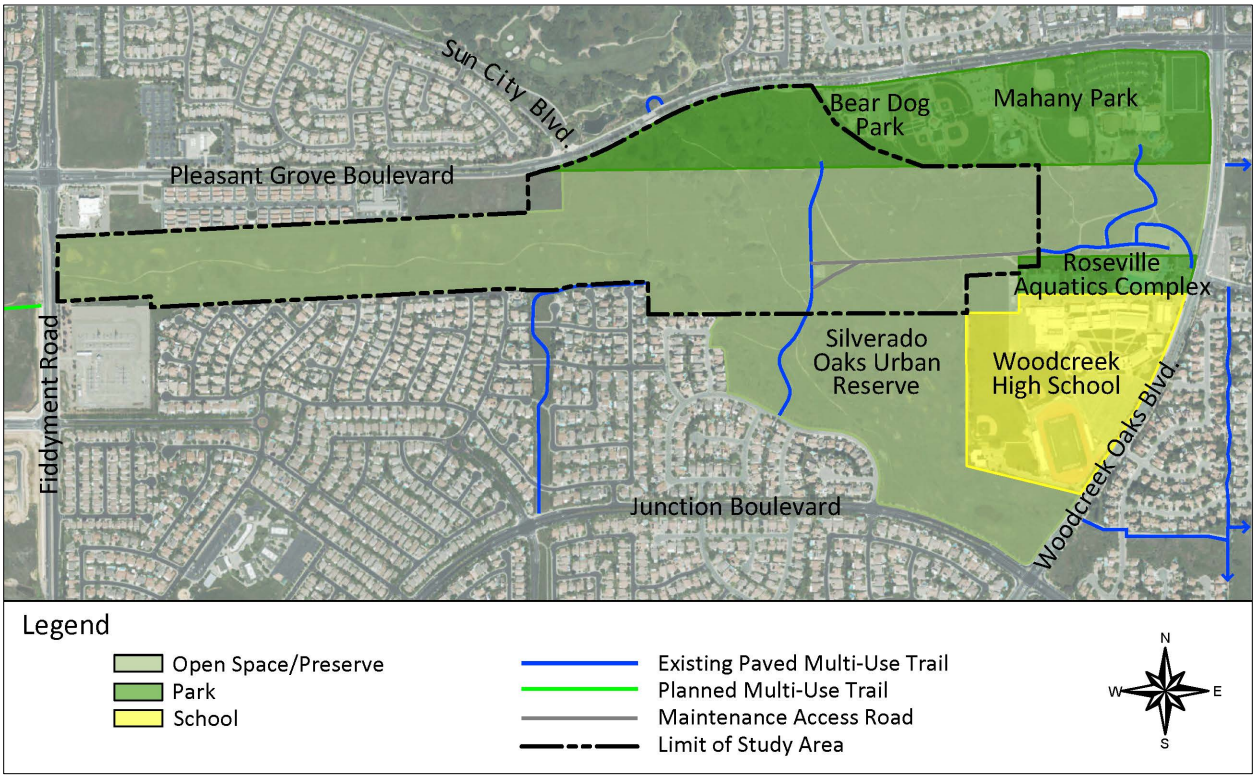
Funding for the next steps necessary to construct the recommended trail alignment has not been identified. As directed by City Council, staff will pursue funding through various federal, state, regional and local sources over the next several years to complete the project. General Fund and Measure B funds were not used for this study and are not used for multi-use trail construction.

This page intentionally left blank

1.0 INTRODUCTION

The approximately 133-acre Mahany Park Open Space Multi-Use Trail Study Area (Study Area) is located in western Roseville between Fiddyment Road and Woodcreek Oaks Boulevard, south of Pleasant Grove Boulevard (Figure 1). Part of the project area is a public park, but most of the area is designated as an open space preserve. It is adjacent to Mahany Park, the Roseville Aquatics Complex, and Woodcreek High School on the east and bounded by residential development on the north and south. The Silverado Oaks Urban Reserve, another open space preserve, is also located immediately south of the Study Area.

Figure 1
SITE LOCATION AND LAND USE



The purpose of this feasibility study is to explore the potential for a paved multi-use trail through the Mahany Park Open Space, resulting in a conceptual alignment, cost estimates and next steps leading to construction. The Study Area includes open space and open space preserves that were established to protect natural resources, including vernal pools, wetlands, creeks, and oak trees. The area is popular for walking, running, and biking and many user-created dirt paths have been established through the area. A paved, connected trail system through the Mahany Park open space may reduce impacts to natural resources, would provide additional recreational opportunities, and would improve the connectivity of the City's trail system providing more opportunities for active transportation for people of all ages, abilities, and incomes.

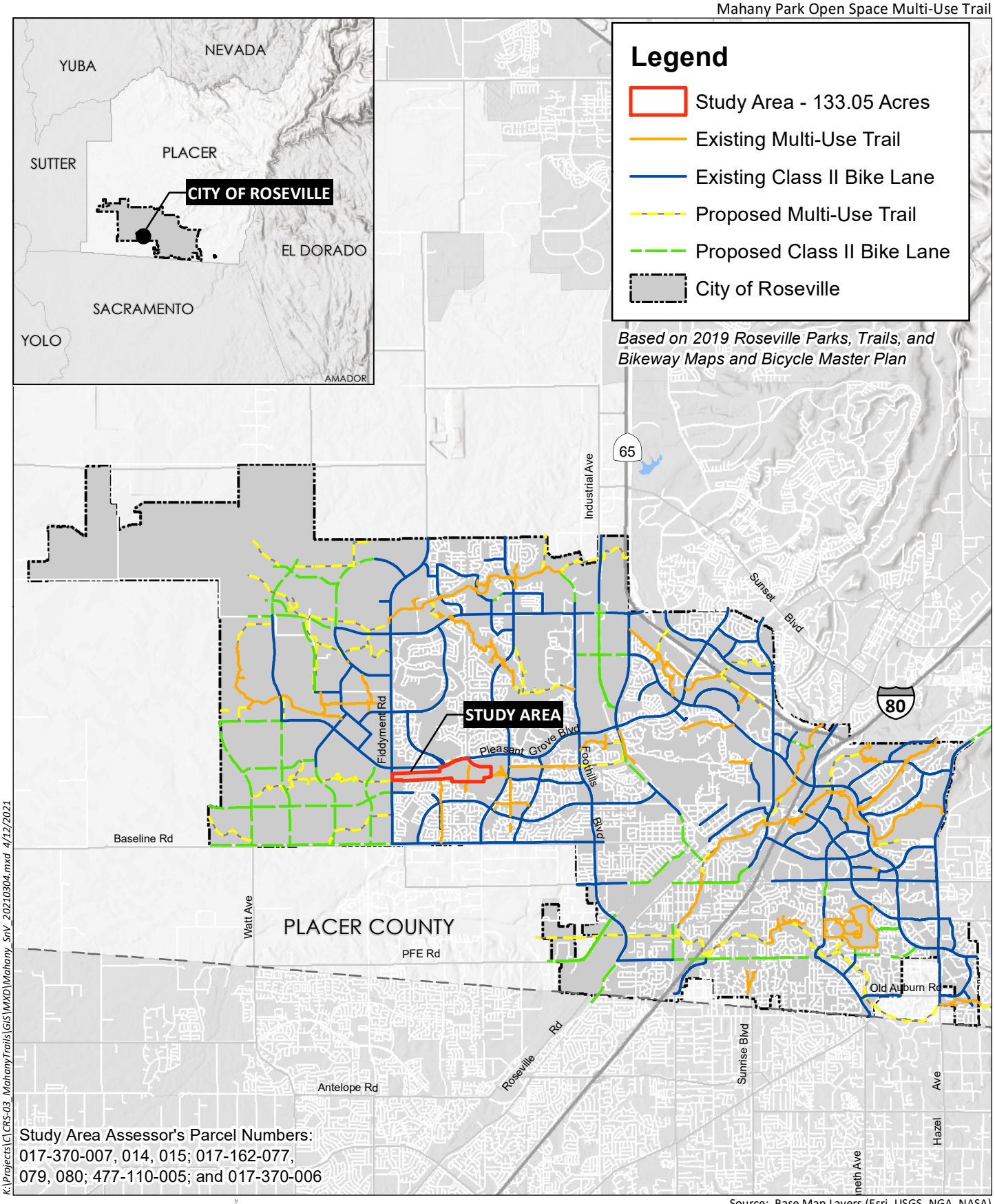
A trail through this area has been considered in several previous planning documents, including the Roseville Open Space Preserve Overarching Management Plan, the City of Roseville Bicycle Master Plan, and Specific Plans for developments adjacent to the area. This document refines the trail alignment

previously considered in those documents based on site conditions, public input, information gathered from regulatory, utility, and City agencies, and the input of the City's project development team.



Existing paved trails in the Study Area end suddenly.

The City of Roseville has an extensive trail and bikeway system, which includes over 36 miles of off-street multi-use trails and over 90 miles of Class II bike lanes (Roseville 2021). As shown in Figure 1, paved multi-use trails enter the Study Area at four locations, but there are no complete paved trails through the Study Area. Existing and planned Class I paved, multi-use trails and Class II bike lanes in the City are shown on Figure 2. The recommended alignment would add approximately 2.4 miles of paved, multi-use trails in the Study Area. The proposed trails would close gaps in the existing multi-use trail system by connecting to existing multi-use trails that end at or near the Study Area. When complete, the additional trails would connect Fiddyment Road in the west with Mahany Regional Park, the Roseville Aquatic Center, Woodcreek High School, and ultimately Woodcreek Oaks Boulevard in the east. The additional trails would provide connections between Pleasant Grove Boulevard to the north and the existing multi-use trails that extend through existing neighborhoods to the south.



HELIX Environmental Planning

City Bikeway Network

Figure 2

2.0 BACKGROUND

The initial phase of the project consisted of site assessments and research to identify the opportunities and constraints of the Study Area. The Study Area was surveyed by biologists and arborists to assess and document the existing natural resources that have the potential to limit improvements. Landscape architects assessed the existing use, recreation amenities and infrastructure, demographics of the surrounding community, and school locations and attendance areas to identify community needs, opportunities, and constraints. The consultant and technical teams met with regulatory agencies and utility companies to identify design requirements and confirm the development approval process. The consultant team reviewed existing planning documents including trail design guidelines, specific plans, the City General Plan. Additionally, on-site trail use counts and an extensive public engagement component consisting of two interactive online surveys were used to gather information about existing and desired use patterns, current access points and desired access points, and preferred trail alignments and amenities.

Three alternative alignment options were developed using the opportunities and constraints identified in the Existing Conditions Report and input from City staff. Prior to the second public engagement effort, the alternative alignments were reviewed with environmental regulatory agencies to ensure that they could be permitted in the open space preserve. Following this preliminary environmental review, the alternative alignments were presented for public comment in the second virtual survey.

2.1 EXISTING CONDITIONS REPORT

The Existing Conditions Report documented the existing conditions, identified design opportunities and constraints, and provided a summary of applicable design guidelines (*Mahany Park Open Space Trail Existing Conditions Report* - Appendix A). The Study Area has a well-developed network of informal dirt paths as well as abundant natural resources, including vernal pool complexes in the western half of the site and mature oak trees and creeks in the eastern half of the site, which are shown on Figure 3. Additionally, there are both overhead and underground utilities throughout the Study Area. Opportunities and constraints are discussed in detail in Section 2.1.2 and identified in Figure 4.

Figure 3
EXISTING CONDITIONS



2.1.1 Existing Documents

A number of existing documents are relevant to this project because they include conceptual alignments for a trail through the Study Area or goals and requirements that should be considered during trail design. These documents are discussed in detail in the Existing Conditions Report (Appendix A) and are summarized below:

- The *Roseville Open Space Preserve Overarching Management Plan* (OSPOMP) provides a universal approach and specific goals for open space management, maintenance, and monitoring in all City open space. The OSPOMP replaces individual management plans written for each open space as they were established. It specifically discusses bike trails and related amenities, defines different types of open space management areas, and includes recreation goals and actions related to the installation of trails within the Study Area. The OSPOMP includes a conceptual alignment for a Class I bike trail within the Study Area, and includes goals and recommendations to discourage user-created trails through sensitive habitats, reclaim user-created paths in open space preserves, protect biological resources by discouraging vandalism, and off-leash dogs, and encourage safe trail use (Roseville 2011). Since the majority of the Study Area is an open space preserve established to preserve natural resources, any trail in the area must meet the goals of the OSPOMP.
- The *City of Roseville General Plan* (General Plan) includes Circulation, Open Space and Conservation, and Parks and Recreation Elements which focus on the preservation and enhancement of the open space and trail networks. The General Plan includes planned Class I bikeways crossing through the Study Area both east to west and north to south. The General Plan elements address development of a bikeway network, including through the Study Area, and access to open space areas for recreation and education to the extent possible while preserving and enhancing natural resources (Roseville 2020). Design of a new trail must address the multiple goals of recreation, education, circulation, and preservation of natural resources.
- The *City of Roseville Bicycle Master Plan* (BMP) guides bikeway policies, programs, and development standards within the City of Roseville. The BMP identifies four Class I bikeways that terminate at or in the Study Area and proposes two additional segments of Class I bike trail within the Study Area, consisting of a north-south trail connecting the existing bikeways and an east-west trail from Mahany Park to Fiddyment Road. It also encourages associated support amenities, such as wayfinding signage, trail maps, and mile markers (Roseville 2008). Standards established in the BMP should be incorporated into the trail design.
- The *Del Webb Specific Plan, Northwest Roseville Specific Plan, North Roseville Specific Plan,* and *Sierra Vista Specific Plan* all include portions of, or are adjacent to, the Study Area. Each specific plan has a Circulation Element and all are consistent with General Plan goals for an extensive bikeway network in the City that include connections through the Study Area. The specific plans also address the importance of preserving open space and natural resources, including vernal pools and oak woodlands. A multi-use trail through the Study Area is an integral part of the bicycle/pedestrian master plans in the circulation elements in each of these specific plan areas.
- The *City of Roseville Design and Construction Standards* (City Standards) provide requirements for the design and construction of civil improvements within the City, including bikeways. Design of the trail through the Study Area must meet the minimum standards established in the City Standards.

- The City of Roseville Flood Damage Prevention Ordinance (Flood Ordinance) requires that new development not increase the base flood height by more than one-tenth of a foot in areas where a floodplain elevation has been established but no floodway has been designated. The Kaseberg Creek East Branch is subject to this requirement. Design of the creek crossings must meet the standards established in the Flood Ordinance.

2.1.2 Opportunities and Constraints

The existing conditions in the Study Area were assessed through site walks, trail user counts, interviews with key stakeholders, and biological surveys. Additionally, the demographics of the community and neighborhood schools were researched. This information was used to identify current use of the open space, the opportunities that could facilitate trail construction or improve trail user experience, and constraints that limit where a trail can be located. A feature may simultaneously be both an opportunity and a constraint. Opportunities identified on the site include:



Mature oak trees are a unique feature of the Study Area.

- Connections to existing paved multi-use trails including the bicycle/pedestrian trail undercrossing of Pleasant Grove Boulevard;
- Gravel maintenance access road to lift station;
- User-created dirt trails that indicate the routes users wish to take;
- City monitoring well and potential future permanent well, which may allow construction of joint access facilities;
- Woodcreek Oaks High School that uses the area for education and sports activities;
- A pipe culvert that provides a crossing of one of the smaller seasonal creeks;
- Points of interest that provide good views, unique educational opportunities, or opportunities for trail connections. Photographs of the points of interest are in included in Appendix B of the Existing Conditions Report (Appendix A);
- Natural resources such as vernal pools, oak trees, and creeks that provide visual interest and educational opportunities; and
- Mature oak trees that provide shade.

Constraints identified on the site include:

- Existing utilities including overhead utility lines, sewer lift station, and City well site;
- Surrounding residences that are sensitive to changes in noise, traffic, and the visual characteristics of the Study Area;
- Existing walls and fences around the perimeter that limit access points; and

- Sensitive natural resources including vernal pools and seasonal wetlands, mature oak trees, creeks, and riparian habitats.

These opportunities and constraints are summarized in Figure 4, located following page 8, and discussed in more detail below.

2.1.2.1 Constructed Features

Although the Study Area is an open space, there are many constructed features on site, both formal and informal. Formal improvements include a paved multi-use trail connecting to Silverado Oaks Urban Preserve to the south; a gravel maintenance access road connecting the sewer lift station to Mahany Park to the east; perimeter post and cable fences, gates, retaining walls, and soundwalls; utilities; and preserve signs. Utilities are a particular constraint to trail design as extensive overhead power lines and high voltage transmission lines and towers belonging to Pacific Gas and Electric (PG&E), Western Area Power Authority (WAPA), Sacramento Municipal Utility (SMUD), and Roseville Electric run through the open space, and a sewer trunk line with a lift station crosses the eastern half of the site from north to south (see Appendix A, Figure 8). Additionally, a monitoring well is present near the intersection of Sun City Boulevard and Pleasant Grove Boulevard. If this site is selected for a permanent well location, the new well building would likely be located on the east side of the parcel near the existing monitoring well and is expected to be constructed between 2023 and 2025.

Informal improvements consist of a large network of user-created dirt paths and creek crossings. The existing dirt paths illustrate where people want to travel through the Study Area and also indicate what slopes and distances they are willing to navigate. These informal paths are also used extensively by Woodcreek High School classes and sports clubs. Along the informal paths users have constructed bike jumps, “fairy gardens” with small figures and structures, and makeshift bridges, typically of plywood, scrap lumber, or branches. Informal paths are useful to the design process because they clearly show how users wish to access the site, However, they often conflict with the City’s goals to protect natural resources and create hazards that result in public safety concerns.



Example of user-created bridge over Kaseberg Creek East Branch constructed of pallets.

2.1.2.2 Biological Resources

Although most of the Study Area is annual grassland habitat, sensitive habitats including vernal pools and seasonal wetlands, perennial and seasonal creeks, riparian habitat along Kaseberg Creek, and oak woodland composed of protected native oak trees are also present (Figure 4). Vernal pools are



Riparian areas are important habitat for mallards and other species.

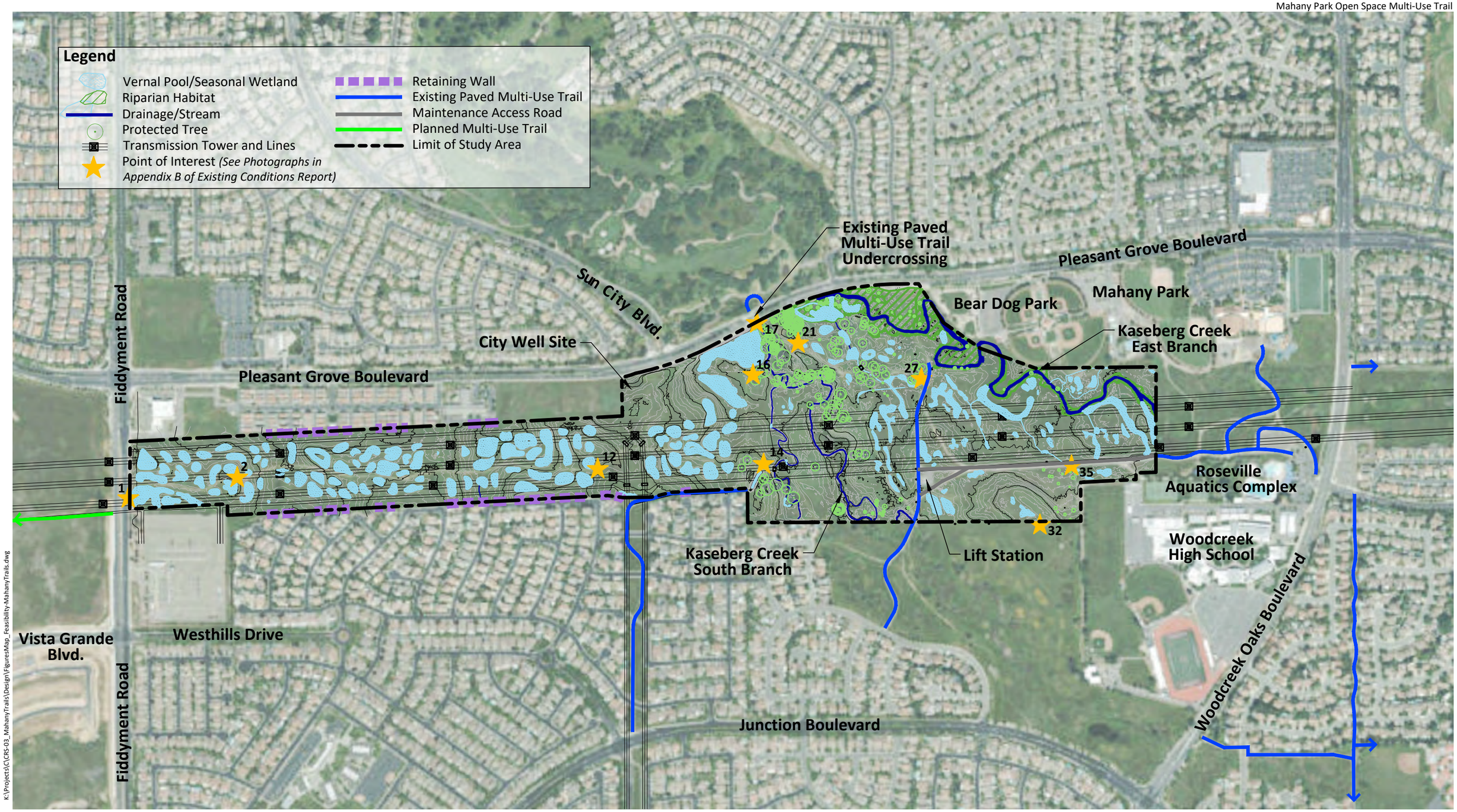
naturally-occurring depressions in soils containing a hardpan or other impermeable layer that prevents water from draining through the soil. They fill with water during the winter and spring rainy season. Vernal pools support unique plants and animals that are found only in California's central valley, including some endangered and threatened species. Seasonal wetlands are similar to vernal pools in that they are wet only in the winter and spring, but typically hold water for a shorter time or may only have saturated soils and no water on the surface. Seasonal wetlands are also important habitat for many animals and plants. The network of creek channels in the Study Area includes Kaseberg Creek East Branch, a perennial creek that flows year-round, and Kaseberg Creek South Branch, which includes two smaller seasonal creek channels that only carry water after rain events. Riparian habitat is found along Kaseberg Creek East Branch (Figure 4) and includes plants that thrive on the year-round water such as willows and cottonwoods. Groves of mature oak trees form oak woodland habitat in the eastern half of the site. In addition to providing food and shelter for many species of wildlife, oak trees with a trunk greater than six inches in diameter are protected by the City of Roseville Tree Ordinance.

The potential for special-status species, plants and animals that are listed on the federal or state endangered species list or otherwise legally protected, to occur on the site was assessed. Thirty-three special-status species were identified with the potential to occur on the site. Although only one of these species, an active white-tailed kite nest, was observed during the general site surveys, those surveys were not targeted specifically for those species, so more may be present. The Biological Constraints Report provides a detailed discussion of natural resources in the Study Area, special-status species that might be found in the Study Area, and recommended design and construction measures to avoid or minimize impacts to sensitive biological resources (Appendix B).



The Study Area is home to many species; including acorn woodpeckers.

The location of sensitive habitats is an important constraint to trail design. Impacts to them should be avoided to the greatest extent possible to be consistent with the City's goals for preservation of natural resources as established in the 2035 General Plan, Open Space and Conservation Element, and the requirements of the OSPOMP. However, sensitive habitats also provide opportunities for scenic views, public education, and providing shade for trail users.



K:\Projects\CC\CRS-03_MahanyTrails\Design\FiguresMap_Feasibility-MahanyTrails.dwg

0 600 FEET

N W E S

HELIX Environmental Planning

Opportunities and Constraints

Figure 4

2.1.3 Design Guidelines

Due to the utilities and protected natural resources in the Study Area, additional design requirements apply to the project. In addition to the City Standards, design of the trail must also be consistent with the OSPOMP and access and setback requirements of the various utility companies. Since the design guidelines vary between agencies, shared improvements such as gates and access roads should be designed to meet the most stringent requirements. The applicable design guidelines are included in Section 4.0 of the Existing Conditions Report (Appendix A) and summarized below.

- Trail shall be 10 feet wide with a minimum 2-foot-wide graded shoulder and one shoulder shall consist of class II aggregate base and the other of decomposed granite.
- Trail segments serving as maintenance roads must be a minimum of three-inch-thick asphalt over eight-inch-thick aggregate base.
- Post and cable fence must be a minimum of three feet from paved surface.
- Width of access points for maintenance vehicles shall be at least 20 feet.
- No excavation within 10 feet of any SMUD structure.
- Creek crossings must not increase flood elevation by more than one-tenth of a foot.
- Safety and directional signs are required. Interpretive signs may be installed as appropriate.

2.2 REGULATORY AGENCY COORDINATION

Many of the sensitive biological resources are regulated by state and federal agencies. Federally-protected species are regulated by the U.S. Fish and Wildlife Service (USFWS). The U.S. Army Corps of Engineers (USACE) regulates creeks and certain other wetlands that are subject to Federal law. The California Department of Fish and Wildlife (CDFW) regulates creeks, riparian areas, and species protected by the state of California. Creeks, seasonal wetlands, vernal pools, and other water bodies are regulated by the Regional Water Quality Control Board (RWQCB). Consultation and permits from these agencies are required prior to impacting a regulated resource. As part of the preliminary design process, these agencies were contacted to determine if the conceptual design was feasible, identify any agency concerns or standards pertaining to design of the trail, and review the permit process. A summary of the discussions with the regulatory agencies is included in Appendix C.

Since the majority of the site was established to protect the vernal pool habitat and because vernal pools are subject to regulation as a wetland and as habitat for special-status species, avoiding or minimizing impacts to vernal pools is a prime concern for the agencies described above. Minimizing impacts includes avoiding direct impacts caused by constructing the trail through a pool and minimizing indirect impacts, such as changing the drainage patterns around vernal pools with grading and paving. To minimize impacts to this sensitive habitat, the trail should be located away from the pools whenever possible.

Creek crossings were another major point of concern to regulatory agencies because there is the potential to impact water bodies and riparian habitat. Constructing a bridge that completely spans the channel, rather than installing a pipe or box culvert is one way to minimize impacts to these resources. The trail should also be kept outside of the riparian habitat whenever possible.

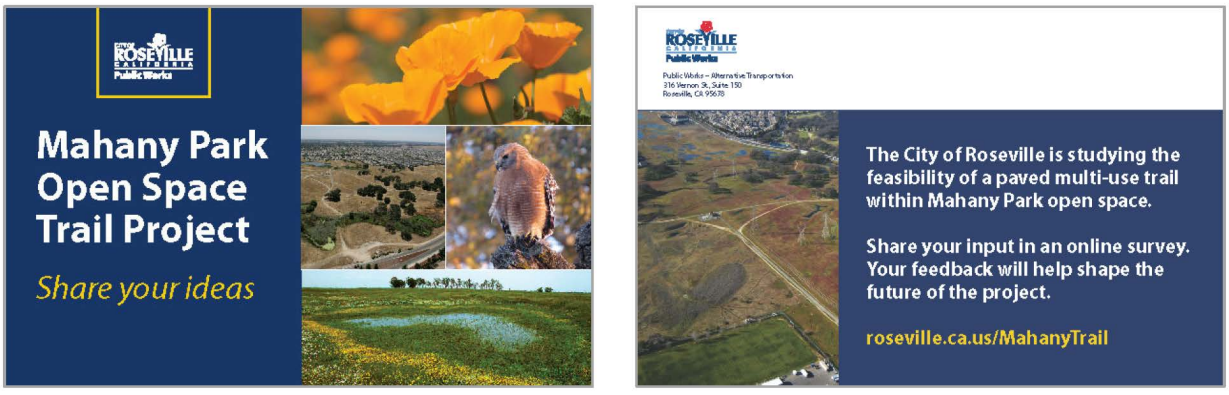
If special-status species, as described in Section 2.1.2.2, are found in the Study Area in the future, there may be additional design requirements to avoid or minimize impacts to them. Recommendations for additional studies and permits are discussed further in Section 4.

2.3 PUBLIC ENGAGEMENT

Public engagement was an important part of the project that directly influenced the development of the recommended trail alignment. Due to social distancing requirements caused by the COVID-19 pandemic, all outreach efforts were virtual. Members of the public were informed about the project and opportunities to provide their input through the City's social media, e-mail lists, and project website; signs posted in the Study Area; a local TV news story; and direct mailing to local residents. In lieu of in-person workshops, two online surveys were developed to inform and engage the public in the process of developing a recommended trail alignment.

2.3.1 First Online Survey

The purpose of the first online survey was to introduce the project, share the reasons why it is being done, and gather information on how respondents currently access and use the Study Area and how they would like to access and use it. The survey also gathered information about preferred trail amenities, and views about the pros and cons of a paved multi-use trail in the Study Area. The survey was available online from May 26, 2020 to June 12, 2020. It was publicized by the City through email to more than 48,000 recipients, social media (Facebook, Twitter, Instagram, and Nextdoor) resulting in more than 27,000 impressions, and direct mailing to more than 7,500 households in the neighborhoods surrounding the Study Area. Informational signs with the survey website were also placed around the Study Area. Additionally, the City shared an informational video on its YouTube, social media, website, and e-mail channels and ABC 10 aired a news story about the project. A total of 1,306 responses were received.



Front *Back*

Postcard mailed to residences within a half-mile of the Study Area notifying them of the first online survey.



Social media post used to publicize the first online survey.



Informational signs posted around the open space to advertise the first online survey.

The results of the first online survey indicated that the existing gravel access road on the east and the gate and dirt path at Fiddyment Road are the two most-used access points, followed by Mahany Park's parking lot, Silverado Oaks Urban Reserve on the south, Pleasant Grove Boulevard bicycle/pedestrian underpass, and Pleasant Grove Boulevard by Bear Dog Park. The most desired access points are the existing gravel maintenance road on the east, the dirt path at Fiddyment Road, and Bear Dog Park on Pleasant Grove Boulevard. The most used and most desired access points are shown on Figure 6 of the Existing Conditions Report (Appendix A). There was strong support for including trash cans, benches, dog waste stations, and directional, wayfinding, and educational signs in the project as well as significant interest in exercise stations. Overall, there was strong support for the concept of a paved trail, with almost half the respondents indicating they have no concerns; however respondents expressed a desire to retain dirt trails for aesthetic and recreation purposes. Additionally, there was concern that improved access from the surrounding neighborhood may lead to increased traffic. A summary of the first online survey is included in Appendix D of the Existing Conditions Report (Appendix A).

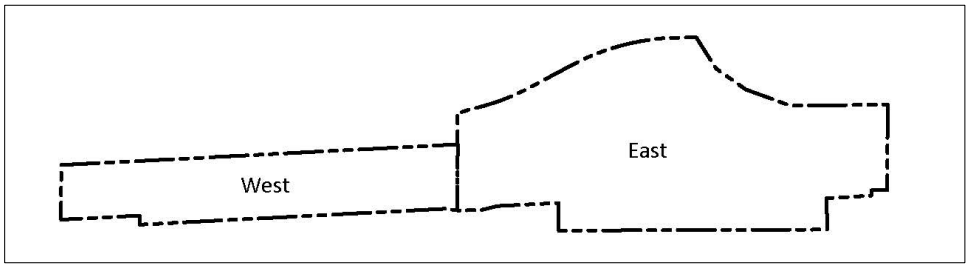
The results of the first online survey were used to develop potential trail alignment options. Many of the suggested amenities have been included in the conceptual design, as discussed in Section 3.3. Additionally, the desire to retain dirt paths led to the consideration of expanded shoulders along the proposed trail. Potential off-site parking locations at the west end of the Study Area were considered to address concerns about increased traffic in residential neighborhoods.

2.3.2 Second Online Survey

The purpose of the second online survey was to present the options for a trail alignment through the Study Area and gather feedback to inform a final recommendation. The trail alignment options presented in the survey were developed based on the opportunities and constraints and biological resources reports, results of the first online survey, regulatory agency coordination, and City goals and policies.

To simplify the presentation of the alignment options, the Study Area was split into east and west sections (Figure 5). Three alignment options were developed for the western half of the Study Area and two alignment options were developed for the eastern half of the Study Area. Any of the western options could be used with either of the eastern alignment options.

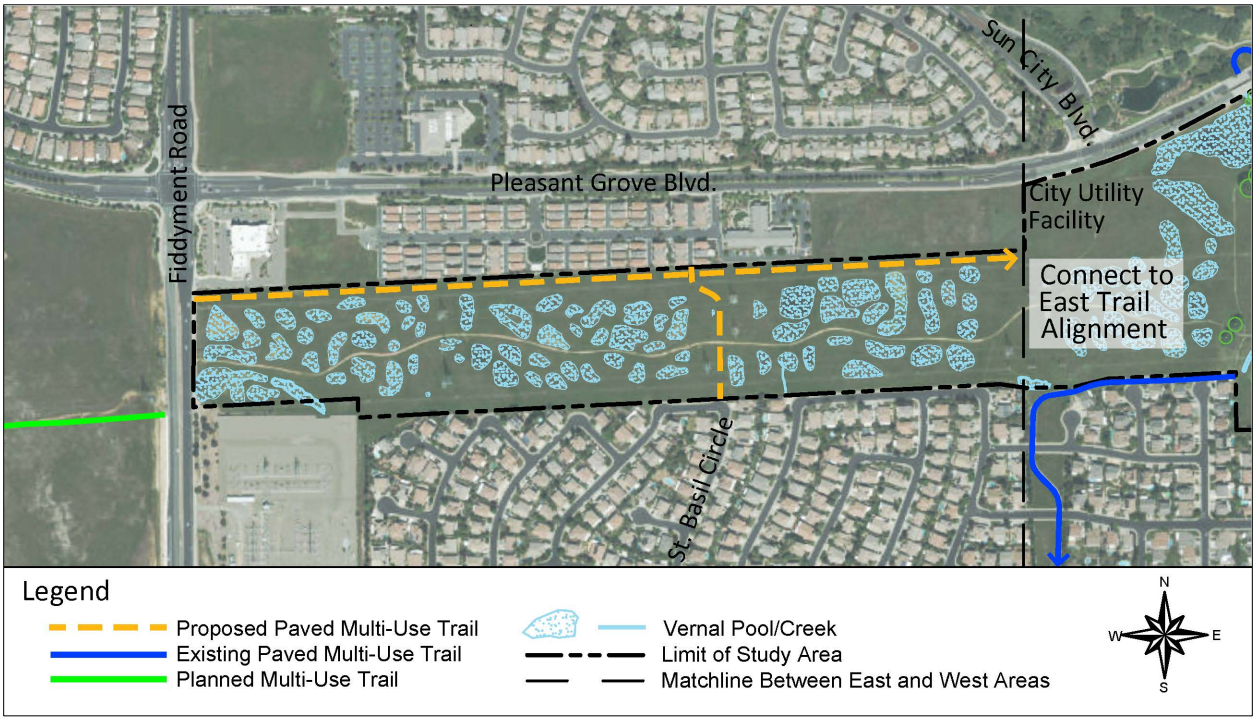
Figure 5
STUDY AREA SECTIONS



2.3.2.1 Western Area Options

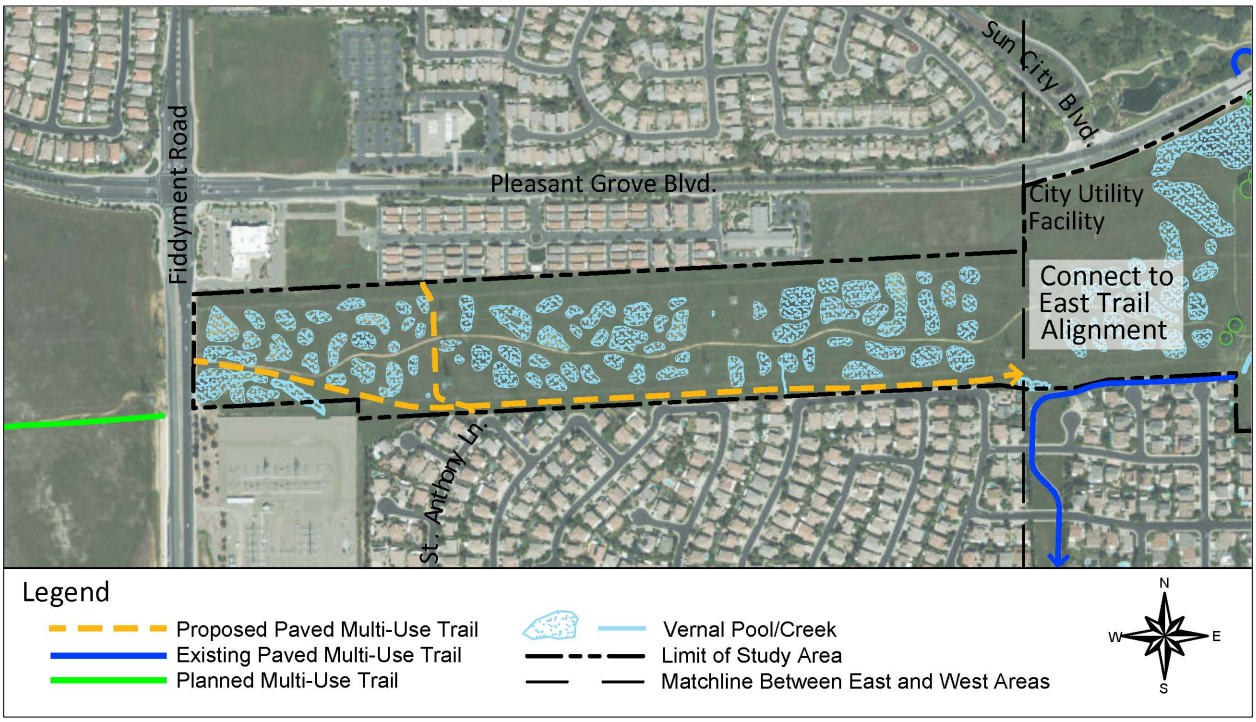
Western Option A (Figure 6) located the proposed trail along the northern edge of the Study Area between the utility lines and the northern property boundary. This option included a connection between the residential developments to the north and south of the Study Area at Saint Basil Circle. This option provides a connection to Fiddyment Road closest to the existing signalized intersection with Pleasant Grove Boulevard.

Figure 6
WESTERN OPTION A



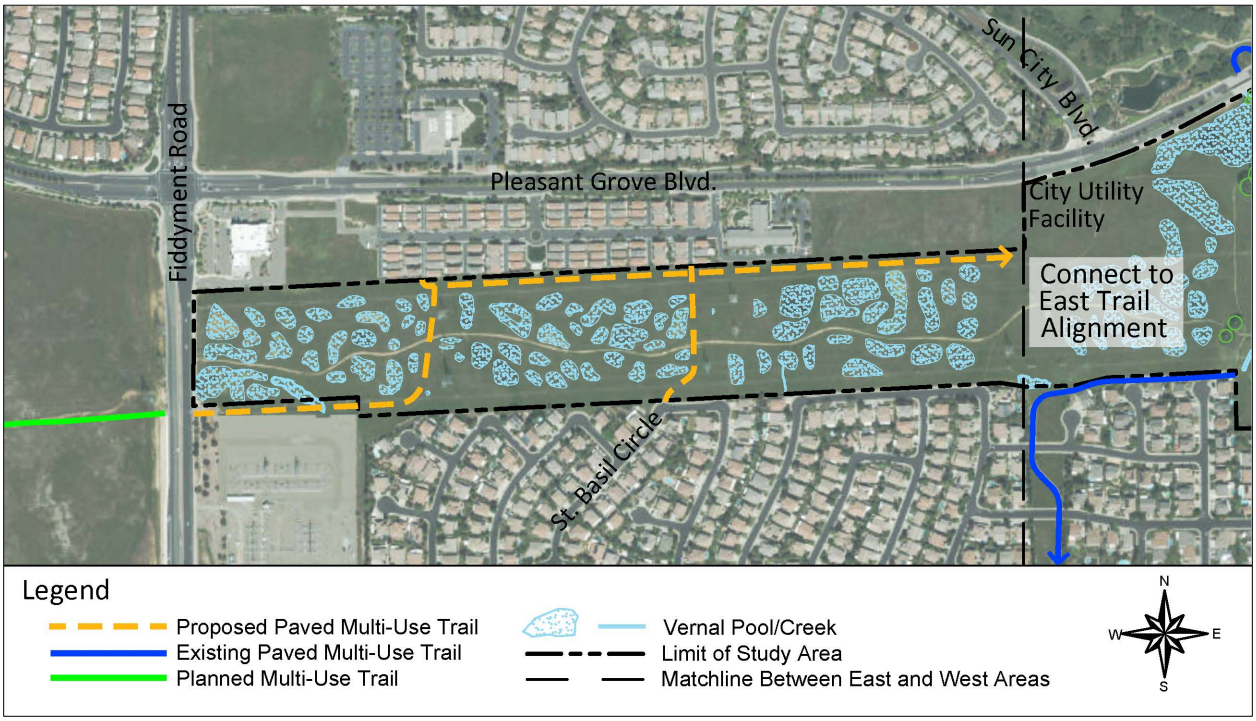
Western Option B (Figure 7) located the proposed trail mostly along the southern edge of the Study Area, veering north through the vernal pool complex for the final 900 feet to meet Fiddyment Road at the existing gate near the center of the western property line. This option included a connection between the residential developments to the north and south of the Study Area at Saint Anthony Lane.

Figure 7
WESTERN OPTION B



Western Option C (Figure 8) located the majority of the proposed trail along the northern boundary, before curving south through the vernal pool complex to extend along the southern boundary for the western 800 feet. It also includes two connections between the residential developments to the north and to the south of the Study Area. This option connects to Fiddyment Road directly across from the planned trail in the Sierra Vista Specific Plan and would require a mid-block crossing on Fiddyment Road. Although this option provides the most direct connection to the City's bikeway network, the southern connection to Fiddyment Road would require construction on the City-owned parcel to the south and will directly impact a vernal pool.

Figure 8
WESTERN OPTION C

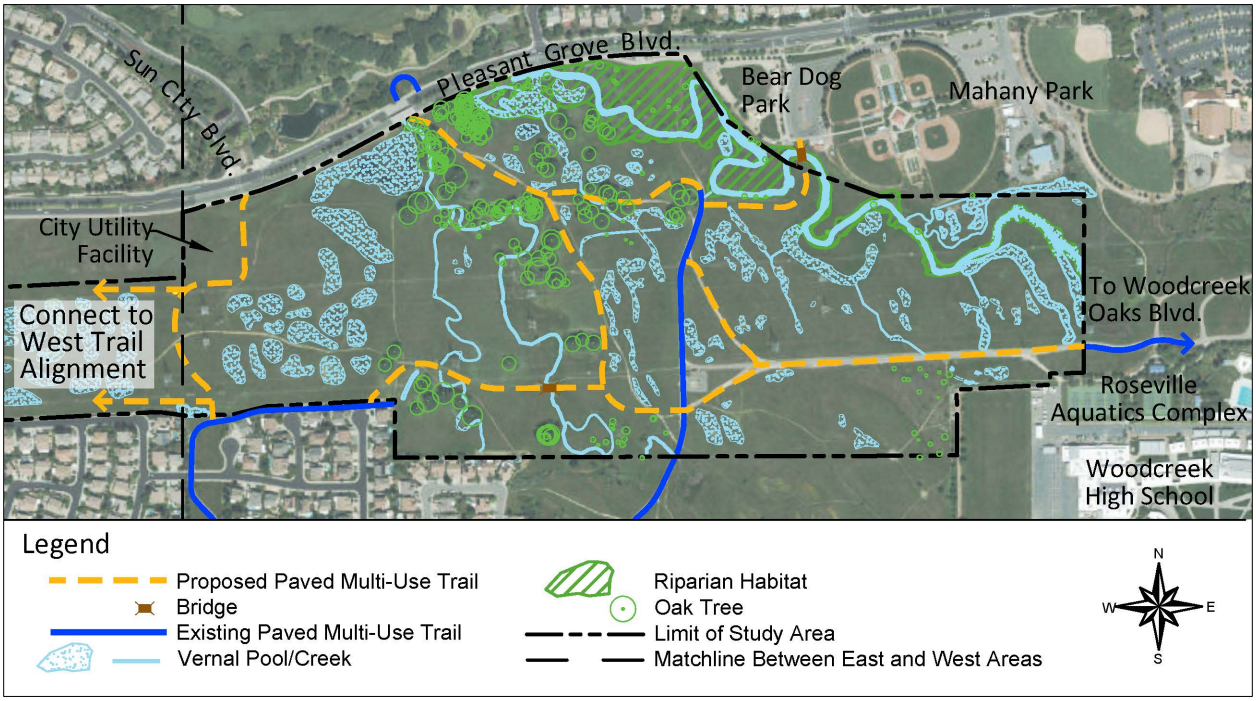


.

2.3.2.2 Eastern Area Options

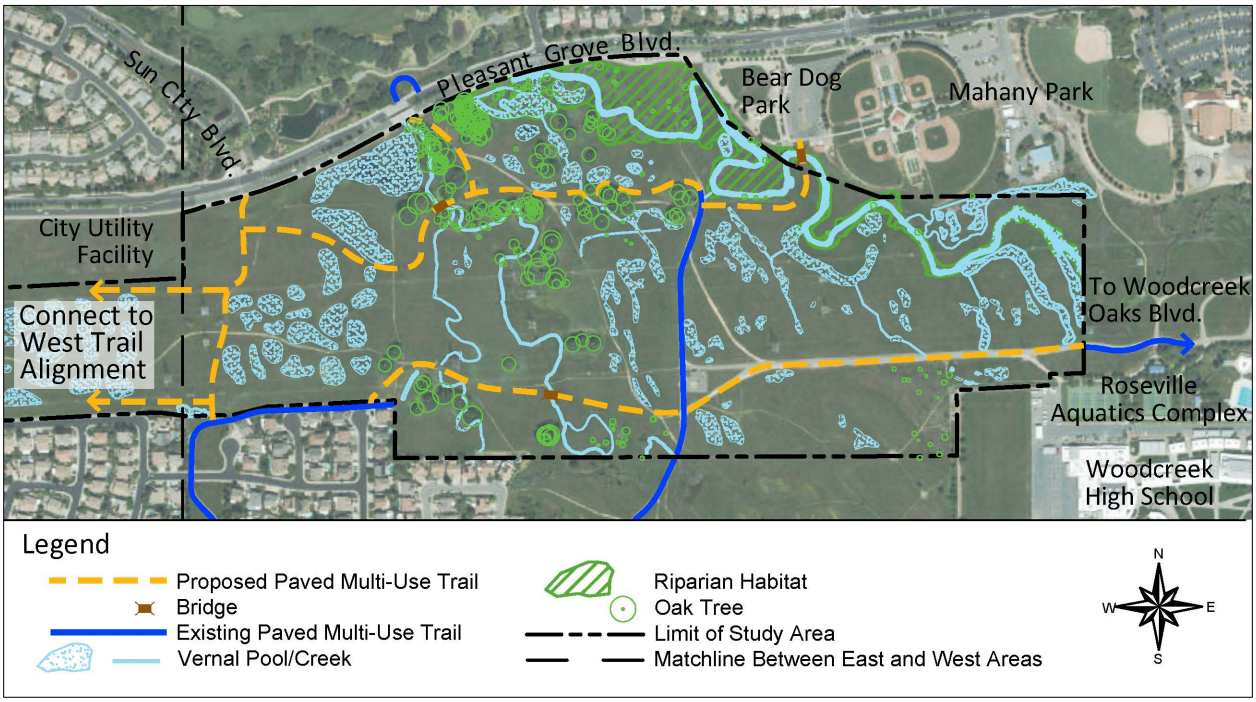
Eastern Option A (Figure 9) proposed a small loop trail in the eastern third of the Study Area consisting of the existing multi-use trail and one of the largest existing dirt paths. This option includes a bridge over Kaseberg Creek for a year-round connection to Bear Dog Park, connections to the existing multi-use trails adjoining the Study Area, and connections to the signalized intersection of Sun City Boulevard and Pleasant Grove Boulevard. This option includes a second bridge over the seasonal creek to allow year-round use of the trail.

Figure 9
EASTERN OPTION A



Eastern Option B (Figure 10) proposed an approximately one-mile loop trail connecting the existing multi-use trails in and adjacent to the Study Area. A new trail segment connects the signalized intersection of Sun City Boulevard and Pleasant Grove Boulevard and the existing greenbelt bike trail just south of the Study Area. This north-south segment is connected to the existing multi-use trail in the Study Area by two trail segments to form a loop. This option includes three new bridges allowing year around use of the trail network through the Study Area. This option also includes a connection to Bear Dog Park and all the existing multi-use trails adjoining the Study Area.

Figure 10
EASTERN OPTION B



The second online survey was available between October 31 and November 13, 2020. The survey was publicized via the City's existing communication links, including emails to almost 55,000 recipients, newsletters, social media (Facebook, Twitter, Instagram, and Nextdoor), and lawn signs with the website address that were placed along paths in the Study Area and in the neighboring community directing people to the survey. This outreach effort resulted more than 15,200 impressions. A total of 326 survey responses were received. The summary of the responses to the second virtual survey is included in Appendix D.

Overall, respondents preferred Western Option A, which locates the trail along the north boundary of the site, due to its connection to Fiddyment Road and the location of the north-south connection to residential neighborhoods. There was also significant interest in Western Option C due to the potential mid-block crossing connection to trails in the Sierra Vista Specific Plan Area. However, this option also generated concerns about increased costs and longer schedule due to environmental impacts because of the trail's proximity to vernal pools.

Eastern Option B, which provides the longer loop trail, and includes areas of shaded trail through the oak woodlands, was slightly preferred over Eastern Option A.

The survey format also encouraged written comments from survey participants. Common issues of concern included safety in crossing Fiddyment Road and other larger streets, potential disruptions or increase in parking/traffic in nearby neighborhoods, impacts to natural resources, and the desire for continued use of the existing dirt paths. Respondents also noted suggestions for other trail amenities, including privacy fences, benches, dog waste stations, exercise stations, bathrooms, directional and educational signage, and shade.

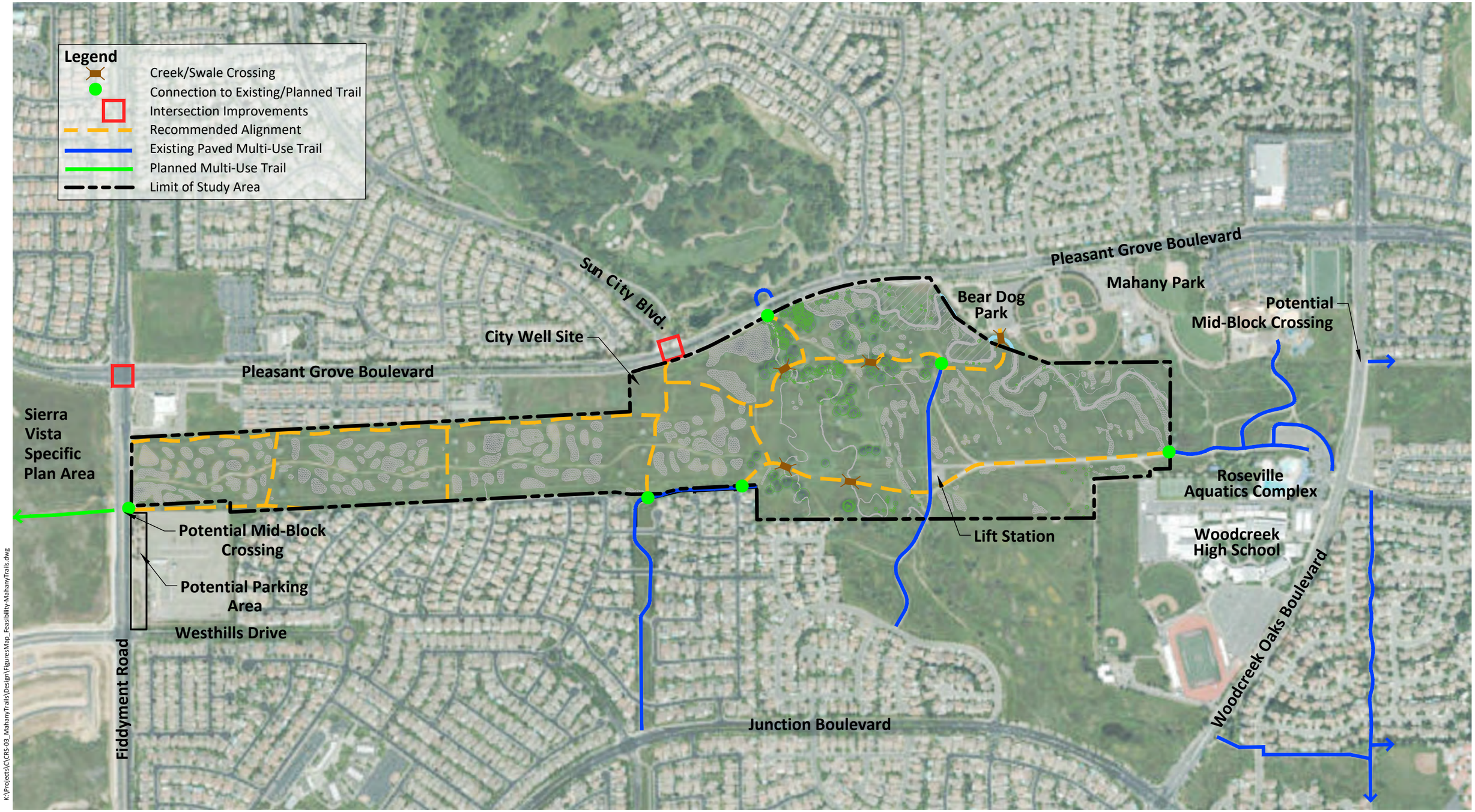
3.0 RECOMMENDED PROJECT

The recommended project was developed using information from existing planning documents; site assessments resulting in the Biological Resources and Opportunities and Constraints Reports; interviews with stakeholders; a robust public engagement program including two online, interactive surveys; consultation with regulatory agencies; and ongoing coordination with City departments. These efforts identified a recommended project which will:

- Provide multiple, connections to the surrounding neighborhoods, schools, trails, roads, and parks;
- Provide permanent all-weather crossings of creeks in the Study Area to allow safe use year-round;
- Protect natural resources, including vernal pool habitat;
- Maintain required access for existing utilities;
- Close gaps in the trail and bikeway system to provide safe, convenient bicycle/pedestrian connections to recreational, educational and employment opportunities for people of all ages, abilities, and incomes; and
- Include a variety of amenities along the trail.

3.1 ALIGNMENT

The recommended alignment (Figure 11) combines elements of multiple options presented in the second online survey. It addresses gaps in the existing bikeway system with approximately 2.4 miles of new trail connecting to all of the existing multi-use trails. The recommended alignment provides access through the open space preserve while protecting sensitive habitats and provides opportunities for users to learn more about why it is important to protect these areas. It provides safe, convenient bicycle/pedestrian connections to recreational, educational, and employment opportunities for people of all ages, abilities, and incomes.



K:\Projects\C\CRS-03_MahanyTrails\Design\FiguresMap_Feasibility-MahanyTrails.dwg

0 600 FEET

N W E S

HELIX Environmental Planning

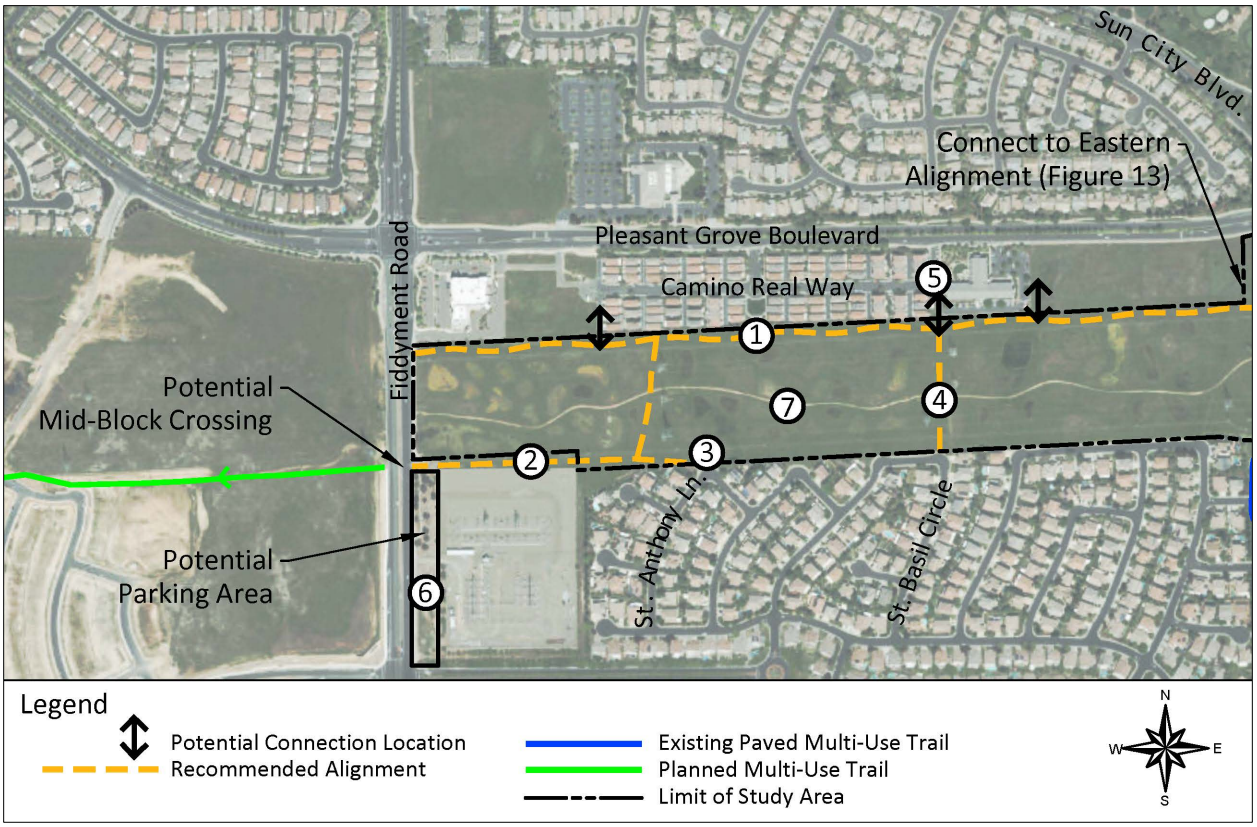
Recommended Trail Alignment

Figure 11

3.1.1 Recommended Western Alignment

The recommended western alignment combines elements of Western Options A and C. Key features of the recommended alignment in this area are shown in Figure 12 and described below.

Figure 12
RECOMMENDED WESTERN ALIGNMENT



1. The recommended trail alignment meanders between the existing utility lines and the northern property boundary of the Study Area. This alignment places the majority of the trail away from vernal pools and overhead utility lines. Additionally, the width of the area allows the trail to be set back from adjacent residences to the north. The trail meanders gently through the area to provide interest for users, a concern expressed in the second online survey. This trail segment offers a connection to Fiddyment Road close to the Pleasant Grove Boulevard intersection to facilitate active transportation connections between neighborhoods, schools, recreational and employment opportunities in west Roseville.

2. This trail segment crosses through the vernal pool complex and runs along the wall adjacent to the existing electrical substation to Fiddyment Road. This location was chosen to take advantage of a break in the vernal pool complex and minimize locating the trail directly adjacent to residences south of the Study Area. This segment will connect with the planned trail in the Sierra Vista Specific Plan area on the east side of Fiddyment Road and will require safety improvements to provide a mid-block crossing.

3. A short trail segment connects the segment described in #2 with Saint Anthony Lane to provide access to the bikeway network from this neighborhood.

4. This trail segment connects the northern trail segment to the neighborhoods in the south. This location was chosen to take advantage of a break in the vernal pool complex, in order to minimize impacts to this habitat, and to provide evenly spaced access to the bikeway network.

5. An access point to the neighborhoods north of the Study Area is needed to provide a connection to the bikeway network, but its exact location has not been determined. Potential connection locations are limited by a number of retaining walls located along the northern boundary of the Study Area. A possible location is an extension of the trail segment described in #4. This location is also located near the Eskaton senior living facility which may facilitate access to the open space for residents with limited mobility. Another possible location is at the west end of Camino Real Way, however there are concerns that either of these connections would worsen already limited parking availability in the neighborhood to the north. Alternately, it may be feasible to include a trail access point with a future project on the currently undeveloped property between Pleasant Grove Boulevard and the recommended trail alignment.

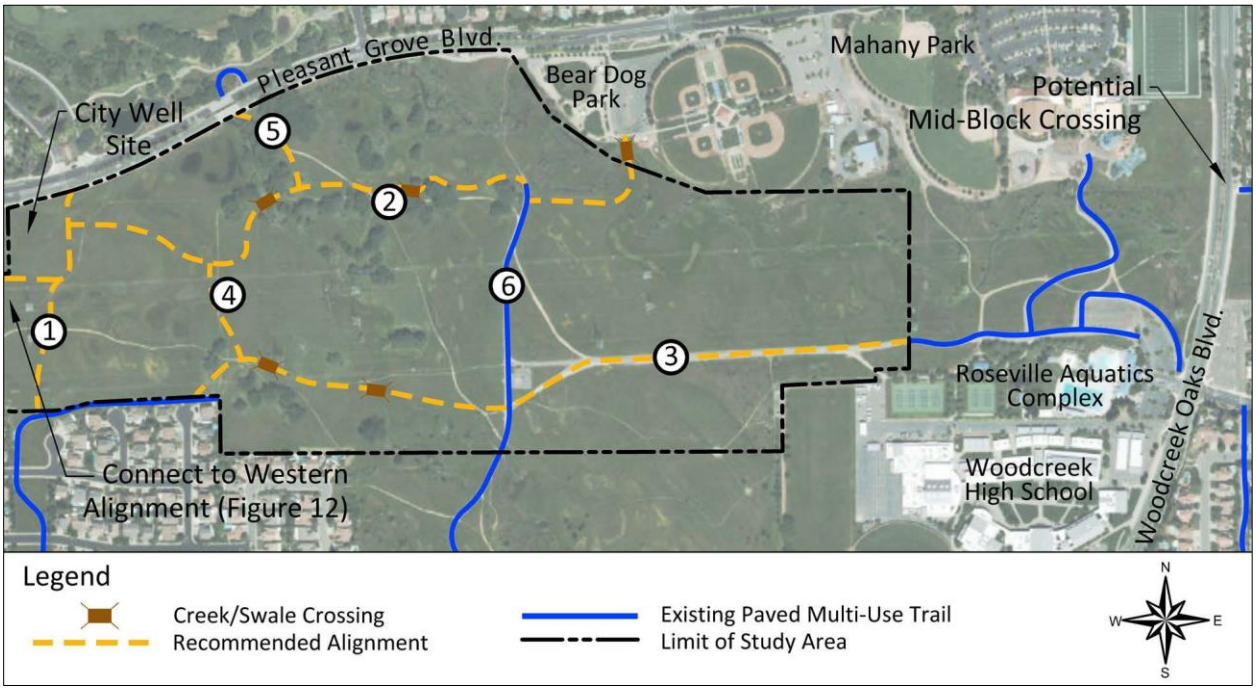
6. This area has been identified as potential off-street parking on City-owned property along Fiddyment Road. This area could provide a parking option on the west end of the Study Area, reducing the potential for people to park in the nearby residential neighborhoods.

7. The dirt path which meanders through the center of the west half of the Study Area, encroaches on the vernal pool complex and is not recommended for improvement as a formal trail, or for continued use. This dirt path should be restored to grassland to reduce impacts to sensitive habitat and special-status species, consistent with the OSPOMP.

3.1.2 Recommended Eastern Alignment

The recommended eastern alignment provides "loop" trails that connect existing trails and many of the most heavily used access points. This design modified Eastern Option B by adding a second short connection between the north and south sides of the loop. Key features of the recommended alignment in this area are shown in Figure 13 and described below.

Figure 13
RECOMMENDED EASTERN ALIGNMENT



1. This trail segment extends the existing multi-use trail from the neighborhood to the south through the vernal pool preserve to the Sun City Boulevard intersection. This central north-south segment is a vital connection in the bikeway network because it connects to the west area trail that leads to Fiddyment Road, to Pleasant Grove Boulevard and the Sun City neighborhood to the north, and to the two trails that form the loop in the east side of the Study Area. This trail segment provides opportunities for education and rest areas with good views across the vernal pool landscape. A City well site is being explored next to this trail segment. Future trail construction will require coordination with the City's Environmental Utilities department to explore funding opportunities for a shared access facility.

2. The northern trail segment winds around seasonal wetlands and through oak woodlands on the way to Bear Dog Park, which was identified through the public engagement process as one of the most desired access points to the Study Area. This segment creates permanent crossings over the seasonal creek, a small seasonal swale, and Kaseberg Creek and also provides segments of shaded trails, which were identified as highly desired by participants in the public engagement process The location of this trail segment provides unique opportunities for educational opportunities relating to the oak woodlands, creeks, and riparian habitat.

3. The southern trail segment starts at the end of the existing multi-use trail that currently provides connections to Woodcreek High School, the Roseville Aquatic Center, and the eastern portion of Mahany Park. This segment will pave the existing gravel maintenance road and includes two creek crossings, thereby providing year-round access through the site. This connection also provides access to the City bikeway network east of Woodcreek Oaks Boulevard.

4. A short spur trail connects the northern and southern trails (#2 and #3) before they cross the seasonal drainages, forming an inner loop. This short connector trail between the north and south trails provides users with options for length of trail they wish to travel.

5. This trail segment connects northern trail segment (#2) to the existing Pleasant Grove Boulevard undercrossing. This is an important connection because it provides access to the wide sidewalks and Class II bike lanes on the north side of Pleasant Grove Boulevard

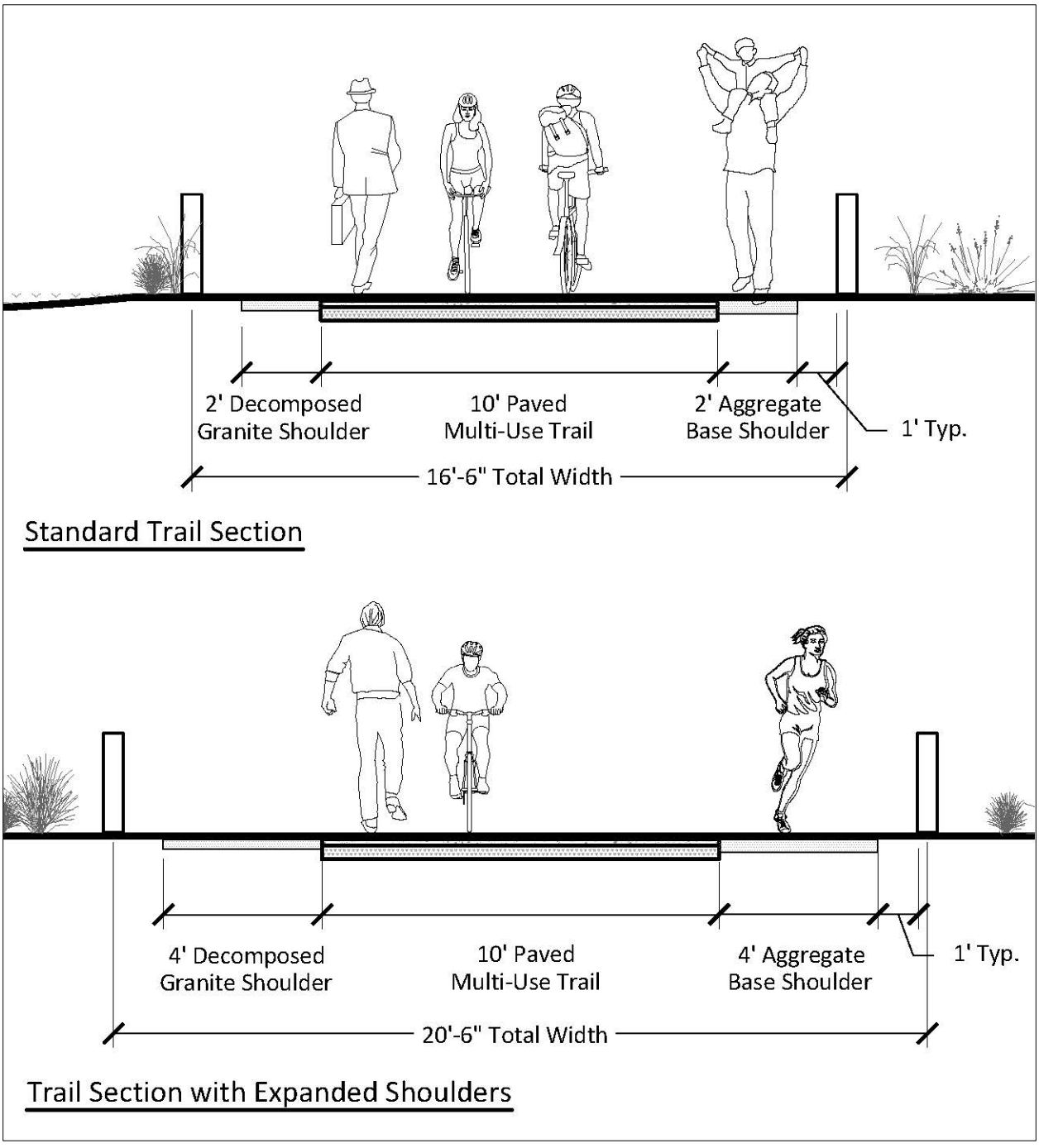
6. Trail segments #2 and #3 connect with the existing multi-use trail that runs north/south through the Silverado Oaks Preserve.

3.2 TRAIL DESIGN

The trail will generally use the City Standard trail design in accordance with the current City *Design and Construction Standards*. All of the constructed trails will consist of a ten-foot wide paved trail with one aggregate base shoulder and one decomposed granite shoulder. In response to public comments indicating a desire to retain dirt trails, wider shoulders may be used in some areas to provide additional areas of unpaved trail. Figure 14 shows typical trail sections.

The City Standards refer to Caltrans standards for design speed, turning radii, and other engineering design requirements. The standard design speed for multi-use trails is 20 mph, which requires a minimum radius of 90 feet and stopping distance of 125 feet. Additionally, any areas steeper than 4% for more than 500 feet require design using a design speed of 30 mph and stopping distance of 230 feet (Caltrans 2019). Although the recommended alignment incorporated these standards to the greatest extent possible, site constraints such as steep slopes near creek channels and locations of protected oak trees, create areas where the design standards cannot be met. Areas that exceed 5% slope or do not comply with minimum radius standards and therefore will require additional consideration during project design are shown in Appendix E. Countermeasures, such as warning signs and striping, will be required on any trail sections that do not meet the design standards.

Figure 14
TYPICAL TRAIL SECTIONS



3.2.1 Pavement Materials

Although the current City Standard for trails outside of flood zones is asphalt paving, concrete; permeable asphalt; permeable concrete; or stabilized decomposed granite or #9 crushed gravel may be considered for some trail sections. Although other materials are more expensive to install than standard asphalt, they may provide other benefits that balance the life-cycle cost. Pavement materials options should be explored during preliminary engineering. Key design considerations of these materials are summarized in Table 1 (FHWA 2012 and 2015).

Table 1
PAVEMENT MATERIALS OPTIONS

Material	Pro	Con	Estimated Cost per LF of Trail
Standard Asphalt	• City Standard material • Can be resurfaced • Standard paint markings can be used	• Requires periodic resurfacing	$30
Pervious Asphalt	• Reduced runoff may reduce impacts on vernal pool and creek hydrology • Less ponding makes safer to use in rain	• Cannot be resurfaced by seal coating or crack sealing • Requires regular vacuuming to maintain permeability • Paint pavement markings should be limited to retain permeability • Requires specialized installation	$60
Standard Concrete	• Longer lifespan than asphalt paving • Currently used in floodprone areas of City bikeways • Standard paint markings can be used	• Less flexible than asphalt • Cracks or uneven sections are hard to repair and can cause a safety hazard	$130
Pervious Concrete	• Longer lifespan than asphalt • Reduced runoff may reduce impacts on vernal pool and creek hydrology • Less ponding makes safer to use in rain	• Requires regular vacuuming to maintain permeability • Paint pavement markings should be limited to retain permeability • Requires specialized installation	$190
Decomposed Granite	• Provides softer, more natural surface for running and mountain biking • Reduced runoff may reduce impacts on vernal pool and creek hydrology	• High maintenance costs for washout and weed control • Easily rutted in wet weather	$135
Stabilized Crushed Gravel	• Provides softer, more natural surface for running and mountain biking • Reduced runoff may reduce impacts on vernal pool and creek hydrology	• May be rutted in wet weather • Requires weed control	$150

3.2.1.1 Lift Station Access

There is an existing lift station on the eastern end of the site at the end of the existing gravel maintenance road (Figure 4). The recommended trail segment between the existing parking lots at the Aquatics Center to the east and the lift station, which is currently a gravel maintenance road, should be engineered to accommodate heavy construction vehicles. Access and clearance requirements in this area should be confirmed with City Environmental Utilities staff during preliminary engineering.

3.2.2 Creek and Swale Crossings

In order to allow safe year-round trail use and maintain the existing hydrology, permanent crossings of creeks and swales will be constructed. Swales are small depressions where water flows but that do not have a defined bed and bank, they often connect vernal pools and seasonal wetlands. These crossing structures may be large bridges across the seasonal and perennial creeks or small pipes that allow water to flow under the trail from one wetland to another. Based on the creeks and wetlands mapped in the Existing Conditions Report, five crossings will be required for the recommended alignment (Figure 11).



Existing bridge over seasonal creek in the Silverado Oaks Open Space just south of the Study Area.

It is anticipated that three larger creek crossings will be necessary to provide year-round use of the proposed trail. The crossings of the larger creeks can be either bridges or open-bottom culverts. Bridges can span a long distance and be installed entirely outside of the creek channel, which can reduce environmental impacts and avoid or minimize the need for permits from regulatory agencies, but often cost more to construct. An open-bottom culvert is typically a three-sided concrete box with no bottom, which allows the native streambed to be preserved. Culverts are often installed within the stream channel, requiring permits from regulatory agencies, but may also span over the channel similar to a bridge. One crossing is planned to use a large existing pipe culvert through which the western seasonal drainage flows. The final crossing is expected to be a new small pipe culvert over a seasonal swale. The exact design and material of crossings will be determined during preliminary engineering and should consider construction, maintenance, and permitting costs as well as the requirements of the Flood Ordinance. Additionally, the large existing pipe culvert should be investigated further during preliminary engineering to verify its ability to support a paved trail.

3.2.3 Connections to Existing and Planned Bikeway System

3.2.3.1 Planned and Existing Bikeways

The recommended alignment connects to all five of the existing multi-use trails that enter the Study Area and provides important bicycle/pedestrian connections from surrounding residential areas to transit stops, employment, education, and recreation opportunities (Figure 11). Additionally, the trail

will connect to the planned multi-use trail in the Sierra Vista Specific Plan area by way of a mid-block crossing, which is discussed below.

3.2.3.2 Road Crossings

The recommended alignment will connect with Fiddyment Road at two locations (Figure 11). The northern connection is located closest to the intersection with Pleasant Grove Boulevard and provides access for people desiring to travel to the neighborhoods to the north and west. Intersection improvements to facilitate bicycle traffic that should be considered during preliminary engineering, include:

- High-visibility bike lanes;
- Widening sidewalks to 10-feet wide between Study Area and Fiddyment Road/Pleasant Grove Boulevard intersection to allow shared use in both directions;
- Leaning rails, if compatible with right turn pocket; and
- Bicycle signal improvements.



Example of intersection improvements for bicyclists.

The southern connection aligns with the future multi-use trail in the Sierra Vista Specific Plan Area. Due to the high volume and speed of traffic on Fiddyment Road, this southern connection is not feasible without a mid-block crossing. Due to the overhead utility lines in the area, this crossing is expected to be an at-grade crossing and should include:

- High-visibility crosswalks;
- Pedestrian hybrid beacon or pedestrian signal;
- Crossing warning signs;
- Warning signage and stop lines; and
- Adequate nighttime lighting (Fehr and Peers 2020).



View of mid-block crossing location on Fiddyment Road looking toward the Sierra Vista Specific Plan Area.

The recommended alignment connects to Pleasant Grove Boulevard at the existing signalized intersection with Sun City Boulevard (Figure 11). Although there is an existing crosswalk at this location, the addition of intersection improvements to facilitate bike crossings should be investigated further during preliminary engineering. This connection is intended to be an access point for local residents taking advantage of the existing crosswalk at the intersection rather than an access point for regional users, no parking is provided at this location.

The recommended alignment also connects to the existing bicycle/pedestrian undercrossing of Pleasant Grove Boulevard (Figure 11), which provides access to the sidewalk and Class II bike lane on the north side of the street. Currently, there is a driveway apron that allows access between the undercrossing

and the westbound bike lane. A connection from the undercrossing to the eastbound bike lane on Pleasant Grove Boulevard was not considered at this location due to the steep existing grades and surrounding biological resources, but the eastbound bike lane will be accessible at the Sun City Boulevard intersection. Additionally, high-visibility bike lanes along Pleasant Grove Boulevard should be considered during preliminary engineering.

Although the Study Area does not extend to Woodcreek Oaks Boulevard, it will form a major link between the trail system east of Woodcreek Oaks Boulevard and the western portion of the City, potentially increasing the amount of trail-user traffic crossing this road. Currently the multi-use trail connects to the signalized intersection at McAnally Drive and trail users return to the trail system to the east by using the sidewalk (Figure 11). A dirt trail and wooden bridge connect the gravel parking area in Mahany Park to Woodcreek Oaks in a direct crossing from this trail. However, if east-west through-traffic increases, there may be increased demand for a more direct at-grade mid-block crossing between Mahany Park and the eastern trail system across Woodcreek Oaks Boulevard. This crossing would require similar improvements to those described above for a Fiddyment Road crossing.

3.2.4 Restoration

There are currently many user-created dirt paths through the Study Area. Eliminating use of the trails by educating and redirecting users to the new paved trails with post and cable fencing and signage may be sufficient for some of the smaller trails to naturally revegetate without further intervention. However, due to the compacted soil and width of the larger trails, it may be necessary for more active restoration to be completed in some areas. Active restoration may include tilling the soil to reduce compaction and seeding with native plants. Any restoration activities should be completed in accordance with the OSPOMP.



Large dirt paths through the vernal pool complex should be restored.

3.3 TRAIL AMENITIES

Survey respondents expressed interest in a variety of improvements and amenities in addition to multi-use paved trails. Benches, trash cans, dog waste stations, and signage are all amenities requested by survey participants that are compatible with a trail through the open space preserve. Shade, safety lighting, and parking are amenities that should be considered in selected areas, but may not be appropriate additions throughout the Study Area. Some improvements suggested by survey participants, such as additional restrooms, drinking fountains, dirt mountain bike trails, and basketball courts are not recommended for inclusion in the project due to the Study Area's designation as an open space, its proximity to developed recreation facilities, and lack of utility



Existing bench along gravel access road near Woodcreek High School.

connections. The City may consider these improvements at other locations. All trail amenities should be designed in accordance with the current City Standards.

3.3.1 Benches

The results of both outreach surveys indicated a strong desire from the public for benches and other resting points along the trails. Design best practices recommend placing benches at approximately 1/4-mile intervals or a slow 10-minute walk along trails. Additionally, benches should be placed at points of interest to take advantage of good views or significant natural features and at trail intersections or other natural congregation points. Whenever possible benches should be placed to take advantage of shade provided by existing trees or include with a roof or canopy to provide shade.

3.3.2 Trash Stations

Providing trash cans is an important aspect of reducing littering within the open space preserve. The site is heavily used for walking dogs and is located near the dog park, so dog waste bag dispensers should be placed with trash cans, at trail entrances and intersections. They should be well-separated from benches, wayfinding, and interpretive signs to minimize noxious smells at stopping points.

3.3.3 Signage

3.3.3.1 Share the Trail Etiquette Guidelines

In 2010, staff from the Alternative Transportation, Engineering, Parks, Open Space, Police, Fire, City Attorney and Risk Management Departments/Divisions met to review the nature of complaints related to trail use, and trail etiquette guidelines from other jurisdictions.

Share the Trail Etiquette Guidelines resulted from this collaborative effort, along with consideration of trail behaviors and results from a widely circulated public opinion survey. Share the Trail Etiquette Guidelines are a detailed list of recommendations for trail users developed to reduce trail user conflict. The guidelines, which were incorporated into a “Share the Trail” sign and trail markings, are:

- Use the trail responsibly,
- Don’t block the trail,
- Keep dogs under control – 6’ leash maximum,
- Travel at a safe speed,
- Pass with care,
- Bicyclists keep right except to pass, and
- Pedestrians keep left to face oncoming bicyclists.



Trail Etiquette sign.

In addition to the signs and markings placed on the trail, Share the Trail education is communicated in the following ways:

- City website www.roseville.ca.us/sharethetrail.
- Video posted to websites, shown on COR-TV, shared on social media channels, in email newsletters, and at special events.
- Handouts distributed to the public at special events, on trails by Police Department representatives and City maintenance crews at parks, City facilities, and local bike shops.
- Parks, Trails & Bikeways Map.

In addition to the signs and markings developed for Share the Trail Etiquette guidelines, additional signage to inform trail users about sensitive habitats will be necessary and may include:

- Habitat Restoration Area – Stay on Trail
- Open Space Preserve – Stay on Trail
- Dogs Must be on Leash – 6' Maximum (Roseville Municipal Code 8.02.240)

Share the Trail Etiquette Guidelines and guidelines for preserving and/or restoring open space habitats and sensitive areas will be part of the final project design.



Informational trail signs and pavement markings.

3.3.3.2 Interpretive Signs

Interpretive trail signs provide self-guided education opportunities for trail users of all ages and abilities to develop a connection and appreciation for the surrounding landscape. Interpretive signs may describe the animals, plants, creeks, and plants that surround trails and can instill an appreciation of a natural habitat along with a renewed respect for preserving it and inspire people to make choices that preserve and improve their City. Due to the many natural resources, sensitive habitats, utilities and history in the study area, there is great potential for educational opportunities. Interpretive signs to educate and inform trail users should be developed and incorporated into trail design in coordination with the City's Utility Exploration Center, nearby schools and in coordination with the City's existing interpretive sign programs. Interpretive signage topics may include:



Example of interpretive sign.

- Natural habitats on site: Vernal pools, oak woodland, annual grassland, riparian woodlands, and the importance of open space preserves to plants and wildlife in an urban area.
- Plants and wildlife: Rare or unique species found here; what you can do to protect wildlife and keep it wild.
- Creeks and their watersheds: Water cycle and the watershed that runs through the City flows to the Sacramento River and ultimately to the ocean.

- Importance of your choices: How decisions made at home affects natural habitats and water quality.
- Storm water: Where does water go, how is it treated, what pollutants are a problem, how you can help keep storm water clean.
- Electrical power grid – Where to the lines run; how does the substation work, power line safety, renewable energy, what's that buzzing sound?
- Recycled water: How wastewater is handled, why this is a valuable resource, how you can help keep treatment costs low.

3.3.3.3 Wayfinding Signs

Wayfinding signs provide guidance to visitors to help them navigate the trail system. Site-specific wayfinding signs provide a map of the trail network within the Study Area and connections to local roads and the City's bikeway network. Wayfinding signs should be placed at major intersections within the Study Area and at the connections to trails that extend offsite.

3.3.4 Trees and Shaded Trails

In addition to the desire for shaded benches described above, many people expressed desire for more shade along the trails. Due to the proximity of overhead utility lines and vernal pools, adding trees is likely not feasible in the western half of the Study Area. There is some potential for tree planting in the eastern half of the Study Area outside of the utility easements. Any planting should be consistent with the OSPOMP which requires that only native species should be planted in the Study Area. Current guidelines restrict tree height to ten to fifteen feet at maturity, depending on the utility, within an electrical transmission line easement, so oak tree planting is not feasible on much of the Study Area. In areas where trees can be planted, they should be placed on the south or west side of the trail or bench for maximum shade impact. Planting for shade could also provide planting locations for mitigation oak trees, however this would require ongoing maintenance to ensure establishment of the mitigation trees. There is no irrigation connection currently available on the site, therefore mitigation planting would likely require hand watering for three to five years during establishment. The final determination of whether mitigation trees or other native landscape is installed will be made during preliminary engineering.

3.3.5 Lighting

Although often desired for security and to allow safe trail use at night, artificial lighting can also have negative effects. Artificial lighting at night may impact plants and wildlife by interfering with their natural circadian rhythms. Installing new lighting can also be disruptive to adjacent residents. Due to the Study Area designation as an open space preserve, lighting should be kept to the minimum required for safety and security. To further reduce impacts from artificial lighting, motion-controlled lights that brighten when a trail user approaches, should be considered. Solar-powered LED lights provide a viable option for installing lights in areas without an electrical supply. The exact type and location of lighting along the trail will be determined during preliminary engineering.

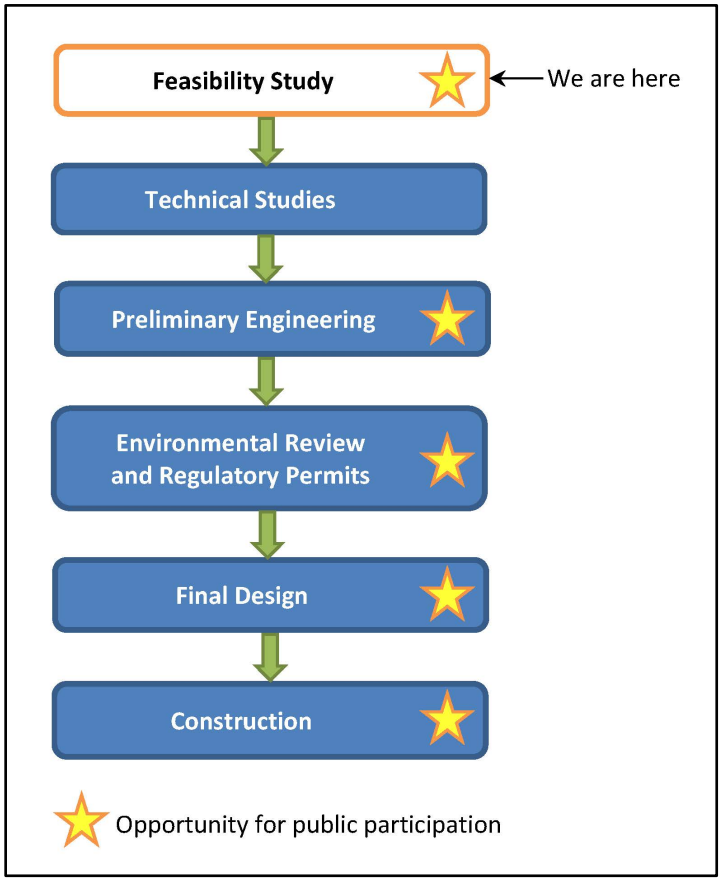
3.3.6 Parking

Although no new parking is proposed within the Study Area, there may be a need for additional parking if use of the Study Area increases. The majority of the existing public parking is at the east end of the Study Area at Mahany Park and the Roseville Aquatic Complex. There is no public parking on the west end of the Study Area. To provide parking facilities along Fiddyment Road, the City could investigate a joint use agreement with the CVS shopping center immediately north of the Study Area. There may also be sufficient space to develop off-street parking between Fiddyment Road and the electrical substation (Figure 13).

4.0 NEXT STEPS

This study represents the first step in constructing multi-use trails through the Study Area. Prior to construction, additional planning and design will be required. Responses received through the public engagement process indicated there is a strong for trail users and nearby residents to be kept informed and engaged in the next steps leading to trail construction. Additional opportunities for public input and participation will occur throughout the design process, as shown in Figure 15 and discussed in the appropriate sections below. Estimated costs for planning, design, and construction are included in Section 4.6.

Figure 15
NEXT STEPS*



* Dependent on funding

4.1 TECHNICAL STUDIES

Technical studies provide detailed information that are critical to design decisions and the environmental review process. Although a biological constraints report was prepared as part of this study, the report should be updated to reflect current conditions before environmental review for the project begins. Focused biological resource surveys and a formal aquatic resource delineation report may be required. Additionally, a cultural resources evaluation is expected to be needed. An assessment

of existing transportation conditions around the Study Area, which provided general recommendations for safety improvements to existing roads (see Section 3.2.3.2), was prepared for this study (Fehr and Peers 2020), however, additional in-depth traffic studies are required for development of mid-block crossings and site-specific recommendations. Geotechnical studies will also be required as a basis for engineering design of the creek crossings. These studies typically take two to three months to complete and should be done prior to the start of preliminary design, so study results and recommendations can be integrated into the design.

4.2 PRELIMINARY ENGINEERING

Design will begin with preliminary engineering, when the final alignment, trail materials, amenities, bridges, and overall project footprint will be determined based on project budget and City priorities. For this project, preliminary engineering will also include additional public outreach, particularly regarding connections with adjoining neighborhoods. As part of the preliminary engineering design requirements for the various utilities (WAPA, SMUD, PG&E, Roseville Electric, City sewer and storm water departments) should be confirmed. The decision to construct one or both of the recommended connections to Fiddyment Road will be made during this phase. Although costly, the mid-block crossing provides a direct connection to the City bikeway network and improved safety, which could help this project score higher in the competitive grant process. Preliminary engineering must be completed to facilitate environmental review and regulatory permitting. Preliminary engineering is expected to take three to six months.

4.3 ENVIRONMENTAL REVIEW

Although a trail through the Study Area has been conceptually reviewed in previous documents, a project specific environmental review will be required to ensure compliance with the California Environmental Quality Act (CEQA). This will include a public review and comment period. Based on the size and the potential environmental impacts of the project, an Initial Study will be necessary to determine if a Mitigated Negative Declaration will be appropriate, or if a more in-depth environmental review is necessary. If federal funds are used to construct the project, then a National Environmental Protection Act (NEPA) evaluation will also be required.

The environmental review process can begin once preliminary design is complete (see Section 4.5). However, if design changes later result in impacts outside of the project scope considered in the environmental review, a supplemental review may be required. The environmental review process for a project of this size typically take six to nine months to complete.

4.4 REGULATORY PERMITS

As discussed in Section 2.2, permits from the California Department of Fish and Wildlife, U.S. Fish and Wildlife Service, Regional Water Quality Control Board, U.S. Army Corps of Engineers, may be required prior to construction of any improvement that will impact a protected aquatic feature, habitat, or special-status species.

- CDFW: Since the project will construct trail through riparian habitat, a Lake and Streambed Alteration agreement will likely be required even if the creek crossings do not directly impact the channel. Additionally, if special-status species are discovered on site during the additional biological resource surveys an Incidental Take Permit may be required.

- USFWS: Since the proposed alignment directly impacts a vernal pool, coordination with the USFWS will be required. Additionally, if special-status species are discovered on site during the additional biological resource surveys an Incidental Take Permit may be required.
- RWQCB: Since the proposed alignment directly impacts a vernal pool, a permit from this agency will be required. This permit will also cover any project impacts to areas within the creek channels.
- USACE: If the bridges are designed to avoid all impacts to jurisdictional waters by spanning the channel completely and existing regulations are still applicable, no permit from this agency is anticipated to be required.

The regulatory permit process may take six months to a year, or longer, depending on the type and extents of resources impacted. This process can be started concurrently with the environmental review process at the time a stable project description and adequate design information is available, but the CEQA or NEPA documents must be complete prior to the issuance of regulatory permits. Each permit will likely include mitigation requirements that should be integrated into the final construction documents. The costs and benefits of avoiding impacts to jurisdictional features should be evaluated during the preliminary design phase of construction documents to determine the best project design.

4.5 FINAL DESIGN

Following completion of the preliminary engineering, environmental review and regulatory permitting, full construction documents consisting of plans, specifications, and estimates will be prepared in accordance with City Standards. The construction documents will include information on trail alignment and design, site grading, creek crossings, benches/rest areas, signage, connections to existing trails, midblock crossings, and any other improvements included in the project such as parking, planting, or lighting, as well as measures for protection of sensitive habitats and erosion control measures. Improvement plans must be submitted to WAPA and SMUD independently for approval prior to construction. Review of plans in relation to Roseville Electric, sewer, and water will be completed as part of the standard City plan review process. The City will include public review and comment opportunities in the plan review process. The final design process typically requires nine months to a year to complete. Environmental review and regulatory permitting should be completed prior to the completion of final construction documents so that appropriate avoidance and mitigation measures can be integrated into the project.

4.6 CONSTRUCTION

Although construction will be primarily completed by a contractor, there are opportunities for community involvement, including installation of benches, dog waste stations, small community-built bridges, or tree planting. Additionally, there may be opportunities for community members to “adopt” a creek or trail segment following construction. Construction is anticipated to be completed in approximately 6 months, but the schedule will depend on weather conditions and the details of the final design. The cost to construct the trail will depend on which paving materials are selected, the extent of expanded shoulders, site amenities, and materials costs at the time of construction. Overall, the construction cost of the trail is expected range between approximately $275 per linear foot, if standard asphalt and shoulders are used, to $460 per linear foot, if pervious materials and expanded shoulders are selected.

Table 2
CONSTRUCTION COST ESTIMATE

Item	Quantity	Unit	Unit Price	Total Cost
Paved Trail	12,625	LF		
Standard Asphalt			$30	$378,750
Pervious Asphalt			$60	$757,500
Standard Concrete			$130	$1,641,250
Pervious Concrete			$190	$2,398,750
Decomposed Granite Shoulder	12,625	LF		
Standard 2’ width			$27	$340,875
Expanded 4’ width			$54	$681,750
Aggregate Base Shoulder	12,625	LF		
Standard 2’ width			$2.50	$31,563
Expanded 4’ width			$5	$63,125
Striping	12,625	LF	$9	$113,625
Post and Cable Fence	25,250	LF	$30	$757,500
Bridges (3 total)	1	EA	$250,000	$250,000
Rest node	11	EA	$6,500	$71,500
Trash Station		EA	$3,800	$41,800
Informational Signs	20	EA	$300	$6,000
Interpretive/Wayfinding Signs	15	EA	$1,400	$21,000
At-grade mid-block crossing	1	EA	$350,000	$350,000
Miscellaneous Construction Costs				$1,100,000

The estimates shown in Table 2 are based on the following City design standards and assumptions:

- Paved trails are ten feet wide.
- Standard asphalt paved trail includes two inches of asphalt over four inches of Class II aggregate base.
- Pervious asphalt paved trail includes three inches of pervious asphalt over six inches of pervious base.
- Standard concrete paved trail includes four inches of concrete over four inches of Class II aggregate base.
- Pervious concrete paved trail includes four inches of pervious concrete over six inches of pervious base.
- Aggregate base shoulder is four inches deep. (2 feet wide per City Standard, additional cost for wider shoulders).
- Decomposed granite shoulders are 3 inches deep and stabilized with organic binder. (2 feet wide per City Standard, additional cost for wider shoulders).
- Bridges include two 20-foot long and one 30-foot long, 10-foot wide metal pre-fabricated bridge with concrete abutments. The cost for a pipe culvert for the swale crossing is included in miscellaneous construction costs.
- Rest node includes City Standard bench installed on 5’ x 11’ three-inch deep decomposed granite pad, and standard 4’ x 12’ fabric shade shelter.

- Trash Station includes and trash can with dog waste bag dispenser installed on 5’ x 5’ three-inch deep decomposed granite pad.
- Interpretive and wayfinding signs will be 24” x 36”, mounted on a standard single-post pedestal. Costs of signs includes 6’ x 6’ three-inch deep decomposed granite pad.
- Miscellaneous construction costs for items not specifically included in table, such as mobilization, grading, and erosion control, is estimated as the median of 30% of itemized costs.

4.7 FUNDING

As shown in Table 3, the total estimated cost to implement the complete project is between $4.3 million and $6.7 million. This includes approximately $865,000 for planning, permitting, and design and $3,400,000 to $5,800,000 in construction costs, depending on materials.

Table 3
IMPLEMENTATION COST ESTIMATE

Step	Estimated Cost
Technical Studies	
Biological Resources Assessment and Special-Status Species Surveys	$16,000
Aquatic Resource Delineation	$10,000
Cultural Resources Assessment	$12,000
Traffic Study	$40,000
Geotechnical Study	$20,000
Preliminary Engineering	$60,000
Public Engagement	$85,000
Environmental Review[1]	
CEQA Document	$40,000
NEPA Document Support[1]	$25,000
Regulatory Permits[2]	
CDFW SAA	$9,000
RWQCB Permit	$8,000
USFWS Consultation	$12,000
Mitigation Fees[3]	$30,000
Final Design	$500,000
Construction	$3,430,000 - $5,820,000
Total Project Cost	$4,297,000 - $6,697,000

[1] Assumes Caltrans or other lead agency prepares NEPA document with technical study support from applicant.
[2] Assumes crossings fully span creeks, one vernal pool is directly impacted, and no additional special-status species identified in technical studies. Actual regulatory permits required will depend on project design and regulatory requirements at the time.
[3] Assumes 5:1 mitigation for impacts to 0.02 acres of vernal pool at rate of $300,000 per acre and any impacts to riparian habitat will be mitigated on site as part of project design. Actual mitigation requirements will be determined as part of the regulatory permitting process.

Funding has not been identified for the next steps required for trail construction. If directed by City Council, staff will pursue funding through various competitive federal, state, and regional grant programs and local sources over the next several years to complete the project. General Fund and Measure B funds are not used for multi-use trail construction. Transportation, sustainability, and recreation-related grants are typically funded through annual appropriation bills, bond measures, or fee

programs. Some programs are cyclical, with additional rounds of funding becoming available over time, while other programs end once their funds are distributed. Lists of potential grant opportunities are listed on the State of California's website (www.grants.ca.gov) and Sacramento Area Council of Governments (SACOG) website (https://www.sacog.org/statewide-funding-opportunities). Grant applications are typically competitive and eligible projects, application requirements, and scoring criteria may change over time as grant funding is renewed. Potential funding sources that may be pursued for this project include:

- Active Transportation Program (ATP) – The goal of this state program is to increase biking and walking trips, improve safety and mobility of non-motorized users, reduce greenhouse gas emissions, and enhance public health. ATP funds are administered through Caltrans and SACOG. No matching funds are required.
- Recreation Trails Program (RTP), non-motorized trails – This federally funded program is administered through the California Department of Parks and Recreation Office of Grants and Local Services. This grant program requires that the applicant match at least 12% of the total project cost. Eligible projects must be listed on the state or local transportation improvement plan. This program is currently only funded through fiscal year 2020.
- Affordable Housing and Sustainable Communities Grant Program – This program administered by the California Strategic Growth Council funds projects that allow residents to drive less by making sure housing, jobs, and key destinations are accessible by walking, biking, and transit. This program requires matching funds.
- Congestion Mitigation and Air Quality (CMAQ) Program – This program is funded by the Federal government and administered locally by the Placer County Transportation Planning Agency (PCTPA). The purpose of the program is to fund transportation projects designed to reduce traffic congestion and improve air quality.
- Transportation Development Act (TDA) – This program creates the Local Transportation Fund with revenue derived from ¼% of the state retail sales tax. These funds may be used for a wide variety of transportation projects, including bicycle and pedestrian facilities.
- Habitat Conservation Fund – This state grant program is administered through the California Department of Parks and Recreation Office of Grants and Local Services. Eligible projects include nature interpretation programs to bring urban residents into park and wildlife areas and protection of various plant and animal species. Matching funds are required.
- Wildlife Conservation Board Public Access Program – This program is administered by the Wildlife Conservation Board with the goal to increase public access to wildlife-oriented activities, including ADA trails, interpretive signs, and bird observation areas.
- Habitat Enhancement and Restoration Program – This program run by the California Habitat Conservation Board funds projects that provide assistance for the restoration and enhancement of fish and wildlife resources. No matching funds are required.
- PeopleForBikes Community Grant Program – This program, funded by the non-profit PeopleForBikes, supports bicycle infrastructure projects that make it easier and safer for people of all ages and abilities to ride. The grant limit is $10,000 and matching funding is required. This grant is typically directed to community-based non-profits for smaller projects.

5.0 REFERENCES

Caltrans. 2019. Highway Design Manual. Available from: https://dot.ca.gov/programs/design/manual-highway-design-manual-hdm.

CDFW. 2020. September 30, 2020. Personal Communication with Patrick Moezinger.

Federal Highway Administration (FHWA). April 2015. TechBrief – Porous Asphalt Pavements with Stone Reservoirs; FHWA-HIF-15-009. Available from: https://www.fhwa.dot.gov/pavement/asphalt/pubs/hif15009.pdf.

December 2012. TechBrief – Pervious Concrete; FHWA-HIF-13-006. Available from: https://www.fhwa.dot.gov/pavement/concrete/pubs/hif13006/hif13006.pdf.

Fehr and Peers. 2020. September 10. Memorandum - Existing Transportation Conditions near Mahany Park. Roseville, CA.

Roseville, City of. 2021. February. Parks, Trails, and Bikeways Map. Available from: www.roseville.ca.us/map.

2020. January 2020. City of Roseville Design and Construction Standards. Available from: https://www.roseville.ca.us/government/departments/development_services/engineering_land_development/construction_management_inspection/design_construction_standards.

2020. August. City of Roseville General Plan 2035. Available from: https://www.roseville.ca.us/government/departments/development_services/planning/general_plan_development_guidelines.

2011. August 5. City of Roseville Open Space Preserve Overarching Management Plan. Available from: https://www.roseville.ca.us/government/departments/development_services/planning/citywide_planning_documents/open_space_preserve_overarching_management_plan.

2008. City of Roseville Bicycle Master Plan. Available from: https://www.roseville ca.us/UserFiles/Servers/Server_7964838/File/Government/Departments/Public%20Works/Biking%20&%20Walking/Planning/2008%20Bicycle%20Master%20Plan2. pdf.

USACE. 2020. October 7, 2020. Personal Communication with Leah Fisher.

USFWS. 2020. October 1, 2020. Personal Communication with Ian Perkins-Taylor and Andrew Raabe.

This page intentionally left blank

Appendix A

Existing Conditions Report

This page intentionally left blank

Mahany Park Open Space Trail

Existing Conditions Report

October 2020 | CRS-03

Prepared for:

City of Roseville
311 Vernon Street
Roseville, CA 95678

Prepared by:

HELIX Environmental Planning, Inc.
1677 Eureka Road, Suite 100
Roseville, CA 95661

Mahany Park Open Space Trail

Existing Conditions Report

Prepared for:

City of Roseville
311 Vernon Street
Roseville, CA 95678

Prepared by:

HELIX Environmental Planning, Inc.
1677 Eureka Road, Suite 100
Roseville, CA 95661

October 2020 | CRS-03

This page intentionally left blank

TABLE OF CONTENTS

Section **Page**

1.0 INTRODUCTION 1

2.0 STUDY AREA BACKGROUND 2

2.1 Location 2
2.2 Land Use and Zoning 2
2.3 Planning Policies 5
2.3.1 Roseville Open Space Preserve Overarching Management Plan 5
2.3.2 City of Roseville General Plan 7
2.3.3 City of Roseville Bicycle Master Plan 8
2.3.4 Specific Plan Areas 8
2.4 Schools 10
2.5 Demographics 13

3.0 OPPORTUNITIES AND CONSTRAINTS 16

3.1 Biological Resources 16
3.2 Topography and Floodplain 20
3.3 Cultural Resources 20
3.4 Use and Traffic Patterns 20
3.5 Points of Interest 23
3.6 Constructed Features 23
3.6.1 Informal Paths 23
3.6.2 Connections to Existing Trails 24
3.6.3 Utilities 24

4.0 TRAIL DESIGN GUIDELINES 28

4.1 Open Space Preserve Overarching Management Plan 28
4.2 City of Roseville Design and Construction Standards 29
4.3 Utilities 30
4.3.1 Roseville Electric 30
4.3.2 SMUD 30
4.3.3 WAPA 31
4.3.4 Sewer 31

5.0 REFERENCES 36

LIST OF APPENDICES

A Stakeholder Interviews
B Opportunities and Constraints Table
C Trail Use Counts
D Survey Results

TABLE OF CONTENTS (cont.)

LIST OF FIGURES

No.	Title	Page
1	Site Location and Regional Bike Trails	3
2	Surrounding Land Use	4
3	School Attendance Area Boundaries	12
4	Census Tracts	15
5	Biological Constraints	18
6	Access Points	22
7	Opportunities and Constraints	25
8	Utilities and Easements	27

LIST OF TABLES

No.	Title	Page
1	Summary of Biological Resource Avoidance Recommendations	17
2	Summary of Design Guidelines	33

LIST OF CHARTS

No.	Title	Page
1	Residents by Age	13

ACRONYMS AND ABBREVIATIONS

Bicycle Master Plan	City of Roseville Bicycle Master Plan
Caltrans	California Department Transportation
CDFW	California Department of Fish and Wildlife
City Standards	City of Roseville Design and Construction Standards
DCJESD	Dry Creek Joint Elementary School District
DWSP	Del Webb Specific Plan
FEMA	Federal Emergency Management Agency
General Plan	City of Roseville General Plan
HELIX	HELIX Environmental Planning, Inc.
MPH	Miles per hour
MUTCD	Manual on Uniform Traffic Control Devices
NOAA	National Oceanic and Atmospheric Administration
NMFS	National Marine Fisheries Service
NRSP	North Roseville Specific Plan
NWRSP	Northwest Roseville Specific Plan
OSPOMP	Open Space Preserve Overarching Management Plan
RCSD	Roseville City School District
RJUHSD	Roseville Joint Unified High School District
Roseville Electric	City of Roseville Electric Utility Department
RWQCB	Regional Water Quality Control Board
SMUD	Sacramento Municipal Utility District
SVSP	Sierra Vista Specific Plan
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
WAPA	Western Area Power Administration

This page intentionally left blank

1.0 INTRODUCTION

The purpose of this report is to document the existing conditions of the Mahany Park Open Space (Study Area), document design opportunities and constraints, and provide a summary of applicable design guidelines. This report will inform the development of conceptual alignments of Class I trails and related recreational amenities, which will be documented in the Mahany Park Open Space Trail Feasibility Report. The Study Area is located in western Roseville, California, amidst residential and commercial developments. Its location adjacent to Mahany Park, the Roseville Aquatics Center, and Woodcreek High School make it an important access corridor for students and families. Although existing paved, multi-use trails connect to the site at four locations, there are no complete paved trails through the Study Area. Connections between the paved trails have been created by users over time in the form of dirt paths. These dirt paths often cut through wetlands or drainages and they may be impacting the natural resources that the Open Space was established to protect. Design of improvements within the Study Area must comply with guidelines established in multiple City of Roseville documents, federal and state resource agency regulations, and requirements of the utilities who have established easements and facilities within the Study Area.

The existing conditions of the Study Area were evaluated by a HELIX Environmental Planning, Inc. (HELIX) landscape architect and landscape planner on March 5, 2020. During this site visit, opportunities, such as good views and interesting natural resources, approved improvements, such as utilities, gates, signs, and paved trails, unapproved improvements, such as user-created dirt paths, bridges, and dirt bike jumps, were mapped and photo-documented. This information, combined with applicable design constraints will be used to develop options for trail alignments and other improvements to the Study Area to improve connectivity and safety, and reduce impacts to sensitive natural resources.

2.0 STUDY AREA BACKGROUND

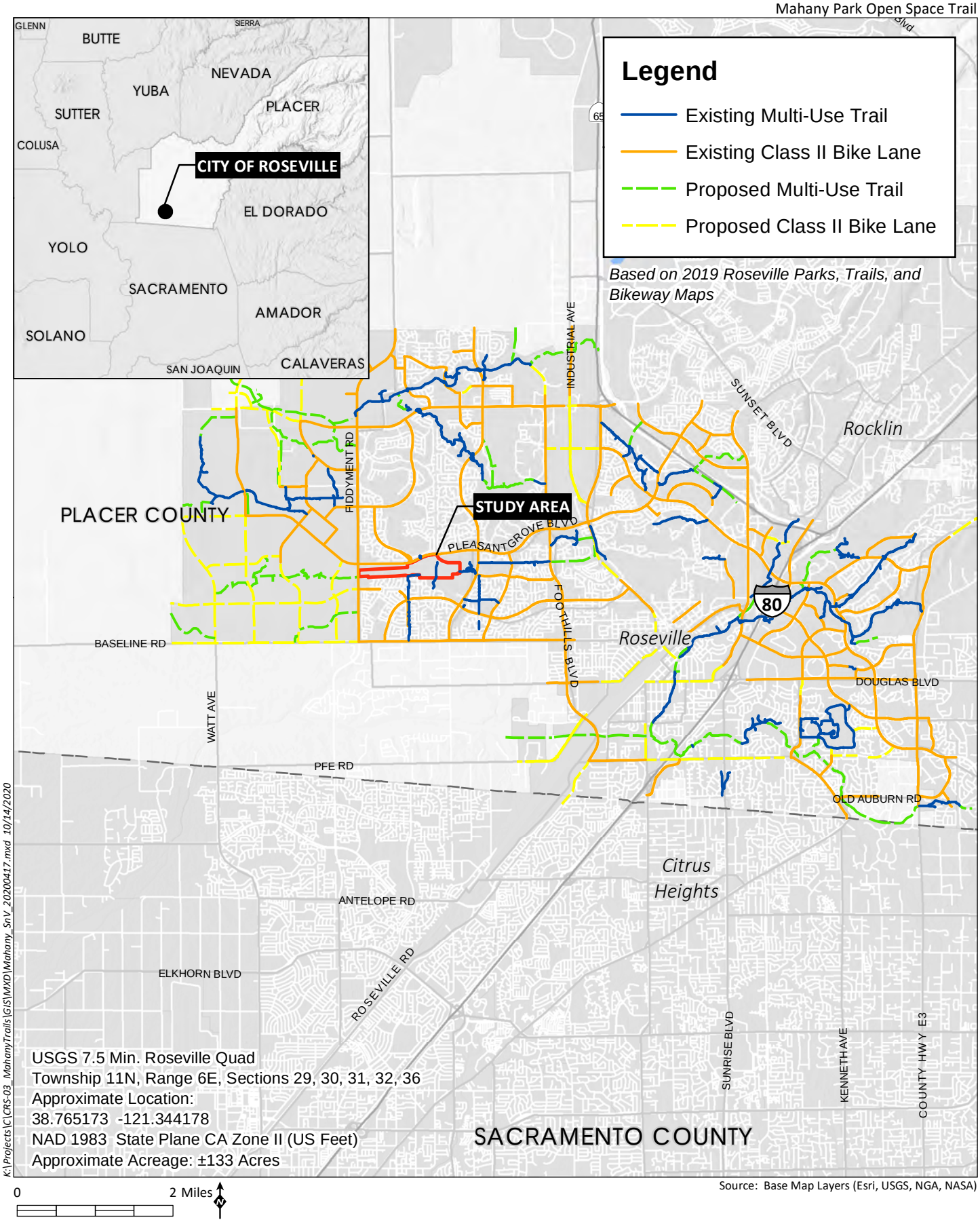
2.1 LOCATION

The Study Area is owned by the City of Roseville and encompasses APNs: 017-370-007, 014, 015; 017-162-077, 079, 080; 477-110-005; and the western edge of 017-370-006 (City of Roseville 2020b). It is located in western Roseville between Fiddyment Road and Woodcreek Oaks Boulevard, south of Pleasant Grove Boulevard (Figure 1).

2.2 LAND USE AND ZONING

The majority of the Study Area is zoned as open space and it is more specifically defined as open space preserve in the Roseville Open Space Preserve Overarching Management Plan (OSPOMP). A small area in the southeast corner of the Study Area is general open space. The remainder of the Study Area is zoned as Park and Recreation (City of Roseville 2017). The Study area is split between the North Roseville Specific Plan area, which includes the western half of the site, the Northwest Roseville Specific Plan area on the east, and the Del Webb Specific Plan area to the north. The Sierra Vista Specific Plan is located to the west of the Study Area and the West Roseville Specific Plan Area is located northwest of the Study Area (Figure 2). The site is crossed by multiple utility easements containing both large electrical transmission lines and standard electrical utility poles.

The predominant land use surrounding the Study Area is residential. The Study Area ends at Fiddyment Road on the west, beyond which are planned commercial and residential areas that are currently being developed. Immediately adjacent to the Study Area on the north is commercial development, high-density housing, and a senior assisted-living facility, beyond which is Pleasant Grove Boulevard. Beyond Pleasant Grove Boulevard to the north and northwest are active adult single-family residential communities. To the northeast and east of the project area is Mahany Park, a regional park that includes the Martha Riley Library, the Utility Exploration Center, Bear Dog Park, and the Sports Center; the Roseville Aquatics Complex; and Woodcreek High School, beyond which is Woodcreek Oaks Boulevard. The eastern end of the southern boundary of the Study Area abuts the Silverado Oaks Urban Preserve and the western half is bounded by single family residences.

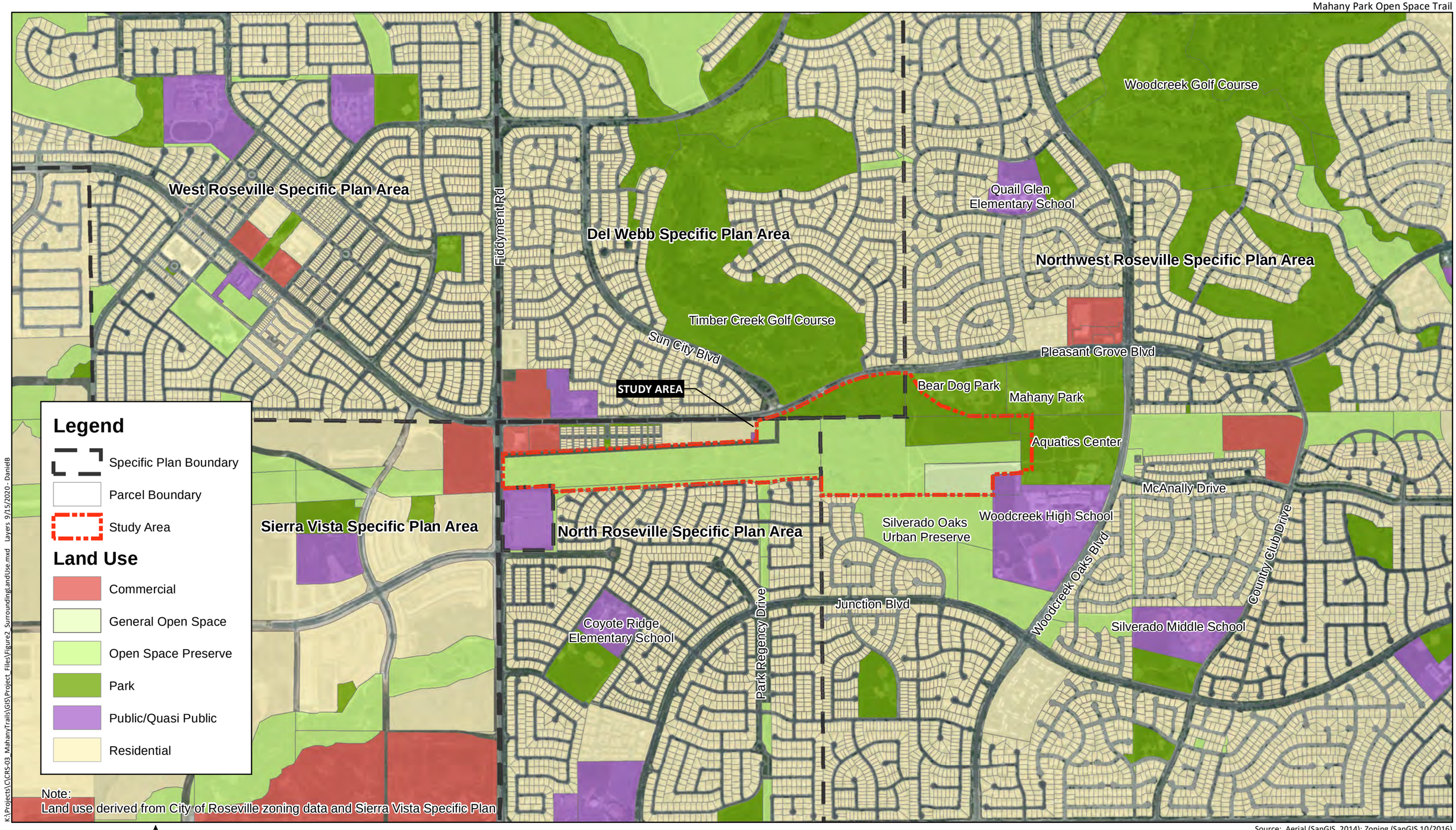


Source: Base Map Layers (Esri, USGS, NGA, NASA)

HELIX Environmental Planning

Site Location and Regional Bike Trails

Figure 1



Source: Aerial (SanGIS, 2014); Zoning (SanGIS 10/2016)

HELIX Environmental Planning

Surrounding Land Use

Figure 2

2.3 PLANNING POLICIES

2.3.1 Roseville Open Space Preserve Overarching Management Plan

The Roseville Open Space Preserve Overarching Management Plan provides a universal approach and specific goals for open space management, maintenance, and monitoring in all City open space and replaces individual management plans written for each open space as they were established. The OSPOMP recognizes the need for maintenance, installation, and replacement of City facilities, including bike trails and maintenance roads, while requiring that the City will protect biological resources from unpermitted impacts. The OSPOMP was approved by the U.S. Army Corps of Engineers (USACE), and the U.S. Fish and Wildlife Service (USFWS). As part of their approval of the document, the USFWS issued a biological opinion that covers limited amounts of direct and indirect impacts to vernal pools as part of allowed maintenance activities. City facility maintenance, replacement, or modification that causes ground disturbance within 250 feet of listed vernal pool invertebrate habitat is considered to be having indirect impacts. Maintenance activities that exceed these limits and installation of new facilities are not covered under the OSPOMP biological opinion and will require additional consultation with the USFWS. Additionally, consultation with wildlife agencies is required if the work is not covered by the OSPOMP biological opinion or the endangered/threatened species habitat is under the jurisdiction of NOAA Fisheries/NMFS.

Chapter 9 of the OSPOMP includes a discussion of bike trails and related amenities, such as benches, signs, and trash cans. Bridges and riparian crossings are not specifically discussed in the OSPOMP. While existing trails were either permitted and installed as part of the development requiring an Open Space Preserve or were permitted separately as their own project within the General Open Space, new trails shall be installed and maintained in accordance with the Bicycle Master plan and the OSPOMP. Conceptual alignments for new trails within the Study Area were included in the OSPOMP, but coordination with the appropriate State and Federal Agencies for approval of the final alignment will be required prior to construction.

The OSPOMP defines the two types of open space management areas: open space preserve and general open space, jointly referred to as open space. Areas designated as open space preserve is land that was required to be set aside as part of a regulatory permitting action and is typically protected by either a conservation easement or declaration of covenants and restrictions. Sensitive biological resources, such as jurisdictional waters or legally-protected species, are typically located in open space preserves. Off-trail public access in open space preserves is prohibited. General open space is the remainder of the City's open space and is not subject to State or Federal permit-related restrictions. As previously described, the majority of the Study Area is classified as open space preserve, with a small area in the southeast corner of the Study Area classified as general open space (Figure 2).

In addition to annual monitoring and maintenance requirements, the OSPOMP provides specific minimization and avoidance measures for restoration or correction of vandalism both inside and outside of vernal pools and bike trail maintenance and replacement. It also includes restoration guidelines for a variety of other conditions, some of which have occurred in the Study Area, including disturbance of grassy upland areas, accidental fill of wetlands/waters of the U.S., restoration of fencing and signage, correction of erosion, removal of graffiti and vandalism, undesignated (social) trails, un-permitted bike jumps/tracks, and landscaping/gardens. Implementing any of these restoration measures would be considered maintenance and are permitted under the existing biological opinion.

The OSPOMP includes recreation goals and accompanying actions that may be related to the installation of trails within the Study Area include. These goals and related actions are detailed below and should be incorporated into the design of improvements within the Study Area:

- Goal 11-1: Encourage appropriate use of the City's Open Space by providing bike trails and overlook points.
    - Action 11-1-1: Provide a connected paved bike trail system through the City's Open Space, avoiding trails through sensitive habitats such as vernal pool grassland.
    - Action 11-1-2: Provide bike trails with adequate width, grade, visual clearance, and surface materials to provide safe passage for anticipated users of all abilities.
    - Action 11-1-3: Provide safe access to designated overlook points in a limited number of appropriate locations.
- Goal 11-2: Install fencing adjacent to trails and overlook points to reduce off-trail traffic and protect visitors.
    - Action 11-2-1: Install fencing adjacent to trails and overlook points where it is not currently in place.
    - Action 11-2-2: Maintain current and future fencing.
    - Action 11-2-3: Reclaim social trails and eliminate access to entry points within Open Space Preserve areas. Within General Open Space, reclaim social trails only if the Open Space Manager determines they are negatively impacting Preserve resources.
    - Action 11-2-4: Monitor/map significant recreational impacts on resources and determine how to avoid continued impacts.
- Goal 11-3: Discourage Vandalism and other unwanted activities by taking a comprehensive approach to enforcement that includes signage, patrols, and a telephone hotline for reporting violations.
    - Action 11-3-1: Regularly patrol the City's Open Space.
    - Action 11-3-2: Install consistent Open Space signage that is constructed out of materials that are not easy to damage.
    - Action 11-3-3: Provide a telephone number where residents can report suspicious or illegal activities.
- Goal 11-4: Enforce restriction on off-trail, off-leash dogs to protect biological resources.
    - Action 11-4-1: Educate residents regarding City leash laws.
    - Action 11-4-2: Enforce leash laws.
- Goal 11-5: Monitor recreation uses within the Open Space.
    - Action 11-5-1: Determine if recreational uses are having an impact on biological resources within the open space.
    - Action 11-5-2: Determine if residents are using the recreation opportunities by conducting formal or informal surveys.

- Goal 11-1 [*sic*]: Encourage safe and appropriate use of the City's Open Space by schools conducting environmental education (City of Roseville 2011).
    - Action 11-1-1: Provide guidance to teachers desiring to utilize the open space for educational purposes.
    - Action 11-1-2: Ensure that educational uses are safe and do not adversely impact biological resources.

2.3.2 City of Roseville General Plan

The relevant sections of the City's General Plan are the Circulation, Open Space and Conservation, and Parks and Recreation elements. These elements focus on the preservation and enhancement of the open space and trail networks and recognizes that there is a balance between habitat protection and public use.

The Circulation element includes goals and policies to develop a balanced transportation system for automobiles, transit, bicycles, and pedestrian. It defines Class I Bike Paths as paths that "that provide a completely separated right-of-way designated for the exclusive use of bicycles and pedestrians with crossflows by motorists minimized. Class I paths often follow natural amenities such as creeks, drainage, or utility line easements, and are used by both commuter and recreational riders." (III-50). Through goals, policies, and implementation measures it encourages a network on bicycle infrastructure and the implementation of the Bicycle Master Plan. Figure III-6 "Bikeway System", which does not differentiate between existing and planned bikeways, identifies the main east-west and north-south informal paths within the Study Area as Class I trails.

The Open Space and Conservation Element states its overall goal to, "preserve a comprehensive interconnecting system of open space, encompassing preservation and enhancement of natural habitat and significant resource areas for the use, appreciation, and enjoyment of the community." (V-2) This element specifically encourages through its goals, policies, and implementation measures the preservation and connection of open spaces and providing public education and access wherever compatible.

The Parks and Recreation Element specifically discusses open space lands and how they have recreational value for both active and passive use. They encourage improvements such as bike trails, signage, and pedestrian pathways. Within open space areas, this Element provides the following criteria:

- Locate improvements consistent with the Open Space Element;
- Provide access to open space areas except those areas sensitive to human presence;
- Provide an interconnecting system of open space corridors consisting of both public and private open space and, where feasible, incorporate bikeways and pedestrian paths, interpretive signage, etc.;
- Highlight unique or special features into the open spaces, such as cultural heritage, historical features, etc. through outreach, educational kiosks, interpretive signs, etc.;
- Consider regional linkages between open space and adjacent communities; and

- Private open space may be required to include public access for purposes of recreation and implementation of the City of Roseville Bicycle Master Plan, Pedestrian Master Plan or other adopted planning documents (City of Roseville 2016).

While the General plan does not provide detailed design guidelines, any proposed improvements in the Study Area must be consistent with the policies established in the General Plan.

2.3.3 City of Roseville Bicycle Master Plan

The Bicycle Master Plan was developed within the context of the Circulation Element of the City's General Plan. It is intended to guide bikeway policies, programs and development standards to make bicycling in Roseville more safe, comfortable, convenient, and enjoyable for all bicyclists. The ultimate goal of this effort is to increase the number of persons who bicycle in Roseville for transportation to work, school, and errands, and for recreation.

The Bicycle Master Plan includes plans for a Class I bike trail system. Consistent with the General Plan, Class I bikeways are intended for use by bicyclists, pedestrians and other non-motorized users. Equestrians are prohibited from using Class I bikeways in Roseville, but Class I bike trails are sometimes used as maintenance and emergency vehicle access within open space. The Bicycle Master Plan encourages the implementation of associated facilities such as bicycle parking, mile markers and destination guide signs, and trail maps at trailheads.

The Bicycle Master Plan identifies four instances of existing Class I bikeways that terminate at or in the Study Area that end with no connection, as described in Section 3.6.2. It proposes an additional 0.71 mile of Class I bikeways within Mahany Park Open Space, consisting of a north-south trail connecting the existing bikeways and an east-west trail from Mahany Park to Fiddyment Road (City of Roseville 2008).

2.3.4 Specific Plan Areas

As shown in Figure 2, the Study Area overlaps three specific plan areas and is directly adjacent to a fourth area currently under development. Although each specific plan document includes design requirements for trails, the current City standards, discussed in Section 4, take precedence.

2.3.4.1 Del Webb Specific Plan

The Del Webb Specific Plan (DWSP) sets forth regulations, conditions, and programs for 1,200 acres to develop an active adult community. Included in the DWSP is the ~14-acre northern parcel of the Study Area which is defined as a City-Wide Park (Figure 2). The DWSP discusses bike and pedestrian paths, showing a planned 10-foot wide bike path from the Pleasant Grove Boulevard undercrossing and extending first south, and then splitting to extend east and west. The east extension is intended to connect the park system and City-wide bike trail system. The west extension is intended to connect the south side of Pleasant Grove Boulevard. Within parks, the DWSP requires the paths be 8 to 10 feet wide; constructed of concrete or asphalt; and aligned to consider topography, landscaping, existing trees and wetlands, street lighting, and adjacent land uses. The DWSP identifies trees and wetlands within the Study Area and recognizes the importance of enhancing and monitoring them (City of Roseville 1993).

2.3.4.2 Northwest Roseville Specific Plan

The Northwest Roseville Specific Plan (NWRSP) guides development in the eastern half of the Study Area. It defines the four eastern parcels of the Study Area as open space and park. The NWRSP discusses bikeways and pedestrian pathways, showing a bikeway traveling through the eastern half of the preserve, but it does not show how the bikeway will terminate or connect to anything to the west of the specific plan area. The NWRSP establishes Class I bikeways shall be a minimum of 8 feet wide and not meander more than the distance of its width over a 100-foot run; not exceed a 5% slope; and shal be constructed of concrete if the bikeway is to double as a pedestrian path.

The NWRSP describes a 375-foot wide power line easement that runs east-west across the plan area and includes the Study Area and specifies that the easement is to include a pedestrian/bike path. The NWRSP also speaks to the importance of protecting and maintaining open space, vernal pools, and oak woodland (City of Roseville 1989).

2.3.4.3 North Roseville Specific Plan

The North Roseville Specific Plan (NRSP) is a comprehensive plan to guide the urbanization of 1,552 acres and complete the land-use and infrastructure planning for the associated area of the City, including Neighborhood D, which contains the western half of the Study Area. The NRSP includes in the land use map the three parcels which make up the western half of the Study Area. The narrow open space parcels along the north and south boundaries of the Study Area are 'Open space - vegetation buffers' while the large parcel through the center is 'Open Space - wetland compensation'. In Section 4.3, the NRSP discusses bike and pedestrian pathways, calling them out as 14' typical, but variable within open spaces. The associated figure shows no bike path within the Study Area but does show the trail stub that currently dead ends at the south side of the Study Area and specifically notes that it be connected to the City-wide trail system.

Included as an appendix to the NRSP is the North Roseville Design Guidelines (NRDG), which specifies open fencing along the open space perimeters and requires that pathways be defined within open spaces unless otherwise required by the wetland permitting authority. According to the design guidelines, open fencing must meet the following requirements: be 4 to 6-feet in height and construction of tubular steel, mesh, or wrought iron; mesh fencing shall be black vinyl-coated, with painted black posts and top rail; open fence or wooden posts with a cable strand connecting them may be used on the street adjacent to the open space (City of Roseville 1997).

2.3.4.4 Sierra Vista Specific Plan

Although the Study Area is not located within the Sierra Vista Specific Plan (SVSP), it is useful to consider this area to help ensure continuity in the trail network. The SVSP establishes a land use and regulatory framework to guide development of the approximately 2,075-acre Plan Area located to the west of Fiddyment Road and north of Baseline Road. The SVSP is immediately west of the Study Area and one of its project objectives is to "provide connections through the community in the east-west direction …via a system of open space, paseos, and Class IA bikeways." An east-west Class I bikeway is proposed in the Plan Area which stops just across Fiddyment from the southwest corner of the Study Area. The land immediately west of the Study Area, which this bike path is to travel through, is defined as a community commercial/business professional land use. The SVSP establishes the following guidelines for bike paths: the Class I system within an open space may meander to minimize environmental impacts and create

visual interest; bike paths should have 10 feet of pavement with lane striping, plus a 2-foot decomposed granite/gravel shoulder on each site; and barriers will be provided along bike paths to separate the pathways from the open space preserve areas. Barriers can be bollards, rail fence, vertical curbs, post and cable, posts, etc. as long as it complies with the associated Section 404 permit.

There is additional discussion of appropriate at-grade street crossings where Class I path intersects at or near signalized intersections. Recommended traffic control measures for crossing collector or residential streets may include ramps, botts dots (reflective raised markers), striping, or signage. No specific guidance on crossing Fiddyment Road or connecting to the Study Area is provided in the SVSP (City of Roseville 2010).

2.4 SCHOOLS

There are four public school districts in the vicinity of the Study Area: Roseville Joint Union High School District (RJUHSD), Dry Creek Joint Elementary School District (DCJESD), Roseville City School District (RCSD) (Figure 3), and Center Unified School District (CUSD). Additionally, a number of private schools and daycare facilities are located in the vicinity but are not further discussed in this document.

Roseville Joint Union High School District has six high schools, including Woodcreek High School, which is adjacent to the Study Area, and West Park High School, located approximately 1.45 miles to the northwest, which is currently under construction. Fiddyment Road is the attendance dividing line between these two high schools; students living east of this road attend Woodcreek High School while students living west of the road will attend West Park High School starting in the 2020-2021 school year. West Park will also serve students living in the north portion of the Sierra Vista Specific Plan Area (City of Roseville 2010). Adjacent to Woodcreek High School is Challenge High School, which provides a therapeutic intervention program to students that would not thrive in a traditional classroom setting and serves the entire District (RJUHSD 2020a, 2020b, 2020c, and 2020d).

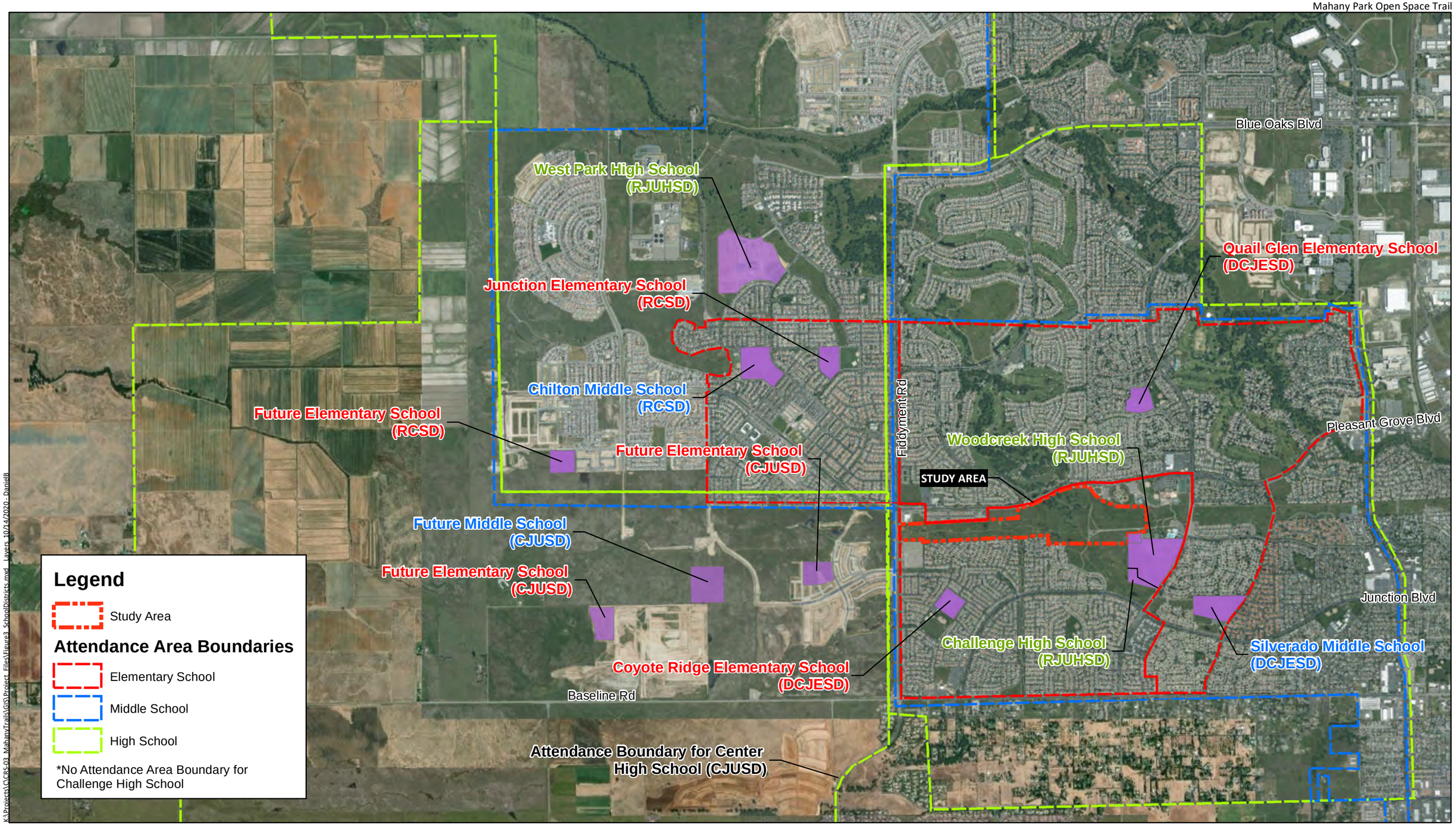
The Study Area and the majority of the surrounding area is located in Dry Creek Joint Elementary School District for middle and elementary schools. Most residents south of Pleasant Grove Boulevard, with the exception of the high-density housing immediately north of the Study Area, attend Coyote Ridge Elementary School, which is located approximately 0.24 mile south of the Study Area. Residents north of Pleasant Grove Boulevard and east of Woodcreek Oaks Boulevard attend Quail Glen Elementary School, which is located approximately 0.44 mile northeast of the Study Area. Both elementary schools serve students from transitional kindergarten through 5th grade. Students from both of these elementary schools attend Silverado Middle School for 6th to 8th grade, which is located approximately 0.42 mile southeast of the Study Area (DCJESD 2020a, 2020b, 2020c, 2020d).

Roseville City School District provides middle and elementary schools for people located northwest of the intersection of Fiddyment Road and Pleasant Grove Boulevard. Residents in this area attend Junction Elementary School, located 0.75 mile northwest of Study Area, for transitional kindergarten through 5th grade. Students then transition to Chilton Middle School, located approximately 0.97 mile northwest of the Study Area, for 6th through 8th grades (MySchoolLocation 2020; RCSD 2020a, 2020b). An additional elementary school will be constructed in the northern area of the Sierra Vista Specific Plan Area (City of Roseville 2010). Center Unified School District will provide two elementary schools and one middle school for residents in the majority of the SVSP area. The closest elementary school will be located ~1/3 of a mile west of the Study Area and adjacent to a planned open space and trail corridor that connects to the Study Area. The middle school will be located ~1.0 mile west of the site along the

same open space corridor. Students in this area will currently attend Center High School, located ~3.4 miles southwest of the Study Area. In the future, these students are expected to be served by a future high school located to the west in unincorporated Placer County.

The Study Area may provide an important route to school for some students. As previously discussed, and shown in Figure 3, the service area for Silverado Middle School surrounds the Study Area on three sides and Woodcreek High School and Challenge High School are located adjacent to the Study Area. Therefore, it is likely that students from these schools use the Study Area to travel to and from school. Additionally, Woodcreek High School uses a portion of the Study Area as an educational tool, providing hands-on learning opportunities for High School students and providing tours for elementary school students teaching about nature, vernal pools, and the preserve (RJUHSD 2020c). The Study Area is also used by school sports teams for fitness training and fundraising (see Appendix A).

Due to the service areas and school locations, students from West Park High School, Chilton Middle School, Junction Elementary, Coyote Ridge Elementary, Quail Glen Elementary, and most of the schools in the SCSP area traveling between home to school will not pass through the Study Area and it is unlikely to be used for school activities. However, these students may use the Study Area as a destination or to access extracurricular activities. The Study Area is located within walking distance of Coyote Ridge Elementary and the future elementary school in the SVSP area and could be used for educational activities.



Source: Aerial (SanGIS, 2014); Zoning (SanGIS 10/2016)

HELIX Environmental Planning

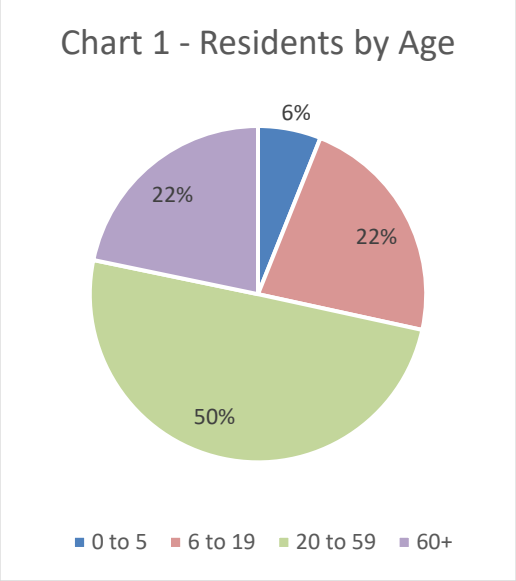
School Attendance Area Boundaries

Figure 3

2.5 DEMOGRAPHICS

The Study Area is located in Census Tract 06|061|0210. 35. To capture the Study Area and the neighborhoods immediately around it, this demographics analysis was performed on tracts 0210. 35, as well as tracts 0210. 37, 0210. 38, 0210. 40, 0210. 43, 0210. 44, and 0213.22 (Figure 4). The analysis is based on 2018 5-year projections (USCB 2018).

Within these seven tracts are an estimated 47,615 residents, 47% of whom are male and 52% of whom are female in 16,579 households. Approximately 75% (12,470) of the households are families with an average of 3.65 persons/household. The remaining quarter are single-person households, or unrelated roommates. Residents are relatively proportionately divided between adults (age 20 to 59), seniors (60 and over), youth (19 and under) (Chart 1). In this respect the seven tracts surrounding Study Area have a similar age makeup as the City as a whole. Within the vicinity of the Study Area, almost all (95%) of 5 to 19-year-olds are enrolled in school, including preschool through college. Of those enrolled, 96% (~9,700) are attending public schools (USCB 2018). As discussed in this report, because the Study Area is located between residential areas and their assigned schools, it has the potential to be an important route to school. The large senior population in the area also indicates that the Study Area offers an opportunity for daytime use by retired persons.



Residents primarily speak English at home. While 18% of residents speak a different language at home and 5% of residents do not speak English very well. Amongst households who do not speak English well, 21% speak Spanish, 28% speak an Indo-European language, and 50% speak an Asian-Pacific Islander language (USCB 2018). The majority of residents speak English well meaning there is an opportunity to communicate to Study Area users via using English-language only signage and programs. If signage in additional languages was an interest of the community, Asian-Pacific Islander language signs present the opportunity to reach the most residents.

California's median household income in 2018 was $71,228 and median household income in the City of Roseville is $84,105. Five of the seven census tracts surrounding the Study Area (0210.35, 0210.38, 0210.43, 0210.44, and 0213.22) have a median household income higher than either the state or City, ranging from $98,167 to $120,990. The median household income for tract 0210.37 is $60,927 and for

tract 0210.40 is $45,865. Since tract 0210.40's median household income is less than 80% of the state's median household income, this community is considered low-income. This tract includes residents in an age-restricted senior community, many of whom are on fixed incomes. Within these seven tracts, 4,105 residents (~9%) are reported to be below poverty level, with 925 of these residents under the age of 18. Poverty level compares family size and composition against income thresholds to determine who falls below the threshold. These thresholds are defined by the Census Bureau, with the poverty threshold for a family of four being $25,701 in 2018 (USCB 2019). Ensuring that residents below the poverty level and low-income communities have access to and benefit from any improvements within the Study Area is important for the health and wellbeing of these more vulnerable community members.

Residents 16 and older generally have access to vehicles with 82% having access to 2 or more vehicles, 16% having access to one vehicle, and 2% having access to no vehicles (USCB 2018). With this ready access to cars, it is more likely that the site will be used by youth commuting to school or for recreational purposes than as a way for residents to get to work.

Of housed residents within these six tracts, 95% have a computer and broadband internet connection at home, 3% have a computer, but no internet subscription, and 2% have no computer. Within tracts 0201.37 and 0201.40, respectively, only 83% and 84% of housed residents have access to both a computer and broadband internet connection. While the majority of local residents can access information about recreation opportunities or limitations online, additional analog outreach and communication efforts may be needed to reach all community members in the two tracts with lower internet access.

Mahany Park Open Space Trail

0213.22

0210.40

0210.44

0210.43

0210.37

0210.38

0210.35

STUDY AREA

Fiddyment Rd

Pleasant Grove Blvd

Junction Blvd

Woodcreek Oaks Blvd

Foothill Blvd

Baseline Rd

Legend

Study Area

Census Tracts

0 2,000 Feet

N

Source: Aerial (SanGIS, 2014); Zoning (SanGIS 10/2016)

K:\Projects\CYCR5-03_MahanyTrails\GIS\Project_Files\Figure4_CensusTract.mxd Layers 9/15/2020 - DanielB

HELIX Environmental Planning

Census Tracts

Figure 4

3.0 OPPORTUNITIES AND CONSTRAINTS

The existing natural resources, built elements, and extensive informal use of the Study Area present both design opportunities and constraints.

3.1 BIOLOGICAL RESOURCES

The Study Area includes a variety of habitats that are home for many species of wildlife and plants. The majority of the Study Area is annual grassland habitat. Natural and constructed vernal pools and seasonal wetlands occur within the annual grassland habitat. Oak woodland habitat occurs in the eastern to central portion of the Study Area and riparian woodland habitat occurs along Kaseberg Creek in the northeast portion of the Study Area. Smaller seasonal drainages cross the center of the Study Area, flowing from south to the north before joining Kaseberg Creek. The Study Area contains 259 native oak trees protected under the City of Roseville Tree Ordinance and an additional 502 non-protected trees. Special-status species are those that are legally protected under state, Federal, or local codes or that receive consideration during California Environmental Quality Act (CEQA) review. The habitats in the Study Area provide potential habitat for 24 special-status wildlife species and 9 special-status plant species, as well as many more common species. Detailed descriptions of these habitats and species are included under separate cover (HELIX 2020).

Many of the biological resources found in the Study Area are legally protected under Federal, State, or local regulations. As discussed previously in Section 2, the open space was established primarily to protect these resources, specifically the vernal pools, creeks, drainages, other wetlands, riparian habitat, and protected oak trees (Figure 5). Vernal pools are wetlands that hold water in the winter and spring. They are a unique habitat and home to many endemic species that are found only in California's Central Valley, including a number of species on the Federal and State endangered species lists. Creeks, drainages, and other wetlands are protected by both Federal and State laws regulating water quality. Riparian habitat is protected by the State of California under the Fish and Game Code. Although oak woodlands as a whole do not merit special legal protections in the City, individual oak trees with a trunk diameter of 6-inches or greater are protected by the City of Roseville Tree Ordinance. Additionally, special-status species are protected regardless of the habitat in which they are found. Before disturbing any of these protected resources, a permit and coordination with the appropriate agency may be required. Failure to obtain approvals prior to disturbance can result in fines or even jail time, depending on the severity of the impact.

The legal requirements to protect these features constrain where trails and associated amenities can be located and limit where users should be allowed access. These habitats also present an opportunity for education and passive recreation which can be fostered through interpretive signage and placement of benches and rest points to encourage observation. The trees also provide shade in an otherwise exposed area, which, based on the many user-created trails along and through the shaded areas, is desirable to users. Design recommendations to protect the sensitive biological resources are summarized in Table 1 below (HELIX 2020).

Table 1
SUMMARY OF BIOLOGICAL RESOURCE AVOIDANCE RECOMMENDATIONS

Sensitive Resource	Avoidance Measures During Design	Regulating Agency*
Habitat		
Vernal Pool Habitat	Avoid direct impacts and minimize impacts to watershed.	USACE, RWQCB
Riparian Woodland Habitat	Avoid or minimize direct impacts to habitat.	CDFW
Protected Trees	Avoid or minimize development within the tree protection zone.	City of Roseville
Jurisdictional Waters	Avoid or minimize impacts to jurisdictional waters.	USACE, RWQCB
Special Status Species		
Special-Status Plants	Avoid or minimize direct impacts to vernal pools and Kaseberg Creek.	CDFW
Burrowing Owl	Minimize impacts to annual grassland habitat.	CDFW
Swainson's Hawk	Avoid or minimize removal of mature trees from oak woodland and riparian woodland. Minimize impacts to annual grassland habitat.	CDFW
Raptor Nests and Other Nesting Birds	Avoid or minimize impacts within 50 feet of known active nests.	CDFW
Pallid Bat	Preserve dead trees or trees with hollows to the greatest extent feasible.	CDFW
Western Pond Turtle	Avoid or minimize impacts to Kaseberg Creek and within 500 feet of Kaseberg Creek.	CDFW
Western Spadefoot Toad	Avoid direct impacts to and minimize impacts within 800 feet of vernal pools and seasonal wetlands.	CDFW
Vernal Pool Invertebrate	Avoid direct impacts to vernal pools. Minimize impacts to vernal pool watersheds or construction within 250 feet of pools.	CDFW, USFWS
Valley Elderberry Longhorn Beetle	Maintain minimum 20-foot setback from riparian areas that could not be surveyed.	CDFW, USFWS
Andrenid Bee	Minimize impacts to annual grassland habitat.	CDFW

*CDFW – California Department of Fish and Wildlife
RWQCB – Regional Water Quality Control Board
USACE – U.S. Army Corps of Engineers
USFWS – U.S. Fish and Wildlife Service



K:\Projects\CCRS-03_MahanyTrails\Design\FiguresMap-MahanyTrails.dwg

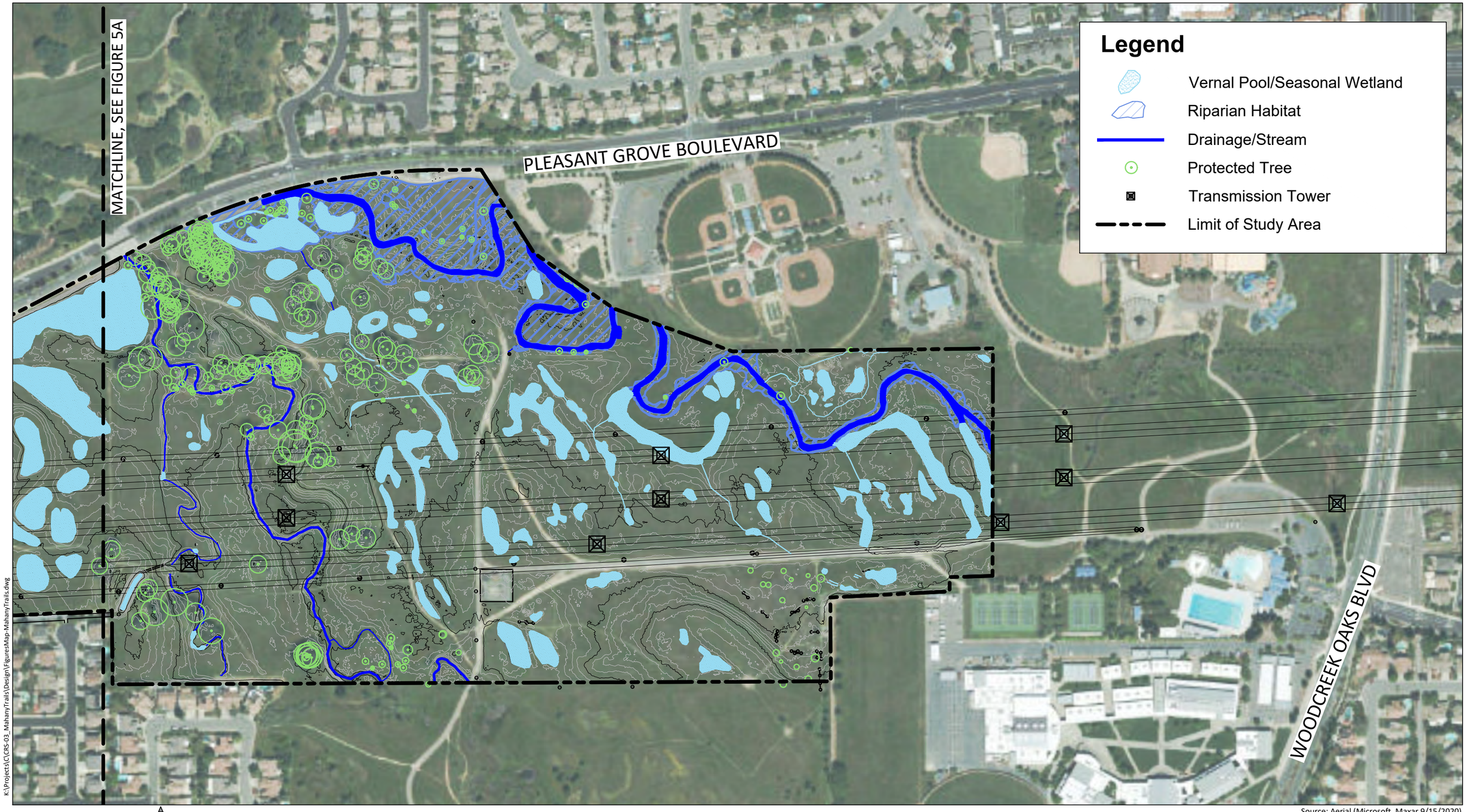
0 280 FEET

Source: Aerial (Microsoft, Maxar 9/15/2020).

HELIX Environmental Planning

Biological Constraints

Figure 5A



K:\Project\C\CRS-03_MahanyTrails\Design\FiguresMap-MahanyTrails.dwg

0 280 FEET

Source: Aerial (Microsoft, Maxar 9/15/2020).

HELIX Environmental Planning

Biological Constraints

Figure 5B

3.2 TOPOGRAPHY AND FLOODPLAIN

The general topography of Study Area consists of rolling and moderately sloped areas, with elevations that range from approximately 116 to 137 feet (35 to 41 meters) above mean sea level (MSL). Variations in the terrain offer just enough rise to allow for views across much of the Study Area. The rolling topography results in multiple high points in the Study Area, some immediately adjacent to Fiddyment Road and others approximately 750' east of Fiddyment Road, shortly before the first set of transmission towers. From here, the land slopes down in terraces to the seasonal drainages or streams that flow from north to south through the center of the Study Area. The eastern half of the Study Area slopes gently down to these seasonal drainages or directly to Kaseberg Creek, which cuts across the northeast corner of the Study Area. Steep slopes, particularly along the north boundary of the site where the grade comes up to meet Pleasant Grove Boulevard, limit access. The far western complex of vernal pools flows towards Fiddyment Road. There are no culverts under Fiddyment Road, so water collects behind the existing sidewalk. Although an area of 100-year floodplain was mapped along Kaseberg Creek and one of the seasonal streams in the General Plan (City of Roseville 2016), the entire Study Area is outside of the 100-year floodplain according to the most recent Federal mapping (FEMA 2018). While this means that proposed improvements are not subject to approval by outside flood control agencies, care should still be taken to avoid designs that might negatively impact the capacity of the creeks and drainages in the Study Area.

3.3 CULTURAL RESOURCES

Archaeological surveys of the Study Area were conducted approximately 40 years ago as part of the development of the surrounding area. One historic site and several prehistoric and historic isolated artifacts were identified within the general vicinity, but none of the artifacts were recommended as potentially unique resources and important cultural resources are not known to occur in the Study Area (Maniery and Maniery 1986). However, since cultural records are constantly being updated, a new cultural records search and archaeological survey should be conducted prior to construction. Additionally, consultation with local tribes should be conducted in accordance with AB 52 or current guidelines.

3.4 USE AND TRAFFIC PATTERNS

In addition to mapping the informal paths, traffic patterns in the Study Area were observed during two formal trail use counts. During each trail use count period observations were made from two locations: at the west end of the Study Area next to Fiddyment Road and at the existing lift station at the eastern end of the Study Area (Figure 6). Trail use was observed on Tuesday, June 2 from 5:00 to 7:00 p.m. and Saturday, June 6 from 7:30 to 9:30 a.m. A total of 84 people were observed using the trails in the Study Area on Tuesday evening and 99 people were observed on Saturday morning. Overall, there was a relatively even mix of pedestrians and bicyclists observed, although 80% of the users were pedestrians on Saturday morning. A total of 15% of pedestrians were accompanied by dogs on Tuesday evening and 30% of pedestrians were accompanied by dogs on Saturday morning. The full results of the trail use counts are included in Appendix C.

An online survey was conducted between Tuesday, May 26, 2020 and Friday, June 12, 2020 to gather information on how people currently access and use the Study Area, what improvements they wish to see, and what concerns they have about creating paved trails. 1,306 people responded to the survey. The access points most frequently used currently are the existing gravel access road on the east and the

west dirt path at Fiddyment Road. Other access points used by more than 15% of respondents include Mahany Park's parking lot, Silverado Oaks Urban Reserve on the south, Pleasant Grove Boulevard underpass, and Pleasant Grove Boulevard by Bear Dog Park. The most desired access points are the existing access road on the east, the outlet at Fiddyment Road, and Bear Dog Park. Other popular access points, desired by more than 15% of respondents, include Mahany Park, the Roseville Aquatics Complex, Woodcreek High School, Silverado Oaks Urban Reserve, the greenbelt bike path at Roadrunner Court, at the end of Bottlebrush Circle, at the intersection of Sun City Boulevard and Pleasant Grove Boulevard, and at the Pleasant Grove Boulevard underpass (Figure 6). The online survey results are included in Appendix D.

A preliminary traffic study was prepared examining turning movements and collisions at major intersections surrounding the Study Area. This study categorizes Pleasant Grove Boulevard and Fiddyment Road as 4+ lane roads with raised medians, speed limits of 45 and 50 miles per hour (MPH) respectively, and vehicle average daily traffic exceeds 15,000. Woodcreek Oaks Boulevard is categorized as 4+ lanes with a raised median and a speed limit of 40 MPH and vehicle average daily traffic between 9,000 and 15,000. The study recommends if at-grade crossings across any of these roads are considered, they include high-visibility crosswalk markings, adequate nighttime lighting levels, crossing warning signs, Advance Yield Here To (Stop Here For) Pedestrians sign and yield (Stop) line, and Pedestrian Hybrid Beacon (PHB) or pedestrian signals. A pedestrian over crossing or tunnel may be an appropriate solution depending on the future connections and development of the trail network. Three collisions involving a pedestrian or bicycle were identified between 2015 and 2019, one near the Fiddyment Road – Westhills Drive intersection, and two near the Pleasant Grove Boulevard – Woodcreek Oaks Boulevard intersection. Since the accident at Fiddyment Road – Westhills Drive, the intersection has been signalized. Vehicle collisions from 2015 to 2019 are more broadly analyzed, showing the most frequently reported factor in collisions was unsafe speed on study roadways and the most frequently reported collision types were rear-end and broadside collisions (Fehr and Peers 2020).

Based on the results of these studies, most people are traversing the site from Fiddyment Road in the east to Mahany Park in the west and from the end of the existing paved multi-use trail in the south to the Pleasant Grove Boulevard undercrossing (Figure 6). There is high demand for access from Mahany Park, indicating that the Study Area may be providing a City or regional amenity with many users driving to the site from elsewhere to use the existing paths, rather than accessing it strictly from local neighborhoods. Also of note, is the strong preference in the online survey for access near Bear Dog Park, which is reflected in the significant number of dogs observed during the trail use counts.



K:\Projects\C\CRS-03_MahanyTrails\Design\FiguresMap-MahanyTrails.dwg

Source: Aerial (Microsoft, Maxar 9/15/2020).

HELIX Environmental Planning

Access Points

Figure 6

3.5 POINTS OF INTEREST

Points of interest, locations within the Study Area with good views or that provide unique educational opportunities, are shown on Figure 7. The viewshed within the Study Area is broad, with relatively flat topography allowing views in most directions until built structures such as fences, walls, and houses or other buildings obstruct the sightline. Present within almost any view in the open space are the electrical towers, poles, and power lines that run the length of the site. In addition to their visual presence the high-voltage transmission lines (owned by SMUD and WAPA) emit a low humming/buzzing sound which is audible when walking the Open Space. The views onsite also include broad expanses of vernal pools surrounded by annual grassland to the west and woodland through the center and to the north. To the east more grassland and vernal pools are visible as well at Mahany Park and the perimeter of Woodcreek High School. The clear views of the vernal pools and woodlands create educational opportunities.

The Study Area provides opportunities for both passive and active education about a myriad of topics. The presence of many natural resources can inspire education about the species and habitats found in the Study Area or the importance of environmental stewardship. The many utility features in the Study Area and proximity to the Utility Exploration Center create an opportunity to incorporate utility-related interpretive signage along the propose Bike Trail to encourage users to think about how their actions at home influence their City. Passive education may take the form of interpretive signs, digital or paper nature trails, or similar activities that can be used at will by visitors to the Study Area. Some active education is already underway in the form of tours for local elementary schools by the Woodcreek High Nature Area class (Appendix A). Additional tours for the general public or clean-up days are examples of active education activities.

3.6 CONSTRUCTED FEATURES

There are many constructed improvements in the Study Area, both formal and informal. Formal improvements include a paved multi-use trail connecting to Silverado Oaks Urban Preserve to the south; gravel maintenance access road connecting the sewer lift station to Mahany Park to the east; perimeter post and cable fence, gates, retaining walls, and soundwalls; utilities; and preserve signs. Informal improvements consist of user-created paths, bike jumps, fairy gardens, and makeshift bridges, typically of plywood, scrap lumber, or branches. Historically, the City has removed informal bridges due to safety concerns and because they were not approved by regulatory agencies through the proper permit processes. Interventions show areas where users have intervened in the landscape for example by repairing an informal path or digging a hole. Conflicts highlight locations where user needs are in direct conflict with the site, for example where informal paths cross fences or creeks. Constructed features are shown on Figure 6 and photographs of representative features are shown in Appendix B.

3.6.1 Informal Paths

The Study Area has many informal paths crossing the site (Figure 7). These paths range from 1-foot wide tracks where the foliage is flattened or sparse to well-defined bare dirt paths up to 8-feet wide. One of the two largest paths run east to west across the site beginning on the west side at Fiddyment and merging into the gravel maintenance access road on the east side. The other large path runs northwest to southeast from the Pleasant Grove Boulevard underpass to the existing bike path just north of the bridge. Smaller paths cut in from the cul-de-sacs of the surrounding neighborhoods, connecting to the main east-west path. There are also smaller paths connecting Mahany Park and Bear Dog Park and a few

other meandering paths, primarily in the north-central portion of the site. These paths cross the creeks in multiple locations. At these locations there are signs that users have been frequently crossing the creek including muddy bicycle tracks and footprints, debris such as plywood, sticks, and rocks to create stepping stones or temporary bridges, and signs of informal bridges which have been removed. These paths are both directly and indirectly impacting the sensitive biological resources, although they are generally routed away from vernal pools and the creek. While these paths are useful to the design process because they clearly show how users wish to access the site, they are in conflict with the City's goals and environmental regulations to protect natural resources.

3.6.2 Connections to Existing Trails

There are four existing paved multi-use trails that enter the Study Area and connect it to the larger City-wide trail system. Just east of the Roadrunner Court cul-de-sac, a paved multi-use trail ends at the southern boundary of the Study Area. Paved multi-use trails in Mahany Park on east boundary of the Study Area end in a gravel maintenance access road leading to the existing sewer lift station. The third multi-use trail extends from Silverado Oaks Urban Preserve in the south, runs north past the sewer lift station, and ends south of Kaseberg Creek. An undercrossing on the northern boundary where Kaseberg Creek flows under Pleasant Grove Boulevard connects the existing bike trails to the north with the Study Area. All of these terminated trails continue with user-created paths, indicating a desire to have them connect to each other, the larger site, and other destinations. Connecting to these existing trails provides an opportunity for greater connectivity.

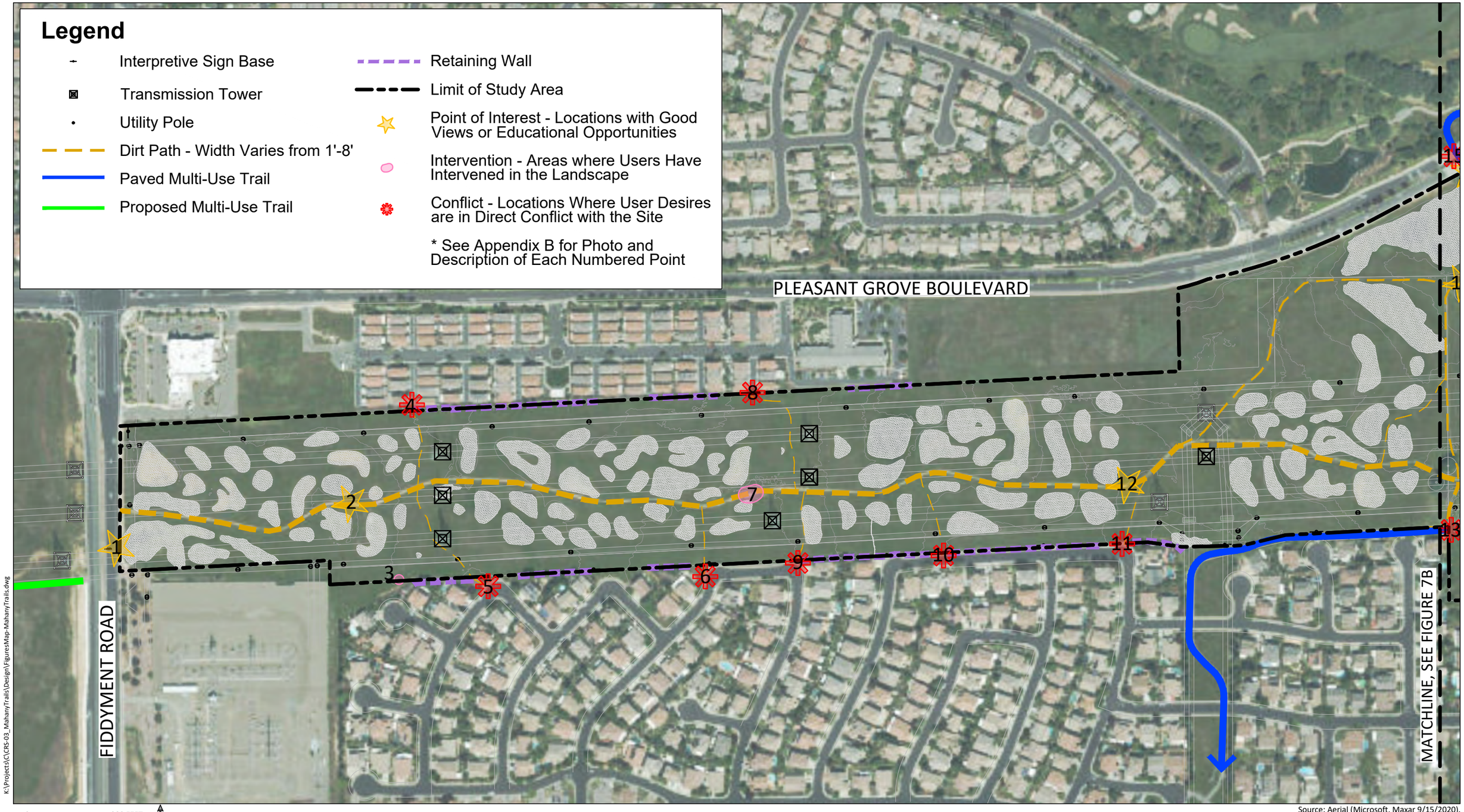
3.6.3 Utilities

Extensive overhead and underground utilities run through the Study Area (Figure 8). The City of Roseville Electric Utility Department (Roseville Electric) has two sets of power lines on wood poles within easements within Mahany Open Space. Sacramento Municipal Utility District (SMUD) has one set of high voltage transmission lines on transmission towers within an easement within Mahany Open Space. Western Area Power Administration (WAPA) has two sets of high-voltage transmission lines, each on their own set of transmission towers within an easement within Mahany Open Space. A sewer trunk line crosses the eastern half of the site from north to south. A sewer lift station is associated with a sewer force main which extends east from the sewer lift station under the gravel maintenance access road.

Legend

- Interpretive Sign Base
- Transmission Tower
- Utility Pole
- Dirt Path - Width Varies from 1'-8'
- Paved Multi-Use Trail
- Proposed Multi-Use Trail
- Retaining Wall
- Limit of Study Area
- Point of Interest - Locations with Good Views or Educational Opportunities
- Intervention - Areas where Users Have Intervened in the Landscape
- Conflict - Locations Where User Desires are in Direct Conflict with the Site

* See Appendix B for Photo and Description of Each Numbered Point



K:\Projects\CC\CRS-03_MahanyTrails\Design\FiguresMap-MahanyTrails.dwg

0 280 FEET

Source: Aerial (Microsoft, Maxar 9/15/2020).

HELIX Environmental Planning

Opportunities and Constraints

Figure 7A

MATCHLINE, SEE FIGURE 7A

PLEASANT GROVE BOULEVARD

WOODCREEK OAKS BLVD

Legend

- Open Space Sign
- Interpretive Sign Base
- Transmission Tower
- Utility Pole
- Dirt Path - Width Varies from 1'-8'
- Paved Multi-Use Trail
- Maintenance Access Road
- Proposed Multi-Use Trail
- Limit of Study Area
- Point of Interest - Locations with Good Views or Educational Opportunities
- Intervention - Areas where Users Have Intervened in the Landscape
- Conflict - Locations Where User Desires are in Direct Conflict with the Site

* See Appendix B for Photo and Description of Each Numbered Point

K:\Projects\CV\CRS-03_MahanyTrails\Design\Figures\Map-MahanyTrails.dwg

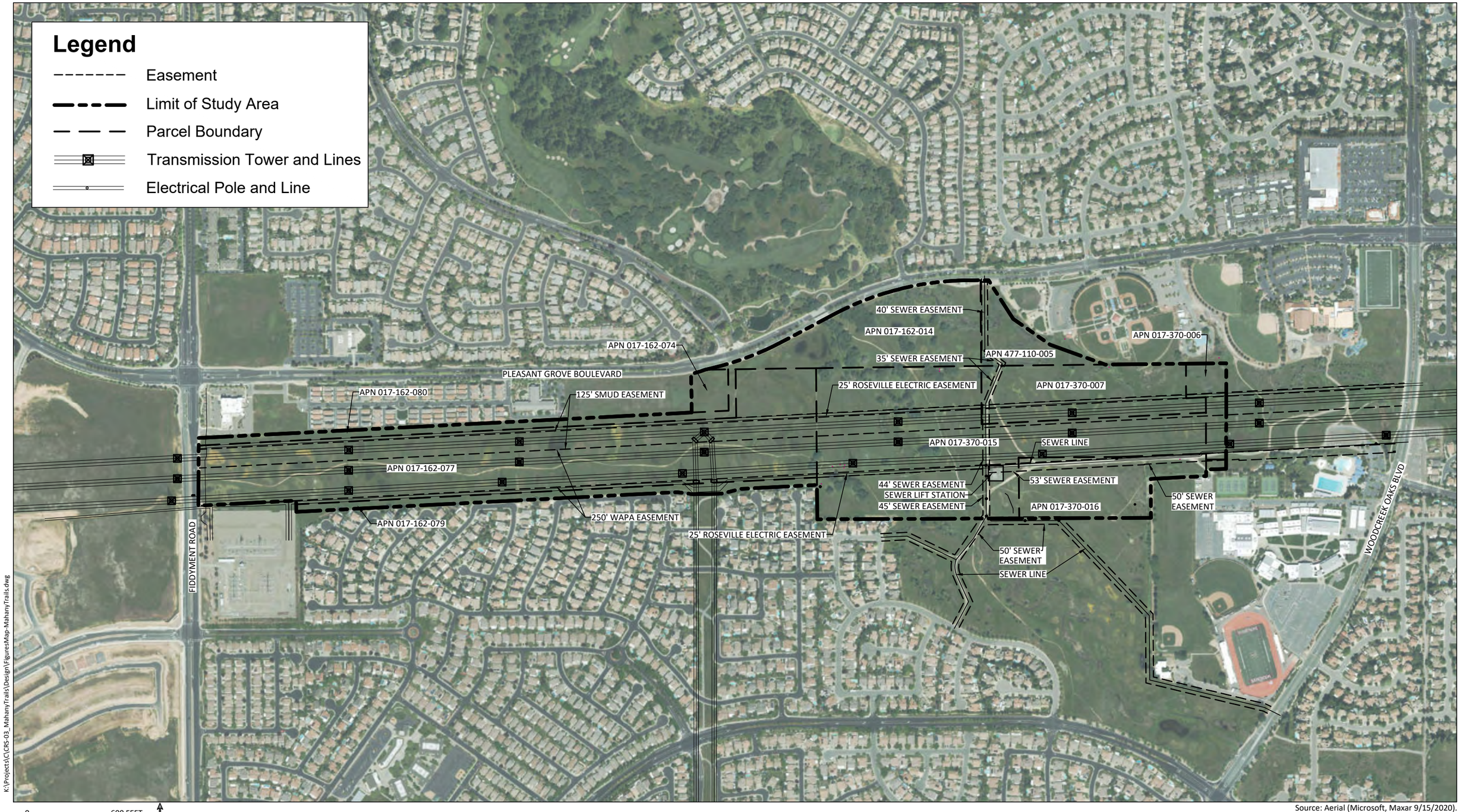
0 280 FEET

Source: Aerial (Microsoft, Maxar 9/15/2020).

HELIX Environmental Planning

Opportunities and Constraints

Figure 7B



K:\Project\C\CRS-03_MahanyTrails\Design\FiguresMap-MahanyTrails.dwg

0 600 FEET

Source: Aerial (Microsoft, Maxar 9/15/2020).

HELIX Environmental Planning

Utilities and Easements

Figure 8

4.0 TRAIL DESIGN GUIDELINES

A number of documents provide guidelines for trail design and development in the City of Roseville. Additionally, the Study Area includes Open Space Preserves established to protect sensitive natural resources and which are therefore subject to additional restrictions, as well as extensive utility infrastructure. Applicable design guidelines are discussed in the sections below and summarized in Table 2.

4.1 OPEN SPACE PRESERVE OVERARCHING MANAGEMENT PLAN

As discussed in Section 2, the OSPOMP provides guidelines for restoration of various habitats. These guidelines should be integrated into the final project to restore areas impacted by informal dirt trails, user interventions, and other disturbances to the open space preserve. Applicable restoration measures in the OSOMP include:

- The restoration of grassy upland areas includes seeding, temporary erosion control measures, and invasive plant removal. These guidelines apply to damaged areas of grassland habitat.

- The restoration of accidental fill of wetlands of the U.S. includes notifying the USACE and USFWS, removal of fill, minor regrading, and revegetation. These guidelines may apply where dirt paths cross or veer into wetlands.

- The restoration of fencing and signage includes fixing, upgrading, or replacing the section of fencing or the sign which was damaged to its original specifications. These guidelines apply to damaged or graffitied signs or fences.

- The restoration of erosion can include minor grading and reseeding with native seeds to stabilize exposed soil, use of straw wattles, or the installation of turf reinforcement mat/erosion control blanketing, or other erosion control methods approved by the city engineer in consultation with the open space manager. These guidelines apply to areas eroded by repeated pedestrian or bicycle use.

- The restoration of undesignated trails includes adding signage, repairing fencing, ripping soil and spreading native seed mix, and distributing flyers to residents near the Open Space. These guidelines apply to the dirt paths throughout the Study Area.

- The restoration of un-permitted bike jumps/trails includes dismantling jumps in upland areas using shovel or small equipment. No loose soil is to be put in the wetlands unless the soil was removed from the wetlands resulting in a hole. If the construction of bike jumps impacted the wetlands, the Open Space manager will notify the USACE and USFWS. These guidelines apply wherever there are un-permitted bike jumps.

- The restoration of landscaping or gardens includes notifying the party responsible, requesting corrective action, and then requiring payment if the City has to correct the problem. This protocol would apply to the fairy garden established near the sewer lift station.

Additional design requirements in the OSPOMP include:

- Where fencing along roadway and bike trails is required by an Agency permit, fencing will be post and cable, four-foot black vinyl covered chain link, four-foot tubular steel, guard rail, or concrete rail fencing.

- Bollards are to be placed in locations where trails enter the Open Space to prevent unauthorized vehicle access. Gates are currently installed to allow access for maintenance crews, emergency vehicles, and/or monitoring staff.

- The City may install additional open space preserve signs as needed. The City may also install interpretive signs near the various native communities which education the public about native communities, their conservation, common species, and which encourage respect. Included in the appendix of the OSPOMP are guidelines for the design open space preserve and interpretive signs and sign examples.

4.2 CITY OF ROSEVILLE DESIGN AND CONSTRUCTION STANDARDS

The City of Roseville Design and Construction Standards (City Standards) are requirements for the design and construction of civil improvement projects within the City of Roseville. Section 13 – Bikeways provide standards to ensure that transportation and recreational bikeways are constructed in a manner that provide a safe and comfortable use by both bicycles and pedestrians. These standards are illustrated in standard details BK-1 through BK-5. Bikeways must be designed to meet the following requirements:

- The minimum paved width for a two-way bike path shall be 10 feet and have a minimum of 2-foot wide graded shoulders adjacent to the pavement.

- If the bike path is located adjacent to a creek, ditch, or downslope greater than 3:1, a minimum shoulder width of 5 feet from edge of pavement to top of slope is required.

- One shoulder shall consist of Class 2 Aggregate Base and the other shall consist of decomposed granite. Where profile grades are 4% or more, the decomposed granite may be stabilized with lime/fly ash or cement treatment or be replaced with Class 2 Aggregate Base.

- A minimum of 3 feet of horizontal clearance to obstructions, including post and cable fencing shall be provided adjacent to pavement where downgrades are less than 4% and a minimum of 5 feet from the edge of pavement where downgrades exceed 4%.

- Maximum recommended grade is 5% but can be 5-6% for up to 800 feet, 7% for up to 400 feet, or 8% for up to 200 feet and signed appropriately as required.

- The vertical clearance required is a minimum of 12 feet when Fire Department access is required, otherwise 9 feet.

- When a bike path is to be located in the City's Floodplain, the path shall be designed to be no more than one foot below the 10-year storm event water surface elevation. The minimum

elevation of the bike path constructed in a floodplain shall coincide with the 2-year water surface elevation.

- Bike bridges shall conform to requirements for pedestrian and bicycle bridges within Caltrans Bridge Design Specifications. Bridge shall have minimum width of 12 feet where Fire Department access is required, or 10 feet where it is not.

- Pavement markings shall be per Caltrans Standard Section 84-3 and California MUTCD Section 9C. 03 and signs per Section 9B. 01.

- Guide signs to roadways, and other points of interest shall be provided at trail junctions and as determined by City Engineer.

- Entry points to bike paths shall be designed to prevent unauthorized vehicle entry, which may include signage (City of Roseville 2020a).

4.3 UTILITIES

As discussed in Section 3 and shown on Figure 7, a number of utility easements cross the Study Area and the entire western half of the Study Area largely occurs within utility easements. While some design guidelines for the various utilities apply only to the areas within their easements, shared improvements, such as gates and access roads should be designed to meet the most stringent requirements.

4.3.1 Roseville Electric

Roseville Electric reviews plans as part of the City's standard process for electronic plan review (Roseville Electric 2020a). Relevant Roseville Electric design requirements include:

- No grading within 10 feet of electrical poles without notification (Roseville Electric 2020a).

- Maintenance roads must be minimum three-inch-thick asphalt over eight-inch-thick aggregate base (Roseville Electric 2020b).

4.3.2 SMUD

SMUD's Guide for Transmission Encroachment considers 'passive recreational parks', including trails, as acceptable secondary uses within transmission easements so long as they do not impact SMUD's ability to enjoy its full rights within its easements (SMUD 2013). SMUD requires an application and improvement plans be submitted to their Land Specialist within their Real Estate Services Department for internal review and approval (SMUD 2020). Relevant SMUD specific design requirements include:

- No excavation within 10 feet of any structure shall be allowed (SMUD 2008).

- Grading must maintain safe clearances (15' for wood pole or anchor, 25' for steel lattice tower and steel pole) and any fill shall be compacted to 90% maximum dry density (SMUD 2013).

- Joint use of public facilities is not allowed, and existing access road may not be impacted by installation of a trail. Access roads must be provided if current access road is impacted (SMUD 2013).

- Where a fence or wall restricts access to a SMUD right of wall, gates are required. Gates must have a minimum of 15' opening and be provisioned for a SMUD standard lock (SMUD 2013).

- Any metal structures within the right of way are to be properly grounded (SMUD 2008).

- Any vertical structure shall not exceed 15 feet in height (SMUD 2013).

- Construction activities within 25 feet of transmission towers will require the presence of a SMUD inspector onsite prior to the beginning of any work in that area (SMUD 2013).

4.3.3 WAPA

WAPA requires all improvement plans be submitted to their Reality Specialist for internal review and approval (WAPA 2020a). Relevant WAPA specific design requirements include:

- Thirty feet of unobstructed access is required around towers. If trails do not restrict maintenance equipment access, they may be allowed within 30 feet of the transmission line structure, particularly if they double as a maintenance road (WAPA 2020a).

- No ground elevation changes are allowed within 20 feet of a transmission line structure. (WAPA 2020b).

- A 14-foot wide gate is required on any fence which restricts access to their equipment. (WAPA 2020b).

4.3.4 Sewer

The City of Roseville operates and maintains the sewer system. Sewer reviews plans as part of the City's standard process for electronic plan review (City of Roseville 2020d). Although the existing sewer trunk line and lift station are not located in a separate easement, the City of Roseville Design and Construction Standards provide the following guidance for development around sewer lines:

- Easement width must be minimum of 15 feet centered on sewer line and their minimum width must be equal to the trench width plus two additional feet for every one foot of depth of pipe.

- No trees or permanent structures are allowed within easement.

- A minimum 12-inch clearance from top of pipe to any other utility or improvement.

- Load on pipe must not exceed that allowed by pipe rigidity, as determined by Marston's formula (City of Roseville 2020a).

- The sewer force main and lift station may be utilized for future wastewater and recycled water projects, so access for construction and operation and maintenance vehicles and personnel to these sites must be maintained.

- In order to accommodate future projects within the sewer lift station, a staging area of approximately 10,000 square feet adjacent to the sewer lift station will be required. Construction of a multi-use trail must not interfere with this staging area (City of Roseville 2020c).

- Where existing sewer force main runs under the gravel maintenance access road, any future paving must not damage the sewer force main.

- Any new paving along the gravel maintenance access road must be able to withstand access by a vactor truck (a large, 3 axeled, vacuum tractor truck). A standard City bike lane is an adequate width (City of Roseville 2020d).

Table 2
SUMMARY OF DESIGN GUIDELINES

Source	General Trail Design	Trail Width	Fencing and Trail Access	Gates	Setbacks	Signage and Educational Opportunities	Approval Requirements
Open Space Preserve Overarching Management Plan (OSPOMP) 2011	Paved bike trails to have adequate width, grade, visual clearance, and surface materials to provide safe passage for anticipated users of all abilities. Within Open Space Preserve, reclaim social trails and eliminate access to entry points. Within General Open Space, reclaim social trails only if the Open Space Manager determines they are negatively impacting Preserve resources.		Install fencing adjacent to trails and overlook points. Fencing will be post and cable, four-foot black vinyl covered chain link, four-foot tubular steel, guard rail, or concrete rail fencing. Bollards are placed in locations where trails enter into the Open Space to prevent unauthorized vehicle access.	Gates are currently installed to allow access for maintenance crews, emergency vehicles, and/or monitoring staff.	Avoid trails through sensitive habitats such as vernal pool grassland.	Install additional open space preserve signs as needed. The City may also install interpretive signs near the various native communities which education the public about native communities, their conservation, common species, and which encourage respect. Discourage Vandalism and other unwanted activities by taking a comprehensive approach to enforcement that includes signage, patrols, and a telephone hotline for reporting violations. Install consistent Open Space signage that is constructed out of materials that are not easy to damage. Educate residents regarding City leash laws. Encourage safe and appropriate use of the City's Open Space by schools conducting environmental education. (Sample open space and interpretative signage provided in OSPOMP.)	Existing trails were either permitted and installed as part of the development requiring an Open Space Preserve or were permitted separately as their own project within the General Open Space. When plans are developed, the Project Proponent will coordinate with the appropriate State and Federal Agencies from approval of all required permits including Section 7 or 10 consultation with the USFWS.
City of Roseville Bicycle Master Plan 2008	Estimated 0.77 miles of trail in Project Area at cost of $1.3 million a mile.					Recommend installation of bike parking, mile markers and destination guide signs, and trail maps at trailheads.	
City of Roseville Design/Construction Standards	Trail shall be minimum 2" asphalt over 4" aggregate base. Base must be greater if vehicular or emergency access is required. One shoulder shall be decomposed granite paving and the other should be Class 2 aggregate base. Sections over 4% can have Class 2 aggregate base on both sides or decomposed granite paving may be stabilized with lime/fly ash or cement treatment. Design speed for 20 mph. If downgrade exceeds 4%, minimum design speed shall be 30 mph. Maximum grade recommended is 5% and 2% cross slope.	Minimum width to be 10' for two-way trail and 5' for one-way. Trail shall have a 2' shoulder on both sides of pavement. Clear width on structures between railings shall not be less than 12'. When fire access is required, 12' clear width required.	Post and cable fencing to be a minimum 3' clearance from adjacent pavement. Design trail access to prevent unauthorized vehicular entry.	Access points with a width of 20' shall be placed at intervals of 750' and cable must be coated with yellow to designate access and padlock provided on both ends	Minimum 3' clearance to permanent obstructions where downgrades are less than 4%, 5' when over 4%. If trail is adjacent to a continuous fixed object, a 4" white edge line, 2' away from the fixed object is required. 5' minimum from top of slope if adjacent to creek, ditch, or downslope greater than 3:1.	See California Manual on Uniform Traffic Control Devices Section 9B.01. Shared-use paths shall conform to 9B-1 for Class I trails. Trail junctions shall have guide signs and as determined by City Engineer. Entrances shall have entry signs with regulatory sign prohibiting motor vehicle entry. Trail segments greater than 5% slope shall be posted with appropriate warning sign.	Bike bridges to support gross pounds but shall include maintenance vehicle traffic loading with approval of Fire Department and City Engineer. vehicular weight of less than 30,000 Letter of Map Revision may need to be submitted to FEMA for approval as determined by public works for bridges in floodplains. Bikeway improvement plans must be accepted by Development Services Engineering Division and meet requirements of Section 3 "Plan Sheet Requirements".

Table 2 (cont.**)**
SUMMARY OF DESIGN GUIDELINES

Source	General Trail Design	Trail Width	Fencing and Trail Access	Gates	Setbacks	Signage and Educational Opportunities	Approval Requirements
City of Roseville Design/Construction Standards (cont.)	Bikeway design must conform to "Guide for Development of Bicycle Facilities", Caltrans "Bikeway Planning and Design", CA Manual on Uniform Traffic Control Devices for Streets and Highways", and any relevant Specific Plan. Stopping site distances per Section 7-12 and figure 1003.1D of Caltrans Highway Design Manual. Lateral clearance and horizontal curves shall conform to 1003.1F from Caltrans.						
SMUD	SMUD's Guide for Transmission Encroachment considers features they term 'passive recreational parks' which includes trails, as acceptable secondary uses within transmission easements so as not to impact SMUD's ability to enjoy its full rights within its easements. Joint use of public facilities is not allowed, and existing access roads may not be impacted by installation of a trail. Access roads must be provided if current access road is impacted.		Metal structures within ROW must be properly grounded. Vertical structures cannot be more than 15' high.	15' gates are required where wall or fence restricts access.	No grading within 15' of wood poles and 25' from steel structures. Construction activities within 25' of structures require presence of SMUD inspector onsite prior to work beginning. No excavation within 10' of any structure.		Plans must be submitted to their land specialist within Real Estate Services department for approval.
WAPA	No maintenance road guidance provided.			14' gate needed on any proposed fence that restricts access to equipment	30' unobstructed access around towers. Trails can be within 30' buffer if they do not restrict maintenance equipment access or double as maintenance road. No ground elevation changes allowed within 20' of structures.		Need improvement plans submitted to their Reality Specialist for approval.
Roseville Electric	Maintenance roads must be minimum three-inch-thick asphalt over eight-inch-thick aggregate base.				No grading within 10' of electrical poles without notification.		Roseville Electric reviews plans as part of the City's standard process for electronic plan review.

Table 2 (cont.**)**
SUMMARY OF DESIGN GUIDELINES

Source	General Trail Design	Trail Width	Fencing and Trail Access	Gates	Setbacks	Signage and Educational Opportunities	Approval Requirements
Roseville Sewer	Where sewer line is present, the sewer easement width is a minimum 15' centered on sewer line and their minimum width must be equal to the trench width plus two additional feet for every one foot of depth of pipe. The sewer force main and lift station may be utilized for future wastewater and recycled water projects, so access for construction and operation and maintenance vehicles and personnel to these sites must be maintained. In order to accommodate future projects within the sewer lift station, a staging area of approximately 10,000 square feet adjacent to the sewer lift station will be required. Construction of a multi-use trail must not interfere with this staging area.		Any new paving along the gravel maintenance access road must be able to withstand access by a vactor truck (a large, 3 axle, vacuum tractor truck). A standard City bike lane is an adequate width		Where existing sewer force main runs under the gravel maintenance access road, any future paving must not damage the sewer force main. Within a sewer easement: -No trees or permanent structures are allowed. - A minimum of 12" clearance required from top of pipe to any other utility or improvement. - Load on pipe must not exceed that allowed by pipe rigidity.		Sewer reviews plans as part of the City's standard process for electronic plan review.
U.S. Fish and Wildlife Service					Avoid direct impacts to vernal pools. Evaluation of Indirect impacts will be based on impact to pool microwatersheds. Development downhill/ downstream from pools will have less impact.		Section 7 or 10 consultation prior to construction. Possible Incidental Take Permit, depending on project footprint and sensitive resources.
California Department of Fish and Wildlife					Avoid direct impacts to riparian vegetation and creek channels.		Submit 1600 Permit application prior to construction. Possible Incidental Take Permit, depending on project footprint and sensitive resources.
U.S. Army Corps of Engineers					Avoid direct impacts to waters of the U.S.		No involvement unless direct impacts to jurisdictional waters of the U.S., in which case Section 404 permit is needed prior to construction.

5.0 REFERENCES

Dry Creek Joint Elementary School District (DCJESD). 2020a. School Attendance Area. [Cited April 16, 2020]. Available from: https://dcjesd-ca.schoolloop.com/pf4/cms2/view_page?d=x&group_id=1346926119723&vdid=in2k4d1qv2hbfm.

2020b. Silverado Middle School [Internet]. [Cited April 16, 2020]. Available from: https://sms-dcjesd-ca.schoolloop.com/.

2020c. Coyote Ridge Elementary School [Internet]. [Cited April 16, 2020]. Available from: https://cr-dcjesd-ca.schoolloop.com/.

2020d. Quail Glen Elementary School [Internet]. [Cited April 16, 2020]. Available from: https://qg-dcjesd-ca.schoolloop.com/.

Federal Emergency Management Agency (FEMA). 2018. November 2. National Flood Insurance Program Flood Insurance Rate Map. Placer County, CA and Incorporated areas. Panel 939. Version 2.3.3.3. Map Number 06061C0939H.

Fehr and Peers. 2020, July 30. Existing Transportation Conditions near Mahany Park. Roseville, CA.

HELIX Environmental Planning, Inc. April 2020. Mahany Park Open Space Trail Biological Constraints Report. Folsom, CA.

Maniery, J and Maniery, M. 1986, January. Cultural Resource Inventory and Evaluation of Rich, Shenker, and Carlsberg Parcels, Roseville Placer County California.

MySchoolLocation. 2020. Roseville City School District [Internet]. [Cited April 16, 2020]. Available from: https://myschoollocation.com/rosevillecitysd/.

Roseville, City of. 2020a, January. City of Roseville Design and Construction Standards. Available from: https://www.roseville.ca.us/government/departments/development_services/engineering_land_development/construction_management_inspection/design_construction_standards.

2020b. Property Information Tool [Internet]. [Cited 2020, April 16]. Available from: https://www.roseville.ca.us/government/departments/development_services/engineering_land_development/property_information_and_maps.

2020c. March 13. Personal communication with T. Jordan, Senior Engineer, Environmental Utilities Department.

2020d. July 27. Personal communication with T. Jordan, Senior Engineer, Environmental Utilities Department.

2017. March. Zoning Map [Internet]. [Cited 2020, April 16]. Available from: https://www.roseville.ca.us/UserFiles/Servers/Server_7964838/File/Government/Departments/Development%20Services/Planning/Zoning%20Information/Zoning_30X40_2017%20FINAL_20170324. pdf.

2016. June 15 [last amended 2016, August 17.] City of Roseville General Plan 2035. Available from: https://www.roseville.ca.us/government/departments/development_services/planning/general_plan_development_guidelines.

2011. August 5. City of Roseville Open Space Preserve Overarching Management Plan. Available from: https://www.roseville.ca.us/government/departments/development_services/planning/citywide_planning_documents/open_space_preserve_overarching_management_plan.

2010. May 5. Sierra Vista Specific Plan. Available from: https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=8775140.

2008. City of Roseville Bicycle Master Plan. Available from: https://www.roseville ca.us/UserFiles/Servers/Server_7964838/File/Government/Departments/Public%20Works/Biking%20&%20Walking/Planning/2008%20Bicycle%20Master%20Plan2. pdf.

1997. August 6. [last amended 2008, March 19.] North Roseville Specific Plan. Available from: https://www.roseville.ca.us/cms/One. aspx?portalId=7964922&pageId=8775124.

1993. December 15. [last amended 2007, March 28.] Del Webb Specific Plan. Available from: https://www.roseville.ca.us/government/departments/development_services/planning/specific_plans_planning_areas/del_webb_specific_plan.

1989. May 10. [last amended March 4, 2009.] Northwest Roseville Specific Plan. Available from: https://www.roseville.ca.us/cms/One. aspx?portalId=7964922&pageId=8775134.

Roseville City School District (RCSD). 2020a. Barbara Chilton Middle School [Internet]. [Cited April 16, 2020]. Available from: https://chilton.rcsdk8.org/.

2020b. Junction Elementary [Internet]. [Cited April 16, 2020]. Available from: https://junction.rcsdk8.org/.

Roseville Electric. 2020a. Personal communication with Keith Litts, Electric Engineering Tech [April 14, 2020].

2020b. Personal communication with Keith Litts, Electric Engineering Tech [April 9, 2020].

Roseville Joint Unified High School District (RJUHSD). 2020a. Attendance Areas (effective as of 2020-21 School Year). [Internet]. [Cited April 16, 2020]. Available from: https://www.rjuhsd.us/domain/5.

2020b. Therapeutic Intervention Program [Internet]. [Cited April 16, 2020]. Available from: https://www.rjuhsd.us/Page/36.

2020c. Woodcreek High School. [Internet]. [Cited April 16, 2020]. Available from: https://www.rjuhsd.us/woodcreek.

2020d. West Park High School. [Internet]. [Cited April 16, 2020]. Available from: https://www.rjuhsd.us/westpark.

Sacramento Municipal Utility District (SMUD). 2013. January. Guide for Transmission Encroachment. Technical Procedure TP6002.

2008. July. Sacramento Municipal Utility District Requirements and Guidelines for Uses Within Electric Transmission Easement. [Flier].

SMUD. March 23, 2020. Personal communication with J. Hernandez, Principal Electrical Engineer, Grid Assets.

United States Census Bureau (USCB). 2019. Income and Poverty in the United States:2018 [Internet]. [Cited July 20, 2020] Available from: https://www.census.gov/content/census/en/library/publications/2019/demo/p60-266.html.

2018. American Community Survey Census Data [Internet]. [Cited June 26, 2020] Available from: https://data.census.gov/cedsci/?g=0100000US&tid=ACSDP1Y2018. DP05.

Western Area Power Administration (WAPA). 2020a. Personal communication with S. Nielson, Western Area Power Administration I Sierra Nevada Region [March 27, 2020].

2020b. General Guidelines Concerning the Use Of Electric Transmission Line Rights-Of-Way RE: Cottonwood-Roseville and Roseville-Elverta/Fiddyment-Elverta 230-kV Transmission Lines. [Received via e-mail March 26. 2020].

Appendix A

Stakeholder Interviews

This page intentionally left blank

Mahany Park and Open Space Trail Feasibility Study

Stakeholder Questions

Name: Guru Niyam K.

Contact: woodcreekoaksna@gmail.com (e-mail preferred). (707) 718-5526

Date of Interview: 5/15/2020

Interviewed by: JLL

Position: Secretary for Woodcreek Oaks Neighborhood Association.

Ensure they are familiar with the project boundary (website is Roseville.ca.us/mahanytrail)

1. How do you currently use the site?
   Personally enjoys going out and walking through the open space. A few years ago there was a makeshift bridge then it was removed. Ever since bridge removed haven't gone on west side of the open space. Before that used to run all the time. Now will take the kids out to enjoy the spring flowers and vernal pools (used the wrong word – vernen pool). Stays pretty close to the high school now. Really enjoy walking on the dirt trails and reading signs in the nature area.
2. Do you have any concerns about the site as it is currently?
   No bridge. Not exactly a concern, but don't really like walking on the gravel path. Not a lot of shade, so need to plan accordingly.
3. Would you like to use the site differently? If so, what amenities would you like to see?
   Bridge/crossing to allow use of full site.
4. If a multi-use trail was added to the site would you use it? If yes, how?
   Having a bike path has real perks, but also likes dirt trail. Kids and her bike often, but not within preserve because of the dirt. Would bike on it with family if paved. Trys to avoid streets, so would be nice to have more off-street path. There is a balance between wildness of site (which she loves) and the trail, so wants to retain natural feel. Loves how there are fallen trees, wildlife at different times of year.
5. In your opinion, what are the benefits of adding a multi-use trail to the site?
   More off-street bike trail is great. Used to go to dry creek to ride. 1.5 mile each way with playground at end was great there. A multi-use trail presents so much opportunity for younger kids/families. There is a ton of trail on other side of town with miner's ravine, would like more on this side.
6. Do you have concerns about adding a multi-use trail to the site?
   Retain natural feel. Don't want eyesore. People love walking their dogs through there. Some trash cans and signage about picking up after dogs would be great. Maybe more trees/shade. It is nice to have dirt trails to run on too. Maybe keep dirt trails?
7. Are you aware that the site is a preserve put in place to protect the vernal pools and the endangered species they contain?
   Did notice behind the high school the nature area had signs and explained about it. Knew that there were areas to preserve/protect right around nature area (which she was calling Silverado Oaks Preserve, but only actually referencing nature area). Didn't realize the rest of the site was a preserve.

Follow up questions, would you like to see more interpretative signage: Likes the informational signs. Gives kids a way to connect to the space and helps to let her answer questions/prompt discussion. Really likes the idea of having spread out interpretative signage so people don't take it for granted. That's what we get to enjoy about it.

8. Do you have anything you would like to add?
   There is a bike trail that pops out onto Woodcreek oaks. Then you can cross Woodcreek oaks then get onto trail behind the pool which would ultimately take you into Mahany preserve. One thing that could be an issue is people coming from east and want to cross Woodcreek oaks midblock (not at crossing). Trail continues directly on other side of street, this is safety concern. Educate people to go to traffic light. There is a little bridge, keep or remove to deter people? It would be so nice to have a safe midblock crossing. Add signs?
   Would love to connect to the greenbelt to the south.

Mahany Park and Open Space Trail Feasibility Study

Stakeholder Questions

Name: Kendra Grinsell

Contact: 916-624-6405

Date of Interview: 5/13/2020

Interviewed by: JLL

Position: Woodcreek High School Nature Center Coordinator and Science Teacher

Ensure they are familiar with the project boundary (website is Roseville.ca.us/mahanytrail)

1. How do you currently use the site?
   Sit down shows at the two bench areas out there (30 min) then kids hike the trails (down toward bridge then up to bike trail by sub station then through oak grove then down gravel road)
   Group size for tour normally 6-12 plus 4-6 parents that follow. Up to 20 people, typical 15. 2 side by side or single file.
2. Do you have any concerns about the site as it is currently?
   The oak grove area will get paint ballers and pellet gun kids. Dirt bike ramps and forts. Broken branches for 'bunkers' and digging. Less common now. The trail through middle of oak grove overrun with thistle. Now go down under powerlines and have to walk further. Used to turn at oak tree line (by open space sign which leads to digging) now have to go farther west to most exposed area.
3. Would you like to use the site differently? If so, what amenities would you like to see?
   Add trail through oak grove. When first started added native garden – gone now because rodents ate through drip, then drought. Repaired leak and marsh went away. Hoped for post and cabling along trail. Discussed permeant sign, but lots of vandalism of benches and signs. Kids will drink, smoke, start fires by benches. Clean every Monday. Because there are no lights, people can't see youth sitting out there. Will graffiti out there.
   Follow up question: Would you like if trails were paved? Like that its dirt because it feels natural, but kids with disabilities have trouble navigating through mud.
4. If a multi-use trail was added to the site would you use it? If yes, how?
   Would use if they paved gravel road. Will keep their general route regardless of what we do. Have access to only one vernal pool. Left most of the two if looking at signs from gravel road. Permission to dip/look into.
   Follow up question: Do you want water access? Not for nature center program. There is another nature program that isn't realize used yet, but if it takes off, freshman do nature projects and would be helpful to have water access. Kids get access to river between bridges toward Mahany.
5. In your opinion, what are the benefits of adding a multi-use trail to the site?
   More people staying on the paved trail and not wander into grass lands. Access for people with disabilities. More cyclists too.
6. Do you have concerns about adding a multi-use trail to the site?
   Worried about bringing more people to the site. Big problem is dogs off leash, chasing wildlife.

7. Are you aware that the site is a preserve put in place to protect the vernal pools and the endangered species they contain?
   Yes aware.
   Follow up: do you feel this is commonly known? No. We try to educate other people out there. Nobody knows what a vernal pools is. Treated like free open space where you can do whatever you want. Need to be monitored more.
8. Do you have anything you would like to add?
   Kendra asked if the City was looking into more educational pieces. I explained yes, looking into signage.
9. Would you be ok with us asking follow up questions? Would you like to join next weeks education conversation?
   Sure and yes.

Mahany Park and Open Space Trail Feasibility Study

Stakeholder Questions

Name: Scott Corey

Contact: (916) 257-1147

Date of Interview: 5/12/2020

Interviewed by: JLL

Position: Cycling Team (club) Coach

Ensure they are familiar with the project boundary (website is Roseville.ca.us/mahanytrail)

1. How do you currently use the site?
   Team currently uses area. Big event is ride-a-thon 1.25 mile course along trail and they complete multiple laps to raise money.
2. Do you have any concerns about the site as it is currently?
   Not necessarily. Main thing is want to have multi-use environment. Haven't seen any misuse. The ground gets soft/muddy.
3. Would you like to use the site differently? If so, what amenities would you like to see?
   Want to maintain dirt trails. Would like to be able to have training areas for team and potentially for high schools in area. Obstacles and tight turns in areas that are not heavily used. This is something that has been brought up by the league as well (short course racery). Team would be willing to maintain these trails.
4. If a multi-use trail was added to the site would you use it? If yes, how?
   A paved trail would be used by team as well, because we do some training with road bikes, but it will mostly to get from the school to Fiddyment, no actual training on site.
5. In your opinion, what are the benefits of adding a multi-use trail to the site?
   Would benefit the school a lot, adding additional running paths, more open for community. Roseville prides itself on paved multi use trails. Love that trails reinforce the community aspect.
6. Do you have concerns about adding a multi-use trail to the site?
   Don't want to lose all the dirt trails.
   Follow up question - Does gravel or DG provide same benefits as dirt?
   No gravel is really hard to ride on. Hard on tires and can throw rocks up at other ridders, slide out on turns. DG is better, but not as good as dirt.
7. Are you aware that the site is a preserve put in place to protect the vernal pools and the endangered species they contain?
   No, only aware of electrical easements. Think interpretative signage and map of boundaries and messaging to tread lightly and learn about purpose would be useful. No one on team knows this.
8. Do you have anything you would like to add?
   Glad to see work is being done. Would like to see stuff for bikers – love informal trails. Do need to watch out for creek. To help protect creek suggest a bridge. Mountain bike team is interested in helping – volunteer days (40 kids, 10-20 adults), same for cross country team. Cross country team runs there too.

Mahany Park and Open Space Trail Feasibility Study

Stakeholder Questions

Name: Gregg Bates

Contact: valleyfoothill@gmail.com; 916-773-6575

Date of Interview: 7/9/2020

Interviewed by: Meredith Branstad

Position: Dry Creek Conservancy/ Valley Foothill Watersheds Collaborative

1. How do you currently use the site?

Group does not have current projects active on site. In the past, they worked with the Roseville UEC previously for restoration and maintenance projects along Kaseberg Creek. Installed riparian planting (oaks, wild rose, monkeyflower, other riparian species) and drip irrigation lines, between Woodcreek Oaks Blvd and the existing footbridge especially on north side. Did a second project in the area behind the Mahany Park batting cages. Group installed plants and did spring and fall maintenance. The projects had some Eagle Scout involvement.

City also did restoration near Pleasant Grove Blvd crossing.

Used to do trash clean-up site relatively routinely in conjunction with City's Celebrate the Earth event. Haven't been doing it since event was cancelled. City has taken over most of maintenance of the area.

Also have done invasive species removal along the creek; Callery pears were a particular problem in the past.

2. Do you have concerns about adding a multi-use trail to the site?

The less asphalt the better to reduce runoff and water quality. Think it's a good thing to have one major asphalt path and dirt/ permeable paths for rest.

3. Do you have anything you would like to add?

Interpretive sign ideas:

- Explain the planting projects done along the creek – UEC could provide more information.
- Benefits to water quality, wildlife benefits of restoring urban steams. Holistic ecosystem of private residential landscape with urban streams.
- Don't release your pets - invasive snake in lakes downstream (Pete Balfour from ECORP studied it)/ red-eared sliders/ feral cats.
- Oak grove and wildlife (hawks, woodpeckers).
- Natural fire regime and how to manage it now in urban setting – grazing management strategy.

Opportunities to do perennial grassland restoration – but would need to protect from goat grazing.

Drainage under Woodcreek Oaks has been an erosion issue and sediment backing up creek and causing flooding. Maybe opportunities for revegetation on creek east of project site to reduce erosion.



K:\Projects\C\CRS-03_Mahany\Trails\Design\FiguresMap-Mahany\Trails.dwg

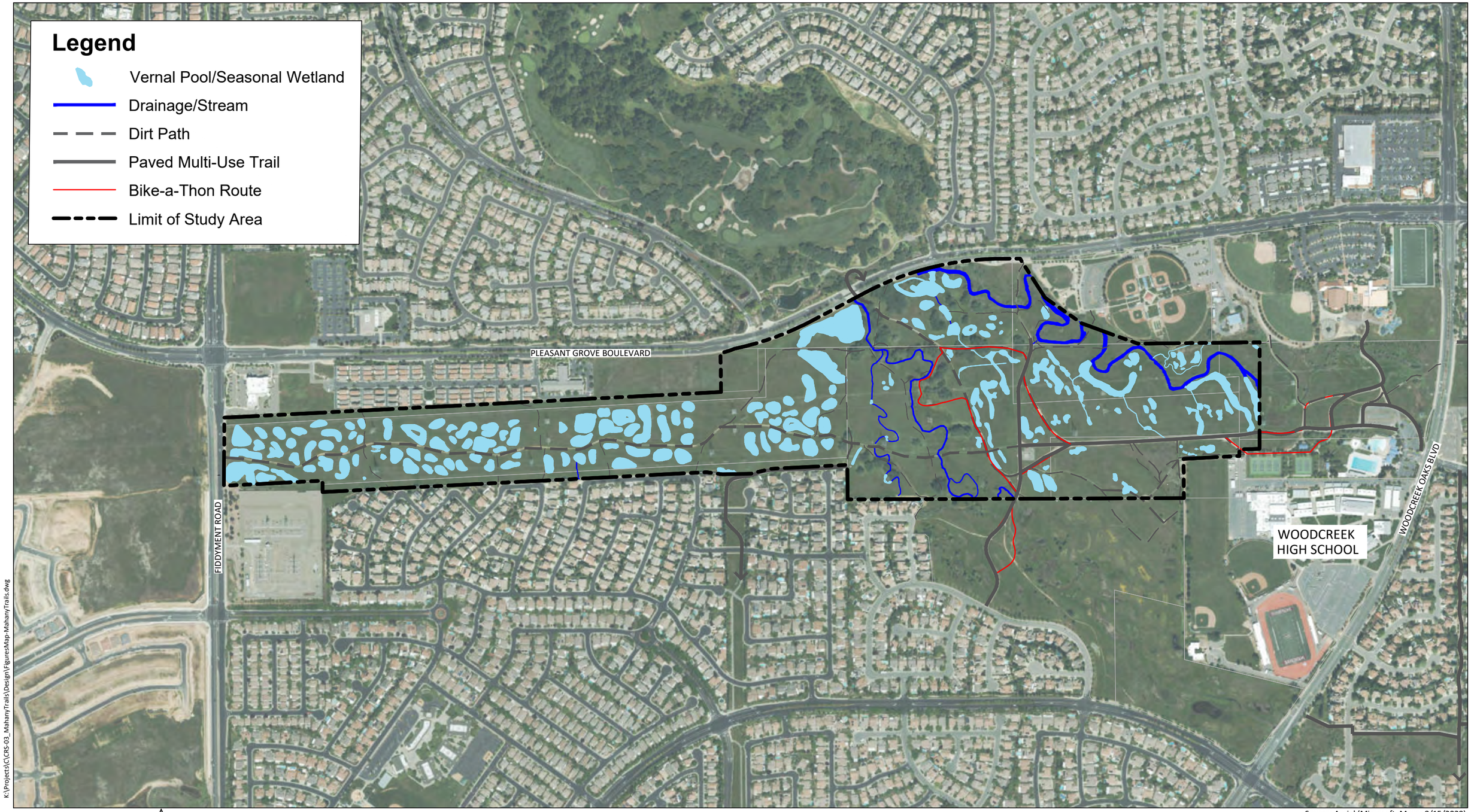
0 600 FEET

Source: Aerial (Microsoft, Maxar 9/15/2020).

HELIX Environmental Planning

Education Center Tour Group Route

Figure A-1



K:\Projects\C\CRS-03_MahanyTrails\Design\FiguresMap-MahanyTrails.dwg

0 600 FEET

Source: Aerial (Microsoft, Maxar 9/15/2020).

HELIX Environmental Planning

Cycling Team Bike-A-Thon Route

Figure A-2

Appendix B

Opportunities and Constraints Table

This page intentionally left blank

Within the Study Area are distinct site conditions where the natural features, formal improvements, and/or informal improvements interact. These site conditions are noted in the representative site photos table, below. Three types of points are identified:

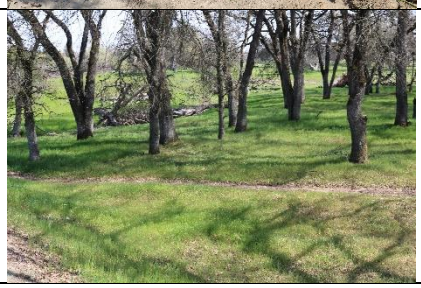
- Points of Interest – Locations where the combination of formal and informal improvements, in conjunction with the natural features, creates a notable condition.
- Interventions - Locations where users have informally intervened in the landscape.
- Conflicts - Locations where user needs are in direct conflict with the site.

This appendix supports the discussion of constructed features in section 3.6 of this report.

Point Number	Point Type	Description	Photo
1	Point of Interest	Crossing opportunity where Mahany Open Space aligns with existing maintenance road/future bike trail on the other side of Fiddyment while avoiding electrical towers.	
2	Point of Interest	This slight rise offers views looking west of well-defined vernal pools.	
3	Intervention	Large hole in ground presents possible hazard to site users and indicates homeowner use of Preserve.	
4	Conflict	Undesignated path from the adjacent neighborhood has the potential to cause disturbance to the site's sensitive resources. Path entrance requires users to go around plants.	

Point Number	Point Type	Description	Photo
5	Conflict	Undesignated path from the adjacent neighborhood has the potential to cause disturbance to the site's sensitive resources. Path entrance requires users to go over or around post and cable fence.	
6	Conflict	Undesignated path from the adjacent neighborhood has the potential to cause disturbance to the site's sensitive resources. Path entrance requires users to go in between and around shrubs.	
7	Intervention	Evidence of attempted trail widening and repair by site users.	
8	Conflict	Undesignated path from the adjacent neighborhood has the potential to cause disturbance to the site's sensitive resources. Path entrance requires users to go over or around post and cable fence.	
9	Conflict	Undesignated path from the adjacent neighborhood has the potential to cause disturbance to the site's sensitive resources. Path entrance requires users to go over or around post and cable fence.	

Point Number	Point Type	Description	Photo
10	Conflict	Undesignated path from the adjacent neighborhood has the potential to cause disturbance to the site's sensitive resources. Path entrance requires users to go over or around post and cable fence.	
11	Conflict	Undesignated path from the adjacent neighborhood has the potential to cause disturbance to the site's sensitive resources. Path entrance requires users to go over or around post and cable fence.	
12	Point of Interest	View looking west presents opportunity to view several well-defined vernal pools.	
13	Conflict	The bike path terminates with no obvious connection for bike riders.	
14	Point of Interest	Culvert under user created trail. Could allow for formalized trail crossing.	
15	Conflict	Debris has been laid down to allow users to cross over the creek.	

Point Number	Point Type	Description	Photo
16	Point of Interest	A shaded location offers a view looking north of a large, well-defined vernal pool.	
17	Point of Interest	This location offers safe north-south passage under the road and connects to existing bike path north of Preserve.	
18	Conflict	Undesignated path from Pleasant Grove Blvd. requires users to go over or around post and cable fence and up/down steep slope. Path is causing erosion.	
19	Conflict	Signs of user-built creek crossing which has been removed.	
20	Conflict	Undesignated path from Pleasant Grove Blvd. requires users to go over or around post and cable fence and through oak woodland.	

Point Number	Point Type	Description	Photo
21	Point of Interest	Smaller well-defined vernal pool very close to path presents education opportunity.	
22	Intervention	Large recently dug hole in ground with intentional seeming square shape, vertical edges, and stepped interior. Tools and trash present indicate ongoing project.	
23	Conflict	Creek and path crossing showing signs of pedestrian and bicycle users crossing through creek in this location.	
24	Conflict	Creek and path crossing showing signs of pedestrian and bicycle users crossing through creek in this location.	
25	Intervention	Large user-constructed bike jump area located within and adjacent to several vernal pools.	
26	Conflict	Debris has been laid down to facilitate creek-crossing.	

Point Number	Point Type	Description	Photo
27	Point of Interest	Ample shade and beautiful view is provided by a grove of oak trees adjacent to existing bike path. Opportunity for oak tree education.	
28	Conflict	User-constructed bike jumps boarder the existing gravel path.	
29	Conflict	Undesignated path from Bear Dog Park requires users to go up/down steep slope. Path is causing erosion.	
30	Conflict	Debris and pallets have been laid down to facilitate creek crossing.	
31	Conflict	Debris and plywood have been laid down to facilitate creek crossing.	
32	Point of Interest	The outdoor classroom is used and maintained by Woodcreek High School for their education program	

Point Number	Point Type	Description	Photo
33	Intervention	Piles of seemingly landscape materials debris indicate unauthorized disposal of material in Open Space.	
34	Point of Interest	The outdoor classroom is used and maintained by Woodcreek High School for their education program	
35	Point of Interest	Bench located along path with views of Woodcreek High Schools education area.	
36	Conflict	User-created path cuts between parking lot and gravel maintenance access road. Tire tracks indicate it is used by vehicles, but vehicles were not observed so reasons for driving into area are not known.	

This page intentionally left blank

Appendix C

Trail Use Counts

This page intentionally left blank

HELIX Environmental Planning, Inc.
11 Natoma Street, Suite 155
Folsom, CA 95630
916.365.8700 **tel**
www.**helixepi**.com

Mahany Park Open Space Trail Feasibility Study
Trail Use Count Data Sheet

Date: 6/2/2020

Observer's Name: Daniel Blair

Location: Intersection of existing dirt path and Fiddyment Road at west end of Study Area

Start Time: 5:00 pm

End Time: 7:00 pm

Weather: Sunny, 95 degrees

Other Notes:

People who entered the count area and then turned to travel in another direction were counted only once in the direction of travel from which they entered the Study Area. People entering from Fiddyment Road are included in the eastbound count.

People who made a round trip during the trail count period were counted traveling in both directions.

1 person was initially traveling south on Fiddyment then turned east.

3 people were initially traveling north on Fiddyment then turned east.

4 people were initially traveling west then turned south.

2 people were initially traveling west then turned north.

1 person was traveling west then turned east, roundtrip.

People observed traveling along Fiddyment but not entering the Study Area included: 1 pedestrian going north, 6 bicyclists headed north, and 2 bicyclists headed south.

Direction of Travel: East on Path

Time Block	Bike	Pedestrian	Other (Skateboard, Scooter, Stroller, etc.)	Wearing Helmet?	Dog?
00-:15		1			
15-:30					
30-:45					
45-1:00		1			
1:00-1:15					
1:15-1:30		1			
1:30-1:45					
1:45-2:00	2			2	
Total	**2**	**3**		**2**	

Direction of Travel: West on Path

Time Block	Bike	Pedestrian	Other (Skateboard, Scooter, Stroller, etc.)	Wearing Helmet?	Dog?
00-:15	1	1		1	
15-:30		1			
30-:45		1			
45-1:00					
1:00-1:15					
1:15-1:30					
1:30-1:45	3			2	
1:45-2:00					
Total	**4**	**3**		**3**	

HELIX Environmental Planning, Inc.
11 Natoma Street, Suite 155
Folsom, CA 95630
916.365.8700 **tel**
www.**helixepi**.com

Mahany Park Open Space Trail Feasibility Study
Trail Use Count Data Sheet

Date: 6/2/2020

Observer's Name: Carolyn Hagele

Location: Lift Station on eastern end of Study Area

Start Time: 5:00 pm

End Time: 7:00 pm

Weather: Sunny, 95 degrees

Other Notes:

People who entered the count area and then turned to travel in another direction were counted only once in the direction of travel from which they entered the Study Area.

People who made a round trip during the trail count period were counted traveling in both directions.

8 people were initially traveling north then turned east.

7 people were traveling north then turned west.

5 people were traveling south then turned west.

1 person made a roundtrip on the east-west path.

Direction of Travel East

Time Block	Bike	Pedestrian	Other (Skateboard, Scooter, Stroller, etc.)	Wearing Helmet?	Dog?
00-:15	1	2		1	
15-:30					
30-:45	3	2		3	
45-1:00	3			1	
1:00-1:15		2			
1:15-1:30		1			1
1:30-1:45	2				
1:45-2:00		1			
Total	**9**	**8**		**5**	**1**

Direction of Travel: West

Time Block	Bike	Pedestrian	Other (Skateboard, Scooter, Stroller, etc.)	Wearing Helmet?	Dog?
00-:15		1			
15-:30		2			1
30-:45	6			1	
45-1:00	4		1 stroller		
1:00-1:15					
1:15-1:30					
1:30-1:45	2				
1:45-2:00		2			
Total	**12**	**5**	**1**	**1**	**1**

Direction of Travel: North

Time Block	Bike	Pedestrian	Other (Skateboard, Scooter, Stroller, etc.)	Wearing Helmet?	Dog?
00-:15		2			
15-:30		1			1
30-:45	3	4		3	
45-1:00	4			4	
1:00-1:15		2			1
1:15-1:30					
1:30-1:45	6			4	
1:45-2:00	2	3		2	1
Total	**15**	**12**		**13**	**3**

Direction of Travel: South

Time Block	Bike	Pedestrian	Other (Skateboard, Scooter, Stroller, etc.)	Wearing Helmet?	Dog?
00-:15					
15-:30					
30-:45	5	2		5	
45-1:00					
1:00-1:15					
1:15-1:30					
1:30-1:45	3				
1:45-2:00					
Total	**8**	**2**		**5**	

HELIX Environmental Planning, Inc.
11 Natoma Street, Suite 155
Folsom, CA 95630
916.365.8700 **tel**
www.**helixepi**.com

Mahany Park Open Space Trail Feasibility Study
Trail Use Count Data Sheet

Date: 6/6/2020

Observer's Name: Carolyn Hagele

Location: Intersection of existing dirt path and Fiddyment Road at west end of Study Area

Start Time: 7:30 am

End Time: 9:30 am

Weather: Overcast then sunny, 55 to 60 degrees

Other Notes:

People who entered the count area and then turned to travel in another direction were counted only once in the direction of travel from which they entered the Study Area. People entering from Fiddyment Road are included in the eastbound count.

People who made a round trip during the trail count period were counted traveling in both directions.

2 people were initially traveling south on Fiddyment then turned east.

5 people were initially traveling west then turned south.

3 people were initially traveling west then turned north.

2 people were traveling west then turned east, roundtrip.

People observed traveling along Fiddyment but not entering the Study Area included: 4 pedestrians going north, 5 going south, 2 bicyclists headed north, and 3 bicyclists headed south.

Direction of Travel: West on Path

Time Block	Bike	Pedestrian	Other (Skateboard, Scooter, Stroller, etc.)	Wearing Helmet?	Dog?
00-:15		2			1
15-:30		2			
30-:45					
45-1:00					
1:00-1:15					
1:15-1:30		2			
1:30-1:45	4			4	
1:45-2:00					
Total	**4**	**6**		**4**	**1**

Direction of Travel: East on Path

Time Block	Bike	Pedestrian	Other (Skateboard, Scooter, Stroller, etc.)	Wearing Helmet?	Dog?
00-:15					
15-:30		2			
30-:45					
45-1:00					
1:00-1:15		2			
1:15-1:30					
1:30-1:45					
1:45-2:00					
Total		**4**			

HELIX Environmental Planning, Inc.
11 Natoma Street, Suite 155
Folsom, CA 95630
916.365.8700 **tel**
www.**helixepi**.com

Mahany Park Open Space Trail Feasibility Study
Trail Use Count Data Sheets

Date: 6/6/2020

Observer's Name: Daniel Blair

Location: Lift Station on eastern end of Study Area

Start Time: 7:30 am

End Time: 9:30 am

Weather: Overcast/later sunny, 55-61 degrees

Other Notes:

People who entered the count area and then turned to travel in another direction were counted only once in the direction of travel from which they entered the Study Area.

People who made a round trip during the trail count period were counted traveling in both directions.

4 people were initially traveling east then turned south

2 people were initially traveling east then turned north

8 people were initially traveling west then turned south

18 people were initially traveling west then turned north

10 people were initially traveling north then turned east.

2 people were initially traveling north then turned west.

1 person was initially traveling south then turned west.

1 person made a round trip along east-west path.

Direction of Travel: East

Time Block	Bike	Pedestrian	Other (Skateboard, Scooter, Stroller, etc.)	Wearing Helmet?	Dog?
00-:15		2			
15-:30					
30-:45		2			1
45-1:00					
1:00-1:15					
1:15-1:30		1			
1:30-1:45		1			
1:45-2:00	2	2			
Total	**2**	**8**			**1**

Direction of Travel: West

Time Block	Bike	Pedestrian	Other (Skateboard, Scooter, Stroller, etc.)	Wearing Helmet?	Dog?
00-:15		10			3
15-:30		8			5
30-:45		4			
45-1:00		1			
1:00-1:15	3	3			1
1:15-1:30	4	3			1
1:30-1:45		4			2
1:45-2:00		6			1
Total	**7**	**39**			**13**

Direction of Travel: North

Time Block	Bike	Pedestrian	Other (Skateboard, Scooter, Stroller, etc.)	Wearing Helmet?	Dog?
00-:15					
15-:30		5			2
30-:45		1			1
45-1:00		4			2
1:00-1:15		3			1
1:15-1:30		3			
1:30-1:45	2	2			
1:45-2:00	1	4			3
Total	**3**	**22**			**9**

Direction of Travel: South

Time Block	Bike	Pedestrian	Other (Skateboard, Scooter, Stroller, etc.)	Wearing Helmet?	Dog?
00-:15					
15-:30					
30-:45					
45-1:00		1			
1:00-1:15					
1:15-1:30		1			1
1:30-1:45		1			
1:45-2:00		1			
Total		**4**			**1**

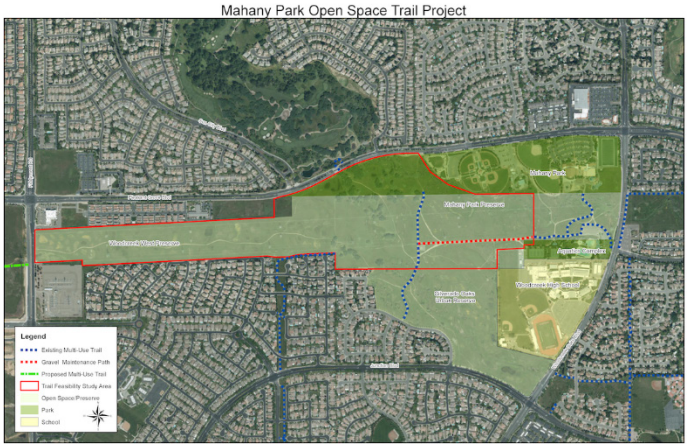
Appendix D

Survey Results

This page intentionally left blank

Introduction

The City of Roseville is studying the feasibility of developing a paved multi-use trail within Mahany Park open space which will ultimately connect with existing and proposed paved trails nearby. Part of the Mahany Park open space project area is a public park, but most of the area is considered an open space preserve. Currently, when visitors walk or bike through the area, they create dirt paths that can damage the endangered plants and wildlife within the open space preserve. The study will evaluate factors such as creeks, sensitive habitats and wildlife, topography, safety, aesthetics, and land use impacts. The open space has use limitations and trail suggestions will be considered within those constraints.



Map of the Mahany Park open space study area

The City of Roseville implemented a two and a half-week online community survey for the Mahany Park Open Space Trail Project to understand how Roseville residents and Mahany Park visitors currently use informal trails, how they access these trails, what types of future amenities they would like as a part of a paved trail, and any potential concerns with creating a paved multi-use trail. The online community survey was available from Tuesday, May 26, 2020 to Friday, June 12, 2020. The project team received more than 1,300 responses from community members. Due to the recent COVID-19 health emergency, this online survey is taking place in lieu of an in-person public workshop.

Methodology

The online informational video and community survey provided participants an opportunity to learn more about the feasibility study and provide their thoughts at the early phase of the study.

The project team received 1,306 submissions from community members. A full list of the comments submitted is available in the Appendix.



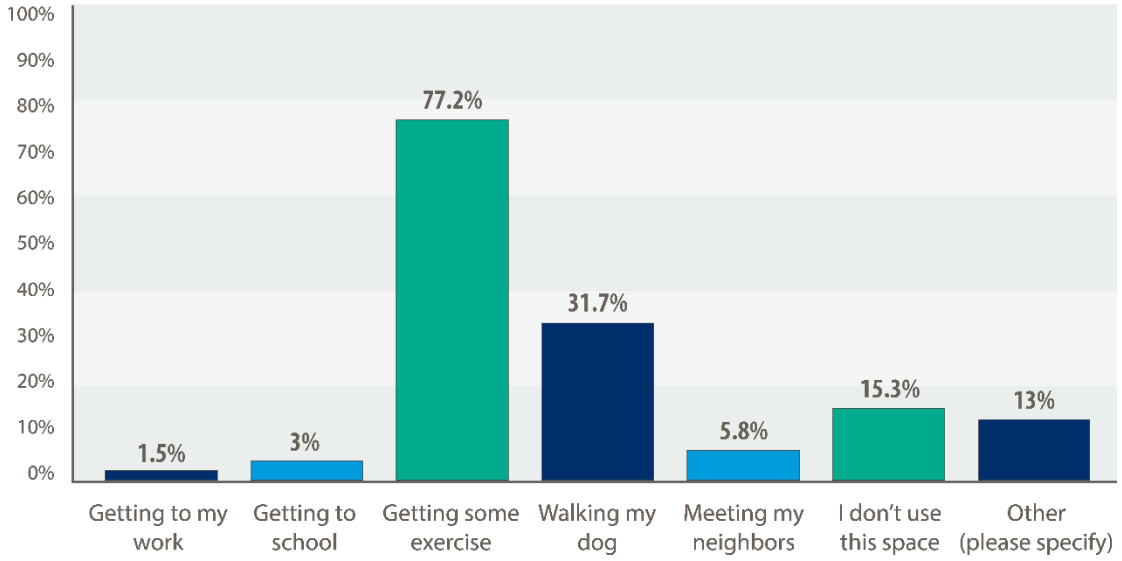
Aerial view of Mahany Park open space from the informational video

The online survey consisted of eleven (11) questions on:

- Why Mahany park visitor travel through the open space
- Mode of transportation typically used
- Existing and suggested open space access points
- Future trail amenities
- Benefits or opportunities of a paved multi-use trail at Mahany open space
- Potential concerns of a paved multi-use trail

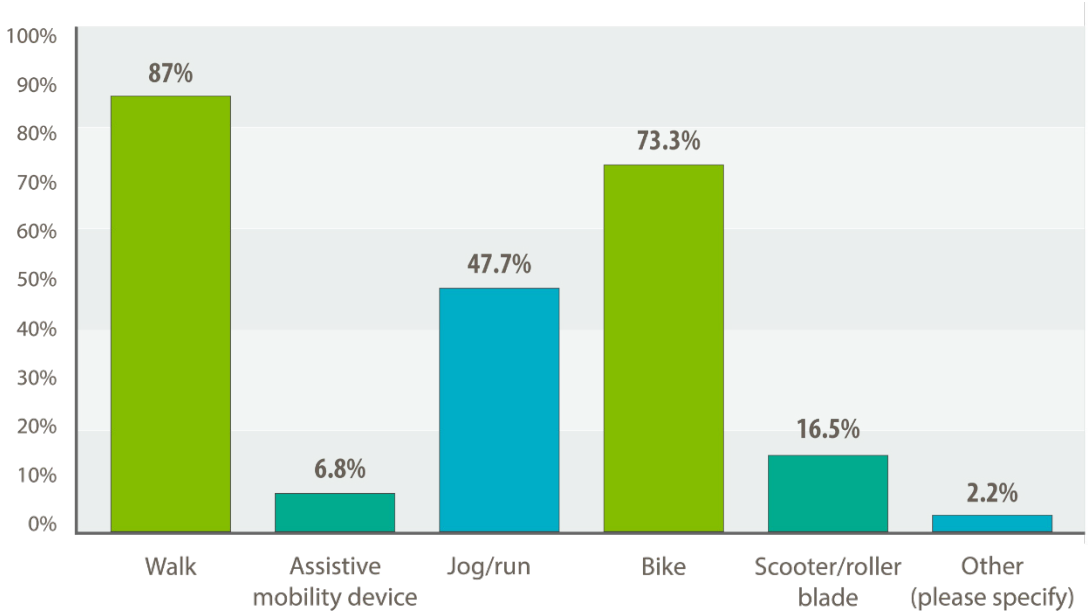
Overview of Results

1. Why do you typically travel through Mahany Park open space? (select all that apply)



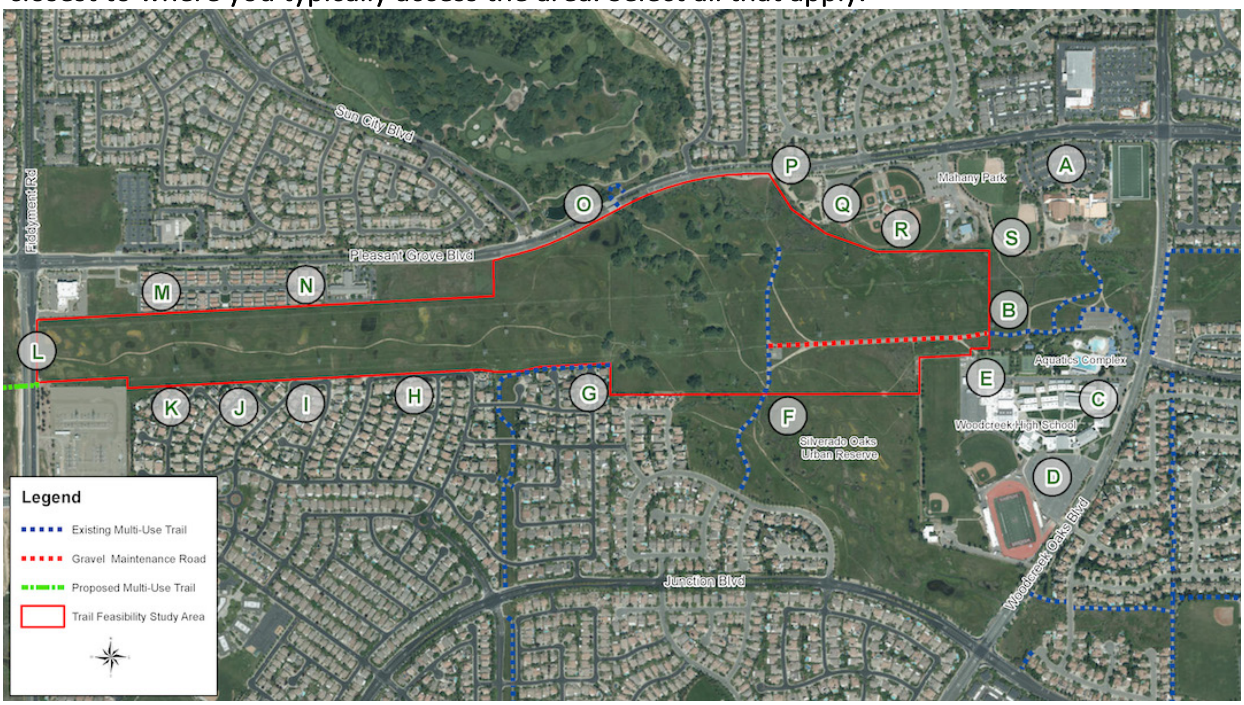
For the "Other" category, participants wrote in that they enjoying traveling through the open space to view wildlife or enjoy nature (**30.5% of "Other" responses**), go for a bike ride (**16.5% of "Other" responses**), run errands or go shopping at nearby stores (**13.5% of "Other" responses**), spend time with their friends or family (**9.4% of "Other" responses**), and getting to the library (**8.8% of "Other" responses**).

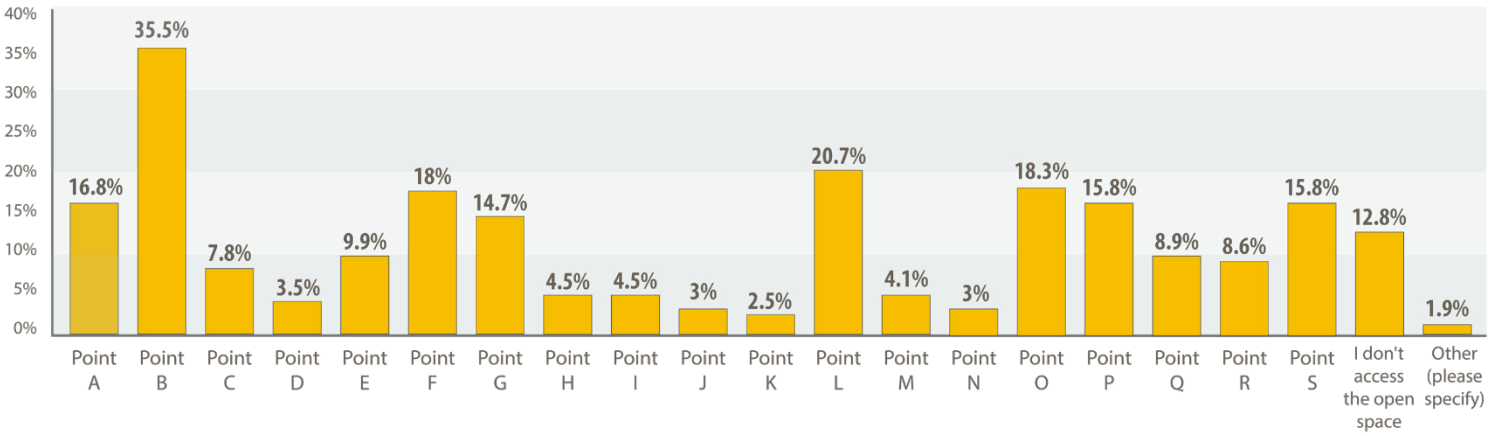
2. What mode of transportation would you want to use on future trails? (select all that apply)



For the "Other" category, participants wrote in that they would want to use their skateboard (**54% of "Other" responses**) or a baby stroller (**46% of "Other" responses**).

3. Where do you typically access Mahany Park open space? Using the above map as a reference, select the access point(s) closest to where you typically access the area. Select all that apply.





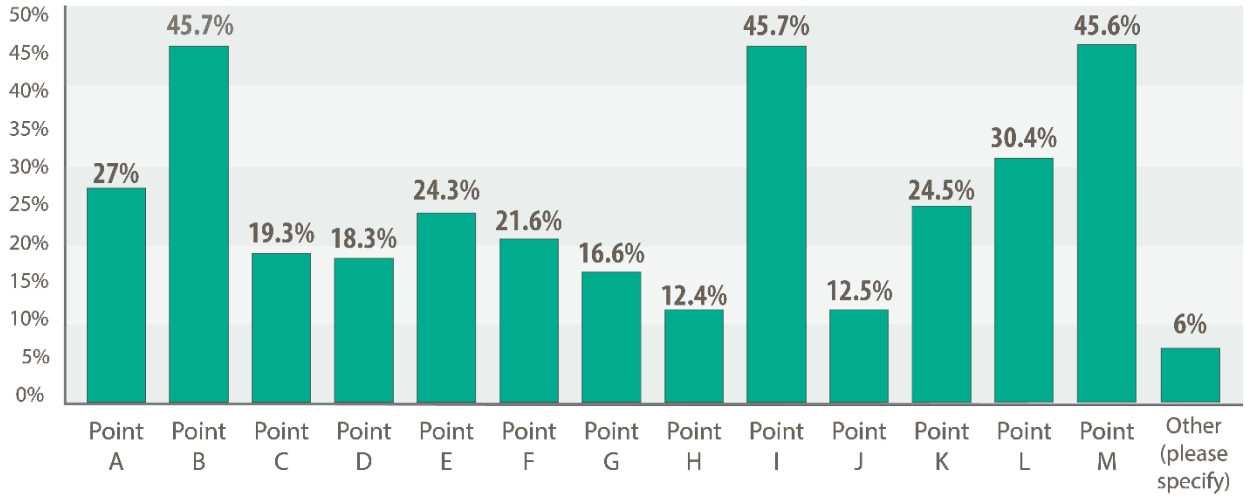
`

For the "Other" category, respondents wrote the below answers:

- All points (2)
- Between F and D
- Between F and G
- Dirt trail off of Woodcreek Oaks between Pleasant Grove and the Aquatic Center
- Glastonbury circle, past the fence
- On Junction at the first street west of Woodcreek oaks
- Woodcreek Blvd. and Junction
- Woodcreek Blvd
- The dirt trail off Woodcreek in between Point A and Point C. But we use every single spot.
- Typically from a side trail off Junction Blvd.
- Walk from parking areas
- We go through Sun City Boulevard under Pleasant Grove
- By the all-weather field and the Aquatic Complex

4. If the City were to construct a paved trail at Mahany Park open space, where would you want to locate public access points? Select all that apply.



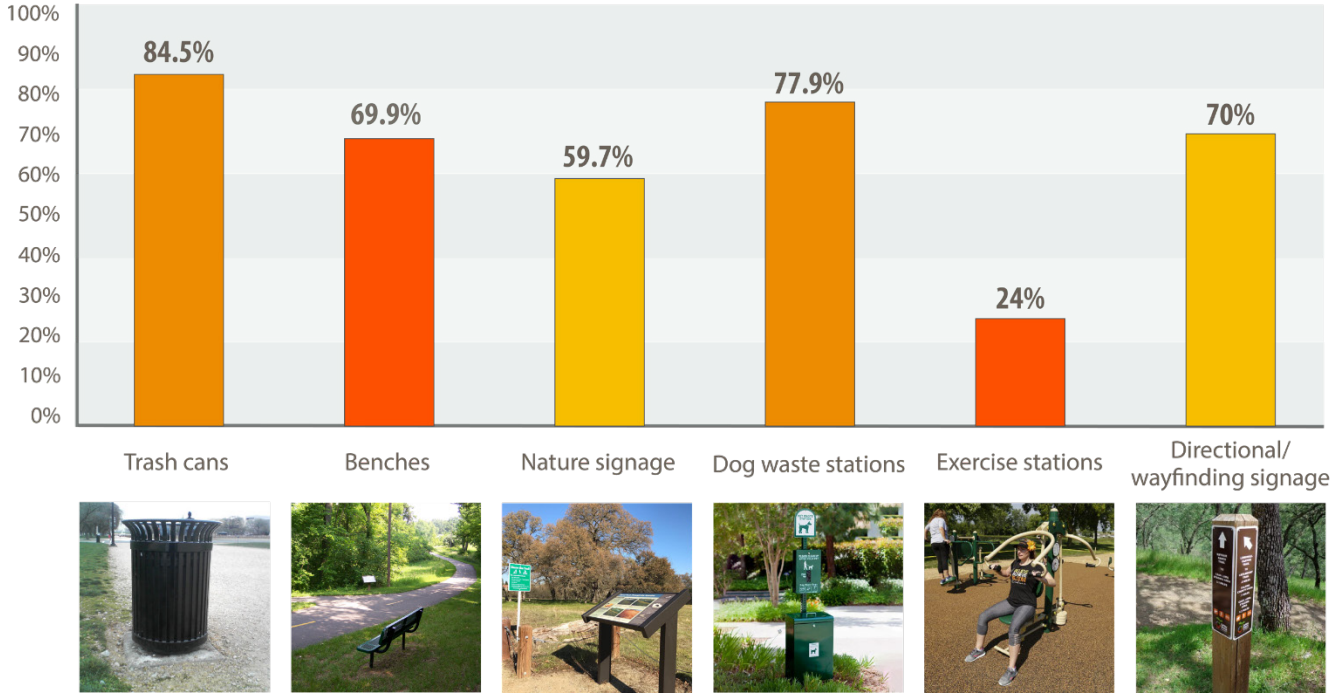


For the "Other" category, respondents wrote the below answers:

- None (13)
- No paving (13)
- All (2)
- An access point with adequate/convenient auto and bicycle parking, and handicap accessibility
- Anywhere there is sufficient parking

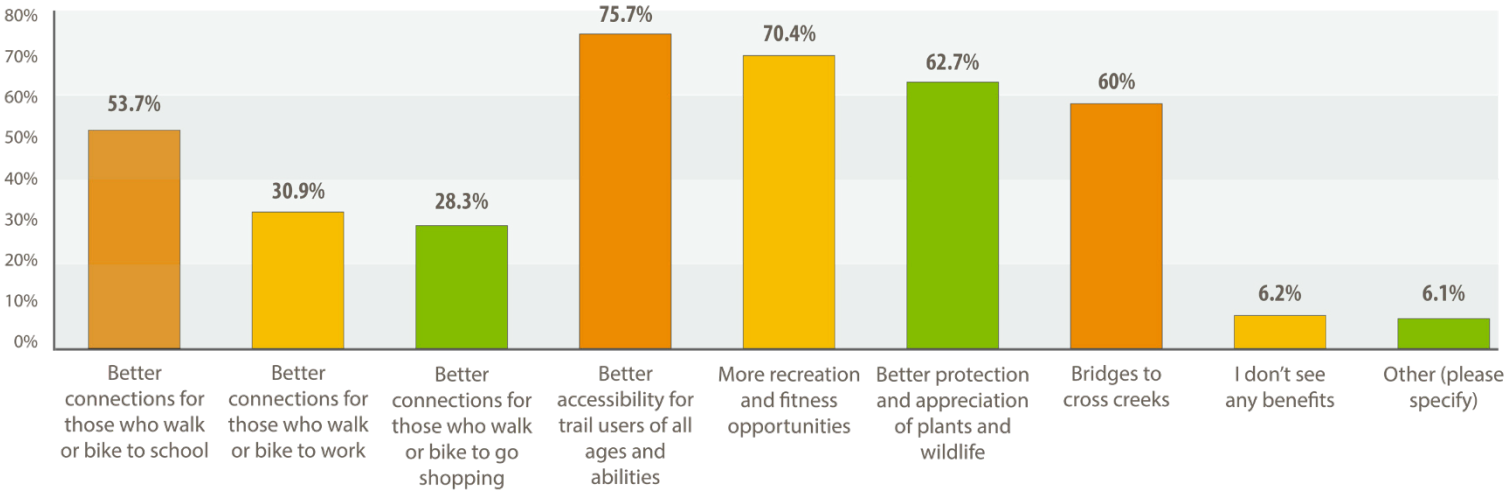
- As many as feasible
- Can you also work on Point M from the existing access points?
- Connect to the trail on Country Club
- Connect to trail from Sun City Blvd. or surrounding area
- Connect with Pleasant Grove Creek Trail
- Connecting from Riverside/Darling
- Corner of Woodcreek and Country Club
- Crosswalk connecting to Woodcreek
- It would be so nice to access from Fiddyment, there are so many walkers and runners
- Mark trail heads and access points where there is parking
- More is better
- Not sure, parking is a consideration. Dog park lot already congested.
- Off Woodcreek Oaks in the field between the pool and soccer field
- Pave Point B to Point E for those in need, but I prefer the dirt trail and run on the side of the pavement anyway
- Please don't put it by H, G, F and E. We live in this neighborhood and don't want to see increased traffic down our streets for people at access the entrances or extra parking on our streets
- We love riding the dirt trails! M is the toughest area to access
- Whatever is most accessible for most people
- Where ever there's parking
- Woodcreek Blvd.

5. Which amenities would you like to see along a paved multi-use trail in Mahany Park open space? (select all that apply)



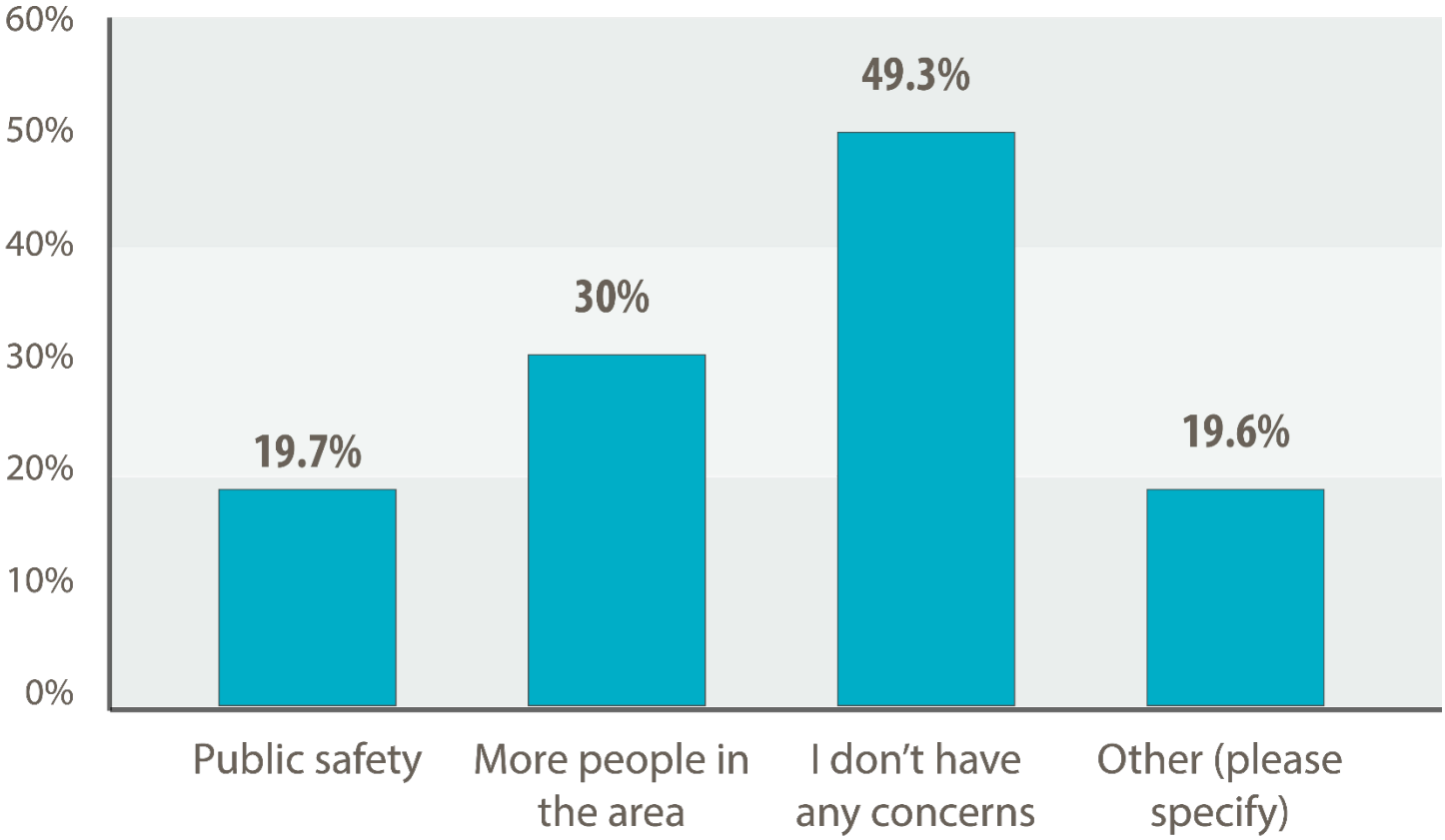
For the "Other" category, participants most often wrote about wanting more water fountains or water refill stations along the paved trail (**23% of "Other" responses**), restrooms or port-a-pottys (**17.3% of "Other" responses**), more trees or structures to create shaded areas (**16.8% of "Other" responses**), bridges for stream crossing (**9.8% of "Other" responses**), some dirt paths specifically for mountain bikes (**5.8% of "Other" responses**), lighting (**4.6% of "Other" responses**), and bicycle repair or pump stations (**4.6% of "Other" responses**).

6. What do you think are the benefits or opportunities in creating a paved multi-use trail in Mahany Park open space? (select all that apply)



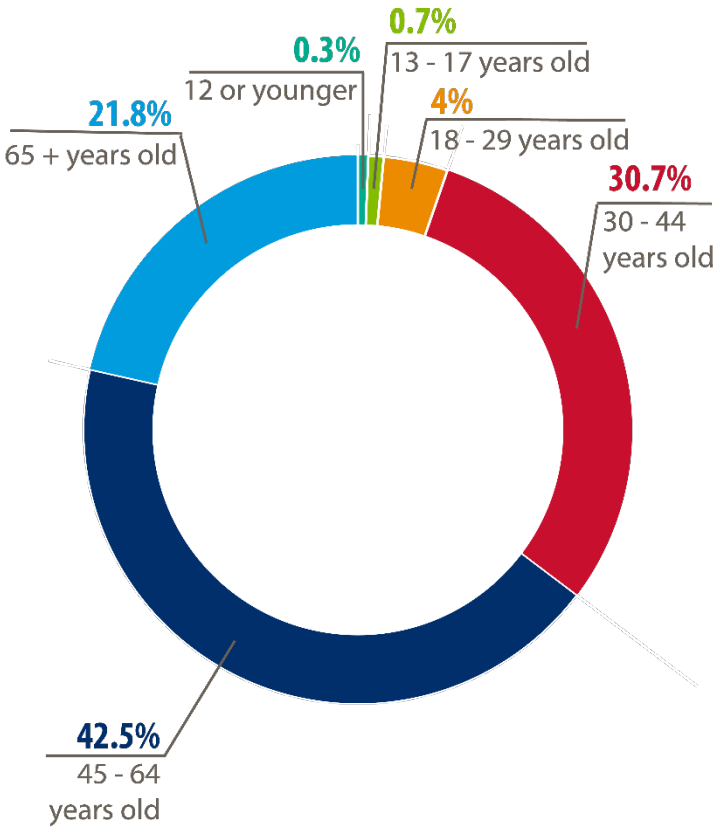
For the "Other" category, respondents most often wrote about how a paved trail would provide a safe area for cyclists, pedestrians and runners to travel not next to motor vehicles (**28% of "Other" responses**), provide a better opportunity to enjoy the open space in a natural setting (**16% of "Other" responses**), provide connections to other trails in the area (**16% of "Other" responses**), more opportunities for people to walk their dogs (**12% of "Other" responses**), better opportunities to meet and connect with their community (**12% of "Other" responses**), better connections for those who walk or bike to the library (**8% of "Other" responses**), and better ADA accessibility (**8% of "Other" responses**).

7. What are some concerns you may have about creating a paved multi-use trail in Mahany Park open space? (Select all that apply)

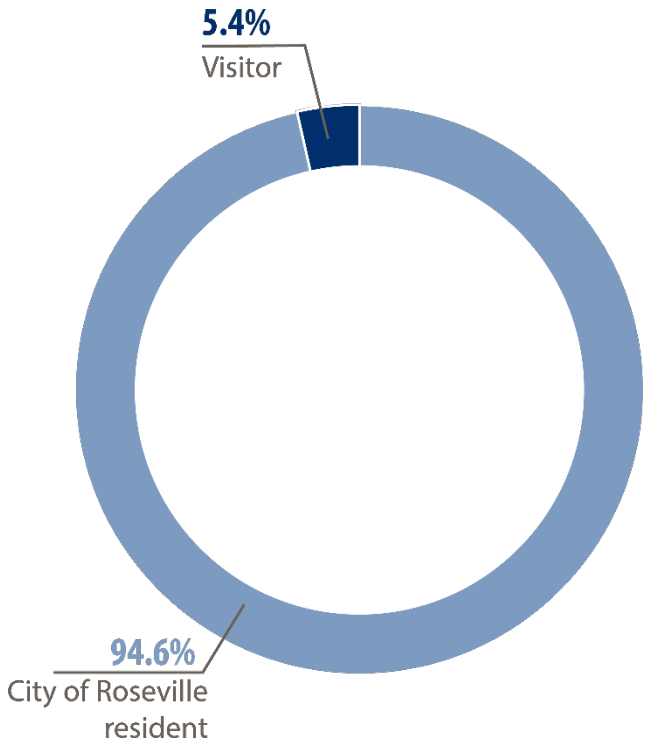


For the "Other" category, respondents most often wrote about concerns over whether or not a paved multi-use trail would disturb or damage nearby plants and wildlife (**24.4% of "Other" responses**). Respondents also noted that a paved multi-use trail looks less natural and might take away from the aesthetic of the open space (**18.4% of "Other" responses**), how the increase in traffic might lead to more litter and waste (**7.6% of "Other" responses**), the potential for more homeless encampments (**7.6% of "Other" responses**), that the cost and maintenance of the paved trail might be too high (**7.6% of "Other" responses**), potential conflict between cyclists and pedestrians using the paved trail (**6.8% of "Other" responses**), and that some people have personal preference to run or cycle on a dirt path (**6.4% of "Other" responses**).

The survey gave respondents the option to leave information about their age and where they live. Below are the data:



What is your age?



Are you a Mahany Park visitor or Roseville resident?

If people answered that they were a Mahany Park visitor, they were also asked to write what city they are from. Below are the answers:

- Rocklin (29)
- Citrus Heights (6)
- Lincoln (6)
- Antelope (4)
- Granite Bay (4)
- Auburn (3)
- Sacramento (3)
- Folsom (2)
- Loomis (2)
- North Highlands (2)
- Colfax (1)
- Davis (1)
- Fair Oaks (1)
- Los Angeles (1)
- Penryn (1)
- Pinole (1)
- Placer County (1)
- Pleasant Grove (1)
- West Sacramento (1)

Notification

The City of Roseville posted the online community survey on the Mahany Park Open Space Trail Project website, roseville.ca.us/MahanyTrail.

Several email notifications were distributed to a database of more than 48,000 recipients, which included residents, businesses, and community groups.

Social media messages were posted on Facebook, Twitter, Instagram and Nextdoor resulting in more than 27,000 impressions.

A direct mail postcard was sent to more than 7,500 households in the neighborhood surrounding the Mahany Park area. Residents were notified of the project and survey opportunity.



Informational signage posted around the open space

Informational H-stake signs were also placed around the Mahany Park open space.

The City shared the informational video via their YouTube channel, website, email and social media.

Additionally, ABC10 aired a news story on the project and online survey.





Postcard mailed to residents notifying them of the survey

Appendix

- List of community member comments

Community Member Comments

Table of Contents

Why do you typically travel through Mahany Park open space? (Other).....12
What mode of transportation would you want to use on future trails? (Other).....16
Where do you typically access Mahany Park open space? Using the above map as a reference, select the access point(s) closest to where you typically access the area. (Other).....16
If the City were to construct a paved trail at Mahany Park open space, where would you want to locate public access points? (Other).....17
Which amenities would you like to see along a paved multi-use trail in Mahany Park open space? (Other).....18
What do you think are the benefits or opportunities in creating a paved multi-use trail in Mahany Park open space? (Other).....23
What are some concerns you may have about creating a paved multi-use trail in Mahany Park open space? (Other).....26
If you are a visitor, what city are you from?.....33
Do you have any other comments or questions about the Mahany Park Open Space Trail Project?.....35
Public comments from social media.....53

Why do you typically travel through Mahany Park open space? (Other)

- Enjoying some nature and peace away from traffic
- Going to Library
- Bike riding
- Getting to and from the sports center on my bicycle
- Wildlife/nature viewing
- Ride bike with family
- Exercise while waiting to get daughter's from school, library, or sport activity
- Visiting family
- Walking while my kids place sports
- Enjoying nature
- Wildlife viewing
- Fresh air, exercise and wildlife spotting
- Enjoying nature and wildlife
- Walk to park, library, bank, shopping
- Going to the Riley's grocery store and Starbucks from my house
- Visiting
- Go to the pool and the dog park
- Going to the Aquatics Complex
- Biking
- Going bus stop, store, and Mahany Park, as well as bike rides
- Finding jumps and pump tracks with friends
- Enjoying the peaceful atmosphere
- Going to CVS or dog park
- Going to Raley's and/or Starbucks shopping center
- Mountain bike ride
- Running errands
- Going to the park
- Riding bike
- I used to work cleaning open space
- Walking to Starbucks or riding my bike
- Bicycle
- Cross country team running
- Rarely use it
- Walking to stores
- Riding dirt bikes with family
- Leisure walk with kids
- Cycling
- Enjoying out door nature
- See the creeks and ponds
- I live near Maidu Park and frequently enjoy the paved trails there and can see the benefits for Mahany Park

- Birding
- When my kids have activities nearby
- Getting to pool and library
- Ride bike
- Bike riding
- Nature viewing
- Enjoy nature
- Relaxing walk after playing tennis at Mahany
- Observe nature
- Bicycling
- Photography
- Bicycle route to stay off of Pleasant Grove
- Observe nature
- Family time, traveling to gym or cafe
- I enjoy seeing the nature. Birds, hares, etc.
- Taking my son to preschool
- Running
- Bird watching
- I bike through here all the time to get out of the house
- I would use the area if there were a paved trail
- Birding
- The only place in Roseville that isn't paved and gives a sense of being out in nature. So peaceful to walk out there for de-stressing and mental health
- Peace and quiet and to find exciting critters
- Just seeing some nature
- Enjoy the outdoors and nature
- Enjoy nature, oak trees, open space
- Photography
- Natural area/oak trees
- Bird watching, photography
- Birding
- Wildlife surveying
- Spend time outdoors, in nature
- Taking kid to grandma's house
- Getting to shopping and library
- Outdoor exercise like walking, running, picnics, nature walks
- A beautiful way to get to the library or enjoy an evening stroll with friends
- School field trip/nature walks, Mahany Park facilities
- Walking to the library and/or Raley's/Starbucks
- Family outing
- Enjoying the wetlands
- Getting to library

- Mostly to access swim complex on bike
- Natural beauty nearby
- Going to stores
- Daily walk
- Cross country and track training the dirt is good for our legs
- Overflow parking for the Roseville Aquatics Complex
- Enjoy nature
- Exploration
- Biking with family
- Enjoying the peace of nature
- We live in Quail Glen, and it's one of our two go-to spots for cycling and family time.
- Outdoor education field trips
- Spending time with our family just out in nature
- Enjoying the beautiful open space with vernal pools and oak woodlands
- See the sights
- Biking
- Birding
- To view wildlife
- Photography & bird watching
- Woodcreek mountain bike team ride-a-thon
- See the spring flowers and be out in nature.
- Enjoying nature or crossing from the library to the water park
- Escaping the City congestion
- Access to Woodcreek library
- Observe wildlife
- Getting groceries
- Going to the Aquatics center, the library, and the Raley's shopping center
- Nature walk/bike
- Walking to shopping/coffee
- Enjoying outdoors
- Getting to the commuter bus stop
- Bicycle
- I wasn’t too aware of this space, but I greatly desire more connect trails like Miners Ravine
- Play with my kids
- Getting to stores
- Kids playing
- Birding
- Go to the tennis courts, go to the library, play with RC cars
- Specifically, Woodcreek cross country uses the space to train.
- Biking
- Bird watching
- Run it for Woodcreek Cross Country

- I'd like to see it connected to Westpark
- Exploring nature with my children
- Nature walks and mountain bike rides, we enjoy the dirt trails
- Running
- Kids walk to school or the library on the path
- Getting to ball games at Mahany
- Getting to the library
- Bike riding with the family
- Just a place to "get away from it all for a while"
- Getting to nearby stores
- Getting to my commuter bus
- Biking
- Taking the kids to get them outside
- Bike to stores
- Would use it for exercise if it had paved trails
- Enjoy the space not next to the traffic/roads
- Walks/bike rides
- Not yet; maybe once it's paved
- Library, ballfield
- Errands, library, groceries, etc.
- Walk to shopping
- Hangout after school
- Bike riding
- Get fresh air, reduce stress
- Playgrounds
- To enjoy & partake if the natural beauty & wildlife
- Enjoying and respecting the wildlife and jogging
- Viewing wildlife
- Biking
- Playing Pokémon Go
- Walking to the CVS
- Going to kids playground or library
- View nature
- Exploring the area and beautiful nature
- Ride my recumbent trike
- Dog park
- Map shown is extremely hard to read
- Exercise
- Going to the bank and grocery store
- Riding bicycles
- For fun/recreation
- Going to the Library

- To enjoy the outdoors
- Casual/relaxing walk
- Visiting the library and park with kids; we park at library
- I've only used it twice and that was to walk to the library with my grandchildren

What mode of transportation would you want to use on future trails? (Other)

- Electric scooter
- Skateboard
- Electric assist bicycle
- Skateboard
- Stroller
- Skateboard
- Long board and rip stick
- Skateboard
- Skateboard
- E-bikes
- I pedal a recumbent trike (two front wheels)
- Adult tricycle
- All
- Skateboard
- Stroller
- Stroller
- Stroller
- Group tours
- Stroller
- Baby stroller
- Electric motorcycle (kids)
- Mountain bike

Where do you typically access Mahany Park open space? Using the above map as a reference, select the access point(s) closest to where you typically access the area. (Other)

- Go through Sun City under Pleasant Grove.
- I access from all points
- Typically from a side trail off Junction Blvd. is our favorite entrance
- All over
- I would like to use
- Woodcreek and junction , right off junction dirt entry before F
- On Junction at the first street west of Woodcreek oaks Blvd.
- Closest access is Point J
- Glastonbury circle, there's a path past the fence
- Walk from parking areas

- Our primary access point is the dirt trail off Woodcreek in between A & C. But we use every single spot.
- Trail heads are not marked. Parking is not provided for most access points
- Between F and G
- Woodcreek Blvd
- Dirt trail off of Woodcreek Oaks between Pleasant Grove and the Aquatic Center
- Between F and D
- I didn't access because I use Miners Ravine .
- We walk on a dirt path between the all-weather field and the Aquatic Complex.

If the City were to construct a paved trail at Mahany Park open space, where would you want to locate public access points? (Other)

- Don't care for paved access points as the ones currently available are adequate
- Connect to trail from Sun City or surrounding area.
- Connecting from Riverside/Darling
- None
- Living in Westpark, Point I is the most critical access point for my family
- Not sure, parking is a consideration. Dog park lot already congested.
- Leave it as it is, just protect the trees and wildlife
- More is better
- None, I like that it hasn't been paved over.
- None of the above.
- Crosswalk connecting to existing bike trail near Woodcreek
- I would prefer to leave the trail unpaved
- Please don't pave any if it
- Do not pave
- None
- Due to it being a natural area, I am concerned about the impact of adding paved trails
- Do not support the new trail as it would create more vandalism and fires
- I'm against paved path
- I do not want a paved trail
- Can you connect to existing paths?
- Can you guys also work on Point M from the existing access points please
- I enjoy walking on natural surfaces
- No paved trail
- No more pavement please
- The only spot that I would like to be paves is the gravel maintenance road
- Whatever is most accessible for most people
- Don't construct it
- None
- An access point with adequate/convenient auto and bicycle parking, and handicap accessibility
- I am not for a paved path

- Please don't put it by H, G, F and E. We live in this neighborhood and don't want to see increased traffic down our streets for people at access the entrances or extra parking on our streets
- As many as feasible
- None. Don't need any more access points
- Pave Point B to Point E for those in need, but I prefer the dirt trail and run on the side of the pavement anyway
- We love riding the dirt trails! M is the toughest are to access
- It would be so nice to access from Fiddyment, there are so many walkers and runners, CVS, etc. there are no stores for food in the west park area, so it's so helpful to access from walking trails
- Any
- Should not pave
- Anywhere there is sufficient parking
- Connect with Pleasant Grove Creek Trail
- We don't need more access points
- Mark trail heads, access points where there is parking.
- None
- Corner of Woodcreek and Country Club
- Please don't pave the trails. I don't want to bring more people to the area or have people parking in our neighborhood to access the trail.
- Mostly H because that is where I live
- I would like it to stay a dirt trail
- Woodcreek
- All marked
- Where ever there's parking
- All
- None
- None
- None
- Let what nature we have be left alone
- Connect to the trail on Country Club
- Not by the dog park. Parking is limited there as is.
- Off Woodcreek Oaks in the field between the pool and soccer field
- None

Which amenities would you like to see along a paved multi-use trail in Mahany Park open space? (Other)

- Benches with shade
- Picnic tables
- Trees planted near benches
- Tree cover/shade
- Signage on the bath way for walkers directions with arrows and bikers direction with arrows
- Picnic tables, bridges across drainage/creek on interior near access point O (permanent to replace non-compliant ones removed)

- Drinking water fountain
- Plant more trees for shade and possibly lights?
- Grass for picnic and movie in park: skateboard area
- Shade for benches or rest stops
- Roller blade areas
- Port-a-potty
- It should be well lit at night, with cameras. That's if it will be available to use at night.
- More markings for bikes right, pedestrian left
- Shade trees
- Some dedicated dirt trails/dirt features for bikes. There are quite a few parents that use this area to teach mountain biking basics to 4-8 years old. These features have been a great feature for Covid-19 PE class for both of my kids. It would probably be significantly cheaper to study how to create these features in areas that do not do harm to plants/animals instead of paving over the area. Building a pump track where the current paved trail and the main dirt trail meet would be of great community benefit and prevent the current dirt trails that causing problems in sensitive area to diminish.
- None
- A sign showing how far major cities are from that point (ex. SAN FRANCISCO - 100 Miles, TOKYO - 2,000 Miles, etc.)
- Restroom
- Shade structures or more trees, footbridges to cross creeks, lighting for evening use
- An updated map of Roseville trails, bike rack/lock areas near bathroom, trees/shade, water, clear direction for which side of the path to walk or bike on
- Parks and playgrounds
- Planted trees along the trail
- “Stay On The Path” signage. Shade stations.
- Tiny BMX tracks
- No amenities
- Benches, please don't encourage more dogs
- Covered structure over benches for hot days, signs for pet owners to keep dogs on leash
- I'm a casual mountain biker so prefer the dirt trails that are already there. They are great for walkers and bikers provided you don't have a street bike.
- Plant additional trees for future shade
- Bridges across the creeks, more trees/shade, drinking water
- Rebuild bridge over creek, it’s rather rickety
- Garbage cans
- Bathrooms and drinking fountains
- Rebuild bridges over water ways
- Bike tool rack and drinking water fountain
- Water resources
- I see signage regarding pet waste, but no trash cans. They would be the priority.
- Lighting, emergency phones, trail loop distance markers, and bike speed limit signage

- Please don't take all the dirt trails away. It is easier to walk on for the body than pavement.
- Mileage reference markers
- Don't pave it and no exercise stations - keep it as a natural preserve to the fullest extent possible; with least intrusions. Even if paved path, people will still go off and it will encourage bad use of motorcycles, skaters, golf carts, etc.
- Shade trees near the trail
- Picnic table at the top of the hill to watch the sunset
- Source of water/solar fountain for wildlife drinking during hot days of summer
- Just trails only
- Appear to be vernal pools and wetlands. Is there potential for educational and scenic viewpoints.
- Shade
- Bridges across streams
- Please don't ruin this space by paving.
- A simple exercise circuit as you walk or run. Bike tire pump and repair stations like on UC Davis Campus
- Bike ramps for kids, fairy garden
- Creek crossings
- I like it the way it is. I like the natural open space.
- Hills for training high school cross country runners and public exercise, rolling hills turns not just a flat paved road
- Water fountains
- Emergency pulls/phone, picnic benches, bathrooms (closed at dark), repair under bridge access point ('O') and thank you for considering. Similar to the Stevens Creek trail in Mt. View/Palo Alto
- Picnic areas, parking
- Restroom
- Need a permanent bridge across creek
- Sanitizing stations
- Water
- Bathrooms, drinking fountains, solar lights, shade where it doesn't exist, bike part tool stops
- Drinking fountain for people and pets; covered rest area
- Directional arrows and partial mile markers (steps)
- Let's not go overboard, less clutter is better
- Don't construct it.
- Restrooms
- Please protect the oak trees and vernal ponds
- The less the better. Keep it natural.
- Designated unpaved trail (2 to 3 feet wide) adjacent to the new designated paved trail to provide dirt jogging (easier on joints and part of why I go there to run) over other trails in the city
- Bathrooms
- Accessible bathrooms, secure bike parking stands, potable water faucet/drinking fountains, shade/trees, lighting at night, mile/distance markers, inconspicuous exercise stations, grassy areas to sit and exercise/stretch/rest, drought resistant plantings/wildflowers

- Water fountain to add water to your bottles
- Trail volunteer group
- Water filling stations or fountains
- Water fountain, restrooms
- I walk these trails almost every day. The dirt trails are well used and most walkers/runners/bikes do not go off them. One area I have a concern for is the creek crossing in the large oak grove. A few years ago a bridge was in place to cross. The city removed this bridge. Since I have seen alternate paths made to circumvent that spot. I have also seen the Woodcreek High School track team crossing that spot (when it's dry) with a few galls and stumbles. I would suggest the city places a path through the grove with a well-designed environmentally friendly bridge there
- Bridges keep people and dogs on the trail. Lack of bridges and people create their own no matter how many times your staff removes them.
- Kids play structure
- Bike skills park
- Photo opportunity spaces
- Keep some dirt trails to provide variety for bikes and joggers
- I love the idea of nature signage but find it becomes hard to read after a while. Perhaps too much sun? Seems a waste of time and resources.
- Restrooms, water fountains
- Bridges for creek crossings would be great. Also, the gravel path on the side of the paved path is fantastic for older runners! Lastly, a bathroom and water faucet would be incredible at the west end of the land down by Fiddyment.
- Water access
- Shade
- Dirt jogging path next to paved trail
- Newly planted oak trees and other native species
- Restrooms
- Restrooms, water refill stations
- Restrooms or ADA port-a-pottys
- Mile markers; decorative/aesthetic bridges or crossings; photography spots
- Pull outs for hikers and bikers to rest, without stopping traffic or damaging sensitive terrain
- None
- Food. It’s like a dry desert out in west park for kids whose parents work full time
- Water fountains
- Shade
- Water, creek, pond, bridge, use to be so nice
- Restroom/water fountain
- Trees for more shade. The trail itself is to exposed for summertime activities.
- I want the space left natural
- Create shade! Plant trees. Install shade structures. Add water stations for people and dogs.
- signage pointing to water and restrooms close to the trail
- Trees for more shade

- Put a divided line on the paths one side for walkers only other side for faster movement, joggers, bikes skaters etc. and they stay in that lane coming and going, they don't switch lanes depending on direction of travel. Roseville needs to fix all the paths that are throughout the city like this, too many close calls or accidents with the switching of lanes based on your direction. The current method doesn't work, very dangerous!
- Keep it natural
- Lighting
- Quality trail bridges
- Safe drinking water
- Mileage on trails
- Off road, dirt mountain bike course
- Trees. It's too hot for the humans and animals not to have covered pathways
- Shaded areas with trees or other for the benches.
- Water
- Shade trees, water fountain
- Signs for runners bikers
- None
- Lights
- Maintain dirt trails in addition to paved trails
- Replace the bridge that was removed by the city
- Restrooms
- All of the above complete take the nature out of this area. It's enjoyable to have a dirt area to enjoy.
- 10-12 ft pathways
- Bridges over the creeks
- Bike racks, water
- Plant more trees along the path
- Hydration station, also please don't remove the fairy garden.
- Water fountain, shades
- Some shade trees
- Water fountains/bathrooms
- Keep it minimalist so it still feels like a preserve
- Water station for people and pets
- Right of signage
- Drinking water
- Children play areas
- Restrooms, water bottle refill station
- Playground
- Water fountains, bathrooms
- Bathrooms of some kind
- Restrooms
- Bike/walk directions. Bike fix it stations, air pump
- Restrooms

- Water fountain
- Water fountains, doggie water fountains
- Water refill stations
- Perhaps a water fountain for thirsty walkers
- More doggie pots
- Bike tool station
- Some kind of toilet system
- Nothing but walkers so wildlife can continue to prosper
- Picnic areas and less ditches
- Sundial, right away signage
- Emergency phones; distance readings on the different directional posts (1 Mile, 2 Miles, etc).
- Bridge over the creek
- Water fountain, nearby public restroom
- Bike repair station(s)
- Shady areas
- Lots of signs reminding people dogs are to be on leashes
- Bathrooms, solar powered LED trail lights, bike tool stations
- Bathrooms. Runners and cyclists need them along the trails.
- Water fountains
- Bathroom please
- Restrooms
- Natural surface trails with erosion control
- Water fountains
- Hopscotch, simple play structures, picnic tables, bathroom
- I love Roseville's trails and parks.
- Bike park, we have very few in Roseville

What do you think are the benefits or opportunities in creating a paved multi-use trail in Mahany Park open space? (Other)

- I enjoy how much of Roseville you can cover without going on the main streets
- Safe place without traffic to bike/walk
- Opportunities to enjoy open spaces rather than being next to traffic
- Social opportunities within the community
- Neighborhood morale and comradery. Less traffic as more opportunities to bike. Increase the beauty and respect for others and their community. Increases safety in the area by having more accessibility for others to be involved and helpful in cases of suspicious activity. Less opportunity for mischief by those foraging through open areas.
- Joy of picnics and movies in park; potential live bands with food trucks
- I avoid area in summer, too many bull horn thorns
- Community interaction is facilitated on the trail rather than car
- I love the nature. The paved trails are not necessary.
- I can ride my bike to the pool or library

- Better connections for those who walk or bike to the library and aquatics complex
- Expansion of biking trails to connect with other biking trails
- I feel like what makes the Mahany trails is having the dirt paths to go exploring or make jumps to have fun with on your bike
- Better connections to walk dogs, ride bikes locally without being on busy road
- Benches are the only improvement, the rest create ugliness in a beautiful natural setting
- A paved multi use trail will bring more people to the area and more disturbance to the nature preserve.
- I love riding my bike and running on the dirt trails, so I am somewhat hoping to keep some trails unpaved. But I do see the possibilities for improving access for kids riding to school, or even adults riding to the store for groceries/shopping.
- It could help reduce the amount of dogs walking through the baseball complex, and reduce the risk of concern for a child or adult getting bit.
- I like it the way it is. Natural looking trails. Keeps traffic down. The paved bike trails, and sidewalks are taken up by non-courteous walkers and bikers
- Picnic tables
- Bikes and motor bikes can be a danger
- Paving a bad idea. It is a preserve, so it should be kept as natural as possible with limited use by all.
- Cycling
- Connecting to other Roseville paths would be great for biking through and enjoying more what Roseville has to offer
- I hope it will result in better protection for wildlife
- Beautiful natural space. Conserve it but somehow make it more accessible.
- Larger connected multi use trails
- Disability access, but otherwise detracts from nature feel
- Connect to existential trails throughout the area so you can bike long distances safely not just within one park. Make the parks connected and think outside of just this park. Think about making it safe to bike to Sacramento or Folsom or Rocklin
- I like it the way it is, but a bridge to cross the creek would be nice
- Maybe one very simple bridge across the creek near the pleasant grove overpass near Sun City entrance
- Elementary field trips, middle school and high school athletes and teams can have practice and train daily
- Increase dog walking areas, Safety as the trail is already used but more safety would be better, less chance of hurting yourself with a paved road.
- Reduces natural setting, becomes urban
- Beatification of the area
- Love the trails but don't understand why everything needs to be paved
- Fun
- I think what makes this park special, is when walking on the dirt paths, you feel a deeper connection to nature and greater appreciation for the plants and animals. It feels set apart from regular parks, it’s not overly maintained and that’s what makes it special
- Adds to attract more families and people to live and recreate in Roseville
- I am for improvements but just not paving the paths. I love to go jogging there and the reason I go is because it is one of the only places left

where I can run on a natural surface (dirt). If I want to run on cement or a road I have every street in Roseville. This space should be improved but left as natural as possible

- I see a number of folks with strollers
- I would not want any paved trail over existing bridges or creeks
- I enjoy being on the trails that exist without paved roads. The ones that exist just get graffiti on them.
- Meandering dirt paths are a pleasure. Paving will remove that pleasure. Please do not install barriers to dirt paths.
- I enjoy the feel of the blue oaks trail system- mixed of nature/ dirt trails and the paved trail system. Replacing the gravel trail and having an entrance by the dog park would help.
- It's safer to ride on the trails than on Fiddyment, Pleasant Grove or Blue Oaks
- Overall connectivity throughout the city
- Dog walking
- Shade trees
- Places for families and dogs to just play
- Safer options to ride bike, walk, etc.
- Outdoor quality of life is why we love Roseville
- Access to library and sports areas
- Please connect all trails. West Roseville had a few and they are not connected. Driver's do not respect bikers
- None
- Less goat heads in my bike tires
- Easier areas for Geo caching
- Wheelchair bound usage
- Walk baby stroller/paved vs gravel
- Reduced traffic congestion from driving cars.
- Safe place for joggers to use away from vehicle traffic
- Will all trails eventually connect?
- The dirt trails are fun the way they are
- Again, leave it alone. It's absolutely perfect in this natural state.
- I have lived here for 12 years and have seen what people have done to this entire area. You removed a once viable bridge and forced people to destroy it even more by forging new trails. Off road and gas vehicle have been used within the area and vernal pools and habitat will be destroyed, not preserved as you state.
- Safe location to exercise away from the dangers of city streets and traffic
- Restrooms
- This project has the potential to transform the open space preserve from a barrier to active transportation to a veritable hub of it.
- Better access for kids to get to school without damaging local wildlife
- Right now people just do whatever they want, wherever they want in the open space. I know because my apartment faces the preserve and I see it every day, all day long

- It would be great if, eventually all the trails tied together somehow. Maybe a break here or there logistically but overall having one cohesive trail makes sense.
- I would prefer it to remain unpaved, it's significantly better for joints to keep it an unpaved trail

What are some concerns you may have about creating a paved multi-use trail in Mahany Park open space? (Other)

- Pavement is hot, we need more trees
- I would prefer unpaved
- Cost to tax payers
- None, it is an underutilized space with a lot of potential
- Not enough access points so people will stray from path. Maybe add minimum barriers on each side and signage to protect wildlife/vegetation.
- More people generally means more litter and disregard for natural areas. Dog waste and drink containers seem to be prevalent in other areas of town.
- Litter in the open space if not enough receptacles
- Maintaining Woodcreek High School nature docent program that educates younger kids; possible negative environmental impact
- Proper use of trails
- Trash and traffic may cause more damage than noted today.
- Nature preservation
- I don't think that the current path is an issue.
- Maybe a walking path separate from the biking path to avoid collisions.
- That the costs of the trail were not already paid for using regional park fees the several specific plans in this area.
- Fire safety during summer months. Also using goats for brush clearance must continue.
- It would disrupt the nature and animals more if there are more people that use the trail
- People still not staying on trails and still causing damage to wild area.
- It's open space, natural and open. More people means more trash, dog poop etc.
- More use more litter
- Mountain biking isn't the same on pavement
- Loose dogs from the dog park concern me.
- Costs
- Potential for more people to go off the path and damage the ecosystem.
- Cost and maintenance. Seems like Roseville is already concerned about revenue.
- fencing on trails that limits access and creates congestion
- Destruction of wildlife
- Don't need a hangout space of any kind
- More paving over. More unnecessary and ugly improvements
- I can access the area from my back yard, and I don't want more people within sight of my yard.
- Destruction of natural habitats
- I am older and still jog every other day in Mahaney Park since it opened in the early 1990s. I cannot jog on pavement anymore, must have dirt or the gravel road. I want that to continue somehow.
- More trash.

- How it affects wildlife in the area. How waste is controlled.
- Would there be crushed gravel shoulders for runners?
- Protection of land and animals
- Please keep some dirt trails, pavement gets hot
- Decrease of nature there
- I don’t want to see this area paved over.
- Toxicity of pavement, increased traffic, less observance of nature but instead a focus on speed of getting thru the area, and if there will be a budget to continue to maintain the trails.
- Prefer dirt for mountain bike use
- Homeless camps
- NIMBY pushback by local residents adjacent to proposed paved multi-use trail and complaints from same group if/when paved trail exists
- Dogs and bikes don’t mix very well. The dog could get hurt and/or the cyclist could crash and be severely injured.
- Damage to wetlands, nature preserve
- I don't think we need a trail in Mahany Park. I think a skatepark would be a better choice to build.
- Creating a paved road through the wild life area concerns me greatly. I absolutely love the natural paths that are already in place. It is absolutely possible to bike through the paths as they are. My least favorite part of the existing paths is the rocky trail going from the aquatic center. I wish it were more of a dirt trail.
- Make bridges rated for fire apparatus
- Loss of dirt paths that make it feel more connected with nature
- It won’t be used if not properly connected
- Environmental concerns such as what the pavement and amenities would do to wildlife.
- Dogs not on leashes on the trail, width of trail, and litter
- That you will ruin its natural beauty by paving it
- More people, more chaos with skaters, bikers; more vehicle traffic drawn to the area. Roseville is getting over run as it is.
- Bicycle riders taking over.
- I think keeping the open space as natural as possible without any pavement, etc. is very important
- Taking a mostly native open space preserve and turning it into a paved and manicured greenbelt
- Impact on wildlife.
- Clear signs indicating trail use etiquette
- Teens already use motorized scooters, the problem will be worse if on a paved path.
- Litter/pollution in creeks
- Dirt/gravel is easier on the feet/knees for walking/running
- People confusing open space with a park.
- Too much paved space that doesn't retail natural open space look/feel
- Unintended damage to wetlands
- Impact on the natural ecosystem
- Still having non paved paths - would like to have this option
- Fires and vandalism to the existing trees and habitats, problems with people riding dirt bikes also.

- Fires during the summer, area is overgrown
- One more area we lose to cement. Roseville is becoming less and less green. There are plenty of sidewalks areas, very few natural paths.
- High cost for implementation
- Open space preservation
- Taking away other current trails
- It takes away from the nature and is not necessary
- Destruction of the natural ecosystem
- I like it the way it is . I like the relaxed open space and the ability to wander wherever I want to go . If you put a paved ride into it then all the cyclists will claim it and change the whole feeling if it. I say that as an avid cyclist. It will turn out like the one from foothills to Fiddyment just a boring paved road. Please don't change it .
- Plants and wildlife
- Trash
- Disturbing the wildlife that lives there.
- I think that one straight paved path from Woodcreek to Fiddyment is perfect and all other trails should be left as is
- Leash law signage
- Increase in the homeless staying there
- That it will no longer feel like a natural space. It is so difficult to escape this concrete jungle. It will feel more like a park.
- Impact on wildlife by making it more accessible by people and associated litter problems
- Homeless gatherings, hangout for kids late night parting, bad people destroy the nature but the benefits far outweigh these points.
- Reduces natural setting, becomes urban
- Dogs off leash
- It will ruin the atmosphere of a wilderness area. It will make it seem more modern, and many people enjoy the sense of adventure when going through the wilderness area, and with a paved path, it will ruin the sense of adventure.
- Concern about it looking like a road, with fast bikers, etc. Prefer it to be a smaller natural trail
- Protection of bird habitat
- Why can't we have some elements in this city (concrete jungle) that are natural?
- The current dirt paths have a more nature feel to my walks and jogs.
- Wildlife and habitats of animals plus I enjoy the rustic nature feel about it. It's an escape.
- Who will pay to build and maintain it? More taxes?
- Crowding out animal inhabitants
- Small paths that don't provide even space for social distancing.
- Property taxes to pay for path, maintenance and police
- Bikes are a hazard for hikers. Bikers are usually clueless about the risk for injury to pedestrians
- I'm concerned that Roseville is not focusing on the needs of citizens in West Roseville who have been waiting more than 7 years for essential services like grocery, retail and gas stations.
- Habitat disruption

- People need to know the rules of the road.
- The wild life will leave
- Loss of wild space. Putting a trail in will rob the area of its natural, raw feel.
- The oak trees and vernal ponds
- Environmental Damage
- Concern for wildlife and plant preservation
- Open space is the only accessible dirt trails nearby; I don't want to lose the only place to go bike casually on dirt.
- Traffic increase during construction.
- Grafitti
- Environment
- Avoid damage to Oak Tree root systems
- Environmental. It's not a pristine area but is functional, maintaining that function during construction would be a concern
- Cost - can the city afford this?
- Cyclists speeding and not observing posted speed limits.
- Damaging to the existing nature in the preserve
- Loss of aesthetic and authenticity
- Adequate parking and handicap accessibility
- Currently these dirt and rock trails are perfect as is, quiet and relatively unknown, and a nice place to walk and hike in the little hills. I fear that adding a paved path will take away from this as it will become much more used by bikes who tend to go much more fast on paved trails vs the dirt and rock that is there. I don't want it to lose its serenity. I also don't want to see increased traffic down our quiet streets or extra cars parking on our roads.
- Dogs off leases is a common issue
- I enjoy trail riding so would not want to see many paved trails
- Graffiti/ trash. We enjoy the open space because there are less paths. We use it every day and why we moved here. Don't want it to be a formal recreation area
- Safety of wildlife during construction
- I think the area may lose some appeal as a natural/undeveloped area. I enjoy the packed dirt trails and the way they are part of the land. I'd love to see some bridges over the creeks/ditches, and perhaps paving of the wide, straight roads. However, I don't want to the place to become just another city park.
- Costs
- Disturbing wildlife
- Destroyed environment
- Keeping the open space vibe
- I enjoy the natural feel of the trails the way they are.
- Potential accidents if bikers and pedestrians use same path
- Cost. We are suffering a pandemic and loss of wages and jobs. Some people cannot afford food and you want to spend this money on a trail? More space for homeless in Roseville.
- Barriers between pavement and dirt paths. Keep dirt paths accessible.

- Balancing water retention and plant habitats
- Would clearly defined dirt trails be ok? Would help keep a more natural feel, retain less heat and perhaps less long term maintenance expense.
- My initial concern would be that it would remove/ reduce the amount of dirt/ nature trails.
- Vandalism to man-made or natural habitats
- Losing unpaved trail access and use
- Accidents. Cyclists go fast. Kids on scooters are all over the place. Dogs on long leads. Slow walking vs fast. There is just a lot of potential for conflict.
- I see this as a benefit
- Protection of habitats
- Pavement is hot in summer months and can burn the feet of dogs. Leave it alone.
- Educating walkers and bikers on right of way and courtesy. It appears that students and senior citizens might frequent the trail. Perhaps a bike speed limit would be needed. Directional arrows as on the Pleasant Grove trail for walkers and bikers would be a must.
- Disruption of wildlife and native plants
- Wildlife safety
- Taking away from the natural dirt trails that runners/bikers like to have access to
- How construction will affect existing wildlife.
- Unleashed dogs
- Easier access for homeless
- Shrinking nature's footprint
- Cost unnecessary
- Ruining natural splendor
- Wildlife
- Why must every park be developed?
- High speed bicycles. Vandalism
- Nothing wrong with it now.
- First a paved surface in the summer heat of Roseville would be DANGEROUS for dogs! Bicycle riders would dominate the path also endangering the people walking their dogs. Bikers go too fast; many bikers don't indicate they are passing and many bikers expect walkers to move off the paths to make way for the bikes.
- Wildlife safety
- Misuse by those who don’t care
- May not be used as much and can ruin the feel of nature
- Dollars spent when they are scarce.
- Unleashed dogs and amount of trash and dog waste.
- Cost
- Losing the nature feel of the trail
- See my concern above about path directions on safety.
- The same dirt trails have been there for years. People like exploring the little dirt trails and I think that keeps them from randomly making new trails.
- Maintaining a protected open space for plants and wildlife
- Ruining the cool natural trails there now

- Animal safety and preserving nature
- Bathroom
- Homeless camps
- I am concerned that it is pointless.
- Less dirt trails
- Having to read and listen to NIMBY neighbors.
- Homeless camps
- Likely runners and dog owners will still utilize dirt path next to black top as it is less impact for runners and not as hot as black top for dog paws
- Industrializing nature areas
- Removing access to all dirt trails. It's better to run on dirt.
- Loss of suburban cross-country bike trails
- To be honest, I enjoy feeling as if I'm more connected with nature while running on a dirt trail, and I'm afraid that the paved road would take away that aspect. Especially because paved roads are large and unnaturally colored. It would also smell like asphalt for a while.
- Habitat protection
- Restroom access
- Paving the area. We often see wildlife on the dirt trails. I don't see a reason to introduce more pavement to gravel to their environment.
- Trash
- Homeless attraction
- Homeless
- Disruption of wild life and landscape of the open space
- Negative impact on nature; one of the best things about walking along there is that it is more like hiking than walking on a sidewalk.
- Would like to see park rangers
- There are many paper trails and not many dirt trails I would like to see this day a dirt trail
- Takes away from the natural feel of the area
- Encampments
- That we protect the wild life - plants and critters
- Homeless people-safety issues
- Keeping clean, no trash
- I would use the paved trail, but we also enjoy the use of single track trails. They add an extra experience to recreation in the city.
- Lose the sense of wildness
- Losing the wild feel/nature
- Preservation of the flora and fauna
- Trail bikes running over walkers
- Environmental impact
- Social distancing
- Increased trash

- I enjoy that the area is natural and undeveloped. It is so much cooler to get away from all the houses and pavement in the summertime. Too many paved trails would ruin the area.
- criminals tend to hide in these types of "off the beaten road" trails. Female Jogger/walker safety is a concern.
- I prefer dirt trails.
- Too much traffic that might negatively impact wildlife
- Environmental preservation and prevention of damage to habitat due to increased ease of access to sensitive areas.
- More trash
- Homeless
- Allows access for new homeless encampments
- Asphalt, runners and road bikes going 25 mph don't mix
- The dirt trails are fine the way they are, it is nice to not always be on pavement when running or biking
- Not a good use of City money right now
- Bicyclists are dangerous and do not share the road. Let me use the existing bike lanes we as taxpayers already paid for.
- Ruining a fragile ecosystem with more concrete and people.
- Attracting homeless camps
- Litter management
- Waste human trash and dog poop/bags
- Homeless encampments
- Homeless and drug users
- Less extensive trails and access than currently exists
- Unsafe crossing areas
- Homeless camping out
- Natural habits getting destroyed
- More concrete, the more heat the surface retains particularly in the hot months.
- Trail width. When trail are busy it can create safety issues. Minimize impact to natural resources, while creating opportunities to view and learn about natural aspects.
- If adequate connections are not provided, the existing issues with volunteer trails will continue as the new path becomes more of a magnet for users. Maximizing connectivity is critical.
- Natural surface trails are important to protect. I don't think a paved trail is needed.
- I like the dirt trails
- Cost
- Well there are coyotes out there we see them at night outside the dog park area fence. Other problems I would see teens vandalizing stuff. Homeless camps and drug use will become a problem
- Littering - having trash cans and dog bag stations is must
- Creating a trail without public bathrooms
- More people without some sort of enforcement to rules could do more harm than good
- I ride mountain bike there as does the Woodcreek high school mountain bike team. Pave only what you must and do not close access to the dirt trails.

- Whether paving will disturb wildlife habitats more than walking on the dirt
- This may reduce numerous alternative paths created throughout the area
- Loss of natural surface trails
- We love that there are currently several dirt trails that are fun to bike on. It would be great to keep some of the trails as dirt.
- Homeless camps and increased trash
- Cost, is this an appropriate use of funds during Covid?
- Unpaved trails are significantly better for joint health and connection to the outdoors
- Where does this money come from?
- Disruption and destruction of environment

If you are a visitor, what city are you from?

- Pinole
- Rocklin
- North highlands
- Rocklin
- Rocklin
- Rocklin
- Folsom
- Lincoln
- Rocklin
- Rocklin
- Granite Bay
- Rocklin
- Pleasant Grove
- Rocklin
- Granite Bay
- Rocklin
- Citrus Heights
- Antelope
- Rocklin
- Rocklin
- Rocklin
- Loomis
- Rocklin
- North Highlands
- Penryn
- Citrus Heights
- Rocklin
- Rocklin
- Lincoln
- Rocklin

- Citrus heights
- Antelope
- Rocklin
- Rocklin
- Lincoln
- Rocklin
- Citrus heights
- Rocklin
- Antelope
- Citrus Heights
- Rocklin
- Rocklin
- Rocklin
- Granite Bay
- Antelope
- Rocklin
- Colfax
- West Sacramento
- Lincoln
- Fair Oaks
- Sacramento
- Rocklin
- Lincoln
- Rocklin
- Los Angeles
- Loomis
- Sacramento
- Placer County
- Citrus Heights
- Sacramento
- Folsom
- Auburn
- Rocklin
- Lincoln
- Davis
- Auburn
- Rocklin
- Rocklin
- Granite Bay
- Auburn

Do you have any other comments or questions about the Mahany Park Open Space Trail Project?

- Thank you for providing an opportunity for our input. I would like to see the city implement as much uninterrupted bike trails as possible. Stopping at a major intersection and riding on busy streets keeps me from biking locally. My wife and I prefer taking our bikes to the ARBT. Question above regarding if safety was a concern - our concern is for wide enough trials for bikers and walkers. Thank you again.
- Please plant more trees and stop cutting down adult trees. We need more shade and greenery in Roseville
- A trail would be so helpful for residents to get to the Roseville Sports Center, Riley Library, and the Aquatics Complex without getting in the car!
- Overall I actually like the space as is
- I really enjoy riding through this space with the kids on adventures, and it did strike me as odd when we started using it that there are random trails that end in nothing or in creeks. It would be great to focus on a paved system that protected the creeks and kept people from randomly exploring more sensitive areas of the space.
- Please make sure to add signage to indicate directions for walkers/joggers and bicyclists along entire route-either by painting on the path or signs.
- Plant more plants/trees, otherwise I appreciate this park
- Having at least one restroom/port-a-potty in the area would be so helpful. Not everybody has a home nearby when the need arises.
- I believe we can have a good balance of preserving nature and having people be out in nature so that they can both enjoy and appreciate it. Also, we have had Scout nature walks there. I learned a lot and I would like school children to have that opportunity. That is also why I like the idea of nature signs.
- Please make this trail happen. It is so unsafe currently to have to walk, jog or bike along the busy fast paced roads around the area. Our poor kids have to ride their bike along Fiddyment to get to school as huge trucks whiz by at 50 - 60mph.
- Will the building of the paved trails seriously disrupt wild life?
- I fully understand the desire to better protect the wildlife and natural areas. Would it be possible to create dirt trails - meaning control which ones should be used with the normal path fencing (posts with a cable), but leave the pathway dirt? My family uses the space both for bike riding - kids love to ride on dirt - and for running, as a dirt is far better on your body than pavement. So rope off where I can and can't run/ride to control some of the off-road stuff, but leave it dirt!
- Have a butterfly house. Use Roseville's summer heat and solar power, as an attraction and place to go, learn, enchant.
- I really appreciate all the great trails in Roseville. I am excited about this project.
- This is great.
- Please do not lose the nature part of the area.
- I think paving a trail would be a waste of materials. Growing up in the area, I've never had an issue accessing the trail space.
- Please connect this trail to the riverside/darling access point.
- I really like the idea. My wife and I recently moved from the South Land Park Neighborhood. I was on the board for SLPNA for 8 years, and was also very active in getting the Del Rio Trail project started.
- Make main use trails wider than side branch trails

- Would be great if this trail was expanded to other areas in Roseville, like a protected bike lane down Woodcreek and along baseline. Getting from baseline to Mahany can be dangerous
- Thank you. We moved to Roseville because off the bike trails. More trails would be welcomed.
- I would prefer that the repair and maintenance of the trail around the outside of Maidu Park and other areas of the City take precedence over this trail when using non-regional park building permit fees (which are intended for construction of these types of projects).
- Consider paving the gravel parking area next to the aquatic center for trailhead parking. Trees along the trail would be nice to keep it shaded in the hot summers.
- Build a little bridge that crosses behind the dog park off the paved main trail. So you can go directly from Alsbury all the way straight on the path to Pleasant Grove
- As a senior, I am not comfortable walking on non-paved trails so this would add a very nice opportunity for me to get into a more natural setting for my walks.
- I think it is a great idea to have some wonderful pathways.
- Leave it alone, it is a great place to take a respite from all the noise.
- Please do not add a paved trail. Do not disrupt the space any more
- The trail should be extended into West Park
- Also include signage for trail etiquette: i.e. regarding trail markings (e.g. which side to walk vs ride a bike) and sharing the trail.
- I'm completely in favor of this project.
- I think it's a great idea to have a paved controlled access trail, both for the sake of trail users and for the wildlife
- Drainage on the path of the pedestrian undercrossing near Sun City needs to be address as there is always a muddy area to traverse. Also graffiti has become an issue and needs to be addressed more quickly. I would love to see footbridges to cross the creeks, which swell during the rainy seasons, making the areas impassable.
- Makes sense to at least pave the existing gravel road and to complete the trail from E to M, connecting to Pleasant Grove Blvd. near the dog park.
- I would love to leave it the way it is and has been. Just because the city of Roseville keeps allowing thousands of people to crowd in here, doesn't mean we need to ruin what has been open space with NO paved trails. Want paved trails, pick a different place. We live right next to it and don't want all the people, trash, and noise that will come. The graffiti, litter, and dog poop is enough already! And garbage cans don't look nice in wetlands. Just saying.
- How many access points will there likely be?
- I have noticed a lot more bicyclists going off trail. I hope this will somehow be discouraged in the future. They go through the grass and wild flowers.
- I would like to see it connect to west park with a tunnel underneath Fiddyment.
- I think it would be a great amenity for the community and a great use of the space.
- The more trails the better!
- I love the idea of a network of trails to use in that space and look forward to completion when I can start using it.
- I'm very pleased that this is being considered and look forward to the grand opening of it.
- How long will it take to finish all of this?

- I would like to be able to cross creeks. I would also like to be able to use inline skates on the trails.
- Thanks so much for addressing this important need! Please make sure this is accessible from Fiddyment!
- I think monies should be maintained to cover the expense of goats for fire protection. And removal of dead trees on trails that could be a hazard. At this time no other money should be spent on this while independent small business owners are struggling to come back from the shutdown of covid-19. All extra money should go to them to help them reopen and continue their livelihood.
- I just would like to see a paved trail from Fiddyment to Woodcreek.
- Please plant tree along the trail
- Need to insure power lines are not accessible to potential vandalism or personal harm.
- It would be awesome for there to be accessible BMX pump tracks for those people (like me) to go do jumps and have fun. You will be surprised of how many friends I have are wanting a track for their bikes to mess around on.
- No fencing on the trails please! Leave it as natural as possible.
- A nature preserve is something to be preserved not degraded with your proposed improvements.
- Mahany Park is filled with enough trails already. It's appeal is that it's not overrun with bicyclists. It's perfect area for walkers and their dogs. If anything, the trails need to be fixed over the creeks where the original foot paths have been washed out.
- This would be very nice, use this trail every week.
- Many people leave their dog poop bags in the trails. Many people let their dogs off the leash with kids and other dogs around.
- However, I would like to see the bridge over the creek that was removed several years ago re-installed.
- The more trails that allow for enjoyment of open spaces, the better.
- I would like to see the proposed sand volleyball courts completed near the tennis courts. What is the status?
- Please leave some of the open space wild.
- We have used the open space area at least since moving here 18 years ago. We would love to see an open space trail area. We are especially interested in the trail linking up with other bike trails in the area.
- My only concern is more people and trash.
- I think it’s a great project to connect bike trails around the city. Better connections crossing major streets help also for people trying to bike around the city and would encourage more biking.
- Love the bike trails in the city. Which they were fully connected more since riding on roads today (even within bike lanes) is more dangerous than ever with rampant cell phone use while driving.
- Since there is already a rudimentary trail system in the area, I think improving the trails by paving them would be a fantastic idea.
- Multiple paths would make it easier to social distance.
- I think it's wonderful that you are allowing residents to have an input on this project. Nature areas to walk are important to our mental health.
- I checked the trails out this morning on my bike. Less developed than I expected. I like bike trails, but it might be good to keep some trails undeveloped to keep the bikes off. Also, nice to have benches in shade. there was a wide bridge whose boards need some love.
- Yes, getting run out of the way by bikes speeding buy

- I would love to have more trails to ride in Roseville! I often take my bike down to Folsom because they have so many established trails there. I would love to have the same where I live. I live in Westpark.
- Help connect our city trails and set the foundation to make Roseville a city that you can walk and bike anywhere on safe trail systems
- We love it as is, please don't pave it.
- I really would hate to see things paved over. One of the reasons that I enjoy this area is because it is not paved. There is so much to see and I feel that paving it will completely ruin the experience and scare the wild life away because it would be messing with the natural habitat.
- Is there a gravel option with updated nature signs? Is there a plan to better monitor the area for inappropriate use? We see lights in the area at night. Also, someone was sleeping in a hammock tied to trees in the daytime. Some spray paint under overpass.
- Please continue to try to connect walking and biking trails so we don't have to be on the street
- This is great. A large t-shape through the middle connecting existing trails would be most cost effective.
- It's about time to do this.
- I would like to have a paved path that leads under the bridge near Rose Creek Road from Sun City to Mahany Park.
- I think it would be better to build a skatepark at Mahany Park rather than a trail.
- Wish they had finished the sand volleyball court in the park behind the aquatic center.
- I use this space often and enjoy bringing my children there for nature study. The less natural it is made, the less appealing it becomes. There is such beauty in the lazy dirt paths that wind through the Oaks. I fear that a paved path will bring many more commuters and possibly even transients to the area as has occurred in the downtown Roseville parks. I'm also concerned that with a Paved path there will be toilets added to the area which is thoroughly unnecessary as there is already restrooms near the library. Thanks for allowing us who use the space to share our input.
- It would be a great benefit to connect all trails together eventually. To be able to bike from one part of Roseville to all areas of Roseville similar to what Folsom has.
- Will our taxes go up to fund this?
- Please hook up to all trails leading to Folsom lake.
- Although I understand the need to protect habitat and vegetation, there is an appeal to walking a narrow path which at the moment is dirt. It is more like being in nature than on pavement. The one thing we appreciate about Roseville is all the open spaces to walk. Thanks so much for all you do to make that possible.
- Let's do it!
- Connect all Roseville bike trails.
- The most important part of the trail for us is to pave the part that is gravel so there is a complete paved way to ride to the high school, library, and park. Second, is safe creek crossings.
- People are already using the dirt and chip-and-seal access roads out here. There is a problem with user created bridges in several areas and adding something the city maintains would likely be an overall benefit to the area, as it would mostly confine the areas people use to better maintained trails and having trash cans and dog pots would at least greatly help with the amount of litter and dog droppings left by users of the open space area. Increased traffic would be an ecological detriment in that it increases human traffic in the preserve, but increased traffic would also hopefully increase responsibility of users as they have others around.

- Let's do it! Long overdue to have a bike trail extension west of the pool and school
- No dead ends. Follow existing dirt paths, no right angles. Bridge connections above or below arterial roadways.
- Nope
- I think it's a fabulous idea to have a paved path through the open space
- Have you thought about asking for donations from local organizations or businesses for some of the things needed, like benches or signage or dog waste stations? You might find some of the local organizations might get behind the cause financially to help out.
- Thank you for this project.
- More benches and swings for kids, any activity to bring people out
- This is the Cross Country team's only trail to run on for morning practice. The only thing I would add to the existing trails is more/updated wildlife signage and bridges to cross creeks, which have been a dangerous hazard in the past.
- I would love to see these trails remain dirt
- I think this is a great idea. I wish we could have more trash cans and dog waste stations around our city to help alleviate all of the garbage, waste, and litter that is throughout our residential sidewalks.
- We do need green space pedestrian/bike crossings through highway 65 near Pleasant Grove and near Blue Oaks or Stanford Ranch.
- Please complete this project as soon as possible! Definitely needed many years ago.
- What's the timing and funding sources for this proposal?
- Good idea
- Please keep some dirt trails.
- Paving the general maintenance road would greatly help, I hate riding my bike on it as it's way too bumpy and there is no other access to Woodcreek Oaks from the North/South existing bike trail.
- Please do not pave a trail. Please limit parking and access points. Please keep it as natural and protected as intended. Enforce dog walkers keep dogs on leash and pick up poop. I have seen dog owners turn dogs loose to chase migrating geese in the vernal ponds - awful! Paving will only encourage and increase all kinds of traffic in the park and surrounding areas. Please save your money and spend it on something else like energy rebates, supporting more police activities as the city is growing too fast and is losing the very amenities that used to make it a safe and special place to live.
- I thought the 1/2 percent city sales tax was to supplement the police and fire departments. I don't like seeing it spent on other projects. Our police force needs to be supplemented.
- In Roseville there are many greenbelt bike paths and maintained city parks. The Mahany nature preserve is unique in that it is mostly native valley plants and landscape as well as endangered vernal pools. While paving some of the main trails such as the access road running parallel to the powerlines running E-W and adding bridges for better access might be beneficial, the unpaved dirt trails I would say add to the experience people desire when they visit the Mahany nature center. If visitors want to walk on a paved bike trail there is one in Mahany and many throughout Roseville. While increasing trail signage, interpretive signage, and access would be positive, I would argue strongly against paving everything in order to keep the space somewhat wild.
- Thank you
- I love the idea.
- Please start ASAP

- Love the idea
- I would like to see the leash law enforced. I have been swarmed by dogs multiple times since COVID-19 started with many people out there with dogs off leash. The off leash dogs and owners who can't control them trample thru the plants.
- My family walks the dog several times per week in the Mahany Open Space. We have a Labrador Retriever that loves to play in the water. We have hundreds of friends in the area that walk their dogs off-leash too. These dogs need to run and handlers need Covid-19 safe outdoor activities. For the most part, dog handlers are responsible and self-regulate dogs with aggressive or runaway behavior. We don't need this area turned into a park with rules, parking issues and amateur ornithologists thinking it's a bird sanctuary.
- There are a few bad examples I would like to avoid, namely Veteran's park which is totally off limit to dogs also the trail West of Nichols Park the chain-link fence on the north side of this trail prohibits access to the creek. Pleasant Grove Creek Trail is nice but there are traffic issues with speeding bikers and joggers on the paved sections that are reluctant to slow down. Having leashed dogs makes these situations even harder to manage, like a giant bolas ensnaring everyone in a tangle.
- I am disabled and have limited mobility, a few foot bridges would be useful. There are three places that would be on my list; The North Bridge (38°46'00.42" N, 121°20'17.49" W) by the cardboard recycling bins near the Bear dog park (Point Q). Middle Bridge connecting the Main East and West trails (38°45'51.58" N, 121°20'30.69" W) or as an alternate a Woodland Bridge (38°45'58.70" N, 121°20'36.15" W) on the trail through the oak grove.
- If there were an unlimited budget, it would be nice to put in some tables on the two hill tops (38°45'48.84" N, 121°20'13.43" W) and (38°45'47.16" N, 121°20'11.85" W) and rip out the old benches. It's the best place to watch the sunset. And a garbage can, the kids leave a lot of broken glass up there.
- I was hoping you would pave the gravel maintenance road and replace the surfacing on the bridges.
- Please have all the trails connect.
- Exciting! Thank you!
- None. Thank you for the opportunity to comment
- If trail is going west of Fiddyment one day as shown, pave the existing access/maintenance road off of Fiddyment to park
- Has there been an Environmental Impact Statement conducted for adding paved trails to this open space?
- I would love to see a Par course type exercise stations that you could do as you walk run or bike along the way like they have at many colleges. The equipment is very low maintenance and not very expensive.
- Would love a trail, and to build some bridges! But would hope to keep it simple, so traffic doesn't increase. And also to stick to the current paths and not add new ones closer to homes.
- I use the trails of Mahany Park 5 times a week. I like it as it is, but definitely see the benefits of upgrading the trails. I hope you consider those "paths" that we have created through the woods south of proposed access point L and upgrade them.
- I think this project is a great idea!
- When I walk on some of the trails, they are not wide enough. Bikes come up behind me and dangerously try to go around, but there isn't enough room.
- Would love to see connection from veterans park to Mahany and to Miners Ravine
- Your posted map does not show the proposed trail - there is no highlighted green trail on the map aside from a small part off of Fiddyment road. You should re-publish the map to show what you are actually proposing.

- I would love exercise stations.
- We love the existing walking paths and use them a lot. It makes sense to add more and do it in a good way, the same as it has been done.
- Leave it as it is , a nice relaxed walking areas with no restrictions and a proper open space for everyone to enjoy.
- More police patrol on bike. Public safety.
- Adverse impacts to natural drainage and runoff are a concern; adverse impacts to wildlife
- It's nice that it feels simple and rustic. I appreciate having lands like this so close to Sun City.
- Please make the trail happen
- This is nice to think about but is this a wise use of funds during a depression? How much will taxes go up on the unemployed?
- This seems like a worthwhile project.
- Consider restrooms
- It is needed for safe scenic trail walking by the residents of Sun City; for long overdue removal of dead trees, etc.; for better brush fire control; for aesthetics; and for better insect control eg. mosquitoes.
- Can't our taxpayer money be used for a better purpose than this?
- If this project moves forward, I would suggest that the unpaved trails now being used be the ones that are paved & limit the NEW trails created to keep costs down since this project will not be used by a LARGE number of people. Keep the goats/sheep coming to keep the growth down & make sure LIGHTING is included to keep the people safe.
- It would be nice for the city to leave some places in the natural state that they are currently in. Adding garbage cans or dog waste bag stations are a plus. Otherwise that is all.
- Welcome all paved, off-road areas to walk and bike
- I would like to see the bike trails connect to existing trails and expanded so I can stay out of traffic.
- Leash laws should be posted. Nothing is worse than going on a run and approaching dogs without a leash, it's always scary.
- Please connect or make plans for a strong future connection to Sierra Vista community (e.g. pedestrian only light/ cross walk). The Sierra Vista specific plan calls for a commercial development and hopefully a access path through that future development. We need to get access to this wonderful project.
- I love this area!! I visit it weekly. I think it would be fantastic to have more trails that are user friendly to run, bike and walk on in Mahany Park!
- Paved pathways will reduce erosion, will probably encourage more people to use trails in rainy months, will encourage users to stay on trails and out of fragile land areas.
- Maybe add more "fun facts" signage or nature/map signage. Also if possible, maybe add some lighting along the proposed trails since it gets very dark once the sunsets and would help for safety. Also, add some bridges along creeks.
- Will the bridge crossing the creek located by the old water substation be maintained/ fixed, some of the wooden planks are rotting and getting loose (bridge is located in the area of "F" on the map above for Existing Access Points).
- A pedestrian overpass at Pleasant Grove and Woodcreek would be nice.
- Let’s definitely make this happen! We love Roseville!

- I think this is a great idea and as west Roseville continues to grow this will provide a much needed recreation destination for families.
- Wait until the City finances improve
- Has the project been approved to be built and the city is just looking for input or is the city debating whether to proceed with building the trail?
- Will you be taking public donations after the $300K?
- More bike trails allow for safer modes of transportation that are not shared with cars
- Plant some colorful trees, shade, water stations Please plant some nice small trees, planting in front of Fiddyment transformer station. The surrounding area by the station is an eyesore. The landscaping in front of the station has been severely neglected!!
- I go on these trails almost every day and I really enjoy them, I've lived here my whole life and the trails have lots of memories for me and the bike jumps that are there are really fun, and if it becomes paved, it will ruin the ability to enjoy the trails for me and my visitation of these trails will significantly decrease. Please do not pave these trails. It will seriously ruin the atmosphere and I will not enjoy a paved trail.
- Great idea! We walk the trail out to the small power shed and back to the library.
- How much would this cost? The map does not show where the trail would be located, would it connect with Fiddyment, Raley's, Library, Ball parks?
- Thanks for doing it. I'd love to see it ultimately connect to the Dry Creek Trail way
- I drive special to Mahany Park open space to run on the dirt trails. It hurts more to run on paved trails. All the trails around my house are paved and not enjoyable to run on. I also like to walk my dogs on dirt trails as temperatures rise it's hot on their paws to walk on paved trails versus dirt trails. Please keep this area natural.
- What plants and habitat are endangered in the area that would be improved by putting in a paved path? I think that paving paths throughout this area would be more of a threat to the "endangered habitat" than leaving it as is. Adding bridges over certain creeks and endangered areas would be more of a benefit than spending money on paving trails. I feel that people would continue to create dirt paths throughout the area, therefore negating any benefit that paved paths would create.
- I have lived in West Roseville for 17 years. I am proud of the fact that we have the Mahany Park nature preserve and it feels like you're taking a nature walk (ignoring the powerlines, of course.) I like the dirt paths.
- Mountain bike area or flat track
- How is this being paid for?
- Yes! It seems to me there are other needs that should take priority over paving a trail. Repair streets. I'd like to send you a bill for the roundup I use to kill the weeds on the streets in front of my house.
- Leave it like it is except lighting
- Please provide visible lines of sight around tight corners or steep slopes for bicyclist and pedestrians and provide money for maintenance for park staff to complete plant trimmings for over grown areas that impede visible lines of sight. Please put solar LED lights under bridges. Please provide 1'-2' wide compact granite shoulders on each side of the paved trail for walks and runners. Please plan and budget for maintenance for future slurry seals and maintenance on the asphalt trail.
- What are the environmental impacts?
- One of the reasons I like walking through the area is to get off of the asphalt and concrete that covers most of the rest of Roseville.

- I was very disappointed when the former plank bridges crossing the creek were removed. So having another bridge would be nice.
- I don't understand the contention that having a swath of asphalt through the area is less disruptive to nature than dirt paths (some of which were created by wildlife). I have been walking the area for over 20 years and have noticed different dirt paths come and go.
- You have too many names for the area, Mahany Park Preserve, Woodcreek West Preserve, Silverado Oaks Reserve, Woodcreek Nature Preserve. In fact, putting an improved multi-use trail through a "Preserve" seems kind of antithetical. I guess I am ambivalent about the project. From my perspective, there are things that would be nice about it, but I could easily do without it.
- I like it the way it is.
- Well overdue. Always wondered who owned the property and why it was so underdeveloped
- I repeat, less focus on open space and more on the needs of West Roseville residents.
- I actually like the dirt roads/trails, so see the bridges as the most important element.
- Leave it just the way it is. We love the natural feeling of the open space.
- The most important improvement is providing cross over of the creeks which would greatly improve connection with all the trails.
- Frequent user of pleasant grove creek trail. People do not know how to use the trail, unattended children, oblivious adults, right way to walk or bike, littering, dog poop, unleashed dogs & children, lastly mandatory trail safety course attendance.
- More paved trails = more people = more congestion, trash, and less nature = less wildlife = fewer reasons to have the open space area.
- Trails increase the desirability for family living and working in Roseville. Build and connect trails.
- I regularly use and enjoy this open space and have been picking up trash throughout the area for 9 years. Trash cans would be an excellent addition. Thank you for the thoughtful consideration of further improvement to this multi-use area
- It's such a beautiful peaceful walk right now you will change all that by changing the environment
- About time
- One of the best birding spots in Roseville. Plant more native trees and plants. Don't let the goats eat the willows. Protect the large oaks.
- I like the nature area the way it is, not looking forward to having more people in the area parking their cars in the neighborhood so access the trails. I live here and purchased the house because it had a wetland preserve so as to know that there would be no future infill projects.
- One of the top 10 Birding Hotspots in Placer County
- Great idea!
- This would be great. Would love to walk and ride my bike through the park.
- I love this trail. I run and walk my dog on it every day. I am 36 years old and have been using this trail since I was 14 years old in Cross Country at Woodcreek. It is invaluable to my perception of why I KNOW Roseville is the best city in Placer County. I love how clean the streets/trails are and look forward to putting our tax dollars towards something that will increase our quality of life.
- Excited for more trails!
- I frequently have to avoid walking through the park because it is common for people to unleash their dogs.

- I relocated to Roseville one year ago and didn't know there was an Open Space at Mahany Park. I'm eager to see trails added so that I can use that space. I'd rather walk on a paved trail than through any area where I could disrupt vegetation or animals.
- Excited
- If you want to preserve the area, I do not see making improvements which will drastically increase traffic being a good move.
- Keep the area dark, it's great to have a place to go see the stars from.
- Adding a trail through the area is a much needed improvement. Crossing the creek W. of the dog park would be a nice addition to the area. Providing a trail through or near the old Oaks might discourage some abuse of that area. I've seen 400 year old oaks fall to the ground, it is heart breaking. It would be nice to see the old trees in this area continue outlive the residents.
- Would it be possible to fence off some of the vernal pools to protect them from people and unleashed dogs? Would it be possible to add more oak plantings in with this effort for some of the areas out there?
- As a side, I've lived in Roseville for over 20 years and ran that informal trail the entire time. It used to be one path but over time has spiders out into several. It's a beautiful piece of nature in the city that I'd love to have responsible city management of for both environmental and public benefit.
- I would love more trails, but wonder if the city should be budgeting a project like this right now in a time of such economic uncertainty.
- Please at least put asphalt on existing gravel maintenance "red" path
- The space is so beautiful and tranquil. It offers local residents the opportunity to enjoy the outdoors close to home. Sometimes paved trails can bring a lot of traffic to nearby neighborhood homes that would be unwelcome and unfair to the homeowners who bought specifically for a quiet neighborhood near a green space.
- I would like to see it remain as it is
- I think paving the wide, gravel part is a good idea. It provides better and easier access to some people and is more bike friendly. But what we currently have is a nice way to connect with nature in the middle of the suburbs, and I don't think we should undo that
- I continue to encourage the City of Roseville and Placer County to develop and interconnect their multi-use trails.
- The elementary school nature walk field trip with High School student presenters was peaceful and enjoyable. Hopefully a new multi-use trail will not negatively impact the natural beauty of the space and the wildlife and their habitat. All existing Mahany Park areas and nearby public facilities are unique and wonderful.
- I would support small wood bridges being added to make the many creeks easier to cross when they have water in them.
- Mostly I would love to see the power lines go away and be sunk underground. They are ugly and I worry about being around them in terms of my health. On the other hand, I am pretty sure the only reason this space is not developed is because the power lines are there. Let's be honest, there is not much public open space actually set aside. "
- Nice to see more rec options for residents
- I have lived near this open space for 13 years and have longed for a paved trail in this area both for exercise and for my kids to walk/bike to school on! However, what I don't understand when looking at this map is why the trail can't just go through the

middle of the open space like the dirt trails already do?! They are nice trails that could be made even better by paving them and building a bridge over the creek! I walk the Veterans Park trail quite frequently and I know that there have been bridges and additional trails added there within the last 5 years or so. When looking at the proposed trails on the other side of Fiddyment it does look like that trail would run through where to electrical towers are, not around.

- Also the gravel maintenance road is horrible to bike or walk on, is this going to be paved as well?
- And lastly, I don't like the idea of having to walk out on Fiddyment or Pleasant Grove at all. Those are very busy streets and if you're trying to enjoy a nice walk having to walk with cars zooming by you is not very relaxing!
- Public water fountain and restroom station. Entrance F is currently not so friendly to strollers or bikes.
- I would not want any paved trail over existing bridges or creeks. Please keep it as natural as possible by not paving in the interior of the park. If paving, please limit to outer perimeter only.
- Keep it accessible and fun for trail riding mountain bikers.
- It's a great idea. As much as possible, connect with other trails.
- I see the damage due to trespass as a failure by the city to protect the open space habitat in the first place. The open space was protected as mitigation for previous urban development and the city has a (legally binding) stewardship obligation that cannot be set aside. The excuse that you must "pave it to save it" does not hold up. There should be an analysis of the stewardship obligation of the city, which is not even mentioned.
- I wish there were a better way to link the trails, so you could use them to get places without using the street as much
- Connect East to west Roseville
- Wish it would remain untouched. There are enough paved areas if people want to go on them I have seen many people enjoying the paths walking running and biking especially during the quarantine. Don't need bathrooms or fitness stations or trash cans out there
- Please build the Linda Creek trail first.
- I'm a bike rider who doesn't like riding on the streets as some drivers are careless in driving habits and wander into bike lanes.
- I've loved this place since I've lived in Roseville (12 years). It's been a huge part of my childhood and growing up, and I hope it can be a source of natural beauty for many years.
- The pump station at the end of the gravel road looks awful and run down, is it even used? It needs to be fixed up and maybe have some plants around it. For a city that takes great care of its infrastructure it's a sad sight and has been for many years.
- I would like the city to protect the large oaks from the goats which it employs for fire protection. Over the last few years I have seen the goats doing damage to the trees by foraging on the lower branches. I have an plant and tree science background. This damages the beautiful heritage oaks. The lower branches sometimes do not recover from the stripping of foliage and bark.
- I live a block away and walk there most evenings in the spring through fall. I am concerned about the wildlife being disturbed. Please keep this in mind as you plan additional use of this space
- I am concerned that trails will become too busy
- I love the space.
- Great ride location. Keep up your good work for the residents of Roseville. Thanks for the survey.

- If this project goes underway, please make sure that it doesn't affect the environment at all!!!
- Love the idea
- I don't believe this is a necessary project. The beauty of this area is it's "natural" feel. There are enough designated paths already.
- If possible, a gravel/smooth dirt trail would be a nice addition to Roseville's trail system.
- Keep doing a great job. You can't please everyone, but be fiscally conservative and spend your residents tax money wisely. Keep focus on community and the people that pay for a great Roseville.
- More details on other bike trails this project will connect with.
- None
- A paved trail that links the dog park, Junction, and the Roseville Aquatics Complex is 20 years overdue. Nonmotorized access is not possible without using a high-speed arterial or collector.
- Well-designed survey. Thank you.
- I think this is way overdue excited Roseville is creating paved trails I would like the trail to be connected to Suncity so people don't have to cross or access the roads to be able to go to the other side.
- Connect all bike trails throughout all Roseville
- Construct bike park with jumps.
- I love walking the local trails and would like to see it linked with others for additional trail options.
- Our trails are fantastic. I would love to have all trails connect without the need to go onto roads/sidewalks. For example, the trail that goes past Barbara Chilton and then extends west and curves north could connect to the trail that goes through the pistachio trees / orchards on the trail that is north of Blue Oaks Blvd. This would be fairly easy to do, and this would allow people to connect many more of the trails together for fitness and recreation. Thanks for all of the work on our trails and parks!
- I do have a question about the land that is at the corner of Fiddyment and Blue Oaks. We have been waiting for a long time for trails on that land. When will the promised ""nature trails"" be established there? Thanks for any information that you can provide (jmwhitman92@gmail.com).
- Thanks for building trails to prevent erosion and damage to plants.
- This has been needed for a very long time!
- More small trees on the Western portion for shade would benefit, or a public fruit tree picking area e.g. lemons, figs, olives.
- Would very much appreciate having this additional paved trail
- This would be a lovely place for an evening walk.
- I think this is a great idea. My family and I already utilize the space for bike riding and are interested in doing so for many more years to come.
- From the maps provided I don't see much proposed improvement within the red-outlined area - just a small additional trail outside the red lines.
- Keep up the "open minded" approach to alternative modes of transportation for an area growing too fast
- Would be great to have safe bridges to cross the creek at all the access points.
- Shaded areas with benches.
- Hope you create the trails such that the preserve can be protected and admired.
- Pavement is hot in summer months and can burn the feet of dogs. Leave it alone. Complete waste of money.

- Thanks so much for taking input. This would be a great addition to our already wonderful city trails and parks.
- I would love to see a paved trail in the open spaces. I enjoy walking , especially in nature areas.
- Is there a way to keep motorized or semi-motorized (electric bike/scooters) off the trails? I've seen OHV using trails on the west end of town.
- We have learned from the COVID 19 quarantine just how vital these outdoor opportunities are for citizens of all ages. I want to thank the City for having the foresight to construct such beautiful parks and set aside open space. I served on the Parks and Rec Commission back in the 90s. I believe that Ed Mahany would be so happy to see today's residents enjoying this land while preserving its beauty.
- Yes please make it only for dogs on a leash.
- I'd rather it stay unpaved. It's a great place where people can still go ride dirt bikes and mountain bikes, explore the marshes, and walk along well-worn footpaths. It's nice to still have a chunk of Roseville in its natural state to explore.
- Better use of money that you usually waste!
- I think this is great, especially if it’s connected to other paths. I don’t like riding my bike on the street & desperately are looking for longer, safer places to ride. Thank you!
- I come to Roseville with my kids and push my Grandma who lives in Del Webb on the paved trails and my kids ride their scooters. More paving would be nice and we would be able to go farther.
- The open space is relatively flat and serves well as-is, unpaved. I believe that paving a trail through would reduce the charm and character of the open space and increase traffic and refuse through the area.
- I think a multi-use trail is a welcome addition to the space, since it can provide a nice area away from streets and cars to enjoy a walk/run/bike.
- Good ide
- Do not pave
- Again, please plant more trees and have it connect into existing bike trail
- How will it connect to existing trails and what trails will it connect too?
- Thus is a place where people can walk outside and feel a connection with natural beauty. Not every park requires all kinds of amenities. There are ample bike lanes and sidewalks, as well as developed parks. Leave the open space as is, people want and need more undeveloped areas in Roseville or it will soon feel like San Jose.
- There is little information and general knowledge of this trail system and all trail systems in Roseville. We have been here 6 years, we are walkers, and yet we never knew there was a Mahaney trail. No maps, no signage, no marketing of such city trails.
- The more trails in Roseville the better
- I would like to see these paths better connected to each other. Right now it seem like it's .5 miles here and .5 miles there. It would be nice to have a 5 to 10 mi. loop.
- Please work with WLL Board.
- What bucket of funds does this come out of? I am concerned that there are other more pressing needs with limited dollars. How is it being prioritized? Not sure this is priority.
- Living in the Westpark area, my family and I would love to see a trail through this area as well as a connector and trails in the open discernment directly to the west of Fiddyment (under the power lines). We live to bike and walk and for safety prefer trails over roads. It would be nice to be able to bike to get

groceries at Raley's and visit shops/eateries nearby.

- Pavement is bad for walkers/joggers joints. Also, the paving material is full of chemicals that bleed into the surrounding areas.
- I think making it a large loop with a few different inlets from streets/neighborhoods would be the best. Roseville needs another trail, a large circle like Maidu Park. Please!
- Looks like a good project! Emphasis should be on connections between existing and proposed trails so as to create a transportation system.
- The open space is so beautiful and feels like a walk in the country. I think the impact on wildlife from bringing in noisy equipment and smelly asphalt would not be good. A lot of people stay off the trails in the wet season which gives wild life a break from people.
- Leave it natural, not everything needs to be paved.
- I love that trails will connect to the larger network. Please consider adding lighting in some areas. Perhaps solar powered?
- Will there be a paved trail down the middle of the open space down to Fiddyment? It is not shown as proposed on the map.
- Please don't pave. We have enough paved trails. We need the nature
- Just build bridges across creeks on current dirt/gravel trails and done. Don't need anything more.
- Some dirt trails built in would be awesome too
- Please provide access across the creek from point M on pleasant grove to existing trail coming north
- Would be great to incorporate more features for mountain bikers. Maybe a bike park.
- These improvements would be received well by the community.
- Make it happen
- A paved path to the dog park would be amazing. A paved or gravel path from the aquatic center to Fiddyment would be great for exercise.
- Keep dirt trails parallel to paved trails. Don't just pave over them.
- This multi-use trail is a wonderful idea. Thank you very much.
- Please connect all trails. Drivers do not respect bikers. There are a few trials in West Roseville that should be connected.
- Any ponds or Creek areas for nature.
- When will it connect West of Fiddyment & South of Pleasant Grove?
- I would love to see all our trails connected; makes for great adventures with family and friends when we walk, run or ride our bikes.
- Dirt paths are still good. Don't pave everything.
- It would be great to be able to ride from here and connect up with Washington to Royer and jump on the trail to Folsom.
- Water fountain at either ends and in the middle.
- Wonderful
- A parking area at the end of the trail (access point L) would be nice.
- Since we all get taxed a huge percentage of each sale for the wetlands, how fast can you get this done?
- Please make bridges over the little rivers , we would like to bike
- Great idea! Lots of teenagers take it to and home from school. Maybe some safety features. Worry about homeless in the field.

- The more ways we have to get out and appreciate nature, the better
- I think it sounds like a great idea.
- I do currently enjoy the dirt fire road path out there more than I enjoy paved trail and visit because of the option to run on dirt
- It would be great for the city
- I would love for this path to be paved and for multiple points to enter the path. I see it as a great form of exercise, and to enjoy nature. I would really utilize the open space preserve more if there was paved access. Right now I worry about uneven ground and tripping and falling where there isn't a bridge across the creeks.
- We also need shops and gas station
- I would like it left the way it is. I like hiking on the dirt tails. People will still make their own trials even with the paved trails. I am against the pave project.
- This is a great idea
- It was make it easier for the kids to ride bikes on. Thank you!
- Install a Par course
- It would be amazing
- Please build this!
- Please Do it
- I love Roseville open space projects and I think it's great during the events of recent times to encourage more people to spend time outside since we know in this format it's less risk than other indoor leisure activities.
- Thank you for helping improve trail connectivity.
- I like paved trails for biking
- Looking for a continuation of the bike trail
- Can't wait for the improvements
- Paved trails are great, but dirt single track trails are also a lot of fun for the whole family. You truly feel removed from the city and in nature when you are on a dirt trail. Roseville should start a program to develop and maintain single track throughout the city. This would be much cheaper than spending millions of tax payer dollars on paved trails. Again I love both, but think we need more single track in the city.
- I love the trails. Big proponent of having trails be able to connect together!
- Would like to see the area planted with blue oaks.
- I think the footpaths would be reduced just by putting in bridges, especially in trees near Pleasant Grove where people trample the bank trying to find way across stream that has steep banks
- Access points from Pleasant Grove Blvd. are the most needed.
- Pave the trail along the power lines, the rocks aren’t nice to bikes, man or beasts
- Finish the trail across the creek to Pleasant Grove next to the dog park
- I currently use the Open Space and feel bad about using all the dirt "paths."
- I think it’s a great idea. Trees or fruit trees will be great. As well as water station or water for drinking. Miles marker will be great too.
- Would love to see the gravel path paved to connect to other paved pathways.
- Possible restroom and or water fountain

- I lived near current access Point P and used the area frequently, all seasons. Tremendous asset. Now live in East Roseville, still drive over to walk my dog in the old stomping grounds he traveled as a pup 12 years ago.
- Please add pavement markings for those who cannot read to walk left, ride right. I think if you painted this info head to head showing the direction if going one way and again a few feet farther along to show if walking in the opposite direction it might help the obvious confusion. People and often foreign language users do not read the green sign at all.
- I moved here last year and didn't know there was an open space and will access it now that I know it's there when I go to the library.
- Leashed Dog Signs thru out
- A timeline for how long the process is would be nice to have.
- Excited to see it happen.
- We must consider a safe way to cross Fiddyment for residents in West Park and Sierra Vista to safely access this Mahany Park Open Space Trail from the west.
- I would prefer to keep it as-is and more natural rather than more paved trails
- I don't currently use the trail space but if it were connected to other trails I do use, I would begin to use it
- Do it. I've been waiting for this to be completed for years.
- Connect existing bike trails and build creek bridges, but leave the rest alone
- I moved too Roseville because off the walking/bike paths. The more the better
- What a wonderful idea! It would be nice to connect with the existing trail along the power transmission line on the other side of Woodcreek Oaks Blvd.
- I have always wanted to walk back there but have been hesitant because of the uneven surfaces. I would love to have more paved walking trails in the area.
- Building more trails - and linking them together - is a win, win for everyone
- I live in Olympus Point so my use would be minimal at best. However, it seems like a good idea for the City and will help protect those habitats.
- We really need paved trails that start in point E and ends at the Roseville Commuter Stop (park and ride). Currently is hard to bike to the Commuter Stop. I live close to point E
- Trail etiquette pamphlets or signage at trail heads would be amazing - The amount of people "doing their own thing" is unsafe
- Keep the dirt trails
- will you openly allow input? Too many people and too many improvements all in the name of progress. Ruining the only remaining preserve we have by laying concrete. Most people do not respect wildlife, natural areas, or common sense to clean up after their dogs. The police will not even come out when dirt bikes, quad runners and golf carts are reported as they rip through trails. The few animals and wildlife that still exist will be pushed out.
- Leave it the way it is
- Consider moving Fiddyment Road access points (on both east and west side of the road) a little bit north, closer to Pleasant Grove Blvd, to encourage using the signaled intersection instead of jaywalking across the road.
- Would like to see shade structures at points along the trail. It often gets very hot walking with little ones within minimal cover.

- Connect it to Maidu.
- This would be great. Even if it is a simple trail that extends the length of the open space and connects to the existing trail. It doesn't not need to be super extensive and cross crossing all over.
- It would be wonderful to create this trail and especially connect it with other paved trails in the area. I am always looking for safe places to exercise away from the dangerous conditions that exist on Roseville's public streets. Drivers are paying less and less attention, which increases the risks to those riding their bikes, running, and walking along our streets. I hope the City of Roseville agrees to go forward with this plan.
- It's beautiful. Keep it clean
- I would love to see all the pathways eventually connect. I'd love to be able to ride my bike from the path head at Woodcreek near the overflow lot to the restaurants on pleasant grove and somehow see it connect to the path off Diamond Oaks that takes you to the Fountains and mall.
- Much overdue
- I would like Roseville to have a vast network of bike trails similar to Folsom.
- Maye a couple drinking fountains for children and dogs
- I would love to see more trails in this area because there are limited places to explore on a bike due to the limited paved trails in this area. The nature is beautiful in this area but hard to explore and appreciate due to the limited paved trails. I think connecting different parks and neighborhoods with trails helps limit the need to drive to these areas, and helps promote biking and walking to different parks and neighborhoods. This will promote cleaner air and more community interaction.
- Area needs more trees.
- I'm a runner and would love to have more paved trails around to keep me off sidewalks and near traffic. It's also safer to bring my kids along when traffic isn't a concern.
- I really like to see the paved multi-use trails. I would like to see more continuity between the trails. I think there are plans to connect trails but I don't know how long that will take.
- It is time to do this because of the population boom
- Great project, just do it
- This is really a great opportunity to dramatically improve both N-S and E-W connectivity in North Roseville, especially by making direct connections between surrounding neighborhoods and both Mahany Park and Woodcreek HS. This also provides an opportunity to maximize the value of the existing undercrossing of Pleasant Grove Blvd. I also think interpretation of the natural area is important to foster a sense of stewardship for the preserve, which will ultimately help it thrive as its primary purpose, a preserve.
- Yes, I support this project
- Trails are important, my first priority is another trail over or under Interstate 80 in the Cirby Street area.
- A paved path would be beneficial to students attending Woodcreek HS. It also would be nice to have more bike trails in this area.
- I think it would be a very nice addition to existing trail complex that make Roseville such an great place to live
- Create more dirt trails too
- I'm so excited to hear this could be in the works.
- I really think this trail could be incredible for the community. I think it would serve the community better than apartment complexes or another shopping center. I also believe this would be important in helping

with the preservation of a lot of wildlife in the area.
- Most important to replace the bridges that the city removed a few years ago making Mahany Park almost unusable
- It gets too crowded now
- How fast can you make it happen?
- Bathroom. Bridge over creek. Water fountain.
- I've always wondered what killed the numerous dead oak trees along the waterway. If you're adding informational signage, the information would be interesting to know.
- Where will the Woodcreek HS MTB team practice if they lose their trail? Please consider that natural surface trails can be sustainable with proper design and maintenance, and are much more enjoyable. A parallel natural trail may be a solution.
- I love this area and I walk through it 3-5 times a week. I would love to see some improvements without hurting the current feel of it. It's very soothing and relaxing to walk through .
- There are no connections to the "Saint" Streets from the trail and we have to walk through the plants if we need a quick way home. We'd love a dirt path connection to some of these streets. Also, the post and cable fencing at these streets do not have any openings to get bikes through. We have two young kids (one we're pulling in a bike trailer) and we're unable to get through this way. The same issue occurs near Junction as well as Aylesbury.
- It would be wonderful to have a connecting bike trail through the western part of the city. Away from "freeway" conditions on major thoroughfares.
- Great idea
- This is the right direction for the city and citizens
- Roseville should have a network of multiuse trails that connect west and east, such that people could bike across town in safety.
- I like how it is. No bikes speeding by. Perfect as it is
- Put gravel trails in, don't pave it. Bridges to cross creeks so it doesn't erode the land
- My concern is about destruction of the habitats
- Not sure it’s worth the tax dollars to do this especially given our poor economy right now
- Don't have this valuable resource

Public Comments from Social Media

- After living here 21 years, Roseville has horrendously mismanaged this area. First the inadequate slope for drainage under Pleasant Grove Blvd created back up, raising the water table. Addition of housing irrigation runoff in the summer added to this problem. Dozens of 100 - 200 year old blue oaks have died in the last 20 years due to too much water. Second besides the vernal pools, much of the understory vegetation is invasive plants typical of the long term grazing impacts from California. Lately concern over fire danger has led the city to use goats to graze vegetation down to the ground. These goats are moved all around the sacramento region, and therefore spread weed seeds in their fur and feces. I suggest you develop an adequate habitat management and restoration plan on top of the concept of just paving the walkways.
- I would prefer you left it just the way it is. A little untarnished dose of nature. Helps keep me sane. I agree with the other folks on here already: manage this natural resource properly, but spend our tax dollars on

the important things first. Laying more pavement is unneeded.
- Could you clean up the homeless camps by Olympus Pointe Sculpture Park?
- Not too paving. Too much of our city is now a concrete jungle. Sand and gravel a path if you must.
- Like others said, just leave it the way it is. If anything plant more trees there.
- How about people use the existing spaces that we've been taxed for.
- The more trails, the merrier. Also, a great addition to our existing parks that have a vast area not being used, would be pump tracks. A concrete course with jumps and turns for bikes.
- My morning walk
- It would be nice to see a paved sidewalk on Pleasant Grove near the fountains so people didn't have to walk or bike in dirt. The sidewalk just stops till the light.
- Just pave it, they will come.
- Yes, connect and make trails!
- Look forward to learning more.
- Build a new bike park like Auburn did, along with a new skate park.
- The balance of trails and open spaces is one of Roseville's greatest treasures.
- Personally I'd like to see the city invest some money into fixing the death trap that is Maidu Skate Park before you start paving over more open space preserves.
- I would prefer that it remain as much of a nature preserve as possible, permeable pathways, least amount of development
- This would be awesome! Looking forward to a trail from far west Roseville to fountains.
- Great idea on the trail, but don't pave it
- Sounds inviting for many reasons. Trails for running, walking, biking etc. and watching nature and it's beauty
- Excellent idea. Always nice to be close to nature. Definitely pave it so everyone has a chance to safely walk/ride the trail.
- What about a off road mountain bike trail with some rough terrain?
- Yes, keep people on the paved path, let nature have the rest.
- Can Roseville please get a legitimate Skate/BMX Park. Love how two monster projects are going on at both Crabb and Central Park and neither are getting a concrete park. Please let me know how I can actually help make this a reality
- I feel like the public is very respectful of using the trails that have been worn away and that there is not an over abundance of them.
- My kids really enjoy the dirt trails. Since Roseville doesn't have a bike park, dirt trails in the open space are the next best thing.
- I love Roseville and all the wonderful trails dirt or paved.
- It's nice to live in Roseville. We have lots of nice trails.
- Take that money and put into our schools.
- It is hard to think about a walking path, during a pandemic, with our children suffering, and more money being taken away from their future.
- Although there are several joint use agreements between parks and the schools around town too may be worth mentioning.

- Open up the batting cages at Mahany & Maidu
- Put in a disc golf course.
- Yes, we need more walking trails and as long as it doesn't interfere with wildlife. And it sounds like this will actually help.
- Dirt trails are way more fun and it is a great contact with nature. I believe dirt trails absorb less heat than paved trails, making happier hikers.
- Make more golf cart trail for west park.
- Put some bike trails and/or a park. You spend enough time and effort tearing down the jumps built by kids, put in a park so they don’t have to tear up non-designated property. There are already plenty of paved trails for walkers and casual riders.
- We really like the fact that it is dirt. We go for bike rides or nature walks. My kids never want to be on the paved portion because it’s boring. They love being on the dirt. Keeping it dirt makes you feel like you’ve left the city and gone into nature. I hope you reconsider.

Appendix B

Biological Constraints Report

This page intentionally left blank

HELIX Environmental Planning

Mahany Park Open Space Trail

Biological Constraints Report

August 2020 | CRS-03

Prepared for:

City of Roseville
311 Vernon Street
Roseville, CA 95678

Prepared by:

HELIX Environmental Planning, Inc.
1677 Eureka Road, Suite 100
Roseville, CA 95661

Mahany Park Open Space Trail

Biological Constraints Report

Prepared for:

City of Roseville
311 Vernon Street
Roseville, CA 95678

Prepared by:

HELIX Environmental Planning, Inc.
1677 Eureka Road, Suite 100
Roseville, CA 95661

August 2020 | CRS-03

This page intentionally left blank

TABLE OF CONTENTS

Section **Page**

1.0 INTRODUCTION 1

2.0 PROJECT SITE 1

2.1 Project Location 1
2.2 Topography and Watershed 1

3.0 REGULATORY BACKGROUND 3

3.1 Jurisdictional Waters 3
3.1.1 Federal Jurisdiction 3
3.1.2 State Jurisdiction 6
3.2 Riparian Habitat/Section 1600 of Fish and Game Code 6
3.3 Protected Species 7
3.3.1 Federal Endangered Species Act 7
3.3.2 California Endangered Species Act and Fully Protected Species 7
3.4 CEQA Significance 8
3.4.1 California Native Plant Protection Act 8
3.4.2 California Department of Fish and Wildlife Species of Concern 9
3.5 Roseville Native Oak Tree Ordinance 10

4.0 HABITATS AND SPECIAL-STATUS SPECIES 11

4.1 Annual Grassland 14
4.1.1 Burrowing Owl 14
4.1.2 Grasshopper Sparrow 14
4.1.3 Long-Billed Curlew 15
4.1.4 Purple Martin 15
4.1.5 Tricolored Blackbird 15
4.1.6 Western Spadefoot Toad 15
4.1.7 Stinkbells 15
4.2 Oak Woodland 16
4.2.1 Nuttall's Woodpecker 16
4.2.2 Oak Titmouse 16
4.2.3 Pallid Bat 16
4.2.4 Yellow-Billed Magpie 17
4.3 Riparian Woodland and Creek 17
4.3.1 Black-crowned Night Heron 17
4.3.2 Common Yellowthroat 17
4.3.3 Great Blue Heron 17
4.3.4 Great Egret 18
4.3.5 Song Sparrow ("Modesto" Population) 18
4.3.6 Swainson's Hawk 18
4.3.7 White-Tailed Kite 18

TABLE OF CONTENTS (cont.)

Section **Page**

4.3.8 Valley Elderberry Longhorn Beetle 18
4.3.9 Western Pond Turtle 19
4.3.10 Sanford's Arrowhead 19
4.4 Vernal Pools 19
4.4.1 Andrenid Bee 20
4.4.2 California Linderiella 20
4.4.3 Ricksecker's Water Scavenger Beetle 20
4.4.4 Vernal Pool Fairy Shrimp 20
4.4.5 Vernal Pool Tadpole Shrimp 20
4.4.6 Ahart's Dwarf Rush 20
4.4.7 Boggs Lake Hedge-Hyssop 20
4.4.8 Dwarf Downingia 21
4.4.9 Legenere 21
4.4.10 Pincushion Navarretia 21
4.4.11 Red Bluff Dwarf Rush 21
4.4.12 Valley Brodiaea 21
4.5 Protected Trees 21

5.0 RECOMMENDATIONS 24

5.1 Special-Status Species 25
5.1.1 Special-Status Plants 25
5.1.2 Burrowing Owl 26
5.1.3 Swainson's Hawk Foraging Habitat and Nesting Habitat 26
5.1.4 Nesting Birds and Raptors 27
5.1.5 Pallid Bat 28
5.1.6 Western Pond Turtle 28
5.1.7 Western Spadefoot Toad 29
5.1.8 Vernal Pool Invertebrates 29
5.1.9 Valley Elderberry Longhorn Beetle 30
5.1.10 Andrenid Bee 30
5.2 Future Permits and Environmental COmpliance 31
5.2.1 Environmental Review 31
5.2.2 Regulatory Permits 31
5.2.3 Protected Trees 31

6.0 REFERENCES 34

LIST OF APPENDICES

A Regionally Occurring Listed and Special-Status Species
B Plant and Wildlife Species Observed
C Representative Site Photos
D Tree Survey Data

TABLE OF CONTENTS (cont.)

LIST OF FIGURES

No.	Title	Page
1	Site Location	2
2	Biological Constraints	13
3	Approximate Tree Locations	23

LIST OF TABLES

No.	Title	Page
1	Habitats and Potential Special-Status Species	12
2	Number of Trees by Health and Structure Ratings	22
3	Summary of Avoidance Recommendations	24

ACRONYMS AND ABBREVIATIONS

CDFW	California Department of Fish and Wildlife
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CSA	California Special Animals
CWA	Clean Water Act
DBH	diameter at breast height
EPA	Environmental Protection Agency
FESA	Federal Endangered Species Act
HCP	Habitat Conservation Plan
HELIX	HELIX Environmental Planning, Inc.
HUC	hydrologic unit code
IPaC	Information for Planning and Consultation
ISA	International Society of Arboriculture
MBTA	Migratory Bird Treaty Act
MM	mitigation measure
MSL	mean sea level
NCCP	Natural Community Conservation Plan
NEPA	National Environmental Protection Act
NPDES	National Pollution Discharge Elimination System
OHWM	ordinary high water mark
PER	Planning and Environmental Review
RWQCB	Regional Water Quality Control Board
SAA	Streambed Alteration Agreement
SSC	Species of Special Concern
SWRCB	State Water Resources Control Board
TPZ	tree protection zone

ACRONYMS AND ABBREVIATIONS (cont.)

USACE	U.S. Army Corps of Engineers
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
WEAP	Worker Environmental Awareness Program
WOTUS	Waters of the U.S.
WQC	Water Quality Certification

This page intentionally left blank

1.0 INTRODUCTION

The purpose of this Biological Constraints report is to assess the general biological resources on the Mahany Park Open Space site (Study Area), to assess its suitability to support special-status species and sensitive vegetation communities or habitats, and to provide recommendations for any regulatory permitting or further analysis that may be required prior to development activities. HELIX Environmental Planning, Inc. (HELIX) conducted biological and arborist surveys of the Study Area in February 2020.

2.0 PROJECT SITE

2.1 PROJECT LOCATION

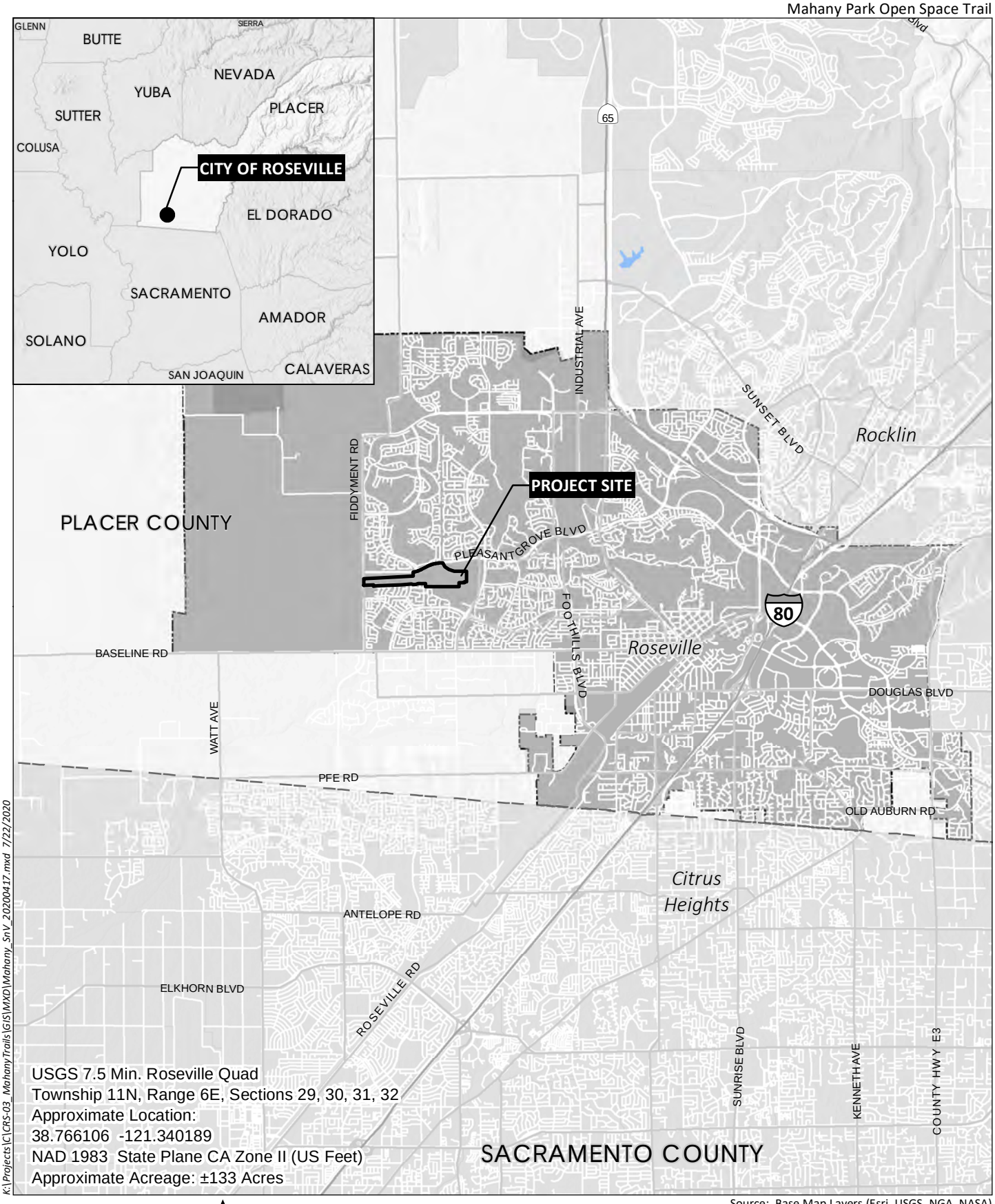
The ±133-acre acre Study Area is located in the western half of the City of Roseville, California. It is within Township 11N, Range 6E, Sections 29, 30, 31, and 32 of the United States Geological Survey (USGS) 7.5-minute series *Roseville* quadrangle and its approximate location is -121.340189 West and 38.766106 North. Parks, schools, businesses, and multi-family and single-family residences surround the Study Area. Pleasant Grove Boulevard, Mahany Regional Park, and Bear Dog Park are located to the north of the Study Area. Bottlebrush Circle, Woodcreek High School, and Silverado Oaks Urban Preserve are located to the south of the Study Area. Fiddyment Road is located to the west of the Study Area. A CVS drugstore is to the northwest of the Study Area and to the east of the Study Area is Woodcreek Oaks Boulevard (Figure 1).

2.2 TOPOGRAPHY AND WATERSHED

The general topography of the Study Area consists of rolling and moderately sloped areas, with elevations that range from approximately 116 to 137 feet (35 to 41 meters) above mean sea level (MSL).

The Study Area is in the Pleasant Grove Creek Watershed Hydrologic Unit Code (HUC) 12-180201610302 and the Curry Creek Watershed HUC 12-180201610401. Both creeks empty into the Pleasant Grove Creek Canal which drains to the Sacramento River via the Cross Canal. The majority of the Study Area is located within the Pleasant Grove Creek Watershed. The hydrologic regime within the Study Area is predominantly seasonal stormwater runoff and direct precipitation, which primarily falls between November and March. Kaseberg Creek, a major drainage of the Pleasant Grove watershed meanderers through the eastern portion of the Study Area.

Mahany Park Open Space Trail



K:\Projects\C\CRS-03_MahanyTrails\GIS\MXD\Mahany_SnV_20200417.mxd 7/22/2020

Source: Base Map Layers (Esri, USGS, NGA, NASA)

HELIX Environmental Planning

Site Location

Figure 1

3.0 REGULATORY BACKGROUND

3.1 JURISDICTIONAL WATERS

3.1.1 Federal Jurisdiction

Any person, firm, or agency planning to alter or work in Waters of the U.S. (WOTUS), including the discharge of dredged or fill material, must first obtain authorization from the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act (CWA; 33 United States Code [USC] 1344). Waters of the U.S. are defined as:

(1) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;

(2) All interstate waters, including interstate wetlands;

(3) The territorial seas;

(4) All impoundments of waters otherwise identified as waters of the United States under this section;

(5) All tributaries, as defined in paragraph (c)(3) of this section, of waters identified in paragraphs (a)(1) through (3) of this section;

(6) All waters adjacent to a water identified in paragraphs (a)(1) through (5) of this section, including wetlands, ponds, lakes, oxbows, impoundments, and similar waters;

(7) All waters in paragraphs (a)(7)(i) through (v) of this section where they are determined, on a case-specific basis, to have a significant nexus to a water identified in paragraphs (a)(1) through (3) of this section. The waters identified in each of paragraphs (a)(7)(i) through (v) of this section are similarly situated and shall be combined, for purposes of a significant nexus analysis, in the watershed that drains to the nearest water identified in paragraphs (a)(1) through (3) of this section. Waters identified in this paragraph shall not be combined with waters identified in paragraph (a)(6) of this section when performing a significant nexus analysis. If waters identified in this paragraph are also an adjacent water under paragraph (a)(6), they are an adjacent water and no case-specific significant nexus analysis is required.

(i) ***Prairie potholes.*** Prairie potholes are a complex of glacially formed wetlands, usually occurring in depressions that lack permanent natural outlets, located in the upper Midwest.

(ii) ***Carolina bays and Delmarva bays.*** Carolina bays and Delmarva bays are ponded, depressional wetlands that occur along the Atlantic coastal plain.

(iii) ***Pocosins.*** Pocosins are evergreen shrub and tree dominated wetlands found predominantly along the Central Atlantic coastal plain.

(iv) ***Western vernal pools.*** Western vernal pools are seasonal wetlands located in parts of California and associated with topographic depression, soils with poor drainage, mild, wet winters and hot, dry summers.

(v) ***Texas coastal prairie wetlands.*** Texas coastal prairie wetlands are freshwater wetlands that occur as a mosaic of depressions, ridges, intermound flats, and mima mound wetlands located along the Texas Gulf Coast.

(8) All waters located within the 100-year floodplain of a water identified in paragraphs (a)(1) through (3) of this section and all waters located within 4,000 feet of the high tide line or ordinary high water mark of a water identified in paragraphs (a)(1) through (5) of this section where they are determined on a case-specific basis to have a significant nexus to a water identified in paragraphs (a)(1) through (3) of this section. For waters determined to have a significant nexus, the entire water is a water of the United States if a portion is located within the 100-year floodplain of a water identified in paragraphs (a)(1) through (3) of this section or within 4,000 feet of the high tide line or ordinary high water mark. Waters identified in this paragraph shall not be combined with waters identified in paragraph (a)(6) of this section when performing a significant nexus analysis. If waters identified in this paragraph are also an adjacent water under paragraph (a)(6), they are an adjacent water and no case-specific significant nexus analysis is required.

Within non-tidal waters that meet the definition given above, and in the absence of adjacent wetlands, the indicator used by the USACE to determine the lateral extent of its jurisdiction is the ordinary high water mark (OHWM), which is defined as that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

Wetlands are defined under the CFR Part 328.3 as those areas that are inundated or saturated by surface or ground water at a frequency and duration to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

The USACE has determined that not all features which meet the WOTUS definition are, in fact, considered WOTUS. Normally, features not considered WOTUS include:

(1) Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the CWA.

(2) Prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other Federal agency, for the purposes of the CWA, the final authority regarding CWA jurisdiction remains with the U.S. Environmental Protection Agency (EPA).

(3) The following ditches:

(i) Ditches with ephemeral flow that are not a relocated tributary or excavated in a tributary.

(ii) Ditches with intermittent flow that are not a relocated tributary, excavated in a tributary, or drain wetlands.

(iii) Ditches that do not flow, either directly or through another water, into a water identified in paragraphs (a)(1) through (3) of this section.

(4) The following features:

(i) Artificially irrigated areas that would revert to dry land should application of water to that area cease;

(ii) Artificial, constructed lakes and ponds created in dry land such as farm and stock watering ponds, irrigation ponds, settling basins, fields flooded for rice growing, log cleaning ponds, or cooling ponds;

(iii) Artificial reflecting pools or swimming pools created in dry land;

(iv) Small ornamental waters created in dry land;

(v) Water-filled depressions created in dry land incidental to mining or construction activity, including pits excavated for obtaining fill, sand, or gravel that fill with water;

(vi) Erosional features, including gullies, rills, and other ephemeral features that do not meet the definition of tributary, non-wetland swales, and lawfully constructed grassed waterways; and

(vii) Puddles.

(5) Groundwater, including groundwater drained through subsurface drainage systems.

(6) Stormwater control features constructed to convey, treat, or store stormwater that are created in dry land.

(7) Wastewater recycling structures constructed in dry land; detention and retention basins built for wastewater recycling; groundwater recharge basins; percolation ponds built for wastewater recycling; and water distributary structures built for wastewater recycling.

Other features may be excluded based on Federal court rulings (e.g., SWANCC and Rapanos) or by regulation.

Permits, licenses, variances, or similar authorization may also be required by other federal, state, and local statutes. Section 10 of the Rivers and Harbors Act of 1899 prohibits the obstruction or alteration of navigable WOTUS without a permit from the USACE (33 USC 403).

On January 23, 2020 the EPA and the USACE finalized the Navigable Waters Protection Rule to define Waters of the U.S. and establish federal regulatory authority under the CWA. The rule will become effective 60 days after publication in the *Federal Register*. On April 21, 2020, the EPA and USACE published the Navigable Waters Protection Rule to define "Waters of the United States" in the Federal Register. On June 22, 2020 the Navigable Waters Protection Rule: Definition of "Waters of the United States" (NWPR) became effective in 49 states, including California, and in all US territories.

3.1.2 State Jurisdiction

Regional Water Quality Control Board

Any action requiring a CWA Section 404 permit must also obtain a CWA Section 401 Water Quality Certification. The State of California Water Quality Certification (WQC) Program was formally initiated by the State Water Resources Control Board (SWRCB) in 1990 under the requirements stipulated by Section 401 of the Federal CWA. Although the Clean Water Act is a Federal law, Section 401 of the CWA recognizes that states have the primary authority and responsibility for setting water quality standards. In California, under Section 401, the State and Regional Water Boards are the authorities that certify that issuance of a federal license or permit does not violate California's water quality standards (i.e., that they do not violate Porter-Cologne and the Water Code). The WQC Program currently issues the WQC for discharges requiring USACE permits for fill and dredge discharges within Waters of the United States, and now also implements the State's wetland protection and hydromodification regulation program under the Porter Cologne Water Quality Control Act.

On April 2, 2019, the SWRCB adopted a State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State (Procedures), for inclusion in the forthcoming Water Quality Control Plan for Inland Surface Waters and Enclosed Bays and Estuaries and Ocean Waters of California. The Procedures consist of four major elements: 1) a wetland definition; 2) a framework for determining if a feature that meets the wetland definition is a water of the state; 3) wetland delineation procedures; and 4) procedures for the submittal, review and approval of applications for Water Quality Certifications and Waste Discharge Requirements for dredge or fill activities. The Office of administrative Law approved the Procedures on August 28, 2019, and the Procedures became effective May 28, 2020.

Under the Procedures and the State Water Code (Water Code §13050(e)), "Waters of the State" are defined as "any surface water or groundwater, including saline waters, within the boundaries of the state." Unless excluded by the Procedures, any activity that could result in discharge of dredged or fill material to Waters of the State, which includes Waters of the U.S. and non-federal Waters of the State, requires filing of an application under the Procedures.

The Porter-Cologne Water Quality Control Act (Porter-Cologne Act, Water Code Section 13000 et seq.) is California's statutory authority for the protection of water quality in conjunction with the federal CWA. The Porter-Cologne Act requires the SWRCB and RWQCBs under the CWA to adopt and periodically update water quality control plans, or basin plans. Basin plans are plans in which beneficial uses, water quality objectives, and implementation programs are established for each of the nine regions in California. The Porter-Cologne Act also requires dischargers of pollutants or dredged or fill material to notify the RWQCBs of such activities by filing Reports of Waste Discharge and authorizes the SWRCB and RWQCBs to issue and enforce waste discharge requirements, National Pollution Discharge Elimination System (NPDES) permits, Section 401 water quality certifications, or other approvals.

3.2 RIPARIAN HABITAT/SECTION 1600 OF FISH AND GAME CODE

The California Department of Fish and Wildlife (CDFW) is a trustee agency that has jurisdiction under Section 1600 et seq. of the California Fish and Game Code. Under Sections 1602 and 1603, a private party must notify CDFW if a proposed project will "substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake designated by the department, or use any material from the streambed, except when the department has been notified

pursuant to Section 1601." Additionally, CDFW asserts jurisdiction over native riparian habitat adjacent to aquatic features, including native trees over four inches in diameter at breast height (DBH). If an existing fish or wildlife resource may be substantially adversely affected by the activity, CDFW may propose reasonable measures that will allow protection of those resources. If these measures are agreeable to the parties involved, they may enter into an agreement with CDFW identifying the approved activities and associated mitigation measures. Generally, CDFW recommends that an application for a Streambed Alteration Agreement (SAA) be submitted for any work done within the lateral limit of water flow or the edge of riparian vegetation, whichever is greater.

3.3 PROTECTED SPECIES

3.3.1 Federal Endangered Species Act

The U.S. Fish and Wildlife Service (USFWS) enforces the provisions stipulated within the Federal Endangered Species Act of 1973 (FESA; 16 USC 1531 et seq.). Species identified as federally threatened or endangered (50 CFR 17.11, and 17.12) are protected from take, defined as direct or indirect harm, unless a Section 10 permit is granted to an entity other than a federal agency or a Biological Opinion with incidental take provisions is rendered to a federal lead agency via a Section 7 consultation. Pursuant to the requirements of FESA, an agency reviewing a proposed project within its jurisdiction must determine whether any federally-listed species may be present in the study area and determine whether the proposed project will jeopardize the continued existence of or result in the destruction or adverse modification of critical habitat of such species (16 USC 1536 (a)[3], [4]). Other federal agencies designate species of concern (species that have the potential to become listed), which are evaluated during environmental review under the National Environmental Protection Act (NEPA) or CEQA although they are not otherwise protected under FESA.

3.3.2 California Endangered Species Act and Fully Protected Species

The California Endangered Species Act (CESA) (California Fish and Game Code Sections 2050 to 2097) is similar to the FESA. The California Fish and Wildlife Commission is responsible for maintaining lists of threatened and endangered species under CESA. CESA prohibits the take of listed and candidate (petitioned to be listed) species. "Take" under California law means to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch capture, or kill (California Fish and Game Code, Section 86). The CDFW can authorize take of a state-listed species under Section 2081 of the California Fish and Game Code if the take is incidental to an otherwise lawful activity, the impacts are minimized and fully mitigated, funding is ensured to implement and monitor mitigation measures, and CDFW determines that issuance would not jeopardize the continued existence of the species. A CESA permit must be obtained if a project will result in the "take" of listed species, either during construction or over the life of the project. For species listed under both FESA and CESA requiring a Biological Opinion under Section 7 of the FESA, CDFW may also authorize impacts to CESA species by issuing a Consistency Determination under Section 2080.1 of the Fish and Game Code.

Legal protection is also provided for wildlife species in California that are identified as "fully protected animals." These species are protected under Sections 3511 (birds), 4700 (mammals), 5050 (reptiles and amphibians), and 5515 (fish) of the California Fish and Game Code. These statutes prohibit take or possession of fully protected species at any time. CDFW is unable to authorize incidental take of fully protected species when activities are proposed in areas inhabited by these species. CDFW has informed non-federal agencies and private parties that they must avoid take of any fully protected species in

carrying out projects. However, Senate Bill 618 (2011) allows the CDFW to issue permits authorizing the incidental take of fully protected species under the CESA, so long as any such take authorization is issued in conjunction with the approval of a Natural Community Conservation Plan that covers the fully protected species (California Fish and Game Code Section 2835).

3.4 CEQA SIGNIFICANCE

Section 15064.7 of the State CEQA Guidelines encourages local agencies to develop and publish the thresholds that the agency uses in determining the significance of environmental effects caused by projects under its review. However, agencies may also rely upon the guidance provided by the expanded Initial Study Checklist included in Appendix G of the CEQA Guidelines. Appendix G provides examples of impacts that would normally be considered significant. Based on these examples, impacts to biological resources would normally be considered significant if the project would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS;

- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the CDFW or USFWS;

- Have a substantial adverse effect on State or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;

- Interfere substantially with the movement of any native resident or migratory fish or wildlife species, or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;

- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; and

- Conflict with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Community Conservation Plan (NCCP), or other approved local, regional or state habitat conservation plan.

An evaluation of whether or not an impact on biological resources would be substantial must consider both the resource itself and how that resource fits into a regional or local context. Substantial impacts would be those that would diminish, or result in the loss of, an important biological resource, or those that would obviously conflict with local, State, or federal resource conservation plans, goals, or regulations. Impacts are sometimes locally important but not significant according to CEQA. The reason for this is that although the impacts would result in an adverse alteration of existing conditions, they would not substantially diminish, or result in the permanent loss of, an important resource on a population-wide or region-wide basis.

3.4.1 California Native Plant Protection Act

The California Native Plant Protection Act of 1977 (California Fish and Game Code Sections 1900-1913) requires all state agencies to use their authority to carry out programs to conserve endangered and

otherwise rare species of native plants. Provisions of the act prohibit the taking of listed plants from the wild and require notification of CDFW at least 10 days in advance of any change in land use (other than changing from one agricultural use to another), which allows CDFW to salvage listed plants that would otherwise be destroyed.

The California Native Plant Society (CNPS) is a non-governmental conservation organization that has developed a list of plants of special concern in California. This information is published in the *Inventory of Rare and Endangered Vascular Plants of California*. Potential impacts to populations of CNPS-ranked plants receive consideration under CEQA review. The following identifies the definitions of the CNPS Rare Plant Ranking System:

Rank 1A: Plants presumed Extinct in California and either rare or extinct elsewhere

Rank 1B: Plants Rare, Threatened, or Endangered in California and elsewhere

Rank 2A: Plants presumed extirpated in California but common elsewhere

Rank 2B: Plants Rare, Threatened, or Endangered in California, but more common elsewhere

Rank 3: Plants about which we need more information – A Review List

Rank 4: Plants of limited distribution – A Watch List

Although the CNPS is not a regulatory agency and plants on these lists have no formal regulatory protection, plants with a Ranking of 1A through 2B may be considered to meet the definition of endangered, rare, or threatened species under Section 15380(d) of CEQA (see above), and impacts to these species may be considered "significant."

In addition, CDFW recommends, and local governments may require, protection of species which are regionally significant, such as locally rare species, disjunct populations, essential nesting and roosting habitat for more common wildlife species, or plants with a CNPS Ranking of 3 and 4.

3.4.2 California Department of Fish and Wildlife Species of Concern

Some additional fish, amphibian, reptile, bird, and mammal species may receive consideration by CDFW and lead agencies during the CEQA process, in addition to species that are formally listed under FESA or CESA or are fully protected. These species are included on the Special Animals List, which is maintained by CDFW. This list tracks species in California whose numbers, reproductive success, or habitat may be in decline. In addition to "Species of Special Concern" (SSC), the Special Animals List includes species that are tracked in the California Natural Diversity Database (CNDDB) but warrant no legal protection. These species are identified as "California Special Animals" (CSA).

Additionally, California Fish and Game Code Subsections 3503 and 3800 prohibit the possession, take, or needless destruction of birds, their nests, and eggs, and the salvage of dead nongame birds. California Fish and Game Code Subsection 3503.5 protects all birds in the orders of Falconiformes and Strigiformes (birds of prey). Fish and Game Code Subsection 3511 states that fully protected birds or parts thereof may not be taken or possessed at any time. Fish and Game Code Subsection 3513 states that it is unlawful to take or possess any migratory nongame bird as designated in the Migratory Bird Treaty Act or any part of such migratory nongame bird except as provided by rules and regulations adopted by the Secretary of the Interior under provisions of the Migratory Bird Treaty Act. The Attorney General of California has released an opinion that the Fish and Game Code prohibits incidental take.

3.5 ROSEVILLE NATIVE OAK TREE ORDINANCE

The City of Roseville (City) Native Oak Tree Ordinance (Ordinance) regulates encroachment within the protected zone and removal of protected trees (City of Roseville 2020a). Protected trees include any native oak, defined as valley oak (*Quercus lobata*), blue oak (*Quercus douglasii*), interior live oak (*Quercus wislizeni*), or any hybrid between these species, with a trunk diameter of six inches or greater at breast height (54 inches or 4.5-feet above grade) measured as a total of a single trunk or multiple trunks. The tree protection zone) is the area within a circle around the tree defined by the largest radius of the canopy plus one foot.

City projects, such as the Mahany Trail Project, do not require a tree permit, but are required to comply with the preservation and mitigation requirements of the Native Oak Tree Ordinance. The City requires mitigation for tree removal. However, trees identified by an arborist as dead or hazardous trees do not require mitigation. The City may approve any of the following methods or combination thereof; however, on-site tree replacement is the preferred method.

- Replacement trees may be planted on-site or in other areas where maintenance and irrigation are provided to ensure survival of the trees. Removal of protected trees to be replaced shall be calculated based upon an inch for an inch replacement of the DBH of the removed tree(s) where:
    - One 15-gallon tree will replace 1-inch DBH of the removed tree;
    - One 24-inch box tree will replace two inches; and
    - One 36-inch box tree will replace three inches.

  The replacement trees shall have a combined diameter equivalent not less than the total diameter of the tree(s) removed. A minimum of 50 percent of the replacement requirement shall be met with native oak trees and up to 50 percent may be fulfilled with non-native species;

- Relocation of native oak trees from one area to another, may be considered by the City in certain cases. Credit shall be given for relocation on the same basis as replacement, and guidelines and limitations for relocation are outlined under the Ordinance;

- Implementation of a revegetation program to propagate native oak trees from seed using currently accepted methods; and/or

- Payment of an in-lieu mitigation fee, if the City determines that the other methods outlined above are not feasible or desirable.

4.0 HABITATS AND SPECIAL-STATUS SPECIES

The ±133-acre Study Area includes 95.25 acres of annual grassland, 5.96 acres of oak woodland, 5.24 acres riparian woodland, and 4.34 acres of disturbed area. Aquatic features include 18.01 acres of vernal pools, 2.43 acres of seasonal wetlands, 0.38 acre of seasonal drainage, and 1.43 acres of perennial drainage (Kaseberg Creek), all of which are anticipated to be jurisdictional waters. Paved multi-use trails and a gravel access road that leads to an existing utility building transects the central portions of the Study Area. Many overhead utility lines cross the site, including three lines of high-voltage transmission towers and two lines of utility poles. Numerous informal dirt paths cross the annual grassland, oak woodland, and portions of the riparian habitat (Figure 2).

Regionally occurring special-status species were identified by conducting a search of the California Natural Diversity Database (CDFW 2020), the CNPS Ranking List (CNPS 2020), and the USFWS IPaC list (USFWS 2020) for special-status species documented within the P*leasant Grove, Nicolaus, Sheridan, Verona, Roseville, Taylor Monument, Rio Linda, and Citrus Heights* USGS quadrangles. HELIX biologist Marisa Brilts conducted a biological constraints level survey on February 17 and 18, 2020. An arborist survey was also conducted within the Study Area by a HELIX International Society of Arboriculture (ISA)-Certified Arborist Charlotte Marks (WE-10519A) on February 17, 18, and 19, 2020.

A total of forty-four special-status wildlife and thirteen special-status plant species have the potential to be found in the vicinity of the Study Area (Appendix A). Based on research and site conditions, twenty-four special-status wildlife and nine special-status plants have the potential to occur within the Study Area. Special-status wildlife species with potential to occur in the Study Area are burrowing owl (*Athene cunicularia*), Swainson's hawk (*Buteo swainsoni*), western spadefoot toad (*Spea hammondii*), western pond turtle (*Actinemys marmorata*), pallid bat (*Antrozous pallidus*), valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), and andrenid bee (*Andrena subapasta*). Additionally, there is potential for nesting birds and raptors, including grasshopper sparrow (*Ammodramus savannarum*), long-billed curlew (*Numenius americanus*), purple martin (*Progne subis*), Nuttall's woodpecker (*Picoides nuttallii*), oak titmouse (*Baeolophus inornatus*), yellow-billed magpie (*Pica nuttalli*), black-crowned night heron (*Nycticorax nycticorax*), common yellowthroat (*Geothlypis trichas*), great blue heron (*Ardea herodias*), great egret (*Ardea alba*), song sparrow (Modesto population) (*Melospiza melodia*), tricolored blackbird (*Agelaius tricolor*), and white-tailed kite (*Elanus leucurus*), and vernal pool invertebrates, including California linderiella (*Linderiella occidentalis*), Ricksecker's water scavenger beetle (*Hydrochara rickseckeri*), vernal pool fairy shrimp (*Branchinecta lynchi*), and vernal pool tadpole shrimp (*Lepidurus packardi*), to occur. Special-status plant species with the potential to occur within the Study Area include stinkbells (*Fritillaria agrestis*), Sanford's arrowhead (*Sagittaria sanfordii*), Ahart's dwarf rush (*Juncus leiospermus* var*. ahartii*), Boggs Lake hedge-hyssop (*Gratiola heterosepala*), dwarf downingia (*Downingia pusilla*), legenere (*Legenere limosa*), pincushion navarretia (*Navarretia myersii* ssp. *myersii*), Red Bluff dwarf rush (*Juncus leiospermus*), and valley brodiaea (*Brodiaea rosea* ssp. *vallicola*).

Table 1, below, lists the habitats and the number of special-status species that could occur within that habitat (note that a species may occur in multiple habitats). For example, Swainson's hawk may forage in the annual grasslands and has the potential to nest in the oak woodland, therefore this species is identified in both habitats. Information on these species is included in the discussion of the appropriate habitat below. Species observed during field surveys are included in Appendix B and representative site photos are included in Appendix C.

Table 1
HABITATS AND POTENTIAL SPECIAL-STATUS SPECIES

Habitat	Acres	Potential Special-Status Species	
		Wildlife	*Plants*
Annual Grassland	95.25	Burrowing owl *Swainson's hawk Nesting birds and raptors Western spadefoot toad	Stinkbells
Oak Woodland	5.96	Nesting birds and raptors *Pallid bat	
Riparian Woodland and Creek	6.67	Nesting birds and raptors *Pallid bat *Swainson's hawk Western pond turtle Valley elderberry longhorn beetle *Andrenid bee	Sanford's arrowhead
Vernal Pool	18.01	Vernal pool invertebrates Western spadefoot toad *Andrenid bee	Boggs Lake hedge Dwarf downingia Legenere Pincushion navarretia Red bluff dwarf rush Valley brodiaea

(*) Species has the potential to occur in multiple habitats.

Mahany Park Open Space Trail

Legend

- Active Nest
- Study Area - 133.05 Acres
- Oak Woodland - 5.96 Acres
- Riparian Woodland - 5.24 Acres
- Annual Grassland - 95.25 Acres
- Disturbed - 4.34 Acres
- Vernal Pool - 18.01 Acres
- Seasonal Wetland - 2.43 Acres
- Seasonal Drainage - 0.38 Acre
- Kaseberg Creek - 1.43 Acres

Pleasant Grove Blvd

Fiddyment Rd

Woodcreek High School

T:\PROJECTS\CVCRS-ALL\CRS-03_MahanyTrails\Map\Mahany_biocoms_20200415.mxd 4/30/2020

0 450 Feet

Source: Aerial (City of Roseville, 4/22/2019).

HELIX Environmental Planning

Biological Communities

Figure 2

4.1 ANNUAL GRASSLAND

Annual grassland occurs within the majority of the Study Area, Figure 2. The annual grassland landscape supports many different grasses, forbs, and isolated small clusters of trees and shrubs. Growth occurs during early spring turning the landscape green. During the summer many of the plants in this community are dormant. Plants commonly found in the annual grassland include wild oat (*Avena fatua*), Italian ryegrass (*Festuca perennis*), barley (*Hordeum marinum*), brome (*Bromus* sp.), wild rye (*Elymus* sp.), and medusa head (*Elymus caput-medusae*), as well as forbs such as filarees (*Erodium* spp.) and mustard (*Brassica* sp.). California's Mediterranean type grasslands are recognized among the world's "hot spots" of native biodiversity, despite being generally dominated by non-native species (Bartolome et al. 2014).

Within the annual grasslands are seasonal wetland and drainages, as well as vernal pools, which are discussed in more detail below. Seasonal wetlands and drainages are dependent on rainfall and they can be inundated for days to weeks after a storm.

Black-tailed deer (*Odocoileus hemionus columbianus*), black-tailed jackrabbit (*Lepus californicus*), California ground squirrel (*Spermophilus beecheyi*), pocket gopher (*Thomomys bottae*), and house mouse (*Mus musculus*) were documented within the Study Area. Western meadowlarks (*Sturnella neglecta*) and western kingbirds (*Tyrannus verticalis*) feed on insects and seeds, red tailed hawks (*Buteo jamaicensis*), northern harrier (*Circus cyaneus*), and red shouldered hawks (*Buteo lineatus*) feed on gophers and mice that are commonly found within annual grassland habitats. Evidence and/or observations of these species was noted during the field survey of the Study Area. Additional species observed are listed in Appendix B.

Appendix A lists the number of known CNDDB occurrences of special-status species within a 5-mile radius of the Study Area as well as additional information about special-status species with the potential to occur within the Study Area. Swainson's hawk has the potential to forage in the annual grassland and is discussed in further detail in Section 4.3 – Riparian Woodland and Creek.

4.1.1 Burrowing Owl

Burrowing owl is a California Species of Special Concern. This small ground-dwelling owl generally inhabits gently sloping areas, characterized by low, sparse vegetation (Poulin et al. 2011). The breeding season for burrowing owls is from February to August, peaking in April and May (Zeiner et al. 1990). Burrowing owls nest in burrows in the ground, often in old ground squirrel burrows. Burrowing owls are also known to use artificial burrows including pipes, culverts, and nest boxes. The annual grassland and existing ground squirrel burrows within this community provide suitable habitat for this species within the Study Area. The burrows within the annual grassland and drainages/culverts provide wintering and nesting habitat for this species. This species is predominantly non-migratory in California.

4.1.2 Grasshopper Sparrow

Grasshopper sparrow is a California Species of Special Concern. This small sparrow frequents annual grassland and grasshopper sparrow nests are often constructed at the base of an overhanging clump of grass. These weak fliers don't tend to fly around much but rather scurry on the ground like mice (Cornell Lab of Ornithology 2019). This migratory bird is observed between April and June during the summer breeding season in California.

4.1.3 Long-Billed Curlew

Long-billed curlew is a Bird of Conservation Concern. It is the largest bird in the sandpiper family. The long-billed curlew nests in low-growing vegetation (4 to 8-inches high) and is often found in annual grasslands and vernal pools during the summer breeding months. In the winter, they migrate to the coast where they inhabit wetlands, tidal estuaries, mudflats, flooded fields, and occasionally beaches (Cornell Lab of Ornithology 2019).

4.1.4 Purple Martin

The purple martin is California Species of Special Concern. This species is in the swallow family and is known to perform aerial acrobatics to snap up flying insects. They nest in wide variety of open annual grasslands and partially open habitats like the of the riparian woodland and creek and oak woodland communities within the Study Area. They nest in tree cavities, abandoned woodpecker holes, crevices in rocks, and sometimes in bird houses or gourds put up by humans. At the end of the summer breeding season they gather in big flocks and make their way to South America (Hood 2017).

4.1.5 Tricolored Blackbird

The tricolored blackbird is a California Threatened Species. Tricolored blackbirds look very much like their cousin, the red-winged blackbird. What distinguishes these two species from one and other is the addition of the white strip on the shoulder of the tricolored blackbird. Male tricolored blackbirds are entirely black with a bright red shoulder patch bordered below by a white to cream-colored band. Females are dark gray-brown overall. This species forages in grasslands and breeds in freshwater marshes. Nests occur in large colonies of up to thousands of individuals (NatureServe 2020). Nesting locations must be large enough to support a minimum colony of approximately fifty pairs (Zeiner et al. 1990). This species forages in grasslands and agricultural fields with low-growing vegetation (Shuford and Gardladi 2008).

4.1.6 Western Spadefoot Toad

Western spadefoot toad is a California Species of Special Concern. This species spends most of the year underground, where individuals seek refuge from desiccation by constructing and residing in small burrows. Adults emerge from underground with the onset of the first rains of the season (Zeiner et al. 1988-1990). Breeding and egg laying occur in temporary pools and quiet streams. Breeding typically end in March, but may extend as late as May, depending on rainfall (Stebbins 2003; Zeiner et al. 1988-1990). Egg masses contain approximately 10 to 42 eggs, and are attached to vegetation or other submerged objects, and hatch within approximately two weeks (Zeiner et al. 1988-1990). Western spadefoot toads are most commonly found in grassland habitats containing vernal pool complexes but can also be found in burrows adjacent to drainages. This species has been found to move an average of 800 feet from its breeding pool (Muths 2003). Its skin is smoother than that of the wester toad and it has two pale strips along its back. The “spade” is a sharp, black ridge on its hind feet that enables the toad to dig its burrow.

4.1.7 Stinkbells

Stinkbells are a CNPS Rare Plant Rank 4.2 plant species. Stinkbells are a perennial bulbiferous herb found in clay soils, sometimes in serpentinite soil in moist annul grasslands. Flowers are white with greenish to

pinkish markings on the outer surface and purple brown on the inner surface. The flowers have an unpleasant odor, hence its name. The typical bloom period is between March and June (CNPS 2020).

4.2 OAK WOODLAND

Oak woodland is located in the eastern and central portions of the Study Area (Figure 2). Denser stands of large, mature oaks are located in the north and central portions of the Study Area associated with Kaseberg Creek.

The oak woodland within the Study Area is primarily characterized by an overstory of native oak trees including blue oak, interior live oak, and valley oak. The understory is mostly devoid of other woody vegetation and is composed primarily of non-native annual grasses like that found in the annual grassland community. Woody plants that were observed in this community include poison oak (*Toxicodendron diversilobum*) and Himalayan blackberry (*Rubus armeniacus*).

Acorn woodpeckers (*Melanerpes formicivorus*) were seen adding acorns to acorn granaries, northern flickers (*Colaptes auratus*), a red-tailed hawk, California scrub jays (*Aphelocoma californica*), American crow (*Corvus brachyrhynchos*), and red shouldered hawk were observed perched in trees or soaring above the oak woodland. In addition, a great horned owl (*Bubo virginianus*) was observed in its nest in an oak in the northeastern section of the oak woodland see Figure 2 for approximate nest location.

Special-status species with the potential to occur in the oak woodland habitat are listed below. Appendix A lists the number of known CNDDB occurrences of special-status species within a 5 miles radius of the Study Area as well as additional information about special-status species with the potential to occur. Purple martin and stinkbells were previously discussed under Section 4.1 – Annual Grassland, as these species have the potential to occur within the annual grassland as well as the oak woodland.

4.2.1 Nuttall's Woodpecker

Nuttall's woodpecker is a Bird of Conservation Concern. This small woodpecker has black and white spots covering most of its body. Males have a bright red crown where females lack this. Nesting occurs primarily in oak cavities (Cornell Lab of Ornithology 2019) and this species in non-migratory.

4.2.2 Oak Titmouse

Oak titmouse is a Bird of Conservation Concern. This species is about the size of a sparrow. This rather plain gray bird has a crest on its head. It nests in natural tree cavities or in woodpecker holes (Hood 2017) and this species is non-migratory.

4.2.3 Pallid Bat

Pallid bat is a California Species of Special Concern. This bat is yellowish brown to cream colored. A distinguishing characteristic is its large ears that are almost half as long as the total length of its head and body. Also, its eyes are larger than most species of North American bats. Day roosts are located in crevices and occasionally in hollow trees and buildings. Pallid bats forage over riparian woodland and creek habitat. Roosts must protect bats from high temperatures during the day (Barbour; Davis 1969). This species can be observed year-round.

4.2.4 Yellow-Billed Magpie

Yellow-billed magpie or "California magpie" is a Bird of Conservation Concern. This species is only found in California and nowhere else in the world. This boisterous bird is about the size of a crow with a long tail. Its white belly and wing patches stand out against the black of its head and tail. Yellow-billed magpies' nest in tall trees averaging 47 feet often in clumps of mistletoe (Hood 2017).

4.3 RIPARIAN WOODLAND AND CREEK

Riparian woodland and Kaseberg Creek are located in the northeast portion of the Study Area. The overstory of this community is comprised of willows (*Salix* sp.) cottonwoods (*Populus fremontii* ssp. *fremontii*), and oaks. The understory, specifically southwest of Bear Dog Park and south of Pleasant Grove Boulevard, is comprised of vines and brush such as wild grape (*Vitis californica*), coyote bush (*Baccharis pilularis*), and Himalayan blackberry.

Kaseberg Creek exhibits a bed, bank, and OHWM. The creek is not highly vegetated because of the scouring effect of fast-moving water; however, sections of the creek were colonized by plants including sedges (*Carex* sp.), rushes (*Juncus* sp.), and willows (*Salix* sp.*).*

Special-status species with the potential to occur in the riparian and creek habitat are listed below. Appendix A lists the number of known CNDDB occurrences of special-status species within a 5 miles radius of the Study Area as well as additional information about special-status species with the potential to occur. Purple martin has the potential to nest and feed within the riparian and creek habitat. This species was previously discussed in Section 4.1 – Annual Grassland.

4.3.1 Black-crowned Night Heron

The black-crowned night heron is considered a California Special Animal. This primarily nocturnal, short-necked heron comes out at dusk to hunt on a variety of prey including insects, small fish, and rodents. Adults have a dark black crown and back. This species in non-migratory in this region (Hayes et al. 2006).

4.3.2 Common Yellowthroat

Common yellowthroat is a Bird of Conservation Concern. This small sparrow sized bird has yellow plumage around its throat. This species feeds in moist areas typically along creeks and drainages and nests are woven by females using various grasses (Hood 2017). This non-migratory bird is observed year-round.

4.3.3 Great Blue Heron

Great blue heron is considered a California Special Animal. This large bird stands about 4 feet tall with a wingspan of 6 feet (Hood 2017). This grey-blue bird is an expert fisherman, hunting in vernal pools, creeks, and wetlands. This non-migratory bird is observed year-round.

4.3.4 Great Egret

The great egret is considered a California Special Animal. This large all white bird has a long neck and stands about 3 feet tall. Egrets feed by wading through the water slowly, then spearing their prey with a sudden lunge (Cornell Lab of Ornithology 2019) This non-migratory bird is observed year-round.

4.3.5 Song Sparrow ("Modesto" Population)

Song sparrow is a California Species of Concern. This medium sized bulky sparrow is found in thickets and bushes. Their coloring includes brown upperparts with dark streaks on the back with white underneath with dark streaking and a dark brown spot in the middle of the breast. They have a brown cap and a long brown rounded tail (Cornell Lab of Ornithology 2019). This non-migratory bird is observed year-round.

4.3.6 Swainson's Hawk

Swainson's hawk is a California Threatened Species. They arrive in the Central Valley between March and early April to establish breeding territories. Breeding occurs from late March to late August, peaking in late May through July (Zeiner et al. 1990). In the Central Valley, Swainson's hawks nest in isolated trees, small groves, or large woodlands next to open grasslands or agricultural fields. This species typically nests near riparian areas; however, it has been known to nest in urban areas as well. In the Central Valley, the most commonly used trees include cottonwoods, willows, sycamores (*Platanus* sp.), valley oaks, walnuts (*Juglans* sp.), and occasionally gum trees (*Eucalyptus* sp.), pines (*Pinus* sp.) and redwoods (*Sequoia sempervirens*) (Woodbridge 1998). Nest locations are typically located within a 10-mile radius of suitable foraging habitats, which include annual grassland and agricultural fields. There are seven historic nest locations recorded within 5 miles of the Study Area. Swainson's hawks leave their breeding grounds to return to their wintering grounds in late August or early September.

4.3.7 White-Tailed Kite

White-tailed kite is a California Fully Protected Species. This largely pale raptor is easily identified by its entirely white tail and black shoulder patches. It has a unique way of hunting; the white-tailed kite rapidly beats its wings allowing it to hover in place. During the nonbreeding season, it gathers in communal roosts (Cornell Lab of Ornithology 2019). This non-migratory bird is observed year-round. This species was observed in the Study Area during the February 17 and 18, 2020 field survey.

4.3.8 Valley Elderberry Longhorn Beetle

The valley elderberry longhorn beetle is a Federally Threatened Species. It is associated with elderberry shrubs (*Sambucus* sp.) often within riparian habitats. Adult males have red-orange wing covers with four elongate spots. Adult females have dark colored wing coverings. Females lay their eggs on the bark of elderberry shrubs. Larvae hatch and burrow into the stems, and presence can be indicated by bore-holes in stems of elderberries (USFWS 2017). Although no elderberry shrubs were observed during the field survey, a section of riparian habitat located adjacent to Bear Dog Park, in the northeastern portion of the Study Area was not fully accessible due to thick undergrowth. Therefore, there is the potential that suitable habitat exists in the Study Area for valley elderberry longhorn beetle.

4.3.9 Western Pond Turtle

Western pond turtle is a California Species of Special Concern. This species occurs in ponds, lakes, rivers, streams, creeks, marshes, and irrigation ditches with suitable basking sites. Suitable aquatic habitat typically has a muddy or rocky bottom. Western pond turtles nest and overwinter in areas of sparse vegetation, usually grassland, typically within 500 feet of aquatic habitat. The typical shell coloring is dark brown, blackish or olive a network of with lines and spots (Hayes et al. 2006). Western pond turtle may be present in the Study Area year-round.

4.3.10 Sanford's Arrowhead

Sanford's arrowhead is a CNPS Rare Plant Rank 1B.2 plant species. This aquatic perennial herb has leaves that are very often submerged, variable in shape, usually long and strap-shaped like an arrowhead. The plant is monoecious, with individuals bearing both male and female flowers. The male flowers have rings of stamens at the centers. Female flowers each have a spherical cluster of pistils which develops into a head of tiny fruits. The typical bloom period is May through October (CNPS 2020).

4.4 VERNAL POOLS

Vernal pools are found within the annual grasslands of the Study Area where impervious layers of clay underlie the surface soil. Vernal pools have three distinct phases: the wet phase, the flowering phase, and the dry phase. The vernal pools in the Study Area were just entering the flowering phase during the February 17 and 18 site survey, however, some deeper pools were still inundated. Common vernal pools species observed within the Study Area included woolly marbles (*Psilocarphus brevissimus*), spikerush (*Eleocharis macrostachy*), and popcorn-flower (*Plagiobothrys stipitatus*). Additionally, a common garter snake (*Thamnophis sirtalis)* was observed.

During the wet phase or rainy season, which typically occurs between November and March (April), pools fill with water creating habitats for a unique array of plants and animals. Aquatic life is teeming in the vernal pools. In addition to listed vernal pool invertebrates, water fleas (Cladocera), copepods (Copepoda), seed shrimp (Ostracoda), flatworms (Turbellaria), diving water beetles (Dytiscidae), midges (Chironomidae), crawling water beetles (Haliplidae), and Sierran treefrog (*Pseudacris sierra*) have the potential to occur within the pools. Typically, around March the vernal pools start to dry up and flowers start to emerge. Vivid yellow concentric rings are sometimes seen around the perimeter of the pool. Pink, purple, and white flowers bloom. During the summer months, vernal pools blend into the dry annual grassland landscape. Mammals, like ground squirrels and jack rabbits, birds, and insects all come to the dry pools to feed on the seeds and bulbs of the vernal pool plants. Other larger species, like raptors, feed on them.

Special-status species with the potential to occur in the vernal pool habitat are listed below. Appendix A lists the number of known CNDDB occurrences of special-status species within a 5 miles radius of the Study Area as well as additional information about special-status species. Long-billed curlew has the potential to feed in the vernal pools in the wet season, western spadefoot toad has the potential to breed and lay eggs during the wet season. Both species are discussed in Section 4.1 – Annual Grassland. Herons and egrets have the potential to feed in the vernal pools and are discussed in Section 4.3 – Riparian Woodland and Creek.

4.4.1 Andrenid Bee

Andrenid bees are California Special Animals. These ground nesters will be underground in the summer, fall and winter and emerge in early spring to forage and pollinate early blooming plants, such as willows and other early blooming wildflowers found in vernal pools, annual grasslands, and riparian woodland.

4.4.2 California Linderiella

California linderiella is a California Special Animal. Cysts containing the invertebrates hatch soon after the vernal pools become inundated. The cysts can stay dormant as the vernal pool dries and they can withstand extreme environmental conditions until they hatch (Eriksen and Belk 1999). Unlike the other fairy shrimp, the California linderiella is a member of the family Linderiellidae. It is smaller than fairy shrimp in the family Branchinectidae, typically ~10 millimeters (0.39 inch) in length and has red eyes (Dodds 1923).

4.4.3 Ricksecker's Water Scavenger Beetle

Ricksecker's water scavenger beetle is a California Special Animal. These aquatic beetles are known to occur in vernal pools. Ideal habitat includes, neutral to slightly alkaline, clear, low dissolved salts, dominated with vernal pool plant species, and complex of vernal pool crustacean species.

4.4.4 Vernal Pool Fairy Shrimp

Vernal pool fairy shrimp are Federally listed as Threatened. Cysts containing the invertebrates hatch soon after the vernal pool becomes inundated. The cysts can stay dormant as the vernal pool dries and they can withstand extreme environmental conditions until they hatch. Cyst dispersal can occur through watershed connections of freshwater habitats or via bird discharge (cysts are consumed by a bird and deposited in other habitats) (Eriksen and Belk 1999).

4.4.5 Vernal Pool Tadpole Shrimp

Vernal pool tadpole shrimp are Federally listed as Endangered. One of the largest crustaceans found in vernal pools, vernal pool tadpole shrimp produce cysts or eggs that lie buried in the soil until the next winter rains trigger the eggs to hatch. The cysts may hatch in as little as 4 days (Ahl 1991). Mature vernal pool tadpole shrimp range from 0.6 to 3.3 inches in length (USFWS 2006). Vernal pool tadpole shrimp have a shield-like cover called a carapace that can be olive-green, brown or gray. Their abdomen sticks out behind the carapace and ends in two long, thin tails.

4.4.6 Ahart's Dwarf Rush

Ahart's dwarf rush is State Listed as Endangered and a CNPS 1B.2 plant species. Ahart's dwarf rush is annual herb that blooms from March through May (CNPS 2020).

4.4.7 Boggs Lake Hedge-Hyssop

Boggs Lake hedge-hyssop is State Listed as Endangered and a CNPS 1B.2 plant species. Flowers are white with light green strips. This species requires fresh-water conditions and usually occurs in vernal pool habitat. The bloom period is from April through August (CNPS 2020).

4.4.8 Dwarf Downingia

Dwarf downingia is a CNPS 2B.2 plant species. A member of the bellflower family this annual herbaceous plant has flowers that are typically white to slight blue. This species requires shallow, fresh-water conditions and usually occurs in vernal pool habitat. The bloom period is March through May (CNPS 2020).

4.4.9 Legenere

Legenere is a CNPS 1B.1 plant species. A member of the bellflower family this annual herbaceous plant requires fresh-water conditions and usually occurs in vernal pool habitat. Flowers are white. The bloom period is April through June (CNPS 2020).

4.4.10 Pincushion Navarretia

Pincushion navarretia is a CNPS 1B.1 plant species. Flowers are white. This species is found in vernal pools, which are often located on acidic soils. The bloom period is April through May (CNPS 2020).

4.4.11 Red Bluff Dwarf Rush

Red Bluff dwarf is a CNPS 1B.1 plant species. This rush is a grass like annual herb in the rush family. This species requires fresh-water conditions and usually occurs in vernal pool habitat. The bloom period is March through June (CNPS 2020).

4.4.12 Valley Brodiaea

Valley brodiaea is a CNPS 4.2 plant species. This perennial bulbiferous species is typically found on silty, sandy, or gravelly loam soils within swales of annual grassland and vernal pools. The bloom period is from April through May or June (CNPS 2020).

4.5 PROTECTED TREES

A total of 259 protected native oak trees were surveyed within the Study Area by ISA-Certified Arborist Charlotte Marks (WE-10519A) on February 17, 18 and 19, 2020. Protected trees identified in the Study Area include 227 blue oaks, 23 interior live oaks, and nine valley oaks. Additionally, 502 non-protected trees including 457 blue oaks, 37 interior live oaks, seven valley oaks and one cork oak tree (*Quercus suber*) were observed within the Study Area but were not individually surveyed. A total of 19 dead native oak trees were mapped within the Study Area. Detailed tree data for all surveyed trees is included in Appendix C. The approximate locations of all surveyed trees are shown on Figure 3. Table 2 shows the number of protected trees by health and structure ratings.

Table 2
NUMBER OF TREES BY HEALTH AND STRUCTURE RATINGS

		Health					
		Good	**Fair-Good**	**Fair**	**Poor-Fair**	**Poor**	**Total Trees**
Structure	**Good**	0	0	0	0	0	**0**
	Fair-Good	0	0	2	0	0	**2**
	Fair	0	0	132	20	0	**152**
	Poor-Fair	0	0	43	31	6	**80**
	Poor	0	0	0	12	13	**25**
	Total Trees	**0**	**0**	**177**	**63**	**19**	**259**

Approximately 68 percent of the trees (177 of 259) are in Fair health and approximately 59 percent (154 of 259) are in Fair or better structure. These trees are typically suitable for preservation and integration into the project even in close proximity to people and property. However, they should be re-assessed during the final project design. A total of 62 trees (24 percent) are recommended for removal due to Poor to Poor-Fair health and structural condition, as noted in Appendix D. These trees may not be suitable for preservation around new development or in areas where people or property may be significantly injured by tree failure. Many of the trees in poor health have moderate to severe trunk rot and/or limb rot, bark wounds, trunk death, and trunk lean, which provide entry points for disease and decay organisms, and are a potential hazard to public safety in the long term. However, dead and dying trees provide vital habitat for wildlife, such as for nesting and breeding, and should be preserved where they do not pose a hazard to people or property. Therefore, even trees in poor condition should be removed only when it is determined that the tree presents an unacceptable risk to the public or infrastructure.

Mahany Park Open Space Trail

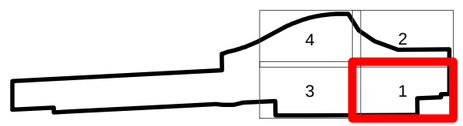
Legend

- Dead native oak trees
- Non-protected native oak trees
- Protected native oak trees
- Project Study Area ± 133 Acres

1416 1412 1411 1415 1413 1410 1401 1414 1402 1409 1408 1403 1407 1406 1404 1405

Woodcreek High School

Index Map



T:\PROJECTS\CVCRS-ALL\CRS-03_Mahany\Trails\Map\arb.mxd 4/27/2020

0 100 Feet

Source: Aerial (Photo Science, Inc, 2009).

HELIX Environmental Planning

Approximate Tree Locations

Figure 3 - Page 1

Pleasant Grove Blvd

Bear
Dog Park

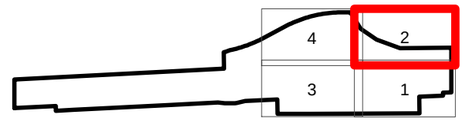
Mahany
Baseball
Complex

1379
1378
1377
1393
1392
1391
1258
1255
1257
1256

Legend

- Dead native oak trees
- Non-protected native oak trees
- Protected native oak trees
- Project Study Area ± 133 Acres

Index Map



T:\PROJECTS\CLCRS-ALL\CRS-03_MahanyTrails\Map\arb.mxd 4/27/2020

0 100 Feet

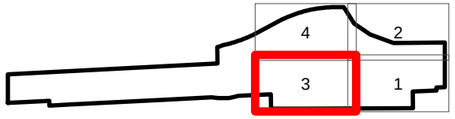
N

Source: Aerial (Photo Science, Inc, 2009).

HELIX Environmental Planning

Approximate Tree Locations

Index Map



Legend

- Dead native oak trees
- Non-protected native oak trees
- Protected native oak trees
- Project Study Area ± 133 Acres

1462 1460 1463 1464 1466 1465 1459 1456 1455 1458 1452 1457 1454 1453 1450 1449 1451 1447 1446 1448 1445 1444 1441 1442 1440 1443 1439 1435 1434 1436 1437 1431 1433 1432 1438 1425 1426 1424 1430 1427 1428 1423 1422 1421 1429 1419 1418 1417 1420

T:\PROJECTS\CVCRS-ALL\CRS-03_MahanyTrails\Map\arb.mxd 4/27/2020

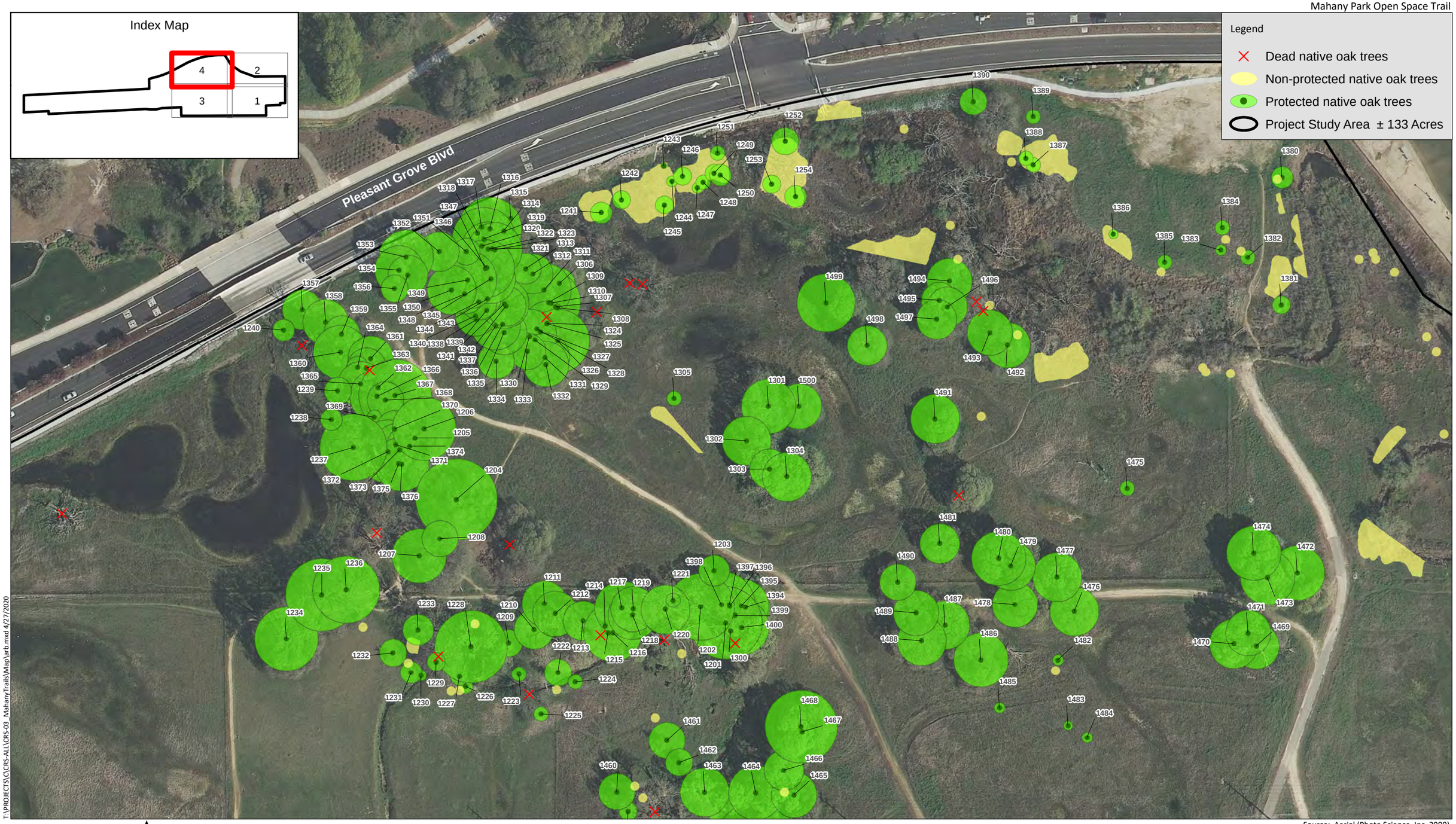
0 100 Feet

Source: Aerial (Photo Science, Inc, 2009).

HELIX Environmental Planning

Approximate Tree Locations

Figure 3 - Page 3



T:\PROJECTS\CVCRS-ALL\CRS-03_MahanyTrails\Map\arb.mxd 4/27/2020

0 100 Feet

Source: Aerial (Photo Science, Inc, 2009).

HELIX Environmental Planning

Approximate Tree Locations

5.0 RECOMMENDATIONS

Special-status species with the potential to occur on the site include nine plant species, burrowing owl, Swainson's hawk, other migratory birds and raptors, pallid bat, western pond turtle, western spadefoot Andrenid bee, vernal pool invertebrates, and valley elderberry longhorn beetle. White-tailed kite and two active bird nests were observed within the Study Area during the field survey.

Table 3 below summarizes recommended avoidance and minimization measures for sensitive habitats, plants, and wildlife that have the potential to occur within the Study Area and additional studies or permitting that may be required. These recommendations are further detailed following the table.

Table 3
SUMMARY OF AVOIDANCE RECOMMENDATIONS

Sensitive Resource	Avoidance Measures During Design	Additional Studies and Avoidance Measures During Construction
Habitat		
Vernal Pool Habitat	Avoid direct impacts and minimize impacts to watershed.	Implement water quality and erosion control measures during construction to prevent runoff into vernal pools.
Riparian Woodland Habitat	Avoid or minimize direct impacts to habitat.	Obtain 1600 Agreement prior to work in riparian areas.
Protected Trees	Avoid or minimize development within the tree protection zone.	Implement tree protection measures and mitigation for impacted trees in accordance with Native Oak Tree Ordinance.
Jurisdictional Waters	Avoid or minimize impacts to jurisdictional waters.	Submit wetland map for verification and obtain applicable permits from the USACE and RWQCB as required prior to construction.
Special-Status Species		
Special-Status Plants	Avoid or minimize direct impacts to vernal pools and Kaseberg Creek.	Conduct focused botanical survey of project footprint and surrounding 50 feet, where accessible, during bloom season prior to construction.
Burrowing Owl	Minimize impacts to annual grassland habitat.	Conduct protocol surveys prior to construction.
Swainson's Hawk	Avoid or minimize removal of mature trees from oak woodland and riparian woodland. Minimize impacts to annual grassland habitat.	Conduct site clearing outside of nesting season. Conduct pre-construction surveys if construction will occur between February 28 and September 15. Implement avoidance measures as required until young have fledged. Implement mitigation for loss of foraging habitat as required.
Raptor Nests and other nesting birds	Avoid or minimize impacts within 50 feet of known active nests.	Conduct site clearing outside of nesting season. Conduct pre-construction surveys if construction will occur between February 1 and August 31. Implement avoidance measures as required until young have fledged.

Table 3 (cont.)
SUMMARY OF AVOIDANCE RECOMMENDATIONS

Sensitive Resource	Avoidance Measures During Design	Additional Studies and Avoidance Measures During Construction
Pallid Bat	Preserve dead trees or trees with hollows to the greatest extent feasible.	Conduct pre-construction surveys and implement construction training and monitoring measures if species is found.
Western Pond Turtle	Avoid or minimize impacts to Kaseberg Creek and within 500 feet of Kaseberg Creek.	Conduct pre-construction surveys and implement construction training and monitoring measures if species is found.
Western Spadefoot Toad	Avoid direct impacts to and minimize impacts within 800 feet of vernal pools and seasonal wetlands.	Conduct pre-construction surveys and implement construction training and monitoring measures if species is found.
Vernal Pool Invertebrate	Avoid direct impacts to vernal pools. Minimize impacts to vernal pool watersheds or construction within 250 feet of pools.	Consult with USFWS to determine extent of project impact once construction documents are completed. Implement water quality and erosion control measures during construction to prevent runoff into vernal pools.
Valley Elderberry Longhorn Beetle	Maintain minimum 20-foot setback from riparian areas that could not be surveyed.	Survey riparian areas within 165 feet of project area for elderberry shrubs.
Andrenid Bee	Minimize impacts to annual grassland habitat.	No species-specific measures.

5.1 SPECIAL-STATUS SPECIES

5.1.1 Special-Status Plants

Nine special-status plants have the potential to occur within the Study Area including stinkbells, Stanford's arrowhead, Ahart's dwarf rush, Boggs Lake hedge-hyssop, dwarf dowiningia, legenere, pincushion navarretia, Red Bluff dwarf rush, and valley brodiaea. These species were not observed during the field survey; however, the survey was not floristic in nature and was conducted outside of the typical identification period for these plants.

Avoidance and Minimization Measures

Special-status plant species have the potential to occur in the annual grassland, riparian woodland, and vernal pools within the Study Area. Since there are no known populations of these species, direct avoidance during design is not feasible. However, impacts to eight of the nine species can be minimized or avoided by avoiding direct impacts to vernal pools and Kaseberg Creek.

Prior to construction of any improvements in the Study Area, a qualified botanist should conduct special-status plant surveys of the Study Area during the appropriate identification period for these species. One survey conducted between April and May will satisfy the blooming period for all nine potentially occurring special-status plant species. If no special-status plants are observed within the Study Area, then a letter report documenting the survey results should be prepared and submitted to the City and no further measures are recommended.

If special-status plants are observed within the Study Area, the location of the special-status plants should be marked with pin flags or other highly visible markers and may also be marked by GPS. The Project proponent should determine if the special-status plant(s) onsite can be avoided by Project design or utilize construction techniques to avoid impacts to the special-status plant species. All special-status plants to be avoided within the Study Area should have exclusion fencing or other highly visible material marking the avoidance area and the avoidance area should remain in place throughout the entire construction period. Prior to commencement of work activities, a designated botanist/biologist should provide a Worker Environmental Awareness Program (WEAP) training to all Project-related personnel. The training should include information on identifying special-status species found on the project site, their ecology and habitat requirements, the Project boundaries, and the avoidance and minimization measures to be followed to avoid impacts to those species. Upon completion of the training, all construction personnel should sign a form stating that they have attended the training and understand all the measures. Proof of this instruction should be kept on file with the Project proponent.

If special-status plants are found within the Study Area and cannot be avoided, the Project proponent should consult with the CDFW and/or the USFWS as appropriate, and depending on the status of the plant species in question, determine appropriate measures to mitigate for the loss of special-status plant populations within the Study Area. These measures may include gathering seed from impacted populations for planting within nearby appropriate habitat, preserving or enhancing existing offsite populations of the plant species affected by the Project, or restoring suitable habitat for special-status plant species habitat as directed by the regulatory agencies.

5.1.2 Burrowing Owl

The annual grassland within the Study Area contains herbaceous habitat and some small mammal burrows that are potentially suitable nesting habitat for burrowing owl, although no burrowing owls were observed during the field survey.

Avoidance and Minimization Measures

Since there are no known populations of these species, direct avoidance during design is not feasible. However, avoiding or minimizing the loss of annual grassland habitat will reduce the potential for the project to impact burrowing owl.

Prior to the start of construction, protocol surveys for the presence of burrowing owl should be conducted by a qualified biologist in accordance with the CDFW 2012 Staff Report. If burrowing owls are observed on or within 500 feet of proposed development activities that will result in ground disturbance, then an impact assessment should be prepared and submitted to the CDFW, in accordance with the CDFW 2012 Staff Report. If it is determined that project activities may result in impacts to occupied western burrowing owl habitat, then the project proponent should consult with CDFW and develop a detailed mitigation plan establishing avoidance and mitigation measures based on the requirements set forth in Appendix A of the CDFW 2012 Staff Report (CDFW 2012).

5.1.3 Swainson's Hawk Foraging Habitat and Nesting Habitat

The annual grassland within the Study Area provides suitable foraging habitat and the mature trees in the riparian and oak woodlands provide suitable nesting habitat for Swainson's hawk. The CDFW considers five or more vacant acres of suitable foraging habitat within ten miles of an active nest within

the last five years to be significant foraging habitat for Swainson's hawk, the conversion of which to urban uses is considered a significant impact (CDFW 1994; Staff Report). Although implementation of the trail project will retain the majority of the annual grassland habitat, loss of habitat may require mitigation.

Avoidance and Minimization Measures

Since there are no known occurrences of Swainson's hawk in the Study Area, direct avoidance during design is not feasible. However, avoiding or minimizing the removal of mature trees that could be used for nesting and the loss of annual grassland foraging habitat will reduce the potential for the project to impact Swainson's hawk.

Trees should be removed between September 16 and February 28, which is outside of the Swainson's hawk nesting season, if feasible.

Prior to the start of construction, protocol surveys for active Swainson's hawk nests should be conducted by a qualified biologist in accordance with the *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (Swainson's Hawk Technical Advisory Committee 2000). If no active Swainson's hawk nests are observed, then a letter report documenting the results of the survey should be provided to the City for their records, and no additional measures are recommended.

If active nests are observed on or within ¼-mile of the project site, then additional avoidance measures are recommended. CDFW should be consulted to determine to establish an appropriate noise buffer, develop take avoidance measures, and implement a monitoring and reporting program prior to any construction activities occurring within ¼-mile of the nest. A pre-construction WEAP training should be completed. Biological monitoring of the nest should be conducted until the young have fledged.

If the project impacts five or more acres of annual grassland habitat, mitigation for loss of this foraging habitat should implemented in accordance with the Staff Report. Foraging habitat losses on projects located greater than five miles but less than ten miles of an active nest tree documented within the last five years shall be mitigated at a 0.5:1 ratio.

5.1.4 Nesting Birds and Raptors

The various habitats within the Study Area provide potential nesting and foraging habitat for many raptor and other bird species. One white-tailed kite was observed foraging and two active nests were observed within Study Area during the field survey.

Avoidance and Minimization Measures

Although only two active nests were observed during the field survey, it is likely that additional nests will be established in the future. Avoidance and minimization measures during design include maintaining a 50-foot minimum setback from known active nests and minimizing impacts to oak woodland and riparian woodland habitats.

If feasible, then ground clearing activities and tree/shrub removal should be completed between September 1 and January 31, outside of the nesting season.

If construction begins during the nesting season (February 1 through August 31), then a pre-construction nesting bird survey shall be conducted within 14 days prior to the commencement of construction activities or vegetation removal. If the pre-construction survey results in no evidence of active nests, then a letter report should be submitted to the City for their records and no additional measures are recommended.

If active nests are found, additional avoidance measures are recommended. A pre-construction WEAP training should be completed. A qualified biologist should establish an appropriate species-specific buffer zone around the nests. The biologist shall mark the buffer zone with high visible flagging or pin flags and maintain the buffer zone until all construction has been completed, until the end of the breeding season, or until the young have successfully fledged and/or the nest is no longer active. The active nests should be monitored weekly during construction to evaluate potential nesting disturbance caused by construction activities.

If establishing the typical buffer zone is impractical, then the qualified biologist may reduce the buffer, depending on the species, and conduct daily monitoring to ensure that the nest is not disturbed and that no forced fledging occurs. Daily monitoring shall occur until the qualified biologist determines that the nest is no longer occupied or that it has been determined that nesting activity is not negatively affected by adjacent Project construction activities.

5.1.5 Pallid Bat

Pallid bat has the potential to roost in hollows within trees and the existing utility building and to forage within the Study Area.

Avoidance and Minimization Measures

The potential for impacts to pallid bat can be minimized during the design process by retaining dead trees or trees with hollows whenever possible.

A qualified biologist should conduct a pre-construction survey for the pallid bat within 14 days prior to the start of tree removal or grading operations. If no bat roosts are observed, then a letter report documenting the results of the survey should be provided to the City for their records, and no additional measures are recommended. If construction does not commence within 14 days of the pre-construction survey, or halts for more than 14 days, a new survey is recommended.

If pallid bat is found, additional avoidance measures are recommended. A pre-construction WEAP training should be completed. If pallid bats are roosting on or within 100 feet of the proposed project footprint, then the biologist should establish an appropriate buffer around the roost site prior to construction. At a minimum, no trees being used for roosts should be removed until the biologist has determined that bats are no longer roosting. Additional mitigation measures, such as installation of bat boxes or alternate roost structures, would be recommended only if bats are found to be roosting within the proposed project area and roosts were determined to be subject to removal during construction.

5.1.6 Western Pond Turtle

Kaseberg Creek provides aquatic habitat and the adjacent riparian and annual grassland provide upland habitat for this species.

Avoidance and Minimization Measures

The potential for impacts to western pond turtle can be minimized during the design process by avoiding or minimizing impacts to Kaseberg Creek and the surrounding upland areas within 500 feet of the channel, where this species is most likely to be found.

Prior to construction of any improvements in the Study Area, a qualified biologist should conduct a pre-construction survey within 14 days prior to the start of ground disturbance within 500 feet of riparian and creek habitat. If no western pond turtles are observed, then a letter report documenting the results of the survey should be provided to the City for their records, and no additional measures are recommended. If construction does not commence within 14 days of the pre-construction survey, or halts for more than 14 days, a new survey is recommended.

If western pond turtles are found, additional avoidance measures are recommended. A pre-construction WEAP training should be completed. A qualified biologist should conduct a pre-construction survey within 24 hours prior to commencement of construction activities within 500 feet of the perennial drainage and be present during grading activities in this area for the purpose of relocating any western pond turtles found within the construction footprint to suitable habitat away from the construction zone.

5.1.7 Western Spadefoot Toad

The annual grassland within the Study Area provides potential for upland aestivation habitat and the vernal pools and seasonal wetlands provide potential breeding habitat for western spadefoot toad.

Avoidance and Minimization Measures

The potential for impacts to western spadefoot toad can be minimized during the design process by avoiding or minimizing impacts to vernal pools and seasonal wetlands and the surrounding upland areas within 800 feet, where this species is most likely to be found.

A qualified biologist should conduct a pre-construction survey during the breeding season (February to March). This survey should include aquatic surveys of potential breeding ponds for egg masses and terrestrial surveys of surrounding uplands within 800 feet. If no western spadefoot toads are observed, then a letter report documenting the results of the survey should be provided to the City for their records, and no additional measures are recommended.

If western spadefoot toads are found, then additional avoidance measures are recommended. A pre-construction WEAP training should be completed. A qualified biologist should conduct a pre-construction survey within 24 hours prior to commencement of construction activities within 800 feet of vernal pools and seasonal wetlands and be present during grading activities in this area for the purpose of relocating any western spadefoot toad found within the construction footprint to suitable habitat away from the construction zone.

5.1.8 Vernal Pool Invertebrates

California linderiella, Ricksecker's water scavenger beetle, vernal pool fairy shrimp, and vernal pool tadpole shrimp have the potential to occur in the vernal pools within the Study Area. As noted by USFW, indirect effects on avoided vernal pools can occur as a result of adjacent ground disturbing activities

within a 250-foot radius of avoided vernal pools, specifically, activities and/or structures that adversely affect water quality or alter the hydrology.

Avoidance and Minimization Measures

Design of the trail and other improvements should avoid direct impacts to vernal pools, minimize changes to vernal pool watersheds, and maximize setbacks to vernal pools to the greatest extent feasible. Improvements should be designed to avoid directing runoff into pools.

If the proposed trail or other improvements will be located within 250 feet of a vernal pool, consult with USFWS to determine potential project impacts and appropriate mitigation and protection measures. At a minimum, implement erosion control and water quality best practices to prevent runoff from construction site into vernal pools.

5.1.9 Valley Elderberry Longhorn Beetle

Although no elderberry shrubs were observed during the field survey, a section of riparian habitat located adjacent to Bear Dog Park, in the northeastern portion of the Study Area was not fully accessible due thick undergrowth. Therefore, elderberry shrubs could be present and may provide suitable habitat for valley elderberry longhorn beetle.

Avoidance and Minimization Measures

If an elderberry shrub is located and construction is anticipated within 165 feet of the elderberry shrubs, approval by the USFWS must be obtained and a minimum setback of 20 feet from the driplines of the elderberry shrubs must be maintained, in accordance with the U*SFWS Valley Elderberry Longhorn Beetle (Desmocerus californicus dimorphus)* (Framework) (USFWS 2017).

Project activities that will encroach into the 20-foot minimum setback area are assumed to adversely affect valley elderberry longhorn beetle. Project activities that may directly or indirectly affect elderberry shrubs with stems measuring at least one inch, require minimization measures including planting replacement habitat or purchasing mitigation credits from a USFWS-approved mitigation bank. The mitigation ratios vary based on whether exit holes are present and whether the shrubs occur within riparian habitat

5.1.10 Andrenid Bee

The annual grassland and oak woodland within the Study Area contains potentially suitable habitat for Andrenid bee, although no Andrenid bee were observed during the field survey. Since andrenid bee establishes new nests annually, the potential loss of individual nests is not expected to have a significant impact on this species.

Avoidance and Minimization Measures

Since there are no known populations of these species, direct avoidance during design is not feasible. However, avoiding or minimizing the loss of annual grassland habitat and oak woodland habitat will reduce the potential for the project to impact Andrenid bee.

No species-specific mitigation pre-construction measures are recommended for this species.

5.2 FUTURE PERMITS AND ENVIRONMENTAL COMPLIANCE

Additional environmental review and permitting may be required prior to the start of construction.

5.2.1 Environmental Review

Prior to construction, the City must complete a review of the project for compliance with state environmental regulations. If Federal funding is obtained for the project then a NEPA review may also be required. As part of the preparation of these documents additional technical studies may be required.

5.2.2 Regulatory Permits

Prior to initiation of any construction activities which could result in impacts to potentially regulated aquatic features, permits for these impacts under Section 404 and 401 of the CWA and the State Water Code will be required. As part of the permitting process, a formal aquatic resources delineation should be completed and submitted to the USACE for verification of the extent of regulated aquatic features. Any conditions included in the final permits, including prescribed mitigation measures, would be required to be implemented prior to filling or impacting these features.

If aquatic features are determined not to be subject to regulation under the CWA, then these features may still be considered waters of the State. An application for discharge of dredge or fill material should be submitted to the RWQCB prior to the start of construction.

Impacts to the bed and bank or riparian vegetation of any creek or seasonal drainage may require a streambed alteration agreement. An application for a SAA should be submitted to CDFW, which will review it and determine if an SAA is required.

5.2.3 Protected Trees

As outlined under City's Municipal Code Section 19.66.60, *Standard Policies and Procedures for Approved Work*, the following measures define procedures necessary to safeguard the health of protected trees to be preserved onsite or which may be impacted as a result of construction activities (City of Roseville 2020a).

- A minimum five-foot high chain link or substitute fence approved by the City Planning Manager ("Manager") shall be installed at the outermost edge of the protected zone ("TPZ") of each protected tree or groups of protected trees. Exceptions to this policy may occur in cases where protected trees are located on slopes that will not be graded. However, approval must be obtained from the City's Planning Division ("Planning Division") to omit fences in any area of the project.

- Tree protection fencing shall be installed in accordance with the approved fencing plan prior to the commencement of any grading operations or such other time as determined by the review body. The developer shall call the Planning Division for an inspection of the fencing prior to grading operations. Upon approval, the fences shall remain in place throughout the entire construction period and shall not be removed, relocated, taken down, or otherwise modified in whole or in part without prior written authorization from the Planning Division.

- Signs shall be installed along the tree protection fencing in four equidistant locations around each individual protected tree, or at 50-foot intervals along the fencing surrounding a grove of protected trees. The size of each sign must be a minimum of two feet by two feet and must contain the following language:

  "WARNING, THIS FENCE SHALL NOT BE REMOVED OR
  RELOCATED WITHOUT WRITTEN AUTHORIZATION FROM THE
  CITY OF ROSEVILLE PLANNING DIVISION."

- To ensure the preservation of protected trees during construction, a minimum $10,000.00 deposit (or greater, if deemed necessary by the Approving Authority) shall be posted and maintained. The deposit shall be posted in a form approved by the City Attorney prior to any grading, delivery of materials, or movement of heavy equipment onto the site, or issuance of any permits. Each violation of any Tree Permit condition regarding tree preservation shall result in forfeiture of a portion or the entirety of the deposit, at the discretion of the Approving Authority, provided that such determinations may be appealed (City of Roseville 2020b).

- Where a Tree Permit has been approved for construction of a retaining wall(s) within the protected zone of a protected tree, the developer will be required to provide for immediate protection of exposed roots from moisture loss during the time prior to completion of the wall. The retaining wall shall be constructed within 72 hours after completion of grading.

- Pruning of living roots of less than one-inch diameter (minor roots) may be cut, but damaged roots shall be traced back and cleanly cut behind any split, cracked or damaged area. Pruning of living roots over one-inch in diameter (major roots) may not be cut without approval of an ISA-Certified Arborist. Cut all roots cleanly at the edge of the trench. Do not tear or pull roots out of ground. If roots are split during excavation, follow root back to immediately above split and cut cleanly.

- If required, preservation devices such as aeration systems, oak tree wells, drains, special foundation systems, special paving and cabling systems must be installed per approved plans and certified by the project arborist.

- Every effort should be made to avoid cut and/or fill slopes within or in the vicinity of the protected zone of any protected tree. No grade changes are permitted which would cause water to drain to the area within twice the longest radius of the protected zone of any protected tree or would result in the ground being lowered on all sides of the tree.

- When permitted, trenching within the protected zone of a protected tree may only be conducted with hand tools or as otherwise directed by an arborist, in order to avoid root injury.

- A certification letter should be submitted by the project arborist to the Planning Division within five working days of completing any regulated activity within the protected zone of protected trees, attesting that all work was conducted in accordance with the appropriate permits and the requirements of this chapter.

- All conditions of approval should be adhered to as outlined under the project's Tree Permit obtained from the City.

The following measures are general best management practices (BMPs) that are recommended to minimize the potential for injury or damage to occur to trees to be preserved onsite.

- No parking, portable toilets, dumping or storage of any construction materials, including oil, gas, or other chemicals, or other infringement by workers or domesticated animals is allowed in the TPZ;

- Minimize disturbance to the native ground surface (grass, leaf, litter, or mulch) under preserved trees to the greatest extent feasible. All brush, earth, and debris that is required to be removed within the dripline of a preserved tree should be conducted in a manner that prevents injury to the tree;

- All pruning should be done in accordance with ISA American National Standards Institute (ANSI) tree care standards using tree maintenance best practices;

- Climbing spikes should not be used on living trees;

- All exposed roots should be covered with protective material (e.g., damp burlap) during construction to prevent drying out;

- No signs, ropes, cables, or any other item should be attached to a tree; and

- No burning or use of equipment with an open flame should occur near or within the TPZ. Appropriate fire prevention techniques should be employed around all trees to be preserved. This includes prohibiting the use of tools that may cause sparks, such as metal blade trimmers or mowers.

6.0 REFERENCES

Ahl, J.S.B. 1991. Factors affecting contributions of the tadpole shrimp, *Lepidurus packardi,* to its oversummering egg reserves. Hydrobiologia. 212:137-143.

Barbour, R. W., and W. H. Davis. 1969. *Bats of America*. Univ. of Kentucky Press, Lexington.

Bartolome, J., B. Allen-Diaz, S. Barry, L. Ford, M. Hammond, P. Hopkinson, F. Ratcliff, S. Spiegal, and M. White. 2014. Grazing for biodiversity in Californian Mediterranean grasslands. Rangelands. 36(5):36-43.

City of Roseville. 2020a. *Chapter 19.66, Tree Preservation Ordinance*. City of Roseville Municipal Code. Roseville, California. Available online at: http://qcode.us/codes/roseville/?view=desktop&topic=19-iv-19_66-19_66_020.

2020b. *Chapter 19.80, Appeals*. City of Roseville Municipal Code. Roseville, California. Available online at: http://qcode.us/codes/roseville/?view=desktop&topic=19-iv-19_66-19_66_020.

California Department of Fish and Wildlife (CDFW [formerly CDFG]). 1994. Staff Report Regarding Mitigation for Impacts to Swainson's Hawks (*Buteo swainsoni*) in the Central Valley of California. November 1, 1994.

2012. Staff Report on Burrowing Owl Mitigation. State of California, California Natural Resources Agency. Department of Fish and Wildlife. March 7, 2012.

2020. California Natural Diversity Database, Biogeographic Data Branch, Department of Fish and Wildlife. P*leasant Grove, Nicolaus, Sheridan, Verona, Roseville, Taylor Monument, Rio Linda, and Citrus Heights* USGS quadrangles Accessed [2/6/2020].

California Native Plant Society (CNPS). 2020. *Online Electronic Inventory of Rare and Endangered Vascular Plants of California. Online edition, v8-02.* P*leasant Grove, Nicolaus, Sheridan, Verona, Roseville, Taylor Monument, Rio Linda, and Citrus Heights* USGS quadrangles. Available online at http://www.cnps.org/cnps/rareplants/inventory. Accessed [2/6/2020].

Cornell Lab of Ornithology. 2019. All About Birds. Cornell Lab of Ornithology, Ithaca, New York. https://www.allaboutbirds.org. Accessed on [4/23/2020].

Dodds, G. S., 1923. *A new species of phyllopod (Branchinecta occidentalis) Occas*. Papers Mus. Zool. 141: 1–3.

Eriksen, C. and D. Belk. 1999. *Fairy Shrimps of California's Puddles, Pools, and Playas*. Mad River Press, Inc. Eureka, CA.

Hayes, Peter J., Peggy Kraus-Kennedy, and Molly Keller. 2006. *The Outdoor World of the Sacramento Region: A Local Field Guide With Details and Colored Drawings of More Than 600 Plants, Birds, Mammals, Reptiles, Amphibians, Fish, And Insects*. The American River Natural History Association. Sacramento, CA.

Hood, Charles. 2017. *A California Guide to The Birds Among Us*. Versa Press, East Peoria.

Muths E. Home range and movements of boreal toads in undisturbed habitat. Copeia. 2003;2003: 160-165.

NatureServe. 2020. NatureServe Explorer: An Online Encyclopedia of Life [Web Application]. Version 7.1. NatureServe, Arlington, Virginia. Available online at: http://www.natureserve.org/explorer. Accessed [3/27/2020].

Poulin, Ray, L. Danielle Todd, E. A. Haug, B. A. Millsap and M. S. Martell. 2011. *Burrowing Owl* (*Athene cunicularia*), *The Birds of North America* Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology.

Shuford, W.D., and Gardladi, T. editors. 2008. *California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California*. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento.

Stebbins, R. C. 2003. *Western Amphibians and Reptiles, 3rd Edition*. Boston: Houghton Mifflin Co.

Swainson's Hawk Technical Advisory Committee. 2000. Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in the Central Valley.

U.S. Fish and Wildlife Service (USFWS). 2017. Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle (Desmocerus californicus dimorphus). U.S. Fish and Wildlife Service; Sacramento, California. 28 pp.

2020. *Information for Planning and Conservation* (IPaC) *Trust Resource Report: Mahany Open Space*. Available online at: https://ecos.fws.gov/ipac/project/JCM4ZKD535C2ZBAFJLG3WYHFVI. Accessed [2/6/2020].

2006. Draft recovery plan for listed species of the Rogue Valley vernal pool and Illinois Valley wet meadow ecosystems. Region 1, Portland, Oregon. xiii + 136 pages.

Woodbridge, B. 1998. Swainson's Hawk (Buteo swainsoni). The Riparian Bird Conservation Plan: A Strategy for Reversing the Decline of Riparian-associated Birds in California. California Partners in Flight. Available at: www.prbo.org/calpif/htmldocs/species/riparian/swainsons_hawk.htm.

Zeiner, D.C., W.F. Laudenslayer, Jr., K.E. Mayer, and M. White, eds. 1990. California's Wildlife: California Wildlife Habitat Relationships. Wildlife and Habitat Data Analysis Branch, California Department of Fish and Game. Available online at: http://www.dfg.ca.gov/whdab/html/cawildlife.html.

This page intentionally left blank

Appendix A

Regionally Occurring Listed and Special-Status Species

This page intentionally left blank

Appendix A
Regionally Occurring Listed and Special-Status Species

Table 1 — Legally Protected Species

Special-Status Species	Regulatory Status	Habitat Requirements	Identification/ Survey Period	Potential for Occurrence
Plants				
Boggs Lake hedge-hyssop *Gratiola heterosepala*	--; CE; --; 1B	Annual herb found on clay soils in vernal pools and swamps, occasionally along lake margins, from 10 to 2,375 meters.	Blooming period: April – August	**High.** The Study contain suitable vernal pool habitat for this species. There are three CNDDB records for this species within five miles of the Study Area (CDFW 2020).
Invertebrates				
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	FT; --; --; --	Associated with elderberry shrubs (*Sambucus* sp.) often within riparian habitats. Presence can be indicated by bore-holes in stems of elderberries.	March – June (Adults) Year – round (Larvae)	**Low.** Elderberry shrubs were not noted during the site survey however, sections of the riparian habitat west of Bear Dog Park and North of Kaseberg Creek were not accessible due to dense thorny brush. Therefore, elderberry shrubs have the potential to occur within this section of the Study Area.
Vernal pool fairy shrimp *Branchinecta lynchi*	FT; --; --; --	Inhabits vernal pools, swales, and ephemeral freshwater habitat. Known from Alameda, Butte, Calaveras, Colusa, Contra Costa, El Dorado, Fresno, Glenn, Kings, Madera, Merced, Monterey, Napa, Placer, Riverside, Sacramento, San Benito, San Joaquin, San Luis Obispo, Santa Barbara, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Ventura, Yolo, and Yuba counties.	USFWS protocol-level wet-season sampling and/or dry season cyst identification	**High.** The Study contain suitable vernal pool habitat for this species. There are 26 CNDDB records for this species within five miles of the Study Area (CDFW 2020).
Conservancy fairy shrimp *Branchinecta conservatio*	FE; --; --; --	Inhabits vernal pools, swales, and ephemeral freshwater habitat. Known from Butte, Tehama, Glenn, Yolo, Solano, Stanislaus, Merced, and Ventura counties.	USFWS protocol-level wet-season sampling and/or dry season cyst identification	**None.** Although the Study Areas contains vernal pool habitat, the Study is outside of the known geographical range of this species.
Vernal pool tadpole shrimp *Lepidurus packardi*	FE; --; --; --	Inhabits vernal pools, swales, and ephemeral freshwater habitat. Known from Alameda, Butte, Colusa, Contra Costa, Fresno, Glenn, Kings, Merced, Placer, Fresno, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Yolo, and Yuba counties.	USFWS protocol-level wet-season sampling and/or dry season cyst identification.	**High.** The Study Area contains suitable vernal pool and ephemeral freshwater habitat for this species. There is one CNDDB record for this species within five miles of the Study Area (CDFW 2020).
Fish				
Delta smelt *Hypomesus transpacificus*	FT; CE; --; --	Found in open waters of bays, tidal rivers, channels, and sloughs.	Year – Round	**None.** The Study Area does not contain suitable habitat to support this species (i.e., open waters of bays, tidal rivers, channels, and sloughs).
Chinook salmon-Central Valley spring-run *Oncorhynchus tshawytscha*	FT; CT; --; --	Found in the ocean, rivers, creeks, and large inland lakes.	Year-round	**None.** The Study Area does not contain suitable habitat to support this species. Although Kaseberg Creek transects a portion of the Study Area, this creek hydrology does not provide enough flow to support this large fish species
Longfin smelt *Spirinchus thaleichthys*	FC; CT; --; --	Inhabits estuaries and bays in the Delta and Sacramento-San Joaquin Rivers. Migrate to freshwater to spawn.	(November) December – February (June)	**None.** The Study Area does not contain suitable habitat for this species (i.e., estuaries and bays in the Delta).
Steelhead - Central Valley DPS *Oncorhynchus mykiss irideus*	FT; --; --; --	Found in the ocean, rivers, creeks, and large inland lakes. This distinct population only occurs in the Sacramento and San Joaquin Rivers and their tributaries.	Year – Round	**None.** This species is confined to the uppermost portions of the watershed (e.g. Miners and Secret Ravine) for rearing due to the consistently cooler summer temperatures (GANDA 1998) There is one CNDDB record for this species within five miles of the Study Area (CDFW 2020).
Amphibians/Reptiles				
California red-legged frog *Rana draytonii*	FT; CSC; --; --	Found near quiet, permanent pools of streams, marshes, and ponds with extensive vegetation below 1200 meters. Typically occurs in humid forests, woodlands, grassland, and foothill habitats. Adults may disperse considerable distances between pools during rain events. Breeds in permanent pools from January through July.	Year – Round	**None.** This species is generally considered extirpated from the valley.

Appendix A (cont.)
Regionally Occurring Listed and Special-Status Species

Special-Status Species	Regulatory Status	Habitat Requirements	Identification/ Survey Period	Potential for Occurrence
California tiger salamander Central Population *Ambystoma californiense*	FT; CT--; --	Breeds in vernal pools and seasonal ponds in grasslands and oak savannas. Adults spend summer in small mammal burrows.	Drift fence studies during fall and winter for upland habitats. November – February (adults) March 15 – May 15 (larvae)	**None.** The Study Area is not within the known range of the species.
Giant garter snake *Thamnophis gigas*	FT; CT--; --	Found in agricultural wetlands and other wetlands such as irrigation and drainage canals, low gradient streams, marshes, ponds, sloughs, small lakes, and their associated uplands in Sacramento, Sutter, Butte, Colusa, and Glenn counties.	Active outside of dormancy period November-mid March	**None.** The Study Area is outside of the current known range of the species.
Birds				
Bald eagle *Haliaeetus leucocephalus*	FD; CE; --; --	Breeding habitat most commonly includes areas within 2.5 miles (4.0 kilometers) of coastal areas, bays, rivers, lakes, and reservoirs. Nests usually are in tall trees or on pinnacles or cliffs near water.	Year round	**None.** The Study Area does not contain suitable habitat for this species (i.e., within 2.5 miles (4.0 kilometers of coastal areas, bays, rivers, lakes, and reservoirs).
Bank swallow *Riparia riparia*	--; CT; --; -- Nesting	Colonial breeder found in open and partly open situations, frequently near flowing water. Nests on steep sand, dirt, or gravel banks, in burrows dug near the top of the bank, along the edge of inland water, or along the coast, or in gravel pits or road embankments.	February – October	**None.** The Study Area does not provide suitable habitat for this species**.** The banks of the creek are not steep and gravel riparap is adjacent to busy roadways.
California black rail *Laterallus jamaicensis coturniculus*	--; CT; --; --	Saltwater, brackish, and freshwater marshes. Does not occur in wetland areas with annual fluctuations in water level and need a permanent water source of at least 1 inch in depth.	Year – round	**None.** Although the Study Area contains wetland, there is seasonal fluctuation in the hydrology with no permanent water and no marsh habitat is present.
Golden eagle *Aquila chrysaetos*	--; CFP; --; --	Open and semi-open areas in the mountains up to 12,000 feet in elevation. They are also found in canyon lands, rimrock, terrain, and riverside cliffs and bluffs. Nest are built on cliffs and steep escarpments in grassland, in trees, chaparral, shrubland, forests and man-made structures within vegetated areas.	Year -round	**None.** The Study Area does not contain suitable habitat for this species. The Study Area is relatively flat lacking the steep cliff and bluff habitat for nesting this species is generally associated with.
Swainson's hawk *Buteo swainsoni*	--; CT; --; --	Nest peripherally in valley riparian systems, lone trees or groves of trees in agricultural fields. Valley oak, Fremont cottonwood, walnut, and large willow trees, ranging in height from 41 to 82 feet, are the most commonly used nest trees in the Central Valley.	Breeding: March – October	**High.** The Study Area provides suitable nesting habitat within the riparian and oak woodland. The annual grassland provides foraging habitat for this species as numerous rodent burrows were observed during the March 2020 site survey. There are seven CNDDB record for this species within five miles of the Study Area (CDFW 2020).
Tricolored blackbird *Agelaius tricolor*	--; CCE; CSA; --	Nests in colonies near fresh water, usually within emergent wetland habitat with tall, dense cattails, tule, willow, blackberry, wild rose, and other marshy vegetation. Forages in open grassland, wetland, and agricultural habitats.	Year – Round	**Low.** Nesting habitat for this species is limited within the Study Area to small patches within the riparian and creek habitat. Suitable foraging habitat exists for this species within the annual grassland community. There is one CNDDB records for this species within five miles of the Study Area (CDFW 2020).
Western yellow-billed cuckoo *Coccyzus americanus occidentalis*	FT; CE; --; --	Found in woodlands, thickets, orchards, and streamside groves. Breeds mostly in dense deciduous stands, including forest edges, tall thickets, dense second growth, overgrown orchards, and scrubby oak woodlands. Often found in willow groves around marshes. In the west, mostly in streamside trees, including cottonwood-willow groves in arid country.	Late Spring – Early Fall (Breeding)	**None.** Although the Study Area contains some riparian habitat, this species requires large blocks of riparian habitat for nesting. Along the Sacramento River, nesting yellow-billed cuckoos occupied home ranges which included 25 acres (10 hectares) or more of riparian habitat. Another study on the same river found riparian patches with yellow-billed cuckoo pairs to average 99 acres (40 hectares). Home ranges in the South Fork of the Kern River averaged about 42 acres (17 hectares) (CDFW 2017).

Table 1 includes federal threatened or endangered species and eagles, and State threatened, endangered, or fully protected species.

Table 2 — Species Subject to CEQA Review

Special-Status Species	Regulatory Status	Habitat Requirements	Identification/ Survey Period	Potential for Occurrence
Plants				
Ahart's dwarf rush *Juncus leiospermus* var. *ahartii*	--; --; --; 1B	Annual herb found in mesic areas in valley and foothill grasslands from 30 to 229 meters.	Blooming period: March – May	**High.** The Study Area provides suitable habitat for this species within the vernal pool habitat.
Dwarf downingia *Downingia pusilla*	--; --; --; 2B	An annual herb found in mesic areas within valley and foothill grassland and vernal pool habitats from 1 to 445 meters.	Blooming period: March – May	**High.** The Study Area contains suitable vernal pool and grassland habitat for this species. There are sixteen CNDDB records for this species within five miles of the Study Area (CDFW 2020F).
Hispid bird's-beak *Chloropyron mole* ssp. *hispidum*	--; --; --; 1B	Annual hemiparasite herb found on alkaline soil in meadows and seeps, playas, valley and foothill grasslands, from 1-155 meters.	Blooming period: June – September	**None.** The Study Area does not provide suitable habitat for this species (I.e., alkaline soils in meadows and seeps, playas).
Legenere *Legenere limosa*	--; --; --; 1B	Annual herb found in vernal pools from 1 to 880 meters.	Blooming period: April – June.	**High.** The Study Area contains suitable vernal pool habitat for this species. There are three CNDDB records for this species within five miles of the Study Area (CDFW 2020).
Pincushion navarretia *Navarretia myersii* ssp. *myersii*	--; --; --; 1B	Annual herb often found in acidic soils within vernal pools from 20 to 330 meters.	Blooming period: April – May	**Low.** Although the Study Areas contains vernal pools, the soils may not be the adequate pH for this species to thrive.
Red Bluff dwarf rush *Juncus leiospermus*	--; --; --; 1B	Annual herb in vernally moist chaparral, cismontane woodlands, meadows and seeps, valley and foothill grasslands, and vernal pools from 35-1,250 meters.	Blooming period: March – June	**High.** The Study Area contains suitable vernal pool and annual grassland habitat for this species. There is one CNDDB record for this species within five miles of the Study Area (CDFW 2020).
Sanford's arrowhead *Sagittaria sanfordii*	--; --; --; 1B	Perennial rhizomatous herb found in assorted shallow freshwater wetlands, marshes, and swamps from 0 to 650 meters.	Blooming period: May – October	**High**. The seasonal wetlands within the Study Area provide suitable habitat for this species. There are three CNDDB records for this species within five miles of the Study Area (CDFW 2020).
Wolly rosemallow *Hibiscus lasiocarpos var. occidentalis*	--; --; --; 1B	Perennial rhizomatous herb often found on the sides of levees within freshwater marshes and swamps from 0 to 120 meters.	Blooming period: June-September	**None.** The Study Area does not provide suitable habitat for this species.
Invertebrates				
California linderiella *Linderiella occidentalis*	--; CSA; --; --	Found in most landforms, geologic formations and soil types supporting vernal pools in California. They are typically found in deeper vernal pools throughout elevations ranging from 10 to 1,159 meters.	USFWS protocol-level wet-season sampling and/or dry season cyst identification.	**High.** The Study Area contains suitable vernal pool habitat for this species. There are twenty-two CNDDB records for this species within five miles of the Study Area (CDFW 2020).
Fish				
Sacramento splittail *Pogonichthys macrolepidotus*	--; CSC; --; --	Inhabits the streams and tributaries of the Sacramento-San Joaquin Rivers in estuaries, marshes, and freshwater.	Spawns in spring (sometimes in winter and early summer).	**None.** The Study Area is not within the known watersheds this species inhabits.
Amphibians/Reptiles				
Western pond turtle Emys marmorata	--; CSA; --; --	Occurs in a variety of aquatic habitats such as ponds, creeks, ditches, lakes, and marshes. Prefers areas with abundant vegetation and rocky or muddy substrate. Exposed banks or other basking areas such as logs or cattail mats are required. Upland habitat typically occurs within woodlands, forests, or grasslands, within the vicinity of aquatic habitat.	Year – Round	**High.** The Study Area provides suitable aquatic and upland habitat for this species in the riparian and creek habitats.
Western spadefoot *Spea hammondii*	--; CSC; --; --	Found in a variety of upland habitats, including lowlands, foothills, grasslands, open chaparral, and pine-oak woodlands. Habitat preferences include shortgrass plains, and sandy or gravelly soils for burrowing (e.g., alkali flats, washes, alluvial fans). Hibernates/aestivates for most of the year underground. During the breeding season are found in temporary rain pools, and slow-moving streams (e.g., areas flooded by intermittent streams).	Breeding: January – May	**High.** The annual grassland and vernal pools located throughout the Study Area provided suitable habitat for this species. Numerous suitable burrows were noted during the 2020 survey. There are five CNDDB record for this species within five miles of the Study Area (CDFW 2020).

Appendix A (cont.)
Regionally Occurring Listed and Special-Status Species

Special-Status Species	Regulatory Status	Habitat Requirements	Identification/ Survey Period	Potential for Occurrence
Birds				
Black-crowned night heron *Nycticorax nycticorax*	--; CSA; --; --	Found in saltwater, brackish and freshwater habitats that include marshes, swamps, wooded streams, mangroves, lake shores, ponds, and lagoons. Roosting occurs in mangrove forests or swampy woodlands. Nesting occurs in trees near coastal marshes or on marine islands, swamps, marsh vegetation, clumps of grass on the dry ground, orchards, etc. Nesting usually occurs with other heron species.	Winter (Non-breeding)	**Low**. Wetlands, vernal pools and riparian habitat located within the Study Area provide foraging habitat for this species. However, no rookeries were observed.
Burrowing owl *Athene cunicularia*	--; CSC; --; -- (burrowing sites and some wintering sites)	Nests in burrows in the ground, often in old ground squirrel burrows or badger, within open dry grassland and desert habitat. The burrows are found in dry, level, open terrain, including prairie, plains, desert, and grassland with low height vegetation for foraging and available perches, such as fences, utility poles, posts, or raised rodent mounds.	Year – round	**High.** The annual grassland located throughout the Study Area provides suitable habitat for this species. Numerous suitable burrows were noted during the 2020 survey. There is one CNDDB record for this species within five miles of the Study Area (CDFW 2020).
California thrasher *Toxostoma redivivum*	--; CSC; --; --	Found in chaparral within shrubs and small trees and woodlands if ample underbrush is present. This species is only in California and a small part of Baja California.	Year-Round	**None.** The Study Area does not provide suitable habitat for this species (i.e., chaparral).
Common Yellowthroat *Geothlypis trichas*	BCC; --; --; --	Found in open habitats such as marshes, wetland edges, and brushy fields. they are also found in dry upland pine forests, palmetto thickets, drainage ditches, hedgerows, orchards, fields, burned-over oak forests, shrub-covered hillsides, river edges, and disturbed sites. They winter in similar habitats with dense vegetation in the southern United States, Mexico, Central America, and the Caribbean.	Year Round	**High.** The Study Area provides suitable foraging and nesting habitat for this species within the annual grassland, oak woodland, and riparian habitats.
Grasshopper sparrow *Ammodramus savannarum*	--; CSC; --; --	Frequents dense, dry, or well drained grassland, especially native grassland. Nests at base of overhanging clump of grass. This species is known from Los Angeles, Mendocino, Orange, Placer, Sacramento, San Diego, San Luis Obispo, Solano, and Yuba counties, in California.	April – July (breeding)	**Low.** Although portions of the Study Area contain annual grasslands that provide habitat for this species, the Study Area shows signs of recent grazing, thus reducing vegetation density that the species requires for nesting.
Great blue heron *Ardea herodias*	--; CSA; --; --	Inhabits both freshwater and saltwater habitats and forages in grassland and agricultural field. Breeding colonies are located within 2 to 4 miles of feeding areas, often in isolated swamps or on islands, and near lakes and ponds bordered by forests.	Year – round	**Present.** This species was observed feeding in Kaseberg Creek within the Study Area during the March 2020 site visit. Wetlands, vernal pools and riparian habitat located within the Study Area provide foraging habitat for this species. However, no rookeries were observed.
Great egret *Ardea alba*	--; CSA; --; --	Found in marshes, swampy woods, tidal estuaries, lagoons, mangroves, streams, lakes, ponds, fields and meadows. Nests primarily in tall trees, or in woods or thickets near water.	Year – round	**Present.** This species was observed feeding in a seasonal wetland within the Study Area during the March 2020 site visit. Wetlands, vernal pools and riparian habitat located within the Study Area provide foraging habitat for this species. However, no rookeries were observed.
Lewis' woodpecker *Melanerpes lewis*	BCC; --; --; --	Found in open forest and woodland, often logged or burned, including oak, coniferous forest (primarily ponderosa pine), riparian woodland (dominated by cottonwood), orchards, and less commonly in pinyon-juniper habitat. In winter uses oak woodlands, nut and fruit orchards. Nests in natural tree cavities, abandoned northern flicker holes or previously used cavities.	Year Round	**None.** This species inhibits transitional habitats between oak and coniferous forests at higher elevations than the Study Area.
Long-billed curlew *Numenius americanus*	BCC; --; --; --	Nests in low-growing vegetation (4-8" high), including shortgrass and mixed grass prairies and agricultural fields. In the winter, they migrate to the coast where they inhabit wetlands, tidal estuaries, mudflats, flooded fields, and occasionally beaches.	Summer (breeding)	**Low.** Although portions of the Study Area contain annual grasslands that provide habitat for this species, the Study Area shows signs of recent grazing, thus reducing vegetation high that the species requires for nesting.

Appendix A (cont.)
Regionally Occurring Listed and Special-Status Species

Special-Status Species	Regulatory Status	Habitat Requirements	Identification/ Survey Period	Potential for Occurrence
Nuttall's woodpecker *Picoides nuttallii*	BCC; --; --; --	Found primarily in oak woodlands and in riparian woods; rarely in conifer.	Year Round	**High**. The oak woodland and riparian habitat provide suitable foraging and nesting habitat for this species.
Oak titmouse *Baeolophus inornatus*	BCC; --; --; --	Found in oak and pine-oak woodland, arborescent chaparral, and oak-riparian associations. Nests are constructed in natural tree cavities, in woodpecker holes or bird boxes approximately 1 to 11 meters above ground.	Year Round	**High.** The oak woodland and riparian habitat provide suitable foraging and nesting habitat for this species.
Purple martin *Progne subis*	--; CSC; --; --	Nests in wide variety of open and partly open habitats that are often near water or around towns. Nests in tree cavities, abandoned woodpecker holes, crevices in rocks, and sometimes in bird houses or gourds put up by humans.	Summer (breeding)	**High**. The Study Area provides suitable nesting and foraging habitat for this species within the annual grassland, riparian and oak woodland habitat. There is one CNDDB occurrence documented within five miles of the Study Area (CDFW 2020).
Short-billed dowitcher *Limnodromus griseus*	BCC; --; --; --	Found in small lakes, and in manmade environments such as impoundments, sewage ponds, and flooded farm fields as well as in muddy margins of rivers, lakes, and bays. Migrants also rest on rocky and sandy shorelines and occasionally feed in such places, but they forage mostly where there is a fine muddy bottom covered by a few inches of water.	Year Round	**None.** The Study Area does not provide habitat for this species.
Song sparrow ("Modesto" population) *Melospiza melodia*	--; CSC; --; --	Found in thickets, brush, marshes, roadsides, gardens. Habitat varies over its wide range. In most areas, found in brushy fields, stream sides, shrubby marsh edges, woodland edges, hedgerows, well-vegetated gardens. Some coastal populations live in salt marshes. Nests in dense streamside brush in southwestern deserts, and in any kind of dense low cover on Aleutian Islands, Alaska.	Year – round	**High**. The Study Area provides suitable nesting and foraging habitat for this species within the annual grassland, riparian and oak woodland habitat.
White-tailed kite *Elanus leucurus*	--; CFP; --; -- (nesting)	Inhabits savanna, open woodlands, marshes, desert grassland, partially cleared lands and cultivated fields. Nests in trees, often near a marsh in savanna, open woodland, partially cleared lands, and cultivated fields. Foraging occurs within ungrazed or lightly grazed fields and pastures.	Year – round	**Present.** This species was observed in the riparian habitat and foraging in the annual grassland during the 2020 site assessment. The Study Area provides suitable foraging habitat within the annual grassland and nesting habitat for this species within the existing trees located in the oak woodland and riparian habitat. There are eight CNDDB occurrence for this species within five miles of the Study Area (CDFW 2020).
Yellow-billed magpie *Pica nuttalli*	BCC; --; --; --	Found in open oak woodland and oak savannas. Forages and nests in agricultural areas and pastures that feature tall trees (average 47 feet) in large tress often in clumps of mistletoe.	Year Round	**High.** The Study Area provides suitable foraging and nesting habitat for this species within the annual grassland, oak woodland, and riparian habitats.
Mammals				
Pallid bat *Antrozous pallidus*	--; CSC; --; --	Found in grasslands, shrublands, woodlands, and forests from sea level up through mixed conifer forest habitats. Roosts in colonies usually in rock crevices, caves, mines, hollow trees, and buildings.	March – October	**Low.** The Study Area provides suitable roosting habitat for this species within the mixed oak woodland however, the Study Areas lacks caves or mines that this species often utilizes.

Table 2 includes state and federal species of concern and Rank 1 and 2 CNPS species.

Table 3 — Other Species of Interest

Special-Status Species	Regulatory Status	Habitat Requirements	Identification/ Survey Period	Potential for Occurrence
Plants				
Adobe navarretia *Navarretia nigelliformis*	--; --; --; 4.2	Annual herb found on clay and sometimes serpentinite soils in foothill grasslands and sometimes in vernal pools from 100 to 1,000 meters.	Blooming period: April-June	**None.** Although the Study Area contains vernal pools, the Study Area is outside the known elevation range of this species.
Parry's rough tarplant *Centromadia parryi ssp.* rudis	--; --; --; 4.2	Annual herb found in alkaline soil, in vernally mesic, seeps, sometimes roadsides, in valley and foothill grasslands, vernal pools, from 0 to 100 meters.	Blooming period: May – October	**None.** The Study Area does not contain suitable habitat (i.e., alkaline soil) to support this species.
Stinkbells *Fritillaria agrestis*	--; --; --; 4.2	Perennial bulbiferous herb found in clay soils, sometimes in serpentinite, chaparral, cismontane woodland, pinyon and juniper woodland, and valley and foothill grassland from 10 to 1,555 meters.	Blooming period: March – June	**High.** The Study Area provides suitable habitat for this species within the annual grassland. There is one CNDDB record for this species within five miles of the Study Area (CDFW 2020).
Valley brodiaea *Brodiaea rosea* ssp. *vallicola*	--; --; --; 4.2	Perennial bulbiferous herb found in old alluvial terraces on silty, sandy, or gravelly loam soils within swales of valley and foothill grassland and vernal pools.	Blooming period: April – May (June)	**High**. The Study Area provides suitable habitat for this species within the annual grassland and vernal pool habitats located throughout the Study Area. Although there are no CNDDB records within 5 miles of the Study Areas, there are two occurrences within 15 miles to the north and west of the Study Area.
Invertebrates				
Antioch Dunes anthicid beetle *Anthicus antiochensis*	--; CSA; --; --	Found in interior sand dunes and sandbars that are either bare or contain little vegetation cover. Feeds on dead insects. Actively scavenges at night, burrowing into the sand and remaining inactive during the day. Adults overwinter, emerge in the spring to lay eggs from which the larvae hatch, and the next generation of adults emerges in early summer. Adults are most commonly collected in June and July (Davis 1991).	Spring-Summer	**None.** The Study Area does not contain suitable habitat (i.e., sand dunes) to support this species.
An andrenid bee *Andrena subapasta*	--; CSA; --; --	Found in grassland habitats within El Dorado, Placer, Sacramento, and San Joaquin counties. Ground nesters that will be underground from summer, fall and winter and emerge in early spring to forage and pollinate early bloomers, such as willows, maples, violets and other early blooming wildflowers.	Spring – Fall	**High**. The Study Area provides suitable habitat for this species within the ruderal habitat. There is one CNDDB record for this species within five miles of the Study Area (CDFW 2019).
Sacramento Valley tiger beetle *Cicindela hirticollis abrupta*	--; CSA; --; --	Typically found near aquatic environments. Their burrows are located in moist soils that are far enough away from water bodies to avoid being inundated with water. Most frequently found on the sandy shorelines of rivers, lakes, and oceans. (Pearson et al., 2006; Schlesinger and Novak 2011)	Spring-Fall	**None.** The Study Area does not contain suitable habitat (i.e., sandy shorelines of rivers, lakes, and oceans) to support this species.
Sacramento anthicid beetle *Anthicus sacramento*	--; CSA; --; -- (S1)	Found in loose sands along the Sacramento and San Joaquin rivers, from Shasta to San Joaquin counties, and at one site along the Feather River at Nicolaus. Adults overwinter, emerge in the spring to lay eggs from which the larvae hatch, and the next generation of adults emerge in early summer. The collection of larvae in the fall indicates a second generation may be produced. Adults are most commonly collected in June, July, and August (Davis 1991).	Year-Round	**None.** The Study Area does not contain suitable habitat (i.e., rivers) to support this species.
Ricksecker's water scavenger beetle *Hydrochara rickseckeri*	--; CSA; --; --	An endemic aquatic beetle known to occur in vernal pools that are inundated in winter and spring and dry during the summer months. Ideal habitat includes, neutral to slightly alkaline, clear, low dissolved salts, dominated with vernal pool plant species, and complex of vernal pool crustacean species. Known to occur in the Central Valley below 300 meters in elevation.	Year – round	**Low**. The Study Area provides suitable habitat for this species within the vernal pool habitats located throughout the Study Area. Although there are no CNDDB records within 5 miles of the Study Areas, the species is known to occur in the Central Valley below 300 meters in elevation.

Table 3 includes Rank 3 and 4 CNPS species and non-listed invertebrates, which may not be subject to CEQA review.

REFERENCES:

GANDA. 1998. Cirby-Linda-Dry Creek Flood Control Project - Biological Assessment for Chinook Salmon and Steelhead Trout. Prepared for the City of Roseville, Community Development Department and Dames & Moore. 37 pp., plus 187 5/20/2005 appendices.

Appendix B

Plant and Wildlife Species Observed

This page intentionally left blank

Appendix B
Plant Species Observed

Family	Scientific Name	Common Name	Native (N), Non-native (NN), Invasive (I)
Dicots			
Anacardaceae	*Toxicodendron diversilobum*	poison oak	N
Apiaceae	*Sanicula bipinnatifida*	purple sanicle	N
Araceae	*Lemna sp.*	duckweed	N
Araceae	*Baccharis pilularis*	Coyote brush	N
Boraginaceae	*Amsinckia intermedia*	fiddleneck	N
Asteraceae	*Centaurea solstitialis*	yellow star thistle	NN, I
Asteraceae	*Dittrichia graveolens*	stinkwort	NN, I
Asteraceae	*Hypochaeris glabra*	smooth cat's ear	NN, I
Asteraceae	*Lactuca serriola*	prickly lettuce	NN
Asteraceae	*Layia fremontii*	Fremont layia	N
Asteraceae	*Leontodon saxatilis ssp. longirostris*	hawkbit	NN
Asteraceae	*Psilocarphus brevissimus*	woolly marbles	N
Asteraceae	*Silybum marianum*	blessed milkthistle	NN, I
Asteraceae	*Sonchus oleraceus*	sow thistle	NN
Asteraceae	*Xanthium strumarium*	rough cockleburr	N
Brassicaceae	*Brassica nigra*	black mustard	NN, I
Convolvulaceae	*Convolvulus arvensis*	field bindweed	NN
Euphorbiaceae	*Croton setiger*	turkey-mullein	N
Euphorbiaceae	*Triadica sebifera*	Chinese tallowtree	NN, I
Fabaceae	*Trifolium hirtum*	rose clover	NN, I
Fabaceae	*Trifolium sp.*	clover	~
Fabaceae	*Vicia sp.*	vetch	~
Fabaceae	*Vicia villosa*	hairy vetch	NN
Fagaceae	*Quercus douglasii*	blue oak	N
Fagaceae	*Quercus lobata*	valley oak	N
Fagaceae	*Quercus wislizeni var. wislizeni*	interior live oak	N
Geraniaceae	*Erodium botrys*	big heron bill	NN
Geraniaceae	*Geranium dissectum*	wild geranium	NN, I
Geraniaceae	*Geranium molle*	crane's bill geranium	NN
Myrsinaceae	*Lysmachia arvensis*	scarlet pimpernel	NN
Papaveraceae	*Eschscholzia californica*	California poppy	N
Plantaginaceae	*Plantago lanceolata*	English plantain	NN, I
Polemoniaceae	*Navarretia leucocephala*	white headed navarretia	N
Polygonaceae	*Persicaria sp.*	smartweed	(N)
Polygonaceae	*Polygonum aviculare ssp. depressum*	prostrate knotweed	NN
Polygonaceae	*Polypogon monspeliensis*	rabbitsfoot grass	NN, I
Polygonaceae	*Rumex crispus*	curly dock	NN, I
Polygonaceae	*Rumex pulcher*	fiddle dock	NN
Rosaaceae	*Rubus armeniacus*	Himalayan blackberry	NN, I
Rosaceae	*Rosa sp.*	rose	NN
Salicaceae	*Populus fremontii ssp. fremontii*	Fremont cottonwood	N

Appendix B (cont.)
Plant Species Observed

Family	Scientific Name	Common Name	Native (N), Non-native (NN), Invasive (I)
Salicaceae	*Salix sp.*	willow	~
Typhaceae	*Typha sp.*	cattail	N
Verbenaceae	*Phyla nodiflora*	lippia	N
Viscaceae	*Phoradendron leucarpum ssp. macrophyllum*	mistletoe	N
Vitaceae	*Vitis californica*	California grape	N
Monocots			
Cyperaceae	*Cyperus eragrostis*	tall cyperus	N
Cyperaceae	*Eleocharis acicularis*	needle spike rush	N
Cyperaceae	*Eleocharis macrostachya*	spikerush	N
Juncaceae	*Juncus bufonius*	common toad rush	N
Juncaceae	*Juncus sp.*	rush	N
Poaceae	*Alopecurus saccatus*	Pacific foxtail	N
Poaceae	*Avena barbata*	slender oat	NN, I
Poaceae	*Brachypodium distachyon*	false brome	NN, I
Poaceae	*Briza minor*	little quaking grass	N
Poaceae	*Bromus diandrus*	ripgut grass	NN, I
Poaceae	*Bromus hordeaceus*	soft chess	NN, I
Poaceae	*Cynosurus echinatus*	annual dogtail grass	NN, I
Poaceae	*Elymus caput-medusae*	medusa head	NN, I
Poaceae	*Elymus cf. ponticus*	tall wheat grass	NN
Poaceae	*Festuca bromoides*	brome fescue	NN
Poaceae	*Festuca perennis*	rye grass	NN, I
Poaceae	*Hordeum marinum*	seaside barley	NN
Poaceae	*Hordeum murinum*	foxtail barley	NN, I
Poaceae	*Muhlenbergia rigens*	deergrass	N
Themidaceae	*Dichelostema capitatum*	blue dicks	N
Themidaceae	*Triteleia hyacinthina*	white brodiaea	N

Appendix B (cont.)
Wildlife Species Observed

Order	Family	Scientific Name	Common Name
Piciformes	Picidae	*Melanerpes formicivorus*	Acorn woodpecker
Passeriformes	Corvidae	*Corvus brachyrhynchos*	American crow
Passeriformes	Turdidae	*Turdus migratorius*	American robin
Apodiformes	Trochilidae	*Calypte anna*	Anna's hummingbird
Coraciiformes	Alcedinidae	*Megaceryle alcyon*	Belted kingfisher
Passeriformes	Tyrannidae	*Sayornis nigricans*	Black phoebe
Charadriiformes	Recurvirostridae	*Himantopus mexicanus*	Black-necked stilt
Lagomorpha	Leporidae	*Lepus californicus*	Black-tailed jackrabbit
Artiodactyla	Cervidae	*Odocoileus hemionus*	Black-tailed mule deer
Passeriformes	Icteridae	*Euphagus cyanocephalus*	Brewer's blackbird
Rodentia	Sciuridae	*Otospermophilus beecheyi*	California ground squirrel
Galliformes	Odontophoridae	*Callipepla californica*	California quail
Passeriformes	Corvidae	*Aphelocoma californica*	California scrub-jay
Passeriformes	Passerellidae	*Melozone crissalis*	California towhee
Anseriformes	Anatidae	*Branta canadensis*	Canada goose
Passeriformes	Corvidae	*Corvus corax*	Common raven
Passeriformes	Passerellidae	*Junco hyemalis*	Dark-eyed Junco
Lagomorpha	Leporidae	*Sylvilagus audubonii*	Desert cottontail
Carnivora	Felidae	*Felis catus*	Domestic cat
Carnivora	Canidae	*Canis lupus familiaris*	Domestic dog
Passeriformes	Sturnidae	*Sturnella vulgaris*	European starling
Squamata	Colubridae	*Thamnophis sp.*	Garter snake
Pelecaniformes	Ardeidae	*Ardea alba*	Great egret
Strigiformes	Strigidae	*Bubo virginianus*	Great horned owl
Passeriformes	Fringillidae	*Haemorhous mexicanus*	House finch
Passeriformes	Passeridae	*Passer domesticus*	House sparrow
Passeriformes	Troglodytidae	*Troglodytes aedon*	House wren
Charadriiformes	Charadriidae	*Charadrius vociferus*	Killdeer
Anseriformes	Anatidae	*Anas platrhynchos*	Mallard
Columbiformes	Columbidae	*Zenaida macroura*	Mourning dove
Piciformes	Picidae	*Colaptes auratus*	Northern flicker
Passeriformes	Mimidae	*Mimus polyglottos*	Northern mockingbird
Accipititriformes	Accipitridae	*Buteo lineatus*	Red-shouldered hawk
Accipititriformes	Accipitridae	*Buteo jamaicensis*	Red-tailed hawk
Passeriformes	Icteridae	*Agelaius phoeniceus*	Red-winged blackbird
Galliformes	Phasianidae	*Phasianus colchicus*	Ring-necked pheasant
Columbiformes	Columbidae	*Columba livia*	Rock pigeon
Anura	Hylidae	*Hyliola sierra (formerly Pseudacris sierra)*	Sierran tree frog
Accipititriformes	Cathartidae	*Cathartes aura*	Turkey vulture
Squamata	Phrynosomatidae	*Sceloporus occidentalis*	Western fence lizard
Rodentia	Sciuridae	*Sciurus griseus*	Western gray squirrel
Passeriformes	Icteridae	*Sturnella neglecta*	Western meadowlark
Galliformes	Phasianidae	*Meleagris gallopavo*	Wild turkey

This page intentionally left blank

Appendix C

Representative Site Photos

This page intentionally left blank



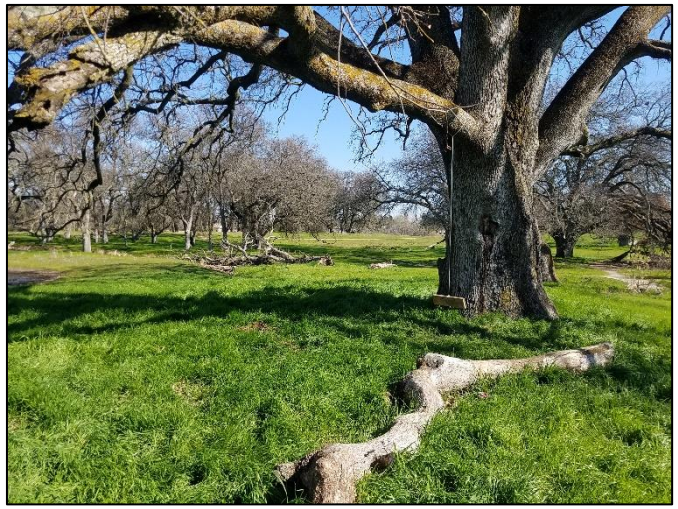
Dirt path within the annual grassland in the western portion of the Study Area.



Garter snake observed along the fringe of a vernal pool.



Overview of an annual grassland, wetland, and adjacent oak woodland west of Kaseberg Creek.



Tree swing on a mature oak within the oak woodland habitat.



Conspan along Pleasant Grove Boulevard.



Seasonal wetland and oak woodland within the central portion of the Study Area.



Active great horned owl nest in oak.



Egret observed in the riparian and creek habitat.

Appendix D

Tree Survey Data

This page intentionally left blank

Appendix D
Tree Survey Data

Tree Number	Tree Species	No. of Trunks	DBH (inches)	DLR (feet)	Height (feet)	Health	Structure	Vigor	Notes
1201	Blue Oak	1	14	40	27	Fair	Poor-Fair	Poor-Fair	lean, asymmetrical canopy, burls, trunk rot, epicormic growth
1202	Blue Oak	1	24	37	30	Poor	Poor	Poor	nails in trunk, wood plank, trunk scar, trunk rot, leader death, epicormic growth , limb rot
1203	Blue Oak	1	30	17	27	Poor	Poor-Fair	Poor	trunk rot, trunk split, asymmetrical canopy, lean, included bark, trunk scar, limb rot
1204	Blue Oak	2	27,59	45	42	Poor	Poor-Fair	Poor-Fair	trunk rot, included bark, limb failure, limb rot
1205	Blue Oak	3	12,20,16	15	30	Fair	Fair	Fair	included bark, multiple trunks, burls, epicormic growth
1206	Blue Oak	2	24,24	35	55	Fair	Fair	Fair	active owl nest, included bark, lean, limb rot, bark damage
1207	Blue Oak	1	52	30	47	Fair	Poor-Fair	Fair	limb failure, included bark, limb rot, bark damage, sapsucker damage
1208	Blue Oak	1	25	20	42	Poor-Fair	Poor-Fair	Poor-Fair	trunk rot, nest cavity, included bark, limb rot, lean, asymmetrical canopy
1209	Interior Live Oak	3	4,6,9	15	22	Fair	Fair	Fair	included bark, dieback
1210	Blue Oak	1	19	22	30	Fair	Poor-Fair	Poor-Fair	lean, included bark, asymmetrical canopy, limb rot
1211	Blue Oak	1	23	25	35	Poor-Fair	Poor	Poor	trunk rot, trunk cavity, hollow trunk, lean, included bark, asymmetrical canopy
1212	Blue Oak	1	27	25	40	Fair	Fair	Fair	included bark, epicormic growth, lean, asymmetrical canopy, wire embedded in the trunk, limb rot
1213	Blue Oak	1	30	22	30	Poor	Poor	Poor	trunk rot, trunk cavity, leader death, burls, included bark, woodpecker damage
1214	Blue Oak	1	9	17	20	Fair	Fair	Fair	included bark, burls
1215	Blue Oak	1	15	17	45	Fair	Fair	Fair	included bark, trunk scar
1216	Blue Oak	1	33	32	42	Poor-Fair	Fair	Poor-Fair	included bark, exfoliating bark , trunk rot, limb rot, lean, bark damage
1217	Blue Oak	1	35	30	37	Poor-Fair	Fair	Fair	included bark, limb rot, trunk rot, nest cavity
1218	Blue Oak	1	19	27	42	Poor-Fair	Fair	Fair	included bark, lean, limb rot, trunk rot, epicormic growth, asymmetrical canopy
1219	Blue Oak	1	13	25	27	Fair	Poor-Fair	Fair	epicormic growth, asymmetrical canopy, trunk scar
1220	Blue Oak	1	25	27	45	Fair	Poor-Fair	Fair	exposed roots, included bark, lean, asymmetrical canopy, burls, limb rot
1221	Blue Oak	1	18	8	25	Poor	Poor	Poor	almost dead
1222	Interior Live Oak	1	10	15	20	Poor-Fair	Fair	Fair	trunk rot, included bark, fungus, epicormic growth, slight lean
1223	Interior Live Oak	2	5,2	8	10	Poor-Fair	Fair	Poor-Fair	trunk rot, lean, dieback, included bark, trunk scar
1224	Blue Oak	1	7	8	17	Fair	Fair	Fair	included bark, bark damage
1225	Blue Oak	3	7,2,2	8	15	Poor-Fair	Poor	Poor	dead tree on trunk, included bark, trunk scar, bark damage, lean
1226	Interior Live Oak	3	5,3,2	8	12	Fair	Fair	Fair	multiple trunks, included bark, bark damage
1227	Interior Live Oak	5	3,4,3,2,2	10	12	Fair	Fair	Fair	pruning cuts, multiple trunk at base, included bark, dieback
1228	Blue Oak	1	39	40	35	Poor-Fair	Poor-Fair	Poor-Fair	trunk rot, trunk death, included bark, limb rot, nest cavities, lean, asymmetrical canopy
1229	Interior Live Oak	2	4,4	10	17	Fair	Fair	Fair	included bark, dieback, dead tree at base, bark damage
1230	Interior Live Oak	4	4,3,2,1	6	10	Fair	Fair	Fair	multiple trunk at base, included bark, dead limb on trunk, bark damage
1231	Blue Oak	1	8	12	17	Fair	Fair	Fair	lean, included bark
1232	Interior Live Oak	1	13	15	22	Fair	Fair	Fair	included bark, dieback, lean
1233	Interior Live Oak	7	9,5,6,3,1,6,9	17	20	Fair	Fair	Fair	multiple trunks, included bark, dieback, bark damage
1234	Blue Oak	1	51	35	65	Fair	Fair	Fair	weighted limbs, nest cavity, burls, included bark, wood plank, bark damage, limb rot
1235	Blue Oak	1	56	40	62	Poor-Fair	Fair	Poor-Fair	trunck cavity, trunk wound, trunk rot, included bark, weighted limbs, burrows at the base of the trunk, rope swing, limb rot

Appendix D
Tree Survey Data

Tree Number	Tree Species	No. of Trunks	DBH (inches)	DLR (feet)	Height (feet)	Health	Structure	Vigor	Notes
1236	Blue Oak	1	33	37	40	Fair	Fair	Fair	wire embedded in the trunk, lean, included bark, burls, limb rot
1237	Blue Oak	1	30	37	50	Fair	Fair	Fair	included bark, asymmetrical canopy, burls, limb rot
1238	Interior Live Oak	1	10	12	25	Fair	Fair	Fair	lean, included bark, dieback
1239	Blue Oak	1	22	15	27	Poor-Fair	Poor-Fair	Poor-Fair	trunck cavity, trunk rot, trunk death, woodpecker damage, included bark, lean
1240	Interior Live Oak	2	6,9	12	22	Fair	Fair	Fair	included bark, slight lean, dieback
1241	Interior Live Oak	2	6,6	12	15	Fair	Fair	Fair	included bark, dieback, codominant trunks
1242	Blue Oak	1	7	10	15	Fair	Fair	Fair	included bark
1243	Interior Live Oak	3	6,4,4	3	15	Fair	Fair	Fair	bark damage, multiple trunk, included bark, sapsucker damage
1244	Blue Oak	3	5,4,2	6	15	Fair	Fair	Fair	multiple trunks, included bark
1245	Interior Live Oak	3	6,4,2	10	12	Fair	Fair	Fair	multiple trunks, included bark, bark damage, dieback
1246	Blue Oak	3	4,6,5	10	20	Fair	Fair	Fair	fused trunks, included bark, multiple trunk
1247	Blue Oak	3	4,3,3	6	10	Fair	Fair	Fair	included bark, multiple trunk
1248	Blue Oak	1	4,2	8	12	Fair	Fair	Fair	codominant trunks, included bark, slight lean
1249	Blue Oak	3	6,4,3	10	22	Fair	Fair	Fair	multiple trunks, fused trunks, included bark
1250	Blue Oak	1	8	12	25	Fair	Fair	Fair	included bark, epicormic growth
1251	Blue Oak	2	6,4	8	17	Fair	Fair	Fair	included bark, codominant trunks, epicormic growth
1252	Valley Oak	2	11,6	15	30	Fair	Fair	Fair	codominant trunks, included bark, epicormic growth, slight lean
1253	Blue Oak	1	6	10	20	Fair	Fair	Fair	slight lean, included bark
1254	Blue Oak	2	5,4	12	20	Fair	Fair	Fair	included bark, slight lean
1255	Interior Live Oak	1	7	12	17	Fair	Fair	Fair	slight lean, included bark, dieback, bark damage
1256	Interior Live Oak	5	4,2,1,2,1	8	10	Fair	Poor-Fair	Fair	multiple trunk at base, included bark, dieback
1257	Blue Oak	1	8	12	22	Fair	Fair	Fair	included bark
1258	Blue Oak	4	4,3,2,2	6	12	Poor-Fair	Poor-Fair	Poor-Fair	bark damage, included bark, multiple trunks, epicormic growth
1300	Blue Oak	2	11,10	17	25	Fair	Fair	Fair	slight lean, asymmetrical canopy, included bark, epicormic growth
1301	Blue Oak	1	36	30	37	Poor-Fair	Poor-Fair	Poor-Fair	lean, limb rot, included bark, asymmetrical canopy, trunk rot, burls
1302	Blue Oak	1	33	27	37	Poor-Fair	Poor-Fair	Poor-Fair	lean, included bark, burls, trunk rot, burrow at the base of the trunk, epicormic growth
1303	Blue Oak	1	39	22	37	Poor-Fair	Poor	Poor-Fair	trunk rot, trunk fail, included bark, wood planks, lean
1304	Blue Oak	1	49	27	35	Poor-Fair	Poor	Poor-Fair	burrow at the base of the trunk, included bark, trunk rot, hollow trunk, lean, trunk cavity, asymmetrical canopy
1305	Blue Oak	1	8	8	15	Fair	Fair	Fair	included bark, bark damage
1306	Blue Oak	1	16	17	25	Fair	Poor-Fair	Fair	asymmetrical canopy, trunk rot, slight lean, included bark, burls
1307	Blue Oak	1	19	22	40	Fair	Poor-Fair	Fair	burls, lean, included bark, limb rot, asymmetrical canopy, burrow at the base of the trunk
1308	Blue Oak	1	12	12	25	Fair	Fair	Fair	burls, included bark, limb rot
1309	Blue Oak	1	12	35	27	Fair	Poor-Fair	Poor-Fair	severe lean, included bark, limb rot
1310	Blue Oak	1	20	27	42	Fair	Fair	Fair	asymmetrical canopy, included bark
1311	Blue Oak	2	11,17	30	47	Fair	Poor-Fair	Fair	codominant trunks, included bark, lean
1312	Blue Oak	1	21	22	50	Fair	Fair	Fair	limb rot, included bark

Appendix D
Tree Survey Data

Tree Number	Tree Species	No. of Trunks	DBH (inches)	DLR (feet)	Height (feet)	Health	Structure	Vigor	Notes
1313	Blue Oak	1	15	17	40	Fair	Fair	Fair	included bark, slight lean, limb rot
1314	Blue Oak	1	17	17	35	Fair	Poor-Fair	Fair	lean, asymmetrical canopy, included bark, burls
1315	Blue Oak	1	13	8	25	Poor	Poor	Poor	trunk failure, trunk rot, hollow trunk, burls, lean, woodpecker damage
1316	Blue Oak	1	27	35	42	Fair	Fair	Fair	included bark, lean, asymmetrical canopy
1317	Blue Oak	1	11	15	20	Fair	Poor-Fair	Fair	asymmetrical canopy, lean, epicormic growth, included bark
1318	Blue Oak	1	11	12	30	Fair	Fair	Fair	included bark, epicormic growth
1319	Blue Oak	1	21	35	47	Fair	Fair	Fair	included bark, slight lean, burls
1320	Blue Oak	1	9	4	25	Poor	Poor	Poor	trunk rot, leader death, epicormic growth
1321	Blue Oak	1	15	20	47	Fair	Fair	Fair	included bark, slight lean
1322	Blue Oak	1	17	30	37	Poor-Fair	Poor-Fair	Poor-Fair	trunk rot, included bark, epicormic growth, lean, trunk death, woodpecker damage, asymmetrical canopy
1323	Blue Oak	2	15,13	30	37	Fair	Fair	Fair	codominant trunks, included bark, limb rot
1324	Blue Oak	1	28	22	50	Fair	Fair	Fair	limb rot, limb death, included bark
1325	Blue Oak	1	27	25	52	Poor-Fair	Fair	Fair	included bark, slight lean, limb death, limb rot, nest cavity
1326	Blue Oak	1	27	35	42	Fair	Poor-Fair	Fair	included bark, lean, limb rot, asymmetrical canopy
1327	Blue Oak	1	11	15	27	Fair	Poor-Fair	Poor-Fair	limb rot, lean, asymmetrical canopy, included bark
1328	Blue Oak	1	8	17	22	Fair	Poor-Fair	Fair	lean, asymmetrical canopy, limb rot, burls
1329	Blue Oak	1	7	12	20	Poor-Fair	Poor	Poor-Fair	trunk rot, woodpecker damage, trunk scar, trunk cavity, lean, epicormic growth
1330	Blue Oak	1	26	30	47	Fair	Fair	Fair	included bark
1331	Blue Oak	1	23	27	40	Fair	Poor-Fair	Poor-Fair	lean, asymmetrical canopy, included bark, limb rot, burls, trunk cavity
1332	Blue Oak	2	23,18	25	45	Fair	Fair	Fair	asymmetrical canopy, slight lean, included bark
1333	Blue Oak	1	28	20	47	Fair	Fair	Fair	burrow at the base of the trunk, included bark, burls, limb rot
1334	Blue Oak	1	27	20	45	Poor-Fair	Fair	Poor-Fair	included bark, limb rot, trunk rot, trunk cavity, burls
1335	Blue Oak	1	15	25	35	Fair	Poor-Fair	Poor-Fair	limb rot, asymmetrical canopy, lean, included bark
1336	Blue Oak	2	10,11	15	30	Poor	Poor	Poor	almost dead
1337	Blue Oak	1	18	27	47	Fair	Fair	Fair	asymmetrical canopy, included bark, lean
1338	Blue Oak	2	19,8	15	25	Poor-Fair	Poor-Fair	Poor-Fair	trunk rot, trunk death, included bark, woodpecker damage ,epicormic growth, lean, asymmetrical canopy
1339	Blue Oak	1	14	22	45	Fair	Fair	Fair	asymmetrical canopy, slight lean, included bark
1340	Blue Oak	2	10,11	22	30	Fair	Poor-Fair	Fair	included bark, lean, burls, epicormic growth
1341	Blue Oak	2	15,11	27	35	Fair	Poor-Fair	Fair	included bark, lean, asymmetrical canopy
1342	Blue Oak	3	12,10,14	22	30	Fair	Fair	Fair	limb rot, included bark
1343	Blue Oak	1	16	15	50	Poor-Fair	Fair	Fair	limb rot, included bark
1344	Blue Oak	1	13	20	50	Poor-Fair	Poor-Fair	Poor-Fair	trunk rot, trunk cavity, epicormic growth, limb death
1345	Blue Oak	1	18	27	30	Poor-Fair	Poor-Fair	Poor-Fair	limb rot, trunk rot, lean, included bark
1346	Blue Oak	1	18	30	50	Fair	Fair	Fair	included bark, bark damage
1347	Blue Oak	1	13	32	37	Poor-Fair	Poor	Poor-Fair	asymmetrical canopy, lean, trunk rot, limb rot, trunk cavity, included bark
1348	Blue Oak	1	17	22	47	Fair	Fair	Fair	asymmetrical canopy, included bark, slight lean, limb rot

Appendix D
Tree Survey Data

Tree Number	Tree Species	No. of Trunks	DBH (inches)	DLR (feet)	Height (feet)	Health	Structure	Vigor	Notes
1349	Blue Oak	1	30	32	47	Fair	Fair	Fair	limb rot, included bark
1350	Blue Oak	1	23	27	42	Fair	Fair	Fair	included bark, limb rot
1351	Blue Oak	1	17	15	37	Poor-Fair	Fair	Fair	trunk cavity, limb rot, included bark, trunk rot
1352	Blue Oak	1	19	22	45	Fair	Fair	Fair	included bark, pruning cuts, burls, bark damage
1353	Blue Oak	2	17,25	30	45	Fair	Poor-Fair	Fair	epicormic growth, included bark, lean, limb rot
1354	Blue Oak	1	27	27	47	Poor-Fair	Poor-Fair	Poor-Fair	asymmetrical canopy, lean, trunk rot, included bark, bark damage, trunk scar
1355	Blue Oak	1	33	22	42	Fair	Fair	Fair	basal cavity , included bark, slight lean, asymmetrical canopy
1356	Blue Oak	2	11,18	15	25	Poor-Fair	Poor-Fair	Poor-Fair	trunk rot, trunck cavity, included bark, lean, asymmetrical canopy, burls
1357	Blue Oak	1	21	22	47	Poor-Fair	Fair	Fair	epicormic growth, limb rot, included bark, nest cavity
1358	Blue Oak	1	22	25	30	Poor	Poor-Fair	Poor	burls, trunk rot, included bark, limb death, limb rot
1359	Blue Oak	1	31	20	50	Fair	Fair	Fair	exposed roots, included bark
1360	Blue Oak	1	22	30	50	Poor-Fair	Poor-Fair	Poor-Fair	trunk rot, exposed roots, limb rot, included bark, slight lean
1361	Blue Oak	1	26	25	55	Poor-Fair	Fair	Poor-Fair	trunk rot, trunk death, included bark, limb rot, epicormic growth
1362	Blue Oak	2	13,15	30	37	Poor-Fair	Fair	Fair	included bark, burls, limb rot, limb death, epicormic growth
1363	Blue Oak	2	13,18	22	55	Poor-Fair	Poor-Fair	Poor-Fair	trunk rot, included bark, limb rot, limb death, lean, asymmetrical canopy
1364	Blue Oak	1	9	12	15	Poor-Fair	Poor-Fair	Poor-Fair	trunk rot, trunk cavity, lean, included bark
1365	Blue Oak	1	15	25	50	Poor-Fair	Poor-Fair	Poor-Fair	exposed roots, included bark, lean, burls, limb rot
1366	Blue Oak	1	24	30	55	Fair	Fair	Fair	limb rot, included bark, lean
1367	Blue Oak	2	23,22	40	47	Poor-Fair	Poor-Fair	Poor-Fair	included bark, lean, trunk rot, limb rot
1368	Blue Oak	2	12,16	20	40	Poor-Fair	Poor-Fair	Poor-Fair	included bark, burls, epicormic growth, limb rot
1369	Blue Oak	1	9	8	27	Fair	Poor-Fair	Poor-Fair	growing into another tree, included bark, limb rot, epicormic growth, burls
1370	Blue Oak	2	20,12	20	55	Poor-Fair	Poor-Fair	Poor-Fair	trunk rot, trunk death, included bark, limb rot, epicormic growth
1371	Blue Oak	1	21	25	55	Poor	Poor	Poor	almost dead
1372	Blue Oak	1	14	35	45	Fair	Poor-Fair	Fair	epicormic growth, slight lean
1373	Blue Oak	1	19	30	50	Fair	Fair	Fair	included bark, lean
1374	Blue Oak	2	12,23	25	42	Poor-Fair	Poor-Fair	Poor-Fair	epicormic growth, included bark, codominant trunks, limb rot, asymmetrical canopy, lean, trunk rot, trunk cavity
1375	Blue Oak	1	16	27	35	Fair	Poor-Fair	Fair	asymmetrical canopy, lean, epicormic growth
1376	Blue Oak	2	22,11	30	25	Poor-Fair	Poor-Fair	Poor-Fair	trunk death, trunk rot, woodpecker damage, included bark, lean, asymmetrical canopy, limb rot
1377	Blue Oak	1	6	10	15	Fair	Fair	Fair	included bark
1378	Blue Oak	2	5,1	8	15	Fair	Fair	Fair	included bark, codominant trunks
1379	Blue Oak	4	4,4,4,5	10	17	Fair	Fair	Fair	included bark, multiple trunk
1380	Interior Live Oak	7	6,6,7,7,8,2,9	12	20	Fair	Fair	Fair	included bark, exposed roots
1381	Blue Oak	2	5,3	10	15	Fair	Fair	Fair	included bark, slight lean
1382	Blue Oak	1	7	8	17	Fair	Fair	Fair	included bark, epicormic growth
1383	Blue Oak	4	2,2,2,2	6	12	Fair	Fair	Fair	included bark, multiple trunk
1384	Blue Oak	4	5,5,2,1	8	12	Fair	Fair	Fair	included bark, epicormic growth

Appendix D
Tree Survey Data

Tree Number	Tree Species	No. of Trunks	DBH (inches)	DLR (feet)	Height (feet)	Health	Structure	Vigor	Notes
1385	Blue Oak	3	6,3,3	8	10	Fair	Fair	Fair	slight lean, included bark
1386	Blue Oak	4	3,4,3,2	5	12	Fair	Fair	Fair	multiple trunk, included bark
1387	Blue Oak	3	2,4,6	8	12	Fair	Fair	Fair	included bark, slight lean, multiple trunk
1388	Blue Oak	2	4,3	8	15	Fair	Fair	Fair	codominant trunks, included bark, epicormic growth
1389	Blue Oak	7	4,3,2,1,2,1,1	8	10	Fair	Poor-Fair	Fair	burrow at the base of the trunk, included bark, lean, asymmetrical canopy, epicormic growth, multiple trunk
1390	Interior Live Oak	7	4,4,5,3,4,11,11	15	20	Fair	Fair	Fair	riprap at base of the tree, multiple trunk, included bark
1391	Blue Oak	2	4,3	6	17	Fair	Fair	Fair	included bark, codominant trunks
1392	Blue Oak	4	4,3,1,1	8	17	Fair	Fair	Fair	multiple trunk, included bark
1393	Blue Oak	7	4,4,4,2,1,1,1	10	15	Fair	Poor-Fair	Fair	bark damage, included bark, multiple trunk, epicormic growth
1394	Blue Oak	1	33	27	37	Poor-Fair	Fair	Fair	asymmetrical canopy, included bark, limb fail, limb rot
1395	Blue Oak	1	19	30	22	Fair	Poor-Fair	Poor-Fair	sevever lean, asymmetrical canopy, epicormic growth, included bark
1396	Blue Oak	1	27	25	37	Fair	Fair	Fair	included bark, epicormic growth, limb rot, bark damage, burls
1397	Blue Oak	1	10	15	25	Fair	Poor-Fair	Poor-Fair	lean, epicormic growth, asymmetrical canopy, included bark
1398	Blue Oak	1	27	37	25	Fair	Poor-Fair	Poor-Fair	lean, asymmetrical canopy, limb rot, included bark
1399	Blue Oak	1	9	10	17	Poor	Poor-Fair	Poor-Fair	trunk rot, lean, included bark, rope on trunk
1400	Blue Oak	1	39	30	42	Fair	Poor-Fair	Fair	included bark, weighted limbs, asymmetrical canopy, burrows at the base of the trunk, limb rot
1401	Valley Oak	2	9,6	10	15	Fair	Fair	Fair	included bark, codominant trunks
1402	Valley Oak	2	4,3	4	10	Fair	Fair	Fair	included bark, codominant trunks
1403	Blue Oak	5	9,3,2,2,3	12	17	Fair	Fair	Fair	included bark, multiple trunks, asymmetrical canopy
1404	Valley Oak	2	4,6	10	22	Fair	Fair	Fair	slight lean, included bark, codominant trunks
1405	Valley Oak	1	9	10	25	Fair	Fair-Good	Fair	included bark, bark damage
1406	Blue Oak	2	3,6	8	12	Fair	Fair	Fair	included bark, codominant trunks
1407	Blue Oak	3	4,3,2	5	8	Fair	Fair	Fair	included bark, multiple trunk
1408	Blue Oak	1	7	10	15	Fair	Fair	Fair	included bark
1409	Valley Oak	2	5,2	8	20	Fair	Fair	Fair	included bark, codominant trunks
1410	Blue Oak	1	8	12	15	Fair	Fair	Fair	lean, included bark
1411	Blue Oak	3	5,4,4	6	12	Fair	Fair	Fair	included bark, codominant trunks, nest
1412	Blue Oak	1	6	8	10	Fair	Fair	Fair	included bark, slight lean
1413	Blue Oak	2	5,1	6	12	Fair	Fair	Fair	included bark, nest, epicormic growth
1414	Valley Oak	1	8	8	25	Fair	Fair	Fair	included bark
1415	Valley Oak	1	8	8	20	Fair	Fair-Good	Fair	included bark, epicormic growth
1416	Valley Oak	2	5,4	8	17	Fair	Fair	Fair	included bark, codominant trunks
1417	Blue Oak	2	5,3	8	17	Fair	Fair	Fair	included bark, codominant trunks
1418	Blue Oak	1	6	10	25	Fair	Fair	Fair	slight lean, included bark
1419	Blue Oak	3	8,3,4	12	15	Fair	Fair	Fair	included bark, codominant trunks , asymmetrical canopy, epicormic growth
1420	Blue Oak	3	2,8,3	8	10	Fair	Fair	Fair	included bark, multiple trunk

Appendix D
Tree Survey Data

Tree Number	Tree Species	No. of Trunks	DBH (inches)	DLR (feet)	Height (feet)	Health	Structure	Vigor	Notes
1421	Blue Oak	1	9	10	22	Fair	Fair	Fair	included bark, epicormic growth
1422	Blue Oak	2	6,4	8	12	Poor	Poor-Fair	Poor	included bark, fire damage, woodpecker damage, exfoliating bark, trunk rot
1423	Blue Oak	4	4,2,1,2	10	15	Poor-Fair	Fair	Fair	bark scar, included bark, multiple trunks, pruning cuts, bark damage
1424	Blue Oak	1	12	15	27	Fair	Fair	Fair	included bark
1425	Blue Oak	3	3,2,8	12	17	Fair	Fair	Fair	included bark, slight lean
1426	Blue Oak	3	4,6,2	10	20	Fair	Fair	Fair	included bark, codominant trunks, trunk scar, bark damage
1427	Blue Oak	2	5,3	6	10	Fair	Fair	Fair	lean, bark damage, included bark, codominant trunks
1428	Blue Oak	2	6,5	10	25	Fair	Fair	Fair	included bark, codominant trunks
1429	Blue Oak	3	4,2,2	6	8	Fair	Fair	Fair	included bark, multiple trunks, trunk scar
1430	Blue Oak	3	4,5,8	10	20	Fair	Fair	Fair	included bark, multiple trunks, bark damage
1431	Blue Oak	1	34	40	35	Poor-Fair	Poor	Poor-Fair	asymmetrical canopy, included bark, lean, limb failure, trunk rot, wood plank
1432	Blue Oak	1	30	30	45	Poor-Fair	Poor	Poor-Fair	trunk rot, limb failure, asymmetrical canopy, lean, limb rot
1433	Blue Oak	1	12	10	25	Fair	Poor-Fair	Fair	slight lean, asymmetrical canopy, bark damage
1434	Blue Oak	1	15	37	27	Fair	Poor-Fair	Poor-Fair	asymmetrical canopy, lean
1435	Blue Oak	1	29	30	65	Fair	Fair	Fair	included bark, limb rot
1436	Blue Oak	1	35	35	45	Poor-Fair	Poor-Fair	Poor-Fair	included bark, lean, asymmetrical canopy, limb rot, limb fail
1437	Blue Oak	2	21, 32	35	32	Poor-Fair	Poor-Fair	Poor-Fair	lean, asymmetrical canopy, included bark, codominant trunks, bark damage, limb rot, wood plank
1438	Blue Oak	1	20	22	15	Poor-Fair	Poor	Poor-Fair	lean, asymmetrical canopy, limb rot, trunk rot
1439	Blue Oak	1	33	40	57	Fair	Fair	Fair	included bark, limb rot, bark damage
1440	Blue Oak	1	39	30	42	Poor-Fair	Fair	Fair	wood plank, included bark, slight lean, limb rot
1441	Blue Oak	1	38	42	60	Poor-Fair	Poor-Fair	Poor-Fair	trunk rot, included bark, slight lean, limb rot, limb fail
1442	Blue Oak	1	49	42	65	Poor-Fair	Fair	Poor-Fair	limb failure, limb rot, included bark
1443	Blue Oak	1	47	27	42	Poor	Poor-Fair	Poor-Fair	trunk rot, included bark, limb failure, trunk rot, limb rot
1444	Blue Oak	1	29	27	50	Fair	Poor-Fair	Fair	lean, limb rot, burrow at the base of the trunk , included bark, asymmetrical canopy
1445	Blue Oak	1	38	27	35	Poor-Fair	Poor-Fair	Poor-Fair	included bark, burl, trunk rot, trunk fail, asymmetrical canopy
1446	Blue Oak	1	38	25	27	Poor-Fair	Poor	Poor-Fair	topped, power lines, weight lmb, included bark, lean
1447	Blue Oak	1	43	27	32	Fair	Fair	Fair	limb rot, included bark
1448	Blue Oak	1	34	27	30	Fair	Fair	Fair	included bark, topped, utility lines
1449	Blue Oak	1	34	30	35	Poor-Fair	Poor-Fair	Poor-Fair	nails in the trunk, included bark, topped, utility lines, burls, pruning cuts
1450	Blue Oak	1	41	25	32	Poor-Fair	Poor-Fair	Poor-Fair	limb rot, trunk rot, included bark, burls, epicormic growth, utility lines
1451	Blue Oak	1	39	30	45	Fair	Fair	Fair-Good	utility lines, included bark, weighted limbs, asymmetrical canopy
1452	Blue Oak	1	24	15	30	Fair	Fair	Fair	sapsucker damage, dieback, slight lean, included bark
1453	Blue Oak	1	18	17	25	Fair	Fair	Fair	dieback, included bark, slight lean
1454	Blue Oak	3	17,32,26	32	45	Fair	Poor-Fair	Fair	multiple trunk at base, lean, included bark, dieback, epicormic growth, trunk fail, trunk rot
1455	Blue Oak	1	18	40	20	Fair	Poor-Fair	Poor-Fair	lean, dieback, lean, asymmetrical canopy
1456	Blue Oak	1	30	50	25	Poor	Poor	Poor	partially uprooted, trunk rot, trunk death, included bark, dieback, exposed roots, lateral trunk

Appendix D
Tree Survey Data

Tree Number	Tree Species	No. of Trunks	DBH (inches)	DLR (feet)	Height (feet)	Health	Structure	Vigor	Notes
1457	Blue Oak	1	14	45	8	Poor	Poor	Poor	limb rot, trunk rot, lateral limb, epicormic growth, dieback, included bark
1458	Blue Oak	1	29	27	42	Poor-Fair	Poor-Fair	Poor-Fair	asymmetrical canopy, bark damage, limb rot, trunk rot, exfoliating bark
1459	Interior Live Oak	2	6,3	10	12	Fair	Fair	Fair	lean, included bark, dead tree limbs on trunk
1460	Interior Live Oak	4	8,9,14,19	20	27	Fair	Fair	Fair	multiple trunk, bark damage, lean, exposed roots, dieback
1461	Interior Live Oak	6	3,6,5,8,2,10	20	20	Poor-Fair	Fair	Fair	bark damage, exfoliating bark, multiple trunks, lean, included bark, dieback, limb rot
1462	Interior Live Oak	5	5,6,7,7,7	15	22	Fair	Fair	Fair	multiple trunks, included bark, dieback, slight lean
1463	Blue Oak	1	24	27	35	Fair	Fair	Fair	limb rot, included bark, exfoliating bark, dieback
1464	Blue Oak	1	19	30	37	Fair	Fair	Fair	dieback, included bark, lean, asymmetrical canopy
1465	Blue Oak	1	34	25	27	Poor-Fair	Poor	Poor-Fair	lean, weighted limbs, included bark, asymmetrical canopy, dieback, limb rot
1466	Blue Oak	1	33	22	47	Fair	Fair	Fair	included bark, dieback
1467	Blue Oak	1	40	30	42	Fair	Fair	Fair	burrow at the base of the trunk, slight lean, included bark, limb rot
1468	Blue Oak	1	36	40	35	Poor-Fair	Poor-Fair	Poor-Fair	severe lean, included bark, dieback, limb rot, weighted limbs
1469	Blue Oak	1	32	25	32	Fair	Poor-Fair	Fair	included bark, lean, asymmetrical canopy, epicormic growth
1470	Blue Oak	1	30	27	35	Fair	Poor-Fair	Fair	lean, included bark, limb rot, asymmetrical canopy
1471	Blue Oak	1	29	25	45	Poor-Fair	Fair	Fair	lean, asymmetrical canopy, limb rot, fire damage
1472	Blue Oak	1	40	30	27	Poor	Poor	Poor	trunk fail, severe trunk rot, trunk cavity
1473	Blue Oak	1	43	30	47	Fair	Fair	Fair	asymmetrical canopy, included bark, limb rot
1474	Blue Oak	1	39	30	42	Fair	Poor-Fair	Fair	included bark, old wood duck nest box, epicormic growth, limb rot, fused limbs, weighted limbs
1475	Blue Oak	5	7,3,3,2,2	8	12	Fair	Fair	Fair	included bark, bark scar
1476	Blue Oak	1	40	27	37	Fair	Poor-Fair	Fair	weighted limbs, included bark, pruning cuts, burls, limb rot
1477	Blue Oak	1	42	27	35	Fair	Fair	Fair	included bark, limb rot, epicormic growth, pruning cuts, burls
1478	Blue Oak	1	42	25	37	Fair	Poor-Fair	Poor-Fair	included bark, weighted limbs, limb rot, bark scars, epicormic growth
1479	Blue Oak	1	28	27	37	Fair	Fair	Fair	included bark, burls, epicormic growth
1480	Blue Oak	1	33	30	47	Fair	Fair	Fair	included bark, limb rot,
1481	Blue Oak	1	38	22	35	Fair	Fair	Fair	included bark, weighted limbs
1482	Interior Live Oak	1	6	6	12	Fair	Fair	Fair	lean, included bark, dieback
1483	Blue Oak	3	3,3,2	5	10	Fair	Fair	Fair	multiple trunks, included bark, slight lean
1484	Blue Oak	1	8	6	12	Fair	Fair	Fair	included bark, epicormic growth
1485	Blue Oak	5	2,2,1,1,4	6	12	Poor	Poor	Poor	bark scars, exfoliating bark, included bark, multiple trunks, trunk rot
1486	Blue Oak	1	42	30	32	Fair	Poor-Fair	Fair	burls, included bark, weighted limbs, limb rot
1487	Blue Oak	1	51	27	40	Poor-Fair	Poor-Fair	Poor-Fair	limb fail, trunk rot, woodpecker damage, included bark
1488	Blue Oak	1	40	27	47	Fair	Poor-Fair	Fair	limb rot, included bark, trunk rot, burls
1489	Blue Oak	1	25	25	42	Fair	Poor-Fair	Fair	burls, limb rot, included bark, bark damage
1490	Blue Oak	1	41	20	32	Fair	Fair	Fair	included bark, burls, limb rot
1491	Blue Oak	1	38	27	32	Poor-Fair	Poor-Fair	Poor-Fair	burls, included bark, limb rot, trunk rot, nest cavities
1492	Blue Oak	1	33	25	45	Fair	Fair	Fair	bark damage, included bark, limb rot

Appendix D
Tree Survey Data

Tree Number	Tree Species	No. of Trunks	DBH (inches)	DLR (feet)	Height (feet)	Health	Structure	Vigor	Notes
1493	Blue Oak	1	23	25	20	Poor	Poor	Poor	trunk rot, hollow trunk, trunk fail, woodpecker damage
1494	Blue Oak	1	35	25	47	Fair	Fair	Fair	dead tree on trunk, included bark, burls, limb rot
1495	Blue Oak	1	19	20	35	Fair	Fair	Fair	asymmetrical canopy, included bark, limb rot
1496	Blue Oak	1	15	22	27	Fair	Poor-Fair	Fair	lean, included bark, asymmetrical canopy, epicormic growth
1497	Blue Oak	1	31	22	42	Fair	Fair	Fair	asymmetrical canopy, included bark, limb rot
1498	Blue Oak	1	43	22	47	Poor-Fair	Fair	Fair	included bark, limb rot, trunk rot, exfoliating bark, woodpecker damage
1499	Blue Oak	1	46	32	42	Poor-Fair	Poor	Poor-Fair	lean, trunk rot, wood planks on trunk, included bark, trunk fail, woodpecker damage, weighted limbs
1500	Blue Oak	1	50	25	40	Poor	Poor	Poor	partially uprooted, lateral trunk, hollow trunk, trunk split, included bark

Appendix C

Summary of Regulatory Agency Coordination

This page intentionally left blank

Appendix C
Summary of Regulatory Agency Coordination

U.S. Fish and Wildlife Service

The design alternatives were reviewed with U.S. Fish and Wildlife Service (USFWS) staff on October 1, 2020. Since the concept of a trail through the Study Area was included in the OSPOMP, further consultation with the USFWS is not required unless a vernal pool is directly impacted. Since the vernal pools in the Study Area were preserved as part of previously permitted projects, any impacts to these features may require a higher than usual mitigation ratio so that the total mitigation incorporates this project and that required for the previous project. Consultation with the USFWS for impacts to vernal pools would be done through the Section 10 process by developing a small-project Habitat Conservation Plan. Consultation with the USFWS for impacts to VELB may be done through the Section 10 process or through Section 7 as part of a permit from the U.S. Army Corps of Engineers (USACE), depending on whether the impact to VELB is a result of impacts to federally jurisdictional waters (USFWS 2020).

U.S. Army Corps of Engineers (USACE)

Under the current Navigable Waters Protection Rule, which was adopted January 23, 2020 and went into effect June 22, 2020, the creeks and drainages and immediately adjacent wetlands may be considered waters of the U.S. and subject to federal jurisdiction. The vernal pool and seasonal wetland complexes may not be waters of the U.S. Although the USACE did review and approve the OSPOMP at a time when vernal pools were subject to federal jurisdiction, their interest in any future projects in the open space preserve will be limited to waters within their jurisdiction (USACE 2020). Any impacts to creek channels or other jurisdictional waters will require a permit under Section 404 of the Clean Water Act. Since these impacts are expected to be small, they are expected to qualify for a Nationwide permit.

California Department of Fish and Wildlife

The design alternatives were reviewed with California Department of Fish and Wildlife (CDFW) staff on September 30, 2020. If there are impacts to riparian areas and creeks, the standard Lake and Streambed Alteration Agreement (LSAA) application will be required. Additionally, if any state listed special-status species are identified in the Study Area prior to construction, CDFW should be consulted to determine appropriate avoidance measures or if an Incidental Take Permit (ITP) might be necessary (CDFW 2020).

Regional Water Quality Control Board

The Regional Water Quality Control Board (RWQCB) regulates impacts to waters of the state. Under the State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Water of the State, adopted on April 2, 2019 which went into effect on May 28, 2020, all surface waters in the Study Area, including vernal pools, seasonal wetlands, and drainages are considered waters of the state. An application will be required to be filed with the RWQCB prior to impacting any water of the state.

This page intentionally left blank

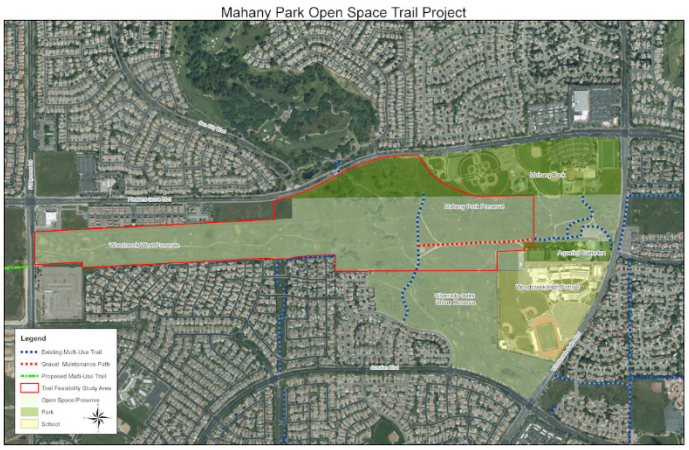
Appendix D

Summary of Second Survey Results

This page intentionally left blank

Introduction

The City of Roseville is studying the feasibility of developing a paved multi-use trail within Mahany Park open space which will ultimately connect with existing and proposed paved trails nearby. Part of the Mahany Park open space project area is a public park, but most of the area is considered an open space preserve. Currently, when visitors walk or bike through the area, they create dirt paths that can damage the endangered plants and wildlife within the open space preserve. The study will evaluate factors such as creeks, sensitive habitats and wildlife, topography, safety, aesthetics, and land use impacts. The open space has use limitations and trail suggestions will be considered within those constraints.



Map of the Mahany Park open space study area

In May 2020 as part of the feasibility study, the project team offered community members an initial opportunity to provide important input to help inform the feasibility study. Based upon technical analysis and community input from the online community survey, the project team developed several alternative trail alignments. From October 31 – November 13, 2020, the project team hosted a subsequent online community survey to understand community preferences for the draft western and eastern alignment options using a contextual map-based questionnaire. The survey featured three options for western trail segment and two options for the eastern segment. The project team received more than 320 responses from community members.

Methodology

The online community survey provided participants an opportunity to learn more about the feasibility study and provide their thoughts on the proposed trail alignments. The project team received 326 submissions from community members. A full list of the comments submitted is available in the Appendix.

To build awareness about the feasibility study and the online community survey, the project team in collaboration with the City's Public Information Officer, promoted the survey via the City's existing communication links (email, newsletters and social media). Promotional lawn signs with the URL address were also placed within the public right-of-way of the trail and neighboring community.

Based upon the following metrics, significant community awareness was created:

- More than 1,200 webpage impressions
- Instagram more than 2,500 impressions/Facebook more than 3,800 impressions
- Nextdoor more than 1,900 impressions
- Twitter more than 5,800 impressions

The online survey consisted of western and eastern alignments maps and a series of questions asking participants to rank their favorite alignment.

Western Trail Alignment Preference: **West Option A**

Respondents liked the connection to Fiddyment Road, the north-south connection, and the overall alignment.



Eastern Trail Alignment Preference: **East Option B**

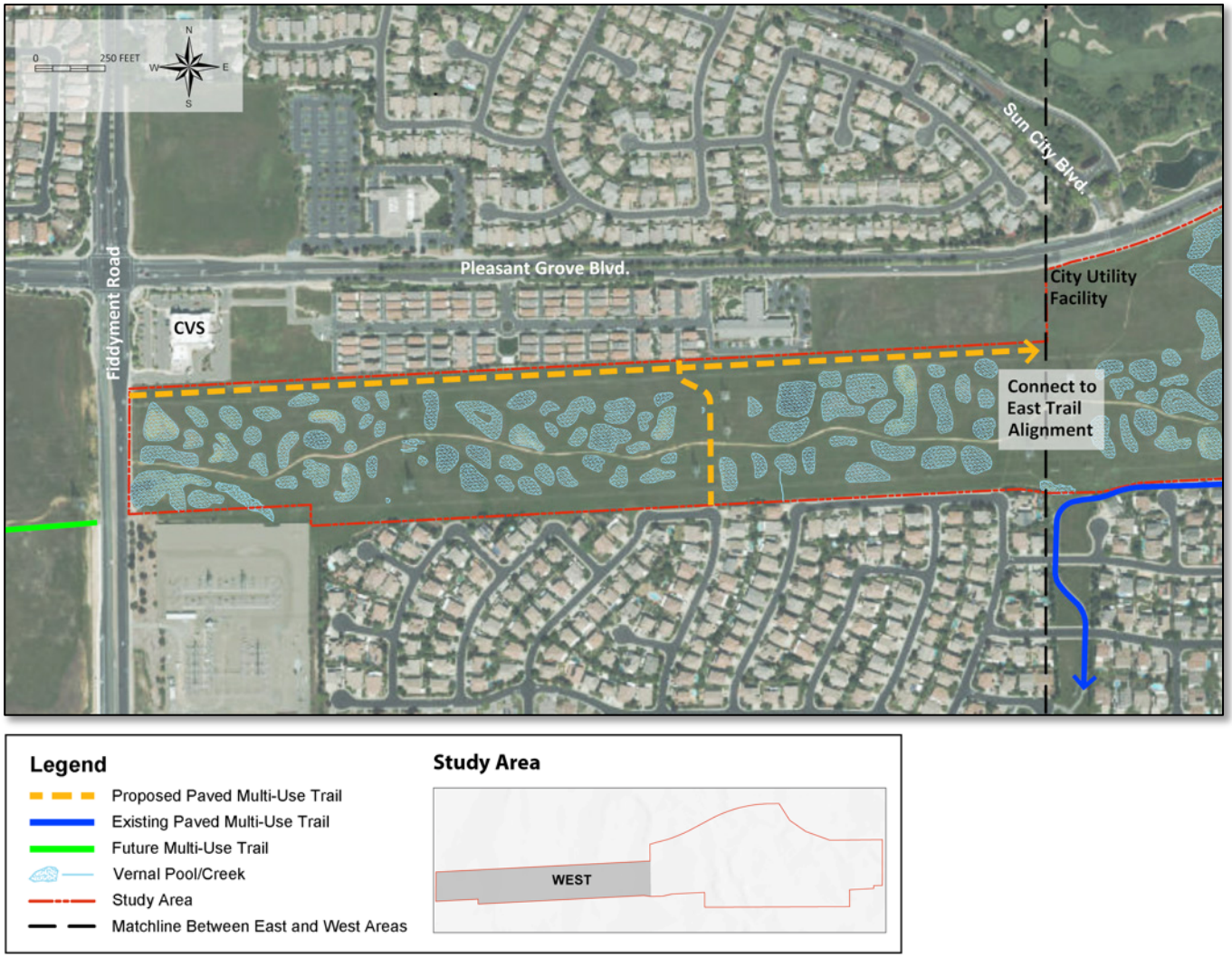
Respondents liked that East Option B would add a paved trail network in the open space that connects to the existing access from Pleasant Grove Boulevard.



Trail Alignment Options

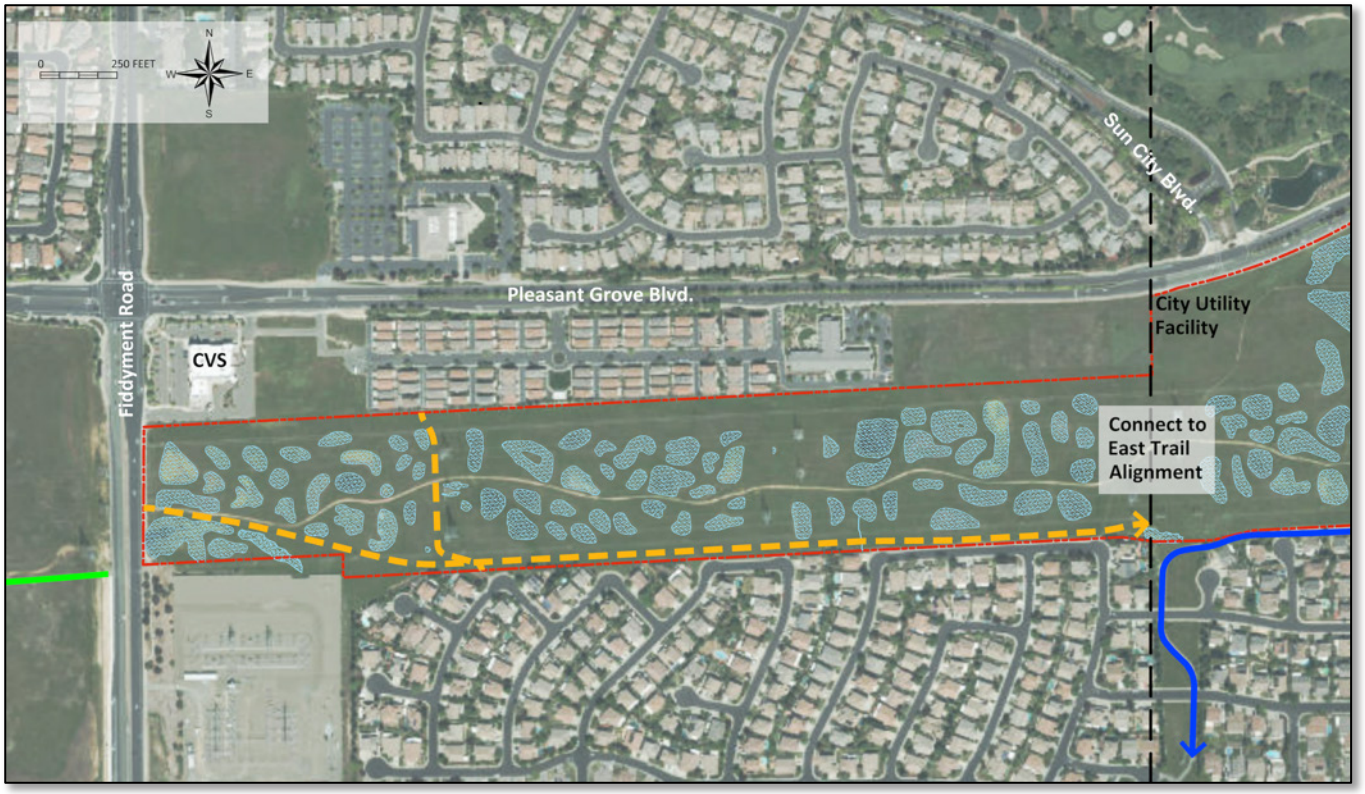
Below are all of the trail alignment options presented in the survey, how they were ranked by participants, and reasons that participants liked or disliked the options.

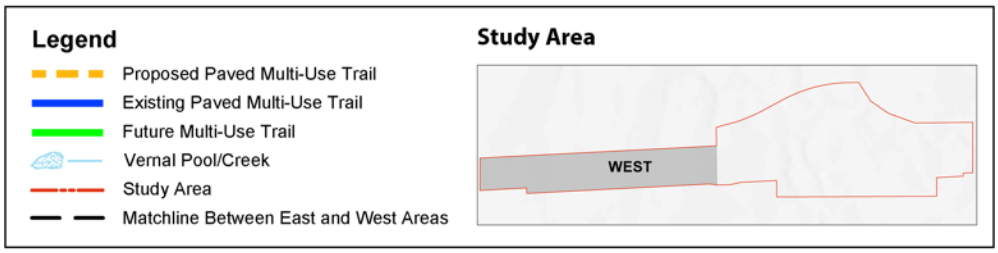
West Option – A: First Preferred Option



- Participants liked that the trail connects to the sidewalk on Fiddyment Road and is closest to the signalized Pleasant Grove Boulevard Intersection crosswalk
- Some respondents disliked the connection to Fiddyment Road.
- Participants liked the north-south connection between neighborhoods and that construction is expected to be most cost-effective due to straight alignment and avoidance of sensitive habitats.
- Some participants disliked that the trail is on the north side of the study area near adjacent neighborhoods.

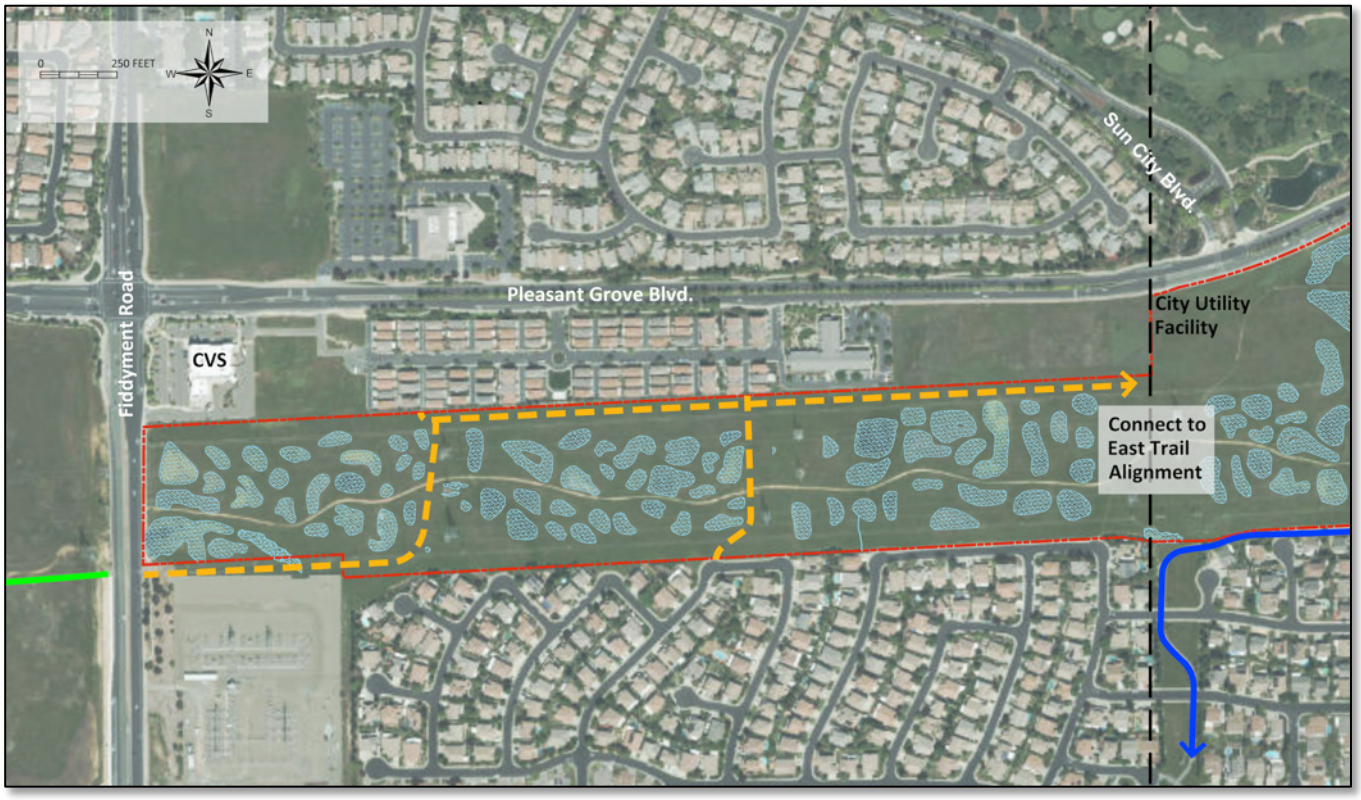
West Option – B: Second Preferred Option

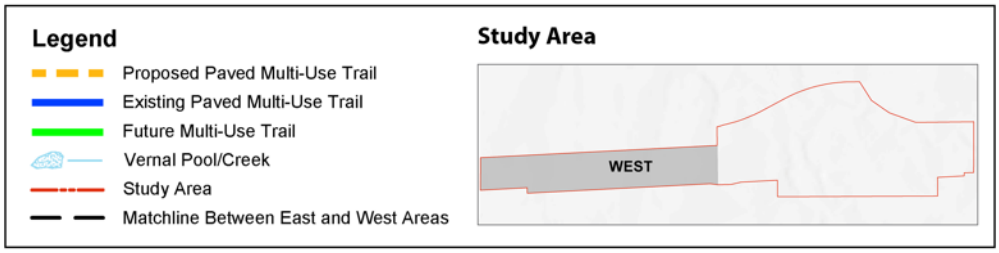




- Participants liked that the trail is on the south side of the study area
- Participants also liked that West Option B has minimal effect on sensitive habitats.

West Option – C: Third Preferred Option

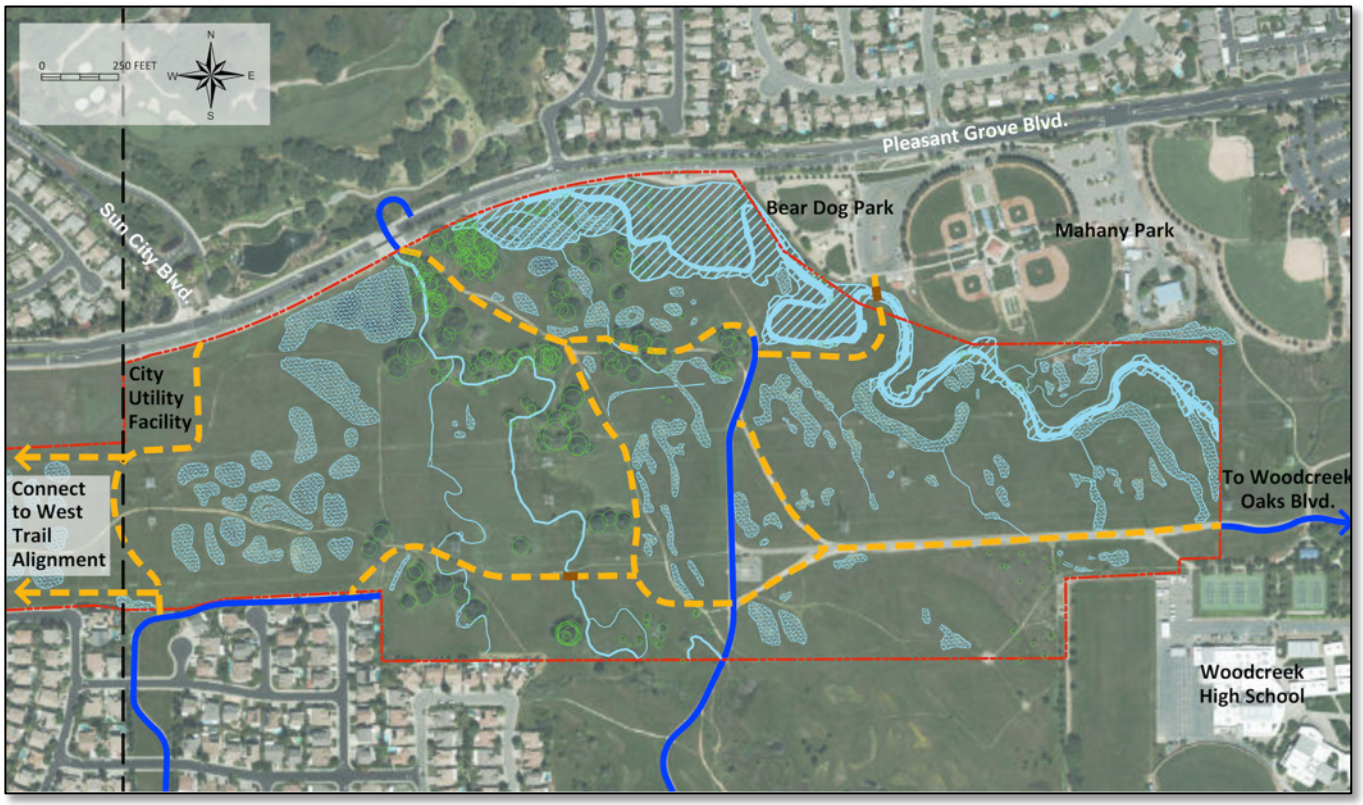


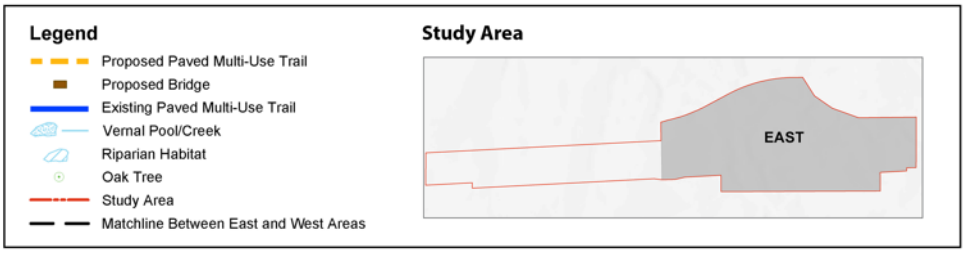


- Some participants liked this option because it would require bike/pedestrian mid-block crossing improvements on Fiddyment Road (e.g., signals, pavement markings, lighting, etc.), allowing for a direct trail connection.
- Participants did not like that this alignment will affect a vernal pool and sensitive habitats and that the alignment is longer
- Participants also disliked that this option would be more costly to construct.

Next, participants reviewed and ranked the eastern alignments.

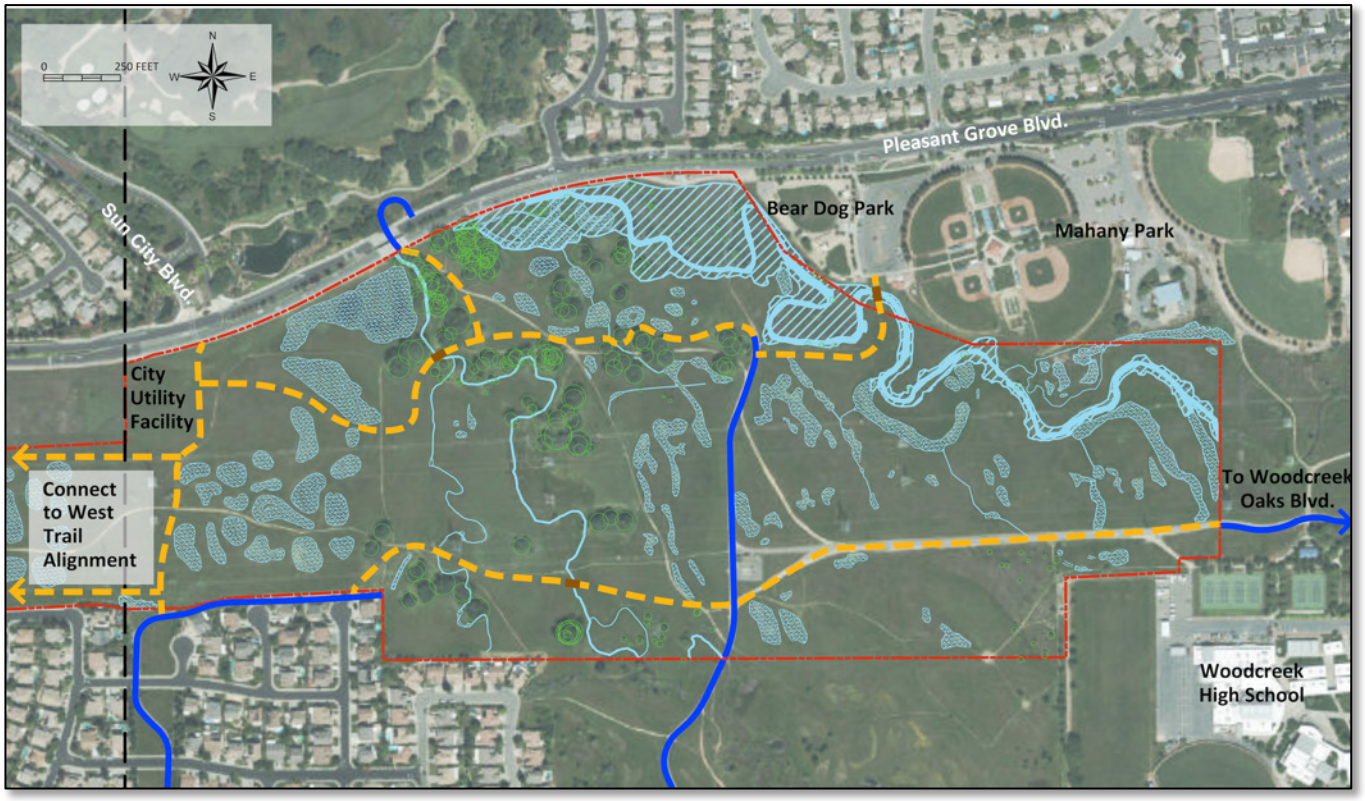
East Option – A: Second Preferred Option

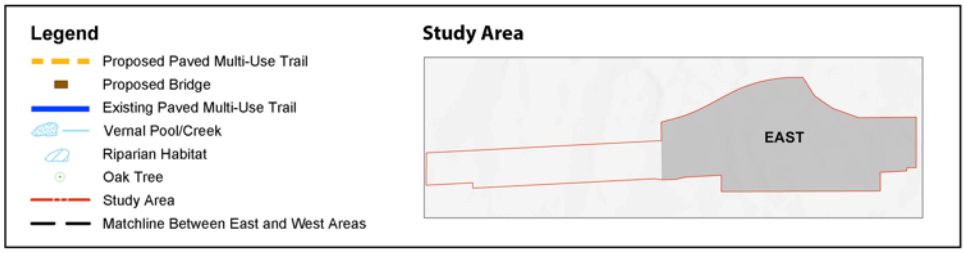




- Participants liked the additional bridge.
- Participants also liked that portions of trail travel through oak woodland, offering shade.
- Some participants liked the north-south connection through the center of the loop.
- Some participants did not like that trail users would need to travel along Pleasant Grove Boulevard to connect to the trail.

East Option – B: First Preferred Option



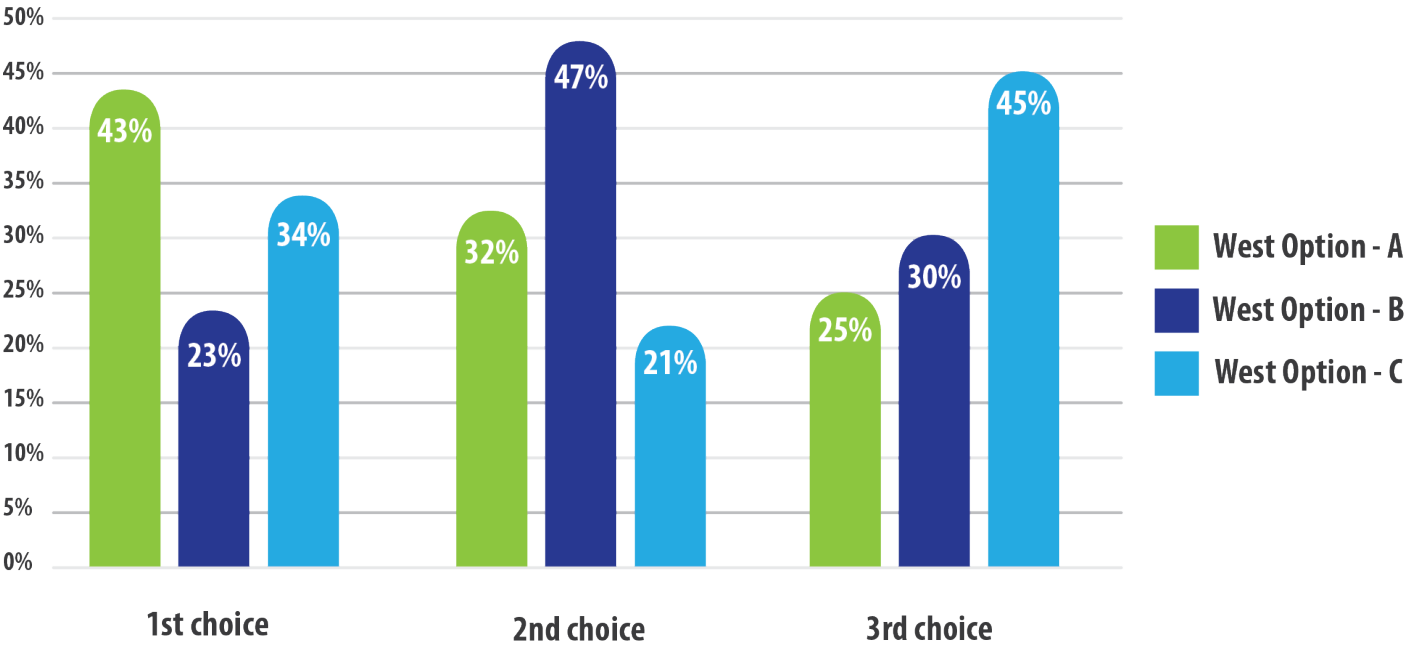


- Participants liked that this option provides a longer recreational "loop" trail.
- Participants also liked the two additional bridges over creeks.
- Participants liked that the trail would allow for trail users to stay off of Pleasant Grove Boulevard and that more portions of trail travel through oak woodland, offering shade.

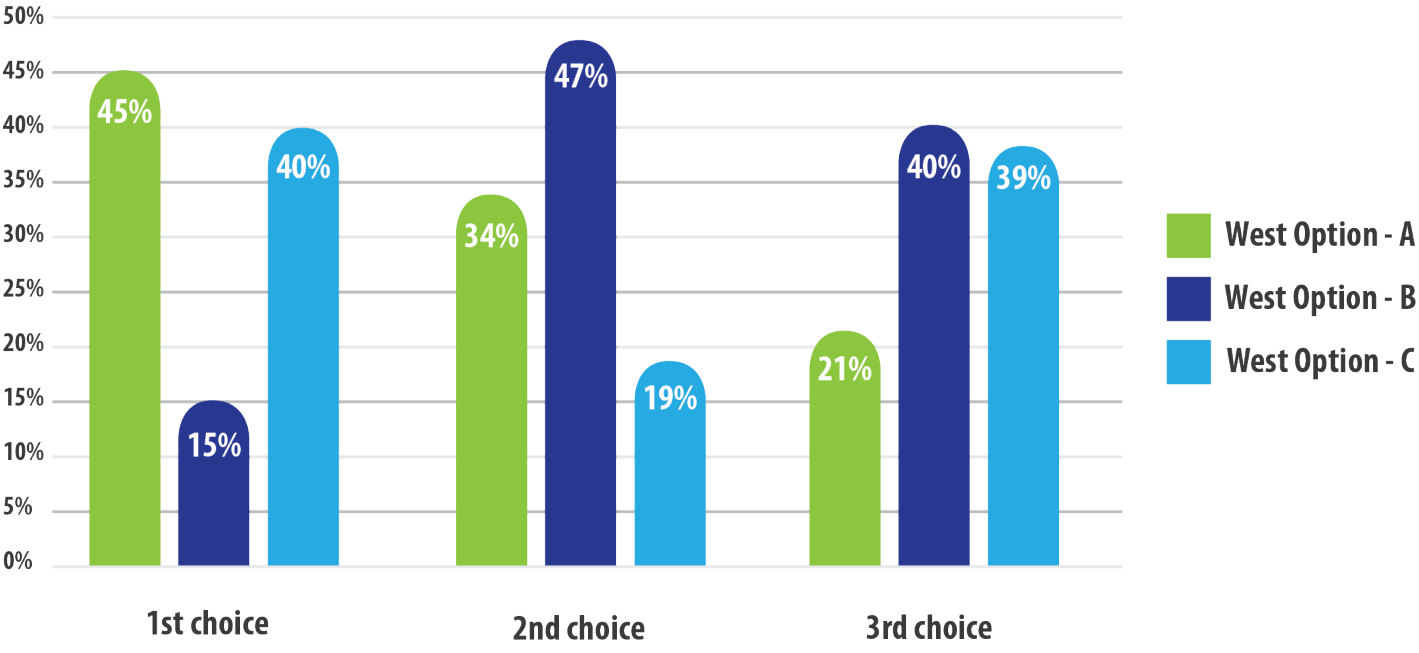
Overview of Results

Below is a compilation of the feedback received.

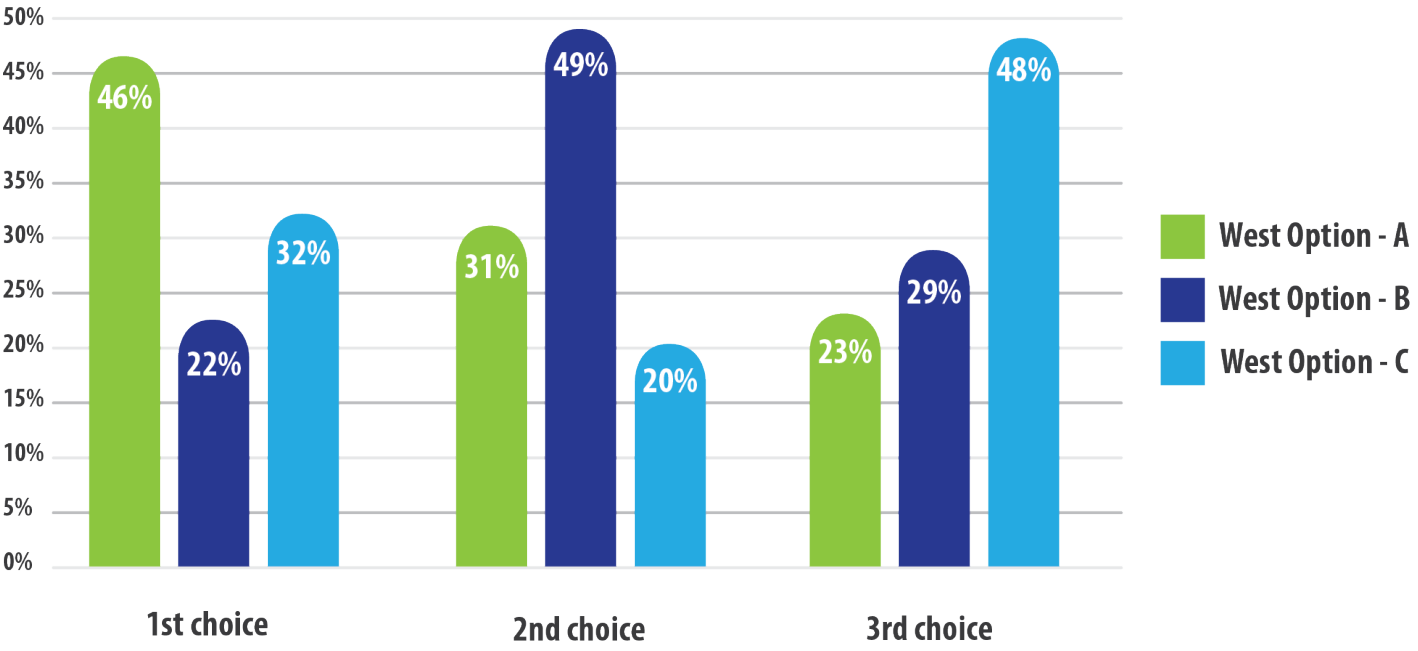
Question 1: Which connection to Fiddyment road do you like the most? (Ranking question)



Question 2: Which north-south connection do you like the most? (Ranking question)



Question 3: Which alignment do you like the most? (Ranking question)



Question 4: Do you have any comments about the West Options?

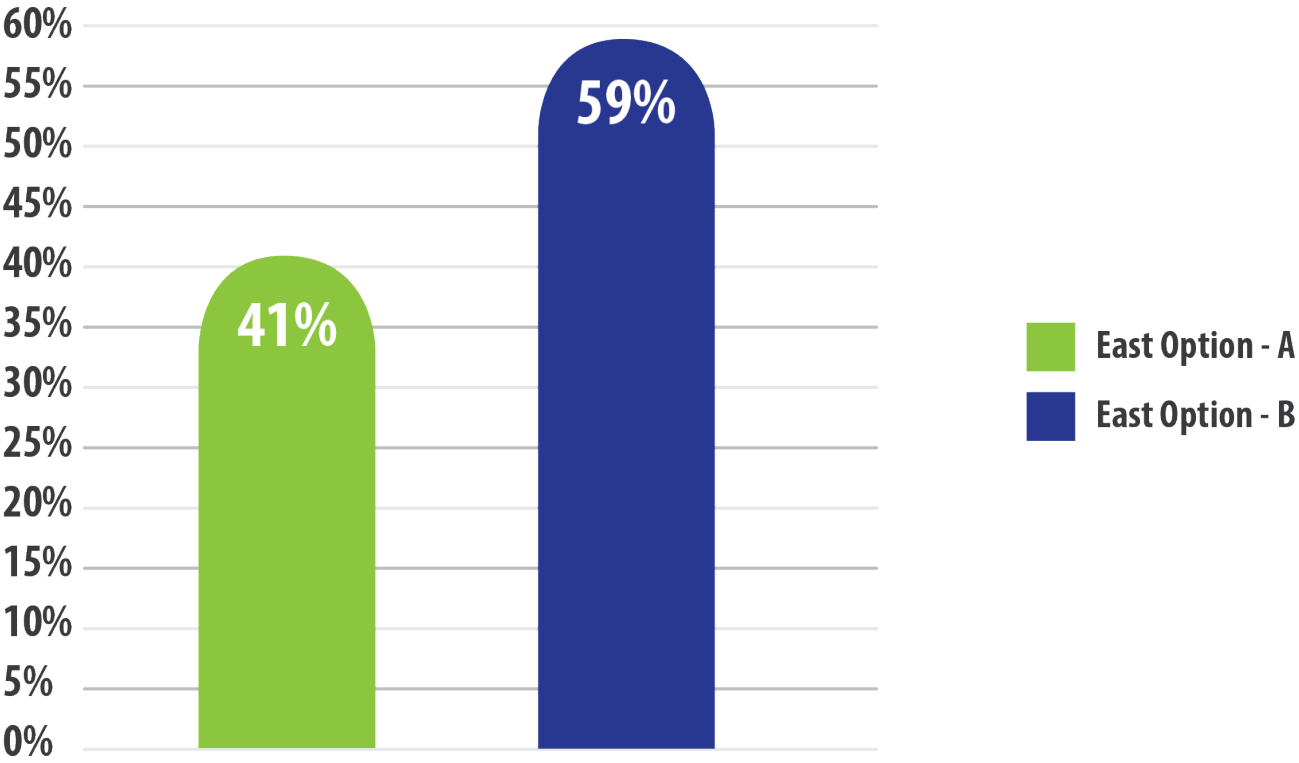
Those who were proponents of West Option C liked the midblock crossing at Fiddyment Road and felt it would be the safest for pedestrians and cyclists. Respondents noted that Option A and B might lead to more unsafe crossings since trail users might be less likely to travel north to the Pleasant Grove Boulevard intersection to cross Fiddyment Road. Respondents also liked that Option C will directly connect to future trails. Those who were against Option C disliked that it was the most expensive option presented, and that it might take longer to construct than other options.

Besides trail user safety, community members were also most concerned with choosing an option that would minimize damage to nearby wetlands and vernal pools. Some comments noted that Option B seemed to be the best option for mitigating impacts to nearby sensitive habitats.

Commentors also showed concern over the paved trail being too close to the northern and southern neighborhoods, and that trail users might disrupt nearby residents. Other concerns listed were that the straighter trail options would not be exciting or interesting for runners and cyclists. Respondents also listed concerns over whether trail users would continue to use the dirt paths, even after a paved trail is constructed.

Finally, respondents wrote about wanting to include other amenities along the trail such as fencing near the entrances for more privacy, benches, bathrooms, dog waste stations, signage and trees or structures to provide shade. A few respondents suggested keeping some dirt paths for runners and people using mountain bicycles.

Question 5: Which option do you prefer?



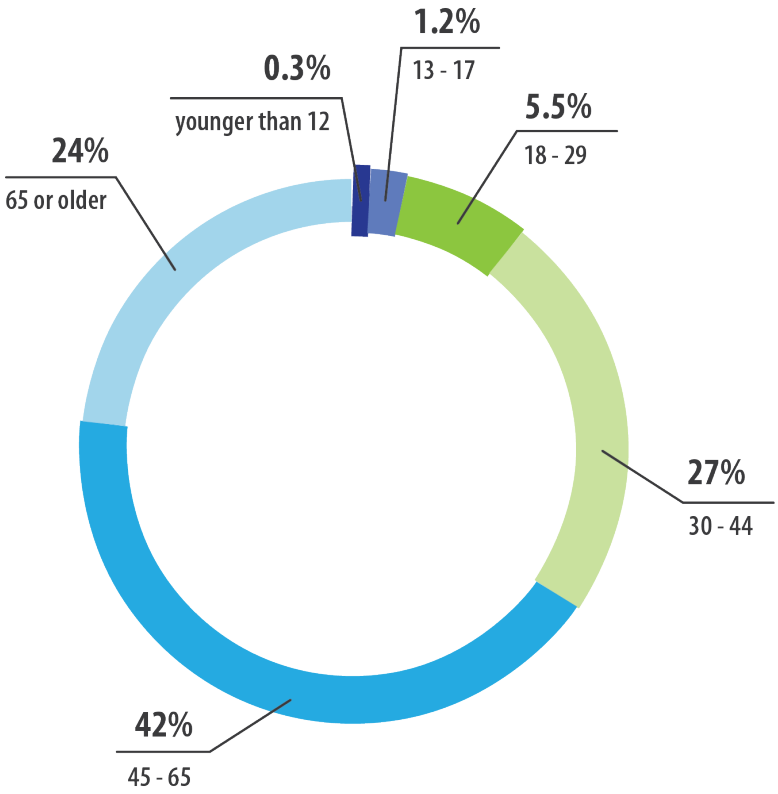
Question 6: do you have any comments about the East Options

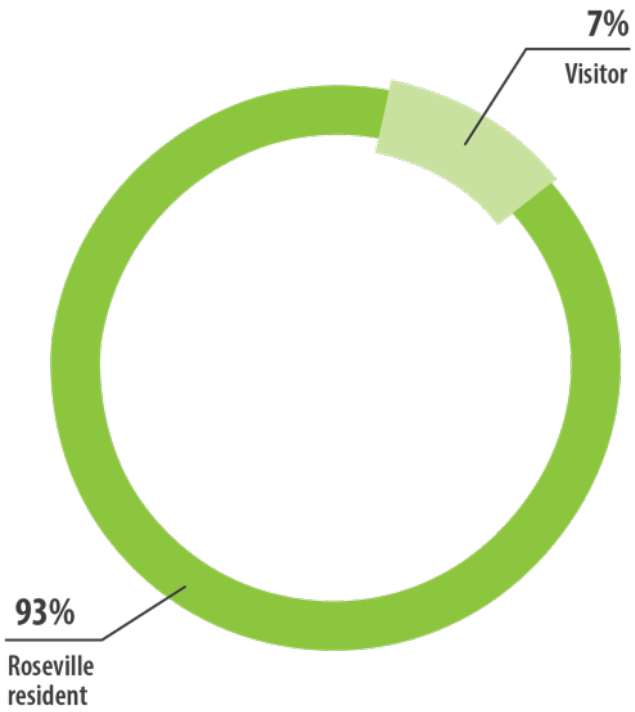
Community members who supported East Option B liked that the paved trail on the north side of open space would allow trail users to stay off of Pleasant Grove Boulevard. Respondents also noted that the paved trail should minimize the impacts to the surrounding wetlands and vernal pools. Many respondents also showed excitement about the bridges and expressed their desire for more ways to cross the creeks in the open space.

Some community members wrote that they liked certain aspects of both Option A and Option B and suggested that the City incorporate some traits from each alignment. Respondents noted that the north-south connection in Option A would be beneficial for overall connectivity within the open space and would reduce the chance of trail users traveling off of the paved trail.

Finally, people also mentioned a number of other amenities that they would like to see implemented along a paved trail such as exercise stations, benches, signage, a basketball court, and increased shade from trees.

On the final page of the survey, respondents could optionally answer some questions about demographics.





If people answered that they were a Roseville visitor, they were also asked to identify which city they are from. Below are the answers:

- Rocklin (4)
- Colfax (2)
- Antelope (1)
- Auburn (1)
- Citrus Heights (1)
- Davis (1)
- Diamond Oaks (1)
- Granite Bay (1)
- Sheridan (1)
- Lincoln (1)
- Loomis Basin (1)
- Sacramento (1)

Communication

- The City of Roseville posted the online community survey on the Mahany Park Open Space Trail Project website, roseville.ca.us/MahanyTrail. Project webpage impressions since survey launch: **1,247**
- Emails to project, trail alert, and main city email newsletter lists: **54,927 recipients total**
- Instagram story and posts: **2,573 impressions, 129 engagements**
- Facebook story and posts (city, parks, and transit accounts): **3,842 impressions, 275 engagements**
- Nextdoor post: **1,968 impressions**
- Twitter posts (city, public works, parks, and transit accounts): **5,810 impressions, 156 engagements**



Informational H-stake signage posted around the open space

Informational H-stake signs were also placed around the Mahany Park open space.

Appendix

- List of community member comments

Appendix of Comments

Social Media Comments

- City of Roseville Facebook:
  - I really love this plan
  - Great idea! Let's do it
  - Great project!
  - I love Roseville's paved trails! My kids and I made use of many of them over the summer as we began an exercise routine. There are some beautiful places in this city! Mahany park would greatly benefit from one of these, as that is a really nice place to walk, but the dirt paths are hard to walk on and hard to see. I would absolutely make good use of a paved trail back there if it were put in! Thanks!
- City of Roseville Instagram:
  - Yes!
  - I'm into it, but I do like the dirt paths for off road biking too.
  - This would be great! We need more trails
  - Yes! As a cyclist, Roseville needs so many more paved bike paths. Folsom has so many more than us!
  - Keep it unpaved
  - No leave it dirt
  - Great idea.
  - Yes please!

- City of Roseville Twitter:
  - What kind of pavement material? Possibly recycled tires would be my choice.
  - If it was up to me, I would just leave it the way it is. We love riding our bikes on the dirt trails and checking out the wildlife. With all of the building that's going on in Roseville, I'm starting to see more and more wildlife making their homes in this area.

Do you have any other comments about the West Options?

- Option A would be a safer alternative to Pleasant Grove, particularly for commuters and errands. Also, may be more viable to plant shade trees.
- Option West B is the best choice for everybody since it connects to existing paths!
- There should be a loop. Bikers, and joggers may like the straight long distances, but disabled, people with strollers and dog walkers tend to go shorter distances and need some shade. Pavement is hot, especially in that big open field in the spring, summer and fall. Since there is none of that in that area a shorter, quicker walk would be more satisfying, hence a loop.
- Use the North to South connection you have on Option A. Use Option A's trail from Fiddyment to the North South connection, but then when the trail reaches the neighborhood have it continue alongside the neighborhood (south) until it meets the pre-existing trail (going around the small vernal pond). I

think that will avoid most vernal ponds and give some variation to the path.

- Alignment should be on the south as this would be more visible and help make it feel safer. Should connect with future trail with mid-block crossing at Fiddyment otherwise there will be too many illegal crossings which would be dangerous.
- Power line crews will continue to use an unpaved path through the area to inspect and maintain the lines. This necessary access will then ensure the continued presence of an unpaved path through the area. For many activities (biking and trail running/hiking) the softer natural surface is desirable, and this alternative dirt trail will be attractive. The city should consciously plan improvements to the unpaved maintenance corridor that would stabilize the soil and support the use of this more natural trail environment instead of assuming that the dirt alternative will naturally disappear when asphalt becomes available. See the example of an uncontrolled dirt path alongside the paved path in the Morgan Creek area between Cook Riolo and Wallerga Roads.
- Please have a mid-block crossing at Fiddyment for safety reasons.
- No power lines above trail is a plus, as is avoiding sensitive habitats. Keeping the connection closer to the Fiddyment Road and Pleasant Grove intersection may keep jaywalking to a minimum.
- Add fencing to prevent people from cutting corners at the path entrances.
- Lease amount of damage to wildlife areas is key.
- Being redirected to the corner signal is definitely out of the way. Any chance for future planning a walkway over Fiddyment? That would make the alignment of C better except for power lines.
- Please add a signal bike crossing on Fiddyment. Pleasant Grove and Fiddyment is too busy for bikes and walking. Also, even though straight paths are cheaper, curves are much more fun for all.
- I would like a path that isn't as straight and winds around some of the pools or creek if possible. Also, if it can connect or have close connection to existing trails that would increase use in total.
- Rather than a non-porous paved trail, how about a gravel trail?
- Consideration of how to connect to the trail when coming from the Pleasant Grove and Fiddyment intersection for bicycles needs to be addressed. It would be dangerous to ride a bike south on Fiddyment against the flow of traffic to access the trail. There is not a safe place to cross Fiddyment to get to the trail for bicyclists riding in the bike lane with southbound traffic on the west side of Fiddyment. The future connection and streetlight are likely years away from being installed.
- Please consider bridges over creeks.
- Please keep existing dirt trail for mountain biking and trail running
- Trail needs to be on south side to prevent countless people trails cutting across vernal pool habitat from the large development.
- I like the direct trail connection to future trails.
- Honestly, I don’t like any of the east-west layouts. Why not just pave down the existing dirt trail under the power lines? I run this trail at least once a week and I’d probably keep running the dirt trail, even if any of these 3 paved trail options existed. The existing dirt trail has numerous bends and slight elevation changes. This is more “interesting” to run than a boring straight path.
- If money was not an issue, Option West-C would be my first choice.
- Curious how you keep people from still using the old trail. It’s really nice how it’s in the middle. Feels more secluded and peaceful.

- No pavement.
- Seems the least impacted currently, needs more pet waste mitigation if it will be more accessible/heavily trafficked.
- Please do not have impact on the vernal pools!! That's one of the charming aspects of this area.
- Connecting at Fiddyment with future multi-use trail is also key (option West C). A big part of the problem with some of Roseville's trails is not having a clear connection between sections.
- I oppose the designated area. I think the designated area needs to adjoin the library and creek area. Not service the new development area. The area you suggest should be paid for by the developers of the new subdivisions W. Roseville Area.
- I do not agree with this project at all and voiced my opinions and concerns on the first survey. Many were of the same opinion about how this will damage the open space beyond repair. Option West C is the worst option and I do not know why it is even considered, given the increases cost and disruption of fragile vernal pools and wildlife areas.
- We live in the houses on Pleasant Grove near CVS that this walking path may go by. I am absolutely opposed to this path going by our tract. While there are fences up for the individual homes that are along the nearby path, I foresee people walking or riding through our neighborhood. So please consider putting this path on the other side like Option B.
- I think the city should seriously consider connecting trail segments that are divided by major roads (e.g., Fiddyment) with pedestrian/bike bridges. Crossing streets such as Fiddyment or Pleasant Grove at cross walks is a harrowing experience, especially during rush hour when drivers are anxious to get to their destination. I'm especially uncomfortable making use of the cross walks with my young children. Having lived in the Valencia/Santa Clarita area in Southern California my family and I made use of the many miles of trails and paseos that were connected via pedestrian bridges across major thoroughfares. This allowed us to access parks, open space, restaurants, grocery stores, and even the mall without ever stepping into a busy road with heavy traffic. The bridges also allowed the city to place holiday decorations, patriotic decorations, and community announcements across roadways which beautified the already visually pleasing bridges and allowed the city to communicate important announcements and city specific messages to every commuter that drove under each bridge. I think the investment in public safety alone would make pedestrian bridges a worthwhile investment. The more our trails are connected the better they will be utilized by both young and old in our community.
- Please quit allowing building and drilling to take place on what was once a protected wetland. This path would not be an issue if apartments, senior living and a CVS were not built in the first place. Protected should be protected.
- Just don't damage the fragile ecosystem, it very important and must be protected. Trash cans must be added to help get trash off the ground and in a place it's supposed to be.
- Wish a nice park with more ziplines and more variety of playgrounds.
- I want whatever has the smallest impact on plants and wildlife in the area.
- would be nice to have signage and shade, at least a little.
- Connecting to the West Park - "future multi-use trail" is extremely important in opting for an alignment project. Fiddyment is a dangerous, large roadway that is not conductive to pedestrian/bike traffic in order to walk all the way down to the

signal crosswalk and then walk back up to the connecting trail. It would have been nice to have a curved trail option but appears not feasible with the vernal pools.

- C option affects the Vernal pools so it shouldn't be done even though it is nice to have more north and south options.
- Why can't there be a continuation of the paved path from where it is (vernal pools) along the black line to Pleasant Grove? Getting to PG without having to jump a stream is key.
- I would do a combination of the options. The trail that runs down the middle of the area makes the most sense for a new paved trail. Minimal disruption, already graded, most likely. Easy to punch in some access points from the neighborhoods to the north and south. It would also be an easy connection to the trail on the east side of Fiddyment Road.
- Need Nighttime lights on trails.
- Trail should lead to crossing Fiddyment again existing signal to optimize bike and per safety.
- Why can't the north/south path just be direct and connect to the road besides the upside down "T" shaped building? It just seems more practical and less invasive to those families living right there on that street where it's designed to come out currently. If straightened it could come out into the parking lot of that building even so people could use their parking lot too for easier, off street access to the trail.
- Honestly this is not what I was expecting for a “Mahany Trail” I was thinking of trails behind the Mahany library and beyond but not all the way to Fiddyment. I live at pleasant grove and Woodcreek oaks and that’s where I walk not down near Fiddyment. This is not useful to me.
- Option A in my opinion is the best choice.
- Please make a basketball court :)
- We shouldn’t pave this area. People will go off the paved path and we will do more harm by bring people and vehicles into this area to pave it.
- I think it's very important to consider input from those whose homes are adjacent to these trails. We don't use the west side of the trial very much, but I feel it's important to connect it to the future trail heading west.
- I’m not sure that paving a trail will help the nature preserve. People like to walk, bike, and run on dirt paths. We have paved surfaces everywhere. This project seems unnecessary.
- Any bridges or paths need to be fire department accessible, and bridges weight rated for fire department apparatus, etc.
- Excited we are putting this together. Another terrific investment in the great city of Roseville
- Alignment C is my favorite but I'm choosing other options based on environmental impact. My concern is that a trail will be developed that is more environmentally friendly, but that people will continue creating their own paths since the trail doesn't go where they want it to go. Perhaps there will be less enviro impact in the long run if paths are built based on where people go.
- This proposed trail must connect to the trail on the other side of Fiddyment Rd, and not rely on the huge intersection that is Fiddyment Rd and Pleasant Grove Blvd. This would give all the neighborhoods south of Pleasant Grove Blvd. quick, easy, and safe access to this proposed Mahany Trail. Additionally, we need to make a safe way for trail users to cross Fiddyment Rd by using a tunnel or bridge, and not by having to stop traffic or creating a crosswalk style crossing, even if it were with a traffic signal. This is because traffic on Fiddyment Rd often exceeds 50

mph and other parts of West Roseville, such as the Pleasant Grove Creek Trail on Fiddyment Rd just north of Blue Oaks, uses a tunnel underneath an overpass.

- The best thing about the exiting dirt trail is that it has some movement/ curves. All the proposed paths appear to be straight. I understand the balance required to protect the environment, but strictly straight paths are boring to ride. The blue oaks to veterans park is a beautifully planned paved trail. I would have liked to see an option more similar to that one.
- I'm concerned that peeps won't walk to the signalized Pleasant Grove intersection crosswalk and will instead try to cross Fiddyment Rd causing road hazards. The closer you can get to a signal will increase the likelihood that peeps will use it. I like Option C the best because it will have a dedicated crosswalk right where it's needed.
- Don't put the trail on the sides near homes. One of the reasons we like this dirt trail is it allows my children and myself to feel out of the city by going through the middle of a wetland or tree covered area. Putting the trail near the home lines will cause noisy walkers near back yards that have always been quiet. There must be an option D that goes through the middle.
- Are these really the only options you're going to give us?
- West Option C for direct connection to trail west of Fiddyment is crucial for ease of users. Diverting to Pleasant Grove is out of way and unlikely to be used.
- I like C for the better connection to future trail west of Fiddyment - though cars speed quite a bit on Fiddyment so would be somewhat concerned with cars, unless there is an actual stoplight there.
- I live in the neighborhood along pleasant grove. How can you put an entrance way, which is right in front of someone's house and down their driveway to the trail? I wouldn't want a bunch of random people walking down my drive and house front!!! so, to me none of those options are acceptable. or maybe your map is not showing where people would enter the trail--it looks to me that in a, b and c some of the entrance ways are off Camino real.
- It's hard to favor any of these options when I live on the west side of Fiddyment. One of my main concerns is the traffic that turns south onto Fiddyment from PGB. Most motorists are too focused on the green light when trying to get south regardless if there are pedestrians walking in crosswalks. What kind of viable option would be available to connect the path from west park neighborhood? I am a cyclist that on average rides 1-2 hundred miles a week. Please consider looking into social media fitness apps as far a current frequently ridden route.
- Boring straight trail will become a fast speedway for bikes. The cost savings will translate into a safety nightmare.
- The most critical thing is that we have paths that connect to one another. Building short little paths that will "eventually" connect to the larger system is a tactic that has been going on for two decades. From North/West Roseville, there is no safe way to commute by bike into Rocklin, Sacramento or certain places within our own city. While we support anything that benefits our environment and the ecosystems of specific parcels, the City of Roseville need to connect existing pathways and focus on making pathways safe through public outreach and adequate signage (walkers/bikers on the left/right).
- Is it possible to accommodate trail runners by putting signage on approved/safe for the local environment dirt trails? This comment applies to any of the open spaces in Roseville.
- Protect the vernal pools.

- Option B seems like a good way to cross from neighborhoods with the least impact for the venial pools yet giving you the opportunity to be the middle and absorb their beauty. Keeping costs down. The only thing I don't like is being under the power lines.
- The most cost effective and least impactful to sensitive areas design is best. One concern is whether people will cut through areas from the north if an actual trail isn't nearby. People will often take (or make) the path of least resistance.
- Please provide public bathrooms.
- Easy connection to other existing or future trails is really appreciated. The ability to use a trail without having to go to a streetlight crossing is preferred.
- I'm not sure a north-south connector is indicated at all; or maybe more are needed. Bikers, walkers and dog walkers are going to enter the wildlife area at access point within a few blocks of their home, regardless of whether it's paved. I would NOT put benches or potties in the area - they will be magnets for after-dark mischief.
- C is too long.
- Where is the bridge located? Ask the kids that go to Woodcreek they ride their bikes that way every day.
- Don't pave it! Please do what bay area does and used a more natural look like crushed granite.
- There is no picture depicting option C....but it sounds awful since it affects sensitive areas, is under power lines, and will cost more. Option B...is not good because it's under power lines and people with some heart issues are affected by being close to power lines. Option A is the best, and only reasonable option because it is not under power lines and will be along a short number of neighbors. I think the less impact on residents (from noise on trail) and less impact on sensitive areas makes this option A much better choice.
- This will be a nice addition to the super nice trails in Roseville. You have and continue to add trails we will really enjoy using in the future. I wish other cities were as willing and proactive in having great parks and multi-use trail. We love them. Keep up the great work.
- I like that the path entrance on Option west B allows access for all neighborhoods to the paved access points, so one single neighborhood street isn't the only spot for access.
- Are there any trees along any of the routes? If not, could some native trees be planted along the south and west sides of the trail to provide shade?
- Option West-C should be eliminated due to having to unsafe crossing of Fiddyment, especially when there are two other existing safe crossing options.
- My main concerns are Fiddyment is too busy to add a new crossing, so I suggest only using the existing light. Also, the fences seem like a natural privacy barrier on choice C. I think it’s bad idea to direct foot traffic so close to the homes that are along Pleasant Grove.
- The existing service road through the middle of the west segment would be the best solution (not A, B or C) for the following reasons. Corridor already disturbed and with a paved path the width of the roadway it can and should be maintained by the entity that owns the power line corridor. Adding another trail alignment will simply split the users into two zones creating more human disturbance within the preserve area. Linkages can be made north-south to connect the neighborhoods. Cost may be slightly higher initially however long term maintenance would be absorbed by others.

- Why not pave the existing foot path already created?
- I don't want to have to go in front of someone's garage to access the trail. None of the north side connections are good. Alignment A would allow multiple north side connections at more public places. On the south side, please connect to the middle of the parallel segment of St Basil instead of in front of someone's home. Maybe consider a second south side connection at Apple Way.
- I like B the best. It connects the best with trail that is already there. And has minimal impact on the environment.
- Multiple access points would benefit neighboring housing.
- I like option C the best, but if the cost is prohibitive (no grant money), then I would go with whatever is cheapest and fastest to construct.
- They are all going to be parking issues. Hopefully most users are those who live in the area and walk to the open space
- Occasional benches would be nice along the paved part.
- Keep the connection close to future multi-use trail.
- Impact on natural habitats (vernal pools/sensitive habitat) should be none to extremely minimal! Having some inconvenience to the human user of this trail is worth saving these crucial environments!!!
- Two connections need to be considered strongly to the community that is to the north or the south. Community connectivity is key for users of the facility. Alternative A appears to be the least connective to all the communities and should not be consider any further.
- Keeping a separate dirt path is something that should also be considered. As a runner I like having the option to go off pavement. The city of Lincoln's bike paths are cut wide to allow side areas of unpaved gavel. Such paths allow for a variety usage.

Do you have any other comments about the East Options?

- All unacceptable.
- Don't hurt the environment, the dirt trails are better on our joints and won't make it so out in the summer, and spring; it needs to be as cool as possible, paint the trail if paved
- Do not neglect the demand for dirt trails. Woodcreek High School has a mountain bike team that practices on the dirt trails that are currently in this area and there are many other uses who prefer to have dirt surfaces to recreate on.
- Please make 2 proposed bridges since they are really need! Especially useful during times of rain when the creek water rises and makes it safer for pedestrians to walk. In option A you have a north south connection that should still remain in option B. Bicyclists/joggers go longer distances. Then casual walkers...that large loop needs to be cut in the middle as option A. The trails have been cut by people who use and love that park Because of the necessity.
- They both look like they cut up the habitat. Is it possible to go around?
- More paving are more options for bikes, which is great!
- Consider non-paved trails in addition to paved trails. I understand the need for a paved trail to connect the bike paths, but not all established trails need to be paved.

- A connector trail on the north end of the park would result in high bike traffic where many people like to enjoy nature and walk dogs. It would be good to keep most of the main bike path on the south end of the park where it already is.
- I think there's potentially a better option than either of these for the East.
- Love the idea of loops.
- I prefer B because I think it is important to have the bridge in the oak trees because people will still attempt to cross there and continue to break down the stream slopes, but people will also continue to use the other trails on the east side of the stream, so you should plan on paving those as well. Those trails would have minimal impacts.
- I like having a loop trail, I would like to have multiple avenues crossing the creeks though.
- I oppose the W. Fiddle-mart Area, designated area. I think the designated area needs to adjoin the library and creek area. Not service the new development area. The area you suggest should be paid for by the developers of the new subdivisions W. Roseville Area.
- I just want whatever has the smallest impact on the wildlife there.
- I bicycle in this area a lot. I do it for exercise and to ease stress. I never plan to go shopping on my bicycle. I do stop for ice cream rarely.
- I like the longer loop trail. Good for bike riding.
- Very pleased this project is under consideration. Thank you for listening to the residents! This will be super helpful for children traveling to school and the park!
- These are both good options, But I like A option a little better.
- Thank you for the bridges.
- It is smart to use existing dirt trails as a basis for the paved multi use trails. People already know where they go and how to access them.
- I prefer more direct north-south connection between Junction and Pleasant Grove.
- Comment was made about one trail having more shade...you could use the acorns shed and plant them alongside the trails after establishing them, that way they improve the trail, and are native. I also hope there are distance measurements on a sign/map somewhere on site. Maybe a few benches under those trees and a fountain at the street, near the map, to fill bottles before starting.
- I appreciate the desire to minimize impact to oak trees and riparian habitat, however East Option B is more like the trails that are currently used and will continue to be used even once the paths are paved. A longer path with shade will be appreciated by the community. The bridges will be a wonderful addition to allow year-round access to the wilderness area.
- We shouldn't pave this area. People will go off the paved paths anyway. We are going to do more harm to the environment by paving the area. People and vehicles will have to go off the path to pave it. Not paving is the best option.
- Make a basketball court it will get a lot of people
- I actually like both of these options. But I like that option A has minimal impact to riparian habitats and oak trees. Could plan C be like A but without the north south portion in the middle? Just have the blue existing trail.
- Same comments about fire department accessibility.

- It would be great to have some outdoor exercise stations along the trails!
- There should be pull-up bars, dips bars, pushup bars, ab stations, and other outdoor calisthenics equipment scattered throughout the trail system.
- A smaller loop would be better for small children and those with limited mobility.
- B avoids having to travel a short stretch along Pleasant Grove.
- People love bridges ... especially in this social media world!
- I regularly run through this area. Although I like the idea of some paved paths, I also really enjoy running on the dirt paths through the oaks - it's one of my favorite parts of my run. I would figure out what ad-hoc paths are being created that are causing problems for habitat and put paved trails in such that they would deter people from these ad-hoc paths, while leaving main dirt paths intact.
- The trail connection to Del Web from the open area needs be fixed. It is always muddy from drainage.
- Again, whichever pathway minimizes environmental impact and maximizes the networking of trials.
- Is it possible to accommodate trail runners by putting signage on approved/safe for the local environment dirt trails? This comment applies to any of the open spaces in town.
- Key point for me is more portions of trail trial through ok woodland, offering shade.
- Please provide public bathrooms.
- Like the bridges that will allow year-round use. Also, like going through oak woodland.
- Option B allows for loop completely internal to the area - this is more preferable than having to be on the Pleasant Grove sidewalk for part of the loop. It would be great if the paved trail could have dirt-gravel 'shoulders' for those wishing a lower-impact walk or run. A few trash cans and dog stations would be awesome, but benches and potties will just facilitate the after-dark substance abuse and mischief.
- Ask high school kids what they prefer? East option B-leaves the middle protected for the little animals. What about the beavers? Are you relocating them?
- Option B is good because a family can stay in the park on the trail the entire time...i.e., not have to go to pleasant grove to make a loop (required in option A). Note: it would be nice if option B had a second trail between the north and south trails, like option A has.
- Don't pave it, used a more natural look like crushed granite.
- In the summer the shade on both options a & b will be nice to have. I also like that the recreational loop will be longer in option b.
- Same comments as I made for the West options.
- A longer trail through the trees is great for bikers, which is how we would use the trail from our home in Sun City.
- North-south connections important because those are currently established routes that will continue to be used.
- Please keep some of the existing dirt roads / paths as unpaved designated jogging tracks (pedestrians only).
- Honestly, these are both good options.
- Good that you are keeping paved connection to commuter buses stop

- The missing paved sections in B will still be heavily used. The logical plan is to provide multiple pathways through points for the amount of traffic on the trails.
- Option A provides the most connectivity as well as paths along what appears to be unpaved paths already. The section of Option B that is from the "City Utility Facility" and Pleasant Grove Connection where the Blue U-Turn is located should be include as part of Option A. This would allow for users to have two separate looped routes without having to access Pleasant Grove Blvd which is a high traffic stress facility for alternative modes of transit.

Please share any additional comments or questions about the Mahany Park Open Space Trail Project.

- Not pleased with any development within this entire area. Leave it alone.
- I walk the trail a lot. Will be glad to see more paved path. I am a Sun City resident.
- Please keep any traffic away from the homes on Pleasant Grove.
- Just be Conscious about your surroundings, they environment is the best part about Roseville, and it needs to be kept clean and healthy. I'm an athlete these things are very important to me!
- Roseville has a very large population of cyclists who prefer off-road type riding using mountain bikes as well as many trail-runners who prefer the reduced physical impact that dirt trails provide. Currently, Roseville offers ZERO officially planned or sanctioned trails for this use. This has led to Roseville citizens traveling away from the city for other locations in Granite Bay, Lincoln, Auburn and Folsom to ride and run on dirt trails, as well as the "spontaneous" creation of trails like those that currently crisscross the Mahany Park Open Space and "Wildlands" to the west of the hospital. While adding to the paved trail network is important, it is not the only way to improve citizens access to quality recreation in our city.
- New to the area...just found the ravine trail from old town to Sierra College Rd. Based on that trail I wholeheartedly support this project. It will be a wonderful addition to our neighborhood and city.
- Did you know coyotes come into that field at night and pass under the bridges on Pleasant Grove into Sun City? Occasionally they can be seen early morning returning to the golf course. Also, thank goodness, we still might Hear and see a pheasant. Early in the spring a great horned owl had a nest with her 2 babies in this area. A lot of people responsibly use the area, but I fear encouraging Even more people with PAVED trails might scare these beautiful animals away. Can't it just stay the way it is with the exception of those bridges??
- Please provide water fountain, including lower connection for dog water too.
- Curves, inclines, declines, bridges, loops, trees, creeks, all of these features create a fun trail to recreate on. Don't avoid the features that are already there. Put as much of the trail next, in, over and through them.
- Please add a restroom.
- Let's keep it as natural habit as possible. That's why people attend the area. Keep it simple.
- Again, PLEASE consider a variety of pave/non-paved trail options.
- Would be nice to have trail connect somewhere to parking lot in front of Riley Library where there is plenty of parking that doesn't compete with the dog park and Pony League baseball fields.
- Please maintain some non-paved trails in the for easy mountain biking. My kids are learning to mountain bike in this area and it is great to have a few miles of dirt trail so close by. I am also in favor of

paved multi-use trail(s) as well for walks and running, especially to connect the new neighborhoods with the trail system.

- Please create the main bike path on the south end of the park where the most traffic already is, and trail would have little to no environment impact.
- The idea of additional trails in the area is always a big plus for Roseville residents.
- However, the trails are built, they will add greatly to the recreational value of the adjacent communities for me and fellow bikers/hikers, this will expand our options, especially during wet weather months. And I favor finding ways to protect habitat and undo the ways that social trails have impacted the habitat. Are there volunteer groups interesting in being ""friends of Mahany Park?"" Perhaps a volunteer organization could help with certain maintenance and improvement. Examples: restoring signs that explain the habitat, adding rest stops, doing fund raising for other maintenance.
- I am just hoping that people on bikes will stop creating their own paths through the sensitive habitat areas. I love the idea of making the area more accessible, especially since I often have a stroller.
- It would be really cool if you could build fun flowy mountain bike trails with jumps
- So excited. Roseville is such a great place to live.
- How will this be paid for. Developers W. Subdivisions should be paying for this green belt park.
- I didn't see the first survey, but this is one of my favorite areas to ride my bike through. One of my favorite things about Roseville is the great bike lanes and paths that make it easy for me and my family to go by bike.
- Love this. Looking forward to riding from West Park to Mahany on these trails very soon!
- Please, please choose to protect our wildlife first.
- If option C for the west side is selected, there should be a pedestrian/bicycle bridge to safely cross Fiddyment road since vehicles pass at high speeds.
- I am against any of these projects. The open space should be left as it is - natural for all of the creatures that inhabit the area to have their habitat and for the few people that walk on the natural paths or ride a bicycle to enjoy nature as it is.
- It sure would be nice if there were cross walks across the main streets where the trails terminate. Just to give the cars a heads up that there may be pedestrian traffic. I'm going to cross weather there is a cross walk or not (I do walk my bike). I do not like riding my bicycle the wrong direction on the road and I am not going to walk 1500 yards to the corner to cross at a light.
- Can you do anything to beautify that old pumping station? It's a decrepit eyesore and it stinks.
- As stated, this project is much needed and very appreciated! This will assist greatly with our children's access to schools and park areas! Thank you for creating an easily understood survey and summary of results!
- Don't forget garbage cans for dog waste and at least two benches.
- This project is long overdue - glad to see it is moving again!
- Need more trees for shade.
- I would hope that the trail being made would be made from as natural a material as possible, perhaps recycled tire shreds? Does it absolutely have to be paved? Natural as possible is best and as little intrusion into the wetlands as possible, the better, as we're already surrounded by plenty of concrete and asphalt. Maybe seek help with native

plantings by getting ahold of the Placer Co. Extension Master Gardeners who can help or direct you to help from college students or other groups promoting native plantings. They can be beautiful!

- Really hard to make a connection to the west end without seeing a map without seeing how it all for together or if I could access the trails safely now and what it would look like.
- It should be built in the least invasive way, so the habitat is protected.
- I love this area because it isn't paved. It's unfortunate that there are power lines there, but we all use electricity, so I get it. I don't see the benefit to paving when people go off trail regardless of a paved path and they are is going to be trampled so we can by construction workers so we can pave it.
- Once again, this project seems unnecessary. People like being in places that look more natural (although the power lines pretty much ruin that).
- It would be great to have some outdoor exercise equipment for the community, such as pull-up bars, parallel bars, and ab stations. Would really help encourage healthy lifestyle fitness practices for the community and for Woodcreek high students. The cost and maintenance would be very low but provide a lot of value to residents.
- Benches!
- Please create an undercrossing on Fiddyment Rd to create a safe way to cross Fiddyment Rd by connecting the proposed Mahany Trail to the future trail just on the other side of Fiddyment Rd serving the West Park and Sierra Vista neighborhoods south of Pleasant Grove Blvd.
- Though I live in Citrus Heights, I frequently use the multi-use trail systems in Roseville.
- In addition to Option A, there should be a bridge going over the Riparian habitat to connect to the existing path that stops just short of the creek. A paved path can then connect the Pleasant Grove sidewalk to the bridge. Currently, people bring make-shift materials to build their bridge...
- This would be wonderful! I'm a runner, and I much prefer the trails to running along busy streets.
- Very much looking forward to the improvements - thank you so much for doing this and for allowing community input!
- It's hard to favor any of these options when I live on the west side of Fiddyment. One of my main concerns is the traffic that turns south onto Fiddyment from PGB. Most motorists are too focused on the green light when trying to get south regardless if there are pedestrians walking in crosswalks. What kind of viable option would be available to connect the path from west park neighborhood? I am a cyclist that on average rides 1-2 hundred miles a week.
- Please make connecting the existing trails within Roseville a priority.
- Repeating my earlier comment here, but basically you have a decent amount of trail runners and off-pavement dirt trail users in the open spaces. This applies to current spaces, and future plans. If these users are unknowingly impacting the local species and environments, is it possible to have them accommodated in the plans for new trail work? Meaning, include in the plan for dirt trails that are of commensurate length to the paved trails with similar amenities (access to shade, logical routing, enough distance to be useful for runners, signage)? Also, recommend including enough groomed dirt trail directly adjacent/off the side of the paved trail so users can pass each other while maintaining more reasonable social distance. When the paved trails of this size are busy it is hard to maintain a social distance...except when there is enough room to step off the trail by four to six feet and keep running on

the side gravel/dirt. Hope that makes sense.

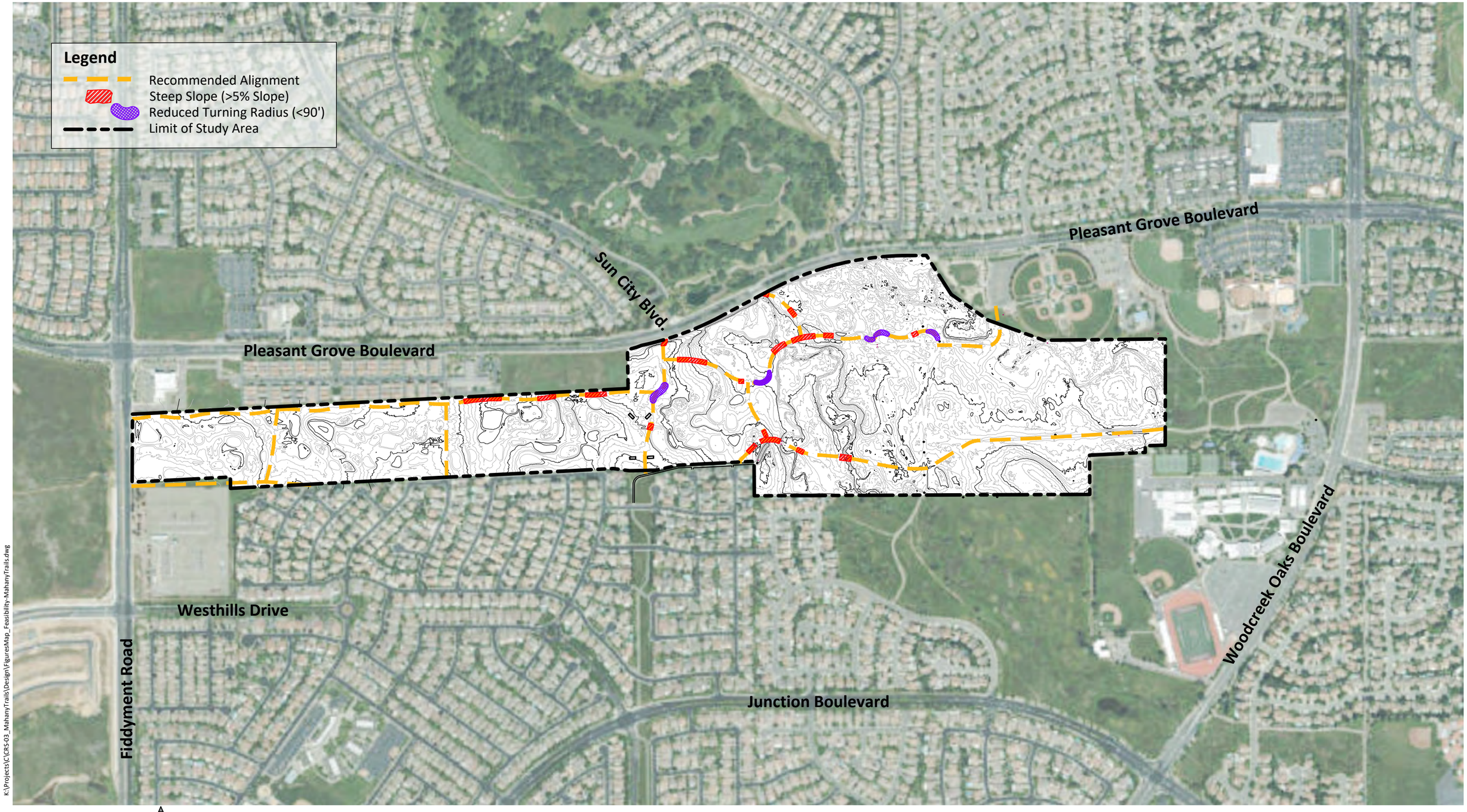
- I like to option you have proposed. It will be a great place to ride or walk when it is complete.
- It would be helpful if the plan also provided for a multi-use trail adjacent and parallel to the sidewalk(s) along Pleasant Grove Avenue, instead of depending on the use of sidewalks along Pleasant Grove Avenue. It is important that the plan provides for public bathrooms.
- For the west side, I would oppose any option that presages a new stoplight on Fiddyment. Please see previous comments in favor of a Dirt/gravel walk/run shoulder to the new paved trails for lower impact walking; and in opposition to benches and potties that encourage after-dark substance abuse & mischief. A few well-placed trash cans and dog stations would be awesome! Am concerned about the use of strollers on these trails - I recently had to detour around a group of three. Strollers that completely took up the trail, necessitating off-trail passage by everyone else.
- Please have the high school students put their input in, I think they would be honored to be included
- I think Roseville is great in how it creates these parks and trails for people. Families included. Though I think more porta-potti's would be nice...especially for families with kids. Adding trails in this park is a wonderful idea!
- A parallel dirt trail for runners and the Woodcreek HS MTB team would really be appreciated. I run in parks to avoid pavement.
- I am so happy this is finally getting done.
- The west option is boring. People are not going to walk along a fence line. They are going to continue to use the trail right thru the middle. There are NO parking options for getting on the trail in the Fiddyment area. The Eskaton apt lot is private and we already have scofflaws from the Camino Real homes parking in our lot because they don't have enough parking for their residents. CVS won't want people parking in their lot. The vacant land behind CVS is already a nightmare with abandoned cars, motorhomes on the dirt etc. and the city won't do anything about it. The trailer has been there 3 years and there are unregistered cars that have been their 2-3 years!
- This plan is long overdue and would create an environmentally conscious trail access for everyone.
- I'd love to see the trail eventually connect easily to the trail that goes through Diamond Oaks to get to the Fountains.
- I run early morning. I live between Junction and Baseline and use the bike path to head over to the Mahany area. I also will use the same are to do banking and light groceries. I also cross Woodcreek at Mahany Pool and use the bike paved area up there. I would love additional bike/paved space to connect over to Pleasant Grove and the Sun City area.
- I use the Bear Dog Park very often and appreciate trails connecting the communities to this park to ensure the continued use of the park. Please consider lighting along this path as users who would use the trail late at night may not feel safe.

This page intentionally left blank

Appendix E

Grading Constraints

This page intentionally left blank



0 600 FEET

K:\Projects\CCRS-03_MahanyTrails\Design\FiguresMap_Feasibility-MahanyTrails.dwg

HELIX Environmental Planning

Grading Constraints

Appendix E

TRANSPORTATION COMMISSION COMMUNICATION

Title:	Mahany Park Open Space Multi-Use Trail Feasibility Study
Contact:	Jeannie Gandler jgandler@roseville.ca.us 916-746-1289

Meeting Date: 5/18/2021
Item #: 5.1.

RECOMMENDATION

Staff recommends the Transportation Commission request the City Council accept the Mahany Park Open Space Multi-Use Trail Feasibility Study and direct staff to pursue funding for the next steps leading to trail construction.

BACKGROUND

The approximately 133-acre Mahany Park Open Space Study Area (Study Area) is located in western Roseville between Fiddyment Road and Woodcreek Oaks Boulevard, south of Pleasant Grove Boulevard. The study area is adjacent to Mahany Park, the Roseville Aquatics Complex, and Woodcreek High School on the east and bounded by residential development on the north and south. Although part of the project area is a public park, most of the area was designated as an open space preserve in the early 1990's when residential construction projects were approved along the southern border of the Study Area. At that time, the west half of the Mahany Park Open Space was established as a preserve, and approximately 10 acres of vernal pools were created and interspersed with naturally occurring vernal pools throughout the area. The Silverado Oaks Urban Reserve, another open space preserve, is also located immediately south of the Study Area.

Study Goals and Process
The purpose of this feasibility study is to explore the potential for a paved multi-use trail through the Mahany Park Open Space, resulting in a conceptual alignment, cost estimates and next steps leading to construction. Helix Environment Planning was hired to complete the study which included the following tasks:

- Establish a Project Development Team comprised of the consultant team and relevant City staff;
- Field walks and preparation of Biological Resources, and Opportunities and Constraints reports;
- Develop and implement a robust public engagement program to learn about current use and desired uses of the open space area;
- Evaluate previously approved planning documents and suggested trail alignments including the City of Roseville Bicycle Master Plan (BMP), the Roseville Open Space and Overarching Management Plan (OSOMP) and Specific Plans for developments adjacent to the area;
- Consultation with regulatory agencies regarding acceptable uses in the open space;
- Develop potential trail alignments for public review;
- Evaluate trail alignments based on public review; and,
- Develop a recommended alignment and cost estimate.

As described above, the Study Area includes open space and open space preserves that were established to protect natural resources, including vernal pools, wetlands, creeks and oak trees. However, the area has become popular for walking, running and biking and many user-created dirt paths have been established through the area. A paved, connected trail system through the open space may reduce impacts to natural resources, would provide additional year-round recreational opportunities, and would improve the connectivity of the City's trail system.

A trail through this area has been considered in several previous planning documents, including the Roseville Open Space Overarching Management Plan (OSOMP), the City of Roseville Bicycle Master Plan, and Specific Plans for developments adjacent to the area. This study refines the trail alignments previously considered in those documents based on site conditions, public engagement, information gathered from regulatory, utility, and City agencies and input from the City's project development team.

Public Engagement
A robust public engagement process was developed to inform the public about the study, current conditions, and to learn about potential user preferences leading to a recommended trail alignment. However, due to COVID-19 precautions and public health guidelines, public engagement components had to be adjusted. Methods of engaging the public and informing them about the study and the public engagement process and components included:

- Direct mailers
- News feature on ABC 10

- Email newsletters
- Facebook, Twitter, Instagram, Nextdoor notifications
- Signage in the project area.

Additionally, a project website was created and updated frequently by City staff, and includes an informational video. In-person workshops were replaced with two interactive online surveys. The first survey was designed to inform the public about the study, to learn how people currently use the open space, and how they would like to use the open space. The second online survey presented trail alignment alternatives based on information from the first online survey, field walks, site analysis including Biological Resources, and Opportunities and Constraints reports, assessment of existing planning documents, consultation with regulatory agencies, phone interviews with stakeholders including Woodcreek High School biology and extra-curricular program teachers, and utility agencies.

Evaluation of Alignment Options

Trail alignment options, developed from the first public engagement/online survey along with a thorough assessment of existing conditions, were presented in the second public engagment/online survey. To simplify the presentation of the trail alignment options, the Study Area was split into east and west sections. Three trail alignment options were developed for the western half of the Study Area and two trail alignment options were developed for the eastern half of the Study Area. Any of the western trail alignment options would connect with either of the eastern trail alignment options.

The western and eastern trail alignment options presented in the second online survey, also listed specific features of each trail alignment which contributed to the suggested location of the trail. Trail alignments were chosen that would include some or all of the following features:

- Avoid sensitive habitats including vernal pools
- Provide shaded areas
- Provide a points of interest/educational opportunities
- Provide north-south connections through the open space to neighborhoods, shopping, schools, parks, roads, and transit stops
- Close gaps in the existing paved trail system by connecting to existing paved trails
- Connect to a planned trail in an adjacent development
- Connect to roadways near controlled intersections

A recommended alignment was developed based on thorough site assessments and the results received from the second public engagement/online survey.

Recommended Trail Alignment

The recommended trail alignment was developed using information from existing planning documents, site assessments resulting in the Biological Resources, and Opportunities and Constraints reports, interviews with stakeholders, a robust public engagement program including two online interactive surveys, consultation with regulatory agencies, and ongoing coordination with City departments. The recommended trail alignment combines elements of the western and eastern trail alignment options presented in the second public engagement/online survey. It closes gaps in the existing bikeway system with approximately 2.4 miles of new trail through the Study Area. The proposed alignment is comprised of paved trails which provide varying lengths of recreational loops and connect users to all existing and planned trails surrounding and leading to the Mahany Park open space. The recommended trail alignment will also:

- Provide multiple connections to the surrounding neighborhoods, schools, transit stops, roads and parks
- Provide permanent all-weather crossings of creeks in the Study Area to allow safe use year-round
- Protect natural resources, including vernal pool habitat
- Maintain required access for existing utilities
- Close gaps in the trail and bikeway system to provide safe, convenient bicycle/pedestrian connections to recreational, educational and employment opportunities for people of all ages, abilities and incomes, and,
- Include a variety of amenities along the trail.

The preliminary cost to construct the trail, including a mid-block crossing on Fiddyment Road, ranges from 4.3 million dollars using standard paving materials to 6.7 million dollars if permeable materials are used throughout. This cost estimate includes all of the remaining steps to complete the project, which include additional traffic studies for a proposed mid-block crossing of Fiddyment Road, geotechnical studies, additional studies required by regulatory agencies, preliminary engineering, environmental reviews, permitting, final design, and construction.

Funding

Funding for the next steps of this project have not been identified. At City Council direction, staff will pursue funding through various federal, state and local sources over the next several years to complete the project. General Fund and Measure B funds were not used for this study and are not used for multi-use trail construction.

Respectfully Submitted,

Jeannie Gandler, Administrative Analyst II/Bikeways

Jason Shykowski, Public Works Director

COUNCIL COMMUNICATION

CC #: 1524
File #: 0600-02

Title: Out-of-State Travel Request - Police Department
Contact: Mark Peinado 916-774-5021 mcpeinado@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 7.34.

RECOMMENDATION TO COUNCIL

Staff request that Council approve out-of-state travel for four School Resource Officers (SROs) to attend a Campus Safety Conference in July, located in San Antonio, Texas.

BACKGROUND

The Roseville Joint Union High School District (RJUHSD) plans to implement a multi-disciplinary behavioral threat assessment and management model at each campus. Roseville Police Department's SROs will be closely involved with the implementation and training of this model and will be involved on each multi-disciplinary team.

The 2021 Campus Safety Conference is an educational conference that brings together security, public safety, emergency management, administration and facilities responsible for protecting K-12 and higher education districts and campuses from across the country. By attending this conference, Roseville Police Department's SROs will be able to learn from experienced professionals and explore methods and leading practices in safety and security.

FISCAL IMPACT

The RJUHSD will be fully funding all travel and training expenses for three officers. The total cost for the fourth officer to attend this conference is $1,616, which includes flight, meals and hotel. There are sufficient funds in the proposed FY2021-22 Police Social Services training budget in the General Fund to cover the expense.

ENVIRONMENTAL REVIEW

The California Environmental Quality Act (CEQA) does not apply to activities that will not result in a direct or reasonably foreseeable indirect physical change in the environment, or is otherwise not considered a project as defined by CEQA Statute §21065 and CEQA State Guidelines §15060(c)(3) and §15378. Approval of out-of-state travel meets the above criteria and is not

subject to CEQA. No additional environmental review is required.

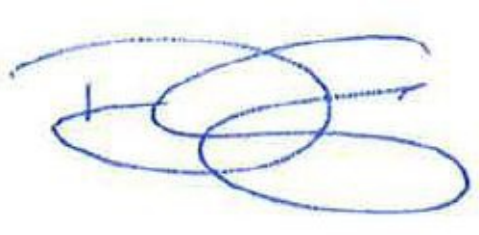
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Goal C - Maintain a safe and healthy community

Respectfully Submitted,

Mark Peinado, Management Analyst

Troy Bergstrom, Police Chief



_____
Dominick Casey, City Manager

ATTACHMENTS:
Description

COUNCIL COMMUNICATION

CC #: 1517
File #: 0400-07

Title: Roseville 80 - North Van Parking Lot - Parcel Map
Contact: David Samuelson 916-774-5442 dsamuelson@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 7.35.

RECOMMENDATION TO COUNCIL

It is recommended that the City Council take the following actions:

1. Approve the parcel map on file with the City Clerk and accept on behalf of the public the easements offered thereon, and approve the abandonment of the easements listed thereon.

BACKGROUND

The Development Services - Engineering section has reviewed the subject parcel map and found that it is in compliance with the Subdivision Map Act and the City's Subdivision Ordinance and all conditions of the tentative map have been met.

This map will be creating four industrial parcels.

FISCAL IMPACT

No fiscal impact to the General Fund.

ENVIRONMENTAL REVIEW

The project consists of a minor land division resulting in four parcels in an urbanized area zoned for industrial purposes; therefore, the project is categorically exempt from the provisions of the California Environmental Quality Act (CEQA) pursuant to CEQA Guidelines Section 15315, and Section 305 of the City's CEQA Implementing Procedures.

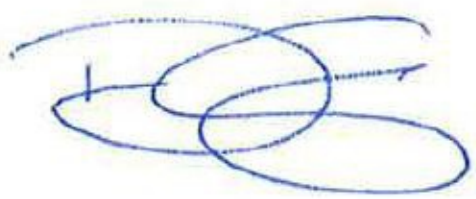
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Goal F - Invest in well-planned infrastructure and growth

Respectfully Submitted,

David Samuelson, Associate Engineer

Mike Isom, Development Services Director



_____

Dominick Casey, City Manager

ATTACHMENTS:

Description

roseville 80 parcel map

BOOK _____ OF PARCEL MAPS, PAGE _____

PARCEL MAP

ROSEVILLE 80 - NORTH VAN PARKING LOT & DSR2_P1

SUBDIVISION NO. PL20-0107
BEING A SUBDIVISION OF PARCEL 4, ROSEVILLE 80
36 PARCEL MAPS 10, PLACER COUNTY RECORDS, BEING A
PORTION OF SECTIONS 21 & 28, T.11N., R.6E., M.D.M.
CITY OF ROSEVILLE, COUNTY OF PLACER, CALIFORNIA
APRIL, 2021
SHEET 1 OF 3

kpff

2250 Douglas Blvd., Suite 200
Roseville, CA 95661
O: 916.772.7688
F: 916.772.7699
www.kpff.com

OWNER'S STATEMENT:

THE UNDERSIGNED HEREBY STATE THAT THEY ARE THE OWNERS OF OR HAVE SOME RIGHT, TITLE OR INTEREST IN THE REAL PROPERTY INCLUDED WITHIN THIS SUBDIVISION; THAT THEY HEREBY CONSENT TO THE PREPARATION AND RECORDATION OF THIS PARCEL MAP OF ROSEVILLE 80 - NORTH VAN PARKING LOT & DSR2_P1; AND DO HEREBY OFFER FOR DEDICATION AND DO HEREBY DEDICATE FOR PARTICULAR PURPOSES THE FOLLOWING:

THE REAL PROPERTY DESCRIBED BELOW IS DEDICATED AS AN EASEMENT FOR PUBLIC PURPOSES:

A. THAT CERTAIN 16 FOOT WIDE EASEMENT FOR PEDESTRIAN ACCESS AND THE INSTALLATION AND MAINTENANCE OF BUS SHELTERS, TOGETHER WITH ANY AND ALL APPURTENANCES PERTAINING THERETO, ON, OVER, UNDER, AND ACROSS THE STRIP OF LAND AS SHOWN ON SHEET 2 OF 3 OF THIS MAP.

B. THAT CERTAIN 8.5 FOOT EASEMENT FOR PEDESTRIAN ACCESS, ON, OVER, UNDER, AND ACROSS THE STRIP OF LAND SHOWN ON SHEET 2 OF 3 OF THIS MAP.

THE REAL PROPERTY DESCRIBED BELOW IS DEDICATED AS AN EASEMENT FOR PRIVATE PURPOSES:

A. PRIVATE RECIPROCAL ACCESS AND UTILITY EASEMENT, ON, OVER, UNDER, AND ACROSS THE STRIP OF LAND SHOWN HEREON ON SHEET 2 OF 3 OF THIS MAP FOR THE MUTUAL BENEFIT OF PARCELS 2, 3 AND 4.

ROSEVILLE 80 LAND, LLC, A DELAWARE LIMITED LIABILITY COMPANY

BY: PDC SACRAMENTO LLC, A DELAWARE LIMITED LIABILITY COMPANY, ITS MANAGER

BY:_____
TIMOTHY SCHAEDLER — DATE
LOCAL PARTNER

CITY CLERK'S STATEMENT:

I HEREBY STATE THAT THE CITY COUNCIL OF THE CITY OF ROSEVILLE HAS APPROVED THIS PARCEL MAP OF ROSEVILLE 80 - NORTH VAN PARKING LOT & DSR2_P1 AND HAS ACCEPTED ON BEHALF OF THE PUBLIC THE EASEMENTS OFFERED HEREON FOR DEDICATION AND HAS APPROVED THE ABANDONMENT OF THE EASEMENTS LISTED WITHIN NOTE 2 ON SHEET 2.

DATED _____

_____
CITY CLERK, CITY OF ROSEVILLE

_____
ASSISTANT CITY CLERK

NOTARY'S ACKNOWLEDGEMENT:

A NOTARY PUBLIC OR OTHER OFFICER COMPLETING THIS CERTIFICATE VERIFIES ONLY THE IDENTITY OF THE INDIVIDUAL WHO SIGNED THE DOCUMENT TO WHICH THIS CERTIFICATE IS ATTACHED, AND NOT THE TRUTHFULNESS, ACCURACY, OR VALIDITY OF THAT DOCUMENT.

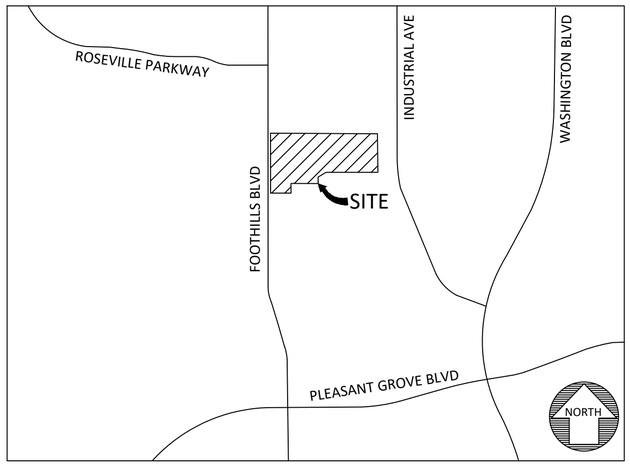
STATE OF _____
COUNTY OF _____

ON _____ BEFORE
ME, _____ A NOTARY PUBLIC PERSONALLY APPEARED
_____,
WHO PROVED TO ME ON THE BASIS OF SATISFACTORY EVIDENCE TO BE THE PERSON(S) WHOSE NAME(S) IS/ARE SUBSCRIBED TO THE WITHIN INSTRUMENT AND ACKNOWLEDGED TO ME THAT HE/SHE/THEY EXECUTED THE SAME IN HIS/HER/THEIR AUTHORIZED CAPACITIY(IES), AND THAT BY HIS/HER/THEIR SIGNATURE(S) ON THE INSTRUMENT THE PERSON(S), OR THE ENTITY UPON BEHALF OF WHICH THE PERSON(S) ACTED, EXECUTED THE INSTRUMENT.

I CERTIFY UNDER PENALTY OF PERJURY UNDER THE LAWS OF THE STATE OF CALIFORNIA THAT THE FOREGOING PARAGRAPH IS TRUE AND CORRECT.

WITNESS MY HAND AND OFFICIAL SEAL

_____
SIGNATURE — PRINT NAME
MY REGISTRATION NUMBER:_____
MY COMMISSION EXPIRES:_____
MY PRINCIPLE PLACE OF BUSINESS IS THE COUNTY OF _____



VICINITY MAP
NOT TO SCALE

SURVEYOR'S STATEMENT:

THIS MAP WAS PREPARED BY ME OR UNDER MY DIRECTION AND IS BASED UPON A FIELD SURVEY IN CONFORMANCE WITH THE REQUIREMENTS OF THE SUBDIVISION MAP ACT AND LOCAL ORDINANCES AT THE REQUEST OF ROSEVILLE 80 LAND, LLC, A DELAWARE LIMITED LIABILITY COMPANY IN APRIL 2020. I HEREBY STATE THAT THIS PARCEL MAP OF ROSEVILLE 80 - NORTH VAN PARKING LOT & DSR2_P1 SUBSTANTIALLY CONFORMS TO THE APPROVED OR CONDITIONALLY APPROVED TENTATIVE MAP THAT ALL MONUMENTS SHOWN HEREON ARE OF THE CHARACTER AND OCCUPY THE POSITIONS INDICATED AND THAT SAID MONUMENTS ARE SUFFICIENT TO ENABLE THE SURVEY TO BE RETRACED.

DIGITALLY SIGNED — 4/21/2021
TROY TETSUKA, PLS NO. 7630 — DATE

PROFESSIONAL LAND SURVEYOR
TROY T. TETSUKA
No. 7630
DIGITALLY SIGNED
Exp. 12/31/22
STATE OF CALIFORNIA

CITY ENGINEER'S STATEMENT:

I HEREBY STATE THAT I HAVE EXAMINED THIS PARCEL MAP OF ROSEVILLE 80 - NORTH VAN PARKING LOT & DSR2_P1 AND FIND IT TO BE SUBSTANTIALLY THE SAME AS THE TENTATIVE MAP ON FILE AND ANY APPROVED ALTERATIONS THEREOF; THAT ALL PROVISIONS OF THE SUBDIVISION MAP ACT AND ALL APPLICABLE CITY ORDINANCES HAVE BEEN COMPLIED WITH.

_____ DATE _____
MARC STOUT
CITY ENGINEER, CITY OF ROSEVILLE
R.C.E. #69879 EXPIRATION DATE 9/30/2022

I HEREBY STATE THAT I AM SATISFIED THAT THIS PARCEL MAP OF ROSEVILLE 80 - NORTH VAN PARKING LOT & DSR2_P1 IS TECHNICALLY CORRECT.

FOR MARC STOUT, CITY ENGINEER, CITY OF ROSEVILLE

_____ DATE _____
TIMOTHY G. BLAIR PLS #8278

PROFESSIONAL LAND SURVEYOR
TIMOTHY G. BLAIR
No. 8278
EXP. 12/31/21
STATE OF CALIFORNIA

RECORDER'S STATEMENT:

FILED THIS _____ DAY OF _____, 20_____, AT _____ _____M. IN BOOK

_____OF PARCEL MAPS, AT PAGE _____ IN THE OFFICE OF THE PLACER COUNTY RECORDER,

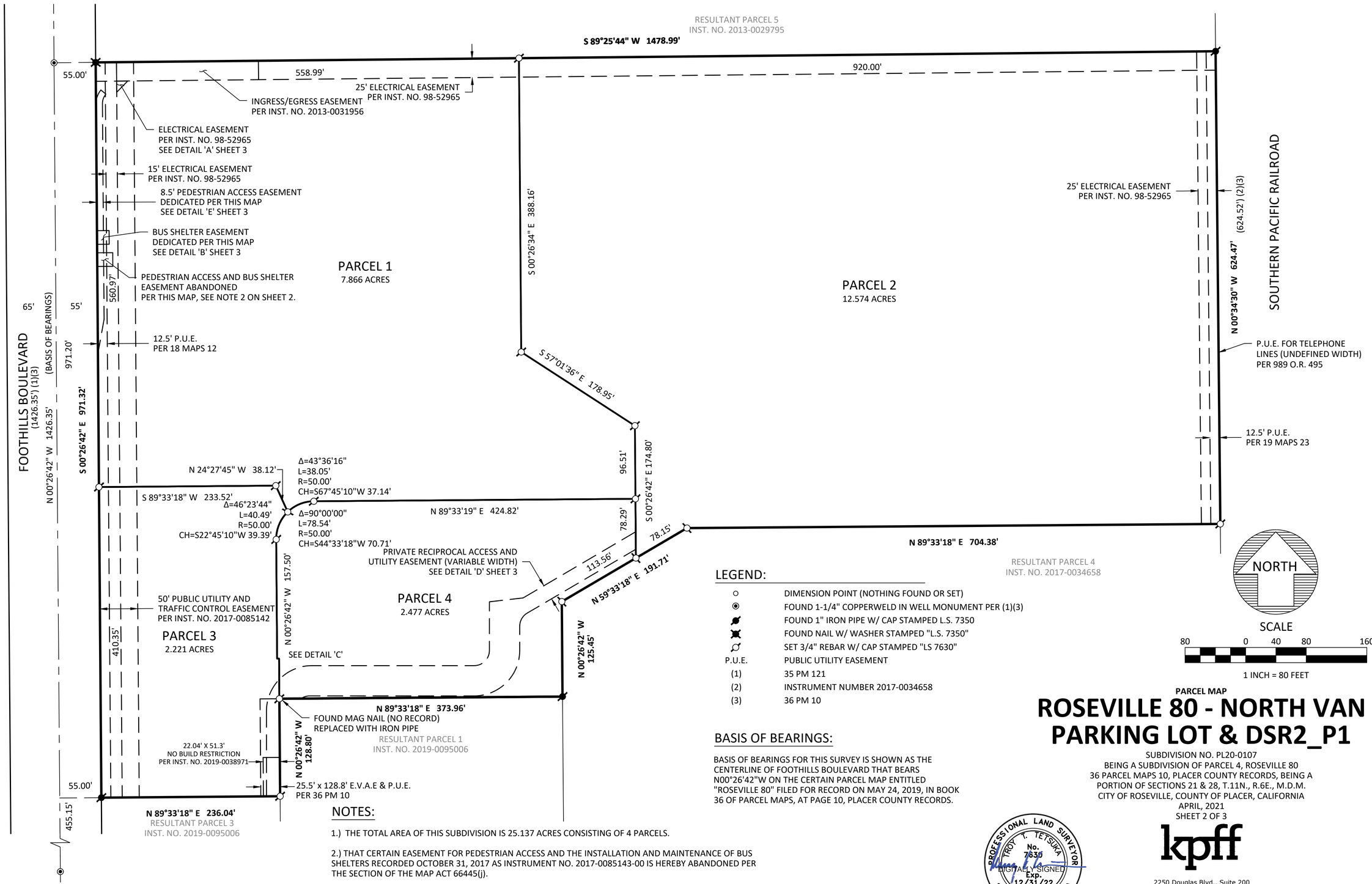
AT THE REQUEST OF KPFF CONSULTING ENGINEERS.

DOCUMENT NO. :2021 - _____

RYAN RONCO
RECORDER OF PLACER COUNTY

BY_____
DEPUTY

BOOK _____ OF PARCEL MAPS, PAGE _____



LEGEND:

○	DIMENSION POINT (NOTHING FOUND OR SET)
◉	FOUND 1-1/4" COPPERWELD IN WELL MONUMENT PER (1)(3)
◪	FOUND 1" IRON PIPE W/ CAP STAMPED L.S. 7350
⊠	FOUND NAIL W/ WASHER STAMPED "L.S. 7350"
◪	SET 3/4" REBAR W/ CAP STAMPED "LS 7630"
P.U.E.	PUBLIC UTILITY EASEMENT
(1)	35 PM 121
(2)	INSTRUMENT NUMBER 2017-0034658
(3)	36 PM 10

BASIS OF BEARINGS:

BASIS OF BEARINGS FOR THIS SURVEY IS SHOWN AS THE CENTERLINE OF FOOTHILLS BOULEVARD THAT BEARS N00°26'42"W ON THE CERTAIN PARCEL MAP ENTITLED "ROSEVILLE 80" FILED FOR RECORD ON MAY 24, 2019, IN BOOK 36 OF PARCEL MAPS, AT PAGE 10, PLACER COUNTY RECORDS.

NOTES:

1.) THE TOTAL AREA OF THIS SUBDIVISION IS 25.137 ACRES CONSISTING OF 4 PARCELS.

2.) THAT CERTAIN EASEMENT FOR PEDESTRIAN ACCESS AND THE INSTALLATION AND MAINTENANCE OF BUS SHELTERS RECORDED OCTOBER 31, 2017 AS INSTRUMENT NO. 2017-0085143-00 IS HEREBY ABANDONED PER THE SECTION OF THE MAP ACT 66445(j).

3.) GEOTECHNICAL REPORT BY GULARTE & ASSOCIATES, INC. DATED JUNE 7TH, 2019 IS ON FILE WITH THE CITY ENGINEERING DIVISION.

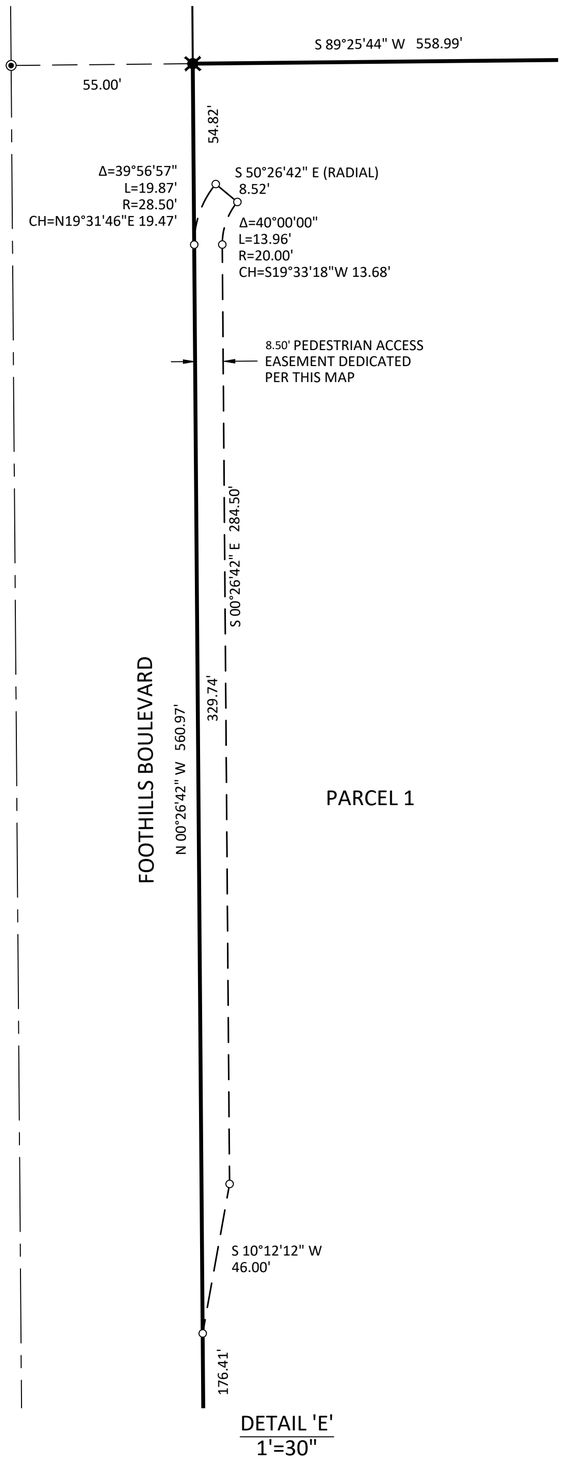
PARCEL MAP

ROSEVILLE 80 - NORTH VAN PARKING LOT & DSR2_P1

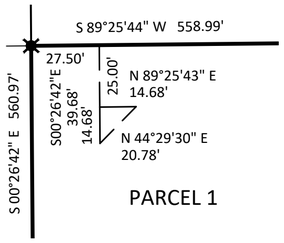
SUBDIVISION NO. PL20-0107
BEING A SUBDIVISION OF PARCEL 4, ROSEVILLE 80
36 PARCEL MAPS 10, PLACER COUNTY RECORDS, BEING A
PORTION OF SECTIONS 21 & 28, T.11N., R.6E., M.D.M.
CITY OF ROSEVILLE, COUNTY OF PLACER, CALIFORNIA
APRIL, 2021
SHEET 2 OF 3

PROFESSIONAL LAND SURVEYOR
TROY T. TETSUKA
No. 7630
DIGITALLY SIGNED
Exp. 12/31/22
STATE OF CALIFORNIA

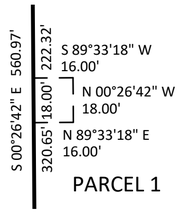
kpff
2250 Douglas Blvd., Suite 200
Roseville, CA 95661
O: 916.772.7688
F: 916.772.7699
www.kpff.com



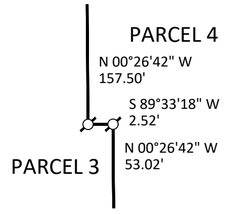
DETAIL 'E'
1"=30"



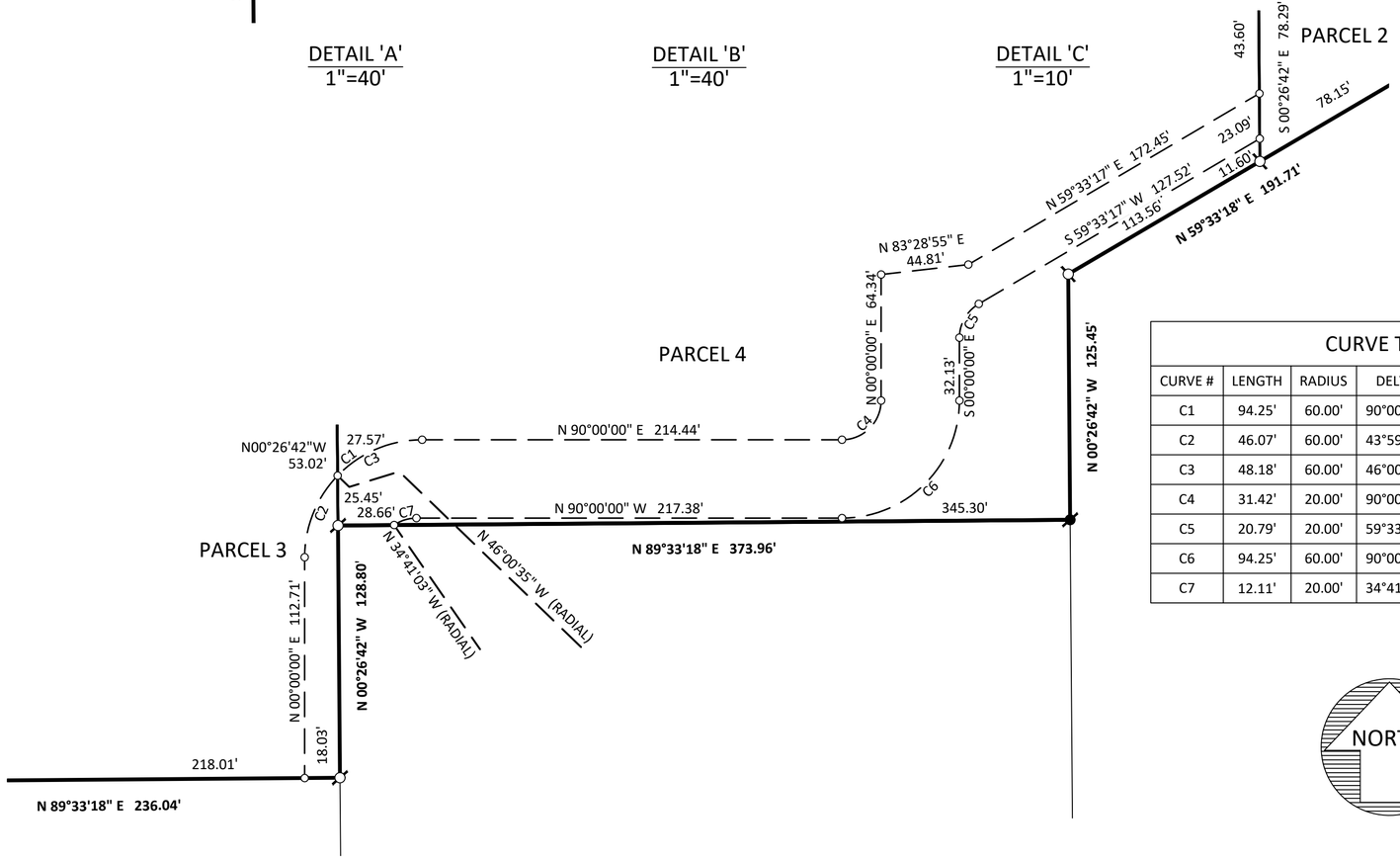
DETAIL 'A'
1"=40'



DETAIL 'B'
1"=40'



DETAIL 'C'
1"=10'



DETAIL 'D'
1'=50"

CURVE TABLE					
CURVE #	LENGTH	RADIUS	DELTA	CH BEARING	CH LENGTH
C1	94.25'	60.00'	90°00'00"	N45°00'00"E	84.85'
C2	46.07'	60.00'	43°59'25"	N21°59'42"E	44.94'
C3	48.18'	60.00'	46°00'35"	N66°59'42"E	46.90'
C4	31.42'	20.00'	90°00'00"	N45°00'00"E	28.28'
C5	20.79'	20.00'	59°33'17"	S29°46'38"W	19.87'
C6	94.25'	60.00'	90°00'00"	S45°00'00"W	84.85'
C7	12.11'	20.00'	34°41'03"	S72°39'28"W	11.92'

PARCEL MAP

ROSEVILLE 80 - NORTH VAN PARKING LOT & DSR2_P1

SUBDIVISION NO. PL20-0107
BEING A SUBDIVISION OF PARCEL 4, ROSEVILLE 80
36 PARCEL MAPS 10, PLACER COUNTY RECORDS, BEING A
PORTION OF SECTIONS 21 & 28, T.11N., R.6E., M.D.M.
CITY OF ROSEVILLE, COUNTY OF PLACER, CALIFORNIA
APRIL, 2021
SHEET 3 OF 3



kpff
2250 Douglas Blvd., Suite 200
Roseville, CA 95661
O: 916.772.7688
F: 916.772.7699
www.kpff.com

COUNCIL COMMUNICATION

CC #: 1522
File #: 0102

Title:	Council Discretionary Funds - Roseville Crime Stoppers
Contact:	Heather Blanco 916-746-1171 hblanco@roseville.ca.us Sonia Orozco 916-774-5269 sorozco@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 8.1.

RECOMMENDATION TO COUNCIL

Recommend the City Council consider a request for $2,000 from Council Discretionary Funds for Roseville Crime Stoppers in support of their annual Fourth of July Fun Run.

BACKGROUND

The request is for $2,000 from Council Discretionary Funds for Roseville Crime Stoppers for the annual Fourth of July Fun Run. The funds raised through runners' fees and sponsorship are used for cash rewards for information leading to arrests and convictions in serious crimes committed in Roseville. The funds are also used to grant scholarships for Roseville youth pursuing careers in public safety, and community education on public safety issues.

Roseville Crime Stoppers did not apply for the Citizen Benefits fund in FY2020-21, although they indicated they have applied for grants in the past, but felt the discretionary funds request is more focused on specific event sponsorship.

The Citizens' Benefit Fund was established in 1993 with the net proceeds from the sale of the Roseville Hospital. The City Council may, after receiving the recommendation of the Roseville Grants Advisory Commission, annually appropriate up to 90 percent of the annual earnings of the Citizens' Benefit Fund for the purpose of improving the quality of life for the citizens of the City of Roseville. The City Council, without the recommendation of the Roseville Grants Advisory Commission, may annually appropriate a minor amount up to $15,000 of the annual earnings for the purpose of improving the quality of life in Roseville.

FISCAL IMPACT

There is no fiscal impact to the City's General Fund. Annually, the Assistant City Manager/Chief Financial Officer allocates $15,000 of the annual earnings on the Citizens' Benefit Fund per section 4.06.040 in the Municipal Code and includes it in the annual budget along with the Citizens'

Benefit Fund resources available for appropriation each year. These earnings are restricted for the purpose of improving the quality of life for Roseville residents and appropriated by the City Council. The balance remaining in the Council's Discretionary Funds for FY2020-21 is $16,509.

ENVIRONMENTAL REVIEW

The California Environmental Quality Act (CEQA) does not apply to activities that will not result in a direct or reasonably foreseeable indirect physical change in the environment, or is otherwise not considered a project as defined by CEQA Statute §21065 and CEQA State Guidelines §15060(c)(3) and §15378. The award of funds meets the above criteria and is not subject to CEQA. No additional environmental review is required.

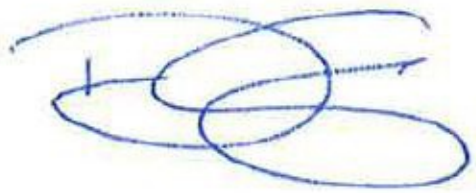
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Goal B - Support community engagement and advocacy

Respectfully Submitted,

Heather Blanco, Management Assistant

Sonia Orozco, City Clerk



_____

Dominick Casey, City Manager

ATTACHMENTS:

Description

Roseville Crime Stoppers Request

Roseville
Crime Stoppers

May 19, 2021

Krista Bernasconi, Mayor
City of Roseville
311 Vernon Street
Roseville, CA 95678

Dear Mayor Bernasconi and City Council:

Roseville Community Crime Stoppers requests a $2,000 sponsorship of its annual Fourth of July Fun Run which serves the community in three important ways:

1) The Fun Run provides Roseville families with an opportunity to enjoy time outdoors together in a safe and healthy activity in celebration of our nation's founding. This year we will be holding the start and finish in Downtown Roseville and have added vendor booths to drive attendance for the Run, Downtown, and during and after the City Parade
2) Roseville Community Crime Stoppers is managing a new software program in cooperation with the Roseville Police Department, having put in place a completely anonymous tip and reward software program for our community
3) Funds raised through runners' fees and sponsorships are used for:
    a. Cash rewards for information leading to arrests and convictions in serious crimes committed in Roseville
    b. Scholarships for Roseville youth pursuing careers in public safety
    c. Community education on public safety issues through distribution of educational materials at public events, and hosting community events such as our Forum on current public safety trends.

The City of Roseville has supported the Crime Stoppers Fourth of July Fun Run for many years with sponsorship. That support, combined with community business and individual sponsorships, provides most of the Crime Stoppers' funding each year. Without it, we would be hard-pressed to support police criminal investigations as we do and provide scholarships to deserving youth and continue our public awareness outreach activities.

Over the 25 years that Crime Stoppers has served the community, we have provided several thousands of dollars in rewards that led to over a hundred convictions and tens of thousands of dollars in recovered property. More than 30 Roseville high school graduates seeking scholarships have received some $30,000 in grants to support their college aspirations. And our Forum on public safety drew some 200 residents. We plan follow up sessions at other venues in the months ahead. The City's annual sponsorships help make these activities possible.

We would greatly appreciate the Council's granting this sponsorship request again this year. If you do, we pledge to apply the funds as we have in the past to doing all we can to keep Roseville a safe place to live, work and play.

Respectfully,

Anne Carpenter, President

COUNCIL COMMUNICATION

CC #: 1534
File #: 0103-33

Title: Placer County 2021 Redistricting Process and Timeline
Contact: Sonia Orozco 916-774-5269 sorozco@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 8.2.

RECOMMENDATION TO COUNCIL

Accept a presentation by Jane Christenson, Placer County Assistant Chief Executive Officer regarding Placer County's 2021 Redistricting process and timeline.

BACKGROUND

Below are excerpts from a memo presented to the Placer County Board of Supervisors at their May 11, 2021 by Jane Christensen, Placer County Assistant Chief Executive Officer. This information requires no action by the Roseville County Council as it is informational only.

The United States Constitution requires a count every ten (10) years of everyone residing in the United States. Information from the U.S. Census is used to help determine where to locate schools, daycare centers, roads/public transportation, hospitals, and other facilities, and is used in making decisions regarding business growth and housing needs. Census data is also used for geographically defining state legislative districts, which initiates a “redistricting” process that begins in the year following a Census. Additionally, U.S. Census data allows county officials to realign supervisorial districts in their counties, considering shifts in population growth since the last Census and assuring equal representation for their constituents in compliance with the “one-person, one-vote” principle of the Voting Rights Act.

The California Elections Code provides basic criteria and process requirements the Board is required to consider in redistricting supervisorial districts. In addition to the Voting Rights Act, consideration is given to the following factors in order of priority: (1) geographic integrity of any local neighborhood or local communities of interest, (2) geographic integrity of any cities or census designated places, (3) easily identifiable and understandable districts bound by natural and artificial barriers, including streets and boundaries of the county when practicable, and (4) encouraging geographical compactness so that nearby areas of population are not bypassed in favor of more distant populations.

At its January 26, 2021 meeting, the Board of Supervisors reviewed a proposed 2021 redistricting timeline. Then, at the February 9, 2021 meeting, the Board approved an updated timeline and authorized the County Planning Commission to serve as the Advisory Redistricting

Commission. The Board also directed staff to initiate work efforts to develop a plan for Placer County supervisorial districts in accordance with State and Federal law. At that time, staff outlined the new laws and requirements for the 2021 process and highlighted the challenges of the then-anticipated federal Census Bureau final data delays which inform map redistricting efforts. These delays, coupled with the state deadlines for county redistricting maps, would result in a significantly compressed timeline for community involvement/outreach over the ensuing year.

Updates from the February 2021 Placer County Board of Supervisors (BOS) Report:

Since the February BOS report, there have been several developments impacting the 2021 Placer County redistricting process and timeline, as summarized below:

- The Federal Census Bureau has announced final data will be provided to the State of California by late summer – slightly earlier than last reported but still much later than the traditional spring data receipt timeframe.

- Consistent with past practice, the State then takes approximately 30 days to review the data to adjust for incarcerated populations before transmitting data to the counties.

- With County final data receipt now anticipated late September, staff was very concerned with the compressed timeline/process, especially given the State's deadline for County redistricting maps, which necessitates Board map approval by ordinance by November 15 (30 days to be effective by current State deadline of December 15).

- Taken together, these delays would allow the County weeks rather than months to create draft maps, obtain public input, draw final maps, and submit them for County Board of Supervisors' approval – a challenging timeline resulting in a compressed window for public map review.

Concerned with the practical impacts of these delays on our Placer County redistricting process, staff worked with Shaw, Yoder, Antwih, Schmelzer & Lange (SYASL), state lobbyists, to advise the Senate Elections and Constitutional Amendment Committee of these challenges. In response, SB 594 (Glazer) has since been advanced to address these compressed timeline issues and provide counties relief in the deadline to redistrict County supervisorial district boundaries. At this writing, SB 594 is moving forward in the legislative process, with final action anticipated before summer. A CEO letter expressing support for this measure is attached, dated April 9, 2021. Also attached is an April 21 letter expressing similar concerns by the CA State Association of Counties (CSAC), the CA Association of Special Districts (CASD), the League of CA Cities (CalCities), Rural County Representatives of CA (RCRC), and Urban Counties of CA (UCC).

Additionally, and in response to increasing public inquiries on the 2021 redistricting process and timeline, County staff has prepared a County redistricting website to provide additional information (www.placer.ca.gov/redistricting). While we anticipate additional updates will be published in the coming months, the current site includes information on:

- the anticipated public meeting schedule for the Advisory Redistricting Commission,
- frequently asked questions (FAQs),
- a mapping hub to provide feedback, access data and view maps when available, and
- the opportunity to sign-up to receive further updates as the process and timeline evolve, pending state legislative action.

This will be a useful resource for interested parties until such time outreach efforts get underway this summer.

Placer County Community Outreach Plans:

For prior redistricting efforts in 2001 and 2011, the County's community outreach included information-sharing with area cities, special districts, school districts, Chambers of Commerce, and Municipal Advisory Committees (MACs). For 2021, staff plans to conduct targeted outreach to cities and special districts such as the Placer County Water Agency, especially as its boundaries are co-terminus with supervisorial district boundaries, as well as hearings with the Advisory Redistricting Commission. Given the still-compressed timeline, other community outreach plans include convening sub-regional town halls (East Placer, Mid-Placer, South Placer), similar to the 2019 Charter Review Committee outreach process, inviting other key stakeholders and ensuring public input is sought in ways that are safe and consistent within current State Covid-19 guidance.

Additionally, the County will provide opportunities to inform the redistricting maps through surveys and public testimony to allow community members to identify geographic areas with common links based upon economic or social interests. The effort to identify communities of interest will also include support from the *Placer Counts Coalition*, which supported the Census outreach effort in 2020. Community outreach efforts will predominantly occur over the summer months (in advance of Census final data receipt this fall) to inform interested parties on the process, milestones, and opportunities for input once map alternatives are available for review/comment.

The timeline for these efforts – based on what is known/anticipated at this writing, is presented below.

Revised 2021 Census Process & Timeline (as of May 11, 2021):

Jan 26 & Feb 9	Board Review/Approval of 2021 Redistricting Process
Feb – May 2021	Staff Analysis of Preliminary Census Data Staff Development of Preliminary Boundary Map Alternatives Staff Advocacy for SB 594 on State Map Deadlines/Requirements 2021 Redistricting Process/Timeline Update to BOS
June 2021	Advisory Redistricting Commission Hearing (tentatively set for June 24)
July – Sept 2021	Pre-Final Data Community Outreach/Subregional Informational Mtgs
Fall 2021	Advisory Redistricting Commission Hearings (dates TBD)
Nov - Dec 2021	BOS Consideration/Action on Revised Boundary Map
Early 2022	Anticipated State Deadline (revised per SB 594) for Revised Boundary Map

The above revised timeline allows for the completion of the Placer County 2021 redistricting effort with ample opportunities for community input/participation, Advisory Redistricting Commission hearings, and Board review/approval, in compliance with Federal/State requirements and the unfortunately compressed timeline due to U.S. Census Bureau final data delays.

FISCAL IMPACT

Not applicable.

ENVIRONMENTAL REVIEW

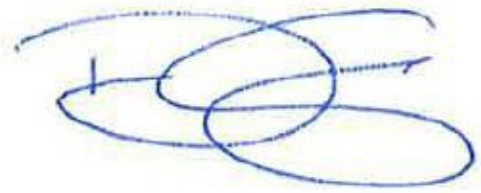
The California Environmental Quality Act (CEQA) does not apply to activities that will not result in a direct or reasonably foreseeable indirect physical change in the environment, or is otherwise not considered a project as defined by CEQA Statute §21065 and CEQA State Guidelines §15060(c)(3) and §15378. A presentation about the Placer County 2021 Redistricting process and timeline meets the above criteria and is not subject to CEQA. No additional environmental review is required.

CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Goal B - Support community engagement and advocacy

Respectfully Submitted,

Sonia Orozco, City Clerk



Dominick Casey, City Manager

ATTACHMENTS:

Description

2021 Placer County Redistricting Process PowerPoint

2021 Redistricting Process



Jane Christenson, Assistant County Executive Officer

May 11, 2021

Background

- Census completed every 10 years
- Impacts funding for schools, infrastructure, housing, and more
- Shifts in population growth help inform redistricting process
- Helps define legislative district boundaries
- Assures compliance with Voting Rights Act



CA Elections Code

- Provides basic criteria and process
- Aligns with Voting Rights Act
- Must consider in this order:
  1. integrity of neighborhoods and communities of interest
  2. integrity of cities and census designated places
  3. natural and artificial barriers, including streets
  4. geographic compactness

Current Timeline

Compressed map review due to data delays



Current Timeline Concerns

Under the current timeline, Placer has roughly **7 weeks** to draft maps, obtain public input, draw final maps, and submit them for BOS approval.

AUGUST 2021

MON	TUE	WED	THU	FRI	SAT	SUN
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

State receives Census data from Feds

SEPTEMBER 2021

MON	TUE	WED	THU	FRI	SAT	SUN
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

Placer receives adjusted Census data

OCTOBER 2021

MON	TUE	WED	THU	FRI	SAT	SUN
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

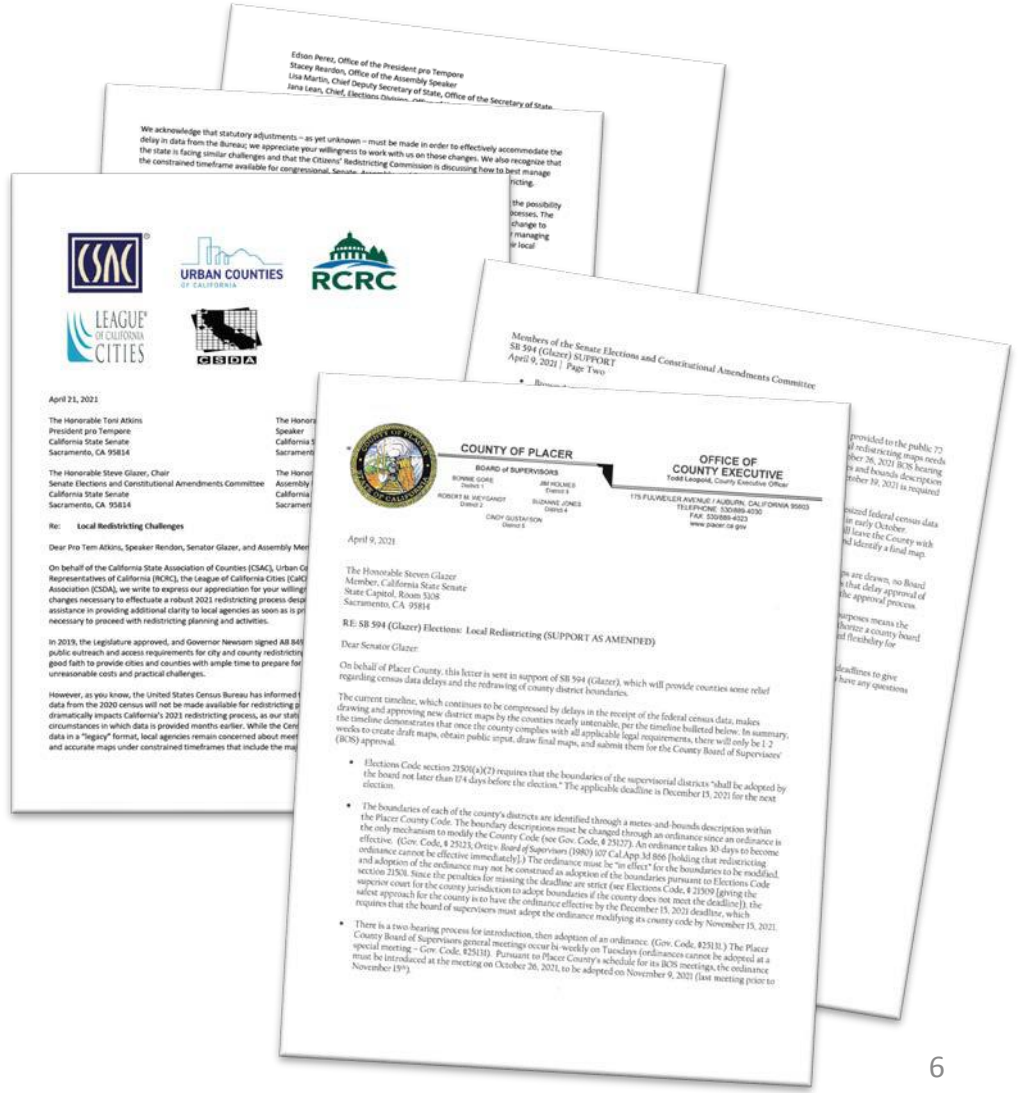
NOVEMBER 2021

MON	TUE	WED	THU	FRI	SAT	SUN
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

Map approval ordinance deadline

SB594 Legislation

- Placer County, CSAC, UCC, RCRC, CalCities, and CSDA sent letters outlining our concerns to the State of California
- SB 594 moving forward to address timeline issues

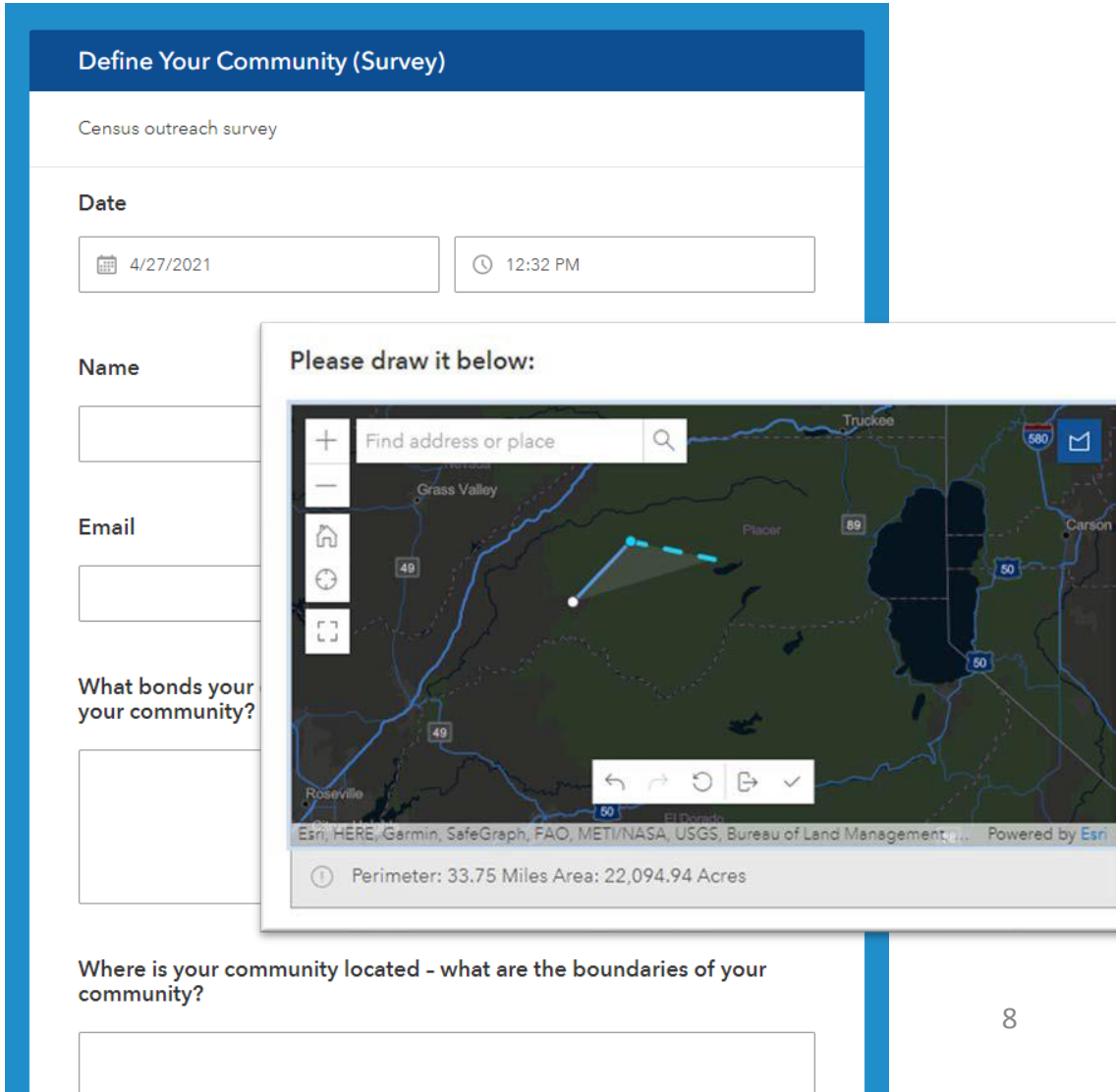


Anticipated Revised Timeline

Feb-May 2021	Staff Analysis of Preliminary Census Data Staff Development of Preliminary Boundary Map Alternatives Staff Advocacy for SB 594 on State Map Deadlines/Requirements 2021 Redistricting Process/Timeline Update to BOS
June 2021	Advisory Redistricting Commission Hearing (tentatively set for June 24)
July-Sep 2021	Pre-Final Data Community Outreach/Subregional Informational Mtgs
Fall 2021	Advisory Redistricting Commission Hearings (dates TBD)
Nov-Dec 2021	BOS Consideration/Action on Revised Boundary Map
Early 2022	Anticipated State Deadline (revised per SB 594) for Revised Boundary Map

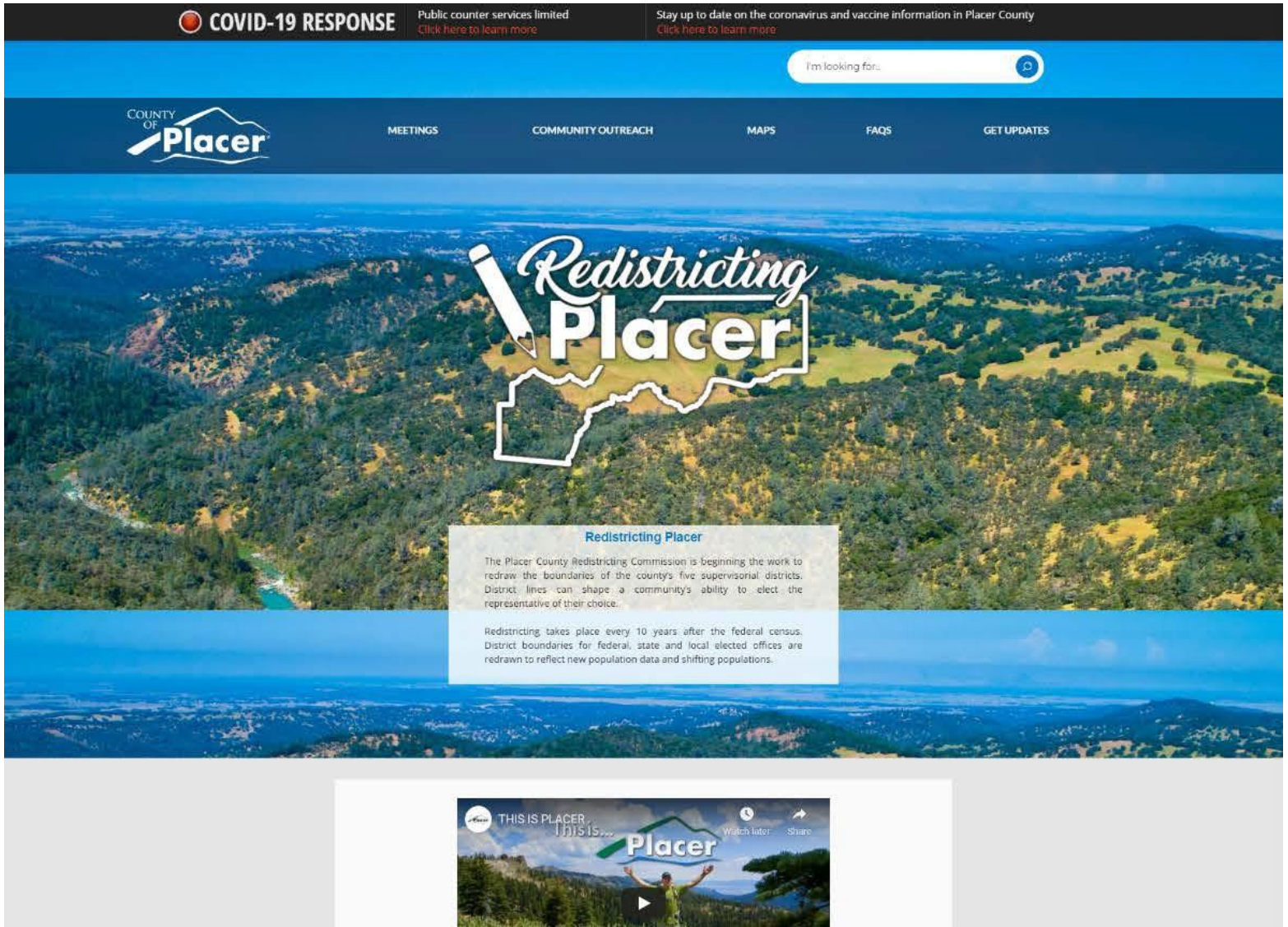
Outreach Strategy

- Redistricting website & survey
- News releases & media outreach
- Social media posts and events
- Weekly newsletters & email blasts
- Regional stakeholder engagement
- Subregional community information meetings



placer.ca.gov/redistricting

- Public meeting schedule
- FAQs
- Mapping hub
- Feedback survey
- Subscribe to updates



How to Participate Now



Visit website



Sign up for updates



Follow us on social

Public Outreach and Education

MAY JUN JUL

Mark Your Calendars



Public Forums



Census Data Delivered



Draft Maps Published



Adoption Hearing

Community Meetings

Commission Hearings

JUL AUG SEPT OCT NOV DEC

Final Maps Approved

Redistricting 101 Video



2021 Redistricting Process



Jane Christenson, Assistant County Executive Officer

May 11, 2021

COUNCIL COMMUNICATION

CC #: 1554
File #: 0108

Title: Results of National Community Survey
Contact: Megan MacPherson Scheid 916-774-5455 mscheid@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 8.3.

RECOMMENDATION TO COUNCIL

Receive results of the National Community Survey conducted among Roseville residents in Spring 2021. Roseville rose to the top of the rankings among hundreds of cities nationwide in a variety of categories related to utilities, city services, economic vibrancy, and quality of life. Commend City staff on residents' acknowledgement of the quality of services the City provides and express appreciation to the community for their support of the City of Roseville.

BACKGROUND

To help inform the deliberations with broad-scale perspectives from residents, Roseville participated for the first time in the National Community Survey (NCS) in January and February 2021. The NCS, conducted in 500 cities in nearly every state in the country, is done in partnership with the International City/County Management Association. The City participated in order to benchmark and track satisfaction levels and priorities over time in our community on a bi-annual basis. This will inform the City's strategic plan, budget, and shed light on perceptions about city and community services.

More than 3,000 surveys were mailed at random to residents, evenly distributed throughout the five districts. The survey was available in English and Spanish. All mailings contained paragraphs in both languages instructing participants on how to complete the survey in their preferred language.

About 1% of the 3,000 mailed invitations or surveys were returned because the household address was vacant or the postal service was unable to deliver the survey as addressed. Of the remaining 2,972 households that received the invitations to participate, 476 completed the survey, providing an overall response rate of 16%. This provides a level of confidence of 95% and a margin of error of plus or minus 5%.

After the survey that was distributed randomly had closed, the same survey was then opened to the entire community to anyone who wanted to provide input. A survey link was provided on the City website, newsletters, and social media. Those results are included separately in the NCS report.

Key highlights from Polco's summary of the National Community Survey

Most of Roseville rankings were higher than both the national average (of 500 cities) and the custom benchmark (of 50 cities nationally of similar size of 100,000-200,000 population). Many rankings were in the top 10 nationally and several were No. 1 in the nation.

- Roseville received the No. 1 ranking as a place to live, for its reputation and image, quality of utility infrastructure, electric utility, wastewater utility, and storm water management.
- No. 2 in the custom benchmark for quality of services provided by the City, overall customer service provided by City employees, and overall economic health.
- In addition, 95% of residents rated Roseville as an excellent or good place to raise children and 83% as a place to retire, both higher than national and custom and benchmarks.
- Overall quality of parks and recreation opportunities was also higher than the custom benchmark at 94% rating as excellent or good, along with recreation centers, availability of paths and walking trails, preservation of open space. 92% gave public library services high marks.
- In terms of safety, 91% rated their overall feeling of safety in Roseville as good or excellent, and the rating jumped to 97% for how safe residents feel in their neighborhood during the day. Fire services received a 97% rating for excellent or good quality.
- Looking at community design, Roseville ranked higher than the custom benchmark for overall appearance, well-designed neighborhoods, overall design and layout of residential and commercial areas, quality of new development, and for both well-planned residential and commercial growth.
- In the areas of mobility, Roseville ranked above the custom benchmark for ease of parking, ease of travel by bicycle, street lighting, street cleaning, sidewalk maintenance, traffic signal maintenance, traffic signal timing, bus or transit services, and street repair.
- The two areas across dozens of data points where Roseville ranked lower than the benchmark were using bus, rail or other public transportation instead of driving, and how important respondents felt it was in the next two years for the Roseville community to focus on residents' connection and engagement with their community.

Government performance was an area in which Roseville received among the highest rankings in the nation. Specifically for the value of services for taxes paid to Roseville, the overall direction that Roseville is taking, generally acting in the best interest of the community, treating residents with respect, treating all residents fairly, being honest, being open and transparent to the public, overall confidence in Roseville government, information residents about issues facing the community, and the job Roseville government does at welcoming resident involvement.

Breaking it down a little further[

Roseville residents enjoy a high quality of life, and the City's utilities contribute to the high marks.

Residents value the quality of life in Roseville, with 9 in 10 giving positive reviews to the City as a place to live and the overall quality of life in the community; these ratings were higher than the national benchmarks. Around 90% of respondents indicated they were either very likely or somewhat likely to remain in Roseville for the next five years and to recommend living in the City to someone who asks. The overall image or reputation of Roseville also received exceptional marks from 93% of community members and ranked above the national benchmark.

In addition to the high indicators of the quality of life, Roseville residents gave exceptional marks to utilities in the community. 97% of community members responded that the overall quality of the

utility infrastructure was excellent or good, while 92% stated similarly for storm water management, putting both items much higher than the national benchmarks. Over 90% of respondents gave positive marks to utility billing, drinking water, garbage collection, sewer services, and power (electric and/or gas) utility, all of which were higher than the national benchmark. Affordable high-speed internet access receive positive scores from about two-thirds of residents.

Community members are pleased with their local government.

Residents gave outstanding and above-average marks to almost every aspect of government performance in Roseville. About 9 in 10 respondents gave high marks to the overall quality of services provided by the City of Roseville as well as the overall customer service provided by Roseville employees. At least three-quarters of residents assigned positive reviews to the City treating residents fairly and with respect, being honest, and generally acting in the best interest of the community. About 77% of residents rated the value of services for the taxes paid to the City and the overall direction of Roseville as excellent or good. Being open and transparent to the public and the overall confidence in Roseville government scored similarly high marks (73% and 72%, respectively). Over 65% of respondents also gave excellent or good marks to the City informing residents about issues facing the community and the job Roseville does at welcoming resident involvement.

Resident's praise Roseville's economy.

Roseville's economy was an important and positively rated facet of the community. The City as a place to work scored much higher than the national benchmark, with 88% of respondents rating it excellent or good. About 9 in 10 residents gave high marks to the overall economic health of Roseville, and the quality of economic development and employment opportunities also received higher-than-average ratings from at least 7 in 10 residents. In addition, the City's shopping opportunities scored much higher than the benchmark (93% excellent or good). At least 8 in 10 respondents positively rated both the overall quality (93%) and variety (87%) of business and service establishments in Roseville.

Inclusivity and engagement scored on par with the nation in Roseville, but respondents indicated strong support for addressing homelessness in the community.

Items relating to inclusivity and engagement, like the sense of civic/community pride and acceptance of the community toward people of diverse backgrounds, were rated excellent or good by about 7 in 10 residents. Similar marks were given to the opportunities to volunteer and to participate in social events and activities. Community members also gave positive scores to the job the City does at making residents feel welcome (80%), valuing/respecting residents from diverse backgrounds (72%), and attracting people from diverse backgrounds (61%).

About 6 in 10 community members indicated that Roseville does an excellent or good job at taking care of vulnerable residents, including the homeless population. When asked other questions pertaining to addressing homelessness in the community, residents expressed strong overall support. While only 23% of residents indicated that homeless is a major or moderate problem in their neighborhood, 65% rated it a major or moderate problem within Roseville as a whole. Almost 8 in 10 residents considered it essential or very important for the City of Roseville to address the challenges of people experiencing homelessness in the community in some way. Residents rated the following approaches as essential or very important for the City to focus on: partnering with Placer County Social Services, non-profits, and health care providers that provide services to homeless individuals (82%), providing access to social services (80%), and creating affordable housing opportunities (62%). In addition, 78% of community members either strongly support or somewhat support the City providing supportive housing for people experiencing homelessness.

Full results can be viewed here: The NCS report on Tableau

FISCAL IMPACT

Not applicable.

ENVIRONMENTAL REVIEW

The California Environmental Quality Act (CEQA) does not apply to activities that will not result in a direct or reasonably foreseeable indirect physical change in the environment, or is otherwise not considered a project as defined by CEQA Statute §21065 and CEQA State Guidelines §15060(c)(3) and §15378. The National Survey Report meets the above criteria and are not subject to CEQA. No additional environmental review is required.

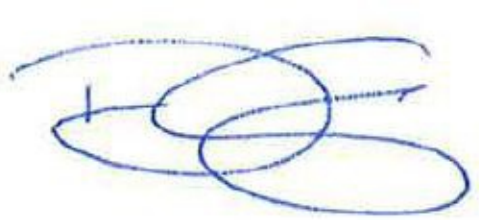
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Goal B: Support Community Engagement and Advocacy
Goal E: Deliver Exceptional City Services

Respectfully Submitted,

Megan MacPherson Scheid, Deputy City Manager

Dominick Casey, City Manager



_____
Dominick Casey, City Manager

ATTACHMENTS:

Description

The NCS Report

THE NCS™

THE NATIONAL COMMUNITY SURVEY™

Roseville, CA

The National Community Survey

Report of Results

2021

Report by:

National Research Center

POWERED BY POLCO

Polco

Visit us online!

www.polco.us

About The NCS™

The National Community Survey™ (The NCS™) report is about the "livability" of Roseville. A livable community is a place that is not simply habitable, but that is desirable. It is not only where people do live, but where they want to live. The survey was developed by the experts at Polco's National Research Center.



Great communities are partnerships of the government, private sector, community-based organizations and residents, all geographically connected. The NCS captures residents' opinions considering ten central facets of a community:

- Economy
- Mobility
- Community Design
- Utilities
- Safety
- Natural Environment
- Parks and Recreation
- Health and Wellness
- Education, Arts, and Culture
- Inclusivity and Engagement



The report provides the opinions of a representative sample of 476 residents of the City of Roseville collected from January 19, 2021 to March 10, 2021. The margin of error around any reported percentage is 5% for all respondents and the response rate for the 2021 survey was 16%. Survey results were weighted so that the demographic profile of respondents was representative of the demographic profile of adults in Roseville.

How the results are reported

For the most part, the percentages presented in the following tabs represent the "percent positive." Most commonly, the percent positive is the combination of the top two most positive response options (i.e., excellent/good, very safe/somewhat safe, etc.). On many of the questions in the survey respondents may answer "don't know." The proportion of respondents giving this reply is shown in the full set of responses included in the tab "Complete data." However, these responses have been removed from the analyses presented in most of the tabs. In other words, the tables and graphs display the responses from respondents who had an opinion about a specific item.

Comparisons to benchmarks

NRC's database of comparative resident opinion is comprised of resident perspectives gathered in surveys from over 600 communities whose residents evaluated the same kinds of topics on The National Community Survey. The comparison evaluations are from the most recent survey completed in each community in the last five years. NRC adds the latest results quickly upon survey completion, keeping the benchmark data fresh and relevant. The communities in the database represent a wide geographic and population range. In each tab, Roseville's results are noted as being "higher" than the benchmark, "lower" than the benchmark or "similar" to the benchmark, meaning that the average rating given by Roseville residents is statistically similar to or different (greater or lesser) than the benchmark. Being rated as "higher" or "lower" than the benchmark means that Roseville's average rating for a particular item was more than 10 points different than the benchmark. If a rating was "much higher" or "much lower," then Roseville's average rating was more than 20 points different when compared to the benchmark.

The survey was administered during the COVID-19 pandemic, a time of challenge for many local governments. While we provide comparisons to national benchmarks, it is important to note that much of the benchmark data was collected prior to the pandemic. This may impact how your City's 2020 ratings compare to other communities' ratings from the past five years.

Methods

Selecting survey recipients

All households within the City of Roseville were eligible to participate in the survey. A list of all households within the zip codes serving Roseville was purchased from Go-Dog Direct based on updated listings from the United States Postal Service. Since some of the zip codes that serve the City of Roseville households may also serve addresses that lie outside of the community, the exact geographic location of each housing unit was compared to community boundaries using the most current municipal boundary file. Addresses located outside of the City of Roseville boundaries were removed from the list of potential households to survey. Each address identified as being within city boundaries was further identified as being within one of the five areas. From that list, addresses were randomly selected as survey recipients, with multi-family housing units (defined as those with a unit number) sampled at a rate of 5:3 compared to single family housing units.

An individual within each household was selected using the birthday method. The birthday method selects a person within the household by asking the "person whose birthday has most recently passed" to complete the questionnaire. The underlying assumption in this method is that day of birth has no relationship to the way people respond to surveys. This instruction was contained in the introduction of the survey.

Conducting the survey

The 3,000 randomly selected households received mailings beginning on January 19, 2021 and the survey remained open for seven weeks. For 1,500 households, the first mailing was a postcard inviting the household to participate in the survey. The next mailing contained a cover letter with instructions, the survey questionnaire, and a postage-paid return envelope. The final mailing contained a reminder letter, another survey, and a postage-paid return envelope. For the remaining 1,500 households, the first mailing was a postcard inviting the household to participate, followed one week later by a reminder postcard. All mailings included a web link to give residents the opportunity to respond to the survey online. All follow-up mailings asked those who had not completed the survey to do so and those who had already done so to refrain from completing the survey again.

The survey was available in English and Spanish. All mailings contained paragraphs in both languages instructing participants on how to complete the survey in their preferred language.

About 1% of the 3,000 mailed invitations or surveys were returned because the household address was vacant or the postal service was unable to deliver the survey as addressed. Of the remaining 2,972 households that received the invitations to participate, 476 completed the survey, providing an overall response rate of 16%. The response rates was calculated using AAPOR's response rate #2* for mailed surveys of unnamed persons.

It is customary to describe the precision of estimates made from surveys by a "level of confidence" and accompanying "confidence interval" (or margin of error). A traditional level of confidence, and the one used here, is 95%. The 95% confidence interval can be any size and quantifies the sampling error or imprecision of the survey results because some residents' opinions are relied on to estimate all residents' opinions. The margin of error for the City of Roseville survey is no greater than plus or minus five percentage points around any given percent reported for all respondents (476 completed surveys).

In addition to the randomly selected "probability sample" of households, a link to an online open participation survey was publicized by the City of Roseville. The open participation survey was identical to the probability sample survey with two small updates; it included a map at the beginning asking where the respondent lives and a question about where they heard about the survey. The open participation survey was open to all city residents and became available on February 23, 2021. The survey remained open for two weeks. The data presented in the following tabs exclude the open participation survey data, but a tab at the end provides the complete frequency of responses to questions by the open participation respondents.

Analyzing the data

Responses from mailed surveys were entered into an electronic dataset using a "key and verify" method, where all responses are entered twice and compared to each other. Any discrepancies were resolved in comparison to the original survey form. Range checks as well as other forms of quality control were also performed. Responses from surveys completed on Polco were downloaded and merged with the mailed survey responses.

The demographics of the survey respondents were compared to those found in the 2010 Census and 2017 American Community Survey estimates for adults in the City of Roseville. The primary objective of weighting survey data is to make the survey respondents reflective of the larger population of the community. The characteristics used for weighting were age, sex, race, Hispanic origin, housing type, housing tenure, and area. No adjustments were made for design effects. Weights were calculated using an iterative, multiplicative raking model known as the ANES Weighting Algorithm.* The results of the weighting scheme for the probability sample are presented in the following table.

NRC aligns demographic labels with those used by the U.S. Census for reporting purposes, when possible. Some categories (e.g., age, race/Hispanic origin, housing type, and length of residency) are combined into smaller subgroups.

		Unweighted	Weighted	Target*
Age	18-34	8%	27%	28%
	35-54	31%	36%	37%
	55+	61%	36%	36%
Area	District 1	16%	19%	19%
	District 2	18%	19%	19%
	District 3	20%	21%	21%
	District 4	22%	19%	19%
	District 5	24%	22%	22%
Hispanic origin	No, not Spanish, Hispanic, or Latino	88%	87%	87%
	Spanish, Hispanic, or Latino	12%	13%	13%
Housing tenure	Own	82%	65%	65%
	Rent	18%	35%	35%
Housing type	Attached	14%	24%	24%
	Detached	86%	76%	76%
Race & Hispanic origin	Not white alone	32%	28%	28%
	White alone, not Hispanic or Latino	68%	72%	72%
Sex	Female	53%	53%	53%
	Male	47%	47%	47%
Sex/age	Female 18-34	4%	14%	14%
	Female 35-54	18%	19%	19%
	Female 55+	30%	20%	20%
	Male 18-34	4%	14%	14%
	Male 35-54	14%	18%	18%
	Male 55+	29%	16%	16%

The survey datasets were analyzed using all or some of a combination of the Statistical Package for the Social Sciences (SPSS), R, Python and Tableau. For the most part, the percentages presented in the reports represent the "percent positive." The percent positive is the combination of the top two most positive response options (i.e., excellent/good, very safe/somewhat safe, essential/very important, etc.), or, in the case of resident behaviors/participation, the percent positive represents the proportion of respondents indicating "yes" or participating in an activity at least once a month.

On many of the questions in the survey respondents may answer "don't know." The proportion of respondents giving this reply is shown in the full set of responses included in the tab "Complete data". However, these responses have been removed from the analyses presented in the reports. In other words, the tables and graphs display the responses from respondents who had an opinion about a specific item.

Contact

The City of Roseville funded this research. Please contact Megan MacPherson Schied of the City of Roseville at mscheid@roseville.ca.us if you have any questions about the survey.

Survey Validity

See the Polco Knowledge Base article on survey validity at https://info.polco.us/knowledge/statistical-vali

* See AAPOR's Standard Definitions for more information at https://www.aapor.org/Publications-Media/AAPOR-Journals/Standard-Definitions.aspx
* Pasek, J. (2010). ANES Weighting Algorithm. Retrieved from https://web.stanford.edu/group/iriss/cgi-bin/anesrake/resources/RakingDescription.pdf
* Targets come from the 2010 Census and 2017 American Community Survey

Highlights

Roseville residents enjoy a high quality of life, and the City's utilities contribute to the high marks.

Residents value the quality of life in Roseville, with 9 in 10 giving positive reviews to the City as a place to live and the overall quality of life in the community; these ratings were higher than the national benchmarks. Around 90% of respondents indicated they were either very likely or somewhat likely to remain in Roseville for the next five years and to recommend living in the City to someone who asks. The overall image or reputation of Roseville also received exceptional marks from 93% of community members and ranked above the national benchmark.

In addition to the high indicators of the quality of life, Roseville residents gave exceptional marks to utilities in the community. 97% of community members responded that the overall quality of the utility infrastructure was excellent or good, while 92% stated similarly for storm water management, putting both items much higher than the national benchmarks. Over 90% of respondents gave positive marks to utility billing, drinking water, garbage collection, sewer services, and power (electric and/or gas) utility, all of which were higher than the national benchmark. Affordable high-speed internet access received positive scores from about two-thirds of residents.

Community members are pleased with their local government.

Residents gave outstanding and above-average marks to almost every aspect of government performance in Roseville. About 9 in 10 respondents gave high marks to the overall quality of services provided by the City of Roseville as well as the overall customer service provided by Roseville employees. At least three-quarters of residents assigned positive reviews to the City treating residents fairly and with respect, being honest, and generally acting in the best interest of the community. About 77% of residents rated the value of services for the taxes paid to the City and the overall direction of Roseville as excellent or good. Being open and transparent to the public and the overall confidence in Roseville government scored similarly high marks (73% and 72%, respectively). Over 65% of respondents also gave excellent or good marks to the City informing residents about issues facing the community and the job Roseville does at welcoming resident involvement. All of the aforementioned items scored higher than the national benchmarks.

When asked about their preferred methods for receiving news and information from the City, more than half of residents indicated they either strongly or somewhat preferred the City's website and email newsletters and around 32% of community members preferred mail. Social media platforms were less popular than other methods; the most preferred platform was Facebook at 25%, followed by Nextdoor (20%), Instagram (16%), and Twitter (10%). Similarly, fewer than 2 in 10 respondents indicated they either strongly or somewhat prefer community meetings or other methods.

Resident's praise Roseville's economy.

Roseville's economy was an important and positively rated facet of the community. The City as a place to work scored much higher than the national benchmark, with 88% of respondents rating it excellent or good. About 9 in 10 residents gave high marks to the overall economic health of Roseville, and the quality of economic development and employment opportunities also received higher-than-average ratings from at least 7 in 10 residents. In addition, the City's shopping opportunities scored much higher than the benchmark (93% excellent or good). At least 8 in 10 respondents positively rated both the overall quality (93%) and variety (87%) of business and service establishments in Roseville.

Inclusivity and engagement scored on par with the nation in Roseville, but respondents indicated strong support for addressing homelessness in the community.

Items relating to inclusivity and engagement, like the sense of civic/community pride and acceptance of the community toward people of diverse backgrounds, were rated excellent or good by about 7 in 10 residents. Similar marks were given to the opportunities to volunteer and to participate in social events and activities. Community members also gave positive scores to the job the City does at making residents feel welcome (80%), valuing/respecting residents from diverse backgrounds (72%), and attracting people from diverse backgrounds (61%).

About 6 in 10 community members indicated that Roseville does an excellent or good job at taking care of vulnerable residents, including the homeless population. When asked other questions pertaining to addressing homelessness in the community, residents expressed strong overall support. While only 23% of residents indicated that homeless is a major or moderate problem in their neighborhood, 65% rated it a major or moderate problem within Roseville as a whole. Almost 8 in 10 residents considered it essential or very important for the City of Roseville to address the challenges of people experiencing homelessness in the community in some way. Residents rated the following approaches as essential or very important for the City to focus on: partnering with Placer County Social Services, non-profits, and health care providers that provide services to homeless individuals (82%), providing access to social services (80%), and creating affordable housing opportunities (62%). In addition, 78% of community members either strongly support or somewhat support the City providing supportive housing for people experiencing homelessness.

Facets of livability

Resident perceptions of quality and importance for each of the facets of community livability provide an overview of community strengths and challenges that are useful for planning, budgeting and performance evaluation. The charts below show the proportion of residents who rated the community facets positively for quality and the priority (importance) placed on each. Also displayed is whether local ratings were lower, similar, or higher than communities across the country (the national benchmark).

Please rate each of the following characteristics as they relate to Roseville as a whole.
(% excellent or good)

		vs. benchmark*
Overall economic health of Roseville	90%	Higher
Overall quality of the transportation system (auto, bicycle, foot, bus) in Roseville	76%	Similar
Overall design or layout of Roseville's residential and commercial areas (e.g., homes, buildings, streets, parks, etc.)	78%	Higher
Overall quality of the utility infrastructure in Roseville (water, sewer, storm water, electric, gas)	97%	Much higher
Overall feeling of safety in Roseville	91%	Similar
Overall quality of natural environment in Roseville	87%	Similar
Overall quality of parks and recreation opportunities	94%	Higher
Overall health and wellness opportunities in Roseville	89%	Higher
Overall opportunities for education, culture, and the arts	69%	Similar
Residents' connection and engagement with their community	66%	Similar

Please rate how important, if at all, you think it is for the Roseville community to focus on each of the following in the coming two years.
(% essential or very important)

Overall economic health of Roseville	92%	Similar
Overall quality of the transportation system (auto, bicycle, foot, bus) in Roseville	76%	Similar
Overall design or layout of Roseville's residential and commercial areas (e.g., homes, buildings, streets, parks, etc.)	82%	Similar
Overall quality of the utility infrastructure in Roseville (water, sewer, storm water, electric, gas)	94%	Higher
Overall feeling of safety in Roseville	95%	Similar
Overall quality of natural environment in Roseville	85%	Similar
Overall quality of parks and recreation opportunities	84%	Similar
Overall health and wellness opportunities in Roseville	79%	Similar
Overall opportunities for education, culture, and the arts	71%	Similar
Residents' connection and engagement with their community	67%	Lower

* Comparison to the national benchmark is shown. If no comparison is available, this is left blanC

Balancing performance and importance

Every jurisdiction must balance limited resources while meeting resident needs and striving to optimize community livability. To this end, it is helpful to know what aspects of the community are most important to residents and which they perceive as being of higher or lower quality. It is especially helpful to know when a facet of livability is considered of high importance but rated as lower quality, as this should be a top priority to address.

To help guide City staff and officials with decisions on future resource allocation, resident ratings of the importance of services were compared to their ratings of the quality of these services. To identify the services perceived by residents to have relatively lower quality at the same time as relatively higher importance, all services were ranked from highest perceived quality to lowest perceived quality and from highest perceived importance to lowest perceived importance. Some services were in the top half of both lists (higher quality and higher importance); some were in the top half of one list but the bottom half of the other (higher quality and lower importance or lower quality and higher importance); and some services were in the bottom half of both lists.

Services receiving quality ratings of excellent or good by 88% or more of respondents were considered of "higher quality" and those with ratings lower than 88% were considered to be of "lower quality." Services were classified as "more important" if they were rated as essential or very important by 83% or more of respondents. Services were rated as "less important" if they received a rating of less than 83%. This classification uses the median ratings for quality and importance to divide the services in half.

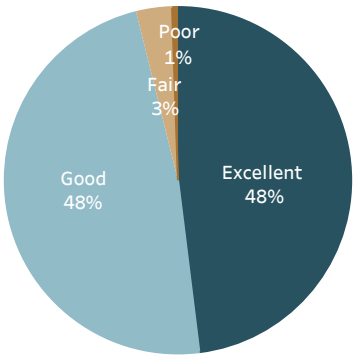
The quadrants in the figure below show which community facets were given higher or lower importance ratings (up-down) and which had higher or lower quality ratings (right-left). Services categorized as higher in importance and lower in quality may warrant further investigation to see if changes to their delivery are necessary.



Quality of life

Measuring community livability starts with assessing the quality of life of those who live there, and ensuring that the community is attractive, accessible, and welcoming to all.

The overall quality of life in Roseville



Please rate each of the following aspects of quality of life in Roseville. (% excellent or good)		vs. benchmark*
Roseville as a place to live	97%	Higher
The overall quality of life in Roseville	96%	Higher

Please indicate how likely or unlikely you are to do each of the following. (% very or somewhat likely)		
Recommend living in Roseville to someone who asks	94%	Similar
Remain in Roseville for the next five years	84%	Similar

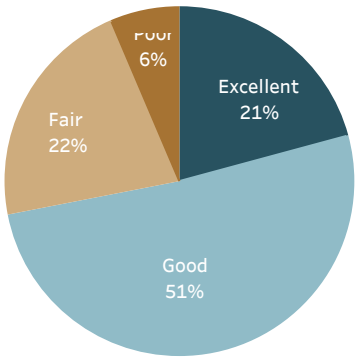
Please rate each of the following characteristics as they relate to Roseville as a whole. (% excellent or good)		
Overall image or reputation of Roseville	93%	Higher

* Comparison to the national benchmark is shown. If no comparison is available, this is left blank.

Governance

Strong local governments produce results that meet the needs of residents while making the best use of available resources, and are responsive to the present and future needs of the community as a whole.

Overall confidence in Roseville government



Please rate the quality of each of the following services in Roseville. (% excellent or good)		vs. benchmark*
Public information services	79%	Similar

Please rate the quality of each of the following services in Roseville. (% excellent or good)		
Overall customer service by Roseville employees (police, receptionists, planners, etc.)	91%	Higher

Please rate the following categories of Roseville government performance. (% excellent or good)		
Treating residents with respect	84%	Higher
Treating all residents fairly	79%	Higher
The value of services for the taxes paid to Roseville	77%	Higher
The overall direction that Roseville is taking	77%	Higher
Generally acting in the best interest of the community	75%	Higher
Being honest	75%	Higher
Being open and transparent to the public	73%	Higher
Overall confidence in Roseville government	72%	Higher
Informing residents about issues facing the community	69%	Higher
The job Roseville government does at welcoming resident involvement	66%	Higher

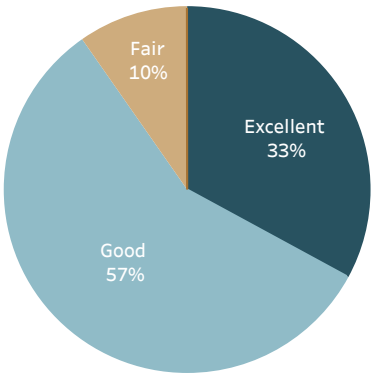
Overall, how would you rate the quality of the services provided by each of the following? (% excellent or good)		
The City of Roseville	89%	Higher
The Federal Government	28%	Similar

*Comparison to the national benchmark is shown. If no comparison is available, this is left blank.

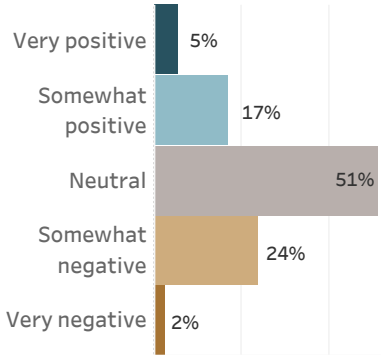
Economy

Local governments work together with private and nonprofit businesses, and with the community at large, to foster sustainable growth, create jobs, and promote a thriving local economy.

Overall economic health of Roseville



What impact, if any, do you think the economy will have on your family income in the next 6 months? Do you think the impact will be:



Please rate each of the following aspects of quality of life in Roseville.
(% excellent or good)

		vs. benchmark*
Roseville as a place to work	88%	Much higher
Roseville as a place to visit	73%	Similar

Please rate each of the following characteristics as they relate to Roseville as a whole.
(% excellent or good)

Overall quality of business and service establishments in Roseville	93%	Higher
Shopping opportunities	93%	
Overall economic health of Roseville	90%	Higher
Variety of business and service establishments in Roseville	87%	Higher
Employment opportunities	69%	Higher
Vibrancy of downtown/commercial area	62%	Similar
Cost of living in Roseville	54%	Similar

Please rate the quality of each of the following services in Roseville.
(% excellent or good)

Economic development	78%	Higher

What impact, if any, do you think the economy will have on your family income in the next 6 months? Do you think the impact will be:
(% very or somewhat positive)

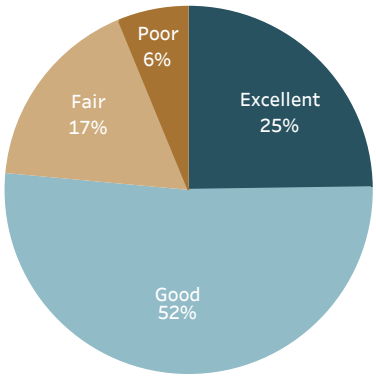
What impact, if any, do you think the economy will have on your family income in the next 6 months? Do you think the impact will be:	22%	Similar

*Comparison to the national benchmark is shown. If no comparison is available, this is left blank.

Mobility

The ease with which residents can move about their communities, whether for commuting, leisure, or recreation, plays a major role in the quality of life for all who live, work, and play in the community.

Overall quality of the transportation system in Roseville



Please rate each of the following characteristics as they relate to Roseville as a whole. (% excellent or good)		vs. benchmark*
Ease of travel by car in Roseville	80%	Similar
Overall quality of the transportation system (auto, bicycle, foot, bus) in Roseville	76%	Similar
Ease of public parking	76%	Higher
Ease of travel by bicycle in Roseville	71%	Higher
Ease of travel as a pedestrian	70%	Similar
Ease of travel by public transportation in Roseville	57%	Higher
Traffic flow on major streets	56%	Similar

Please indicate whether or not you have done each of the following in the last 12 months. (% yes)		
Walked or biked instead of driving	58%	Similar
Carpooled with other adults or children instead of driving alone	45%	Similar
Used bus, rail, or other public transportation instead of driving	10%	Lower

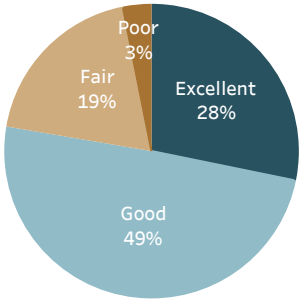
Please rate the quality of each of the following services in Roseville. (% excellent or good)		
Street lighting	82%	Higher
Street cleaning	82%	Higher
Sidewalk maintenance	74%	Higher
Traffic enforcement	69%	Similar
Traffic signal timing	68%	Higher
Bus or transit services	66%	Higher
Street repair	65%	Higher

*Comparison to the national benchmark is shown. If no comparison is available, this is left blank.

Community design

A well-designed community enhances the quality of life for its residents by encouraging smart land use and zoning, ensuring that affordable housing is accessible to all, and providing access to parks and other green spaces.

Overall design or layout of Roseville's residential and commercial areas



Please rate each of the following aspects of quality of life in Roseville. (% excellent or good)		**vs. benchmark***
Your neighborhood as a place to live	92%	Similar

Please rate each of the following characteristics as they relate to Roseville as a whole. (% excellent or good)		
Overall appearance of Roseville	94%	Higher
Well-designed neighborhoods	82%	Higher
Overall design or layout of Roseville's residential and commercial areas (e.g., homes, buildings, streets, parks, etc.)	78%	Higher
Public places where people want to spend time	77%	Similar
Overall quality of new development in Roseville	76%	Higher
Well-planned residential growth	69%	Higher
Preservation of the historical or cultural character of the community	69%	Similar
Well-planned commercial growth	68%	Higher
Variety of housing options	66%	Similar
Availability of affordable quality housing	43%	Similar

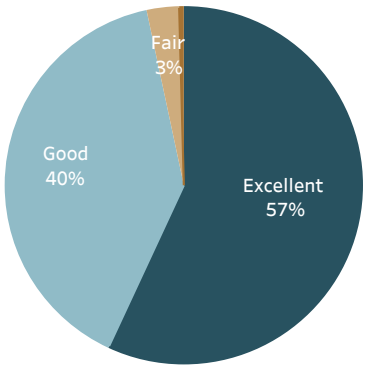
Please rate the quality of each of the following services in Roseville. (% excellent or good)		
Code enforcement (weeds, abandoned buildings, etc.)	71%	Higher
Land use, planning, and zoning	68%	Higher

* Comparison to the national benchmark is shown. If no comparison is available, this is left blank.

Utilities

Services such as water, gas, electricity, and internet access play a vital role in ensuring the physical and economic health and well-being of the communities they serve.

Overall quality of the utility infrastructure in Roseville



Please rate the quality of each of the following services in Roseville. (% excellent or good)		vs. benchmark*
Power (electric and/or gas) utility	96%	Higher
Sewer services	96%	Higher
Garbage collection	95%	Higher
Drinking water	93%	Higher
Storm water management (storm drainage, dams, levees, etc.)	92%	Much higher
Utility billing	90%	Higher
Affordable high-speed internet access	63%	Similar

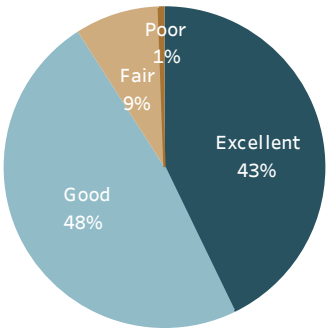
Please rate each of the following characteristics as they relate to Roseville as a whole. (% excellent or good)		
Overall quality of the utility infrastructure in Roseville (water, sewer, storm water, electric, gas)	97%	Much higher

* Comparison to the national benchmark is shown. If no comparison is available, this is left blank.

Safety

Public safety is often the most important task facing local governments. All residents should feel safe and secure in their neighborhoods and in the greater community, and providing robust safety-related services is essential to residents' quality of life.

Overall feeling of safety in Roseville



Please rate each of the following characteristics as they relate to Roseville as a whole. (% excellent or good)		vs. benchmark*
Overall feeling of safety in Roseville	91%	Similar

Please rate how safe or unsafe you feel: (% very or somewhat safe)		
In your neighborhood during the day	97%	Similar
In Roseville's downtown/commercial area during the day	88%	Similar
From violent crime	87%	Similar
From fire, flood, or other natural disaster	87%	Similar
From property crime	77%	Similar

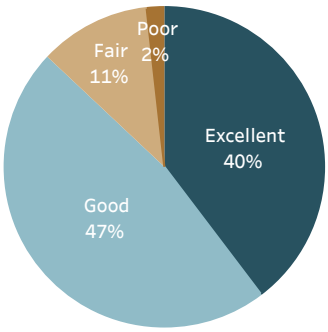
Please rate the quality of each of the following services in Roseville. (% excellent or good)		
Fire services	97%	Similar
Ambulance or emergency medical services	95%	Similar
Fire prevention and education	90%	Higher
Animal control	89%	Higher
Police services	86%	Similar
Crime prevention	84%	Higher
Emergency preparedness (services that prepare the community for natural disasters or other emergency situations)	79%	Similar

* Comparison to the national benchmark is shown. If no comparison is available, this is left blank.

Natural environment

The natural environment plays a vital role in the health and well-being of residents. The natural spaces in which residents live and experience their communities has a direct and profound effect on quality of life.

Overall quality of natural environment in Roseville



Please rate each of the following characteristics as they relate to Roseville as a whole. (% excellent or good)		vs. benchmark*
Cleanliness of Roseville	92%	Higher
Overall quality of natural environment in Roseville	87%	Similar
Water resources (e.g., creeks)	86%	Higher
Air quality	80%	Similar

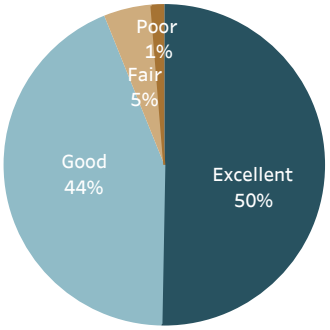
Please rate the quality of each of the following services in Roseville. (% excellent or good)		
Yard waste pick-up	88%	Higher
Recycling	81%	Similar
Preservation of natural areas (open space, farmlands, and greenbelts)	80%	Higher
Roseville open space	78%	Higher

* Comparison to the national benchmark is shown. If no comparison is available, this is left blank.

Parks and recreation

”There are no communities that pride themselves on their quality of life, promote themselves as a desirable location for businesses to relocate, or maintain that they are environmental stewards of their natural resources, without such communities having a robust, active system of parks and recreation programs for public use and enjoyment.”
- National Recreation and Park Association

Overall quality of the parks and recreation opportunities



Please rate each of the following characteristics as they relate to Roseville as a whole. (% excellent or good)		vs. benchmark*
Overall quality of parks and recreation opportunities	94%	Higher
Fitness opportunities (including exercise classes and paths or trails, etc.)	90%	Higher
Availability of paths and walking trails	88%	Higher
Recreational opportunities	83%	Higher

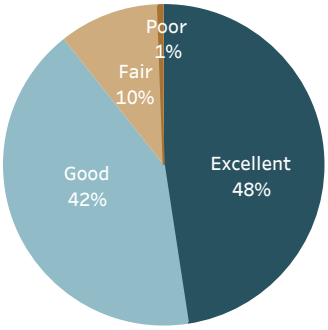
Please rate the quality of each of the following services in Roseville. (% excellent or good)		
City parks	90%	Similar
Recreation centers or facilities	87%	Higher
Recreation programs or classes	86%	Higher

* Comparison to the national benchmark is shown. If no comparison is available, this is left blank.

Health and wellness

The characteristics of and amenities available in the communities in which people live has a direct impact on the health and wellness of residents, and thus, on their quality of life overall.

Overall health and wellness opportunities in Roseville



Please rate each of the following characteristics as they relate to Roseville as a whole.
(% excellent or good)

		vs. benchmark*
Overall health and wellness opportunities in Roseville	89%	Higher
Availability of preventive health services	83%	Higher
Availability of affordable quality food	81%	Higher
Availability of affordable quality health care	78%	Higher
Availability of affordable quality mental health care	62%	Similar

Please rate the quality of each of the following services in Roseville.
(% excellent or good)

Health services	84%	Higher

Would you say that in general your health is:
(% excellent or very good)

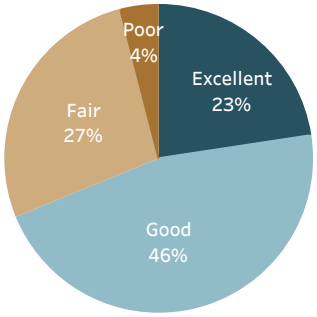
Would you say that in general your health is:	71%	Similar

* Comparison to the national benchmark is shown. If no comparison is available, this is left blank.

Education, arts, and culture

Participation in the arts, in educational opportunities, and in cultural activities is linked to increased civic engagement, greater social tolerance, and enhanced enjoyment of the local community.

Overall opportunities for education, culture and the arts



Please rate each of the following characteristics as they relate to Roseville as a whole. (% excellent or good)		vs. benchmark*
K-12 education	87%	Higher
Adult educational opportunities	70%	Similar
Overall opportunities for education, culture, and the arts	69%	Similar
Opportunities to attend special events and festivals	65%	Similar
Availability of affordable quality childcare/preschool	63%	Higher
Community support for the arts	57%	Similar
Opportunities to attend cultural/arts/music activities	56%	Similar

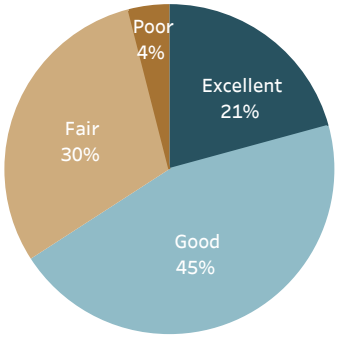
Please rate the quality of each of the following services in Roseville. (% excellent or good)		
Public library services	92%	Similar

* Comparison to the national benchmark is shown. If no comparison is available, this is left blank.

Inclusivity and engagement

Inclusivity refers to a cultural and environmental feeling of belonging; residents who feel invited to participate within their communities feel more included, involved, and engaged than those who do not.

Residents' connection and engagement with their community



Please rate each of the following aspects of quality of life in Roseville. (% excellent or good)		vs. benchmark*
Roseville as a place to raise children	95%	Higher
Roseville as a place to retire	83%	Higher
Sense of community	74%	Similar

Please rate how important, if at all, you think it is for the Roseville community to focus on each of the following in the coming two years. (% essential or very important)		
Residents' connection and engagement with their community	67%	Lower

Please rate the job you feel the Roseville community does at each of the following. (% excellent or good)		
Making all residents feel welcome	80%	Similar
Valuing/respecting residents from diverse backgrounds	72%	Similar
Taking care of vulnerable residents (elderly, disabled, homeless, etc.)	64%	Similar
Attracting people from diverse backgrounds	61%	Similar

Please rate each of the following characteristics as they relate to Roseville as a whole. (% excellent or good)		
Opportunities to volunteer	75%	Similar
Sense of civic/community pride	75%	Similar
Neighborliness of residents in Roseville	71%	Similar
Opportunities to participate in community matters	69%	Similar
Opportunities to participate in social events and activities	66%	Similar
Openness and acceptance of the community toward people of diverse backgrounds	65%	Similar

* Comparison to the national benchmark is shown. If no comparison is available, this is left blank.

Residents' participation levels

Please indicate whether or not you have done each of the following in the last 12 months. (% yes)		vs. benchmark*
Voted in your most recent local election	86%	Similar
Contacted the City of Roseville (in-person, phone, email, or web) for help or information	49%	Similar
Volunteered your time to some group/activity in Roseville	29%	Similar
Watched (online or on television) a local public meeting	22%	Similar
Campaigned or advocated for a local issue, cause, or candidate	18%	Similar
Contacted Roseville elected officials (in-person, phone, email, or web) to express your opinion	12%	Similar
Attended a local public meeting (of local elected officials like City Council or County Commissioners, advisory boards, town halls, HOA, neighborhood watch, ..	10%	Lower

In general, how many times do you: (% a few times a week or more)		
Use or check email	98%	Similar
Access the internet from your home using a computer, laptop, or tablet computer	96%	Similar
Access the internet from your cell phone	94%	Similar
Visit social media sites such as Facebook, Twitter, WhatsApp, etc.	80%	Similar
Shop online	64%	Higher
Share your opinions online	27%	Similar

* Comparison to the national benchmark is shown. If no comparison is available, this is left blank.

Custom questions

Below are the complete set of responses to each custom question on the survey. By default, "don't know" responses are excluded, but may be added to the table using the response filter below.

How much of a problem, if at all, do you think homelessness is in each of the following?	In your neighborhood	Not a problem	53%
		Minor problem	24%
		Moderate problem	15%
		Major problem	8%
	In Roseville overall	Not a problem	3%
		Minor problem	32%
		Moderate problem	48%
		Major problem	17%
	Please rate how important, if at all, you think it is to address the challenges of people experiencing homelessness in Roseville?	Essential	38%
		Very important	40%
		Somewhat important	18%
		Not at all important	3%
	Supportive housing combines housing with social services such as job training, life skills training, substance abuse programs, and community support services (e.g., child care, educational programs, etc.). If transportation needs were met and services were accessible, p..	Strongly support	42%
		Somewhat support	36%
		Somewhat oppose	14%
		Strongly oppose	7%
Please rate how important, if at all, each of the following are for the City of Roseville to focus on to help address homelessness:	Create affordable housing opportunities	Essential	30%
		Very important	32%
		Somewhat important	28%
		Not at all important	10%
	Provide access to social services	Essential	41%
		Very important	39%
		Somewhat important	17%
		Not at all important	2%

Partner with Placer County Social Services, non-profits, and health care providers that provide services to people experiencing homelessness	Essential	45%
	Very important	37%
	Somewhat important	16%
	Not at all important	2%
Please indicate which of the following methods, if any, you prefer as a way to receive news and information from the City of Roseville:	City website	51%
	Email newsletters	52%
	Mail	32%
	Community meetings	16%
	Facebook	25%
	Twitter	10%
	Instagram	16%
	Nextdoor	20%
	Other	3%

Open-ended questions

Below are the verbatim responses to one of the custom questions. You may hover over responses that have been cut off to view the full response.

If Other, please explain.	Apple news
	District newspapers
	Family that works for the City of Roseville
	LinkedIn
	Local Sacramento tv stations
	Mail
	MeWe
	None
	Roseville magazine, free newspaper, flyers sent home with school kids
	Text
	Text messaging
	Text, as in the COVID vaccination updates
	There needs to be more commercial shopping in west Roseville, especially west of Fiddyment Road. There are far too many homes and the existing c..
	Virtual Community meetings
	Word of mouth. Getting my neighborhood involved in whats happening with trash littering our sidewalks, lawns, streets, and gutters. Having do..

National benchmark tables

This table contains the comparisons of Roseville's results to those from other communities. The first column shows the comparison of Roseville's rating to the benchmark. Roseville's results are noted as being "higher", "lower" or "similar" to the benchmark, meaning that the average rating given by Roseville residents is statistically similar to or different than the benchmark. The second column is Roseville's "percent positive." Most commonly, the percent positive is the combination of the top two most positive response options (i.e., excellent/good). The third column is the rank assigned to Roseville's rating among communities where a similar question was asked. The fourth column is the number of communities that asked a similar question. The fifth column shows the percentile for Roseville's result -- that is what percent of surveyed communities had a lower rating than Roseville.

			% positive	Rank	Number of communities	Percentile
Please rate each of the following aspects of quality of life in Roseville.	Roseville as a place to live	Higher	97%	36	361	91
	Your neighborhood as a place to live	Similar	92%	36	302	89
	Roseville as a place to raise children	Higher	95%	39	361	90
	Roseville as a place to work	Much higher	88%	6	346	99
	Roseville as a place to visit	Similar	73%	89	290	70
	Roseville as a place to retire	Higher	83%	38	348	90
	The overall quality of life in Roseville	Higher	96%	32	398	92
	Sense of community	Similar	74%	55	301	82
Please rate each of the following characteristics as they relate to Roseville as a whole.	Overall economic health of Roseville	Higher	90%	28	275	90
	Overall quality of the transportation system (auto, bicycle, foot, bus) in Roseville	Similar	76%	120	277	57
	Overall design or layout of Roseville's residential and commercial areas (e.g., homes, buildings, streets, parks, etc.)	Higher	78%	26	270	91
	Overall quality of the utility infrastructure in Roseville (water, sewer, storm water, electric, gas)	Much higher	97%	1	61	99
	Overall feeling of safety in Roseville	Similar	91%	97	343	72
	Overall quality of natural environment in Roseville	Similar	87%	72	280	75
	Overall quality of parks and recreation opportunities	Higher	94%	8	61	88
	Overall health and wellness opportunities in Roseville	Higher	89%	12	272	96
	Overall opportunities for education, culture, and the arts	Similar	69%	124	271	55
	Residents' connection and engagement with their community	Similar	66%	13	61	79
Please indicate how likely or unlikely you are to do each of the following.	Recommend living in Roseville to someone who asks	Similar	94%	54	287	82
	Remain in Roseville for the next five years	Similar	84%	163	280	42
Please rate how safe or unsafe you feel:	In your neighborhood during the day	Similar	97%	91	330	73
	In Roseville's downtown/commercial area during the day	Similar	88%	201	309	35

Please rate how safe or unsafe you feel:	From property crime	Similar	77%	46	72	37
	From violent crime	Similar	87%	38	72	48
	From fire, flood, or other natural disaster	Similar	87%	21	61	66
Please rate the job you feel the Roseville community does at each of the following.	Making all residents feel welcome	Similar	80%	9	61	86
	Attracting people from diverse backgrounds	Similar	61%	24	61	61
	Valuing/respecting residents from diverse backgrounds	Similar	72%	15	61	76
	Taking care of vulnerable residents (elderly, disabled, homeless, etc.)	Similar	64%	24	61	61
Please rate each of the following characteristics as they relate to Roseville as a whole.	Overall quality of business and service establishments in Roseville	Higher	93%	3	278	99
	Variety of business and service establishments in Roseville	Higher	87%	2	60	97
	Vibrancy of downtown/commercial area	Similar	62%	77	256	70
	Employment opportunities	Higher	69%	22	303	93
	Shopping opportunities	Much higher	93%	3	291	99
	Cost of living in Roseville	Similar	54%	62	273	78
	Overall image or reputation of Roseville	Higher	93%	30	338	92
Please rate each of the following characteristics as they relate to Roseville as a whole.	Traffic flow on major streets	Similar	56%	101	317	69
	Ease of public parking	Higher	76%	26	241	90
	Ease of travel by car in Roseville	Similar	80%	60	303	81
	Ease of travel by public transportation in Roseville	Higher	57%	41	248	84
	Ease of travel by bicycle in Roseville	Higher	71%	64	304	79
	Ease of travel as a pedestrian	Similar	70%	125	304	59
	Well-planned residential growth	Higher	69%	7	63	89
	Well-planned commercial growth	Higher	68%	4	63	94
	Well-designed neighborhoods	Higher	82%	4	63	94
	Preservation of the historical or cultural character of the community	Similar	69%	15	59	75
	Public places where people want to spend time	Similar	77%	63	265	77
	Variety of housing options	Similar	66%	72	281	75
	Availability of affordable quality housing	Similar	43%	126	300	59
	Overall quality of new development in Roseville	Higher	76%	21	291	93
	Overall appearance of Roseville	Higher	94%	40	332	88
	Cleanliness of Roseville	Higher	92%	46	304	85
	Water resources (e.g., creeks)	Higher	86%	9	57	85

Please rate each of the following characteristics as they relate to Roseville as a whole.	Air quality	Similar	80%	145	257	44
	Availability of paths and walking trails	Higher	88%	27	300	92
	Fitness opportunities (including exercise classes and paths or trails, etc.)	Higher	90%	13	261	96
	Recreational opportunities	Higher	83%	49	290	84
	Availability of affordable quality food	Higher	81%	15	256	95
	Availability of affordable quality health care	Higher	78%	26	270	91
	Availability of preventive health services	Higher	83%	19	251	93
	Availability of affordable quality mental health care	Similar	62%	49	248	81
	Opportunities to attend cultural/arts/music activities	Similar	56%	158	289	46
	Community support for the arts	Similar	57%	28	61	55
	Availability of affordable quality childcare/preschool	Higher	63%	45	266	84
	K-12 education	Higher	87%	63	266	77
	Adult educational opportunities	Similar	70%	71	256	73
	Sense of civic/community pride	Similar	75%	17	61	73
	Neighborliness of residents in Roseville	Similar	71%	66	267	76
	Opportunities to participate in social events and activities	Similar	66%	106	271	61
	Opportunities to attend special events and festivals	Similar	65%	146	279	48
	Opportunities to volunteer	Similar	75%	111	271	60
	Opportunities to participate in community matters	Similar	69%	105	276	62
	Openness and acceptance of the community toward people of diverse backgrounds	Similar	65%	102	297	66
Please indicate whether or not you have done each of the following in the last 12 months.	Contacted the City of Roseville (in-person, phone, email, or web) for help or information	Similar	49%	110	325	67
	Contacted Roseville elected officials (in-person, phone, email, or web) to express your opinion	Similar	12%	234	264	12
	Attended a local public meeting (of local elected officials like City Council or County Commissioners, advisory boards, town halls, HOA, n..	Lower	10%	266	268	1
	Watched (online or on television) a local public meeting	Similar	22%	127	243	48
	Volunteered your time to some group/activity in Roseville	Similar	29%	198	272	28
	Campaigned or advocated for a local issue, cause, or candidate	Similar	18%	177	254	31
	Voted in your most recent local election	Similar	86%	14	61	78
	Used bus, rail, or other public transportation instead of driving	Lower	10%	155	230	33
	Carpooled with other adults or children instead of driving alone	Similar	45%	90	259	66
	Walked or biked instead of driving	Similar	58%	125	265	53
Please rate the quality of each of the following services in Roseville.	Public information services	Similar	79%	53	281	82

Please rate the quality of each of the following services in Roseville.	Economic development	Higher	78%	13	281	96
	Traffic enforcement	Similar	69%	106	341	70
	Traffic signal timing	Higher	68%	17	267	94
	Street repair	Higher	65%	35	328	90
	Street cleaning	Higher	82%	10	292	97
	Street lighting	Higher	82%	4	322	99
	Sidewalk maintenance	Higher	74%	22	293	93
	Bus or transit services	Higher	66%	42	241	83
	Land use, planning, and zoning	Higher	68%	14	292	96
	Code enforcement (weeds, abandoned buildings, etc.)	Higher	71%	22	345	94
	Affordable high-speed internet access	Similar	63%	14	58	76
	Garbage collection	Higher	95%	4	319	99
	Drinking water	Higher	93%	4	287	99
	Sewer services	Higher	96%	1	290	100
	Storm water management (storm drainage, dams, levees, etc.)	Much higher	92%	1	318	100
	Power (electric and/or gas) utility	Higher	96%	1	198	100
	Utility billing	Higher	90%	1	243	100
	Police services	Similar	86%	94	387	76
	Crime prevention	Higher	84%	71	342	80
	Animal control	Higher	89%	2	305	100
	Ambulance or emergency medical services	Similar	95%	71	307	77
	Fire services	Similar	97%	50	335	86
	Fire prevention and education	Higher	90%	19	280	94
	Emergency preparedness (services that prepare the community for natural disasters or other emergency situations)	Similar	79%	33	281	89
	Preservation of natural areas (open space, farmlands, and greenbelts)	Higher	80%	18	260	94
	Roseville open space	Higher	78%	26	251	90
	Recycling	Similar	81%	82	325	75
	Yard waste pick-up	Higher	88%	37	265	87
	City parks	Similar	90%	42	300	87
	Recreation programs or classes	Higher	86%	38	298	88
	Recreation centers or facilities	Higher	87%	39	273	86

Please rate the quality of each of the following services in Roseville.	Health services	Higher	84%	22	236	91
	Public library services	Similar	92%	79	299	74
	Overall customer service by Roseville employees (police, receptionists, planners, etc.)	Higher	91%	16	356	96
Please rate the following categories of Roseville government performance.	The value of services for the taxes paid to Roseville	Higher	77%	15	361	96
	The overall direction that Roseville is taking	Higher	77%	15	312	96
	The job Roseville government does at welcoming resident involvement	Higher	66%	25	314	93
	Overall confidence in Roseville government	Higher	72%	17	274	94
	Generally acting in the best interest of the community	Higher	75%	13	278	96
	Being honest	Higher	75%	14	270	95
	Being open and transparent to the public	Higher	73%	2	62	97
	Informing residents about issues facing the community	Higher	69%	7	66	90
	Treating all residents fairly	Higher	79%	9	274	97
	Treating residents with respect	Higher	84%	3	61	96
Overall, how would you rate the quality of the services provided by each ..	The City of Roseville	Higher	89%	27	365	93
	The Federal Government	Similar	28%	239	259	8
Please rate how important, if at all, you think it is for the Roseville community to focus on each of the following in the coming two years.	Overall economic health of Roseville	Similar	92%	41	251	84
	Overall quality of the transportation system (auto, bicycle, foot, bus) in Roseville	Similar	76%	175	251	31
	Overall design or layout of Roseville's residential and commercial areas (e.g., homes, buildings, streets, parks, etc.)	Similar	82%	50	251	81
	Overall quality of the utility infrastructure in Roseville (water, sewer, storm water, electric, gas)	Higher	94%	4	61	94
	Overall feeling of safety in Roseville	Similar	95%	54	251	79
	Overall quality of natural environment in Roseville	Similar	85%	71	251	72
	Overall quality of parks and recreation opportunities	Similar	84%	9	61	86
	Overall health and wellness opportunities in Roseville	Similar	79%	57	250	78
	Overall opportunities for education, culture, and the arts	Similar	71%	173	251	31
	Residents' connection and engagement with their community	Lower	67%	227	252	10
In general, how many times do you:	Access the internet from your home using a computer, laptop, or tablet computer	Similar	96%	21	61	66
	Access the internet from your cell phone	Similar	94%	12	61	81
	Visit social media sites such as Facebook, Twitter, WhatsApp, etc.	Similar	80%	25	61	60
	Use or check email	Similar	98%	15	61	76
	Share your opinions online	Similar	27%	52	61	15
	Shop online	Higher	64%	8	61	87

	Would you say that in general your health is:	Similar	71%	54	260	80
	What impact, if any, do you think the economy will have on your family income in the next 6 months? Do you think the impact will be:	Similar	22%	216	263	18

Custom benchmark tables

This table contains the comparisons of Roseville's results to those from other communities with similar population sizes, ranging from 100,000 to 200,000. The first column shows the comparison of Roseville's rating to the benchmark. Roseville's results are noted as being "higher", "lower" or "similar" to the benchmark, meaning that the average rating given by Roseville residents is statistically similar to or different than the benchmark. The second column is Roseville's "percent positive." Most commonly, the percent positive is the combination of the top two most positive response options (i.e., excellent/good). The third column is the rank assigned to Roseville's rating among communities where a similar question was asked. The fourth column is the number of communities that asked a similar question. The fifth column shows the percentile for Roseville's result -- that is what percent of surveyed communities had a lower rating than Roseville.

			% positive	Rank	Number of communities	Percentile
Please rate each of the following aspects of quality of life in Roseville.	Roseville as a place to live	Higher	97%	1	50	99
	Your neighborhood as a place to live	Higher	92%	1	38	98
	Roseville as a place to raise children	Much higher	95%	3	51	95
	Roseville as a place to work	Much higher	88%	2	49	97
	Roseville as a place to visit	Similar	73%	15	39	63
	Roseville as a place to retire	Higher	83%	5	49	91
	The overall quality of life in Roseville	Higher	96%	2	58	97
	Sense of community	Higher	74%	3	35	92
Please rate each of the following characteristics as they relate to Roseville as a whole.	Overall economic health of Roseville	Higher	90%	2	33	95
	Overall quality of the transportation system (auto, bicycle, foot, bus) in Roseville	Similar	76%	7	33	80
	Overall design or layout of Roseville's residential and commercial areas (e.g., homes, buildings, streets, parks, etc.)	Higher	78%	3	32	91
	Overall quality of the utility infrastructure in Roseville (water, sewer, storm water, electric, gas)	Much higher	97%	1	7	88
	Overall feeling of safety in Roseville	Higher	91%	5	44	89
	Overall quality of natural environment in Roseville	Similar	87%	6	33	83
	Overall quality of parks and recreation opportunities	Similar	94%	2	7	76
	Overall health and wellness opportunities in Roseville	Higher	89%	3	33	92
	Overall opportunities for education, culture, and the arts	Similar	69%	18	32	46
	Residents' connection and engagement with their community	Similar	66%	3	7	63
Please indicate how likely or unlikely you are to do each of the following.	Recommend living in Roseville to someone who asks	Higher	94%	3	34	92
	Remain in Roseville for the next five years	Similar	84%	18	34	49
Please rate how safe or unsafe you feel:	In your neighborhood during the day	Similar	97%	4	44	92
	In Roseville's downtown/commercial area during the day	Similar	88%	17	40	59
	From property crime	Similar	77%	6	11	51

Please rate how safe or unsafe you feel:	From violent crime	Similar	87%	3	11	76
	From fire, flood, or other natural disaster	Similar	87%	3	7	63
Please rate the job you feel the Roseville community does at each of the following.	Making all residents feel welcome	Similar	80%	1	7	88
	Attracting people from diverse backgrounds	Similar	61%	5	7	38
	Valuing/respecting residents from diverse backgrounds	Similar	72%	3	7	63
	Taking care of vulnerable residents (elderly, disabled, homeless, etc.)	Similar	64%	2	7	76
Please rate each of the following characteristics as they relate to Roseville as a whole.	Overall quality of business and service establishments in Roseville	Higher	93%	1	31	97
	Variety of business and service establishments in Roseville	Higher	87%	1	7	88
	Vibrancy of downtown/commercial area	Similar	62%	11	28	63
	Employment opportunities	Higher	69%	5	40	88
	Shopping opportunities	Much higher	93%	1	33	98
	Cost of living in Roseville	Similar	54%	8	32	76
	Overall image or reputation of Roseville	Much higher	93%	1	43	98
Please rate each of the following characteristics as they relate to Roseville as a whole.	Traffic flow on major streets	Higher	56%	6	41	86
	Ease of public parking	Much higher	76%	1	28	97
	Ease of travel by car in Roseville	Higher	80%	4	35	89
	Ease of travel by public transportation in Roseville	Higher	57%	6	32	82
	Ease of travel by bicycle in Roseville	Higher	71%	5	36	87
	Ease of travel as a pedestrian	Similar	70%	9	36	76
	Well-planned residential growth	Higher	69%	2	7	76
	Well-planned commercial growth	Higher	68%	2	7	76
	Well-designed neighborhoods	Higher	82%	1	8	89
	Preservation of the historical or cultural character of the community	Similar	69%	3	7	63
	Public places where people want to spend time	Higher	77%	4	31	88
	Variety of housing options	Higher	66%	6	31	82
	Availability of affordable quality housing	Similar	43%	12	37	69
	Overall quality of new development in Roseville	Higher	76%	3	34	92
	Overall appearance of Roseville	Higher	94%	2	42	96
	Cleanliness of Roseville	Much higher	92%	1	37	98
	Water resources (e.g., creeks)	Higher	86%	1	7	88
	Air quality	Similar	80%	12	32	64
	Availability of paths and walking trails	Much higher	88%	3	36	92

Please rate each of the following characteristics as they relate to Roseville as a whole.	Fitness opportunities (including exercise classes and paths or trails, etc.)	Higher	90%	3	30	91
	Recreational opportunities	Higher	83%	5	32	85
	Availability of affordable quality food	Higher	81%	1	29	97
	Availability of affordable quality health care	Higher	78%	1	32	97
	Availability of preventive health services	Higher	83%	1	28	97
	Availability of affordable quality mental health care	Higher	62%	4	28	87
	Opportunities to attend cultural/arts/music activities	Similar	56%	22	36	41
	Community support for the arts	Similar	57%	5	7	38
	Availability of affordable quality childcare/preschool	Higher	63%	5	33	86
	K-12 education	Higher	87%	6	33	83
	Adult educational opportunities	Similar	70%	10	31	69
	Sense of civic/community pride	Similar	75%	3	7	63
	Neighborliness of residents in Roseville	Similar	71%	4	31	88
	Opportunities to participate in social events and activities	Similar	66%	12	32	64
	Opportunities to attend special events and festivals	Similar	65%	10	32	70
	Opportunities to volunteer	Similar	75%	14	32	58
	Opportunities to participate in community matters	Similar	69%	12	32	64
	Openness and acceptance of the community toward people of diverse backgrounds	Similar	65%	10	35	73
Please indicate whether or not you have done each of the following in the last 12 months.	Contacted the City of Roseville (in-person, phone, email, or web) for help or information	Similar	49%	14	47	71
	Contacted Roseville elected officials (in-person, phone, email, or web) to express your opinion	Similar	12%	29	31	10
	Attended a local public meeting (of local elected officials like City Council or County Commissioners, advisory boards, town halls, HOA, n..	Lower	10%	32	31	1
	Watched (online or on television) a local public meeting	Similar	22%	21	29	31
	Volunteered your time to some group/activity in Roseville	Lower	29%	27	32	19
	Campaigned or advocated for a local issue, cause, or candidate	Similar	18%	22	30	30
	Voted in your most recent local election	Similar	86%	1	7	88
	Used bus, rail, or other public transportation instead of driving	Lower	10%	20	28	32
	Carpooled with other adults or children instead of driving alone	Similar	45%	13	32	61
	Walked or biked instead of driving	Similar	58%	9	31	72
Please rate the quality of each of the following services in Roseville.	Public information services	Similar	79%	2	33	95
	Economic development	Higher	78%	2	34	95
	Traffic enforcement	Similar	69%	4	44	92
	Traffic signal timing	Higher	68%	1	33	98

Please rate the quality of each of the following services in Roseville.	Street repair	Higher	65%	2	37	95
	Street cleaning	Much higher	82%	2	31	94
	Street lighting	Much higher	82%	1	37	98
	Sidewalk maintenance	Higher	74%	2	33	95
	Bus or transit services	Higher	66%	6	30	81
	Land use, planning, and zoning	Higher	68%	1	36	98
	Code enforcement (weeds, abandoned buildings, etc.)	Higher	71%	1	46	98
	Affordable high-speed internet access	Similar	63%	3	6	58
	Garbage collection	Higher	95%	1	42	98
	Drinking water	Much higher	93%	1	35	98
	Sewer services	Higher	96%	1	38	98
	Storm water management (storm drainage, dams, levees, etc.)	Much higher	92%	1	39	98
	Power (electric and/or gas) utility	Much higher	96%	1	25	97
	Utility billing	Much higher	90%	1	31	97
	Police services	Higher	86%	3	57	95
	Crime prevention	Higher	84%	3	46	94
	Animal control	Much higher	89%	1	42	98
	Ambulance or emergency medical services	Similar	95%	3	43	94
	Fire services	Higher	97%	2	49	97
	Fire prevention and education	Higher	90%	1	36	98
	Emergency preparedness (services that prepare the community for natural disasters or other emergency situations)	Higher	79%	2	35	95
	Preservation of natural areas (open space, farmlands, and greenbelts)	Higher	80%	3	31	91
	Roseville open space	Higher	78%	5	31	85
	Recycling	Similar	81%	6	42	87
	Yard waste pick-up	Higher	88%	2	30	94
	City parks	Higher	90%	4	37	90
	Recreation programs or classes	Higher	86%	4	40	91
	Recreation centers or facilities	Higher	87%	3	36	92
	Health services	Higher	84%	2	31	94
	Public library services	Similar	92%	7	44	85
	Overall customer service by Roseville employees (police, receptionists, planners, etc.)	Higher	91%	2	50	97
Please rate the following categories of Roseville	The value of services for the taxes paid to Roseville	Higher	77%	1	53	99

Please rate the following categories of Roseville government performance.	The overall direction that Roseville is taking	Higher	77%	2	39	96
	The job Roseville government does at welcoming resident involvement	Higher	66%	1	42	98
	Overall confidence in Roseville government	Higher	72%	2	32	94
	Generally acting in the best interest of the community	Higher	75%	3	33	92
	Being honest	Higher	75%	2	31	94
	Being open and transparent to the public	Higher	73%	1	7	88
	Informing residents about issues facing the community	Higher	69%	1	9	91
	Treating all residents fairly	Higher	79%	1	31	97
	Treating residents with respect	Higher	84%	1	7	88
Overall, how would you rate the quality of the services provided by each ..	The City of Roseville	Higher	89%	2	52	97
	The Federal Government	Similar	28%	30	31	7
Please rate how important, if at all, you think it is for the Roseville community to focus on each of the following in the coming two years.	Overall economic health of Roseville	Similar	92%	6	27	78
	Overall quality of the transportation system (auto, bicycle, foot, bus) in Roseville	Similar	76%	20	27	26
	Overall design or layout of Roseville's residential and commercial areas (e.g., homes, buildings, streets, parks, etc.)	Similar	82%	6	27	78
	Overall quality of the utility infrastructure in Roseville (water, sewer, storm water, electric, gas)	Similar	94%	1	7	88
	Overall feeling of safety in Roseville	Similar	95%	8	27	71
	Overall quality of natural environment in Roseville	Similar	85%	7	27	75
	Overall quality of parks and recreation opportunities	Similar	84%	2	7	76
	Overall health and wellness opportunities in Roseville	Similar	79%	11	27	60
	Overall opportunities for education, culture, and the arts	Similar	71%	21	27	23
	Residents' connection and engagement with their community	Similar	67%	24	27	12
In general, how many times do you:	Access the internet from your home using a computer, laptop, or tablet computer	Similar	96%	3	7	63
	Access the internet from your cell phone	Similar	94%	4	7	51
	Visit social media sites such as Facebook, Twitter, WhatsApp, etc.	Similar	80%	5	7	38
	Use or check email	Similar	98%	3	7	63
	Share your opinions online	Similar	27%	7	7	13
	Shop online	Higher	64%	2	7	76
	Would you say that in general your health is:	Similar	71%	5	31	85
	What impact, if any, do you think the economy will have on your family income in the next 6 months? Do you think the impact will be:	Similar	22%	28	31	13

Complete set of frequencies

This dashboard contains a complete set of responses to each question on the survey. By default, "Don't know" responses are excluded, but may be added to the table using the response filter to the right. When a table for a question that only permitted a single response does not total to exactly 100%, it is due to the common practice of percentages being rounded to the nearest whole number.

Please rate each of the following aspects of quality of life in Roseville.	Roseville as a place to live	Excellent	
		Good	
		Fair	
		Poor	
	Your neighborhood as a place to live	Excellent	
		Good	
		Fair	
		Poor	
	Roseville as a place to raise children	Excellent	
		Good	
		Fair	
		Poor	
	Roseville as a place to work	Excellent	
		Good	
		Fair	
		Poor	
	Roseville as a place to visit	Excellent	
		Good	
		Fair	
		Poor	
	Roseville as a place to retire	Excellent	
		Good	
		Fair	
		Poor	
	The overall quality of life in Roseville	Excellent	
		Good	
		Fair	
		Poor	
	Sense of community	Excellent	
		Good	
		Fair	
		Poor	
Please rate each of the following characteristics as they relate to Roseville as a whole.	Overall economic health of Roseville	Excellent	
		Good	
		Fair	
		Poor	

Please rate each of the following characteristics as they relate to Roseville as a whole.	Overall quality of the transportation system (auto, bicycle, foot, bus) in Roseville	Excellent	
		Good	
		Fair	
		Poor	
	Overall design or layout of Roseville's residential and commercial areas (e.g., homes, buildings, streets, parks, etc.)	Excellent	
		Good	
		Fair	
		Poor	
	Overall quality of the utility infrastructure in Roseville (water, sewer, storm water, electric, gas)	Excellent	
		Good	
		Fair	
		Poor	
	Overall feeling of safety in Roseville	Excellent	
		Good	
		Fair	
		Poor	
	Overall quality of natural environment in Roseville	Excellent	
		Good	
		Fair	
		Poor	
	Overall quality of parks and recreation opportunities	Excellent	
		Good	
		Fair	
		Poor	
	Overall health and wellness opportunities in Roseville	Excellent	
		Good	
		Fair	
		Poor	
	Overall opportunities for education, culture, and the arts	Excellent	
		Good	
		Fair	
		Poor	
	Residents' connection and engagement with their community	Excellent	
		Good	
		Fair	
		Poor	
Please indicate how likely or unlikely you are to do each of the following.	Recommend living in Roseville to someone who asks	Very likely	
		Somewhat likely	
		Somewhat unlikely	
		Very unlikely	

Please indicate how likely or unlikely you are to do each of the following.	Remain in Roseville for the next five years	Very likely	
		Somewhat likely	
		Somewhat unlikely	
		Very unlikely	
Please rate how safe or unsafe you feel:	In your neighborhood during the day	Very safe	
		Somewhat safe	
		Neither safe nor unsafe	
		Somewhat unsafe	
		Very unsafe	
	In Roseville's downtown/commercial area during the day	Very safe	
		Somewhat safe	
		Neither safe nor unsafe	
		Somewhat unsafe	
		Very unsafe	
	From property crime	Very safe	
		Somewhat safe	
		Neither safe nor unsafe	
		Somewhat unsafe	
		Very unsafe	
	From violent crime	Very safe	
		Somewhat safe	
		Neither safe nor unsafe	
		Somewhat unsafe	
		Very unsafe	
	From fire, flood, or other natural disaster	Very safe	
		Somewhat safe	
		Neither safe nor unsafe	
		Somewhat unsafe	
		Very unsafe	
Please rate the job you feel the Roseville community does at each of the following.	Making all residents feel welcome	Excellent	
		Good	
		Fair	
		Poor	
	Attracting people from diverse backgrounds	Excellent	
		Good	
		Fair	
		Poor	
	Valuing/respecting residents from diverse backgrounds	Excellent	
		Good	
		Fair	

Please rate the job you feel the Roseville community does at each of the following.	Valuing/respecting residents from diverse backgrounds	Poor	
	Taking care of vulnerable residents (elderly, disabled, homeless, etc.)	Excellent	
		Good	
		Fair	
		Poor	
Please rate each of the following characteristics as they relate to Roseville as a whole.	Overall quality of business and service establishments in Roseville	Excellent	
		Good	
		Fair	
		Poor	
	Variety of business and service establishments in Roseville	Excellent	
		Good	
		Fair	
		Poor	
	Vibrancy of downtown/commercial area	Excellent	
		Good	
		Fair	
		Poor	
	Employment opportunities	Excellent	
		Good	
		Fair	
		Poor	
	Shopping opportunities	Excellent	
		Good	
		Fair	
		Poor	
	Cost of living in Roseville	Excellent	
		Good	
		Fair	
		Poor	
	Overall image or reputation of Roseville	Excellent	
		Good	
		Fair	
		Poor	
Please rate each of the following characteristics as they relate to Roseville as a whole.	Traffic flow on major streets	Excellent	
		Good	
		Fair	
		Poor	
	Ease of public parking	Excellent	
		Good	
		Fair	

Please rate each of the following characteristics as they relate to Roseville as a whole.	Ease of public parking	Poor	
	Ease of travel by car in Roseville	Excellent	
		Good	
		Fair	
		Poor	
	Ease of travel by public transportation in Roseville	Excellent	
		Good	
		Fair	
		Poor	
	Ease of travel by bicycle in Roseville	Excellent	
		Good	
		Fair	
		Poor	
	Ease of travel as a pedestrian	Excellent	
		Good	
		Fair	
		Poor	
	Well-planned residential growth	Excellent	
		Good	
		Fair	
		Poor	
	Well-planned commercial growth	Excellent	
		Good	
		Fair	
		Poor	
	Well-designed neighborhoods	Excellent	
		Good	
		Fair	
		Poor	
	Preservation of the historical or cultural character of the community	Excellent	
		Good	
		Fair	
		Poor	
	Public places where people want to spend time	Excellent	
		Good	
		Fair	
		Poor	
	Variety of housing options	Excellent	
		Good	
		Fair	

Please rate each of the following characteristics as they relate to Roseville as a whole.	Variety of housing options	Poor	
	Availability of affordable quality housing	Excellent	
		Good	
		Fair	
		Poor	
	Overall quality of new development in Roseville	Excellent	
		Good	
		Fair	
		Poor	
	Overall appearance of Roseville	Excellent	
		Good	
		Fair	
		Poor	
	Cleanliness of Roseville	Excellent	
		Good	
		Fair	
		Poor	
	Water resources (e.g., creeks)	Excellent	
		Good	
		Fair	
		Poor	
	Air quality	Excellent	
		Good	
		Fair	
		Poor	
	Availability of paths and walking trails	Excellent	
		Good	
		Fair	
		Poor	
	Fitness opportunities (including exercise classes and paths or trails, etc.)	Excellent	
		Good	
		Fair	
		Poor	
	Recreational opportunities	Excellent	
		Good	
		Fair	
		Poor	
	Availability of affordable quality food	Excellent	
		Good	
		Fair	

Please rate each of the following characteristics as they relate to Roseville as a whole.	Availability of affordable quality food	Poor	
	Availability of affordable quality health care	Excellent	
		Good	
		Fair	
		Poor	
	Availability of preventive health services	Excellent	
		Good	
		Fair	
		Poor	
	Availability of affordable quality mental health care	Excellent	
		Good	
		Fair	
		Poor	
	Opportunities to attend cultural/arts/music activities	Excellent	
		Good	
		Fair	
		Poor	
	Community support for the arts	Excellent	
		Good	
		Fair	
		Poor	
	Availability of affordable quality childcare/preschool	Excellent	
		Good	
		Fair	
		Poor	
	K-12 education	Excellent	
		Good	
		Fair	
		Poor	
	Adult educational opportunities	Excellent	
		Good	
		Fair	
		Poor	
	Sense of civic/community pride	Excellent	
		Good	
		Fair	
		Poor	
	Neighborliness of residents in Roseville	Excellent	
		Good	
		Fair	

Please rate each of the following characteristics as they relate to Roseville as a whole.	Neighborliness of residents in Roseville	Poor	
	Opportunities to participate in social events and activities	Excellent	
		Good	
		Fair	
		Poor	
	Opportunities to attend special events and festivals	Excellent	
		Good	
		Fair	
		Poor	
	Opportunities to volunteer	Excellent	
		Good	
		Fair	
		Poor	
	Opportunities to participate in community matters	Excellent	
		Good	
		Fair	
		Poor	
	Openness and acceptance of the community toward people of diverse backgrounds	Excellent	
		Good	
		Fair	
		Poor	
Please indicate whether or not you have done each of the following in the last 12 months.	Contacted the City of Roseville (in-person, phone, email, or web) for help or information	No	
		Yes	
	Contacted Roseville elected officials (in-person, phone, email, or web) to express your opinion	No	
		Yes	
	Attended a local public meeting (of local elected officials like City Council or County Commissioners, advisory boards, town halls, HO..	No	
		Yes	
	Watched (online or on television) a local public meeting	No	
		Yes	
	Volunteered your time to some group/activity in Roseville	No	
		Yes	
	Campaigned or advocated for a local issue, cause, or candidate	No	
		Yes	
	Voted in your most recent local election	No	
		Yes	
	Used bus, rail, or other public transportation instead of driving	No	
		Yes	
	Carpooled with other adults or children instead of driving alone	No	
		Yes	
	Walked or biked instead of driving	No	

have done each of the following in the last 12 months.	Walked or biked instead of driving	Yes	
Please rate the quality of each of the following services in Roseville.	Public information services	Excellent	
		Good	
		Fair	
		Poor	
	Economic development	Excellent	
		Good	
		Fair	
		Poor	
	Traffic enforcement	Excellent	
		Good	
		Fair	
		Poor	
	Traffic signal timing	Excellent	
		Good	
		Fair	
		Poor	
	Street repair	Excellent	
		Good	
		Fair	
		Poor	
	Street cleaning	Excellent	
		Good	
		Fair	
		Poor	
	Street lighting	Excellent	
		Good	
		Fair	
		Poor	
	Sidewalk maintenance	Excellent	
		Good	
		Fair	
		Poor	
	Bus or transit services	Excellent	
		Good	
		Fair	
		Poor	
	Land use, planning, and zoning	Excellent	
		Good	
		Fair	

Please rate the quality of each of the following services in Roseville.	Land use, planning, and zoning	Poor	
	Code enforcement (weeds, abandoned buildings, etc.)	Excellent	
		Good	
		Fair	
		Poor	
	Affordable high-speed internet access	Excellent	
		Good	
		Fair	
		Poor	
	Garbage collection	Excellent	
		Good	
		Fair	
		Poor	
	Drinking water	Excellent	
		Good	
		Fair	
		Poor	
	Sewer services	Excellent	
		Good	
		Fair	
		Poor	
	Storm water management (storm drainage, dams, levees, etc.)	Excellent	
		Good	
		Fair	
		Poor	
	Power (electric and/or gas) utility	Excellent	
		Good	
		Fair	
		Poor	
	Utility billing	Excellent	
		Good	
		Fair	
		Poor	
	Police services	Excellent	
		Good	
		Fair	
		Poor	
	Crime prevention	Excellent	
		Good	
		Fair	

Please rate the quality of each of the following services in Roseville.	Crime prevention	Poor	
	Animal control	Excellent	
		Good	
		Fair	
		Poor	
	Ambulance or emergency medical services	Excellent	
		Good	
		Fair	
		Poor	
	Fire services	Excellent	
		Good	
		Fair	
		Poor	
	Fire prevention and education	Excellent	
		Good	
		Fair	
		Poor	
	Emergency preparedness (services that prepare the community for natural disasters or other emergency situations)	Excellent	
		Good	
		Fair	
		Poor	
	Preservation of natural areas (open space, farmlands, and greenbelts)	Excellent	
		Good	
		Fair	
		Poor	
	Roseville open space	Excellent	
		Good	
		Fair	
		Poor	
	Recycling	Excellent	
		Good	
		Fair	
		Poor	
	Yard waste pick-up	Excellent	
		Good	
		Fair	
		Poor	
	City parks	Excellent	
		Good	
		Fair	

Please rate the quality of each of the following services in Roseville.	City parks	Poor	
	Recreation programs or classes	Excellent	
		Good	
		Fair	
		Poor	
	Recreation centers or facilities	Excellent	
		Good	
		Fair	
		Poor	
	Health services	Excellent	
		Good	
		Fair	
		Poor	
	Public library services	Excellent	
		Good	
		Fair	
		Poor	
	Overall customer service by Roseville employees (police, receptionists, planners, etc.)	Excellent	
		Good	
		Fair	
		Poor	
Please rate the following categories of Roseville government performance.	The value of services for the taxes paid to Roseville	Excellent	
		Good	
		Fair	
		Poor	
	The overall direction that Roseville is taking	Excellent	
		Good	
		Fair	
		Poor	
	The job Roseville government does at welcoming resident involvement	Excellent	
		Good	
		Fair	
		Poor	
	Overall confidence in Roseville government	Excellent	
		Good	
		Fair	
		Poor	
	Generally acting in the best interest of the community	Excellent	
		Good	
		Fair	

Please rate the following categories of Roseville government performance.	Generally acting in the best interest of the community	Poor	
	Being honest	Excellent	
		Good	
		Fair	
		Poor	
	Being open and transparent to the public	Excellent	
		Good	
		Fair	
		Poor	
	Informing residents about issues facing the community	Excellent	
		Good	
		Fair	
		Poor	
	Treating all residents fairly	Excellent	
		Good	
		Fair	
		Poor	
	Treating residents with respect	Excellent	
		Good	
		Fair	
		Poor	
Overall, how would you rate the quality of the services provided by each of the following?	The City of Roseville	Excellent	
		Good	
		Fair	
		Poor	
	The Federal Government	Excellent	
		Good	
		Fair	
		Poor	
Please rate how important, if at all, you think it is for the Roseville community to focus on each of the following in the coming two years.	Overall economic health of Roseville	Essential	
		Very important	
		Somewhat important	
		Not at all important	
	Overall quality of the transportation system (auto, bicycle, foot, bus) in Roseville	Essential	
		Very important	
		Somewhat important	
		Not at all important	
	Overall design or layout of Roseville's residential and commercial areas (e.g., homes, buildings, streets, parks, etc.)	Essential	
		Very important	
		Somewhat important	

Please rate how important, if at all, you think it is for the Roseville community to focus on each of the following in the coming two years.	and commercial areas (e.g., homes, buildings, streets, parks, etc.)	Not at all important	
	Overall quality of the utility infrastructure in Roseville (water, sewer, storm water, electric, gas)	Essential	
		Very important	
		Somewhat important	
		Not at all important	
	Overall feeling of safety in Roseville	Essential	
		Very important	
		Somewhat important	
		Not at all important	
	Overall quality of natural environment in Roseville	Essential	
		Very important	
		Somewhat important	
		Not at all important	
	Overall quality of parks and recreation opportunities	Essential	
		Very important	
		Somewhat important	
		Not at all important	
	Overall health and wellness opportunities in Roseville	Essential	
		Very important	
		Somewhat important	
		Not at all important	
	Overall opportunities for education, culture, and the arts	Essential	
		Very important	
		Somewhat important	
		Not at all important	
	Residents' connection and engagement with their community	Essential	
		Very important	
		Somewhat important	
		Not at all important	
How much of a problem, if at all, do you think homelessness is in each of the following?	In your neighborhood	Not a problem	
		Minor problem	
		Moderate problem	
		Major problem	
	In Roseville overall	Not a problem	
		Minor problem	
		Moderate problem	
		Major problem	
	Please rate how important, if at all, you think it is to address the challenges of people experiencing homelessness in Roseville?	Essential	
		Very important	
		Somewhat important	

	to address the challenges of people experiencing homelessness in Roseville?	Not at all important	
	Supportive housing combines housing with social services such as job training, life skills training, substance abuse programs, and community support services (e.g., child care, educational programs, etc.). If transportation needs were met and services were accessible, provided there was adequate state and federal funding, how much w..	Strongly support	
		Somewhat support	
		Somewhat oppose	
		Strongly oppose	
Please rate how important, if at all, each of the following are for the City of Roseville to focus on to help address homelessness:	Create affordable housing opportunities	Essential	
		Very important	
		Somewhat important	
		Not at all important	
	Provide access to social services	Essential	
		Very important	
		Somewhat important	
		Not at all important	
	Partner with Placer County Social Services, non-profits, and health care providers that provide services to people experiencing homelessness	Essential	
		Very important	
		Somewhat important	
		Not at all important	
	Please indicate which of the following methods, if any, you prefer as a way to receive news and information from the City of Roseville:	City website	
		Email newsletters	
		Mail	
		Community meetings	
		Facebook	
		Twitter	
		Instagram	
		Nextdoor	
		Other	
In general, how many times do you:	Access the internet from your home using a computer, laptop, or tablet computer	Several times a day	
		Once a day	
		A few times a week	
		Every few weeks	
		Less often or never	
	Access the internet from your cell phone	Several times a day	
		Once a day	
		A few times a week	
		Every few weeks	
		Less often or never	
	Visit social media sites such as Facebook, Twitter, WhatsApp, etc.	Several times a day	
		Once a day	
		A few times a week	
		Every few weeks	

In general, how many times do you:	Visit social media sites such as Facebook, Twitter, WhatsApp, etc.	Less often or never	
	Use or check email	Several times a day	
		Once a day	
		A few times a week	
		Every few weeks	
		Less often or never	
	Share your opinions online	Several times a day	
		Once a day	
		A few times a week	
		Every few weeks	
		Less often or never	
	Shop online	Several times a day	
		Once a day	
		A few times a week	
		Every few weeks	
		Less often or never	
	Would you say that in general your health is:	Excellent	
		Very good	
		Good	
		Fair	
		Poor	
	What impact, if any, do you think the economy will have on your family income in the next 6 months? Do you think the impact will be:	Very positive	
		Somewhat positive	
		Neutral	
		Somewhat negative	
		Very negative	
	How many years have you lived in Roseville?	Less than 2 years	
		2-5 years	
		6-10 years	
		11-20 years	
		More than 20 years	
	Which best describes the building you live in?	One family house detached from any other houses	
		Building with two or more homes (duplex, townhome, apa..	
		Mobile home	
		Other	
	Do you rent or own your home?	Rent	
		Own	
	About how much is your monthly housing cost for the place you live (including rent, mortgage payment, property tax, property insurance, and homeowners' association (HOA) fees)?	Less than $500	
		$500 to $999	
		$1,000 to $1,499	

	About how much is your monthly housing cost for the place you live (including rent, mortgage payment, property tax, property insurance, and homeowners' association (HOA) fees)?	$1,500 to $1,999	
		$2,000 to $2,499	
		$2,500 to $2,999	
		$3,000 to $3,499	
		$3,500 or more	
	Do any children 17 or under live in your household?	No	
		Yes	
	Are you or any other members of your household aged 65 or older?	No	
		Yes	
	How much do you anticipate your household's total income before taxes will be for the current year? (Please include in your total income money from all sources for all persons living in your household.)	Less than $25,000	
		$25,000 to $49,999	
		$50,000 to $74,999	
		$75,000 to $99,999	
		$100,000 to $149,999	
		$150,000 or more	
	Are you Spanish, Hispanic, or Latino?	No, not Spanish, Hispanic, or Latino	 1
	What is your race? (Mark one or more races to indicate what race you consider yourself to be.)	American Indian or Alaskan Native	
		Asian, Asian Indian. or Pacific Islander	
		Black or African American	
		White	
		Other	
	In which category is your age?	18-24 years	
		25-34 years	
		35-44 years	
		45-54 years	
		55-64 years	
		65-74 years	
		75 years or older	
	What is your gender?	Female	
		Male	

Comparison of Responses by Respondent Characteristics

Responses have been summarized to show only the proportion of respondents giving a positive answer; for example, the percent of respondents who rated the quality of life as excellent or good.

In the "Statistical significance" tab, you will find a tool to help determine the threshold values for statistically significant differences between groups.

		District 1	District 2	District 3	District 4	District 5
Please rate each of the following aspects of quality of life in Roseville.	Roseville as a place to live	98%	99%	97%	97%	93%
	Your neighborhood as a place to live	97%	77%	99%	96%	89%
	Roseville as a place to raise children	97%	95%	94%	97%	94%
	Roseville as a place to work	91%	84%	87%	90%	91%
	Roseville as a place to visit	67%	68%	81%	78%	69%
	Roseville as a place to retire	78%	80%	82%	87%	86%
	The overall quality of life in Roseville	97%	95%	99%	97%	93%
	Sense of community	74%	71%	69%	87%	70%
Please rate each of the following characteristics as they relate to Roseville as a whole.	Overall economic health of Roseville	91%	86%	91%	94%	90%
	Overall quality of the transportation system (auto, bicycle, foot, bus) in Roseville	84%	72%	73%	79%	74%
	Overall design or layout of Roseville's residential and commercial areas (e.g., homes, buildings, streets, parks, etc.)	84%	69%	84%	80%	72%
	Overall quality of the utility infrastructure in Roseville (water, sewer, storm water, electric, gas)	98%	98%	98%	93%	98%
	Overall feeling of safety in Roseville	87%	91%	93%	91%	94%
	Overall quality of natural environment in Roseville	85%	80%	88%	94%	89%
	Overall quality of parks and recreation opportunities	93%	93%	98%	96%	92%
	Overall health and wellness opportunities in Roseville	92%	86%	95%	90%	85%
	Overall opportunities for education, culture, and the arts	78%	66%	66%	70%	64%
	Residents' connection and engagement with their community	66%	61%	65%	81%	57%
Please indicate how likely or unlikely you are to do each of the following.	Recommend living in Roseville to someone who asks	90%	95%	97%	97%	91%
	Remain in Roseville for the next five years	77%	83%	80%	91%	87%
Please rate how safe or unsafe you feel:	In your neighborhood during the day	96%	97%	99%	98%	94%
	In Roseville's downtown/commercial area during the day	89%	90%	90%	87%	83%
	From property crime	73%	72%	83%	82%	77%
	From violent crime	84%	86%	94%	89%	83%

Please rate how safe or unsafe you feel:	From fire, flood, or other natural disaster	89%	82%	88%	90%	84%
Please rate the job you feel the Roseville community does at each of the following.	Making all residents feel welcome	90%	64%	81%	87%	78%
	Attracting people from diverse backgrounds	51%	53%	59%	76%	64%
	Valuing/respecting residents from diverse backgrounds	76%	69%	66%	76%	74%
	Taking care of vulnerable residents (elderly, disabled, homeless, etc.)	61%	68%	52%	68%	71%
Please rate each of the following characteristics as they relate to Roseville as a whole.	Overall quality of business and service establishments in Roseville	94%	92%	92%	90%	96%
	Variety of business and service establishments in Roseville	90%	88%	87%	85%	87%
	Vibrancy of downtown/commercial area	67%	52%	59%	63%	67%
	Employment opportunities	64%	60%	65%	83%	74%
	Shopping opportunities	94%	89%	95%	93%	92%
	Cost of living in Roseville	47%	50%	51%	64%	59%
	Overall image or reputation of Roseville	93%	89%	96%	95%	93%
Please rate each of the following characteristics as they relate to Roseville as a whole.	Traffic flow on major streets	63%	51%	55%	58%	53%
	Ease of public parking	75%	67%	90%	74%	75%
	Ease of travel by car in Roseville	83%	86%	81%	73%	77%
	Ease of travel by public transportation in Roseville	54%	45%	43%	64%	74%
	Ease of travel by bicycle in Roseville	64%	51%	82%	75%	78%
	Ease of travel as a pedestrian	82%	55%	63%	80%	70%
	Well-planned residential growth	68%	59%	82%	60%	73%
	Well-planned commercial growth	70%	62%	86%	62%	61%
	Well-designed neighborhoods	84%	73%	87%	82%	84%
	Preservation of the historical or cultural character of the community	67%	52%	79%	72%	73%
	Public places where people want to spend time	75%	74%	87%	73%	74%
	Variety of housing options	69%	50%	65%	71%	74%
	Availability of affordable quality housing	45%	31%	39%	49%	51%
	Overall quality of new development in Roseville	73%	65%	82%	74%	83%
	Overall appearance of Roseville	91%	95%	94%	94%	96%
	Cleanliness of Roseville	91%	88%	91%	92%	96%
	Water resources (e.g., creeks)	88%	78%	92%	83%	85%
	Air quality	80%	77%	78%	79%	84%
	Availability of paths and walking trails	87%	78%	96%	92%	89%
	Fitness opportunities (including exercise classes and paths or trails, etc.)	88%	80%	98%	89%	94%

Please rate each of the following characteristics as they relate to Roseville as a whole.	Recreational opportunities	82%	72%	90%	87%	83%
	Availability of affordable quality food	80%	74%	85%	87%	80%
	Availability of affordable quality health care	78%	67%	82%	91%	70%
	Availability of preventive health services	81%	77%	89%	88%	78%
	Availability of affordable quality mental health care	66%	47%	59%	80%	58%
	Opportunities to attend cultural/arts/music activities	53%	54%	58%	64%	49%
	Community support for the arts	69%	47%	61%	58%	51%
	Availability of affordable quality childcare/preschool	68%	37%	78%	76%	57%
	K-12 education	92%	82%	80%	91%	91%
	Adult educational opportunities	82%	70%	55%	77%	65%
	Sense of civic/community pride	77%	67%	72%	82%	74%
	Neighborliness of residents in Roseville	70%	68%	72%	81%	67%
	Opportunities to participate in social events and activities	56%	54%	66%	79%	74%
	Opportunities to attend special events and festivals	58%	58%	72%	63%	72%
	Opportunities to volunteer	78%	62%	77%	80%	80%
	Opportunities to participate in community matters	67%	65%	67%	69%	78%
	Openness and acceptance of the community toward people of diverse backgrounds	65%	60%	62%	70%	69%
Please indicate whether or not you have done each of the following in the last 12 months.	Contacted the City of Roseville (in-person, phone, email, or web) for help or information	54%	48%	42%	41%	58%
	Contacted Roseville elected officials (in-person, phone, email, or web) to express your opinion	9%	11%	13%	6%	19%
	Attended a local public meeting (of local elected officials like City Council or County Commissioners, advisory boards, tow..	7%	5%	8%	16%	13%
	Watched (online or on television) a local public meeting	19%	24%	19%	21%	26%
	Volunteered your time to some group/activity in Roseville	21%	30%	31%	30%	30%
	Campaigned or advocated for a local issue, cause, or candidate	16%	21%	14%	16%	21%
	Voted in your most recent local election	77%	90%	89%	88%	87%
	Used bus, rail, or other public transportation instead of driving	11%	11%	12%	8%	11%
	Carpooled with other adults or children instead of driving alone	38%	51%	35%	48%	52%
	Walked or biked instead of driving	59%	58%	57%	57%	56%
Please rate the quality of each of the following services in Roseville.	Public information services	81%	71%	77%	83%	82%
	Economic development	82%	65%	80%	77%	85%
	Traffic enforcement	84%	63%	64%	65%	69%
	Traffic signal timing	73%	64%	68%	63%	69%
	Street repair	71%	53%	72%	57%	68%

Please rate the quality of each of the following services in Roseville.	Street cleaning	84%	79%	81%	78%	86%
	Street lighting	88%	71%	80%	81%	89%
	Sidewalk maintenance	73%	52%	78%	86%	78%
	Bus or transit services	72%	60%	54%	68%	72%
	Land use, planning, and zoning	78%	74%	74%	59%	58%
	Code enforcement (weeds, abandoned buildings, etc.)	77%	49%	79%	66%	81%
	Affordable high-speed internet access	71%	51%	64%	60%	67%
	Garbage collection	90%	97%	97%	95%	97%
	Drinking water	96%	83%	99%	92%	94%
	Sewer services	95%	91%	100%	93%	98%
	Storm water management (storm drainage, dams, levees, etc.)	92%	88%	93%	92%	97%
	Power (electric and/or gas) utility	99%	99%	94%	94%	93%
	Utility billing	90%	95%	91%	87%	88%
	Police services	85%	86%	83%	92%	85%
	Crime prevention	89%	87%	80%	88%	79%
	Animal control	94%	88%	84%	91%	90%
	Ambulance or emergency medical services	96%	93%	95%	94%	97%
	Fire services	97%	93%	99%	96%	98%
	Fire prevention and education	83%	85%	91%	96%	94%
	Emergency preparedness (services that prepare the community for natural disasters or other emergency situati..	78%	82%	73%	79%	82%
	Preservation of natural areas (open space, farmlands, and greenbelts)	78%	74%	87%	76%	83%
	Roseville open space	85%	65%	88%	78%	73%
	Recycling	82%	75%	84%	75%	89%
	Yard waste pick-up	92%	76%	92%	86%	92%
	City parks	93%	91%	91%	91%	87%
	Recreation programs or classes	87%	72%	91%	87%	89%
	Recreation centers or facilities	86%	78%	93%	86%	90%
	Health services	86%	79%	89%	88%	78%
	Public library services	85%	91%	99%	91%	94%
	Overall customer service by Roseville employees (police, receptionists, planners, etc.)	88%	86%	94%	90%	98%
Please rate the following categories of Roseville government performance.	The value of services for the taxes paid to Roseville	78%	78%	75%	78%	76%
	The overall direction that Roseville is taking	81%	84%	73%	74%	73%

Please rate the following categories of Roseville government performance.	The job Roseville government does at welcoming resident involvement	66%	66%	60%	68%	71%
	Overall confidence in Roseville government	77%	76%	70%	69%	69%
	Generally acting in the best interest of the community	80%	79%	79%	70%	68%
	Being honest	79%	83%	69%	76%	69%
	Being open and transparent to the public	72%	75%	71%	74%	71%
	Informing residents about issues facing the community	66%	69%	69%	75%	65%
	Treating all residents fairly	86%	82%	75%	76%	79%
	Treating residents with respect	88%	92%	87%	80%	76%
Overall, how would you rate the quality of the services provided by each of the following?	The City of Roseville	91%	90%	92%	87%	84%
	The Federal Government	30%	24%	26%	39%	24%
Please rate how important, if at all, you think it is for the Roseville community to focus on each of the following in the coming two years.	Overall economic health of Roseville	90%	97%	88%	98%	90%
	Overall quality of the transportation system (auto, bicycle, foot, bus) in Roseville	69%	83%	70%	78%	80%
	Overall design or layout of Roseville's residential and commercial areas (e.g., homes, buildings, streets, parks, etc.)	84%	68%	81%	93%	85%
	Overall quality of the utility infrastructure in Roseville (water, sewer, storm water, electric, gas)	94%	89%	94%	96%	96%
	Overall feeling of safety in Roseville	91%	96%	93%	97%	95%
	Overall quality of natural environment in Roseville	87%	81%	80%	91%	87%
	Overall quality of parks and recreation opportunities	81%	81%	81%	88%	91%
	Overall health and wellness opportunities in Roseville	73%	79%	80%	84%	80%
	Overall opportunities for education, culture, and the arts	74%	66%	65%	69%	81%
	Residents' connection and engagement with their community	64%	59%	66%	71%	70%
In general, how many times do you:	Access the internet from your home using a computer, laptop, or tablet computer	96%	97%	96%	93%	98%
	Access the internet from your cell phone	93%	95%	96%	92%	96%
	Visit social media sites such as Facebook, Twitter, WhatsApp, etc.	80%	77%	85%	71%	87%
	Use or check email	99%	99%	96%	96%	100%
	Share your opinions online	25%	21%	30%	19%	36%
	Shop online	51%	61%	68%	58%	80%
	Would you say that in general your health is:	65%	74%	72%	76%	68%
	What impact, if any, do you think the economy will have on your family income in the next 6 months? Do you think the i..	10%	26%	28%	24%	21%

Statistical significance thresholds

Below you may select a demographic to find the thresholds for statistically significant differences between groups (i.e. the minimum difference between groups to be considered statistically significant based on the sample sizes). Use the drop down menu to the right to select demographic dimensions. If there were no responses within a specific demographic option, that option will not appear in the dashboard.

Area

	District 1	District 2	District 3	District 4	District 5
District 1		16%	15%	15%	15%
District 2	16%		15%	14%	14%
District 3	15%	15%		14%	14%
District 4	15%	14%	14%		13%
District 5	15%	14%	14%	13%	

Methods (open participation)

As part of its participation in The National Community Survey™ (The NCS™), the City of Roseville conducted a survey of 3,000 residents. Survey invitations were mailed to randomly selected households and data were collected from January 19, 2021 to March 10, 2021. The results from this main survey effort represent the most robust estimate of your residents' opinions.

After the above data collection period was underway, a link to an online open participation survey was publicized by the City of Roseville. The open participation survey was identical to the probability sample survey with two small updates; it included a map at the beginning asking where the respondent lives and also a question about where they heard about the survey. The open participation survey was open to all city residents and became available on February 23, 2021. The survey remained open for two weeks and there were 853 responses.

The open participation survey data were not collected through a random sample and it is unknown who in the community was aware of the survey; therefore, a level of confidence in the representativeness of the sample cannot be estimated. However, to reduce bias where possible, these data were statistically weighted to match the demographic characteristics of the 2010 Census and 2017 American Community Survey estimates for adults in the City of Roseville. The characteristics used for weighting were age, area, sex, race, Hispanic origin, housing type, and housing tenure. No adjustments were made for design effects. Weights were calculated using an iterative, multiplicative raking model known as the ANES Weighting Algorithm.* The results of the weighting scheme for the probability sample are presented in the following table.

* Pasek, J. (2010). ANES Weighting Algorithm. Retrieved from https://web.stanford.edu/group/iriss/cgi-bin/anesrake/resources/RakingDescription.pdf

		Unweighted	Weighted	Target*
Age	18-34	8%	27%	28%
	35-54	40%	37%	37%
	55+	52%	36%	36%
Area	District 1	15%	19%	19%
	District 2	15%	19%	19%
	District 3	13%	21%	21%
	District 4	22%	19%	19%
	District 5	34%	22%	22%
Hispanic	No, not Spanish, Hispanic, or Latino	91%	87%	87%
	Yes, I consider myself to be Spanish, Hispa..	9%	13%	13%
Housing type	Attached	8%	24%	24%
	Detached	92%	76%	76%
Race/ethnicity	Not white alone	25%	28%	28%
	White alone, not Hispanic or Latino	75%	72%	72%
Sex	Female	64%	53%	53%
	Male	36%	47%	47%
Sex/age	Female 18-34	6%	14%	14%
	Female 35-54	27%	19%	19%
	Female 55+	31%	20%	20%
	Male 18-34	3%	13%	14%
	Male 35-54	13%	18%	18%
	Male 55+	20%	16%	16%
Tenure	Own	89%	65%	65%
	Rent	11%	35%	35%

Open participation survey results

This dashboard contains a complete set of responses to each question on the open participation survey. By default, "don't know" responses are excluded, but may be added to the table using the response filter to the right. When a table for a question that only permitted a single response does not total to exactly 100%, it is due to the common practice of percentages being rounded to the nearest whole number.

	Using the map above as a reference, please indicate which District in Roseville you reside.	District 1	
		District 2	
		District 3	
		District 4	
		District 5	
		Not applicable (N/A)	
Please rate each of the following aspects of quality of life in Roseville.	Roseville as a place to live	Excellent	
		Good	
		Fair	
		Poor	
	Your neighborhood as a place to live	Excellent	
		Good	
		Fair	
		Poor	
	Roseville as a place to raise children	Excellent	
		Good	
		Fair	
		Poor	
	Roseville as a place to work	Excellent	
		Good	
		Fair	
		Poor	
	Roseville as a place to visit	Excellent	
		Good	
		Fair	
		Poor	
	Roseville as a place to retire	Excellent	
		Good	
		Fair	
		Poor	
	The overall quality of life in Roseville	Excellent	
		Good	
		Fair	
		Poor	
	Sense of community	Excellent	
		Good	
		Fair	

Please rate each of the following aspects of quality of life in Roseville.	Sense of community	Poor	
Please rate each of the following characteristics as they relate to Roseville as a whole.	Overall economic health of Roseville	Excellent	
		Good	
		Fair	
		Poor	
	Overall quality of the transportation system (auto, bicycle, foot, bus) in Roseville	Excellent	
		Good	
		Fair	
		Poor	
	Overall design or layout of Roseville's residential and commercial areas (e.g., homes, buildings, streets, parks, etc.)	Excellent	
		Good	
		Fair	
		Poor	
	Overall quality of the utility infrastructure in Roseville (water, sewer, storm water, electric, gas)	Excellent	
		Good	
		Fair	
		Poor	
	Overall feeling of safety in Roseville	Excellent	
		Good	
		Fair	
		Poor	
	Overall quality of natural environment in Roseville	Excellent	
		Good	
		Fair	
		Poor	
	Overall quality of parks and recreation opportunities	Excellent	
		Good	
		Fair	
		Poor	
	Overall health and wellness opportunities in Roseville	Excellent	
		Good	
		Fair	
		Poor	
	Overall opportunities for education, culture, and the arts	Excellent	
		Good	
		Fair	
		Poor	
	Residents' connection and engagement with their community	Excellent	
		Good	
		Fair	
		Poor	

Please indicate how likely or unlikely you are to do each of the following.	Recommend living in Roseville to someone who asks	Very likely	
		Somewhat likely	
		Somewhat unlikely	
		Very unlikely	
	Remain in Roseville for the next five years	Very likely	
		Somewhat likely	
		Somewhat unlikely	
		Very unlikely	
Please rate how safe or unsafe you feel:	In your neighborhood during the day	Very safe	
		Somewhat safe	
		Neither safe nor unsafe	
		Somewhat unsafe	
		Very unsafe	
	In Roseville's downtown/commercial area during the day	Very safe	
		Somewhat safe	
		Neither safe nor unsafe	
		Somewhat unsafe	
		Very unsafe	
	From property crime	Very safe	
		Somewhat safe	
		Neither safe nor unsafe	
		Somewhat unsafe	
		Very unsafe	
	From violent crime	Very safe	
		Somewhat safe	
		Neither safe nor unsafe	
		Somewhat unsafe	
		Very unsafe	
	From fire, flood, or other natural disaster	Very safe	
		Somewhat safe	
		Neither safe nor unsafe	
		Somewhat unsafe	
		Very unsafe	
Please rate the job you feel the Roseville community does at each of the following.	Making all residents feel welcome	Excellent	
		Good	
		Fair	
		Poor	
	Attracting people from diverse backgrounds	Excellent	
		Good	
		Fair	
		Poor	

Please rate the job you feel the Roseville community does at each of the following.	Valuing/respecting residents from diverse backgrounds	Excellent	
		Good	
		Fair	
		Poor	
	Taking care of vulnerable residents (elderly, disabled, homeless, etc.)	Excellent	
		Good	
		Fair	
		Poor	
Please rate each of the following characteristics as they relate to Roseville as a whole.	Overall quality of business and service establishments in Roseville	Excellent	
		Good	
		Fair	
		Poor	
	Variety of business and service establishments in Roseville	Excellent	
		Good	
		Fair	
		Poor	
	Vibrancy of downtown/commercial area	Excellent	
		Good	
		Fair	
		Poor	
	Employment opportunities	Excellent	
		Good	
		Fair	
		Poor	
	Shopping opportunities	Excellent	
		Good	
		Fair	
		Poor	
	Cost of living in Roseville	Excellent	
		Good	
		Fair	
		Poor	
	Overall image or reputation of Roseville	Excellent	
		Good	
		Fair	
		Poor	
Please rate each of the following characteristics as they relate to Roseville as a whole.	Traffic flow on major streets	Excellent	
		Good	
		Fair	
		Poor	
	Ease of public parking	Excellent	

Please rate each of the following characteristics as they relate to Roseville as a whole.	Ease of public parking	Good	
		Fair	
		Poor	
	Ease of travel by car in Roseville	Excellent	
		Good	
		Fair	
		Poor	
	Ease of travel by public transportation in Roseville	Excellent	
		Good	
		Fair	
		Poor	
	Ease of travel by bicycle in Roseville	Excellent	
		Good	
		Fair	
		Poor	
	Ease of travel as a pedestrian	Excellent	
		Good	
		Fair	
		Poor	
	Well-planned residential growth	Excellent	
		Good	
		Fair	
		Poor	
	Well-planned commercial growth	Excellent	
		Good	
		Fair	
		Poor	
	Well-designed neighborhoods	Excellent	
		Good	
		Fair	
		Poor	
	Preservation of the historical or cultural character of the community	Excellent	
		Good	
		Fair	
		Poor	
	Public places where people want to spend time	Excellent	
		Good	
		Fair	
		Poor	
	Variety of housing options	Excellent	
		Good	

Please rate each of the following characteristics as they relate to Roseville as a whole.	Variety of housing options	Fair	
		Poor	
	Availability of affordable quality housing	Excellent	
		Good	
		Fair	
		Poor	
	Overall quality of new development in Roseville	Excellent	
		Good	
		Fair	
		Poor	
	Overall appearance of Roseville	Excellent	
		Good	
		Fair	
		Poor	
	Cleanliness of Roseville	Excellent	
		Good	
		Fair	
		Poor	
	Water resources (e.g., creeks)	Excellent	
		Good	
		Fair	
		Poor	
	Air quality	Excellent	
		Good	
		Fair	
		Poor	
	Availability of paths and walking trails	Excellent	
		Good	
		Fair	
		Poor	
	Fitness opportunities (including exercise classes and paths or trails, etc.)	Excellent	
		Good	
		Fair	
		Poor	
	Recreational opportunities	Excellent	
		Good	
		Fair	
		Poor	
	Availability of affordable quality food	Excellent	
		Good	
		Fair	

Please rate each of the following characteristics as they relate to Roseville as a whole.	Availability of affordable quality food	Poor	
	Availability of affordable quality health care	Excellent	
		Good	
		Fair	
		Poor	
	Availability of preventive health services	Excellent	
		Good	
		Fair	
		Poor	
	Availability of affordable quality mental health care	Excellent	
		Good	
		Fair	
		Poor	
	Opportunities to attend cultural/arts/music activities	Excellent	
		Good	
		Fair	
		Poor	
	Community support for the arts	Excellent	
		Good	
		Fair	
		Poor	
	Availability of affordable quality childcare/preschool	Excellent	
		Good	
		Fair	
		Poor	
	K-12 education	Excellent	
		Good	
		Fair	
		Poor	
	Adult educational opportunities	Excellent	
		Good	
		Fair	
		Poor	
	Sense of civic/community pride	Excellent	
		Good	
		Fair	
		Poor	
	Neighborliness of residents in Roseville	Excellent	
		Good	
		Fair	
		Poor	

Please rate each of the following characteristics as they relate to Roseville as a whole.	Opportunities to participate in social events and activities	Excellent	
		Good	
		Fair	
		Poor	
	Opportunities to attend special events and festivals	Excellent	
		Good	
		Fair	
		Poor	
	Opportunities to volunteer	Excellent	
		Good	
		Fair	
		Poor	
	Opportunities to participate in community matters	Excellent	
		Good	
		Fair	
		Poor	
	Openness and acceptance of the community toward people of diverse backgrounds	Excellent	
		Good	
		Fair	
		Poor	
Please indicate whether or not you have done each of the following in the last 12 months.	Contacted the City of Roseville (in-person, phone, email, or web) for help or information	No	
		Yes	
	Contacted Roseville elected officials (in-person, phone, email, or web) to express your opinion	No	
		Yes	
	Attended a local public meeting (of local elected officials like City Council or County Commissioners, advisory boards, town halls, HOA, neighborhood w..	No	
		Yes	
	Watched (online or on television) a local public meeting	No	
		Yes	
	Volunteered your time to some group/activity in Roseville	No	
		Yes	
	Campaigned or advocated for a local issue, cause, or candidate	No	
		Yes	
	Voted in your most recent local election	No	
		Yes	
	Used bus, rail, or other public transportation instead of driving	No	
		Yes	
	Carpooled with other adults or children instead of driving alone	No	
		Yes	
	Walked or biked instead of driving	No	
		Yes	
Please rate the quality of each of the following services in Roseville	Public information services	Excellent	

Please rate the quality of each of the following services in Roseville.	Public information services	Good	
		Fair	
		Poor	
	Economic development	Excellent	
		Good	
		Fair	
		Poor	
	Traffic enforcement	Excellent	
		Good	
		Fair	
		Poor	
	Traffic signal timing	Excellent	
		Good	
		Fair	
		Poor	
	Street repair	Excellent	
		Good	
		Fair	
		Poor	
	Street cleaning	Excellent	
		Good	
		Fair	
		Poor	
	Street lighting	Excellent	
		Good	
		Fair	
		Poor	
	Sidewalk maintenance	Excellent	
		Good	
		Fair	
		Poor	
	Bus or transit services	Excellent	
		Good	
		Fair	
		Poor	
	Land use, planning, and zoning	Excellent	
		Good	
		Fair	
		Poor	
	Code enforcement (weeds, abandoned buildings, etc.)	Excellent	
		Good	

Please rate the quality of each of the following services in Roseville.	Code enforcement (weeds, abandoned buildings, etc.)	Fair	
		Poor	
	Affordable high-speed internet access	Excellent	
		Good	
		Fair	
		Poor	
	Garbage collection	Excellent	
		Good	
		Fair	
		Poor	
	Drinking water	Excellent	
		Good	
		Fair	
		Poor	
	Sewer services	Excellent	
		Good	
		Fair	
		Poor	
	Storm water management (storm drainage, dams, levees, etc.)	Excellent	
		Good	
		Fair	
		Poor	
	Power (electric and/or gas) utility	Excellent	
		Good	
		Fair	
		Poor	
	Utility billing	Excellent	
		Good	
		Fair	
		Poor	
	Police services	Excellent	
		Good	
		Fair	
		Poor	
	Crime prevention	Excellent	
		Good	
		Fair	
		Poor	
	Animal control	Excellent	
		Good	
		Fair	

Please rate the quality of each of the following services in Roseville.	Animal control	Poor	
	Ambulance or emergency medical services	Excellent	
		Good	
		Fair	
		Poor	
	Fire services	Excellent	
		Good	
		Fair	
		Poor	
	Fire prevention and education	Excellent	
		Good	
		Fair	
		Poor	
	Emergency preparedness (services that prepare the community for natural disasters or other emergency situations)	Excellent	
		Good	
		Fair	
		Poor	
	Preservation of natural areas (open space, farmlands, and greenbelts)	Excellent	
		Good	
		Fair	
		Poor	
	Roseville open space	Excellent	
		Good	
		Fair	
		Poor	
	Recycling	Excellent	
		Good	
		Fair	
		Poor	
	Yard waste pick-up	Excellent	
		Good	
		Fair	
		Poor	
	City parks	Excellent	
		Good	
		Fair	
		Poor	
	Recreation programs or classes	Excellent	
		Good	
		Fair	
		Poor	

Please rate the quality of each of the following services in Roseville.	Recreation centers or facilities	Excellent	
		Good	
		Fair	
		Poor	
	Health services	Excellent	
		Good	
		Fair	
		Poor	
	Public library services	Excellent	
		Good	
		Fair	
		Poor	
	Overall customer service by Roseville employees (police, receptionists, planners, etc.)	Excellent	
		Good	
		Fair	
		Poor	
Please rate the following categories of Roseville government performance.	The value of services for the taxes paid to Roseville	Excellent	
		Good	
		Fair	
		Poor	
	The overall direction that Roseville is taking	Excellent	
		Good	
		Fair	
		Poor	
	The job Roseville government does at welcoming resident involvement	Excellent	
		Good	
		Fair	
		Poor	
	Overall confidence in Roseville government	Excellent	
		Good	
		Fair	
		Poor	
	Generally acting in the best interest of the community	Excellent	
		Good	
		Fair	
		Poor	
	Being honest	Excellent	
		Good	
		Fair	
		Poor	
	Being open and transparent to the public	Excellent	

Please rate the following categories of Roseville government performance.	Being open and transparent to the public	Good	
		Fair	
		Poor	
	Informing residents about issues facing the community	Excellent	
		Good	
		Fair	
		Poor	
	Treating all residents fairly	Excellent	
		Good	
		Fair	
		Poor	
	Treating residents with respect	Excellent	
		Good	
		Fair	
		Poor	
Overall, how would you rate the quality of the services provided by each of the following?	The City of Roseville	Excellent	
		Good	
		Fair	
		Poor	
	The Federal Government	Excellent	
		Good	
		Fair	
		Poor	
Please rate how important, if at all, you think it is for the Roseville community to focus on each of the following in the coming two years.	Overall economic health of Roseville	Essential	
		Very important	
		Somewhat important	
		Not at all important	
	Overall quality of the transportation system (auto, bicycle, foot, bus) in Roseville	Essential	
		Very important	
		Somewhat important	
		Not at all important	
	Overall design or layout of Roseville's residential and commercial areas (e.g., homes, buildings, streets, parks, etc.)	Essential	
		Very important	
		Somewhat important	
		Not at all important	
	Overall quality of the utility infrastructure in Roseville (water, sewer, storm water, electric, gas)	Essential	
		Very important	
		Somewhat important	
		Not at all important	
	Overall feeling of safety in Roseville	Essential	
		Very important	

Please rate how important, if at all, you think it is for the Roseville community to focus on each of the following in the coming two years.	Overall feeling of safety in Roseville	Somewhat important	
		Not at all important	
	Overall quality of natural environment in Roseville	Essential	
		Very important	
		Somewhat important	
		Not at all important	
	Overall quality of parks and recreation opportunities	Essential	
		Very important	
		Somewhat important	
		Not at all important	
	Overall health and wellness opportunities in Roseville	Essential	
		Very important	
		Somewhat important	
		Not at all important	
	Overall opportunities for education, culture, and the arts	Essential	
		Very important	
		Somewhat important	
		Not at all important	
	Residents' connection and engagement with their community	Essential	
		Very important	
		Somewhat important	
		Not at all important	
How much of a problem, if at all, do you think homelessness is in each of the following?	In your neighborhood	Not a problem	
		Minor problem	
		Moderate problem	
		Major problem	
	In Roseville overall	Not a problem	
		Minor problem	
		Moderate problem	
		Major problem	
	Please rate how important, if at all, you think it is to address the challenges of people experiencing homelessness in Roseville?	Essential	
		Very important	
		Somewhat important	
		Not at all important	
	Supportive housing combines housing with social services such as job training, life skills training, substance abuse programs, and community support services (e.g., child care, educational programs, etc.). If transportation needs were met and services were accessible, provided there was adequate state and federal funding, how much would you support ..	Strongly support	
		Somewhat support	
		Somewhat oppose	
		Strongly oppose	
Please rate how important, if at all, each of the following are for the City of Roseville to focus on to help address homelessness:	Create affordable housing opportunities	Essential	
		Very important	
		Somewhat important	

Please rate how important, if at all, each of the following are for the City of Roseville to focus on to help address homelessness:	Create affordable housing opportunities	Not at all important	
	Provide access to social services	Essential	
		Very important	
		Somewhat important	
		Not at all important	
	Partner with Placer County Social Services, non-profits, and health care providers that provide services to people experiencing homelessness	Essential	
		Very important	
		Somewhat important	
		Not at all important	
	Please indicate which of the following methods, if any, you prefer as a way to receive news and information from the City of Roseville:	City website	
		Email newsletters	
		Mail	
		Community meetings	
		Facebook	
		Twitter	
		Instagram	
		Nextdoor	
		Other	
In general, how many times do you:	Access the internet from your home using a computer, laptop, or tablet computer	Several times a day	
		Once a day	
		A few times a week	
		Every few weeks	
		Less often or never	
	Access the internet from your cell phone	Several times a day	
		Once a day	
		A few times a week	
		Every few weeks	
		Less often or never	
	Visit social media sites such as Facebook, Twitter, WhatsApp, etc.	Several times a day	
		Once a day	
		A few times a week	
		Every few weeks	
		Less often or never	
	Use or check email	Several times a day	
		Once a day	
		A few times a week	
		Less often or never	
	Share your opinions online	Several times a day	
		Once a day	
		A few times a week	
		Every few weeks	

In general, how many times do you:	Share your opinions online	Less often or never
	Shop online	Several times a day
		Once a day
		A few times a week
		Every few weeks
		Less often or never
	Would you say that in general your health is:	Excellent
		Very good
		Good
		Fair
		Poor
	What impact, if any, do you think the economy will have on your family income in the next 6 months? Do you think the impact will be:	Very positive
		Somewhat positive
		Neutral
		Somewhat negative
		Very negative
	How many years have you lived in Roseville?	Less than 2 years
		2-5 years
		6-10 years
		11-20 years
		More than 20 years
	Which best describes the building you live in?	One family house detached from any other houses
		Building with two or more homes (duplex, townhome, apa..
		Mobile home
		Other
	Do you rent or own your home?	Rent
		Own
	About how much is your monthly housing cost for the place you live (including rent, mortgage payment, property tax, property insurance, and homeowners' association (HOA) fees)?	Less than $500
		$500 to $999
		$1,000 to $1,499
		$1,500 to $1,999
		$2,000 to $2,499
		$2,500 to $2,999
		$3,000 to $3,499
		$3,500 or more
	Do any children 17 or under live in your household?	No
		Yes
	Are you or any other members of your household aged 65 or older?	No
		Yes
	How much do you anticipate your household's total income before taxes will be for the current year? (Please include in your total income money from all sources for all persons living in your household.)	Less than $25,000
		$25,000 to $49,999

How much do you anticipate your household's total income before taxes will be for the current year? (Please include in your total income money from all sources for all persons living in your household.)	$50,000 to $74,999	
	$75,000 to $99,999	
	$100,000 to $149,999	
	$150,000 or more	
Are you Spanish, Hispanic, or Latino?	No, not Spanish, Hispanic, or Latino	
What is your race? (Mark one or more races to indicate what race you consider yourself to be.)	American Indian or Alaskan Native	
	Asian, Asian Indian. or Pacific Islander	
	Black or African American	
	White	
	Other	
In which category is your age?	18-24 years	
	25-34 years	
	35-44 years	
	45-54 years	
	55-64 years	
	65-74 years	
	75 years or older	
What is your gender?	Female	
	Male	
	Identify in another way	
How did you hear about this survey?	The City's website	
	The City's social media (Facebook, Twitter, Instagram,..	
	Received an email from the City	
	In a City newsletter or utility bill	
	Received a postcard or letter from the City	
	Nextdoor	
	In my Facebook feed	
	Saw a flyer or poster about it	
	Heard about it from a family member, friend or neighborhood	
	Heard about it from a business or social organization in my co..	
	Polco's weekly email	
	Other	

COUNCIL COMMUNICATION

CC #: 1553
File #: 0102

Title:	City Policy on Display of Flags
Contact:	Dion Louthan 916-774-5362 dlouthan@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 8.4.

RECOMMENDATION TO COUNCIL

Staff recommends the City Council consider the two proposed versions of a "City of Roseville Policy on Display of Flags" ("Flag Policy") and either adopt a resolution approving one of the two proposed Flag Policies or provide staff with further direction.

BACKGROUND

At the May 6, 2021, City Council meeting, the City Council discussed and directed staff to bring forward a policy on display of flags at City of Roseville ("City") owned properties for City Council's consideration. The City Council requested two versions of the policy. Specifically, they requested a version that memorialized the past practice ("Policy 1") and a version that would allow for display of a commemorative flag at City Council's sole direction ("Policy 2").

Flags and flagpoles owned or maintained by the City of Roseville are not intended to serve as a forum for free expression by the public, but rather are a non-public forum. The City has had a longstanding practice, but not a formal policy. A Flag Policy would outline an official policy for the display of any flag by the City and create an objective standard going forward.

Staff reviewed similar policies for the display of flags from several California cities. Many of the cities who adopted such policies are located in or adjacent to the Bay Area, however staff reviewed policies for cities around the State in order to have a broad sampling. The two proposed Flag Policy versions are based on policies from the cities of: Dublin, Elk Grove, Fountain Valley (Orange County), Pittsburg, San Pablo, San Ramon, South Lake Tahoe, Sunnyvale, and Tracy, and represent legally defensible and commonly accepted verbiage.

The term "commemorative flag" is the commonly used term to define any non-governmental flag (meaning not formally recognized nationally and congressionally as a governmental flag or associated with a local government). Additionally, neither Policy 1 nor Policy 2 apply to City-owned properties that are leased to third parties.

Policy 1- Memorializes Past Practice

Historically, the U.S. Flag, the California State Flag, and the City of Roseville Flag, or a combination thereof, have been displayed on the flagpoles at the Civic Center (both indoors and outdoors), as well as on other flagpoles located at other City owned properties, such as fire stations, the police department, parks, the corporation yard, and ball fields. This is consistent with both federal and state law (United States Code, Title 4, Ch. 1, et seq., and California Government Code sections 430 et seq.). Additionally, as part of the approved park design, the nationally and congressionally approved prisoner of war missing in action ("POW-MIA") flag is displayed at Veteran's Memorial Park-North and the Korean War Veteran's Memorial at Maidu Regional Park. The past practice of the City has been to only display those legally required and governmentally recognized flags at City owned properties. Policy 1 memorializes this past practice.

Policy 2- Allows "Commemorative Flags"

The proposed Policy 2 mirrors Policy 1 for all City owned properties, except at the outdoor flagpole located at the Civic Center (the corner of S. Grant and Vernon Streets). At this location, City Council can elect to display a commemorative flag in the position of lowest honor to the U.S. Flag, California State Flag, and, if displayed, the City of Roseville flag (this lowest position is required by law). The policy complies with state and federal laws and is structured in a manner that treats commemorative flags as government speech.

The policy prohibits third-party requests for commemorative flag displays and only allows for the display of commemorative flags when the request is brought forth by a member of the City Council and a majority of the City Council members agree to place the discussion on the agenda. The decision to display the commemorative flag must then be authorized by a majority vote of the City Council at a duly noticed regular or special City Council meeting, as an expression of the City Council's official sentiments.

Policy 2 also provides that any commemorative flag being considered must be consistent with the current City Council recognized goals and priorities and City strategic plan. Consistent with Federal and State law, Policy 2 makes clear that the following are not allowed as commemorative flags and will not be considered by the City Council:

i. Flags of a particular religious movement or creed, to avoid the appearance of City government endorsing religion or a particular religious movement or creed;

ii. Flags of a political party, to avoid the appearance of City government endorsing a political party; and

iii. Flags advocating a certain outcome in an election.

Policy 2 also makes clear that the City must obtain the commemorative flag itself.

FISCAL IMPACT

Adoption of Policy 1 will have no fiscal impact, as only legally required and governmentally recognized flags will be flown, and the costs of such flags are already provided for in the approved budget.

Adoption of Policy 2 will have a minimal fiscal impact associated with the City obtaining any

authorized commemorative flag. The costs are wholly dependent on the number of commemorative flags authorized by City Council and the costs for such flags, but given it is proposed at one location, it is anticipated to be very low.

ENVIRONMENTAL REVIEW

The California Environmental Quality Act (CEQA) does not apply to activities that will not result in a direct or reasonably foreseeable indirect physical change in the environment, or is otherwise not considered a project as defined by CEQA Statute §21065 and CEQA State Guidelines §15060(c)(3) and §15378.

The consideration and adoption of either proposed Flag Policy meets the above criteria and is not subject to CEQA. No additional environmental review is required.

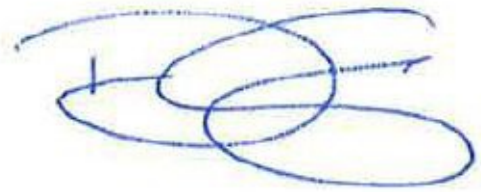
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Goal B - Support community engagement and advocacy

Respectfully Submitted,

Dion Louthan, Assistant City Manager

Dominick Casey, City Manager



_____

Dominick Casey, City Manager

ATTACHMENTS:

Description

Resolution 21-283

Combined Display of Flag Policies Roseville

RESOLUTION NO. 21-283

ADOPTING A CITY OF ROSEVILLE POLICY ON DISPLAY OF FLAGS

WHEREAS, the City of Roseville currently displays, as required by existing law, the United States Flag, the State of California Flag, the City of Roseville Flag, and at two park memorial locations, the congressionally and nationally recognized prisoner of war missing in action "POW-MIA" Flag; and

WHEREAS, the City of Roseville does not have a formal policy regarding the display of flags; and

WHEREAS, at the May 5, 2021, City Council meeting, the City Council directed staff to prepare versions of a Policy on Display of Flags for the City Council to consider and adopt; and

WHEREAS, the City Council desires to establish a policy that provides guidance and standards for the indoor and outdoor display of flags at City of Roseville owned properties; and

WHEREAS, in adopting this Policy on Display of Flags, the City Council declares that flags and flagpoles owned or maintained by the City of Roseville are not intended to serve as a forum for free expression by the public, but rather as a nonpublic forum for the display of flags outlined in the Policy on Display of Flags, as an expression of the City Council's official sentiments (government speech).

NOW, THEREFORE, BE IT RESOLVED that the City Council of the City of Roseville approves the Policy on Display of Flags, attached and incorporated hereto as Exhibit A.

PASSED AND ADOPTED by the Council of the City of Roseville this____day of _____, 20_, by the following vote on roll call:

AYES COUNCILMEMBERS:

NOES COUNCILMEMBERS:

ABSENT COUNCILMEMBERS:

_____
MAYOR

ATTEST:

_____
City Clerk

CITY OF ROSEVILLE POLICY ON DISPLAY OF FLAGS

The Roseville City Council (hereinafter "City Council") desires to establish a "Policy on Display of Flags" (hereinafter "Policy"). In adopting this Policy, the City Council declares that the City of Roseville's flagpoles are not intended to serve as a forum for free expression of the public, but rather for the display of Federal, State, and City of Roseville flags, consistent with applicable law and past practice.

I. Purpose

A. The purpose of this Policy is to establish clear guidance from the City Council regarding the indoor and outdoor display of flags at City of Roseville (hereinafter "City") owned properties.

B. In adopting this Policy, the City Council desires to memorialize the past practice of displaying only nationally and congressionally recognized flags, consistent with required law.

C. In adopting this Policy, the City Council declares that flagpoles owned or maintained by the City are not intended to serve as a forum for free expression by the public. Rather, such flagpoles are a non-public forum for the display of Federal, State, and City of Roseville flags, as authorized by this Policy, as an expression of the City Council's official sentiments (government speech).

D. The City will not display a commemorative flag based on a request from a third party, nor will the City use its flagpoles to sponsor the expression of a third party.

II. Policy

A. Conformance with Federal and State Regulations. Flags shall be displayed in accordance with all Federal and State statutes and regulations, including, but not limited to United States Code, Title 4, Chapter 1, et seq., and California Government Code sections 430 et seq., as may be amended from time to time, and this Policy.

B. For all City owned properties (including parks). If there is an outside flagpole, the United States Flag may be displayed and the State of California Flag may be displayed, as described in section II(A) above. The City of Roseville Flag may also be displayed from such flagpole. If flags are displayed indoors, those flags are limited to the United States Flag, State of California Flag, and City of Roseville Flag. Commemorative flags may not be displayed.

If such City owned property is leased or licensed to a third party, that third party shall not be bound by this Policy, but must comply with any Federal, State, or local laws related to display of flags.

In addition, Veteran's Memorial Park North and Maidu Regional Park, may

allow the display of the nationally and congressionally recognized prisoner-of-war/missing-in-action ("POW-MIA") flags. (See 36 U.S.C. § 902, Federal Public Law §116-67, Federal Public Law §94-344.)

III. **Procedures**

A. Consistent with section II(A), no other flag shall be placed above the United States Flag and no other flag shall be larger than the United States Flag.

B. Flags should be hoisted briskly and lowered ceremoniously. The United States Flag should be hoisted first and lowered last.

C. Flags shall be displayed during operating hours on all days on which the City is open for business, and on national and state holidays. Flags may be displayed twenty-four (24) hours a day as long as they are illuminated during darkness.

D. Flags shall not be displayed during inclement weather, unless all- weather flags are used and are illuminated during darkness.

E. When flags are displayed on a single pole, the order from top to bottom shall be: the United States Flag, the California State Flag, if displayed, the City of Roseville flag, and, if displayed, the POW-MIA flag.

F. When the flags are displayed from adjacent flag poles, the United States Flag shall be displayed at the highest point of honor. The California State Flag shall be placed in the second position of honor.

CITY OF ROSEVILLE POLICY ON DISPLAY OF FLAGS

The Roseville City Council (hereinafter "City Council") desires to establish a "Policy on Display of Flags" (hereinafter "Policy"). In adopting this Policy, the City Council declares that the City of Roseville's flagpoles are not intended to serve as a forum for free expression of the public, but rather for the display of Federal, State, and City of Roseville flags, and any "commemorative flag" as may be authorized by this Policy and the City Council as an expression of the City Council's official sentiments.

I. Purpose

A. The purpose of this Policy is to establish clear guidance from the City Council regarding the indoor and outdoor display of flags at City of Roseville (hereinafter "City") owned properties.

B. In adopting this Policy, the City Council declares that flagpoles owned or maintained by the City are not intended to serve as a forum for free expression by the public. Rather, such flagpoles are a non-public forum for the display of Federal, State, and City of Roseville flags, and any commemorative flag (as defined by section II(C)(1) below), as authorized by the City Council and this Policy as an expression of the City Council's official sentiments (government speech).

C. The City will not display a commemorative flag based on a request from a third party, nor will the City use its flagpoles to sponsor the expression of a third party.

II. Policy

A. Conformance with Federal and State Regulations. Flags shall be displayed in accordance with all Federal and State statutes and regulations, including, but not limited to United States Code, Title 4, Chapter 1, et seq., and California Government Code sections 430 et seq., as may be amended from time to time, and this Policy.

B. For all City owned properties (including parks), other than the Civic Center, located at 311 Vernon Street, Roseville. If there is an outside flagpole, the United States Flag may be displayed and the State of California Flag may be displayed, as described in section II(A) above. The City of Roseville Flag may also be displayed from such flagpole. If flags are displayed indoors, those flags are limited to the United States Flag, State of California Flag, and City of Roseville Flag. Commemorative flags may not be displayed.

If such City owned property is leased and/or licensed to a third party, that third party shall not be bound by this Policy, but must comply with any Federal, State, or local laws related to display of flags.

In addition, Veteran's Memorial Park North and Maidu Regional Park, may allow the display of the nationally and congressionally recognized prisoner-of-

war/missing-in-action ("POW-MIA") flags. (See 36 U.S.C. § 902, Federal Public Law §116-67, Federal Public Law §94-344.)

C. Civic Center, located at 311 Vernon Street, Roseville. Regarding the flagpole outside of the Civic Center, located on the corner of Vernon Street and S. Grant Street, the United States Flag shall be displayed and the State of California Flag shall be displayed, as described in section II(A) above. The City of Roseville Flag may also be displayed from such flagpole, as well as a "commemorative flag" (as defined by section II(C)(1)). If flags are displayed indoors of the Civic Center, those flags are limited to the United States Flag, State of California Flag, and City of Roseville Flag.

1. Commemorative Flag

a. As expression of the City's official government speech, the City Council may authorize the display of a "commemorative flag" to be displayed below any other flags on the Civic Center flagpole, located on the corner of Vernon Street and S. Grant Street. Only commemorative flags that comply with this Policy may be displayed.

b. A commemorative flag is any flag that is consistent with this Policy and not the United States Flag, State of California Flag, City of Roseville Flag, and/or the nationally and congressionally recognized POW-MIA flag.

c. The City Council shall only consider a request to display such a commemorative flag if the request is made by a member of the City Council and a majority of the City Council members agree to place the discussion on the agenda for a regular or special City Council meeting. Requests to display a commemorative flag by members of the public will not be considered.

d. A majority of the City Council must agree to display the commemorative flag as part of an official City Council action at a duly noticed, Ralph M. Brown Act compliant, regular or special City Council meeting.

e. Commemorative flags shall be displayed for a period of time that is reasonable or customary for the subject that is to be commemorated, but no longer than thirty-one (31) continuous days.

f. If any other flag is displayed at half-staff, the commemorative flag will also be displayed at half-staff, height limits permitting.

g. A commemorative flag will only be considered by the City Council if it is commonly identified with, and consistent with, the current City Council recognized goals and priorities and City strategic plan. The following are not allowed as commemorative flags and will not be considered by the City Council:

i. Flags of a particular religious movement or creed, to avoid the

appearance of City government endorsing religion or a particular religious movement or creed;

ii. Flags of a political party, to avoid the appearance of City government endorsing a political party; and

iii. Flags advocating a certain outcome in an election.

h. Any approved commemorative flag will be obtained by the City.

III. **Procedures**

A. Consistent with section II(A), no other flag shall be placed above the United States Flag and no other flag shall be larger than the United States Flag.

B. Flags should be hoisted briskly and lowered ceremoniously. The United States Flag should be hoisted first and lowered last.

C. Flags shall be displayed during operating hours on all days on which the City is open for business, and on national and state holidays. Flags may be displayed twenty-four (24) hours a day as long as they are illuminated during darkness.

D. Flags shall not be displayed during inclement weather, unless all- weather flags are used and are illuminated during darkness.

E. When flags are displayed on a single pole, the order from top to bottom shall be: the United States Flag, the California State Flag, if displayed, the City of Roseville Flag, if displayed the POW-MIA flag, and if displayed and allowed by this Policy, the commemorative flag.

F. When the flags are displayed from adjacent flagpoles, the United States Flag shall be displayed at the highest point of honor. The California State Flag shall be placed in the second position of honor.

COUNCIL COMMUNICATION

CC #: 1555
File #: 0201 & 0103-03-02 & 0103-29-02

Title:	FY2021-22 Citywide Budget, Position Allocation Schedule, Housing Authority Budget and Roseville Finance Authority Budget
Contact:	Scott Pettingell 916-774-1306 spettingell@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 9.1.

RECOMMENDATION TO COUNCIL

Adopt: 1) an ordinance approving the proposed FY2021-22 citywide budget, and approve out-of-state travel requests, new vehicle requests, and the citywide position allocation schedule as incorporated into the FY2021-22 budget document, effective July 1, 2021; 2) a resolution approving the Roseville Housing Authority budget for FY2021-22; and 3) a resolution approving the Roseville Finance Authority budget for FY2021-22.

BACKGROUND

CITYWIDE BUDGET

Fiscal Summary: The FY2021-22 proposed expenditure/expense budget totals approximately $571 million from all funding sources. The total expense budget for the General Fund is approximately $182 million, which includes operating ($176 million) and non-operating ($6 million). The General Fund budget is balanced with revenues equal to expenses.

Positions: Following is a summary of position allocation changes included in the FY2021-22 proposed budget. The proposed budget includes a net increase of 40.25 positions to address critical service level requirements. These positions are recommended to address current workload demands, comply with increased regulations, and increase service levels in high-priority areas. The following table summarizes the recommended positions by Department.

Department	Positions
Total Current Citywide Positions	1,220.23
City Manager	1.00
Development Services	2.00
Economic Development	1.00
Electric	5.00
Environmental Utilities	13.00
Human Resources	1.00

Parks, Recreation & Libraries	9.00
Police	3.00
Public Works	5.25
Total Position Changes	40.25
Total Citywide Positions in FY2021-22 Budget	**1,260.48**

In addition, the citywide position allocation schedule is incorporated into the FY2021-22 budget document.

City Council Goals: The following City Council goals guided the budget process. The FY2021-22 budget document highlights the budget augmentations, City services, and performance measures that align with these goals.

- Remain fiscally responsible in a changing world
- Support community engagement and advocacy
- Maintain a safe and healthy community
- Enhance economic vitality
- Deliver exceptional city services
- Invest in well-planned infrastructure and growth

Measure B: The proposed budget includes $21 million in Measure B local sales tax revenues. These revenues continue to allow the City to maintain current service levels, restore services, and strategically invest in high-priority areas while still achieving a balanced budget.

Process: The proposed budget is the result of an extensive process that included a City Council strategic planning workshop, budget development updates, a utilities budget update, a Capital Improvement Program budget overview, financial policies update, and a budget hearing.

Outreach: The budget process included a public outreach effort that involved publishing budget information on the city website, including the budget in brief document, e-newsletters, and social media.

General Fund Stabilization Reserve: The FY2020-21 budget assumed that the General Fund would require $2.1 million from this fund to balance the budget. Stronger than anticipated property and sales tax indicate that this transfer will not be necessary. The FY2021-22 budget includes a transfer of approximately $2.5 million from the General Fund into the Stabilization Reserve to bring the total reserve balance to $23.8 million. The $23.8 million, in addition to the $2.1 million in additional resources mentioned above, will bring the total balance of this reserve to $25.9 million or 15 percent of the General Fund operations budget. The purpose of the General Fund Stabilization Reserve Fund is to allow time for the City to restructure its operations deliberately as required in an economic downturn to minimize service disruption.

General Fund Emergency Reserve: The FY2021-22 budget includes a transfer of approximately $1.2 million from the General Fund into the Emergency Reserve to bring the total reserve balance to $17.3 million or 10 percent of the General Fund budget before transfers to reserves. The purpose of this reserve is to have the ability to fund significant short-term issues such as expenditures during declared emergencies should the need arise.

Budget Ordinance: The annual budget ordinance includes the following modifications:

- Section 3.4 – Adjusted section clarifying that the City Manager and Assistant City Manager/Chief Financial Officer must ensure that the budget complies with City Council approved financial policies.
- Section 3.5 – Added section authorizing the City Manager or designee to increase the Fiscal Year 2021-22 budget for the remaining unspent appropriations from the prior fiscal year for City Council approved fleet replacement.

- Section 3.6 & 3.7 – Added language clarifying that Capital and Non-Capital project appropriations shall solely be used for the original purpose approved by the City Council.
- Section 3.8 – Added language to require City Council approval to establish a new Capital Improvement Project or Non-Capital Improvement project or cancel a project (without completion).
- Section 3.10 – Adjusted language to clarify process to close completed or inactive projects. .
- Section 3.16 – Adjusted section to require that staff seek City Council approval for all changes to the citywide budget, except as otherwise authorized in the annual budget ordinance.

ROSEVILLE HOUSING AUTHORITY BUDGET

The Roseville Housing Authority (RHA) was formed in October 1974 and administers the Housing Choice Voucher (HCV) Program which provides rental assistance for low-income residents in order to access quality, affordable, and safe housing. RHA ensures housing stability and economic self-sufficiency for up to 735 families, seniors, disabled persons, and veterans annually. Rental assistance for income-qualified participants is paid directly to property owners who participate in the HCV Program. The Housing Authority receives funding from the Federal Department of Housing and Urban Development (HUD). Roseville's HCV program infuses over $6.5 million of federal funds into the local economy each year including administration revenue which covers most of the staff costs to administer the program.
RHA is a separate legal entity from the City; and therefore its budget is approved by its Board of Directors who are represented by the City Council. Activities related to administering the program are performed by City employees who charge a majority portion of their time to the program. Financial activities are audited annually as part of the City-wide audit; and its financial statements are included in the City of Roseville's annual comprehensive financial report.
Budget Analysis: RHA has one fund that accounts for its activities with revenues and expenditures presented in the attached Fund Summary (Attachment B) which also includes its restricted and unrestricted fund balances. The detail for the FY2021-22 revenues and expenditures are presented in the Budget Item Detail (Attachment A) and are further discussed below. RHA has budgeted $5,634,072 for housing assistance payments revenue (HAP) for all vouchers. When a participating household finds rental housing that meets program requirements, written agreements are signed between the owner, tenant and RHA, outlining their respective rights and responsibilities. Program participants pay a share of the rent based on their household income, and RHA pays a calculated amount of rental assistance directly to the property owner each month.

Rental Assistance Programs & Family Self-Sufficiency Funding/Revenue – Administration
RHA administers Regular, Non-Elderly Disabled (NED), Veterans Affairs Supportive Housing (VASH), Mainstream and Project-Based Vouchers. Each year, the Housing Authority also participates in HUD's Family Self-Sufficiency (FSS) Program, which enables families assisted through the HCV Program to increase their earned income and reduce their dependency on state and federal assistance and rental subsidies. In this program, participants elect to divert a portion of their housing assistance payments to an interest-bearing account. During their participation in the FSS program, participants set goals to decrease their dependency on rental assistance. Once participants complete the required objectives of their program plan, they can access the savings account and use the funds for a variety of needs, such as a down-payment on a house, a car, education loans, or other items that further their self-sufficiency goals. HUD awards FSS grants to Housing Authorities who compete for the funding. The FSS funding for FY2021-22 of $72,000 offsets a portion of the salaries and benefits of the program coordinator and other staff who help administer the program.

Administrative and Other Miscellaneous Revenues
RHA earns administrative revenues based on the number of vouchers that have been leased up. The estimated revenues total $744,711. RHA also administers a portion of the HCV Program for tenants that live in the City of Rocklin and charges the City of Rocklin a minimum administrative fee in order to recoup costs for this service. The administrative fee budgeted for FY2021-22 is $27,500 and is based on an existing agreement with Rocklin. Interest, Portability Billing and Fraud Recovery is estimated to be $7,950 for a total of $780,161.

Personnel and other Administrative Costs
The following table illustrates the estimated revenues and estimated expenditures needed to successfully run the HCV program in FY2021-22. Materials, services, supplies and indirect costs total $175,890 and salaries, wages and benefits are $680,290 for a total of $856,180. The difference between the costs and the revenues are covered by the General Fund. This difference is 10% of the total administrative costs, as shown below:

HAP Admin funds earned from projected lease-ups	$672,711
FSS Administrative funds	$72,000
Other Revenues (Rocklin, Repayments and Interest)	$35,450
Total Available Revenues & Resources	**$780,161**
Materials, Services, Supplies & Indirects	$175,890
Salaries, Wages & Benefits	$680,290
Total Administrative Costs	**$856,180**
Variance = Costs covered by the City's General Fund	**$76,019**

The 10% contribution from the City's General Fund (16% in FY2020-21) is the difference between the Housing Authority's administrative revenues and the costs to run the program on an annual basis. The funds needed to run the program effectively are not currently available from HUD due to their annual proration policies. This contribution from the General Fund provides a guarantee that the HCV program can continue to provide rental assistance to very low-income families in Roseville and Rocklin.

ROSEVILLE FINANCE AUTHORITY BUDGET

Debt service payments of $2,377,289 reflect scheduled payments on the Certificates of Participation (COPs) for the Corporation Yard and 316 Vernon Street. The Authority has issued other bonds and COPs, but that debt service is reflected in the City's budget within each respective fund. For community facilities district (CFD) bond issues, the Authority acts as a conduit to collect payments through the County property tax levy process for the repayment of outstanding debt of these special districts.
Transfers out of the Roseville Finance Authority Capital Projects Fund of $414,351 represents funding transferred to the Citywide Parks Fund for the repayment of a loan from the Fleet Replacement Fund which funded a portion of the construction of Harry Crabb Park.
The Roseville Finance Authority budget for FY2021-22 is available in attached C.

FISCAL IMPACT

The FY2021-22 citywide budget document provides a financial summary for each City fund, department, capital improvement project, and non-capital multi-year project.

Attachments A and B provide financial summaries of the FY2021-22 Roseville Housing Authority budget.

Attachment C provides a financial summary of the FY2021-22 Roseville Finance Authority budget.

ENVIRONMENTAL REVIEW

The California Environmental Quality Act (CEQA) does not apply to activities that will not result in a direct or reasonably foreseeable indirect physical change in the environment, or is otherwise not considered a project as defined by CEQA Statute §20165 and CEQA State Guidelines §15060(c)(3) and §15378.

Adoption of the: 1) FY2021-22 citywide budget and approval of out-of-state travel requests, new vehicle requests, and the citywide position allocation schedule; 2) FY2021-22 Roseville Housing Authority budget; and 3) FY2021-22 Roseville Finance Authority budget meet the above criteria and are not subject to CEQA. No additional environmental review is required.

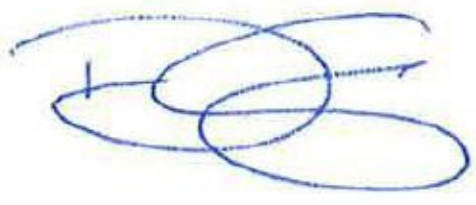
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Adoption of the City's FY2021-22 Budget provides policy direction and legal appropriation authority to continue efforts to accomplish City Council's strategic plan goals.

Respectfully Submitted,

Scott Pettingell, Budget Manager

Dennis Kauffman, Assistant City Manager/Chief Financial Officer



_____

Dominick Casey, City Manager

ATTACHMENTS:

Description

Ordinance 6375

Resolution 6-21

ATTACHMENT A - FY2021-22 Housing Authority Budget Item Detail

ATTACHMENT B - FY2021-22 Housing Authority Fund Summary

Resolution 3-21

ATTACHMENT C - FY2021-22 RFA Budget

ORDINANCE NO. 6375

ORDINANCE OF THE COUNCIL OF THE CITY OF ROSEVILLE
ADOPTING THE ANNUAL BUDGET FOR THE FISCAL YEAR 2021-2022,
ADOPTING BUDGET CONTROL POLICIES, ADOPTING AN APPROPRIATIONS LIMIT,
ADOPTING THE BUDGET FOR THE SUCCESSOR AGENCY OF THE ROSEVILLE
REDEVELOPMENT AGENCY, TO BE EFFECTIVE IMMEDIATELY
AS AN URGENCY MEASURE

THE CITY OF ROSEVILLE ORDAINS:

SECTION 1. The proposed budget for the City of Roseville entitled "Proposed Budget Fiscal Year 2021-2022, City of Roseville, California," a copy of which is on file in the office of the City Clerk, is hereby adopted as the "Annual Budget Fiscal Year 2021-2022, City of Roseville, California."

SECTION 2. The proposed expenses, expenditures, transfers out, revenues, and transfers in shown in the fund, department operating budget and project summaries of the budget document, which are incorporated herein, are hereby appropriated to the departments and activities in the amounts and purposes therein stated. Encumbrances, expenses and expenditures of the various appropriations described in the budget document shall be made by those departments and employees designated therein as the requisitioning authorities.

SECTION 3. The following budget control policies shall become effective upon the adoption of this ordinance:

1. The operating budget of the City of Roseville and the Successor Agency of the Roseville Redevelopment Agency shall be approved by the following major expenditure/expense summary categories:
    a. Salaries and Wages
    b. Benefits
    c. Materials, Supplies, and Services
    d. Internal Reimbursements
    e. Capital Outlay
    f. Debt Service
    g. Transfers Out

2. The City Manager or designee shall apply prudent monitoring procedures to assure that actual expenditures/expenses of the City and the Successor Agency of the Roseville Redevelopment Agency do not exceed the appropriations at the department level by fund.

3. The City Council delegates authority to the City Manager or designee to approve the movement of City Council approved appropriations within the same fund, excluding Capital Improvement and Non-Capital Multiyear Projects.

4. The City Manager and Assistant City Manager/Chief Financial Officer are directed to ensure that the budget complies with City Council approved financial policies.

5. The City Manager or designee is authorized to increase the Fiscal Year 2021-22 budget appropriations for the remaining unspent appropriations from the prior fiscal year for City Council approved fleet replacement.

6. Capital Improvement Plan. The Capital Budget of the City of Roseville and the Successor Agency of the Roseville Redevelopment Agency shall be approved by Capital Improvement Project. Capital project appropriations shall be used solely for the original purpose approved by the City Council.

7. Non-Capital Multiyear Projects. The non-capital multiyear project budget for the City of Roseville and the Successor Agency of the Roseville Redevelopment Agency shall be approved by Non-Capital Multiyear Project. Non-Capital project appropriations shall be used solely for the original purpose approved by the City Council.

8. City Council approval is required to establish or cancel (without completion) new Capital Improvement Projects or Non-Capital Multi-Year Projects.

9. The City Manager or designee is authorized to carryover any unspent appropriations in Capital and Non-Capital Multi-Year Improvements Projects.

10. Annually, completed or inactive Capital Improvement Projects and Non-Capital Multi-Year Improvement Projects will be closed, except for projects that have existing litigation, payment disputes or other extenuating circumstances. An inactive project is defined as one where transaction activity is less than $1,000 over the prior three years. Closures are the responsibility of the designated project manager. The managing department and the City Manager or designee have the authority to take the necessary steps to close completed or inactive projects, including appropriate decreases to the budget.

11. All encumbrances for valid purchase orders and contracts in effect as of June 30, 2021, will remain in effect in the following fiscal year. The City Manager or

designee is authorized to increase the Fiscal Year 2021-22 budget appropriations in the amount of the outstanding encumbrances for valid purchase orders and contracts as of June 30, 2021.

12. The City Manager or designee is authorized to eliminate funds as required for proper accounting and fiscal management when the purpose of a fund has expired and its fund balance has been expended.

13. The City Manager is authorized to revise any appropriation made in the Adopted Budget where the revision does not increase total appropriations by fund and is consistent with City Council intent.

14. The City Manager is authorized to increase appropriations in any department or project from the General Fund Administrative Contingency.

15. The City Manager is authorized to increase appropriations in the Environmental Utilities funds from the respective fund's contingency budget.

16. All increases and decreases to the total adopted budget require City Council approval, except as otherwise authorized in this Ordinance.

17. The City Manager is authorized to refine/add content, as may be needed to meet Government Finance Officers Association (GFOA) and California Society of Municipal Finance Officers (CSMFO) budgeting award requirements, in the Proposed Budget to create the FY2021-22 Approved Budget.

SECTION 4. Pursuant to Article XIII B of the California Constitution, the appropriations limit for the City of Roseville is hereby established in the FY2021-22 Approved Budget. The State Department of Finance provides the City the annual adjustment factors used in the appropriation limit calculation. The factors are the changes in the California Per Capita Personal Income and population levels for the City or the County.

SECTION 5. It is hereby ordered that a copy of this ordinance and the budget document be certified by the City Clerk and filed in the office of the City Clerk. The City Clerk is directed to post a copy of this ordinance in three (3) conspicuous locations in the City and enter the posting thereof in the Ordinance Book.

SECTION 6. This ordinance is required for the orderly operation and maintenance of municipal activities and the appropriations for usual and current expenses of the City and the Successor Agency of the Roseville Redevelopment Agency during the 2021-2022 fiscal year. Therefore, this ordinance shall take effect immediately upon passage hereof as an urgency ordinance, pursuant to Section 5.03 of the Charter of the City of Roseville.

PASSED AND ADOPTED by the Council of the City of Roseville this 16th day of June, 2021 by the following vote on roll call:

AYES COUNCILMEMBERS:

NOES COUNCILMEMBERS:

ABSENT COUNCILMEMBERS:

_____
MAYOR

ATTEST:

_____
City Clerk

HOUSING AUTHORITY OF THE CITY OF ROSEVILLE

RESOLUTION NO. 6-21

APPROVING THE ANNUAL BUDGET FOR
FISCAL YEAR 2021-22

WHEREAS, the Housing Authority of the City of Roseville has reviewed the proposed Housing Authority Budget, Fiscal Year 2021-22, attached hereto as Attachment "A".

NOW, THEREFORE, the Housing Authority of the City of Roseville does hereby resolve that the Housing Authority of the City of Roseville Budget, Fiscal Year 2021-22, is hereby approved.

PASSED AND ADOPTED by the Housing Authority of the City of Roseville this _____day of_____, 20___, by the following vote on roll call:

AYES AUTHORITY MEMBERS:

NOES AUTHORITY MEMBERS:

ABSENT AUTHORITY MEMBERS:

_____
CHAIRMAN

_____
Secretary

EXHIBIT “A”

CITY OF ROSEVILLE							
Department Requested Budget Item Detail							
Center	**Fund**	**Account**	**FY2021-22 Working Budget**	**MMS**	**HAP**	**REVENUES**	**SWB**
54011 - Housing	2801 - HCV	4401 - Federal Grants	6,238,808			6,238,808	
54011 - Housing	2801 - HCV	4435 - Other Grants	181,025			181,025	
10001 - Non-Classified	2801 - HCV	5901 - Reimbursed Indirect Cost - Charged	106,936	106,936			
54011 - Housing	2801 - HCV	5128 - PERS - UAL	83,868				83,868
54011 - Housing	2801 - HCV	5201 - Fuel	200	200			
54011 - Housing	2801 - HCV	5301 - Professional Services	15,024	15,024			
54011 - Housing	2801 - HCV	5351 - Office Supplies	3,200	3,200			
54011 - Housing	2801 - HCV	5385 - Subscriptions	2,000	2,000			
54011 - Housing	2801 - HCV	5387 - Advertising	600	600			
54011 - Housing	2801 - HCV	5389 - Printing	500	500			
54011 - Housing	2801 - HCV	5391 - Postage	4,200	4,200			
54011 - Housing	2801 - HCV	5393 - Software	23,700	23,700			
54011 - Housing	2801 - HCV	5395 - Equipment - Under 5000	1,000	1,000			
54011 - Housing	2801 - HCV	5431 - Repairs And Maintenance - Remodel	4,000	4,000			
54011 - Housing	2801 - HCV	5461 - Training And Development	8,500	8,500			
54011 - Housing	2801 - HCV	5471 - Membership	1,100	1,100			
54011 - Housing	2801 - HCV	5510 - Automotive - vehicle usage	2,316	2,316			
54011 - Housing	2801 - HCV	5512 - Automotive - replacement	2,614	2,614			
54011 - Housing	2801 - HCV	5578 - Grants - Housing Assistance Payments	5,712,304		5,712,304		
54011 - Housing	2801 - HCV	5911 - Reimbursed Cost - Charged (Payroll charged from the General Fund	596,422				596,422
			TOTAL	**175,890**	**5,712,304**	**6,419,833**	**680,290**

ATTACHMENT A

HOUSING AUTHORITY 2801

Annual Budget Fund Summary

	Actual 2020	Estimate FY2021	Budget FY2022
FUND BALANCE RESERVED (HAP)	**$59,390**	**$0**	**117,014**
UNRESERVED, DESIGNATED FUND BALANCE (ADMIN)	**$469,852**	**431,052**	**$483,421**
ACTUAL & ESTIMATED REVENUES - HAP			
Operating Grants - HUD	5,121,697	5,551,068	5,634,072
Fraud Recovery - HUD	8,426	11,000	5,550
Interest on Investments - HAP	36	50	50
Total HAP Revenues	**5,130,159**	**5,562,118**	**5,639,672**
ACTUAL & ESTIMATED REVENUES - ADMIN			
Administrative Fees - HUD	523,553	651,969	672,711
Other Revenue	73,575	73,575	
FSS Coordinator Grant - HUD	44,277	72,000	72,000
Admin Fee - City of Rocklin	27,500	27,500	27,500
Fraud Recovery - Admin	8,426	5,566	7,900
Interest on Investments - Admin	36	50	50
Total Admin Revenues	**677,366**	**830,660**	**780,161**
Total Estimated Available for Appropriation	**6,336,767**	**6,823,829**	**7,020,267**
LESS ACTUAL & ESTIMATED HAP EXPENDITURES			
HAP - Payments to Landlords	5,189,549	5,445,104	5,712,304
Total HAP Expenditures	**5,189,549**	**5,445,104**	**5,712,304**
LESS ACTUAL & ESTIMATED ADMIN EXPENDITURES			
Salaries & Benefits - Admin	522,374	544,416	608,290
Salaries & Benefits - FSS Coordinator	74,628	72,000	72,000
Other Operating Expenses	79,913	110,173	68,954
Indirect Costs	39,252	51,702	106,936
Total Admin Expenditures	**716,167**	**778,291**	**856,180**
FUND BALANCE RESERVED (HAP-NRP)	**(0)**	**117,014**	**44,382**
UNRESERVED FUND BALANCE (ADMIN - UNP)	**431,052**	**483,421**	**407,402**
TOTAL ENDING FUND BALANCE	**$ 431,051**	**$ 600,434**	**$ 451,783**

ROSEVILLE FINANCE AUTHORITY

RESOLUTION NO. 3-21

ADOPTING THE ANNUAL BUDGET FOR THE FISCAL YEAR 2021-22

WHEREAS, the Roseville Finance Authority desires to approve the Roseville Finance Authority Budget FY2021-22,

NOW, THEREFORE, the Roseville Finance Authority does hereby resolve that the attached Roseville Finance Authority Budget FY2021-22 is hereby approved.

PASSED AND ADOPTED by the Roseville Finance Authority this___day of_____, 20___, by the following vote on roll call:

AYES AGENCY MEMBERS:

NOES AGENCY MEMBERS:

ABSENT AGENCY MEMBERS:

_____
CHAIR

ATTEST:

_____
Secretary

Roseville Finance Authority

	(Internal Notes)	Actual FY2020			Estimate FY 2021			Budget FY 2022		
		Debt Service	Capital Projects	Total	Debt Service	Capital Projects	Total	Debt Service	Capital Projects	Total
NONOPERATING REVENUES										
Levy Credit		-	$ 1,385,504	$ 1,385,504	-	$ 1,409,450	$ 1,409,450	-	$ 1,363,042	$ 1,363,042
Transfer In		$ 2,382,713	-	2,382,713	$ 2,377,715	-	2,377,715	$ 2,377,289	-	2,377,289
Interest revenue		35,904	40,884	76,788	-	25,000	25,000	-	30,000	30,000
Total Revenues		**2,418,617**	**1,426,388**	**3,845,005**	**2,377,715**	**1,434,450**	**3,812,165**	**2,377,289**	**1,393,042**	**3,770,331**
LESS OPERATING EXPENSES				-		-	-		-	-
Total Operating Expenses				**-**		**-**	**-**		**-**	**-**
LESS NONOPERATING EXPENSES										
Transfers out		-	1,200,000	1,200,000	-	474,098	474,098	-	414,351	414,351
Debt Service		2,383,213	-	2,383,213	2,378,288	-	2,378,288	2,377,289	-	2,377,289
Total Capital and Debt Expenses		**2,383,213**	**1,200,000**	**3,583,213**	**2,378,288**	**474,098**	**2,852,386**	**2,377,289**	**414,351**	**2,791,640**
INCREASE (DECREASE) FROM OPERATIONS		**35,404**	**226,388**	**261,792**	**(573)**	**960,352**	**959,779**	**-**	**978,691**	**978,691**
FUND BALANCE, BEGINNING OF YEAR		**8,170**	**1,954,557**	**1,962,727**	**43,574**	**2,180,945**	**2,224,519**	**43,001**	**3,141,297**	**3,184,298**
INCREASE (DECREASE) FROM OPERATIONS		**35,404**	**226,388**	**261,792**	**(573)**	**960,352**	**959,779**	**-**	**978,691**	**978,691**
FUND BALANCE, END OF YEAR		**$ 43,574**	**$ 2,180,945**	**$ 2,224,519**	**$ 43,001**	**$ 3,141,297**	**$ 3,184,298**	**$ 43,001**	**$ 4,119,988**	**$ 4,162,989**

COUNCIL COMMUNICATION

CC #: 1549
File #: 0800-02

Title:	Draft 2020 Urban Water Management Plan – Public Hearing for Review and Receive Comments
Contact:	Trevor Joseph 916-746-1708 tjoseph@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 10.1.

RECOMMENDATION TO COUNCIL

Staff recommends City Council hold a public hearing to review and receive comments on the Draft 2020 Urban Water Management Plan (UWMP). If found acceptable, as part of a separate agenda item, staff recommend City Council consider adoption of the UWMP and adopt a resolution including providing authorization to staff to submit the UWMP to the California Department of Water Resources (DWR) as final.

It is staff's recommendation that this agenda item should be considered with and presented concurrently with other agenda items, specifically to conduct a public hearing to review and hear comments and consider the adoption of a Draft Water Shortage Contingency Plan (WSCP). The WSCP ultimately is included in Chapter 8 of the UWMP, but must be presented and considered separately. For this reason, the public hearing and consideration of adoption of the Draft WSCP and consideration of adoption of the Draft 2020 UWMP have been placed as separate agenda items as documented in separate Council Communications (CC).

Staff recommend ordering these items as follows:

1. **Public Hearing – Draft 2020 UWMP (described within this CC)**
2. Public Hearing – Draft WSCP (described within a separate CC)
3. Adoption Hearing – Draft WSCP (described within a separate CC)
4. Adoption Hearing – Draft 2020 UWMP (described within a separate CC)

Specifically these public hearings allow for 1) community input regarding the urban retail water supplier's implementation for complying with the requirements of the California Water Code (CWC), 2) consider the economic impacts of the urban retail water supplier's implementation plan for complying with the CWC, and 3) City provided information on their baseline values, water use targets and compliance, and implementation plan.

After the public hearing, the UWMP may be adopted as prepared or as modified after the hearing or hearings at City Council direction.

BACKGROUND

Beginning in 1985, DWR has required water purveyors delivering water to at least 3,000 customers to prepare an UWMP and update the plan at five-year intervals. The last plan was developed and approved for 2015 and included all City boundaries as they existed at that time.

With ongoing and recent updates to the DWR Guidebook for Urban Water Suppliers, it was determined that City staff would collaborate with a consultant, Waterworks Engineers, Inc., on the development of the 2020 document update. Effort began in December 2020 with collection of significant quantity of information, continuing through a staff review process, and resulting in the proposed plan.

Following the severe drought of 2012-2016, the State of California Legislature sought to expand the water shortage contingency analysis under former law and mandated that a WSCP be adopted by suppliers. The California Water Code recognizes WSCPs as a critical tool during a drought emergency and grants that the State defer to locally adopted WSCPs, to the extent practicable.

FISCAL IMPACT

Conservation programs are a condition of City water contracts, regional agreements, and a matter of State law with the passage of SB X7-7 in 2009. Planning continues to be done on an annual basis and is included in all rate analyses and proposed budgets.

ENVIRONMENTAL REVIEW

The proposed activity is statutorily exempt from the California Environmental Quality Act (CEQA). CEQA does not apply to the preparation and adoption of Urban Water Management plans (California Water Code §10652). The proposed plan would not affect water supplies for fish and wildlife, or expand or add water supplies, and therefore no further environmental review is required.

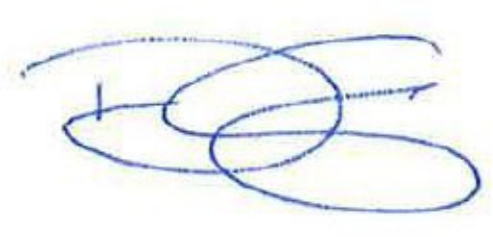
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Goal F - Invest in well-planned infrastructure and growth

Respectfully Submitted,

Trevor Joseph, Hydrogeologist

Richard Plecker, Environmental Utilities Director



Dominick Casey, City Manager

ATTACHMENTS:

Description

Attachment A - Water Urban Management Plan Part 1

Attachment A - Water Urban Management Plan Part 2

Attachment A - Water Urban Management Plan Part 3

Attachment A - Water Urban Management Plan Part 4



DRAFT 2020 URBAN WATER MANAGEMENT PLAN

CITY OF ROSEVILLE CALIFORNIA

City of Roseville
Draft 2020 Urban Water Management Plan

May 2021

Prepared by Water Works Engineers, LLC
Colleen Boak, PE
Esmeralda Diego

Checked by:
Tim Durbin, PE
Cindy Bertsch, PE

Table of Contents

Chapter 1 Urban Water Management Plan Purpose and Description 1-1
1.1 California Legislation 1-1
1.2 Updates to 2020 UWMP 1-2
1.2.1 Lay Description 1-2
1.2.2 Water Loss Reporting 1-2
1.2.3 Energy Use Information 1-2
1.2.4 Groundwater Supplies Coordination 1-2
1.2.5 Five Consecutive Dry-Year Water Reliability Assessment 1-2
1.2.6 Drought Risk Assessment 1-2
1.2.7 Water Shortage Contingency Plan 1-3
1.2.8 Seismic Risk 1-3
1.3 Benefits of UWMP Reporting 1-3
1.4 Plan Organization 1-3
Chapter 2 Plan Preparation 2-1
2.1 Basis for Preparing a Plan 2-1
2.2 Individual or Regional Planning and Compliance 2-1
2.3 Fiscal or Calendar Year and Units of Measure 2-2
2.4 Coordination and Outreach 2-2
2.4.1 Wholesale and Retail Coordination 2-2
2.4.2 Coordination with Other Agencies and the Community 2-3
Chapter 3 System Description 3-1
3.1 General Description 3-1
3.1.1 Transmission 3-1
3.1.2 Water Treatment 3-1
3.1.3 Storage 3-2
3.1.4 Distribution Network 3-3
3.1.5 Groundwater Wells 3-3
3.1.6 Interties 3-4
3.2 Service Area 3-5
3.3 Service Area Climate 3-7
3.4 Service Area Population and Demographics 3-7
3.4.1 Service Area Population 3-7
3.4.2 Social, Economic, and Demographic Factors 3-8
3.5 Land Uses within the Service Area 3-8
Chapter 4 Water Use Characterization 4-1
4.1 Non-Potable Versus Potable Water Use 4-1
4.2 Past, Current, and Projected Water Use by Sector 4-1
4.2.1 Water Use Sectors Listed in Water Code 4-1
4.2.2 Water Use Sectors in Addition to Those Listed in Water Code 4-2
4.2.3 Past Water Use 4-2
4.2.4 Current Water Use 4-3

4.2.5 Projected Water Use 4-3
4.2.6 Distribution System Water Losses 4-7
4.2.7 Estimating Future Water Savings 4-9
4.2.8 Characteristic Five-Year Water Use 4-10
4.3 Water Use for Lower Income Housing 4-10
4.4 Climate Change Considerations 4-11
Chapter 5 SBX7-7 Baselines, Targets, and 2020 Compliance 5-1
5.1 Baselines and Targets 5-1
5.2 Service Area Population 5-2
5.3 Gross Water Use 5-2
5.4 2020 Compliance Daily Per-Capita Water Use 5-2
5.5 Regional Alliance 5-3
Chapter 6 Water Supply Characterization 6-1
6.1 Surface Water 6-1
6.2 Purchased and Imported Water 6-1
6.2.1 Contract Supplies – Vulnerabilities and Restrictions 6-2
6.2.2 Water Forum Agreement 6-2
6.2.3 Other Available Water Purchases 6-2
6.3 Groundwater 6-3
6.3.1 Groundwater Basin Description 6-3
6.3.2 Groundwater Management 6-3
6.3.3 Historical Groundwater Production 6-5
6.3.4 Aquifer Storage and Recovery 6-5
6.4 Stormwater 6-6
6.5 Wastewater and Recycled Water 6-6
6.5.1 Wastewater Collection, Treatment, and Disposal 6-7
6.6 Recycled Water System 6-10
6.6.1 Recycled Water Coordination 6-10
6.7 Recycled Water Beneficial Uses 6-10
6.8 Actions to Encourage and Optimize Future Recycled Water Use 6-12
6.9 Desalinated Water Opportunities 6-13
6.10 Exchanges or Transfers 6-13
6.11 Supply Management 6-14
6.12 Future Water Projects 6-14
6.12.1 Purchased or Imported Water 6-14
6.12.2 Groundwater and ASR Program 6-15
6.13 Summary of Existing and Planned Sources of Water 6-16
6.14 Climate Change Impacts to Supply 6-19
6.14.1 Local Climate Change Outlook 6-19
6.14.2 Regional Climate Studies 6-19
6.14.3 Projected Future Conditions 6-20
Water Supply Reliability 6-23

6.15 Energy Intensity 6-25
Chapter 7 Water Service Reliability and Drought Risk Assessment 7-1
7.1 Constraints on Water Sources 7-1
7.1.1 Legal Constraints 7-1
7.1.2 Water Quality Constraints 7-1
7.1.3 Physical Constraints 7-1
7.1.4 Other Constraints 7-2
7.2 Water Supply Reliability Assessment 7-5
7.2.1 Potable Water Supply and Demand Assessment 7-5
7.2.2 Comparison of Supply and Demand 7-9
7.2.3 Recycled Water Supply and Demand Comparison 7-9
7.2.4 Total Water Supply and Demand Comparison 7-10
7.2.5 Deficit Mitigation 7-12
7.3 Regional Supply and Reliability 7-12
Chapter 8 Water Shortage Contingency Plan 8-1
Chapter 9 Demand Management Measures 9-1
9.1 Demand Management Measures 9-1
9.1.1 Water Waste Prevention Ordinances 9-2
9.1.2 Metering 9-2
9.1.3 Conservation Pricing 9-2
9.1.4 Public Education and Outreach 9-3
9.1.5 Regional Water Authority – Outreach and Education 9-4
9.1.6 Programs to Assess and Manage Distribution System Real Loss 9-8
9.1.7 Water Conservation Program Coordination Staffing Support 9-8
9.2 Other Demand Management Measures 9-8
9.2.1 Residential Conservation Programs 9-9
9.2.2 Commercial, Industrial, Institutional Conservation Programs 9-10
9.3 Planned Implementation to Achieve Water Use Targets 9-11
9.4 Members of the California Urban Water Conservation Council 9-12
Chapter 10 Plan Adoption and Submittal 10-1
10.1 Inclusion of all 2020 Data 10-1
10.2 Notice of Public Hearing 10-1
10.3 Public Hearing and Adoption 10-2
10.4 Plan Submittal 10-2
10.5 Public Availability 10-2
10.6 Public Implementation 10-2
10.7 Amending an Adopted UWMP 10-2
10.8 California Water Code Requirements 10-2

City of Roseville Tables

COR Table 2-A Outreach with Local and Regional Agencies 2-3

COR Table 3-A Potable Water Storage Tanks 3-2
COR Table 3-B Potable Water Pump Stations 3-3
COR Table 3-C Existing Operational Wells 3-4
COR Table 3-D Interties with Neighboring Water Suppliers 3-4
COR Table 3-E Monthly Average Climate Data from 2016 through 2020 3-7
COR Table 3-F City of Roseville 2019 Population by Race 3-8
COR Table 3-G Residential Land Uses and Development Guidelines 3-9
COR Table 3-H Non-Residential Land Uses and Development Guidelines 3-9
COR Table 4-A Past Potable Water Use Volumes by Sector. 4-3
COR Table 4-B Unit Demand Factors for Land Use Type 4-5
COR Table 4-C Specific Plan Water Demands at Buildout by Water Use Sector. 4-5
COR Table 4-D 12 Month Water Loss Audit Reporting for 2015-2019 4-7
COR Table 4-E Loss Reported in AWWA Water Audit for 2017-2019. 4-8
COR Table 4-F Five consecutive year unconstrained demand. 4-10
COR Table 4-G 2020 Affordable Housing Water Use 4-10
COR Table 4-H Affordable Housing Water Use Projections 4-11
COR Table 6-A Surface Water Supply Summary 6-1
COR Table 6-B Projected Change in Precipitation and Temperature Over the American River Basin Study Area Between 1980-2009 and 2070-2099 6-22
COR Table 6-C Change in Hydrologic Indicators Between Historical Observations and Projected Future Hydrology 6-23
COR Table 6-D Energy Intensity Reporting 6-25
COR Table 7-A Water Forum Agreement Hydrologic Year Types 7-3
COR Table 7-B Reliability Assessment Year Type Characterization 7-5
COR Table 7-C Groundwater Supply Availability by Year Type. 7-7
COR Table 7-D Potable Supply Availability by Year Type 7-8
COR Table 9-A Regional Rebates and Installations from 2016 through 2020. 9-6

Department of Water Resources Tables

DWR Table 2-1 2-1
DWR Table 2-2 2-2
DWR Table 2-3 2-2
DWR Table 2-4 2-3
DWR Table 3-1 3-8
DWR Table 4-1 4-3
DWR Table 4-2 4-6
DWR Table 4-3 4-7
DWR Table 4-4 4-8
DWR Table 4-5 4-9
DWR Table 5-1 5-2
DWR Table 5-2 5-3

DWR Table 6-1 6-5
DWR Table 6-2 6-8
DWR Table 6-3 6-9
DWR Table 6-4 6-11
DWR Table 6-5 6-12
DWR Table 6-6 6-13
DWR Table 6-7 6-16
DWR Table 6-8 6-17
DWR Table 6-9 6-18
DWR Table 7-1 7-6
DWR Table 7-2 7-10
DWR Table 7-3 7-10
DWR Table 7-4 7-11
DWR Table 7-5 7-12
DWR Table 10-1 10-1

Figures

Figure 3-1. City of Roseville Water Treatment Plant Treatment Train 3-2
Figure 3-2 Service Area Map 3-6
Figure 4-1 Existing and Projected Service Area Population 4-6
Figure 6-1 Urban Groundwater Infrastructure Schematic 6-6
Figure 7-1 Water Forum Agreement Supply Limitations 7-3

Appendices

Appendix A – Notifications to Wholesale Suppliers
Appendix B – Public and Agency Outreach
Appendix C – Land Use Element
Appendix D – AWWA Water Loss Audits
Appendix E – Proposed Water Loss Standards
Appendix F – 2015 SBX7-7 Verification Form
Appendix G – 2020 SBX7-7 Compliance Form
Appendix H – Intent to Retain Control of Conserved Water
Appendix I – Regional 2020 Wastewater Systems Evaluation Report
Appendix J – 2015 USBR Record of Decision
Appendix K – Water Shortage Contingency Plan
Appendix L – Roseville Municipal Code 14.09
Appendix M – Roseville Municipal Code 14.08.090, 14.08.095, 14.08.100
Appendix N – CalWEP BMP Compliance Reports
Appendix O – Adoption Resolutions and Submission
Appendix P – DWR UWMP Checklist

Abbreviations

Acre(s)	ac
Acre Feet	AF
Acre Feet Per Year	AF/yr
American Community Survey	ACS
American River Basin	Basin
American River Basin Study	ARBS or Study
Aquifer Storage Recovery	ASR
Average Dry Weather Flow	ADWF
Barton Road Water Treatment Plant	BRWTP
California Department of Finance	CDoF
California State Groundwater Elevation Monitoring Program	CASGEM
California Water Code	CWC
California-American Water Company	Cal-Am
Central Valley Project Municipal and Industrial Water Shortage Policy	CVP M&I WSP
Citrus Heights Water District	CHWD
City of Roseville	COR or Roseville
City of Roseville Water Utility	City
Compressed Natural Gas	CNG
Cubic Feet Per Second	cfs
Degrees Fahrenheit	°F
Department of Water Resources	DWR
Drought Risk Assessment	DRA
Dwelling Unit	DU
Environmental Impact Statement	EIS
Environmental Utilities	EU
Equivalent Dwelling Unit	EDU
Gallons Per Day per Dwelling Unit	Gpd/DU
Gallons Per Minute	gpm
Groundwater Management Plan	GWMP
Groundwater Sustainability Agency	GSA
Groundwater Sustainability Plan	GSP
Hot Scenarios	HD, HW
Maximum Contaminant Level	MCL
Middle Fork Project	MFP
Million Gallon(s)	MG
Million Gallons Per Day	MGD
Model Water Efficient Landscape Ordinance	MWELO
Municipal and Industrial	M&I
National Pollutant Discharge Elimination System	NPDES
Operations Criteria and Plan	OCAP

Parts Per Million	ppm
Potential Evapotranspiration	PET
Placer County Water Agency	PCWA
Pounds Per Square Inch	psi
Regional Drought Contingency Plan/ Regional Water Reliability Plan	RWRP
Sacramento Suburban Water District	SSWD
San Juan Water District	SJWD
Senate Bill X7-7	SB X7-7
South Placer Municipal Utilities District	SPMUD
South Placer Wastewater Authority	SPWA
State of California Legislature	Legislature
State Water Project	SWP
Sustainable Groundwater Management Act	SGMA
Thousand Acre-Feet	TAF
United States Bureau of Reclamation	USBR
United States Bureau of Reclamation	USBR
Urban Water Management Plan	UWMP
Urban Water Management Plan Guidebook 2020	Guidebook
Urban Water Retail Supplier	Supplier
Warm Scenarios	WD, WW
Wastewater Treatment Plant	WWTP
Water Demand Tracking Tool	Tool
Water Forum Agreement	WFA
Water Shortage Contingency Plan	WSCP
Water Storage Investment Program	WSIP
Water Treatment Plant	WTP
Western Placer Groundwater Sustainability Agency	WPGSA

Executive Summary

ES. 1 Introduction

An Urban Water Management Plan (UWMP) is the legal and technical water management foundation for suppliers throughout California. A UWMP combines information from various sources that inform water supply and demand such as projects pertaining to local land use planning, regional water supply, infrastructure, and demand management. The City of Roseville Water Utility (City) participates in UWMP updates every five years, as required by law. Each UWMP update addresses all requirements pertaining to urban retail water suppliers in accordance with the Urban Water Management Planning Act and the Water Conservation Act of 2009, also referred to as Senate Bill X7-7 (SB X7-7). Information contained in this 2020 UWMP includes the component listed in the following section.

ES. 2 Plan Components

The plan consists of the following components:

- **Chapter 1:** The basis for preparing a plan and the new requirements.
- **Chapter 2:** Summary of how the plan is prepared and coordination with the public and other local and regional authorities.
- **Chapter 3:** A description of the City's treatment facilities and distribution infrastructure, as well as a description of the population and area served by the City.
- **Chapter 4:** Quantification of water use for the 5-years preceding the plan update and water use projections for a 20-year planning horizon.
- **Chapter 5:** Supporting data for compliance with SB X7-7.
- **Chapter 6:** Description of existing and planned water supplies and water supply management.
- **Chapter 7:** A drought risk assessment (DRA), which analyzes water supplies and demands in a single year or multiple years of a water shortage.
- **Chapter 8**: The Water Shortage Contingency Plan (WSCP), which outlines the process that the City will execute in the event of a water shortage.
- **Chapter 9:** Demand measures that the City integrates and plans to integrate into its regular operations to address increasing demands.
- **Chapter 10:** Record of the process by which the UWMP was adopted, submitted, and implemented with the intention of making the plan widely available to the City's customers and the public.

ES. 3 Basis for Plan Preparation and Coordination

Urban water retail suppliers (suppliers) who either deliver 3,000-acre feet (AF) or more of water or have over 3,000 service connections are required to submit a UWMP. In 2020 the City had 46,112 service connections and supplied a total of 31,896 AF to its customers and therefore is required to prepare and submit an UWMP.

In preparation of the UWMP the City coordinated with the U.S. Bureau of Reclamation (USBR), Placer County Water Agency (PCWA), and San Juan Water District (SJWD), all of which supply water to the city on a wholesale basis. The City also actively sought involvement from the public and other local water agencies. Neighboring water retail suppliers and the community were informed of a public hearing to be held June 16, 2021. In this public

hearing the plan will be presented, and attendees are encouraged to share questions and concerns prior to the presentation of the UWMP in the City Council meeting which will be held on June 16, 2021, during which the plan will be adopted.

ES. 4 System and Supply Description

Raw water from Folsom Lake, the City's primary water source, is conveyed to the City's water treatment plant located in the Granite Bay area and is then distributed through the City's 600 miles of water mains to customers. Other water facilities that the City maintains include potable water storage tanks, pump stations, interties to exchange water with other water agencies, and groundwater wells.

The City receives its contract supplies purchased from USBR, PCWA, and SJWD through Folsom Reservoir. The City currently has 8 wells, 6 of which are in service, and is planning to expand their groundwater program as a means to having a more robust water supply available in the event of a water shortage condition. The City is also considering contract amendments with water agencies that would increase overall water supply resilience.

ES. 5 Past and Projected Water Use

The City supplies water to customers for the following water use sectors:

- Commercial
- Industrial
- Institutional and Governmental
- Multi-Family Residential
- Single Family Residential
- Landscape

The UWMP characterizes water use by sector for the years preceding the plan update as well as projections of water use for the next 25 years. Projections in the 2020 UWMP differ significantly from 2015 projections as a result of the rapid development pace observed in Roseville since the last plan update. When the 2015 UWMP was prepared the City of Roseville's General Plan anticipated that buildout of planned development would be reached in 2065. The City of Roseville updated the General Plan in August 2020 and current estimations, reflecting the pace of development, now indicate buildout of planned development will be complete by 2035. The City has taken a long-term approach to its overall water strategy planning and has planned for a population of up to 198,000 for 2035. The actual volume of water used by each sector for 2020 and updated water use projections through the year 2045 are summarized in ES Table 1.

ES Table 1 Actual 2020 Water Use and Projected Water Use through the Year 2045.

Water Use Sector	2020	2025	2030	2035	2040	2045
Commercial	2,630	6,135	6,508	7,017	7,017	7,017
Industrial	254	4,175	4,726	5,123	5,123	5,123
Institutional/ Governmental	412	8,904	9,494	10,321	10,321	10,321
Multi-Family	1,416	1,752	2,029	2,725	2,725	2,725
Single Family	17,115	22,564	24,508	26,281	26,281	26,281
Landscape	6,422	644	765	805	805	805
Losses	1,600	1,429	1,401	1,587	1,587	1,587
Groundwater recharge	597	1,560	2,720	3,350	3,350	3,350
Total	**30,445**	**47,163**	**52,151**	**57,210**	**57,210**	**57,210**
NOTES: All values are in AF/yr. Values represent potable water use only.						

ES. 6 SB X7-7

SB X7-7 called for a 20% reduction of water use from all retail water suppliers by the year 2020. In the 2015 UWMP the City calculated a 10-year and 5-year baseline period to determine an average baseline gallon per capita per day (GPCD) water use. This baseline demand was calculated to be 309 GPCD in accordance with the SB X7-7 standard methods. The 2020 target compliance water demand was 247 GPCD, a 20% reduction of the baseline. In 2020 the average demand for the City was 203 GPCD, which represents an approximately 34% reduction of the baseline demand. As such, the City is compliant with SB X7-7.

ES. 7 Supply Reliability and Drought Risk Assessment and Water Shortage Contingency Plan

A supply reliability and drought risk assessment were performed. The assessments considered the supply available for a single-year and five-year consecutive drought period for both the near-term and long-term. The supply availability was compared to the total water use to determine if a deficit is projected for any of the conditions. The supply availability is subject to seasonal and climatic shortages and so in a dry or critically dry years increasing limitations are placed on the City for volume of water that they receive from Folsom Lake. The supply and drought risk assessment demonstrated that there may be minor deficits in supply versus demand conditions under certain drought related circumstances. These minor shortages may occur in the near-term extended drought scenario as well as over the longer term for both extended and single year drought conditions. The highest level of deficiency identified represents less than 8% of the annual demand and can be remedied by the simple application of basic conservation measures, estimated to achieve 13% savings. The results of the drought risk assessment are summarized in ES Table 2.

ES Table 2 Near-Term and Long-Term Drought Risk Assessment Summary

Drought Type Assessed	Deficit Range	Description of Anticipated Deficit
Near-Term 5 Consecutive Dry Years	1,647	Deficit Expected in fifth year only
Long-Term Single Dry Year	1,647 – 1,824	Deficit expected in 2025-2045
Long-Term 5 Consecutive Dry Years	7 – 4,904	Deficit expected in fourth year for 2025-2045
	1,647 – 1,824	Deficit expected in fifth year of drought for 2025-2045
NOTES: All values are in AF/yr.		

To mitigate the projected deficits in a water shortage, a Water Shortage Contingency Plan (WSCP) was prepared. The WSCP outlines the procedures that the City will take annually to determine whether there will be a water deficit based on projected water demand and supply availability. If a deficit is anticipated the City will formally declare a water shortage emergency condition of varying levels dependent on the severity of the deficit. The declaration of the water shortage emergency condition will trigger a set of demand reduction actions that is to be carried out by the City and all water users. These demand reduction actions are set forth in the Roseville Municipal Code Chapter 14.09 Water Conservation and Drought Mitigation Ordinance. The legal authority of the City to enforce compliance with the demand reduction actions is granted by the Water Conservation and Drought Mitigation Ordinance.

ES. 8 Demand Management Measures

Aside from the demand reduction actions of the Water Conservation and Drought Mitigation Ordinance, the City has taken a proactive approach to managing demand under normal conditions as well. Demand management measures include accurate metering through a meter retrofit program which was implemented from 2001 to 2011, public education and outreach, and regional rebate programs for efficient water use fixtures. System losses, typically losses due to leaks in the pipe network, can account for a significant portion of water demand. The City continues to be proactive in its approach to address leaks in the system and reduce the overall losses, including an active acoustic leak detection program to identify and repair leaks throughout the distribution system, working to reduce overall system losses.

ES. 10 Plan Adoption and Submittal

The 2020 UWMP will be presented to City Council on June 16, 2021 for adoption. The 2020 UWMP will subsequently be submitted to the California Department of Water Resources for compliance with the Urban Water Management Planning Act. Copies of the plan have been made publicly available at the City's offices and an electronic version is also available for review and download on the City's website: www.roseville.ca.us/UWMP.

Chapter 1 Urban Water Management Plan Purpose and Description

This chapter introduces the Urban Water Management (UWMP) including legislation requiring urban water retail suppliers to submit UWMPs, necessary information required to be reported in the 2020 UWMP, an overview of the changes to legislation since the 2015 City of Roseville UWMP, and a description of benefits to the supplier and its customers in completing a UWMP.

1.1 California Legislation

The Urban Water Management Planning Act was enacted in 1983 by the State of California Legislature (Legislature). The law established the requirement that an urban water supplier (supplier), providing municipal water to over 3,000 customers or 3,000 acre-feet (AF) annually, adopt an UWMP every five years. The aim of the Urban Water Management Planning Act was to address declarations and findings of the California Water Code (CWC):

California Water Code Section 10610.2

(a) The Legislature finds and declares all of the following:

(1) The waters of the state are a limited and renewable resource subject to ever-increasing demands.

(2) The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.

(3) A long-term, reliable supply of water is essential to protect the productivity of California's businesses and economic climate, and increasing long-term water conservation among Californians, improving water use efficiency within the state's communities and agricultural production, and strengthening local and regional drought planning are critical to California's resilience to drought and climate change.

(4) As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years now and into the foreseeable future, and every urban water supplier should collaborate closely with local land-use authorities to ensure water demand forecasts are consistent with current land-use planning.

(5) Public health issues have been raised over a number of contaminants that have been identified in certain local and imported water supplies.

(6) Implementing effective water management strategies, including groundwater storage projects and recycled water projects, may require specific water quality and salinity targets for meeting groundwater basins water quality objectives and promoting beneficial use of recycled water.

(7) Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.

(8) Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.

(9) The quality of source supplies can have a significant impact on water management strategies and supply reliability.

Additionally, efforts aimed at protecting California's water supply were expanded in 2009 with Senate Bill X7-7 (SB X7-7), where Governor Schwarzenegger called for a 20% reduction statewide in per capita water use by 2020.

1.2 Updates to 2020 UWMP

Since the reporting of the 2015 UWMP, there have been various requirements added by the Legislature to the CWC. Subsequent chapters of this report will provide necessary information to address requirements applicable to the City. The major new requirements are described in the following sections.

1.2.1 Lay Description

Pursuant to Section 10630.5, all plans are now required to include a lay description. This description shall include how much water the City has on a reliable basis, anticipated demands for the foreseeable future, the City's plan to meet those future demands, any challenges that the City will face in the future, and other information that will provide the public with an understanding of the City's 2020 UWMP.

The requirement for this lay description is met in the executive summary.

1.2.2 Water Loss Reporting

Pursuant to Section 10631(d)(3)(C), the 2020 UWMP shall include past water loss for the 5-years preceding the plan. The 2015 UWMP included water loss data from 2015 only.

1.2.3 Energy Use Information

Pursuant to 10631.2, the 2020 UWMP shall include any information related to the amount of energy consumed in various water processed to estimate the energy intensity.

1.2.4 Groundwater Supplies Coordination

Pursuant to 10631(b)(4)(A), if groundwater is identified as a source of water available to the supplier the 2020 UWMP shall coordinate with the current version of any groundwater sustainability plan adopted pursuant to 10720, Sustainable Groundwater Management Act, or any other authority for groundwater management for basins underlying the service area.

1.2.5 Five Consecutive Dry-Year Water Reliability Assessment

Pursuant to 10631(f), suppliers must now include a description of actions they will implement for a period of drought lasting five consecutive water years as opposed to the 2015 UWMP requirement, which was for multiple dry water years.

1.2.6 Drought Risk Assessment

Pursuant to 10635(b), all suppliers are required to include a drought risk assessment (DRA) in the UWMP. Interim updates to the DRA may be conducted by the supplier within the five-year cycle of the UWMP update.

1.2.7 Water Shortage Contingency Plan

Pursuant to Section 10632, every urban water supplier shall prepare and adopt a water shortage contingency plan (WSCP). The WSCP shall be included in the 2020 UWMP but is to be adopted separate from the UWMP with the intent that it be updated as needed independently of the UWMP.

1.2.8 Seismic Risk

Pursuant to 10632.5, suppliers shall include a seismic risk assessment and mitigation in the UWMP to assess vulnerabilities of the supplier's facilities. The seismic risk assessment and mitigation plan shall be updated when the UWMP is updated.

1.3 Benefits of UWMP Reporting

UWMP reporting for the City is required by the state and is a critical document for ensuring that the City remains compliant with various regulations. Additionally, completion of a UWMP demonstrating that the City addresses the requirements of the CWC is necessary to be eligible for any Department of Water Resources (DWR) administered grant or loan. Completion of the most recent UWMP may also be required for other state funding.

Beyond establishing grant or loan eligibility the UWMP is intended to be a useful tool for the supplier and the public. Thoughtful preparation of the plan provides the supplier an opportunity for forward thinking and planning, ensuring that their water supply remains robust in the future and continues to meet the dynamic needs of its customers. Throughout plan preparation the City, other suppliers, and local and regional authorities are encouraged to coordinate with one another creating a greater understanding of the region's water demands, ultimately promoting mindful utilization of the state's water resources.

1.4 Plan Organization

This UWMP was prepared in part by use of guidance issued by DWR via the *Urban Water Management Plan Guidebook 2020* (Guidebook). Organization of the plan chapters closely follows the suggested organization in the Guidebook. Where appropriate, submittal tables provided by DWR are used to report data; these tables are denoted by the suffix, "DWR Table". Additional data reporting is done in City of Roseville Tables denoted by the suffix, "COR Table".

Chapter 2 Plan Preparation

This chapter provides an overview of the process by which the plan was prepared and the coordination that was carried out.

2.1 Basis for Preparing a Plan

The City of Roseville Water Utility (City) is a public water system (PWS), which is a system that provides drinking water for human consumption through pipes or other constructed conveyances. The City serves over 3,000 customers and delivers over 3,000 AF annually and as such is required to submit a UWMP. Metrics for total number of customers and volume of water supplied in the City's service area for 2020 are provided in DWR Table 2-1. The UWMP is required to be reviewed and updated every five years; preparation of this UWMP is an update to the most recent UWMP, adopted by the City of Roseville in 2016. As a water retail supplier, the City is also required to comply with the requirements of SB X7-7. This UWMP establishes the City's compliance with the Urban Water Management Planning Act and SB X7-7.

DWR Table 2-1

Submittal Table 2-1 Retail Only: Public Water Systems			
Public Water System Number	Public Water System Name	Number of Municipal Connections 2020	Volume of Water Supplied 2020
3110008	City of Roseville	46,112	30,445
	TOTAL	46,112	30,445
NOTES: All volumes are in AF. Units of measure remain consistent throughout the UWMP as reported in DWR Table 2-3.			

2.2 Individual or Regional Planning and Compliance

The CWC provides mechanisms for participating in area-wide regional, watershed or basin-wide urban water management planning. Per *Department of Water Resources Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use* (DWR Methodologies), water suppliers who receive water from a shared wholesale supplier may form a regional alliance. Although the City and its neighboring water suppliers practice regional water supply planning, the City has not formed a regional alliance with other water suppliers for compliance with SB X7-7. The City has prepared an individual UWMP, reporting solely on its own distribution service area and will not adopt a Regional Urban Water Management Plan (RUWMP), stated in DWR Table 2-2.

DWR Table 2-2

Submittal Table 2-2: Plan Identification			
Select Only One	**Type of Plan**		**Name of RUWMP or Regional Alliance** *if applicable*
☑	**Individual UWMP**		
	☐	Water Supplier is also a member of a RUWMP	
	☐	Water Supplier is also a member of a Regional Alliance	
☐	**Regional Urban Water Management Plan (RUWMP)**		

2.3 Fiscal or Calendar Year and Units of Measure

General metrics for plan preparation are provided in DWR Table 2-3.

DWR Table 2-3

Submittal Table 2-3: Supplier Identification	
Type of Supplier (select one or both)	
☐	Supplier is a wholesaler
☑	Supplier is a retailer
Fiscal or Calendar Year (select one)	
☑	UWMP Tables are in calendar years
☐	UWMP Tables are in fiscal years
If using fiscal years provide month and date that the fiscal year begins (mm/dd)	
Units of measure used in UWMP (select from drop down)	
Unit	AF

2.4 Coordination and Outreach

This section discusses the City's coordination with other agencies and the public.

2.4.1 Wholesale and Retail Coordination

Pursuant to CWC Section 10631(j) the City is to coordinate with wholesale supply agencies that provide the City with water. The City has water supply contracts with Placer County Water Agency (PCWA), San Juan Water District (SJWD), and the U.S. Bureau of Reclamation (USBR). As a retail supplier the City has informed the three agencies

of projected water use in five-year increments for the next 20 years. Documentation of this coordination is provided in Appendix A. DWR Table 2-4 lists those three agencies that the City has coordinated with.

DWR Table 2-4

Submittal Table 2-4 Retail: Water Supplier Information Exchange
The retail Supplier has informed the following wholesale supplier(s) of projected water use in accordance with Water Code Section 10631.
Wholesale Water Supplier Name
U.S. Bureau of Reclamation
Placer County Water Agency
San Juan Water District

2.4.2 Coordination with Other Agencies and the Community

The City has actively sought to coordinate preparation of the UWMP with local and regional agencies and the general public. The City recognizes that how it currently utilizes and plans to utilize its water supply affects not only its own customers, but customers served by neighboring water agencies and individuals or groups that rely on private wells. As the City is dedicated to the responsible and sustainable management of local and regional water resources it has invited participation from the agencies listed in COR Table 2-A. Documentation of this coordination is provided in Appendix B. On February 16, 2021, the City noticed the neighboring cities and counties that preparation of the 2020 UWMP update had begun. Additionally, the City will hold a public hearing on June 16, 2021 to introduce the 2020 UWMP to the public and solicit feedback and answer questions regarding the plan.

COR Table 2-A Outreach with Local and Regional Agencies

Agency Name	Agency Type
U.S. Bureau of Reclamation	Wholesale Supplier
Placer County Water Agency	Water Supplier
San Juan Water District	Water Supplier
California American Water	Water Supplier
Citrus Heights Water District	Water Supplier
Sacramento Municipal utility District	Water Supplier
Sacramento Suburban Water District	Water Supplier
City of Roseville, City Manager	Local City
Placer County Public Works Department	Local County
Placer County Community Development Resource Agency	Local County
Regional Water Authority Sacramento	Regional Organization

Chapter 3 System Description

This chapter provides a description of the system including information on the distribution system; service area boundary; service area climate; service area population, demographics, and socioeconomics; and land uses within the service area.

3.1 General Description

The City of Roseville Water Utility (City) is a public utility owned and operated by the City of Roseville, which is on the interstate 80 corridor, approximately 15 miles northeast of downtown Sacramento California. The City obtains its surface water from Folsom Lake through wholesale purchase primarily from the United States Bureau of Reclamation (USBR) and additional water contracts with Placer County Water Agency (PCWA) and San Juan Water District (SJWD). The City also maintains and operates several production well sites that provide additional water supply reliability to the City with plans to construct more.

3.1.1 Transmission

The City has a diversion capacity of 150 cubic feet per second (cfs) or 96 million gallons per day (MGD) at Folsom Dam. From the pump station raw water is conveyed through parallel pipelines; the original 84-inch diameter pipeline constructed at the same time as the pump station and a 72-inch diameter pipeline completed in 2010 as a joint effort between the City and other water purveyors. The common facilities split at the "Hinkel Y", and thereafter raw water is conveyed through parallel pipelines – a 60-inch diameter pipeline and a 48-inch diameter pipeline – to the City's water treatment plant.

3.1.2 Water Treatment

The City's single water treatment plant (WTP), located within the City but in the Granite Bay area, has a capacity of 100 MGD. There are no plans to expand the WTP as the WTP is sized just above the pumping capacity of the Folsom Dam pump station. The WTP is a conventional treatment plant. The treatment processes include flocculation and sedimentation, clarification, filtration, and disinfection. The treatment train, beginning with the intake at Folsom Lake, is shown in Figure 3-1.

Sedimentation takes place in three parallel clarifiers. The chemicals injected as part of the flocculation and sedimentation processes are caustic soda, alum, and a cationic polymer. Sedimentation takes place in three separate parallel clarifiers. There are 12 anthracite sand filters, which combined have a maximum filtration rate of about 83,000 gallons per minute (gpm). The clear wells have a total volume of 358,500 gallons. Disinfection is achieved using sodium hypochlorite. The City also adds fluoride to treated water at a concentration of 0.7 parts per million (ppm) prior to distribution.

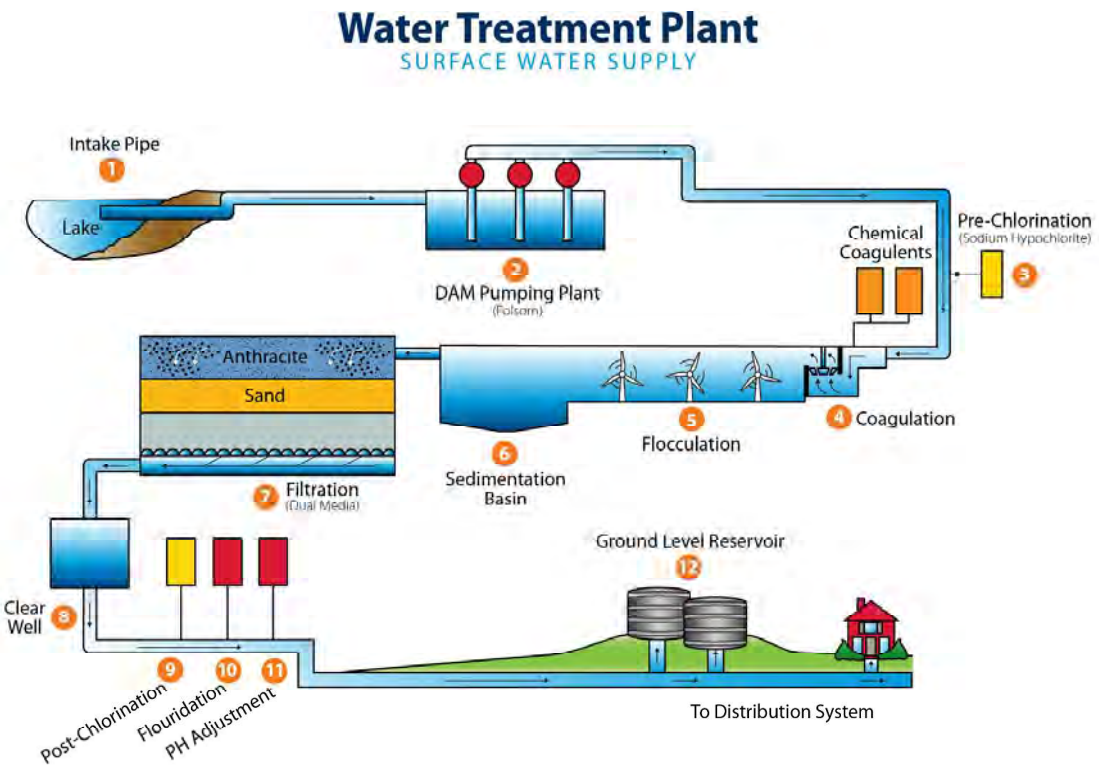


Figure 3-1. City of Roseville Water Treatment Plant Treatment Train

3.1.3 Storage

The City currently utilizes 6 potable water storage tanks, which are critical for maintaining water supply and system pressure during typical demand fluctuations, peak demand fluctuations, and emergency demands. The six water storage tanks have a total nominal capacity of 32 million gallons (MG). The City is also actively constructing two additional water storage tanks which will add a combined capacity of 12 MG, bringing the total storage capacity to 44 MG. The capacity of each tank is listed in COR Table 3-A.

COR Table 3-A Potable Water Storage Tanks

Facility	Existing or Future	Year Constructed	Type	Pressure Zone Served	Capacity (MG)
WTP	Existing	1971	Steel	1, 2, 4, 5	2
WTP	Existing	1990	Pre-Stressed Concrete	1, 2, 4, 5	4
WTP	Existing	2004	Pre-Stressed Concrete	1, 2, 4, 5	6
Northeast	Existing	1998	Pre-Stressed Concrete	1, 2, 4, 5	10
Northeast	Existing	2009	Pre-Stressed Concrete	1, 2, 4, 5	7.25
Halverson	Existing	2008	Pre-Stressed Concrete	2	2.9
West Side	Future	2022	Pre-Stressed Concrete	4	12

3.1.4 Distribution Network

The City maintains a distribution network consisting of approximately 600 miles of pressure pipe ranging from 1 inch to 72 inches in diameter. The network of pipe delivers potable water from the WTP to the City's customers to meet water demands during average day, maximum day, and peak hour conditions. The City aims to operate its system at a minimum pressure of 50 pounds per square inch (psi). Under existing conditions, the City mostly meets the minimum pressure criterion, with few instances where the minimum criteria are not met. These instances are not considered to be significant enough to impact the quality of customer's water service.

There are several specific plans for the City of Roseville which are in the process of being developed or will be developed in coming years. The City will serve these customers through new facilities which were designed during project development and that will be constructed by the developer and incorporated into the City's distribution network. The West Side Tank site will include a pump station with a pumping capacity of 20 MGD at the end of this construction phase, which is anticipated to be completed in 2022, but is designed to have a maximum capacity of 26.6 MGD at buildout. The existing and planned pump stations are summarized in COR Table 3-B.

COR Table 3-B Potable Water Pump Stations

Facility	Existing or Future	Pressure Zone Served
Dual Purpose Pump Station	Existing	1, 2
Highland Reserve North Pump Station	Existing	5
Pleasant Grove Pump Station	Existing	1
Pacific Fruit Express (PFE) Pump Station	Existing	Emergency Intertie
West Side Pump Station	Future	4

3.1.5 Groundwater Wells

The City currently operates 6 groundwater wells, which have a combined capacity of approximately 17,500-acre feet per year (AF/yr) or 15.6 MGD. Capacities of each operational well site are listed in COR Table 3-C. During the 2015 drought the water level in Folsom Lake was the lowest on record, which resulted in fluctuations in water supply. Consequently, the City sought to expand the existing ground water supply program to decrease reliability on Folsom Lake and to provide flexibility. To do so the City plans to utilize Aquifer Storage and Recovery (ASR) technology. ASR is the recharge of water in an aquifer through specially designed groundwater wells and recovery of water from that same well or others after time has passed. During times when there are excess surface water supplies, surface water can be injected using the ASR production wells and extracted during dry periods or when additional surface water is needed for the environment or other beneficial needs. Four of the existing operational wells have ASR capabilities, and the City plans to construct 6 additional wells with ASR capabilities by 2035.

COR Table 3-C Existing Operational Wells

Facility	Install/Rehab Date	Well Depth (Feet)	Zone Served	Pumping Capacity (MGD)
Darling Way, No. 4	1958/ 1999	303	1	1.3
Oakmont, No. 5	1978/ 1999	360	1	2.1
Diamond Creek, No. 6	2002	460	4	4.0
Woodcreek North, No. 7	2008	440	1	2.2
Hayden Parkway, No. 8	2015	520	4	3.1
Blue Oaks Boulevard, No. 12	2015	490	4	3.2

3.1.6 Interties

There are 17 interties with the surrounding jurisdictions of PCWA, SJWD, California-American Water Company (Cal-Am), Citrus Heights Water District (CHWD), and Sacramento Suburban Water District (SSWD). Each intertie is listed in COR Table 3-D.

COR Table 3-D Interties with Neighboring Water Suppliers

Intertie Agency	Facility	Year Constructed	Operational Control Agency	Control Valve Size (Inches)	Agency Receiving Water	Avg. Days/ Yr. Utilized 2015-2020	Days Utilized 2020
SJWD	WTP	1996	Roseville	16	Roseville	>1	0
	Eureka	1999	Roseville	12	Roseville	0	0
	Cavitt Stallman	1999	Roseville	12	Roseville	0	0
PCWA	Five Star	1995	PCWA	12	Roseville	0	0
	Stoneridge	1998	Roseville	12	PCWA	274	274
	Highland Park	2000	Roseville	12	PCWA	0	0
	Pleasant Grove	2000	PCWA	12	Roseville	0	0
	Industrial – Tinker	1989	Roseville	16	Roseville	361	361
	Bianchi Estates	2000	PCWA	12		365	365
Cal-Am	Crowder	2001	Cal-Am	12	Cal-Am	365	365
	PFE	2005	Roseville	16	Cal-Am	354	365
	Vernon Oaks	1988	Roseville	12	Cal-Am	0	0
	Vineyard Rd	1990	Cal-Am		Cal-Am	365	365
CHWD	Orlando	1989	Roseville	6	CHWD	0	0
	Blossom Hill	1986	Roseville	10	CHWD	0	0
	Fairway	2017	Roseville	8	CHWD	0	0
SSWD	PFE/ North Antelope	2005	Roseville	20	Both	0	0

3.1.6.1 San Juan Water District Interties

The three interties that exist between the City and SJWD under normal operations remain closed and are only intended for emergency use. The intertie at the WTP delivers water from SJWD to the City only. The Eureka and Cavitt Stallman interties deliver water to and from the City.

3.1.6.2 Placer County Water Agency Interties

All interties between the City and PCWA, except for the Bianchi estates intertie, can deliver water into the City. The Highland Park and Pleasant Grove interties cannot deliver water from the City to PCWA, but the other four remaining interties can. Through these interties a maximum of 11.5 MGD can be delivered to the City and 12.0 MGD can be delivered to PCWA. Three of the six PCWA interties under normal operations remain opened. The Stoneridge intertie regularly pumps water from the City to PCWA. The Bianchi Estates intertie is regularly kept open as it feeds PCWA's Bianchi Estates system and is the only source of supply for that area. The Industrial- Tinker intertie is normally open in order to deliver water from PCWA to Cal-Am through the Crowder and PFE interties.

3.1.6.3 California American Water Company Intertie

Only the PFE intertie can deliver water to the City and is intended for emergency use with a maximum capacity of 3.5 MGD. Both the Crowder intertie and Vineyard interties cannot deliver water to the city. All three interties can deliver water from the City to Cal-Am and are normally open with a total maximum capacity of 8.35 MGD. The water that is delivered to the Crowder and Vineyard Rd interties is from the PCWA Tinker intertie.

3.1.6.4 Citrus Heights Water District

The three interties between the City and CHWD can all be used to deliver water to and from the City. All three are intended for emergency use and under normal operating conditions remain closed.

3.1.6.5 Sacramento Suburban Water District Intertie

The intertie between the City and SSWD is part of regional development of conjunctive use programs. During an emergency or drought years, the PFE pump station will pump water from SSWD's service area into zone 1 of the City. Likewise, this intertie can be used to deliver water from the City to SSWD. A mutual aid agreement between the City and SSWD is currently being developed.

3.2 Service Area

The City's service area boundary lies within the limits of the City of Roseville. There are a few small areas within the city limits that are served by PCWA, SJWD, and CHWD. The service area is approximately 3,150 acres (ac). The service area and the facilities mentioned in section 3.1 are shown in Figure 3-2.

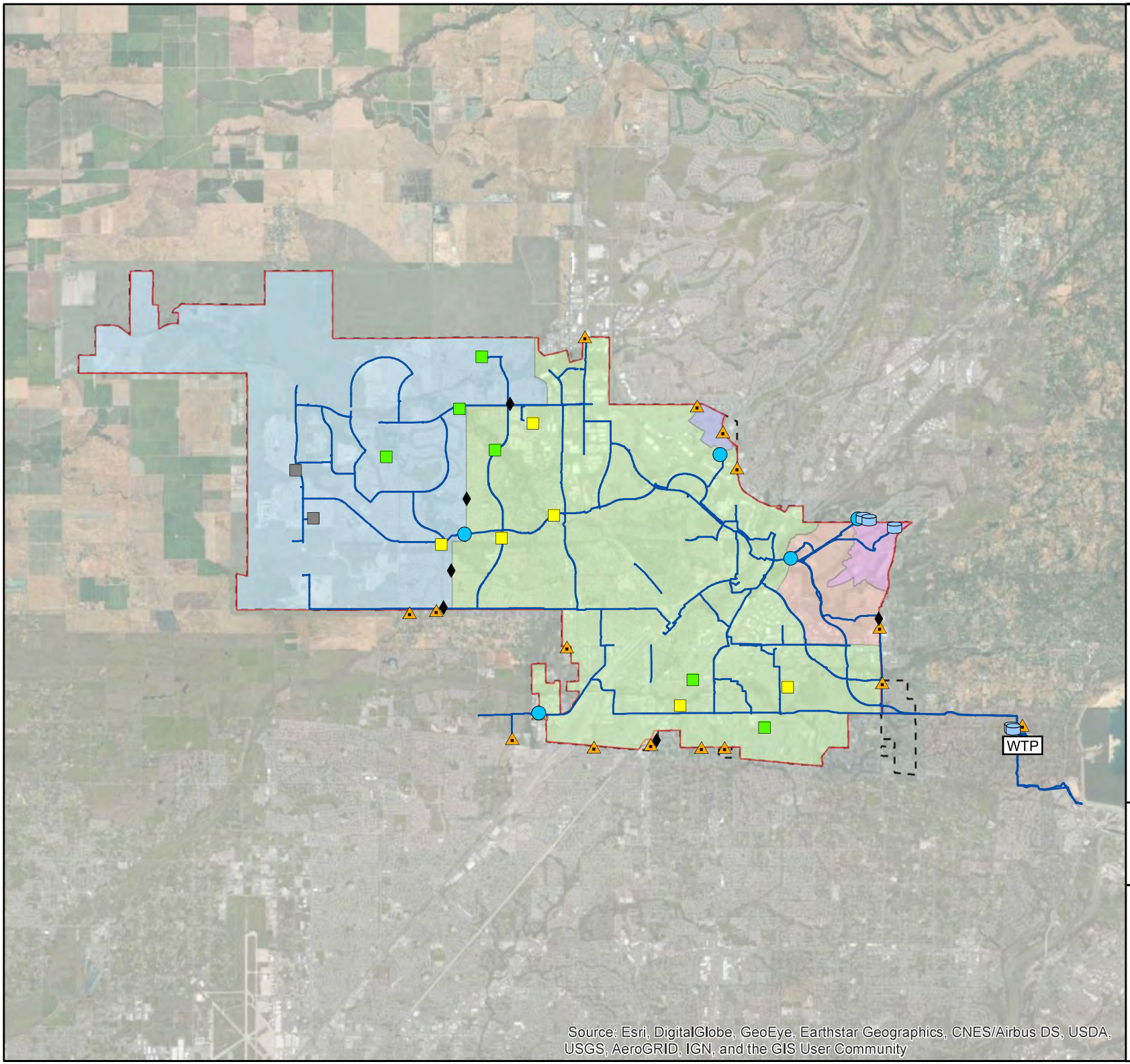


Figure 3-2 Service Area Map

WATERWORKS ENGINEERS

CITY OF ROSEVILLE CALIFORNIA

3.3 Service Area Climate

The service area experiences cool and humid winters and hot and dry summers. The City of Roseville's climate is similar to the City of Sacramento, which is in close proximity. Historical climate data was obtained from California Irrigation Management Information System (CIMIS) for station 155, which is located in Sacramento, for the reporting period of this UWMP and is summarized in COR Table 3-E. The average monthly temperature from 2016 to 2020 ranged from 39.8 degrees Fahrenheit (°F) to 95.1 °F. Typically the wet season begins in October and ends in May, with an average annual total precipitation of 13.3 inches.

COR Table 3-E Monthly Average Climate Data from 2016 through 2020

Month	Average Minimum Temperature (°F)	Average Maximum Temperature (°F)	Average Temperature (°F)	Average Monthly Precipitation (inches)
January	42.7	56.3	49.5	3.6
February	42.5	61.7	52.1	1.7
March	46.3	64.7	55.5	2.3
April	50.6	73.3	62.0	0.8
May	54.2	80.6	67.4	0.8
June	59.2	90.5	74.9	0.0
July	60.9	95.1	78.0	0.0
August	61.3	92.4	76.9	0.0
September	58.9	87.5	73.2	0.0
October	51.7	78.2	65.0	0.7
November	44.7	65.0	54.9	1.2
December	39.8	56.7	48.3	2.1
Averages	51.1	75.2	63.1	1.1

3.4 Service Area Population and Demographics

This section describes the population, demographic, and employment conditions of the City's water service area during the reporting period of the UWMP as well as future projections through 2045.

3.4.1 Service Area Population

Water use is directly tied to a service area's population and analyzing population growth and development trends is critical for the City's planning of water distribution facilities and infrastructure. Current and projected service area population estimates are provided in DWR Table 3-1. These projections differ from total population as a small number of City residents are served by adjacent water purveyors. The projections were estimated in coordination with the City of Roseville's General Plan, direct input from the City of Roseville's Planning Division, and previous studies performed by the City's Environmental Utilities Division. Methods for estimating population projections are further discussed in 5.2.

DWR Table 3-1

Submittal Table 3-1 Retail: Population - Current and Projected						
Population Served	2020	2025	2030	2035	2040	2045
	140,187	151,742	170,526	193,190	193,190	193,190

3.4.2 Social, Economic, and Demographic Factors

The City of Roseville's population in 2019, according to the American Community Survey (ACS), was reported to be 68.2% White alone (not Hispanic or Latino), 14.5% Hispanic or Latino, 10.1% Asian alone, 2.8% Black alone, and all other race categories were less than 1%. A summary of all race categories surveyed is provided in COR Table 3-F. The United States Census Bureau reports that the median household income from 2015-2019 was $89,082. ACS reports that in 2019 8.4% of the population was in poverty and 16.5% of the population was 65 years of age and over. The social, economic, and demographic factors are not believed to affect water management and planning.

COR Table 3-F City of Roseville 2019 Population by Race

Race Category	Percentage
American Indian and Alaska Native alone, not Hispanic or Latino	0.3%
Asian alone, not Hispanic or Latino	10.1%
Black alone, not Hispanic or Latino	2.8%
Hispanic or Latino	14.5%
Native Hawaiian and other Pacific Islander alone, not Hispanic or Latino	0.1%
White alone, not Hispanic or Latino	68.2%
Some other race alone, not Hispanic or Latino	0.0%
Two or more races alone, not Hispanic or Latino	3.9%

3.5 Land Uses within the Service Area

A new requirement of the California Water Code, since the 2015 UWMP was published, requires that land use projections be coordinated with other local and regional land use authorities.

> *California Water Code 101631.*
>
> *(a) The description shall include the current and projected land uses within the existing or anticipates service area affecting the supplier's water management planning. Urban water suppliers shall coordinate with local or regional land use authorities to determine the most appropriate land use information, including, where appropriate, land use information obtained from local or regional land use authorities, as developed pursuant to Article 5 (commencing with section 65300) of Chapter 3 of Division 1 of Title 7 of the Government Code.*

In August 2020, the City of Roseville completed its update to the General Plan, with a planning horizon that extends into 2035. The General Plan includes the Land Use Element, which is provided in Appendix C. The Land

Use Element discusses existing and future land use conditions, with an intended purpose of setting guidelines for managing land use change. The City of Roseville has both residential and non-residential land uses; density and intensity guidelines for each land use type respectively are set forth in the Land Use Element. The land use categories as well as corresponding characteristics from the Land Use Element are summarized in COR Table 3-G and COR Table 3-H.

COR Table 3-G Residential Land Uses and Development Guidelines

Land Use Category	Dwelling Units Per Acre	Estimated Population Per Gross Acre
Low-Density Residential (LDR)	0.5 – 6.9	1.45 – 20.1
Medium-Density Residential (MDR	7.0 – 12.9	20.3 – 37.41
High-Density Residential (HDR)	≥ 13	≥ 27.3

COR Table 3-H Non-Residential Land Uses and Development Guidelines

Land Use Category	Floor to Area Ratio
Neighborhood Commercial (NC)	20% - 40%
Community Commercial	20% - 40%
Regional Commercial	20% - 40%
Business Commercial	20% - 40%
Light Industrial	20% - 50%
Tech/ Business Park	20% - 50%
General Industrial	20% - 50%
Transfer Station	Varies
Central Business District	≤ 300%
Public/ Quasi-Public	Varies

Chapter 4 Water Use Characterization

This chapter provides a description and quantification of the City's past and current water use and future water use projections through the year 2045. Projections provided herein were coordinated with other local and regional planning documents in an effort to develop reliable water use projections.

4.1 Non-Potable Versus Potable Water Use

The City utilizes both potable and non-potable water to meet the diverse water needs of the customers within the service area. Potable water is water that is safe to drink and meets all California drinking water regulations per Title 22. The City's potable water supplies consist of surface water treated at the WTP, groundwater from various wells throughout the City that is chemically treated on site, finished water wheeled from other agencies through interties, and raw water received from other agencies through interties which is subsequently treated at the WTP.

Additionally, the City supplies recycled water, which is non-potable water for approved uses. Recycled water is wastewater that is treated to Title 22 disinfected tertiary standards. The City operates two wastewater treatment plants (WWTPs), Dry Creek and Pleasant Grove, both of which treat wastewater to the high standard required of recycled water. The recycled water produced at the WWTPs is distributed in a separate system from the potable water system and is utilized for landscape irrigation, environmental releases, cooling water, and construction uses.

Lastly, the City delivers raw water, which is also non-potable, to Linda Creek outside of the City's service area. Raw water is untreated water that is used in its natural state or with minimal treatment. The City is required to discharge 404 AF to Linda Creek as part of its instream flow commitment. The City does not deliver raw water to any of its customers within the service area.

4.2 Past, Current, and Projected Water Use by Sector

The following sections describe and quantify past, current, and projected water use. Water uses are delineated by various sectors. Additionally, the new requirement of the 2020 UWMP requiring quantification of system water losses for the five years preceding this plan are reported as follows.

4.2.1 Water Use Sectors Listed in Water Code

Water Code Section 10631(d) requires that water uses be identified for at least the ten following sectors; definitions for each of the sectors are adapted from those provided in the Guidebook.

- **Single-family residential** – A single family dwelling unit. A lot with a free-standing building containing one dwelling unit that may include a detached secondary dwelling. This is a retail demand.
- **Multifamily** – Multiple dwelling units contained within one building or several buildings within one complex. This is a retail demand.
- **Commercial** – A water user that provides or distributes a product or service. Water Code 10608.12(d). This is a retail demand.
- **Industrial** – Water user that is primarily a manufacturer or processor of materials as defined by the North American Industry Classification System (NAICS) code sectors 31 to 33, inclusive, of an entity that is a water user primarily engaged in research and development. Water Code Section 10608.12(h). This is a retail demand.

- **Institutional and governmental** – A water user dedicated to public service. This type of user includes, among other users, higher-education institutions, schools, courts, churches, hospitals, government facilities, and nonprofit research institutions per Water Code Section 10608.12(i). This is a retail demand.
- **Landscape** – Water connections supplying water solely for landscape irrigation. Such landscapes may be associated with multi-family, commercial, industrial, or institutional/governmental sites, but are considered a separate water use sector if the connection is solely for landscape irrigation. This is a retail demand.
- **Sales to other agencies** – These are water sales made to another agency. Projected sales may be based on projected demand provided by the receiving water supplier. This is a wholesale demand.
- **Saline Water Intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof** – *Conjunctive use* is a water management strategy where surface water and groundwater are managed together to increase the total water supply. For purposes of the UWMP, conjunctive use is seen as a management strategy rather than as a water use. This type of water use is best reported as groundwater recharge. *Groundwater recharge* can occur through both natural and artificial means. In the context of this UWMP, artificial groundwater recharge is the managed and intentional replenishment of natural groundwater supplies using techniques such as infiltration basins or injection wells. Water used for groundwater banking or storage may also be reported using this sector. If all, or a portion of, the groundwater recharge is subsequently pumped out of the basin in the same year, that water is reported as a supply from groundwater. *Saline water intrusion barrier* is the practice of injecting water into a freshwater aquifer to prevent the intrusion of saltwater. These may be either a wholesale or retail demand. The City currently does not have any demands under this water use sector.
- **Agricultural** – Water used for commercial agricultural irrigation. Water used for processing agricultural products (e.g., food, beverage, or textile manufacturing) may also be considered industrial process water. This may be either a wholesale or retail demand. The City currently does not have any demands under this water use sector.
- **Distribution system water losses** – Losses that were reported in accordance with the 12-month water loss for each of the prior five years.

4.2.2 Water Use Sectors in Addition to Those Listed in Water Code

Presently, the City has no additional water use sectors outside of the ten listed in CWC. Furthermore, the City expects that future water use will be restricted to the same sectors by which water is currently used based on land use projections from the Land Use Element.

4.2.3 Past Water Use

Past potable water use by sector was analyzed to estimate water use projections into the next 25 years, as required by the CWC. By examining past water use, trends can be understood such as, effects of temporary use restrictions during drought years, effects of long-term demand management measures, and the changing profile of service connections by water use sector. Past water uses from the last two UWMP years, 2010 and 2015, as well as the five years preceding this plan are summarized in COR Table 4-A.

COR Table 4-A Past Potable Water Use Volumes by Sector.

Water Use Sector	2010	2015	2016	2017	2018	2019
Commercial	2,042	1,930	2,101	2,218	2,565	3,021
Industrial	891	934	954	921	797	276
Institutional and Governmental	667	561	650	770	384	393
Multi-Family	2,196	1,464	1,556	1,569	1,376	1,358
Single-Family	15,836	11,680	13,215	14,674	15,303	15,387
Landscape	5,534	4,152	4,691	5,491	5,656	5,974
Other (1)	272	–	–	–	–	–
Total	27,438	20,721	23,176	25,643	26,081	26,409
NOTES: (1) In 2015 and subsequent years thereafter, all water demands are characterized by water use sectors defined in the CWC. All Volumes are in AF.						

4.2.4 Current Water Use

The City's potable and non-potable water uses for 2020 by sector are reported in DWR Table 4-1. There are no existing potable or non-potable demands for the use types of saline barriers, conjunctive use, or agricultural.

DWR Table 4-1

Submittal Table 4-1 Retail: Demands for Potable and Non-Potable Water - Actual			
Use Type	2020 Actual		
Water Use Sector	Additional Description	Level of Treatment	Volume
Commercial	Including non-metered	Drinking Water	2,630
Industrial	Including non-metered	Drinking Water	254
Institutional/Governmental	Including non-metered	Drinking Water	412
Multi-Family	Including non-metered	Drinking Water	1,416
Single Family	Including non-metered	Drinking Water	17,115
Landscape	Including non-metered	Drinking Water	6,422
Losses	Including non-metered	Drinking Water	1,600
Sales/Transfers/Exchanges to other Suppliers	Including non-metered	Drinking Water	1,451
Groundwater recharge	Excludes groundwater pumped and supplied to distribution system.	Drinking Water	597
Sales/Transfers/Exchanges to other Suppliers	Discharge to Linda Creek and water wheeled on behalf of SJWD	Raw Water	404
		TOTAL	32,300
NOTES: All volumes are in AF. Losses are for potable water only. The 2020 Water Audit has not been validated at the time of plan preparation and final losses reported in the validated Water Audit may differ.			

4.2.5 Projected Water Use

The City frequently completes studies aimed at understanding future water use demands to determine the reliability of system supplies and identify and plan for any vulnerabilities. As stated in 3.4.1, the service area population directly impacts water use demands. To estimate projected water use through 2045, the following approach and resources were utilized:

Assumptions:

- The Planning Division's population projection from the 2020 General Plan Land Use Element was utilized, which estimates a population of 198,000 at buildout of all planned development.
- Based on coordination with the City of Roseville's Planning Division, assumed that all planned development would be complete by 2035.
- Assumed that the population past 2035 would remain constant at 198,000 through 2045.
- An estimated 1,843 dwelling units in the City of Roseville are not served by the City. The number of dwelling units are estimated based on other utility accounts.

Population Projection and Water Use Projection Steps

1. Calculated the population not served by the City by multiplying the number of dwelling units and California Department of Finance (CDoF) household multiplier.
2. Subtracted the population not served by the City from the total CDoF City of Roseville population to obtain the service area population for 2016 through 2020.
3. Estimated the current percentage of development for each specific plan from aerial imagery.
4. Input current percentage of development into the City of Roseville's Environmental Utilities (EU) Department's Water Demand Tracking Tool, which calculates buildout water usage for each specific plan. Water use in the Tool is calculated by applying unit demand factors, specific to land use categories, to each of the dwelling units Demand factors and total water use for all specific plans are provided in COR Table 4-B and COR Table 4-C, respectively.
5. Plotted the service area population from 2016 through 2020 and the projected population for 2035 to approximate the population for 2025 and 2030 (Figure 4-1). The resultant population projections were previously summarized in DWR Table 3-1.
6. Updated the Water Demand Tracking Tool development percentage for 2025 and 2030 to reflect population projections and for 2035 to reflect 100% at buildout.

COR Table 4-B Unit Demand Factors for Land Use Type

Residential Land Use Categories	Unit Demand Factor (gpd/DU)
Low Density Residential 1 – LDR1 (<3.5 DUs/Acre)	728
Low Density Residential 2 – LDR2 (3.5 to 5 DUs/Acre)	600
Low/Medium Density Residential 1 – LMDR1 (>5 to 6 DUs/Acre)	521
Low/Medium Density Residential 2 – LMDR2 (>6 to 8 DUs/Acre)	430
Medium Density Residential – MDR (>8 to 12 DUs/Acre)	323
High Density Residential – HDR1 (>12 to 16 DUs/Acre)	288
High Density Residential – HDR2 (>16 DUs/Acre)	177
Non-Residential Land Use Categories	**Unit Demand Factor**
Community Commercial/Retail	2598
Business Professional	2598
Light Industrial	2598
Industrial	2562
Railyard	109
Elementary School	3454
High School	4069
Public/Quasi Public	1780
Parks	2988
Open Space/Right of Way	0

COR Table 4-C Specific Plan Water Demands at Buildout by Water Use Sector.

Specific Plan	Commercial (AF/yr)	Industrial (AF/yr)	Institutional/ Governmental (AF/yr)	Multi-Family (AF/yr)	Single Family (AF/yr)	Landscape (AF/yr)	Total (AF/yr)
Infill	2,232	2,625	6,070	552	8,898	0	20,377
DTRSP	780	7	124	15	92	0	1,018
RSGW	83	0	0	34	57	0	173
SE	530	0	441	393	1,270	0	2,633
NE	1,769	0	65	0	474	0	2,309
STRSP	115	0	335	148	1,481	0	2,079
NCRSP	1,457	226	546	444	1,610	0	4,283
HRNSP	470	0	312	180	701	0	1,663
NWRSP	378	0	1,596	338	4,847	0	7,159
DWSP	37	0	1,273	20	2,056	0	3,386
NI	220	3,718	195	99	826	0	5,057
NRSP	225	0	644	165	2,859	0	3,893
WRSP	231	255	1,465	615	5,648	1,074	9,289
SVSP	623	0	499	335	2,538	0	3,995
CVSP	56	0	88	108	745	0	997
ARSP	150	0	110	187	940	0	1,386

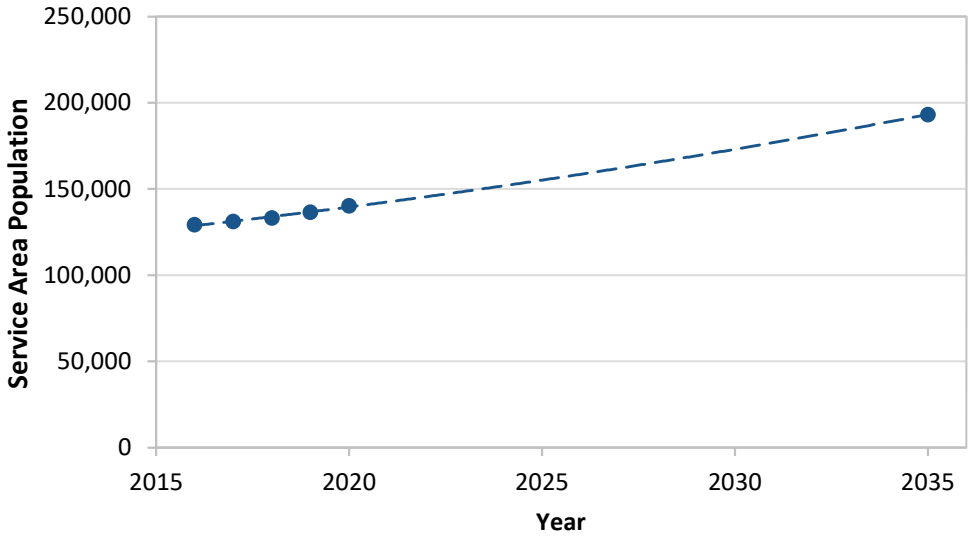


Figure 4-1 Existing and Projected Service Area Population

DWR Table 4-2

Submittal Table 4-2 Retail: Use for Potable and Non-Potable Water - Projected

Use Type	Additional Description (as needed)	Projected Water Use				
		2025	2030	2035	2040	2045
Commercial	Potable water, including non-metered	6,135	6,508	7,017	7,017	7,017
Industrial	Potable water, including non-metered	4,175	4,726	5,123	5,123	5,123
Institutional/Governmental	Potable water, including non-metered	8,904	9,494	10,321	10,321	10,321
Multi-Family	Potable water, including non-metered	1,752	2,029	2,725	2,725	2,725
Single Family	Potable water, including non-metered	22,564	24,508	26,281	26,281	26,281
Landscape	Potable water, including non-metered	644	765	805	805	805
Losses	Potable water	1,429	1,401	1,587	1,587	1,587
Sales/Transfers/Exchanges to other Suppliers	Potable water, including non-metered	0	0	0	0	0
Groundwater recharge	Potable water	1,560	2,720	3,350	3,350	3,350
Sales/Transfers/Exchanges to other Suppliers	Raw Water, Discharge to Linda Creek and water wheeled on behalf of SJWD	404	404	404	404	404
	TOTAL	50,572	47,567	52,555	57,614	57,614

NOTES: The city has no contracts for transfer for 2025 through 2045, as of yet. Projections are inclusive of lower income residential water demands. All values are in AF.

Total Gross water use projections, inclusive of recycled water, are provided in DWR Table 4-3. Recycled water demand is further characterized in DWR Table 6-4 of Chapter 6

DWR Table 4-3

Submittal Table 4-3 Retail: Total Gross Water Use (Potable and Non-Potable)						
	2020	2025	2030	2035	2040	2045
Potable Water, Raw Water	32,300	47,567	52,555	57,614	57,614	57,614
Recycled Water Demand	3,768	4,022	4,435	4,933	4,933	4,933
TOTAL WATER USE	36,068	51,589	56,990	62,547	62,547	62,547
NOTES: All values are in AF. Values include potable and non-potable water use.						

4.2.6 Distribution System Water Losses

Distribution system water losses are the difference between the volume of water that is delivered into the potable drinking water distribution system and actual consumption. Losses are always present in a water system due to pipe leaks, unauthorized connections or use, faulty meters, and unmetered institutional and governmental water use. Each year the City characterizes its water loss in accordance with the American Water Works Association (AWWA) Water Audit Method. CWC requires urban retail water suppliers to conduct and submit validated water loss audit reports annually to DWR on October 1st following the reporting year. Final Water Audit and Validation Reports are available for 2016 through 2019 and provided in Appendix D. As the UWMP is required to be submitted prior to the due date of the Water Audit, values for 2020 stated herein are approximate and may be altered in the final submission of the 2020 Water Audit. Distribution system water losses for five years preceding the plan update from 2015-2019 are summarized in COR Table 4-D and estimated water loss for 2020 is given in DWR Table 4-4.

COR Table 4-D 12 Month Water Loss Audit Reporting for 2015-2019.

Reporting Period Start Date (mm/yyyy)	Volume Water Loss (AF)
01/2015	2,127.52
01/2016	2,330.47
01/2017	2,682.94
01/2018	2,140.95
01/2019	1,865.24

DWR Table 4-4

Submittal Table 4-4 Retail: 12 Month Water Loss Audit Reporting	
Reporting Period Start Date	Volume of Water Loss*
01/2020	1,599.23
** Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.*	
NOTES: All Volumes are in AF. The 2020 Water Audit has not been validated at the time of plan preparation and final water losses reported in the validated Water Audit may differ.	

An update to the CWC requires that 2020 UWMPs and all UWMPs submitted thereafter include data showing whether the urban retail water supplier met the distribution loss standards enacted by the California State Water Resources Control Board (SWRCB) pursuant to Section 10608.34. At the time of plan preparation, the SWRCB has not adopted performance loss standards. Proposed water loss performance standards will set a maximum allowable water loss in gallons per connection per day for the City. The proposed baseline water loss is an average of the 2017 through 2019 water loss and is calculated to be 41.0 gallons per connection per day and the proposed performance standard to be met by 2028 is 22.3 gallons per connection per day Appendix E. Water loss in gallons per connection per day for 2017 through 2020 is shown in COR Table 4-E.

COR Table 4-E Loss Reported in AWWA Water Audit for 2017-2019.

AWWA Loss Category	2017	2018	2019	2020 [(1)]
Apparent Loss	8.02	8.01	7.90	9.78
Real Loss	46.89	34.97	28.78	21.19
Water Loss	54.91	42.98	36.68	30.97
NOTES: All values are gallons per connection per day. [(1)] The 2020 Water Audit has not been validated at the time of plan preparation and final water loss reported in the validated Water Audit may differ.				

The data from 2017 through 2020 demonstrate that the City annually reduced water loss measured as gallons per connection per day. The City continues to prioritize and allocate resources to detecting and repairing leaks in the distribution to reduce water loss. Over the last five years the City has increased the accuracy of reported losses through a process of quantifying the City's authorized unmetered use of water for institutional and governmental operations, which had previously gone unquantified and were reported as water loss. These municipal functions include fire suppression, street sweeping, hydraulic utility excavation, and others. In dedicating resources to tracking and understanding these internal uses, consumption of water for these authorized uses has not been reduced or restricted and the services continue, as necessary. The City anticipates that it is on track to meet the performance standard by 2028.

Note that in DWR Table 4-2 the projected water loss in 2030 and thereafter was calculated by multiplying the performance standard by the estimated number of service connections and for 2025 an intermediate water loss

multiplier of 27.09 gallons per connection per day was used. 2025 through 2045 number of service connections were estimated using the same ratio of 2020 total number of service connections to 2020 population.

4.2.7 Estimating Future Water Savings

As noted in DWR Table 4-2 and the following DWR Table 4-5, water use projections do consider future water savings and lower income residential demands.

DWR Table 4-5

Submittal Table 4-5 Retail Only: Inclusion in Water Use Projections	
Are Future Water Savings Included in Projections?	Yes
Sections where citations of the codes, ordinances, utilized in demand projections are found.	4.2.7.1 4.2.7.2 4.2.7.3
Are Lower Income Residential Demands Included in Projections?	Yes

The unit demand factors and resultant demands calculated by the EU department in COR Table 4-B and COR Table 4-C do not account for reduced demand from conservation measures. However, based on previous years' demand data, the City has observed that passive conservation measures have resulted in an approximate 25% reduced demand from what was projected. This 25% demand reduction is reflected in DWR Table 4-2 for the potable water use categories of Commercial, Industrial, Institutional/ Governmental, Multi-Family, Single Family, and Landscape. Conservation measures are described in the subsequent sections.

4.2.7.1 Compliance with Water Efficient Landscape Requirements

New development areas are required to reduce landscape area and calculated water demands as part of the process for land use approval, as required by the California Code of Regulations Title 23, Division 2 Chapter 2.7 Model Water Efficient Landscape Ordinance (MWELO). The City of Roseville's own standards have additional requirements for Water Efficient Landscaping, which can be found in Chapter 14.18 of the Roseville Municipal Code (available via the City's website).

4.2.7.2 Increased Utilization of Recycled Water

The City of Roseville requires recycled water to be used in most land use development areas currently being planned, and for construction water during drought years. Future required use includes landscaping associated with commercial, industrial, multi-family, parks, and transportation corridors. Guidelines for Recycled Water Service are outlined in Roseville Municipal Code Chapter 14.17 (available via City's website).

4.2.7.3 Implementation of Low Water Use Fixtures

Section 16.01.100 (A.) of the Roseville Municipal Code (available via City's website) states that: "The 2019 California Building Standards Code is hereby adopted by the City of Roseville Municipal Code."

Additionally, the mandatory CALGreen building standards code promotes conservation through the use of appliances and fixtures such as high-efficiency toilets, faucet aerators, and on-demand water heaters.

4.2.8 Characteristic Five-Year Water Use

The California Water Code Section 10635(a) requires that in addition to calculating water use projections over the next 20 years, in five-year increments, that suppliers perform a drought risk assessment lasting five consecutive years. The projected unconstrained demand for 2021-2025 is estimated in table COR Table 4-F. Unconstrained demand is demand absent any water supply or usage restrictions but does include the conservation practices for new construction, outlined in the previous section. This projection informs the drought risk assessment, which is detailed in Chapter 7 .

COR Table 4-F Five consecutive year unconstrained demand.

Gross Water Use	2021	2022	2023	2024	2025
Potable Water, Raw, Other Non-Potable	35,353	38,407	41,460	44,513	47,567
Recycle Raw Water Demand	3,819	3,870	3,920	3,971	4,022
NOTES: All volumes are in AF.					

4.3 Water Use for Lower Income Housing

Policy LU5.5, of the Land Use Element, strives to uphold the City of Roseville's Affordable Housing Goal by requiring that a minimum of 10% of all new housing units cost no more than 30% of the total monthly income of very low-, low-income, and moderate-income households. The City of Roseville EU Department annually coordinates with the Planning Division to gather data related to low-income housing metrics. The total number of affordable housing units in 2020 was 3,103, of which 633 were single family residences and 2,470 were multi-family residences. The water demands for low-income housing for 2020 were estimated by multiplying the number of single family and multi-family units by the average unit demand factor for low to medium density residential and high density residential, respectively, then reducing it by 20% to account for conservation efforts. These estimations are summarized in COR Table 4-G.

COR Table 4-G 2020 Affordable Housing Water Use

Unit Demand Factors	
Average Low to Medium Density Residential Factor for Single Family Units	520.4 (gpd/DU)
Average High Density Residential Factor for Multi-Family Units	232.5 (gpd/DU)
2020 Affordable Housing Water Use	
Single Family Residential	295 (AF/yr)
Multi-Family Residential	516 (AF/yr)
Total	645 (AF/yr)

As stated in DWR Table 4-5, the water use projections of DWR Table 4-2 are inclusive of water use for lower income households. The estimated water demand by sector for each specific plan, in COR Table 4-C, included affordable housing water use in the single family and multi-family water use calculations, which was used to derive the water use projections in DWR Table 4-2. The portion of water from those projections to be used by affordable housing units is shown in COR Table 4-H. As 10% of all new housing construction is required to be allocated to affordable housing, 10% of the difference between each of the five-year projections was added to the preceding period to estimate how much water would be used by low-income housing.

COR Table 4-H Affordable Housing Water Use Projections

Housing Type	2025	2030	2035	2040	2045
Multi-Family Residential	329	356	426	426	426
Single-Family Residential	1,061	1,255	1,433	1,433	1,433
Total Affordable Housing Units	1,390	1,612	1,859	1,859	1,859
NOTES: All values are in AF/yr.					

4.4 Climate Change Considerations

All projections included in Chapter 4 are representative of unconstrained demand except for passive conservation efforts described in 4.2.7. However, consideration of effects that climate change may have on demand projections and water supply and reliability is a critical aspect of ensuring that the City is well positioned to meet future demands. The City's primary water source is surface water from Folsom Lake and the City recognizes that the reliability of this source is reduced during dry years or a drought. A comprehensive study aimed at understanding how climate change will impact the American River Basin, from which the City receives its surface water supplies, was performed in 2020 and is included in Section 6.14.2. The effects of climate change on water supplies are considered in future plans for the groundwater program, a drought risk assessment, and a Water Shortage Contingency Plan**,** which are provided herein.

Chapter 5 SBX7-7 Baselines, Targets, and 2020 Compliance

With the adoption of the Water Conservation Act of 2009, also known as Senate Bill X7-7 (SB X7-7), the State of California is required to achieve a 20% reduction in urban per capita water use by December 31, 2020. Additionally, incremental progress towards meeting the goal was required to be demonstrated in the 2015 UWMP. The 2015 UWMP calculated gallons per capita per day (GPCD) water use and confirmed that the 2015 interim target was met, and that progress was being made toward meeting the water use target for 2020. This chapter summarizes baselines and targets, which were quantified in previous UWMPs, and confirms that the City's 2020 water use is compliant with SB X7-7 legislation.

5.1 Baselines and Targets

The City first addressed SB X7-7 in the 2010 UWMP, where baseline per capita water use, the 2015 interim target, and 2020 target were established and adopted. For the 2015 UWMP update the Department of Water Resources issued guidance that there were significant discrepancies between the CDoF estimated 2010 population and the 2010 population as determined by the 2010 U.S Census, which could result in poor baseline population estimates. Consequently, the City and other water suppliers were required to recalculate baseline population that had been reported in the 2010 UWMP and to modify the 2015 and 2020 targets accordingly.

SB X7-7 requires each urban water retailer to determine their baseline daily per capita water use measured in GPCD, over a 10-year or 15-year baseline period. The 10-year baseline period is defined as a continuous 10-year period ending no earlier than December 31, 2004 and no later than December 31, 2010. SB X7-7 also defines that for suppliers which met a minimum of 10% of their 2008 water demand through recycled water that the baseline could be extended to a maximum of a 15-year baseline period. Only 8.76% of the City's demand was met with recycled water in 2008, consequently the City used a 10 consecutive year period for its baseline. Additionally, SB X7-7 requires that a 5-year baseline per capita water demand be calculated over a 5 consecutive year period ending no earlier than December 31, 2007 and no later than December 31, 2010. Given the requirements the City used the following baseline periods:

- 10-year Baseline Period: 1995-2004
- 5-year Baseline Period: 2003-2007

Since the 2015 UWMP was completed, the City has experienced no changes to the service area that would require recalculation of baseline or targets; there have been annexations for new construction, but these do not trigger recalculation requirements. Baselines and targets are summarized in DWR Table 5-1. The 2015 SB X7-7 Verification Form, which provides tables for detailed calculations of baselines and targets, is provided in Appendix F.

DWR Table 5-1

Submittal Table 5-1 Baselines and Targets Summary from SB X7-7 Verification Form				
Baseline Period	Start Year	End Year	Average Baseline GPCD	Confirmed 2020 Target
10-15 year	1995	2004	309	247
5 Year	2003	2007	295	

5.2 Service Area Population

To correctly calculate compliance water use in GPCD, the population served by the City must be calculated. The method for 2020 service area population was briefly described in Section 4.2.5 and is further explained herein. The 2020 U.S. Census data were not available at the time of plan preparation and could not be used for population estimates, as such the City of Roseville population for 2020 was obtained from CDoF.

The CDoF population estimate for cities utilizes ACS data to distribute the 2010 U.S. census housing units into CDoF's standard housing types. Number of housing unit estimates are respective of new construction, annexations, demolition, and conversions. CDoF coordinates with both local jurisdictions and the U.S. Census Bureau to obtain housing unit change data. For 2020, CDoF estimated that the total population for the City of Roseville was 145,163. However, there are a few areas in the City of Roseville that are not served by the City. The population of the area not served was estimated by determining the total number of households in those areas and applying the household multiplier. The number of households was approximated based on utility information from other City of Roseville departments and the household multiplier was obtained from CDoF. The resulting population for the areas not served by the City is 4,976 and this was subtracted from the CDoF total population to obtain a 2020 service area population of 140,187.

5.3 Gross Water Use

Annual gross water use is defined by the CWC as the volume of water, treated or untreated, that enters the distribution system except for the following: recycled water, the net volume of water placed into long term storage, water conveyed by the retailer for use by another supplier, water delivered for agricultural use, and process water for industrial use if industrial water use is a significant percentage of overall water use. The volume of recycled water used within the City's service area is reported separate from potable water and is excluded from all gross water use volumes reported herein. No other exclusions or deductions were used in the calculation of the baseline gross water use and so are not included in the calculation of the 2020 gross water use.

5.4 2020 Compliance Daily Per-Capita Water Use

The 2020 compliance daily per capita water use (in GPCD) was calculated in accordance with Methodology 4 of DWR's *Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use* document. The SB X7-7 Compliance Form is a set of tables containing calculations demonstrating that the City met the 2020 target and achieved a 20% reduction from its baseline and is provided in Appendix G. 2020 GPCD and target compliance are also summarized in DWR Table 5-2.

DWR Table 5-2

Submittal Table 5-2: 2020 Compliance from SB X7-7 2020 Compliance Form				
2020 GPCD			2020 Confirmed Target GPCD	Did Supplier Achieve Targeted Reduction for 2020? Y/N
Actual 2020 GPCD	2020 TOTAL Adjustments	Adjusted 2020 GPCD		
203	0	203	247	Yes
NOTES: No allowable adjustments were applicable to the City.				

CWC Section 10608.24(d)(1) allows for adjustments to be made for factors outside of the supplier's control when determining compliance. Such factors include differences in evapotranspiration and rainfall, substantial changes to commercial or industrial water use due to increased business output and economic development, and substantial changes to institutional water use resulting from extraordinary events. No adjustments were made to the City's 2020 GPCD, as noted in DWR Table 5-2, and the City was able to demonstrate compliance without adjustments.

5.5 Regional Alliance

The City has complied with SB X7-7 and UWMP requirements as an individual supplier and has elected to not participate in a Regional Alliance.

Chapter 6 Water Supply Characterization

This chapter catalogues and describes the various water resources and supplies available to the City of Roseville including contract supplies from other agencies, surface water, groundwater, storm water, wastewater, and recycled water, as well as water transfers. The supply source, origin, quality, quantity, and impacts of climate change on availability for each source are discussed within this section.

6.1 Surface Water

The City's primary water supply contracts are and have historically been comprised of high-quality surface water received through Folsom Reservoir according to the terms of the City's water supply contracts with the US Bureau of Reclamation (USBR), Placer County Water Agency (PCWA), and San Juan Water District (SJWD). Since these supplies are not considered self-supplied and are instead purchased through other agencies, they are described in Section 6.2 Purchased and Imported Water.

6.2 Purchased and Imported Water

The City has historically relied heavily on its water supply contracts with Placer County Water Agency, the US Bureau of Reclamation, and San Juan Water District. All four untreated surface water contract entitlements for American River water total 66,000 acre-feet per year (AF/yr). The City's current contract and supplies of are outlined in COR Table 6-A.

COR Table 6-A Surface Water Supply Summary

Contract Supply	Supply Type	Quantity	Availability
USBR	Raw Surface Water	32,000 AF	Subject to CVP M&I Usage Policy(1)
PCWA	Raw Surface Water	30,000 AF	All Year Types
SJWD	Raw Surface Water	800 AF	Normal or Wet Hydrologic Years
SJWD	Raw Surface Water	3,200 AF	Normal or Wet Hydrologic Years
(1) The City's USBR Supply is subject in any year to determinations of allotments based on unimpaired inflow to Folsom Reservoir and downstream operations.			

Water supplies from all three source agencies outlined above are received through the same point location at Folsom Dam. Folsom Lake has been the primary source of water supply for the City of Roseville since 1971. Surface water from the American River is collected and diverted at the Folsom Lake Pumping Plant located at Folsom Dam. The City receives supplies from all four of its raw water contract entitlements through the Folsom Lake Municipal and Industrial (M&I) Intake at this facility.

Untreated water supplies received at this point are conveyed by gravity or pumped by USBR depending on lake level through two parallel pipelines (84-inch and 72-inch) to the City's Barton Road Water Treatment Plant (BRWTP), with a capacity for treatment of volumes up to 100 MGD. The 72-inch pipeline was constructed in 2010 to increase redundancy and reliability of this critical supply route, in partnership with SJWD. Additionally, the City has 19 intertie facilities with neighboring agencies through which water supplies may be transferred under normal

water year conditions as well as emergency or drought conditions. In the future, the City is exploring options with PCWA to facilitate receipt of treated water directly through existing and/or new intertie facilities.

6.2.1 Contract Supplies – Vulnerabilities and Restrictions

The City's contract supply with the USBR as part of the Central Valley Project is subject to yearly assignments based on each year's hydrologic conditions. Each year the City is informed in April of the determined percentage allotment of the full 32,000 AF allowed by the contract terms. This determination is made based on the unimpaired inflow of runoff into Folsom Reservoir. This supply is therefore highly vulnerable to climate change and its impacts on rainfall and snowpack conditions upstream of Folsom Reservoir in the Sierra Nevada Mountains. In recent years, this allotment has varied significantly on an annual basis and the City has undertaken dedicated efforts to examine alternatives for increasing water supply reliability in all year types.

The City's contract supply with PCWA is available in all hydrologic year types; it is also conveyed from the Middle Fork Project (MFP) through Folsom Reservoir and received as raw water at the same diversion point at Folsom Dam. The City is currently exploring potential future purchase of additional treated water supply received directly from PCWA to complement the raw water contract supply. PCWA's future Ophir Water Treatment Plant may provide up to 3,360 AF to the City in the future. The City is also currently engaged with PCWA to explore improvements to existing intertie facilities to expand and diversify opportunities for the transfer of supplies not dependent on the diversion facility at Folsom Dam.

The City has two water supply contracts with SJWD totaling 4,000 acre-feet. This supply is only available in Normal or Wet Year types and is received either through Folsom Reservoir or through interties with SJWD.

The City's surface water supplies are all dependent upon the operation of Folsom Reservoir by the US Bureau of Reclamation; the dam that creates the reservoir was originally constructed with a primary purpose of flood control, not water supply, and is still operated according to that primary function. The importance of this facility has led the City to examine options for redundancy, resilience, and or improvements with respect to the intake, and best practices in terms of management of its other water resources.

6.2.2 Water Forum Agreement

The City is a member of the Sacramento River Forum and a signatory to the Water Forum Agreement (WFA). Accordingly, the City has agreed to limit its diversions from the upper American River to 58,900 AF/yr during Normal and Wet water years, and to between 58,900 AF/yr and 43,800 AF/yr in Drier and Driest water years. The City is responsibly committed to the Water Forum Agreement but maintains the position that "By instituting programs to conserve water, it abandons no right, title or interest in or to any City water rights, contractual entitlements or any appurtenant rights necessary to exercise such water rights or entitlements," as described by Resolution No. 09-64, Declaring an Intent to Retain Control of Conserved Water (Appendix H).

6.2.3 Other Available Water Purchases

The City may choose to purchase Article 3F water from the Bureau of Reclamation when such supply is available. This supply source is typically only available in winter and spring months as it is generally considered "excess flow" released by the USBR above and beyond the entitlements of downstream users. In 2019 the City exercised this option and used approximately 950 AF of Article 3F water as part of their ASR program to inject and recharge the

aquifer. This effort represented a continued commitment to provide not only water supply reliability for the City's residents but also to support Conjunctive Use to aid in regional water supply reliability.

6.3 Groundwater

In recent years, the City has taken significant steps to expand and strengthen their Groundwater Program to broaden the City's water supply portfolio. The City currently owns and maintains 6 operational groundwater wells, with 6 additional wells planned for development in the next 10 years, and one planned destruction. Four of the 6 operational wells are capable of Aquifer Storage and Recovery (ASR) whereby treated water is injected into the underlying aquifer for later extraction and use. Currently, the City plans to design all new wells with ASR capability, as the City moves toward a more evenly distributed reliance on diverse water resources and regional sustainability.

Groundwater is considered to be available for use as part of Roseville's water supply portfolio in all year types including Normal, Single-Dry, or Five Consecutive Year Drought scenarios. Importantly, groundwater will be a critical resource in future drought years as it supplements increasingly vulnerable surface water supplies.

6.3.1 Groundwater Basin Description

The City is located over the North American Subbasin of the Sacramento Valley Groundwater Basin. The North American Subbasin (DWR Groundwater Basin Number 5-21.64) is located in the eastern central portion of the Sacramento Groundwater Basin, encompassing portions of Sutter, Placer, and Sacramento Counties. As of 2020, the Basin is listed by DWR as high priority in large part due to the population in the basin and existing and projected future groundwater use, but the basin has neither been adjudicated nor is it considered in overdraft or critical overdraft conditions.

Groundwater elevations in the subbasin along the Placer/Sacramento County line declined at a rate of 1 to 1.5 feet per year for multiple decades until approximately the mid-1990s. Some of the largest decreases have occurred in the area of the former McClellan Air Force Base. From 1995, groundwater elevations were stabilized, and the declining elevation trend was dampened due to groundwater management activities stemming from the Water Forum Agreement restraining further increases in groundwater pumping and implementation of in-lieu banking in the region. Groundwater elevations in Sutter and northern Placer counties generally remain stable, although some wells in southern Sutter County have experienced declines.

In addition, the subbasin has historically been pumped by agricultural and urban users. Recently, in some areas of the subbasin, agricultural land has been and is being developed and converted to urban uses. At this time, the subbasin is operating within the current estimate of sustainable yield.

6.3.2 Groundwater Management

The City actively manages groundwater resources both internally in coordination with land use planning and growth projections as well as regionally in accordance with the provisions of the Sustainable Groundwater Management Act. These efforts are discussed in the following subsections.

6.3.2.1 Western Placer County Groundwater Management Plan

A Groundwater Management Plan (GMP) was completed in November of 2007 in accordance with Senate Bill (SB) 1938 and Assembly Bill (AB) 3030 in cooperation with PCWA, City of Lincoln, and California American Water. The GMP is available through the PCWA website: Western Placer Groundwater Management Plan.

6.3.2.2 Sustainable Groundwater Management Act (SGMA)

The Sustainable Groundwater Management Act of 2014, or SGMA, was a three-bill legislative package composed of AB 1739 (Dickinson), SB 1168 (Pavley), and SB 1319 (Pavley). The package was passed in September 2014 and contains a framework for sustainable management of groundwater supplies by local agencies, with a limited role for state intervention if local agencies fail to meet the requirements of SGMA. SGMA lays out a process and a timeline for local authorities to achieve sustainable management of high and medium priority groundwater basins throughout the state. It also provides tools, authorities, and deadlines to achieve statewide sustainable groundwater management. For local agencies involved in implementation, the requirements are significant and will take years to accomplish. DWR has the responsibility to evaluate local agency progress, while the SWRCB may intervene if DWR determines that local agencies fail to make progress and achieve the requirements of SGMA. Essentially, local agencies who volunteer to comply with SGMA must form as Groundwater Sustainability Agencies (GSAs) and prepare, adopt, and implement a Groundwater Strategic Plan (GSP) that meets the requirements of SGMA.

More specifically, critical required steps include the formation of GSAs within two years of when SGMA became effective; the adoption of GSPs within 5-7 years depending on the status of the basin in question (in critical overdraft condition or not); and preparation, adoption and implementation of a GSP(s) that achieves the sustainability goal within 20 years of plan adoption.

SGMA applies to basins or subbasins designated by DWR as high or medium-priority, based on a statewide prioritization that uses criteria including population, importance and amount of groundwater pumped, extent of irrigated agriculture dependent on groundwater, and other criteria. DWR's final Basin Prioritization findings indicate that there are 127 of California's 515 groundwater basins and subbasins which are high and/or medium-priority. These high and medium-priority basins account for 96% of California's annual groundwater pumping and include 88% of the state's population. The priority ranking for the North American sub-basin of the Sacramento Valley groundwater basin is 24 out of the state's 515 basins, with an overall ranking score of 22.5 and a designation of High Priority.

The City is well along the path of SGMA compliance, having joined the West Placer Groundwater Sustainability Agency (WPGSA) consisting of the City of Lincoln, Placer County Water Agency, Nevada Irrigation District, and the County of Placer. The WPGSA is one of a group of five GSAs formed within the North American Subbasin that consist of West Placer Groundwater Sustainability Authority, Sacramento Groundwater Authority, South Sutter Water District, Sutter County, and Recreation District 1001 GSAs. All five of these GSAs will prepare and submit one joint GSP for the entire Subbasin. This GSP will be submitted to DWR in advance of the January 31, 2022 deadline for high-priority basins not currently in critical overdraft.

6.3.3 Historical Groundwater Production

Until recently, groundwater had not been utilized by the City under normal year conditions. In the 2015 UWMP, the City's groundwater wells were identified for use only in drought or emergency conditions, with minimal pumping for the purpose of maintenance or demonstration of the City's ASR program. Over the last five years, the City has worked to advance and expand the groundwater infrastructure and groundwater program to provide additional water supply reliability.

Beginning in 2018, the City began to regularly operate existing groundwater infrastructure specifically by pumping small volumes of groundwater from the City's production wells and serving that water into the distribution system as part of the maintenance plan. In 2019 and 2020, the City was able to store excess surface water through the use of ASR production wells by injecting that water into the aquifer. As the City continues to develop this program and look to the future of sustainable supply, groundwater pumping patterns will continue to evolve. A summary of the amount of groundwater pumped by the City over the past five years is provided in DWR Table 6-1.

DWR Table 6-1

Submittal Table 6-1 Retail: Groundwater Volume Pumped						
☐	Supplier does not pump groundwater. The supplier will not complete the table below.					
☐	All or part of the groundwater described below is desalinated.					
Groundwater Type	Location or Basin Name	2016	2017	2018	2019	2020
Alluvial Basin	North American Sub-basin of the Sacramento Valley Groundwater Basin 5-21.64	0	0	16.6	23.37	201.1
	TOTAL	0	0	17	23	201
NOTES: Water pumped from Roseville groundwater wells does not need to be desalinated.						

6.3.4 Aquifer Storage and Recovery

The City considers development of a diverse and drought resistant water supply portfolio of primary importance. To this end, the City has invested in both planning and capital improvements develop their Aquifer Storage and Recovery (ASR) Program into a highly functional and critical component of the Water Utility's future. The ASR Program utilizes groundwater pumping infrastructure along with existing water supplies to increase reliability. ASR wells are capable of injecting treated surface water from the distribution system into the groundwater aquifer for later extraction and use. A schematic of wells equipped for ASR within an urban environment, accessing the underlying aquifer for groundwater, is provided in Figure 6-1.

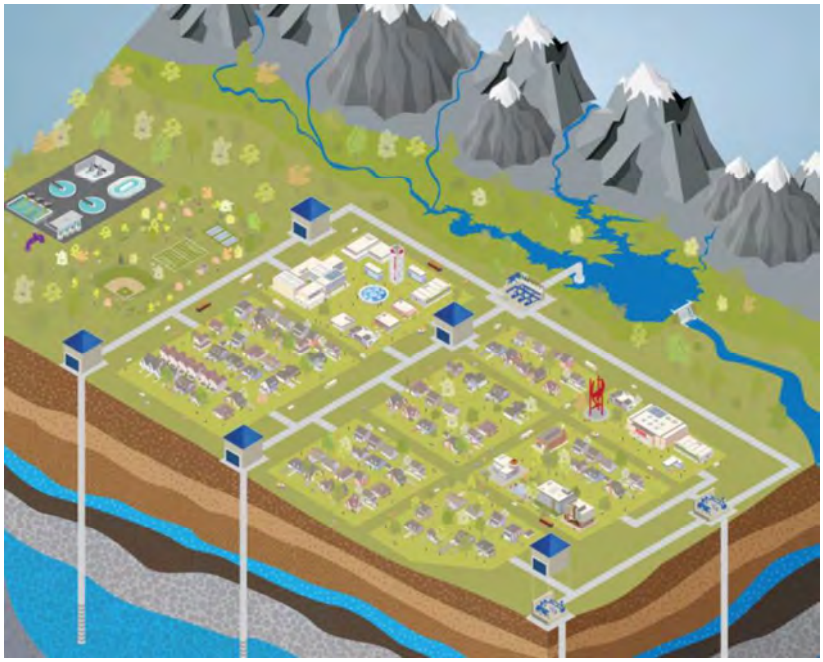


Figure 6-1 Urban Groundwater Infrastructure Schematic

ASR production wells can be used seasonally (i.e. throughout the water year) or periodically over many years to create a "groundwater bank", storing surface water supplies within the aquifer in times of abundance (wet season or years) for use in times of scarcity (dry season or years). An important component of an ASR Program is to maintain consistent and detailed records of groundwater levels within the aquifer and extraction/injection volumes. This information is used to ensure the groundwater basin is managed sustainably providing water supply reliability benefits while avoiding impacts to the groundwater basin. The City is a committed leader in the region with respect to the development of potential future cooperative water banking and responsible regional resource management.

6.4 Stormwater

At this time, the City does not employ any active stormwater recovery measures. In recent years, the City has invested in studies to determine whether stormwater recapture represents a possible resource for future diversity in groundwater recharge projects. Considerations include water rights, timing and quantity of available runoff, property rights, and water quality, among others. Given the complexity of the issues pertaining to stormwater capture or surface spreading, the City continues to conduct analyses to determine the feasibility of this option in the future.

6.5 Wastewater and Recycled Water

The City currently owns and operates two regional wastewater treatment facilities that treat wastewater flows collected from the City, South Placer Municipal Utilities District (SPMUD), and some areas of unincorporated Placer County. This section provides information on wastewater management, as well as its current and potential reuse as a recycled water resource.

6.5.1 Wastewater Collection, Treatment, and Disposal

The South Placer Wastewater Authority (SPWA) was created under a Joint Powers Agreement in October 2000 and is comprised of the City of Roseville, South Placer Municipal Utilities District, and the County of Placer. The SPWA oversees policy for funding regional wastewater infrastructure. The City collaborates with the regional partners on forward planning and best practices for the management of these regional facilities.

The wastewater collection and treatment facilities within the City's service area are maintained and operated by City staff. The wastewater collection facilities outside of the City's service area are maintained by the other SPWA agencies (Placer County and SPMUD). Wastewater outside of the City's service area but within the SPWA Service Area Boundary is conveyed through trunk sewers to the City's wastewater treatment facilities located within the City limits. Metering stations are located at the City's service area boundaries to account for the wastewater entering the City's collection system originating from Placer County and SPMUD collection areas.

The City owns and operates on behalf of the SPWA the Dry Creek Wastewater Treatment Plant (Dry Creek WWTP) and the Pleasant Grove Wastewater Treatment Plant (Pleasant Grove WWTP). Both plants discharge tertiary treated wastewater to surface water. Dry Creek WWTP discharges to Dry Creek while the Pleasant Grove WWTP discharges to Pleasant Grove Creek. The two wastewater treatment plants serve an area that extends beyond the City boundaries.

The Dry Creek WWTP provides tertiary-level wastewater treatment. The treatment consists of screening, grit removal, primary clarification, aeration, nitrification and denitrification, secondary clarification, filtration, and ultraviolet disinfection. Disinfected tertiary-treated wastewater from the Dry Creek WWTP meets Title 22 regulations for full, unrestricted use. The current (2020) average dry weather flow (ADWF) is approximately 8.5 MGD, of which approximately 65%, or 5.5 MGD comes from the City of Roseville.

The plant is currently authorized to discharge up to 18 MGD ADWF into Dry Creek under the Municipal General Order. The Dry Creek WWTP discharge is assigned Municipal General Order enrollee number R5-2017-0085-004 and National Pollutant Discharge Elimination System (NPDES) permit No. CAG585001. Per the State Water Resources Control Board Division of Water Rights, the City is required to maintain an instream flow of four million gallons per day discharge to Dry Creek. Disinfected tertiary treated wastewater from the Dry Creek WWTP meets Title 22 regulations for full, unrestricted use. The Dry Creek WWTP currently (2020) produces 1,063 AF/yr of recycled water. A portion of recycled water from Dry Creek is discharged into a gravity line that supplies a school and Morgan Creek Golf Course, both of which are located in Placer County, outside the City's water service area. The remainder of recycled water from the Dry Creek WWTP is pumped into the recycled water distribution system and used within the City's water service area.

The Pleasant Grove WWTP currently (2020) treats approximately 8.1 MG ADWF with approximately 65% or 5.3 MGD coming from the City of Roseville. The Pleasant Grove WWTP provides disinfected tertiary-level treatment through the process of screening, grit removal, secondary aeration, secondary clarification, filtration, and ultraviolet disinfection. The Pleasant Grove WWTP discharge is assigned Municipal General Order enrollee number R5-2017-0085-005 and National Pollutant Discharge Elimination System Permit No. CAG585001. There are no instream flow requirements for Pleasant Grove Creek.

Disinfected tertiary-treated wastewater from Pleasant Grove WWTP meets Title 22 regulations for full, unrestricted use. The Pleasant Grove WWTP currently (2020) produces 2,434 AF/yr of recycled water that is pumped into the recycled water distribution system and used within the City's service area boundary.

Pleasant Grove WWTP is currently undergoing construction of a major capital improvement project which began in November 2019 and is expected to be complete in 2022. The project includes an increase in treatment capacity from 9.5 MGD up to 12 MGD. Improvements to the treatment process include the addition of primary clarification, waste activated sludge thickening, and anaerobic digestion. This project represents significant improvement to the capacity of the Pleasant Grove WWTP with important components of long-term resilience and improved efficiency of the City's utilities.

The project also includes important improvements which benefit the environmental and create renewable energy resources. Methane from anaerobic digestion will be converted to a renewable compressed natural gas (CNG) to fuel the City's growing solid waste fleet and fuel new microturbines that generate electricity for plant usage. The project includes a receiving facility for energy-dense wastes to enhance methane production.

As previously described, both treatment plants are regional wastewater facilities and as such, wastewater is generated both inside and outside of the City from a combination of residential and non-residential sources. A summary of the volume of wastewater processed at and discharged from each of the City's wastewater treatment plant in 2020 is provided in DWR Table 6-2 and DWR Table 6-3.

DWR Table 6-2

Submittal Table 6-2 Retail: Wastewater Collected Within Service Area in 2020						
100%	Percentage of 2020 service area covered by wastewater collection system					
100%	Percentage of 2020 service area population covered by wastewater collection system					
Wastewater Collection			**Recipient of Collected Wastewater**			
Wastewater Collection Agency	Wastewater Volume Metered or Estimated?	Volume of Wastewater Collected from UWMP Service Area 2020	Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area?	Is WWTP Operation Contracted to a Third Party?
City of Roseville	Metered	5,958	City of Roseville	Pleasant Grove WWTP	Yes	No
City of Roseville	Metered	6,501	City of Roseville	Dry Creek WWTP	Yes	No
Total Wastewater Collected from Service Area in 2020:		12,459				
NOTES: All volumes are in AF. Approximately 65% of the flow received at the Dry Creek WWTP and 65% of the flow received at the Pleasant Grove WWTP originates in the City's water service area.						

DWR Table 6-3

Submittal Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2020

Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Method of Disposal	Wastewater Generated Outside the Service Area Treated?	Treatment Level	2020 volumes				
						Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area	Instream Flow Permit Requirement
Pleasant Grove WWTP	Pleasant Grove Creek	Creek	River or creek outfall	Yes	Tertiary	9,166	6,491	2,434	0	0
Dry Creek WWTP	Dry Creek	Creek	River or creek outfall	Yes	Tertiary	10,001	7,902	956	378	4,481
					Total	19,167	14,393	3,119	378	4,481

NOTES: All volumes are in AF.
100% of influent flow received at both WWTPs is treated and discharged within the City's service area boundary.

6.6 Recycled Water System

6.6.1 Recycled Water Coordination

The City regards recycled water as a valuable resource that is a key component of the City's overall water supply portfolio. The City operates its recycled water system and program in coordination with its regional wastewater partners, including South Placer Municipal Utilities District and Placer County. The City has been successfully irrigating landscaped areas throughout the City \and planning recycled water implementation as part of new development surrounding the City. The City prepared the 2016 Recycled Water Systems Evaluation to position the City for implementing the next phases of recycled water projects as new users within the City come online, and as the various UGA's plan for and install recycled water infrastructure.

The City operates the recycled water program though the requirements of Master Reclamation Permit Order 97-147 (Permit). The Permit implements the reclamation criteria of the City's Title 22 disinfected tertiary recycled water. Current uses of recycled water within the City include irrigation of landscapes and golf courses, industrial cooling for the Roseville Energy Park, and construction purposes such as dust control and soil compaction. Recycled water is also conveyed outside the City's water service area for golf course and landscape irrigation.

The City has prepared the South Placer Regional Wastewater 2020 Systems Evaluation Report (Appendix I), which delineates the current and projected service area boundary, including Urban Growth Areas expected to be added in the near future as development continues. The report provides baseline and projected characterizations of its regional wastewater and recycled water systems. The Systems Evaluation Report was updated to address recent annexations by the SPWA partner agencies, planning revisions, as well as changes in wastewater characteristics and flows. Recycled water supplies and availability are directly linked to the planning and operation of the wastewater treatment plants and must be managed and planned in coordination. The City and its SPWA partners continue utilizing recycled water supplies is to promote responsible water supply management. Beneficial use of available disinfected tertiary treated Title 22 recycled water allows surface water and groundwater supplies to be applied to potable uses.

All agency elements for a reuse program within the City boundary, including land planning, development, wastewater treatment, and water supply, are a part of the City of Roseville government organization.

6.7 Recycled Water Beneficial Uses

The City's recycled water program predominantly serves landscape irrigation customers. The City currently delivers recycled water to golf courses, parks, schools, and many miles of streetscape for landscape irrigation within the City's potable water service area. The City also provides recycled water to a school and a golf course outside of the City's potable water service area. The City delivers recycled water to the Roseville Energy Park, which is owned and operated by the City of Roseville Electric Utility, for industrial cooling purposes. Landscapes at both regional wastewater treatment plants also use recycled water for irrigation purposes. Recycled water can be used for construction purposes such as dust control and soil compaction.

The current and projected direct beneficial uses of recycled water in the City's water service area are shown in DWR Table 6-4.

DWR Table 6-4

Submittal Table 6-4 Retail: Recycled Water Direct Beneficial Uses Within Service Area										
Name of Supplier Producing (Treating) the Recycled Water:		City of Roseville								
Name of Supplier Operating the Recycled Water Distribution System:		City of Roseville								
Beneficial Use Type	Potential Beneficial Uses of Recycled Water	Amount of Potential Uses of Recycled Water	General Description of 2020 Uses	Level of Treatment	2020	2025	2030	2035	2040	2045
Landscape irrigation (excludes golf courses)	Landscape irrigation of public areas and medians.	3,164	Landscape irrigation of public areas and medians.	Disinfected Tertiary	1,336	1,446	1,625	1,841	1,841	1,841
Golf course irrigation	Irrigation	2,577	Excludes golf course usage outside service area boundary.	Disinfected Tertiary	1,744	1,888	2,121	2,403	2,403	2,403
Industrial use	Industrial cooling	310	Roseville Energy Park (REP) cooling water use.	Disinfected Tertiary	310	310	310	310	310	310
Other	Morgan Creek Golf Course	348	Irrigation	Disinfected Tertiary	378	378	378	378	378	378
				Total:	3,768	4,022	4,435	4,933	4,933	4,933
				2020 Internal Reuse	yes					
NOTES: All values are reported in AF.										

The uses listed in DWR Table 6-4 include use of recycled water supply as well as required discharges. Recycled water uses represent demands within the City's service area boundary including all approved specific plans. The 4 million gallon per day required discharge to Dry Creek as an instream flow requirement totaling 4,480 AF/yr is not shown in DWR Table 6-4.

A comparison of the 2020 actual use of recycled water to what was projected for use in 2020 in the 2015 UWMP is provided in DWR Table 6-5.

DWR Table 6-5

Submittal Table 6-5 Retail: 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual		
Use Type	**2015 Projection for 2020**	**2020 Actual Use**
Landscape irrigation (excludes golf courses)	1,923	1,336
Golf course irrigation	1,378	1,744
Industrial use	1,120	310
Total	4,421	3,390
NOTES: All values are in AF. Golf course irrigation does not include golf course irrigation outside the City's service area (Morgan Creek Golf Course)		

6.8 Actions to Encourage and Optimize Future Recycled Water Use

As of 2020, the peak recycled water production in July is approximately equal to the peak recycled water demand in July. For the City to further expand recycled water usage during the irrigation season, additional recycled water must be made available. This will most likely be accomplished through expansion of operational storage, with the necessary storage volume dependent on actual demand requirements. Therefore, the City will continue to evaluate in-City and regional recycled water demands and consider its ability to provide recycled water for future projects.

It is the policy of the City that where the use of recycled water is feasible, appropriate, and acceptable to all applicable regulatory agencies, the City will require an owner or customer to use recycled water for approved uses. The City has other methods of encouraging recycled water use including a rate discount and public education. The recycled water rate for customers is currently 50 percent of the potable water rate. The City also implements an extensive public education campaign to educate its customers about the reliability and other benefits of recycled water. Another major benefit to customers of using recycled water is that it can be used reliably in times of drought. In the event the City imposes drought restrictions on uses, such as irrigation and construction, recycled water is exempt from these restrictions. Under certain drought stages, the City would mandate the use of recycled water for construction purposes.

One target of future recycled water use is new development, as stated in DWR Table 6-6. A major hindrance to expanding use of recycled water in existing developments is lack of infrastructure. Installing new infrastructure in existing areas is exceedingly expensive. The City requires use of recycled water for all commercial irrigation services in newly developing master planned areas. This is feasible because the recycled water infrastructure can

be installed as part of the original project. Additionally, the City is considering expanding recycled water distribution to entities both within and outside the potable water service area.

DWR Table 6-6

Submittal Table 6-6 Retail: Methods to Expand Future Recycled Water Use			
Page 6-12	Page location of recycled water use narrative in UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
Developer Agreements	Per City of Roseville development standards, recycled water must be incorporated into future construction.	2020-2045	1,165
		Total	1,165
NOTES: All values are in AF.			

6.9 Desalinated Water Opportunities

There are no opportunities for the development of desalinated water within the City's service area as a future supply source. The City is not located near any bodies of water that would allow for the option.

6.10 Exchanges or Transfers

The City maintains an on-demand treated water system that is used for municipal and industrial purposes. The City maintains direct treated water interties with five surrounding jurisdictions, as described in Section 2.2.3. The City can transfer water between jurisdictions through these interties or access water to supplement its distribution system. These facilities are designed to be used for wheeling water through the service area or for demand shortage assistance.

As a condition of the Water Forum Agreement, the City has entered into a re-operation agreement with PCWA for up to 20,000 AF to be used when Roseville's surface diversion is cut back. In general, the agreement calls for PCWA to release up to an additional 20,000 AF to the American River on an annual basis during time of reduced water availability in the system. This water is to maintain flows in the Lower American River (Nimbus Dam to Sacramento River), and therefore is not available for the City's use. This re-operation water is considered a transfer, although the ultimate user of the water, if any, has not been identified as part of the agreement - only that the water would be marketed when it was identified as available. It is possible there could be multiple users as the water will flow to the Delta and theoretically be available to all Delta water users.

Also, as a condition of the Water Forum Agreement, the City has committed to not take the entire amount of contracted water from the Upper American River. As a result of having 66,000 AF/yr of water available through various contracts and a commitment to take no more than 58,900 AF/yr from the American River Watershed, there is an opportunity to find a long-term transfer for the 7,100 AF/yr with a user downstream of the confluence of the American and Sacramento Rivers. The Water Code definition of short- and long-term conditions are that short-term is considered for a period of one year or less and long-term is for a period of more than one year.

6.11 Supply Management

The City has historically relied primarily on their suite of surface water contracts, supplying high quality water through the City-owned Barton Road Water Treatment Plant, and serving the City's population through gravity flow. In most year types, the City will continue to rely primarily on these supply sources for the bulk of potable water supply. Of these surface water contracts, the City employs supplies through the USBR contract as a first priority each year, pulling next from the PCWA contract as needed. Each year allocations from the USBR are subject to variation, resulting in potential differences in the duration and quantity of supply pulled from this contract annually.

City Water Utility staff plan to utilize groundwater infrastructure differently in Normal and Dry hydrologic years. In general, Roseville plans to use groundwater infrastructure in accordance with sustainable groundwater management goals and objectives. In a Normal year, this means that the City plans to extract up to the quantity of water banked in that year. In drought years, the City may find the need to operate its wells more significantly to meet demands when significant impacts are seen to surface water supplies. This is outlined further in Chapter 7. As the City continues to install more ASR wells into the coming decade, provisions of the municipal code will be updated to reflect their groundwater strategy.

6.12 Future Water Projects

The City has taken a proactive approach to ensuring resource diversity with a focus on surface water contracts, strong groundwater infrastructure, and highly collaborative regional presence in water planning and future conjunctive use. Future water supply project opportunities, including diversifying the purchasing or importing of water, expansion of the City's groundwater and ASR program, and regional cooperative conjunctive use are discussed in the following sections.

6.12.1 Purchased or Imported Water

In addition to the current contract with PCWA for 30,000 AF/yr of surface water, the City is evaluating and may enter an agreement with PCWA for additional treated surface water supplies available in all hydrologic year types. The treated PCWA water would be supplied by PCWA's future Ophir Water Treatment Plant (Ophir WTP) which will treat water from the Middle Fork Project. The Ophir WTP will be constructed in phases, with the first phase expected to be operational by 2035 and provide an estimated 10 MGD total supply to all customers. Additional phases will be evaluated as PCWA wholesale customers need new supply. The City may purchase up to 3 MGD of normal year capacity from the Ophir WTP, equivalent to 3,360 AF/yr of treated surface water supply.

The City is also exploring future opportunities for water transfers with regional partner agencies in an effort to diversify regional water management strategies in conjunction with responsible groundwater management practices. In 2019, the City executed an agreement for pilot water transfer program with Sacramento Municipal Utilities District (SMUD). This agreement allowed for an annual water transfer for up to 6,000 AF for three years. The transfer allows Roseville to use wet season higher flows to recharge the groundwater aquifer for later season extraction and use. The transfer was executed consistent with Water Forum Agreement policies and goals, as well as an excellent precedent for regional conjunctive use strategies. The City may look to renew this transfer or evaluate similar opportunities in coming years to provide drought resiliency and support the sustainable management of groundwater.

6.12.2 Groundwater and ASR Program

The City has historically relied upon groundwater resources only as a backup supply in times of shortage. Over the last few years and in response to lessons learned during the 2015 drought, changing climate conditions, and the overall need for further diversity and reliability of water supply, the City has invested in efforts to operationalize and expand its groundwater program as a regular part of its water supply portfolio in all year types. Along this vein, the City developed a Groundwater Strategic Plan in an effort to evaluate current infrastructure, potential new well sites, further understand the condition and accessibility of the aquifer within the City's service area boundary, and how groundwater planning would look moving forward. The result of these planning efforts has been the identification of 6 future well sites throughout the City's Pressure Zones 1 and 4, with a heavier emphasis on infrastructure on in Pressure Zone 1. Conceptual design and siting have been completed for these future well sites, with exploratory drilling. The City plans to install these wells and their topside improvements within the next 5-10 years, all with ASR capability to enhance flexibility of operations and expand the City's conjunctive use capabilities. For planning purposes, each well is assumed to extract a nominal 1,750 GPM, with a final production value to be determined upon production well drilling and development. These 6 future wells are expected to represent a total of 16,936 AF/yr of additional water supplies.

Four of the City's six existing wells have ASR injection capability, and at this time the City plans for future wells to also be ASR capable. The ASR Program will not only allow the City to change the pattern of water withdrawal from Folsom Reservoir from peak demand times in the summer to times when water is more available (i.e. the winter) but could also be used as a replacement for surface water in WFA dry/drier years. The expected future water supply programs are listed in DWR Table 6-7.

DWR Table 6-7

Submittal Table 6-7 Retail: Expected Future Water Supply Projects or Programs						
Name of Future Projects or Programs	Joint Project with other suppliers?		Description	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Supplier
	Yes/ No	Agency Name (if applicable)				
Regional Conjunctive Use	Yes	Various	Regional water banking and aquifer storage and recovery projects.	2025	All Year Types	Not Yet Determined
Production/ASR Well Program Expansion	No		Development of up to 6 new production wells with ASR capability.	2035	Potentially, All Year Types	14,431
Ophir Water Treatment Plant	Yes	PCWA	Partnership with PCWA in the development of additional treated water capacity for purchase through existing interties.	2035	All Year Types	3,360
PCWA-Roseville Cooperative Water Reliability Project	Yes	PCWA	Partnership with PCWA to optimize and improve existing interties to increase supply transfer volumes and reliability.	2025	All Year Types	Not Yet Determined
NOTES: All values are in AF.						

6.13 Summary of Existing and Planned Sources of Water

The City's current planned sources of water can be summarized as such:

- The City is currently contracted to purchase 66,000 total AF/yr of American River water diverted from Folsom Lake with certain restrictions (see Chapter 7).
- The City intends to purchase an additional treated water supply from PCWA of 3,360 AF/yr as part of their Ophir Water Treatment Plant project.
- The City neither currently uses nor plans to use surface water that is not mentioned above.
- The City maintains groundwater wells for normal, drought year, and emergency supply. Four of the City's 6 existing active production wells possess ASR capability.
- The City does not currently use storm water as a potable water offset. The City is investigating future opportunities to use stormwater in other beneficial ways.
- The City currently utilizes and has future plans to expand recycled water usage.
- The City neither currently uses nor plans to use desalinated water.
- The City maintains direct treated water interties with four surrounding jurisdictions for use in emergency or water transfer situations.

The actual 2020 water supplies for the City are summarized in DWR Table 6-8 and the future projected water supplies for the City are summarized in DWR Table 6-9.

DWR Table 6-8

Submittal Table 6-8 Retail: Water Supplies — Actual			
Water Supply	Additional Detail on Water Supply	2020	
		Actual Volume	Water Quality
Purchased or Imported Water	US Bureau of Reclamation	24,375	Drinking Water
Purchased or Imported Water	Placer County Water Agency	9,409	Drinking Water
Purchased or Imported Water	San Juan Water District	0	Drinking Water
Groundwater (not desalinated)	City of Roseville owned production wells	201	Drinking Water
Recycled Water	Recycled water produced by City of Roseville WWTPs	3,497	Recycled Water
	Total	37,482	
NOTES: All values are in AF.			

DWR Table 6-9

Submittal Table 6-9 Retail: Water Supplies — Projected

Water Supply	Additional Detail on Water Supply	Projected Water Supply									
		2025		2030		2035		2040		2045	
Water Supply		Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield
Purchased or Imported Water	USBR - CVP Contract Supply	32,000	32,000	32,000	32,000	32,000	32,000	32,000	32,000	32,000	32,000
Purchased or Imported Water	PCWA - Middle Fork Project Supply	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000
Purchased or Imported Water	SJWD	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000
Other	Water Forum Limitation on American River Supply Diversion	-7,100		-7,100		-7,100		-7,100		-7,100	
Purchased or Imported Water	PCWA - Potential Future Purchase (OPHIR WTP)	0	0	0	0	3,360	3,360	3,360	3,360	3,360	3,360
Groundwater (not desalinated)	Groundwater Wells	1,560	7,920	2,720	12,570	3,350	14,430	3,350	14,430	3,350	14,430
Recycled Water	South Placer Wastewater Authority	4,791	4,791	5,269	5,269	5,643	5,643	5,958	5,958	6,383	6,383
	Total	65,311	77,991	66,869	82,309	69,283	86,103	69,598	86,418	70,023	86,843

NOTES: Under normal year operations, the City intends to manage groundwater use sustainably through the active recharge of surface water through the ASR Program. Values shown above assume a 3-month injection window and an equal volume of extraction. New ASR well infrastructure is expected to be operational by 2030, with additional wells installed by 2035.
All values are in AFY.

6.14 Climate Change Impacts to Supply

6.14.1 Local Climate Change Outlook

The City has acknowledged and incorporated many recent lessons learned from the last 10 years of climate related impacts to the reliability of its water supply. Beginning with the extended drought early in the decade, culminating with the extreme shortages experienced in 2015, Roseville has seen unprecedented curtailments of water supply and how important diversity of sources, diversion locations, and other options become when regular supply is interrupted.

It is expected that regional reductions in Sierra Nevada snowpack will continue and worsen in the coming years, creating uncertainty of surface water supplies – specifically the contract Roseville holds with USBR for 32,000 AF annually which can be curtailed down to 0% depending on each year's hydrologic outcome. Further, in drought years a lack of inflow to Folsom Reservoir can reduce water surface elevations significantly and quickly, with the possibility of exposing the intake facility at the dam.

The City's surface water supplies will be more vulnerable to declining snowpack in coming years, with potential for severe limitations in single dry years as well as periods of persistent drought. Integrating cross-seasonal groundwater management (injecting in times of excess for extraction in times of scarcity) will provide much needed resilience in the face of shifting climate conditions.

With these things in mind, the City has taken steps to operationalize its groundwater infrastructure and work toward beneficial use (injection) of excess wet season supplies in preparation for seasonal shortages in surface supply. It is important to note that Roseville is not simply planning to draw from the aquifer to offset its surface water contracts, but rather that they are making concurrent plans to recharge this aquifer and bank supply before the need arises. It is this type of forward planning that Roseville brings to the regional stage in helping the group of agencies relying on these same supply sources to move toward a more sustainable outlook. Diversity of operations and supply sources allow a more flexible approach to each year's specific hydrologic conditions and water demand.

6.14.2 Regional Climate Studies

In 2020, the American River Basin (Basin) region conducted a climate change study in partnership with local water purveyors and the USBR. The purpose of the American River Basin Study (ARBS or Study) was to develop data, tools, analyses, identify supply-demand imbalances, and climate change adaptation strategies specific to the Basin. Under the "new normal" of a changing climate, the ARBS aims to improve the resolution of regional climate change data and to develop regionally specific mitigation and adaptation strategies. As a participant of the study, and service area contained within the Study Area, the following summarizes climate change findings pertinent for the region. More detail, along with the approved study can be found at www.pcwa.net/planning/arbs.

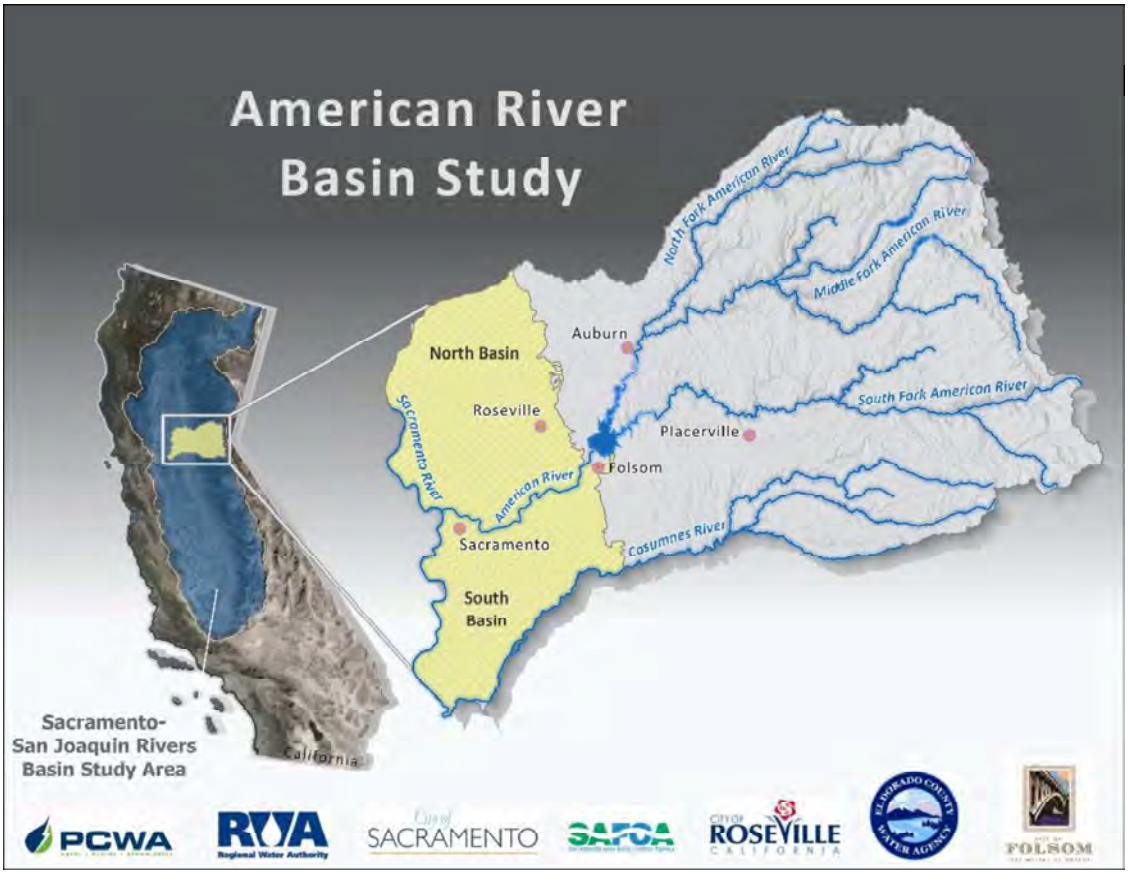


Figure 6-2 American River Basin Study Area

The Study Area is bounded by the Sierra Nevada mountain range to the east, the Feather and Sacramento rivers to the west, the Bear River to the north, and the Cosumnes River to the south (see Figure 6-2). In addition to the American River Watershed, the Study Area encompasses the North and South American Groundwater Subbasins, and Non-Federal Partners' service areas outside of the American River Watershed.

6.14.3 Projected Future Conditions

Analysis of projected future climate conditions in the American River Basin and development of climate scenarios for the ARBS were based on an ensemble of bias-corrected and spatially downscaled climate projections[1]. This ensemble has been used by the California Water Commission and DWR as the primary source of climate projection information in several recent studies, including the Water Storage Investment Program (WSIP) and California's Fourth Climate Change Assessment (Pierce et.al., 2018). Projected future climate conditions were evaluated and characterized based on the ensemble of downscaled climate projections.

[1] Climate projections were developed using Global Climate Models from the Coupled Model Intercomparison Project Phase 5 (CMIP5) and downscaled using Localized Constructed Analogs (LOCA) method projected and coupled with two future emission scenarios (RCP 4.5 and RCP 8.5) available from Dr. David Pierce at the Scripps Institution of Oceanography.

Hydrology scenarios were used to develop streamflow inputs to CalSim 3.0, which was then used to evaluate changes in water supplies, demands, and management throughout the CVP and State Water Project (SWP), including the Study Area. Demands for each water purveyor largely relied upon water purveyor's information provided in Regional Drought Contingency Plan/Regional Water Reliability Plan (RWRP) (Regional Water Authority, 2017) and 2015 UWMPs.

6.14.3.1 Temperature

Surface air temperatures are projected to increase steadily, with average summer temperatures increasing by approximately 7.2 degrees Fahrenheit (°F) by the end of the 21st century (see Figure 6-3), and winter temperatures increasing by 4.9°F. Projections of daily maximum and minimum temperatures suggest similar warming trends during all seasons, with maximum temperatures projected to increase as much as 7.3°F during the summer months.

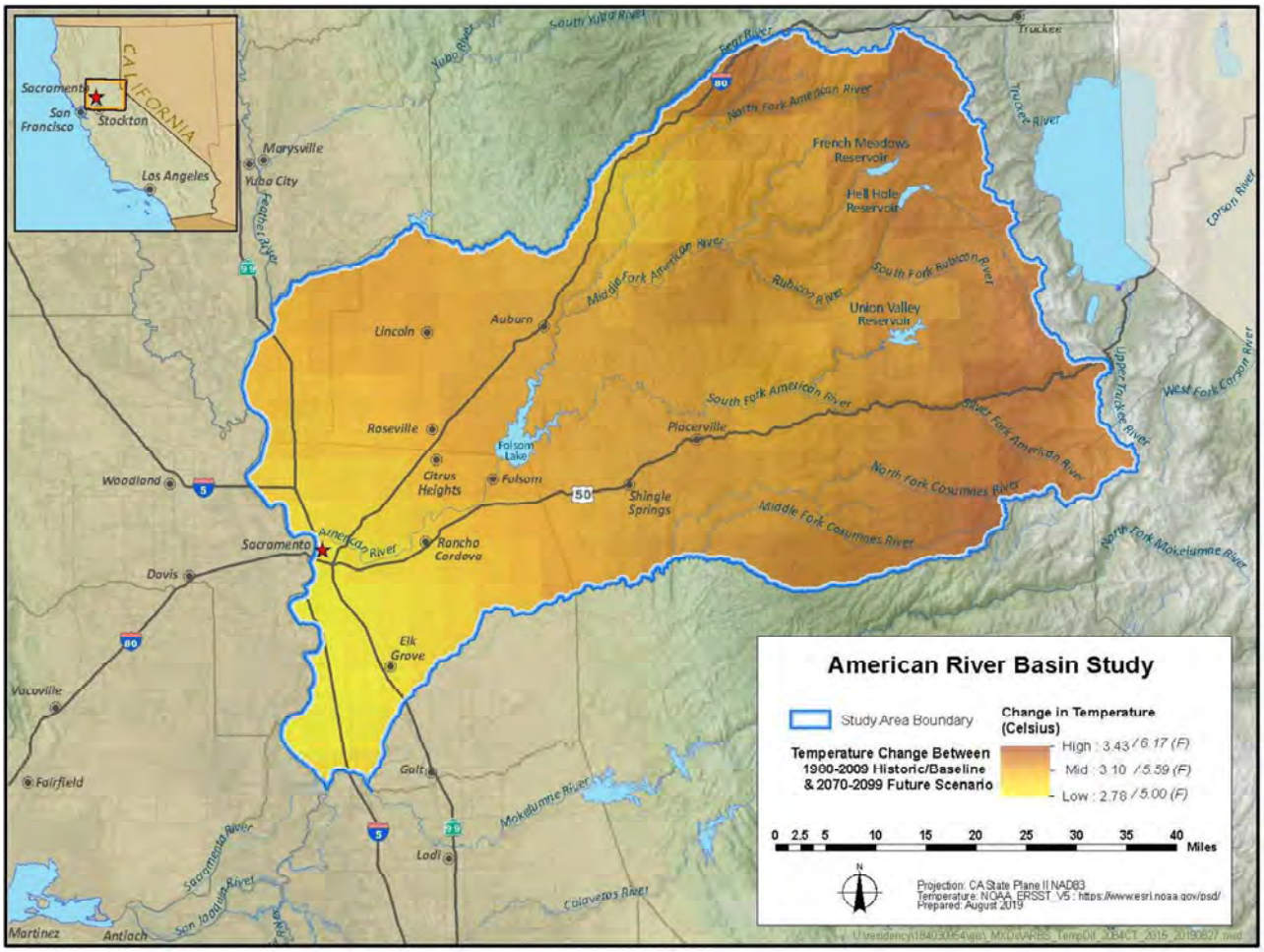


Figure 6-3 Projected Changes in July Temperature between Historical (1980-2009) and End of Century Under Central Tendency Climate Change

6.14.3.2 Precipitation

Annual precipitation projections show no significant trend in the median of change over the 21st century. Many of the available GCM projections show change in precipitation, but there is no consistency in the magnitude and

direction of projected change between models. Approximately half of the projections indicate a minor increase in annual precipitation and half indicate a minor decrease, highlighting the large uncertainty in future precipitation over this region. Although lacking clear trend in projected annual precipitation, by the end of the 21st century the average fall and spring precipitation is expected to decrease, with winter and summer precipitation increasing. Increasing variability is also projected in winter and fall precipitation. A summary of these projections is provided in COR Table 6-B.

COR Table 6-B Projected Change in Precipitation and Temperature Over the American River Basin Study Area Between 1980-2009 and 2070-2099

Season	Percent Change in Basin-Averaged Annual Mean Precipitation (%)	Change in Basin-Averaged Annual Mean Daily Air Temperature (°F)	Change in Annual Mean of Daily Maximum Air Temperature (°F)	Change in Annual Mean of Daily Minimum Air Temperature (°F)
Fall	-6.0	5.8	6.1	5.5
Winter	4.7	4.9	5.0	4.8
Spring	-11.9	5.8	6.3	5.1
Summer	10.4	7.2	7.3	7.0

6.14.3.3 Snowpack

Snow water equivalent (SWE) is a key indicator of water supplies in this region, where runoff is largely influenced by snowmelt. The increasing variability in precipitation combined with increases in surface air temperatures are key drivers in projections of a reduction in annual average SWE. Average SWE is forecasted to decrease by 50-85% across all climate scenarios and future time periods. In addition, areas that accumulate snow above Folsom Reservoir are also projected to have up to a 12-inch decrease in maximum snowpack by end of the century.

6.14.3.4 Evapotranspiration

Potential evapotranspiration (PET) serves as a key indicator of landscape water demands, including consumptive use by evaporation and transpiration from bare soil, water surfaces, native vegetation, and crops. Average annual PET is expected to increase 1.2 to 6.2 inches across all climate scenarios and future time periods. PET is strongly correlated with air temperature and thus expected to increase more under the hot scenarios (HD, HW) than under the warm scenarios (WD, WW).

6.14.3.5 Runoff

Watershed runoff is a direct indicator of local water supply available, as well as to statewide CVP-SWP system. Climate change projections indicate a pronounced shift in the distribution of runoff from May and June to earlier in the season (December to March), implying a transition in precipitation from snow to rainfall and/or earlier snowmelt and increasing the amount of runoff during the winter months. Peak runoff is expected to shift by more than a month earlier by mid to late century (Figure 6-4). Spring runoff will decrease due to reduced winter snowpack. Similar to the precipitation scenarios, there is large uncertainty in projected runoff where the 'wet' scenarios suggest an increase in annual runoff and the 'dry' scenarios suggest a decrease in annual runoff. The projected changes in basin wide runoff range from an increase of 486 thousand acre-feet (TAF) under the warm-wet scenario to a decrease of 203 TAF under the hot-dry scenario by the end of the century.

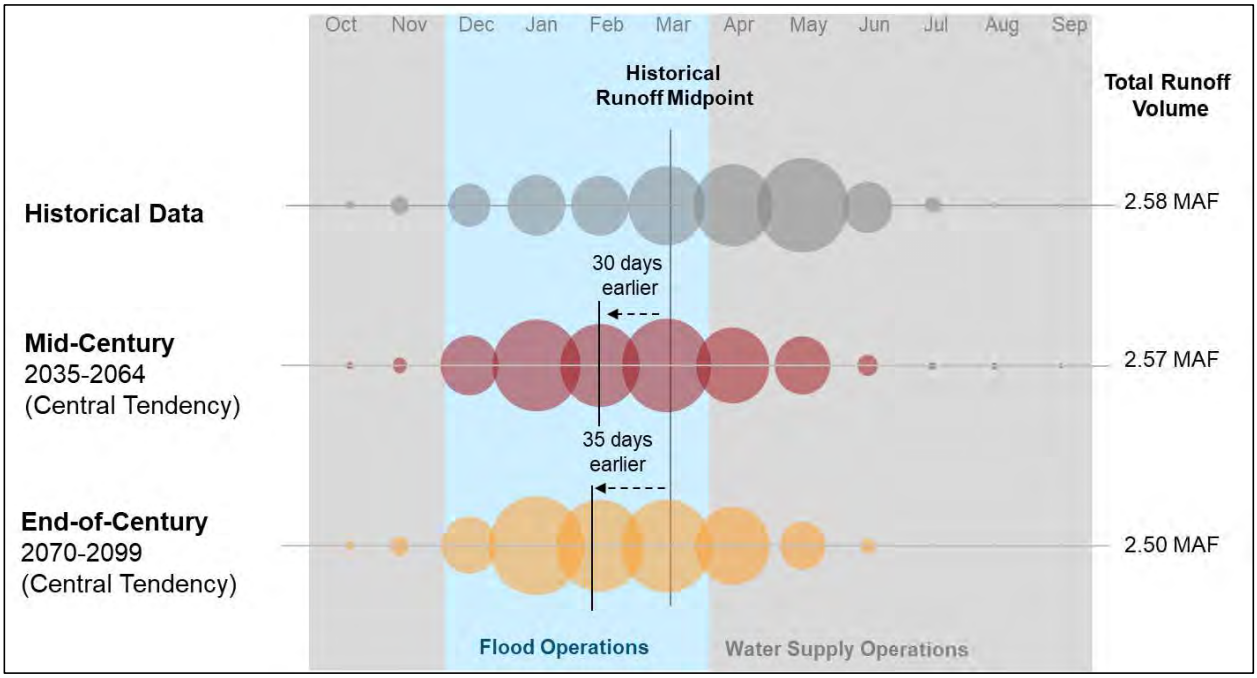


Figure 6-4: Distribution of Average Monthly Runoff for Historical Record (1922-2015) and Future Projections Under Central Tendency Climate Scenario

The change in annual climatic and hydrologic indicators between historical baseline observations (1915 to 2015) and projected future conditions for the ARBS area are listed in COR Table 6-C.

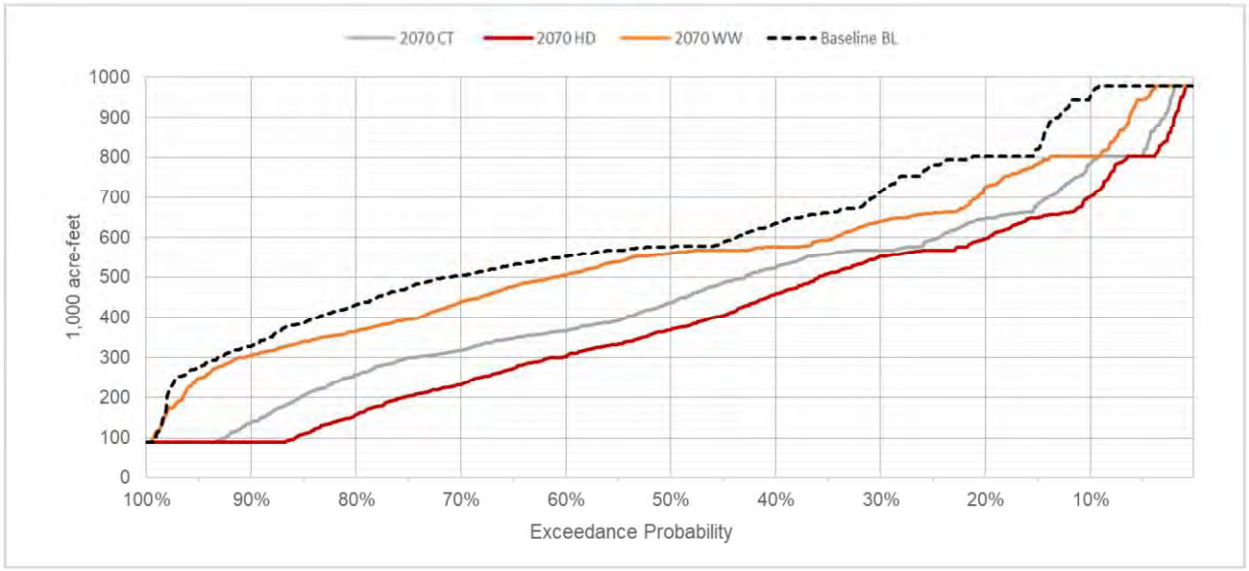
COR Table 6-C Change in Hydrologic Indicators Between Historical Observations and Projected Future Hydrology

Time Period	Climate Scenario	Precip (in)	T_{avg} (°F)	T_{max} (°F)	T_{min} (°F)	PET (in)	SWE_{avg} (in)	SWE_{max} (in)	Runoff (TAF)
1915-2015	Historical Observations	38.2	54.8	67.8	35.6	42.8	1.5	5.7	1,458
2040-2069	Warm-Wet	1.9	4	6.2	1.6	1.6	-0.7	-2.3	701
	Central Tendency	0.1	5	8.1	2.1	2.7	-0.9	-2.8	-2
	Hot-Dry	-2.8	6.2	10.4	2.7	3.7	-1.1	-3.4	-206
2055-2084	Warm-Wet	3.8	4.7	7.4	2	2	-0.8	-2.5	199
	Central Tendency	-1.1	6.3	11.1	2.6	4.1	-1.08	-3.5	-93
	Hot-Dry	-3.4	7.9	13.3	3.7	5	-1.2	-3.8	-185
2070-2099	Warm-Wet	7	5.4	8.3	2.5	1.8	-0.9	-2.9	486
	Central Tendency	-0.6	6.5	11	2.8	3.9	-1	-3.3	-54
	Hot-Dry	-4.6	8.9	15.7	4.1	6.2	-1.3	-4.3	-203

Water Supply Reliability

Changing climate conditions in the Sierra Nevada Mountains threaten the volume of water stored in the snowpack and the timing of runoff entering Folsom Reservoir. Consequently, they can also affect the critical role of Folsom Reservoir in the CVP Operations. Reliance on Folsom Reservoir is expected to increase commensurate with the

impact of sea level rise on salinity in the Delta. Modeling of these factors has illustrated that, without operational adjustments, Folsom Reservoir is projected to have lower end of conservation season (end of September) storage levels and approach "dead pool" more often under most future climate scenarios (see Figure 6-4). Similarly, increased early season runoff would increase flood risks along the Lower American River, leaving less water in the upper watershed available during water supply operations.



Key:
Baseline BL = Historic Conditions, 2070 CT = Central Tendency 2070 Climate Scenario, HD = Hot-Dry 2070 Climate Scenario, WW = Warm-Wet 2070 Climate Scenario

Figure 6-5 Exceedance Plot of Folsom Reservoir Storage (end of September) Under Future Climate Change

Under the 2070 level of development, the ARBS projects a supply-demand imbalance of 63 to 78 TAF/year in the Upper Basin (or Foothills Area) without further conservation or management actions. In the Lower Basin, groundwater extraction is expected to increase by 62 to 155 TAF/year to offset the projected imbalance, which would affect groundwater sustainability.

Based on the water supply and demand imbalance results, the region's water supply reliability has vulnerabilities. The ARBS assessed several adaptation portfolios for addressing the range of vulnerabilities and future supply-demand imbalances for the Study Area for regional benefits. Portfolios analyzed were:

1. Foundational Institutions
2. No Assurances for Long-term CVP Water Contract
3. Alder Creek Storage and Conservation Project
4. Sacramento River Diversion Project
5. Federally Recognized Groundwater Bank (North and South Basin)
6. Folsom Dam Raise with Groundwater Banking (South Basin)
7. Modified Flow Management Standard

The seven formulated adaptation portfolios were quantitatively evaluated using CalSim 3 to alleviate supply-demand imbalances and benefits to the region. The Study's intent was not focused on individual water-supplier's portfolio, but rather how the region could plan to increase regional reliability. The precise composition, scale,

operations, partnerships, funding, and governance to advance these project concepts will require further evaluations and coordination among Basin interests, including USBR, DWR, and SWRCB.

While climate change does have an impact on the basin, impacts are largely seen closer to the end of the century, and not within the timeline of the UWMP. Through proactive adaptation management actions, the Study highlights ways for the region to alleviate climate change impacts by the end of century. Therefore, in consideration of the timeline of the UWMP, the City of Roseville does not reflect any climate change impacts in supply and demand scenarios within this Plan.

6.15 Energy Intensity

A new requirement of the CWC, pursuant to 10631.2. (a), for 2020 UWMPs is that suppliers must include information that can be used to calculate energy intensity of their water service. Typically, a large portion of energy consumed in municipalities is dedicated to the conveyance, treatment, distribution, and storage of water. Maintaining water systems involves numerous pumps, motors, and other equipment which run for most or all hours of the day year-round. Because the water operations consume a significant amount of energy, these facilities can be a substantial contributor to greenhouse gas emissions in communities. Understanding how much energy is consumed at the City's various facilities is critical to ensure that the City is mindfully and efficiently utilizing energy resources.

An analysis of the energy intensity, which is the amount of energy consumed per the volume of potable water supplied, is provided in COR Table 6-D.

COR Table 6-D Energy Intensity Reporting

Start Date for Reporting Period	1/1/2020	Sum of Water Management Processes
End Date	12/31/2020	
Volume of Water Entering Process (AF)		32,300
Energy Consumed (kWh)		10,419,600
Energy Intensity (kWh/AF)		322.60
NOTES: Values include only water management processes that are under the City's operational control.		

The City treats and distributes the majority of its potable supply with the significant aid of gravity flow, from Folsom through the WTP and out into the distribution network throughout the City's service area. Data collected to support the analysis included in COR Table 6-D were primarily sourced from energy consumption billing data for the City's conveyance, treatment, distribution, and storage facilities for potable water. Where data was not available, estimates were made based upon similar facilities as well as calculations proportionate to the volume of water involved in the facility process. Some of the City's conveyance or distribution facilities do not have power sources or are owned by the adjacent utility and therefore do not represent consumption included in the calculation above.

Chapter 7 Water Service Reliability and Drought Risk Assessment

This chapter describes the long-term reliability of the City's water supply portfolio in all hydrologic year types through the year 2045. The City's existing and planned water management strategies and options for increasing the reliability of water supplies are also addressed. Shorter term reliability planning that may require immediate action, such as drought or a catastrophic supply interruption, is addressed in the Water Shortage Contingency Plan.

7.1 Constraints on Water Sources

This section addresses potential legal, environmental, water quality, and climatic effects on the reliability of water supply sources through the year 2045.

7.1.1 Legal Constraints

The City does not anticipate legal factors to affect the reliability of recycled water or purchased water supply within the planning horizon of this UWMP.

There are no existing legal constraints that limit groundwater pumping and the groundwater basin is not currently adjudicated. However, as an updated sustainable yield for the subbasin has yet to be defined under SGMA, the legal authority to enforce the sustainable yield of the subbasin has not been created, and the basin is subject to the users' cooperation in managing the basin until a formal authority is created. The City actively participates in regional discussions regarding best practices and cooperative management of water resources. These issues and concerns are being discussed in forums like the Regional Water Authority and as part of the Western Placer County Groundwater Management Plan along with sustainable groundwater management objectives and activities. The collaborative group of City of Roseville, PCWA, City of Lincoln, and California American Water is responsible for and has been identified as the responsible entity for monitoring groundwater levels meeting requirements of the 2009 SB X7-6 California State Groundwater Elevation Monitoring Program (CASGEM) program. Information gathered as part of this program was included in the groundwater model that was developed to support the ASR application with the Regional Water Quality Control Board to determine impacts of proposed extractions and injections related to groundwater levels in the region.

7.1.2 Water Quality Constraints

The City's water supply portfolio consists of high-quality surface water, recycled water, and groundwater resources. In some areas of the City, iron and manganese can be found in native groundwater at concentrations both above and below the secondary taste and odor maximum contaminant level established for these constituents. The City monitors groundwater quality closely, to ensure water provided for potable use does not exceed these standards.

7.1.3 Physical Constraints

The physical constraints of recycled water, surface water, and groundwater are discussed in the following sections.

7.1.3.1 Recycled Water

Recycled water is physically constrained by flows into the City's wastewater treatment plants. It is therefore seasonally available in higher quantities when demands are lowest during the wet season. The distribution

network of "purple pipe" is also a physical constraint for this supply source, as it only exists in the western portion of the City. Access to recycled water and its availability to offset potable needs are therefore, limited by physical access to this pipe network.

7.1.3.2 Surface Water

The City has identified its Folsom Lake intake as a likely physical constraint on current surface water supplies. All three surface water contract supplies are received through this point of diversion, making it a critical facility for the reliability of Roseville's surface water supply. If the water level of Folsom Lake were to drop close to or below the intake elevation as it nearly did in 2015, the City would not be able to divert water without additional infrastructure. The City is also able to receive supply through interties in emergency conditions; however, the WTP represents the primary diversion point. As a result of this vulnerability and lessons learned in the 2015 drought year, the City is actively exploring cooperative efforts with Folsom diversion and operation partners to duplicate or lower the intake facility to alleviate this concern. The City is likewise examining options for alternate diversion points or use of interties to increase reliability of physical water supply access.

The capacities of the Folsom Dam diversion, Roseville Water Treatment Plant, and distribution systems are sufficient to divert, treat, and convey the projected surface water demands. A 150 cubic feet per second (cfs) capacity limitations at the USBR pumping plant, which was agreed to based on recent pumping plant improvements, is sufficient to provide water to meet the City's needs.

7.1.3.3 Groundwater

The physical constraints on the current groundwater supply are the pumping capacities of existing wells. The total pumping capacities from all the six wells are about 11,050 GPM, approximately 15.9 MGD, per Chapter 3 . The City plans to install 6 additional wells by 2035 to provide additional groundwater supplies. Currently, the City plans to design all new wells with ASR capability to allow for greater groundwater banking and extraction capability throughout seasonal variations in surface water supply availability. Many of these planned well sites have been reassessed and relocated to areas of the City's surface are with more advantageous groundwater conditions as well as hydraulics with respect to the distribution network. Installation of wells higher in the hydraulic grade area of the system will allow for a greater downstream sphere of influence for this infrastructure and more flexible system operation in times of reliance on groundwater.

7.1.4 Other Constraints

Aside from legal and physical constraints, several other considerations affect the availability and reliability of Roseville's water supply portfolio. The City's purchased surface water supply is subject to reductions during dry years (seasonal and climatic shortages) pursuant to the Water Forum Agreement (WFA), the USBR Operations Criteria and Plan (OCAP), and the Central Valley Project Municipal and Industrial Water Shortage Policy (CVP M&I WSP). These agreements and programs are discussed in greater detail in the following subsections.

7.1.4.1 Sacramento Water Forum Agreement

The Sacramento Water Forum is a diverse group of business and agricultural leaders, citizen groups, and environmentalists, water managers, and local governments working together to balance two co-equal objectives:

1. **Provide a reliable and safe water supply for the Sacramento region's long-term growth and economic health.**
2. **Preserve the fishery, wildlife, recreational and aesthetic values of the Lower American River.**

The City, along with several other Sacramento-area water suppliers are signatory to the January 2000 Water Forum Agreement which includes Purveyor Specific Agreements, with the most recent revisions affected to these agreements in 2015. The Water Forum Agreement provides the framework for how water resources, including surface water and groundwater supplies would be used in the region, through the year 2030. The City's Purveyor Specific Agreement includes limitations on City surface water diversions from the American River under various hydrologic conditions. The Water Forum categorized water years into three types, all of which are defined in terms of the projected March through November unimpaired flow into Folsom Reservoir. These hydrologic year types are as follows in COR Table 7-A.

COR Table 7-A Water Forum Agreement Hydrologic Year Types

Year Type	Unimpaired Flow into Folsom Reservoir
Normal/Average or Wet Year	Greater than or equal to 950,000 AF
Drier Year	Between 400,000 and 950,000 AF
Driest/Critically Dry Year	Less than 400,000 AF

Although Roseville's water contract entitlements total 66,000 AF/yr, the City's diversions from the American River are limited by the WFA in normal/wet years, drier, and driest years. In normal/wet years, the City has agreed to limit surface water diversions from the American River to 58,900 AF/yr. In driest or critically dry years, the maximum diversion from the American River is limited to 43,800 AF/yr. In drier years, the City may divert an amount between 43,800 and 58,900 AF/yr from the American River, calculated linearly depending on the unimpaired flow into Folsom Reservoir, as shown in Figure 7-1.

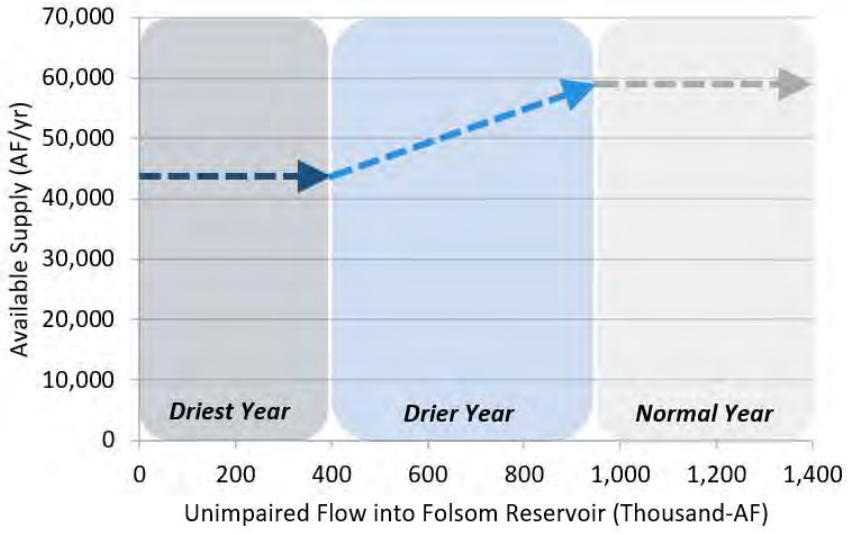


Figure 7-1 Water Forum Agreement Supply Limitations

It is important to note that during the drier and driest years, the City has an agreement with PCWA to release an additional 20,000 AF/yr of water down the American River on the City's behalf through re-operation of PCWA's American River Middle Fork Project (MFP). This 20,000 AF/yr of water is not part of the City's contracted supply of 66,000 AF/yr. The intent of the MFP re-operational releases during drier and driest years is to mitigate environmental impacts resulting from increased diversions above 1995 baseline levels.

7.1.4.2 USBR Operations Criteria and Plan

In addition to the WFA, the City's USBR water is also subject to restrictions as detailed in the 2004 Long Term Central Valley Project Operations and Criteria Plan (location on USBR's website). Chapter 5 of the OCAP entitled "Operations Forecasting" states that CVP allocations can be affected by:

- Forecasted reservoir inflows and Central Valley hydrologic water supply;
- Current amounts of storage in upstream reservoirs and in San Luis Reservoir;
- Projected water demands in the Sacramento Valley;
- Instream and Delta regulatory requirements;
- Annual management of 3406(b)(2) resources (related to fish and wildlife); and/or
- Efficient use of CVP-SWP export capacity through Joint Point of Diversion flexibility.

The OCAP includes a requirement that contractors be informed by USBR no later than February 15 of any possible deficiency in supplies that year. Since 1992, increasing constraints placed on operations by legislative and ESA requirements have made water delivery to CVP contractors more difficult, with recent drought conditions further impacting deliveries. Additionally, it is important to note that the City's USBR water deliveries may be curtailed purely based on downstream Delta conditions, irrespective of available upstream supply.

7.1.4.3 Central Valley and Industrial Water Shortage Policy

Upon a condition of shortage as determined by the OCAP, the CVP M&I WSP details the "incremental steps" by which available M&I water supply is allocated to the CVP water service contractors. From the November 2015 USBR news release, elements of the CVP M&I WSP include:

- Define water shortage terms and conditions for applicable CVP water service contractors, as appropriate.
- Determine the quantity of water made available to CVP water service contractors that, together with the M&I water service contractors' drought water conservation measures and other non-CVP water supplies, would assist the M&I water service contractors in their efforts to protect public health and safety during severe or continuing drought.
- Provide information to CVP water service contractors for their use in water supply planning and development of drought contingency plans.

The Final Environmental Impact Statement (EIS) describes the existing setting, alternatives for future operations under the CVP M&I WSP, and potential environmental impacts of each alternative. USBR selected Alternative 4, the Preferred Alternative, which comprises the Updated CVP M&I Water Shortage Policy developed by USBR with stakeholder input received during preparation of the Final EIS.

The decision will allow USBR the greatest degree of flexibility to address CVP water service contractors' needs during a Condition of Shortage while recognizing that CVP deliveries are subject to the amount of CVP water available. The Updated CVP M&I WSP also provides clarity to the terms, conditions, and procedures of the CVP M&I WSP. A copy of the November 2015 Final Record of Decision is included in Appendix J.

7.2 Water Supply Reliability Assessment

This section addresses the reliability of the City's water supply in average, single dry, and multiple dry water years. The City uses the following water year definitions from the DWR 2020 Guidebook:

COR Table 7-B Reliability Assessment Year Type Characterization

Year Type	Description
Average or Normal Year	A single year or averaged range of years that most closely represents the average water supply available to the Supplier.
Single Dry Year	The year that represents the lowest water supply available to the Supplier.
Five Consecutive Year Drought	The driest five-year historical sequence for the supplier.

The reliability of the potable and recycled water supplies is discussed in the following sections and are compared to the projected potable and recycled water demand.

7.2.1 Potable Water Supply and Demand Assessment

This section provides an assessment of the City's expected water supply and demand for Normal Year, Single Dry Year, and Five Consecutive Year Drought scenarios, based on data available at the time of publication of this UWMP, and discusses the City plans to mitigate potential supply deficits.

The City has identified the following base water years to represent the Year Types:

- **Average or Normal Year**: 2017
- **Single Dry Year**: 2015
- **Five Consecutive Year Drought**: 2011 - 2015

This City has identified these base water years based heavily on lessons learned through the droughts experienced in the last 10 years. In 2017, 100% of the typical contract supply was available, making it a good candidate to represent an average or normal year. In 2015, the City experienced a 75% curtailment of their USBR contract value – a source which had been considered highly reliable until that time. With only a 25% allotment, this represents the lowest experienced water supply level in Roseville's history. The time period between 2011 and 2015 represented multiple years of drought conditions and the lowest average available water supply experienced by the City, and therefore has been identified to represent the five consecutive year drought condition. Supply volumes for base years are provided in DWR Table 7-1.

DWR Table 7-1

Submittal Table 7-1 Retail: Basis of Water Year Data (Reliability Assessment)			
Year Type	Base Year	Available Supplies if Year Type Repeats	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location _____	
		☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available	% of Average Supply
Average Year	2017	64,279	100%
Single-Dry Year	2015	49,739	77%
Consecutive Dry Years 1st Year	2011	64,279	100%
Consecutive Dry Years 2nd Year	2012	59,430	92%
Consecutive Dry Years 3rd Year	2013	59,480	93%
Consecutive Dry Years 4th Year	2014	51,531	80%
Consecutive Dry Years 5th Year	2015	49,942	78%
NOTES: Groundwater is not utilized as a significant source of supply until a Drought Stage 3 is declared by the City. Totals include recycled water which is assumed to be available in all year types. All volumes are in AF.			

The City intends to use their groundwater supply differently in different year types. Under Normal Year conditions, the City intends to inject groundwater at an overall net benefit to the aquifer, or at most to extract groundwater up to the amount injected. In times of drought however, as in a Single Dry Year, or multi-year drought condition, the City can and will utilize their groundwater infrastructure as a larger percentage of overall supply. These assumptions and the resulting groundwater availability by year type are outlined in COR Table 7-C.

COR Table 7-C Groundwater Supply Availability by Year Type.

Groundwater Supplies and Management by Year Type					
Well Data	Operational ASR Wells	6	10	11	11
	Total Annual Extraction Capacity	17,600	28,000	32,100	32,100
	Total Annual Injection Capacity	7,000	12,100	14,900	14,900
Year Type	**Assumptions**	**2020**	**2030**	**2035**	**Buildout**
Normal	In a Normal Year, the City would only typically extract less than or equal to the volume injected. The injection window is estimated at **3 months** for the wet season when additional volume might be available, and **90% capacity** would be assumed to account for 10% down time for maintenance.	1,560	2,720	3,350	3,350
Single Dry	In a Single Dry Year, the City would expect to pump for **6 months** of the year at 9**0% capacity** to allow for 10% down time for maintenance.	7,920	12,570	14,430	14,430
Year 5 of a Multi-Year Drought	In the 5th year of a 5 -Year Drought, the City would expect to pump for **6 months** of the year at 9**0% capacity** to allow for 10% down time for maintenance.	7,920	12,570	14,430	14,430
NOTES: All values are in AF.					

The availability of total water supply from each source by hydrologic year type is outlined in COR Table 7-D.

COR Table 7-D Potable Supply Availability by Year Type

Potable Water Supply Availability by Source and Hydrologic Year Type						
Supply Source	**2020 (current)**	**2025**	**2030**	**2035**	**2040**	**2045**
NORMAL WATER YEAR						
USBR	32,000	32,000	32,000	32,000	32,000	32,000
PCWA	30,000	30,000	30,000	30,000	30,000	30,000
SJWD	4,000	4,000	4,000	4,000	4,000	4,000
Water Forum Limitation	-7,100	-7,100	-7,100	-7,100	-7,100	-7,100
PCWA (Future)	0	0	0	3,360	3,360	3,360
Groundwater	1,560	1,560	2,720	3,350	3,350	3,350
Total	60,460	60,460	61,620	65,610	65,610	65,610
SINGLE DRY YEAR						
USBR	8,000	8,000	8,000	8,000	8,000	8,000
PCWA	30,000	30,000	30,000	30,000	30,000	30,000
SJWD	0	0	0	0	0	0
Water Forum Limitation	0	0	0	0	0	0
PCWA (Future)	0	0	0	3,360	3,360	3,360
Groundwater	7,920	7,920	12,570	14,431	14,431	14,431
Total	45,920	45,920	50,570	55,791	55,791	55,791
FIVE CONSECUTIVE YEAR DROUGHT - YEAR 1						
USBR	32,000	32,000	32,000	32,000	32,000	32,000
PCWA	30,000	30,000	30,000	30,000	30,000	30,000
SJWD	4,000	4,000	4,000	4,000	4,000	4,000
Water Forum Limitation	-7,100	-7,100	-7,100	-7,100	-7,100	-7,100
PCWA (Future)	0	0	0	3,360	3,360	3,360
Groundwater	1,560	1,560	2,720	3,350	3,350	3,350
Total	60,460	60,460	61,620	65,610	65,610	65,610
FIVE CONSECUTIVE YEAR DROUGHT - YEAR 2						
USBR	24,000	24,000	24,000	24,000	24,000	24,000
PCWA	30,000	30,000	30,000	30,000	30,000	30,000
SJWD	0	0	0	0	0	0
PCWA (Future)	0	0	0	3,360	3,360	3,360
Water Forum Limitation	0	0	0	0	0	0
Groundwater	1,560	1,560	2,720	3,350	3,350	3,350
Total	55,560	55,560	56,720	60,710	60,710	60,710

FIVE CONSECUTIVE YEAR DROUGHT - YEAR 3						
USBR	24,000	24,000	24,000	24,000	24,000	24,000
PCWA	30,000	30,000	30,000	30,000	30,000	30,000
SJWD	0	0	0	0	0	0
Water Forum Limitation	0	0	0	0	0	0
PCWA (Future)	0	0	0	3,360	3,360	3,360
Groundwater	1,560	1,560	2,720	3,350	3,350	3,350
Total	55,560	55,560	56,720	60,710	60,710	60,710
FIVE CONSECUTIVE YEAR DROUGHT - YEAR 4						
USBR	16,000	16,000	16,000	16,000	16,000	16,000
PCWA	30,000	30,000	30,000	30,000	30,000	30,000
SJWD	0	0	0	0	0	0
Water Forum Limitation	0	0	0	0	0	0
PCWA (Future)	0	0	0	3,360	3,360	3,360
Groundwater	1,560	1,560	2,720	3,350	3,350	3,350
Total	47,560	47,560	48,720	52,710	52,710	52,710
FIVE CONSECUTIVE YEAR DROUGHT - YEAR 5						
USBR	8,000	8,000	8,000	8,000	8,000	8,000
PCWA	30,000	30,000	30,000	30,000	30,000	30,000
SJWD	0	0	0	0	0	0
Water Forum Limitation	0	0	0	0	0	0
PCWA (future)	0	0	0	3,360	3,360	3,360
Groundwater	7,920	7,920	12,570	14,431	14,431	14,431
Total	45,920	45,920	50,570	55,791	55,791	55,791

NOTES: Groundwater more significantly relied on in single dry years and year 5 of a five consecutive year drought condition.
All values are in AF.

7.2.2 Comparison of Supply and Demand

A comparison of projected water supply and demand during Normal, Single Dry, and Five Consecutive Year Drought conditions are included in DWR Table 7-2, DWR Table 7-3, and DWR Table 7-4. It is important to note that in all scenarios shown in these tables, Normal Year demands are shown. As outlined in Chapter 4 , passive demand reduction savings are incorporated into the demand projections themselves; however, no specific conservation effort to reduce demands in a drought year have been shown in these tables in order to depict the most basic comparison of supply and demand in these year types. As shown, there is an adequate water supply in all normal years. In single dry years and in certain multiple dry years, water supply deficit may occur.

7.2.3 Recycled Water Supply and Demand Comparison

The City's recycled water supply is an important resource as it is considered to be 100% reliable in all water year types. Recycled water supply has been set equal to the projected recycled water demand in these analyses because showing a surplus recycled water supply would mask potential potable water shortages.

7.2.4 Total Water Supply and Demand Comparison

A comparison of projected total (potable and recycled) water supply and demand during a normal water year is included in DWR Table 7-2. As shown, there is an adequate water supply in normal years to meet demands through 2045.

DWR Table 7-2

Submittal Table 7-2 Retail: Normal Year Supply and Demand Comparison					
	2025	2030	2035	2040	2045
Supply totals	64,482	66,055	70,543	70,543	70,543
Demand totals	51,589	56,990	62,547	62,547	62,547
Difference	12,893	9,065	7,996	7,996	7,996
NOTES: An additional 3,360 AF of supply from the PCWA Ophir WTP is assumed to become available in all year types as of 2035. The City plans to have 4 new wells operational by 2030 with an additional 2 following by 2035, as well as the destruction of 1 existing. Supply and demand include Recycled Water. All volumes are in AF.					

A comparison of projected water supply and demand during a Single Dry Year is included in DWR Table 7-3.

DWR Table 7-3

Submittal Table 7-3 Retail: Single Dry Year Supply and Demand Comparison					
	2025	2030	2035	2040	2045
Supply totals*	49,942	55,005	60,723	60,723	60,723
Demand totals*	51,589	56,990	62,547	62,547	62,547
Difference	(1,647)	(1,985)	(1,824)	(1,824)	(1,824)
NOTES: An additional 3,360 AF of supply from the PCWA Ophir WTP is assumed to become available in all year types as of 2035. The City plans to have 4 new wells operational by 2030 with an additional 2 following by 2035, as well as the destruction of 1 existing. Supply and demand include Recycled Water. All volumes are in AF.					

A comparison of projected water supply and demand during a Five Consecutive Year Drought is included in DWR Table 7-4.

DWR Table 7-4

Submittal Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison						
		2025	2030	2035	2040	2045
First year	Supply totals	64,482	66,055	70,543	70,543	70,543
	Demand totals	51,589	56,990	62,547	62,547	62,547
	Difference	12,893	9,065	7,996	7,996	7,996
Second year	Supply totals	59,582	61,155	65,643	65,643	65,643
	Demand totals	51,589	56,990	62,547	62,547	62,547
	Difference	7,993	4,165	3,096	3,096	3,096
Third year	Supply totals	59,582	61,155	65,643	65,643	65,643
	Demand totals	51,589	56,990	62,547	62,547	62,547
	Difference	7,993	4,165	3,096	3,096	3,096
Fourth year	Supply totals	51,582	53,155	57,643	57,643	57,643
	Demand totals	51,589	56,990	62,547	62,547	62,547
	Difference	(7)	(3,835)	(4,904)	(4,904)	(4,904)
Fifth year	Supply totals	49,942	55,005	60,723	60,723	60,723
	Demand totals	51,589	56,990	62,547	62,547	62,547
	Difference	(1,647)	(1,985)	(1,824)	(1,824)	(1,824)
NOTES: An additional 3,360 AF of supply from the PCWA Ophir WTP is assumed to become available in all year types as of 2035. The City plans to have 4 new wells operational by 2030 with an additional 2 following by 2035, as well as the destruction of 1 existing. Supply and demand include Recycled Water. All volumes in AF.						

As stated in DWR Table 7-4, there is sufficient supply to meet demands in Normal Years through 2045. In Single Dry Years and some extended drought years, shortages do occur. DWR Table 7-2, DWR Table 7-3, and DWR Table 7-4 include recycled water supply and demand. The remaining deficits shown will be mitigated by potable water conservation measures implemented as part of the Water Shortage Contingency Plan.

7.2.5 Deficit Mitigation

Depending on the raw water supply available from USBR, and in accordance with the WFA, deficits in potable water supply may occur in a single dry year or the latter stages of an extended drought condition. As shown in DWR Table 7-3 and DWR Table 7-4, the greatest potential deficit between available supply and demand would occur in Year 4 of a Five Consecutive Year Drought condition.

One potential strategy to alleviate deficiencies shown above is indicated in DWR Table 7-5. In DWR Table 7-5, the potential volume of water resulting from potable water demand reductions are shown.

DWR Table 7-5

Submittal Table 7-5: Five-Year Drought Risk Assessment Tables to address Water Code Section 10635(b)

	2021	2022	2023	2024	2025
Total Water Use	39,172	42,276	45,380	48,484	51,589
Total Supplies	64,279	59,430	59,480	51,531	49,942
Surplus/Shortfall w/o WSCP Action	25,107	17,153	14,100	3,047	(1,647)
Planned WSCP Actions (use reduction and supply augmentation)					
WSCP - supply augmentation benefit	0	0	0	0	0
WSCP - use reduction savings benefit	0	0	0	0	6,659
Revised Surplus/(shortfall)	25,107	17,153	14,100	3,047	5,013
Resulting % Use Reduction from WSCP action	0%	0%	0%	0%	13%

NOTES: Supply and demand totals include Recycled Water. Demand reductions actions only apply to the portion of total water use that is potable and not to the recycled water.

The City will determine the needed balance between water conservation and groundwater pumping on a case-by-case basis consistent with the City's Municipal Code. The City also continues to plan for and analyze opportunities for water supply projects or exchanges that would increase the reliability of the raw water supplies diverted from the American River.

7.3 Regional Supply and Reliability

All water consumed by the City comes from local supply sources. No water is imported from other regions, nor does the City anticipate importing water from other regions throughout the UWMP planning period. However, the City is actively engaged in multiple planning projects and coordination intended to strengthen water supply reliability throughout the Sacramento area, in addition to investing in long-term water storage projects like the future Sites Reservoir. Projects like Sites will not provide direct benefit in terms of water supply to Roseville; however, as a regional project it promises to strengthen the Northern California water portfolio as a whole, providing benefit to all who operate within this sphere. The City is a committed regional partner in working to solve supply shortage issues before they become a critical reality, with climate change and increasingly limited supply sources at the crux of the issue. The City will continue these efforts into the future and work with its partner agencies to find the best path forward.

Chapter 8 Water Shortage Contingency Plan

Following the severe drought of 2012-2016, the State of California Legislature sought to expand the water shortage contingency analysis under former law and mandated that a Water Shortage Contingency Plan (WSCP) be adopted by suppliers. A copy of the WSCP is provided in Appendix K.

Chapter 9 Demand Management Measures

This chapter describes the City's historical and existing water conservation program, status of implementation of Demand Management Measures (DMMs), and projected future conservation implementation. The CWC requires that the UWMP include a comprehensive description of historical, current, and projected water conservation programs.

> *CWC 10631 (e) Provide a description of the supplier's water demand management measures. This description shall include all of the following:*
>
> *(1) (A) For an urban retail water supplier, as defined in Section 10608.12, a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years. The narrative shall describe the water demand management measures that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.*
>
> *(B) The narrative pursuant to this paragraph shall include descriptions of the following water demand management measures:*
>
> *(i) Water waste prevention ordinances.*
>
> *(ii) Metering.*
>
> *(iii) Conservation pricing.*
>
> *(iv) Public education and outreach.*
>
> *(v) Programs to assess and manage distribution system real loss.*
>
> *(vi) Water conservation program coordination and staffing support.*
>
> *(vii) Other demand management measures that have a significant impact on water use as measured in gallons per capita per day, including innovative measures, if implemented.*

In previous UWMPs, a substantial amount of data was required to document a water supplier's progress in implementing fourteen specific DMMs. In 2014, Assembly Bill 2067 simplified, clarified, and updated reporting requirements for DMMs. Starting with the 2015 UWMP, focus has turned away from detailed descriptions of each of the fourteen DMMs and has turned to water conservation measures that are being implemented to achieve compliance with SB X7-7. For retail agencies, the number of DMMs has been reduced from fourteen to six (plus an "other" category). A narrative description of the status of the DMMs and how the DMMs will help the water supplier achieve its SBX7-7 water use targets is required. Detailed data are not required.

Members of the CUWCC may include their reporting in the UWMP, but a narrative is also required.

9.1 Demand Management Measures

The six DMMs required to be discussed in the 2020 include the following:

- Water waste prevention ordinances;
- Metering;
- Conservation pricing;
- Public Education and outreach;
- Programs to assess and manage distribution system real loss; and
- Water conservation program coordination and staffing support.

For each DMM, the current program is described, followed by a description of how the DMM was implemented over the previous five years and the planned implementation to achieve the water use targets required by SB X7-7, which is discussed in Chapter 5

9.1.1 Water Waste Prevention Ordinances

The City currently restricts water waste within its service area. Roseville Municipal Code Chapter 14.09, Water Conservation Ordinance (Appendix L), defines water waste and associated penalties of continued infractions. Per the ordinance, customers in violation are provided a series of notifications at one-week intervals: first a courtesy notice, second an administrative warning, and finally a formal citation. If the situation is not remedied by the time specified in the formal citation, additional measures can be taken to enforce compliance. These measures include fines, water restrictions, low flow devices, or discontinued service. In addition, the City may waive the courtesy notice and administrative warning in times of drought.

To enforce the Water Waste Ordinance, the City employs two 1,500 hour/year conservation workers to patrol within the service area limits. The City has also employed contract help at night to conduct water waste patrols. These patrol efforts are ramped up and down seasonally according to the intensity of landscape water usage. In addition, full-time City staff patrol for water waste as part of their normal job duties. In addition to patrols by City staff, the City has an online reporting mechanism that allows customers to report observed water waste anonymously. Customers can visit www.roseville.ca.us/waterwaste and submit an electronic form, which is then further investigated by City staff.

Implementation of this DMM is ongoing and expected to help the City achieve its water use targets by minimizing the nonessential uses of water so that the water is available to be used for human consumption, sanitation, and fire protection.

9.1.2 Metering

A meter retrofit program was developed and implemented from 2001 to 2011. Implementation of metered rates began immediately on all residential metered connections established after January 1, 2002, with the remaining retrofitted homes transitioned in large blocks as retrofits were completed. Customers were provided water use information for a period of one year before transition to volumetric billing began.

The metering DMM helps Roseville achieve its water use targets by providing accurate water use information to both the customer and the City. Higher than normal comparative usage triggers outreach to customers who may have leaks, as well as awareness of efficient water use practices. Overall, metering assists the City in managing customer water use and leak detection efforts.

9.1.3 Conservation Pricing

As a component of its meter retrofit program, the City adopted conservation pricing for water on all metered accounts from 2011 through 2015. Later, and to comply with Proposition 218 requirements, the City transitioned to a per-use, uniform billing rate structure in February 2016. A complete list of service charges, excess water use charges, and water rates are included in Roseville Municipal Code Sections 14.08.090 Service Charges for Metered Service through 14.08.100 Flat Water Rates. This information is included in Appendix M.

Implementation of this DMM is expected to help the City achieve its water use targets by ensuring water customers pay the true cost of water. The City regularly analyzes this cost of water production, capital improvement project needs, level of service requirements and other costs of operating the water system during regular rate studies. Where adjustments need be made, extensive public education efforts are undertaken to maintain transparency of utility operations and funding to support any required rate changes. Sufficient revenue will continue to be available to fund water system operations, maintenance, and water conservation programs.

9.1.4 Public Education and Outreach

The City promotes water conservation and other resource efficiencies in coordination with the Regional Water Authority (RWA), Roseville Electric, and Roseville's Public Information Department. The City distributes information through paid advertisements, television commercials, featured segments on the local government access channel, the internet (through the City's website and streaming video), the City's Utility Exploration Center, several water efficient workshops each year, movie theater ads, newsletters, bill inserts, mill messages, brochures, vehicle decals, community outreach events, community speaker bureaus, and yearly special events.

9.1.4.1 Customer Water Usage Portal

The City plans to implement a customer portal as part of the implementation of Advanced Metering Infrastructure (AMI) which is currently underway. This portal will provide residents with an ability to view their past usage and identify any changes in use patterns that may indicate leaks or opportunities for implementing cost savings by conserving water.

9.1.4.2 Utility Exploration Center

In 2008, the City's utilities jointly funded and created the Roseville Utility Exploration Center (UEC). In addition to serving as a "storefront" for the utilities, the Center is used by the City for community outreach and environmental education. Designed for an interactive experience, the UEC hosts multiple hands-on exhibits with a "learning lab" for demonstrations, presentations, and workshops. Topics include water conservation and watershed protection, energy efficiency, waste reduction, and wastewater management.

Since opening, the Utility Exploration Center has hosted over 640,000 program participants, with approximately 5,000 student (preschool through sixth grade) to the exhibit hall; partnered with cultural, recreational, and utility-related organizations to create a lively series of changing events, workshops, and activities; and connected with residents in a variety of off-site outreach activities.

The Center is housed within the Gold LEED (Leadership in Energy and Environmental Design) certified Martha Riley Library building, which was the first building in Placer County to be so honored. Future plans include the "Inspiration Garden," an outdoor learning space created in partnership with Roseville's Water Efficiency division, with a goal of encouraging more residents to adopt water-wise gardening practices. The garden is planned for completion by summer 2021. Plans are also underway to update the original visitor center exhibits. A larger outdoor project, originally called the IDEAscape, would further expand exhibits to include topics such as river-friendly landscaping and irrigation, utility systems, solar energy, and watershed protection. The project is currently on hold but is anticipated for completion by 2030.

9.1.4.3 Student Outreach

In addition to Regional Water Authority (RWA) student outreach programs, the City independently provides presentations, conservation materials, and facility tours to local schools.

9.1.5 Regional Water Authority – Outreach and Education

In addition to local public education and outreach programs, the City also participates in a regional public education and outreach program through the Regional Water Authority (RWA). RWA is a joint powers authority formed in 2001 to promote collaboration on water management and water supply reliability programs in the greater Sacramento, Placer, El Dorado, Yolo, and Sutter counties. In collaboration with 19 water provider members and other wastewater, stormwater, and energy partners, RWA formed the Water Efficiency Program (WEP) in 2001 to bring cost effectiveness through economies of scale to public education and outreach activities.

The WEP operates on an average annual budget of $530,000 and is supplemented by grant funding. Grants are an important funding resource for the Program. Since 2003, the Program has been awarded $13.2 million in grant funding for public outreach and education as well as a variety of rebate programs, fixture direct install programs, system water loss, individualized customer usage reports, large landscape budgets and more. Of those funds, $3.8 million was awarded between 2016 and 2020.

The main function of the WEP is to develop and distribute public outreach messages to customers in the region by collaborating with its water provider members. The Program distributes these messages on a regional scale through regional media and advertising buys and was honored with the United States Environmental Protection Agency WaterSense Excellence in Education and Outreach Award in 2016. From 2016-2020, the WEP created a series of public outreach campaigns. A summary of each campaign and highlighted achievements is as follows.

Following the historic 2015 California drought, the WEP launched the “Rethink Your Yard” Campaign in 2016 with a focus on prioritizing landscape watering, putting trees first and transitioning thirsty lawn and landscaping to beautiful, low water use, River-Friendly landscapes. The Program advertised the campaign through online ads, social media, commercial radio, Raley Field (local baseball stadium) and local billboards. The campaign featured local homeowners with their newly redesigned yards on billboards throughout the region.

The campaign launched in 2017 focused on encouraging customers to understand and deliver the amount of water their landscape really needs and to make permanent equipment changes to improve efficiency such as installing weather-based irrigation controllers, more efficient sprinklers and drip irrigation. The Program partnered on this messaging with local nurseries through a “Get Growing this Fall” initiative to encourage residents to plant in the fall when days are cooler and plants don’t need as much water to establish roots.

From 2018 through 2020, the regional campaign focused on tackling the landscape overwatering problem with a “Check and Save” message encouraging residents to check the soil moisture with a moisture meter before turning on sprinklers. To support this message, the Program provided free froggy moisture meters via an online request form and at events. In 2019, WEP distributed 3,000 moisture meters to customers throughout the region.

These campaigns are implemented through both paid advertising buys and earned media from public service announcements (PSAs). Every year the campaigns can be heard on local radio stations such as Capital Public Radio

and online through google, Facebook and YouTube advertisements. From 2016-2020, the WEP public outreach campaigns produced:

- Radio Advertising (2016-2020)
  3,443 radio advertisements ran
  17.2 million impressions

- Digital Advertising (Facebook, Google Display Network and Spotify) (2016-2020)
  24.3 million impressions
  262,900 clicks

- Additional advertising (billboards in 2016)
  1.8 million digital advertisements ran
  51.6 million impressions

- Public Service Announcements (Television and Radio) (2016-2020)
  20 million impressions
  $570,000 in value had they been purchased as advertising

The Program also continues messaging through its own Facebook page. From 2016-2020, the Program created about 60 Facebook posts a year featuring water saving tips and other relevant information. The WEP hosted several Facebook sweepstake contests including: Tree Hugger in 2016, where participates submitted pictures hugging a tree to raise awareness about the importance of healthy trees and the Under/Over Debate in 2020, where participates were asked to weigh in what is the proper way to hang toilet paper to raise awareness of toilet leaks. The winner of the Under/Over Debate sweepstakes received a case of toilet paper delivered via mail and gift card to a local hardware store.

The Program continues to utilize the public outreach website bewatersmart.info to reach customers throughout the region. The website contains regional and local water provider information on rebates and services, top ways to save, an interactive watering and water waste information map, a water-wise gardening database, recent press releases, the Sacramento Smart Irrigation Scheduler tool, and more. Educational information and customer services were modified to address the COVID pandemic in 2020 including online water efficiency lessons for kids, a list of nurseries that offered curbside pickup, virtual water wise house calls and numerous virtual educational customer workshops. Between 2016 and 2020, the website averaged 96,000 unique visitors per year.

For more targeted outreach, the Program distributed quarterly e-newsletters to participating residents. The e-newsletters are filled with water savings tips, upcoming events, and other interesting articles. They are usually timed around changes in the weather to help signal the need for residents to adjust their irrigation systems, such as day light savings coupled with a message to dial back sprinkler systems. The e-newsletter reaches 6,300 households.

Every year the WEP selects 3 public events to attend for the public to interact with local water efficiency staff. These events provide an opportunity for the region to communicate its messages in person. Events have included the Sacramento Home & Landscape Show at Cal Expo, Creek Week, Harvest Day, Farm-to-Fork Festival, and several Earth Day events. Additionally, RWA, in coordination with participating local water providers, hosts an annual

Mulch Mayhem event in which customers can pick up a truck load of free mulch from selected locations throughout the region. All in-person regional events were canceled in 2020 due to the COVID pandemic.

The Program is also very active in communicating to local media outlets such as the Sacramento Bee. Between 2016 and 2020, RWA issued 50 press releases on WEP activities and regionally significant news and participated in nearly 30 radio public affairs interviews. The RWA and the WEP were mentioned in dozens of news articles published by local and regional media outlets both within and outside of the Sacramento region during the same time frame.

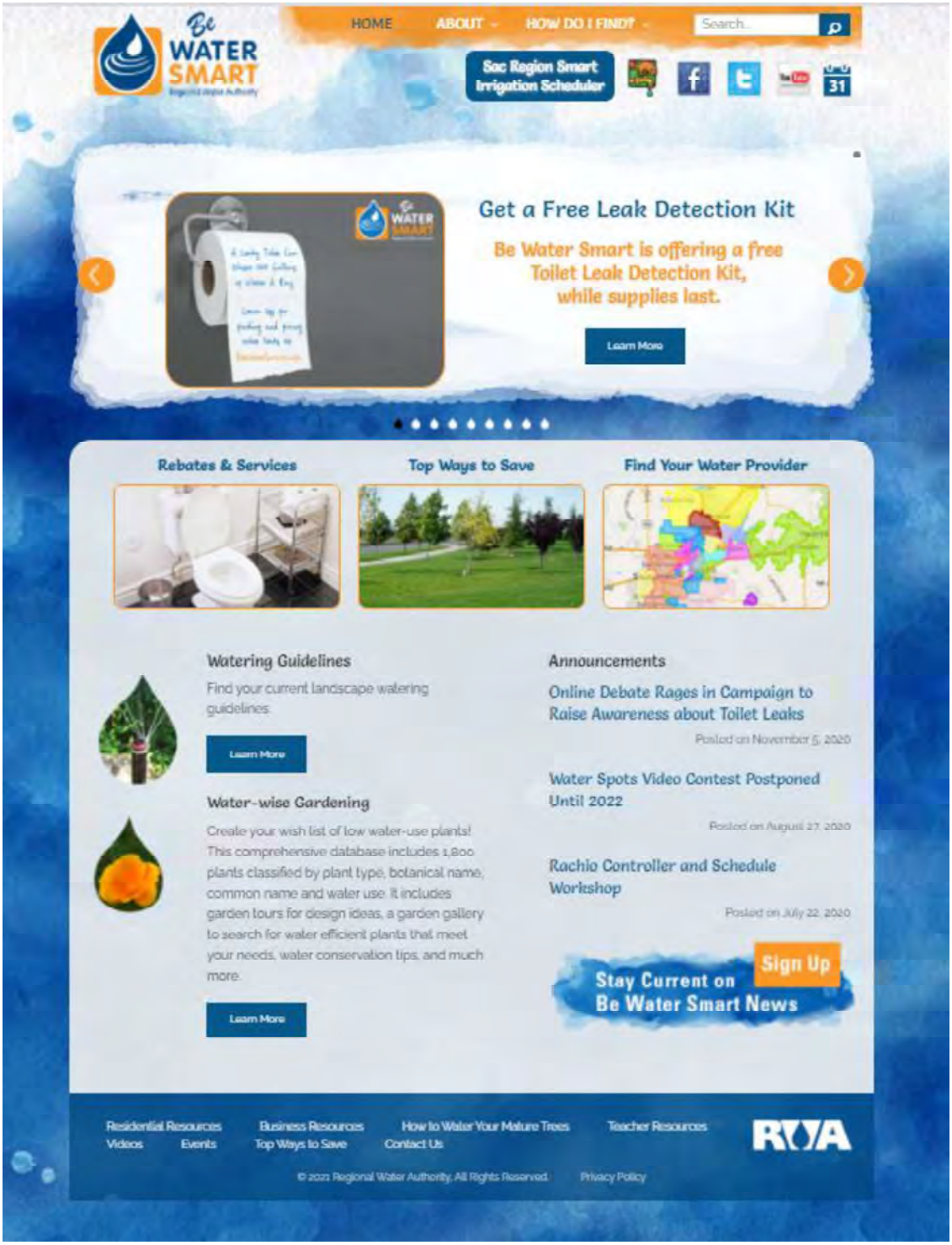
To support public outreach messaging and water savings tips, the Program also coordinated several regional rebate programs, which were partially funded by state and federal grants. A variety of rebate options were provided including toilets, clothes washers, and irrigation efficiencies (full summary in COR Table 9-A). Collectively, these rebates and installations will produce an estimated lifetime (10 years) savings of 6 billion gallons of water and 6.4 million kilowatt hours of energy.

COR Table 9-A Regional Rebates and Installations from 2016 through 2020.

Rebate/Installation Type	2016	2017	2018	2019	2020	Lifetime Water Savings per Type 2016-2020 (MG)	Lifetime Energy Savings per Type 2016-2020 (kWh)**
High Efficiency Clothes Washers Rebates	491	480	453	366	518	111.2	118,094
High Efficiency Toilets Rebates	4,494	3,124	2,255	1,868	904	512.3	544,076
Smart Irrigation Controllers Rebates	245	358	801	556	1,298	667.9	709,299
Irrigation Efficiencies Rebates*	21,271	5,879	5,548	1,724	NA	3,786.4	4,021,178
Turf Replacement Rebates (square feet)	376,613	584,535	236,064	85,375	NA	474.6	503,980
Toilet Direct Installation	1,943	4,542	968	NA	NA	237.4	252,066
Showerhead Direct Installation	1,141	2,512	704	NA	NA	222.6	236,447
Faucet Aerators Direct Installation	1,162	4,314	317	NA	NA	18.5	19,648
Urinal Direct Installation	NA	403	73	NA	NA	10.2	10,878
Total Water Savings per year/Lifetime (MG)	285.9	138.2	104.4	42.9	32.8	6,041.1	
Total Energy Savings per year/Lifetime (kWh)**	303,626	146,717	110,915	45,509	34,799		6,415,665
* Includes: pressure regulator equipment, pipe and pipe fittings, drip or low volume equipment, and sprinkler heads or nozzles.							
**Regional average of 1,062 kilowatt hours per MG							
kWh = kilowatt hours							
MG = million gallons							
NA = no funding available							
Lifetime = 10 years							

In addition to public outreach, the Program also coordinates school education activities. Since 2012, the Program has hosted the Water Spots Video Contest for high school and middle school students. The WEP provides a new contest theme each year and provides the region's teacher and students with relevant facts and images to help develop 30 second video PSAs. Students submit their videos to RWA who hosts a panel of local celebrities including Monica Woods from ABC 10 to decide on a first, second and third place winner. The top 10 scoring videos are then posted online for public voting to select a "people's choice" winner as well. Both teachers and student receive cash prizes and the winning videos are played at Raley Field during River Cats games and in select movie theaters throughout the region. The winning PSAs are incorporated into the WEP's media activities as well. Past themes include *WATER MYTHS BUSTED!, H2o Hero, and Show Off Your Water Smarts.* Between 2016 and

2019, 450 videos were submitted (average of 90 videos a year). The 2020 Water Spots Video Contest was canceled due to the COVID pandemic.



9.1.6 Programs to Assess and Manage Distribution System Real Loss

The City maintains a comprehensive water audit and leak-detection program to assess, identify, and repair potable distribution system losses.

In 2009, the City began using AWWA Water Loss software to develop an annual water loss audit. The City continues to employ this method in compliance with Senate Bill 555, validating the annual audit for accuracy prior to submission to DWR each year by the regulatory deadline of October 1. Results from the audit have helped the City identify where in the distribution process leaks are occurring. This information is coupled with detailed pipeline information stored in the City's asset management and GIS system. Audit information helps identify potentially leak prone areas of the City's distribution system for focused rehabilitation or repair projects. The City has recently implemented a proactive auditory leak detection program by City crew members in addition to the audit analyses to identify leaks. Additionally, an independent desktop analysis of potential areas of loss is planned for the coming year. Once these areas are isolated, responses include corrosion monitoring programs, service cathodic protection, relining and/or replacement. The City's asset management software is then updated with identified leaks, which in turn provides more information useful for prioritization of future rehabilitation programs. In 2020, the City began design of a project to rehabilitate 8 miles of water main in the downtown area to improve the function and longevity of the mains, reducing water loss through older pipes in this area of town.

The City also employs a third-party leak detection service on an annual basis to perform focused auditory surveys for leaks, in addition to in-house training and leak detection processes executed by City operations staff throughout their regular maintenance operations. In combination, these measures and projects employed to identify and reduce system leakage offer the City a comprehensive and proactive approach to the reduction of lost water supply.

9.1.7 Water Conservation Program Coordination Staffing Support

In addition to the employees mentioned in Section 9.1.1, the City employs other individuals as members of the City's internal water conservation program team. Member qualifications include: Certified Landscape Irrigation Auditor (CLIA) certification, Water Distribution Operator D-2 certification, and extensive irrigation system management experience.

In compliance with DWR's UWMP guidelines, the cull contact information for the City's Water Conservation Administrator is listed below:

Bobby Alvarez
Water Conservation Administrator
City of Roseville, Environmental Utilities Department
916-746-1710 (office)
BAlvarez@roseville.ca.us

9.2 Other Demand Management Measures

In addition to the six DMMs described above, the City also implements the following programs:

- Residential Water Wise House Calls

- Residential HET Replacement Program
- Residential Irrigation Rebates
- Residential Cash for Grass Rebates
- Commercial Irrigation Water "Budgets"
- Commercial Irrigation Audit
- Commercial Cash for Grass Rebates
- Commercial Custom Rebate
- Commercial Irrigation Improvements Rebates
- Commercial Food Service Water Efficiency Rebates
- Commercial Landscape Water Use Reviews
- Commercial Interior Water Use Audits
- Commercial Water Waste "Night Patrols"
- Commercial HET Replacement Program

These programs are described in Section 9.2.

9.2.1 Residential Conservation Programs

The City implements several programs to reduce the consumption of water to its residents. The activities of these various programs are described in the following subsections. Implementation of these programs is expected to help the City achieve its water use targets by reducing the amount of water consumed by its residential customers.

9.2.1.1 Water Wise House Calls

The City provides a free home water use inspection service known as the Water Wise House Call Program. Inspections are conducted by trained water conservation technicians and help identify potential water savings for the customer.

Single-family inspections are approximately one hour in length and consist of an indoor and outdoor evaluation. During the interior portion of the inspection, the technician measures flow rates of existing plumbing fixtures (offering high-efficiency alternatives if necessary), checks all fixtures and appliances for leaks, and provides information on the City's currently available rebate programs (further described in Sections 9.1.2, 9.1.3, and 9.1.4).

Following the indoor evaluation, the technician then conducts an outdoor inspection. A typical outdoor inspection tests sprinkler system efficiency, distribution uniformity, pool equipment, as well as an evaluation for leaks via pressure test. Following the sprinkler test, soil moisture probes are utilized to optimize irrigation scheduling through adjustment of the residence's irrigation controller.

Finally, water use information is reviewed, and the customer is provided with suggested corrective actions, information regarding the City's rebate programs, and educational material on how to further water conservation.

In addition to local advertising, Water Wise House Calls are actively marketed to high water use customers by the City's Water Efficiency Division. In 2020, modifications were made to this program to adhere to recommended safety procedures in consideration for the global health crisis caused by COVID-19. Adjusted Water Wise House Calls continue to be conducted in a safe manner for both residents and City employees.

9.2.1.2 Residential High Efficiency Toilet Replacement Program

The City first established a HET rebate program in 2008. Residents can receive up to $100 for replacing an older (pre-1992), non-conserving toilet with a new 1.28 gallon per flush model. Rebates are offered on a first come/first service basis to customers on an annual basis, and the program is advertised regularly on Roseville's Channel 11, bill inserts, conservation articles, newsletters, and the City's website. Customers can also obtain an application by request through the mail or at special events and City office public counters.

The City continued this rebate until 2018 when market saturation caused the water savings realized by this program to diminish significantly. This program is currently under reevaluation to determine whether the current terms and conditions bear revision to reinstate the program. Each year new opportunities are explored, and existing rebate programs evaluated for effectiveness as the City works to offer a suite of available opportunities to residents.

9.2.1.3 Residential Cash for Grass

In 2008, Roseville created a turf replacement program titled "Cash for Grass" that provides incentive for customers to replace their turf with water efficient landscaping. Turf is purchased at $1.00 per square foot up to $1,000 per residential site. To comply, participants must not only remove their turf but also install a low-volume irrigation system to irrigate their new water efficient landscape.

9.2.2 Commercial, Industrial, Institutional Conservation Programs

The City implements several programs to reduce the consumption of water to its commercial, industrial, and institutional customers. The activities of these various programs are described in the following subsections. Implementation of these programs is expected to help the City achieve its water use targets by reducing the amount of water consumed by its non-residential customers.

9.2.2.1 Irrigation Water "Budgets"

The City has developed water "budgets" for the majority of its dedicated irrigation accounts (including those owned by the City). These budgets were created using the City's geographical information system (GIS) to determine irrigated landscape area and then field verified for accuracy. The budget reports, produced monthly, show the site's actual water use compared to the estimated water use based on site demographics. If a site's water usage is significantly greater than expected, City staff may request the site's owner complete a site water audit.

9.2.2.2 Irrigation Audit

Similar to Water Wise House Calls, the City provides a free landscape audit service for irrigation customers upon request. Staff evaluates the irrigation system and makes recommendations for improvement. Rebates are available to further incentivize the customer to make improvements to their irrigation systems.

The City will continue to implement this program and will consider expansion based on the past years' participation.

9.2.2.3 Commercial Cash for Grass

Similar to the Residential Cash for Grass Program, the City offers rebates to commercial customers for replacing turf with water efficient landscaping. Commercial customers can receive $2.00 per square foot.

9.2.2.4 Commercial Irrigation Improvement Rebates

The City offers a suite of rebate opportunities for commercial irrigation customers including for conversion to drip irrigation, high efficiency nozzles, self-adjusting controllers, pressure regulators, as well as installation of irrigation submeters for a total potential rebate value of $15,000 for those who meet the established criteria for their projects. Applications for these rebates are easily accessed through the City's website with clear outlines of qualifying equipment and labor for ease of submission.

9.2.2.5 Commercial Food Service Water Efficiency Rebates

The City also offers a series of rebates available to commercial customers in the food service industry, with a "One-Stop Program" through which they can apply for applicable benefits on the purchase and replacement of cooking appliances (steamers and combination ovens), sanitation equipment (dishwashers), as well as refrigeration equipment (ice machines) with improved efficiency.

9.2.2.6 Customized Rebate Program

In addition to the above rebates, the Customized Rebate Program helps commercial, industrial, and institutional customers save money with financial incentives on capital expenditures for retrofit of existing equipment with more water-efficient technologies. This program applies to hardware upgrades including equipment and technology for space cooling, refrigeration, laundry, cleaning, and flushing. The customized rebate amount is derived by measuring current usage of the process compared to the water usage of the new retrofitted process. Water savings are estimated using the number of days operated per year and the expected life of the equipment (capped at 10 years). Total amount of saved water is rebated at $0.50 per 100 cubic feet. Rebates will be paid on a first-come, first served basis until program funds are depleted.

9.2.2.7 Commercial Interior Water Use Audit

The Commercial Interior Water Use Audit assists commercial properties in lowering water, wastewater, and energy costs. A facility review identifies equipment inefficiencies and provides a detailed report of all inefficiencies and corresponding recommendations.

9.2.2.8 Night Patrols

The City has implemented a Night Patrol program during peak water usage months that helps to identify commercial water waste after normal business hours. Patrols are typically conducted several nights per week.

9.2.2.9 Commercial High Efficiency Toilet Replacement Program

Similar to the Residential High Efficiency Toilet Replacement Program, commercial customers can receive up to $175 for replacing an older (pre-1992), non-conserving toilet with a new 1.28 gallon per flush model.

9.3 Planned Implementation to Achieve Water Use Targets

In most instances, helping customers understand the savings that can be achieved and methods available to achieve these savings is enough to motivate change. Through the above DMMs, the City can help customers

identify these savings, which in turn helps the City to achieve its water use targets. Additionally, the City will continue to work with the Parks Department, area school districts, landscape contractors, and property managers to improve water use efficiency.

9.4 Members of the California Urban Water Conservation Council

In 1991 (amended September 16, 1999), an MOU regarding urban water conservation in California was made that formalizes an agreement between DWR, water utilities, environmental organizations, and other interested groups to implement Best Management Practices (BMPs) and make a cooperative effort to reduce the consumption of California's water resources. This MOU is administered by the California Water Efficiency Partnership (CalWEP).

In 1991, Roseville became a voluntary signatory of CalWEP's MOU (formerly the California Urban Water Conservation Council or CUWCC). Since becoming a signatory to the MOU, the City has implemented and promoted its water use efficiency programs to help customers reduce water demand. The City reports to CalWEP on its coverage of the recommended BMPs on a calendar year basis.

The Urban Water Management Planning Act (Water Code Section 10631 (j)) allows for an urban retail water agency that is a signatory member of CalWEP to meet the DMM requirements by documenting that CalWEP has determined the urban water agency is complying (coverage) with all of the provisions of the MOU. Documentation of the City's compliance is provided in Appendix N.

Chapter 10 Plan Adoption and Submittal

This chapter provides information regarding the notification, public hearing, and adoption of the plan.

10.1 Inclusion of all 2020 Data

Because 2020 is the final compliance year for SB X7-7, the 2020 UWMPs must contain data through the end of 2020. If a water supplier bases its accounting on a fiscal year (July through June) the data must be through the end of the 2020 fiscal year (June 2020). If the water supplier bases its accounting on a calendar year, the data must be through the end of the 2020 calendar year (December 2020).

As indicated in Chapter 1, the City uses a calendar year for the water supply and demand accounting, and therefore this 2020 UWMP includes data through December 2020.

10.2 Notice of Public Hearing

The City provided 60-day notice of the preparation of its 2020 UWMP, and the notice of the 2020 UWMP Public Hearing to the cities and counties listed in DWR Table 10-1.

DWR Table 10-1

Submittal Table 10-1 Retail: Notification to Cities and Counties		
City Name	60 Day Notice	Notice of Public Hearing
City of Roseville	☑	☑
County Name	60 Day Notice	Notice of Public Hearing
Placer County	☑	☑

Other agencies notified included the following:

- California American Water
- Citrus Heights Water District
- Placer County Water Agency
- Regional Water Authority
- San Juan Water District
- Sacramento Municipal Utilities District
- Sacramento Suburban Water District
- US Bureau of Reclamation

Public hearing notifications for adopting the Plan were published in the local newspaper (Roseville Press Tribune) and on the City's website. Copies of the published Notice of Public Hearing will be included in Appendix B.

10.3 Public Hearing and Adoption

The City has encouraged community and public interest involvement in the Plan update through the use of public meetings and web-based communication. Copies of the City's outreach efforts are included in Appendix B.

The public hearing will provide an opportunity for all City water users and the general public to become familiar with the Urban Water Management Plan as well as the Water Shortage Contingency Plan and ask questions about its contents. In addition, the hearing presents an opportunity for the public to learn about or comment on the City's continuing plans for providing a reliable, safe, high-quality water supply. Copies of the draft Urban Water Management Plan, including the Water Shortage Contingency Plan, are available for public inspection on the City's website. The public hearing will be held on June 16, 2021.

Copies of the adoption resolutions will be provided in Appendix O, in the final UWMP and WSCP.

10.4 Plan Submittal

A copy of the 2020 UWMP will be submitted to DWR within 30 days of adoption and by July 1, 2021. The adopted UWMP will be submitted electronically to DWR using the WUEdata submittal tool. A CD or hardcopy of the adopted 2020 UWMP will also be submitted to the California State Library.

No later than 30 days after adoption, a copy of the adopted 2020 UWMP, including the Water Shortage Contingency Plan, will be provided to the cities and counties to which the City provides water.

10.5 Public Availability

No later than 30 days after submittal to DWR, copies of this 2020 UWMP will be available for public review at the City's public offices. An electronic copy of this Plan will also be available for review and download on the City's website: www.roseville.ca.us/UWMP.

10.6 Public Implementation

This Plan will be the source document for any Senate Bill 610 Water Supply Assessment or Senate Bill 221 Water Supply Verifications required for any proposed projects between 2021 and 2025 that are subject to the California Environmental Quality Act (CEQA) and would demand an amount of water equivalent or greater than the amount of water by a 500-dwelling unit project. This Plan will also be the source document for water demand projections and water supply availability. Lastly, this Plan will provide guidance and direction on development of new local supplies and implementation of water conservation programs and recycled water expansion to meet the requirements of the Water Conservation Act.

10.7 Amending an Adopted UWMP

If the City amends its 2020 UWMP or the Water Shortage Contingency Plan contained therein, copies of amendments or changes to the plans will be submitted to DWR, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

10.8 California Water Code Requirements

Demonstration of compliance with all applicable requirements of the California Water Code pertaining to Urban Water Management Plan and Water Shortage Contingency Plan is provided in Appendix P. Appendix P was developed based on the UWMP Checklist provided in the Guidebook and is organized by subject.

Appendix A – Notifications to Wholesale Suppliers

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

May 25, 2021

Mr. Jeremy Shepard, Director of Technical Services
Placer County Water Agency
PO Box 6570
Auburn, CA 95604-6570

RE: City of Roseville 2020 Urban Water Management Plan Demand Projections

Dear Mr. Shepard:

We sent notice earlier this year to inform you that the City of Roseville (City) Water Utility had begun preparation of the 2020 Urban Water Management Plan. In accordance with California Water Code Section 10631, as the City is a retail water supplier receiving water from your agency, we have provided you with projected water use through 2045 in the below table.

Supply Source	2025	2030	2035	2040	2045
Placer County Water Agency Existing Contracts	30,000 AF	30,000 AF	30,000 AF	33,360 AF	33,360 AF
Placer County Water Agency Future Ophir WTP	–	–	Up to 3.6 MGD	Up to 3.6 MGD	Up to 3.6 MGD

A complete draft of the 2020 Urban Water Management Plan, which is inclusive of the newly required Water Shortage Contingency Plan, can be accessed at www.roseville.ca.us/UWMP. A public hearing of the Water Shortage Contingency Plan and Urban Water Management Plan will be held on June 16th at 6 pm. We encourage you to attend the public hearing which will be held through video conferencing. For information regarding broadcasting of the meeting and providing public comment please visit the City's website at https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=16870417.

Should you wish to contact the City regarding either of the plans, you may do so by writing or emailing to the undersigned below. Thank you.

Sincerely,



Trevor Joseph, P.G., C.Hg.
Hydrogeologist
City of Roseville
Environmental Utilities Department
TJoseph@roseville.ca.us

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

May 25, 2021

Mr. Paul Helliker, General Manager
San Juan Water District
9935 Auburn-Folsom Road
Granite Bay, CA 95764

RE: City of Roseville 2020 Urban Water Management Plan Demand Projections

Dear Mr. Helliker:

We sent notice earlier this year to inform you that the City of Roseville (City) Water Utility had begun preparation of the 2020 Urban Water Management Plan. In accordance with California Water Code Section 10631, as the City is a retail water supplier receiving water from your agency, we have provided you with projected water use through 2045 in the below table.

Supply Source	2025	2030	2035	2040	2045
San Juan Water District	4,000 AF	4,000 AF	4,000 AF	4,000 AF	4,000 AF

A complete draft of the 2020 Urban Water Management Plan, which is inclusive of the newly required Water Shortage Contingency Plan, can be accessed at www.roseville.ca.us/UWMP. A public hearing of the Water Shortage Contingency Plan and Urban Water Management Plan will be held on June 16th at 6 pm. We encourage you to attend the public hearing which will be held through video conferencing. For information regarding broadcasting of the meeting and providing public comment please visit the City's website at https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=16870417.

Should you wish to contact the City regarding either of the plans, you may do so by writing or emailing to the undersigned below. Thank you.

Sincerely,



Trevor Joseph, P.G., C.Hg.
Hydrogeologist
City of Roseville
Environmental Utilities Department
TJoseph@roseville.ca.us

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

May 25, 2021

Mr. Drew Lessard, Area Manager
Central California Area Office
7794 Folsom Dam Road
Folsom, CA 95630

RE: City of Roseville 2020 Urban Water Management Plan Demand Projections

Dear Mr. Lessard:

We sent notice earlier this year to inform you that the City of Roseville (City) Water Utility had begun preparation of the 2020 Urban Water Management Plan. In accordance with California Water Code Section 10631, as the City is a retail water supplier receiving water from your agency, we have provided you with projected water use through 2045 in the below table. The City plans to make full beneficial use of each year's allotments.

Supply Source	2025	2030	2035	2040	2045
US Bureau of Reclamation	32,000 AF	32,000 AF	32,000 AF	32,000 AF	32,000 AF

A complete draft of the 2020 Urban Water Management Plan, which is inclusive of the newly required Water Shortage Contingency Plan, can be accessed at www.roseville.ca.us/UWMP. A public hearing of the Water Shortage Contingency Plan and Urban Water Management Plan will be held on June 16th at 6 pm. We encourage you to attend the public hearing which will be held through video conferencing. For information regarding broadcasting of the meeting and providing public comment please visit the City's website at https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=16870417.

Should you wish to contact the City regarding either of the plans, you may do so by writing or emailing to the undersigned below. Thank you.

Sincerely,



Trevor Joseph, P.G., C.Hg.
Hydrogeologist
City of Roseville
Environmental Utilities Department
tjoseph@roseville.ca.us

From:	Joseph, Trevor
To:	Jeremy Shepard; Darin Reintjes
Cc:	York, Linda; Bigley, Sean
Subject:	City of Roseville 2020 Urban Water Management Plan Demand Projections
Date:	Tuesday, May 25, 2021 12:09:00 PM
Attachments:	PCWA_Technical Services Director ldy.pdf image001.png

Hi Jeremy and Darin –

Please see the attached letter as part of the Urban Water Management Plan requirements informing PCWA of our projected water use.

Regards,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
Environmental Utilities
c: (916) 517-2578

Corporation Yard | 2005 Hilltop Circle | Roseville, CA | 95747



From:	Joseph, Trevor
To:	Helliker, Paul (San Juan Water District); Zlotnick, Greg (San Juan Water Distict)
Cc:	Bigley, Sean; York, Linda
Subject:	City of Roseville 2020 Urban Water Management Plan Demand Projections
Date:	Tuesday, May 25, 2021 12:10:41 PM
Attachments:	SJWD_General Manager ldy.pdf image001.png

Hi Paul and Greg –

Please see the attached letter as part of the Urban Water Management Plan requirements informing SJWD of our projected water use.

Regards,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
Environmental Utilities
c: (916) 517-2578

Corporation Yard | 2005 Hilltop Circle | Roseville, CA | 95747

From:	Joseph, Trevor
To:	DLessard@usbr.gov
Cc:	Bigley, Sean; York, Linda
Subject:	City of Roseville 2020 Urban Water Management Plan Demand Projections
Date:	Tuesday, May 25, 2021 12:07:37 PM
Attachments:	image001.png USBR_Area Manager ldy.pdf

Hi Drew –

Please see the attached letter as part of the Urban Water Management Plan requirements informing the USBR of our projected water use.

Regards,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
Environmental Utilities
c: (916) 517-2578

Corporation Yard | 2005 Hilltop Circle | Roseville, CA | 95747

Appendix B – Public and Agency Outreach

CITY OF ROSEVILLE CALIFORNIA

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

February 12, 2021

S. Audie Foster, General Manager
California American Water
4701 Beloit Drive
Sacramento, CA 95838

RE: City of Roseville 2020 Urban Water Management Plan

Dear S. Audie Foster:

The City of Roseville (City) water utility has begun preparing the 2020 Urban Water Management Plan, which must be completed by July 1, 2021. In accordance with California Water Code Section 10642, we are writing to notify you that preparation is underway and to encourage your active input and involvement in the process.

Prior to Board adoption of the plan a public hearing will be held, and we will notify you of the date, time, and location of the meeting. We will also make a draft of the 2020 Urban Water Management Plan available to your agency in advance of the public hearing.

If you wish to contact the City about its review process, you may do so by writing to the undersigned or by email to jtmarks@roseville.ca.us. Thank you.

Sincerely,

Jason Marks

Jason Marks, P.E.
Senior Engineer
City of Roseville
Environmental Utilities Department

CITY OF ROSEVILLE CALIFORNIA

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

February 12, 2021

Mr. Hilary Straus, General Manager
Citrus Heights Water District
6230 Sylvan Road
Citrus Heights, CA 95610

RE: City of Roseville 2020 Urban Water Management Plan

Dear Mr. Straus:

The City of Roseville (City) water utility has begun preparing the 2020 Urban Water Management Plan, which must be completed by July 1, 2021. In accordance with California Water Code Section 10642, we are writing to notify you that preparation is underway and to encourage your active input and involvement in the process.

Prior to Board adoption of the plan a public hearing will be held, and we will notify you of the date, time, and location of the meeting. We will also make a draft of the 2020 Urban Water Management Plan available to your agency in advance of the public hearing.

If you wish to contact the City about its review process, you may do so by writing to the undersigned or by email to jtmarks@roseville.ca.us. Thank you.

Sincerely,

Jason Marks

Jason Marks, P.E.
Senior Engineer
City of Roseville
Environmental Utilities Department

CITY OF ROSEVILLE CALIFORNIA

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

February 12, 2021

Mr. Dominick Casey, City Manager
City of Roseville
311 Vernon Street
Roseville, CA 95678

RE: City of Roseville 2020 Urban Water Management Plan

Dear Mr. Casey:

The City of Roseville (City) water utility has begun preparing the 2020 Urban Water Management Plan, which must be completed by July 1, 2021. In accordance with California Water Code Section 10642, we are writing to notify you that preparation is underway and to encourage your active input and involvement in the process.

Prior to Board adoption of the plan a public hearing will be held, and we will notify you of the date, time, and location of the meeting. We will also make a draft of the 2020 Urban Water Management Plan available to your agency in advance of the public hearing.

If you wish to contact the City about its review process, you may do so by writing to the undersigned or by email to jtmarks@roseville.ca.us. Thank you.

Sincerely,

Jason Marks

Jason Marks, P.E.
Senior Engineer
City of Roseville
Environmental Utilities Department

CITY OF ROSEVILLE CALIFORNIA

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

February 12, 2021

Mr. Jeremy Shepard, Director of Technical Services
Placer County Water Agency
PO Box 6570
Auburn, CA 95604-6570

RE: City of Roseville 2020 Urban Water Management Plan (UWMP)

Dear Mr. Shepard:

We have received your letter dated November 19, 2020 and at this time have no known objection to the proposed summary for the 2020 UWMP. The City of Roseville (City) water utility has begun preparing the 2020 Urban Water Management Plan. In accordance with California Water Code Section 10642, we are writing to notify you that preparation is underway and to encourage your active input and involvement in the process.

Prior to Board adoption of the plan a public hearing will be held, and we will notify you of the date, time, and location of the meeting. We will also make a draft of the 2020 Urban Water Management Plan available to your agency in advance of the public hearing.

If you wish to contact the City about its review process, you may do so by writing to the undersigned or by email to jtmarks@roseville.ca.us. Thank you.

Sincerely,

Jason Marks

Jason Marks, P.E.
Senior Engineer
City of Roseville
Environmental Utilities Department

CITY OF ROSEVILLE CALIFORNIA

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

February 12, 2021

Peter Kraatz, Assistant Director
Placer County Public Works Department
3901 County Center Drive, Suite 220
Auburn, CA 95603

RE: City of Roseville 2020 Urban Water Management Plan

Dear Mr. Kraatz:

The City of Roseville (City) water utility has begun preparing the 2020 Urban Water Management Plan, which must be completed by July 1, 2021. In accordance with California Water Code Section 10642, we are writing to notify you that preparation is underway and to encourage your active input and involvement in the process.

Prior to Board adoption of the plan a public hearing will be held, and we will notify you of the date, time, and location of the meeting. We will also make a draft of the 2020 Urban Water Management Plan available to your agency in advance of the public hearing.

If you wish to contact the City about its review process, you may do so by writing to the undersigned or by email to jtmarks@roseville.ca.us. Thank you.

Sincerely,

Jason Marks

Jason Marks, P.E.
Senior Engineer
City of Roseville
Environmental Utilities Department

CITY OF ROSEVILLE CALIFORNIA

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

February 12, 2021

Lehigh Chavez, Environmental Coordinator
Placer County Community Development Resource Agency
3901 County Center Drive
Auburn, CA 95603

RE: City of Roseville 2020 Urban Water Management Plan

Dear Lehigh Chavez:

The City of Roseville (City) water utility has begun preparing the 2020 Urban Water Management Plan, which must be completed by July 1, 2021. In accordance with California Water Code Section 10642, we are writing to notify you that preparation is underway and to encourage your active input and involvement in the process.

Prior to Board adoption of the plan a public hearing will be held, and we will notify you of the date, time, and location of the meeting. We will also make a draft of the 2020 Urban Water Management Plan available to your agency in advance of the public hearing.

If you wish to contact the City about its review process, you may do so by writing to the undersigned or by email to jtmarks@roseville.ca.us. Thank you.

Sincerely,

Jason Marks

Jason Marks, P.E.
Senior Engineer
City of Roseville
Environmental Utilities Department

CITY OF ROSEVILLE CALIFORNIA

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

February 12, 2021

Regional Water Authority
5620 Birdcage Street, Suite 180
Citrus Heights, CA 95610

RE: City of Roseville 2020 Urban Water Management Plan

Dear RWA Members:

The City of Roseville (City) water utility has begun preparing the 2020 Urban Water Management Plan, which must be completed by July 1, 2021. In accordance with California Water Code Section 10642, we are writing to notify you that preparation is underway and to encourage your active input and involvement in the process.

Prior to Board adoption of the plan a public hearing will be held, and we will notify you of the date, time, and location of the meeting. We will also make a draft of the 2020 Urban Water Management Plan available to your agency in advance of the public hearing.

If you wish to contact the City about its review process, you may do so by writing to the undersigned or by email to jtmarks@roseville.ca.us. Thank you.

Sincerely,

Jason Marks

Jason Marks, P.E.
Senior Engineer
City of Roseville
Environmental Utilities Department

CITY OF ROSEVILLE CALIFORNIA

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

February 12, 2021

Mr. Paul Helliker, General Manager
San Juan Water District
9935 Auburn-Folsom Road
Granite Bay, CA 95764

RE: City of Roseville 2020 Urban Water Management Plan

Dear Mr. Helliker:

The City of Roseville (City) water utility has begun preparing the 2020 Urban Water Management Plan, which must be completed by July 1, 2021. In accordance with California Water Code Section 10642, we are writing to notify you that preparation is underway and to encourage your active input and involvement in the process. Additionally, in accordance with California Water Code Section 10631, as we are a retail water supplier receiving water from your agency, we will provide you with projected water use for the next 20 years (up to the year 2040).

Prior to Board adoption of the plan a public hearing will be held, and we will notify you of the date, time, and location of the meeting. We will also make a draft of the 2020 Urban Water Management Plan available to your agency in advance of the public hearing.

If you wish to contact the City about its review process, you may do so by writing to the undersigned or by email to jtmarks@roseville.ca.us. Thank you.

Sincerely,

Jason Marks

Jason Marks, P.E.
Senior Engineer
City of Roseville
Environmental Utilities Department

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

February 12, 2021

Ansel Lundberg, Water and Power Contract Specialist
Sacramento Municipal Utility District
6201 S Street
Sacramento, CA 95817

RE: City of Roseville 2020 Urban Water Management Plan

Dear Ansel Lundberg:

The City of Roseville (City) water utility has begun preparing the 2020 Urban Water Management Plan, which must be completed by July 1, 2021. In accordance with California Water Code Section 10642, we are writing to notify you that preparation is underway and to encourage your active input and involvement in the process.

Prior to Board adoption of the plan a public hearing will be held, and we will notify you of the date, time, and location of the meeting. We will also make a draft of the 2020 Urban Water Management Plan available to your agency in advance of the public hearing.

If you wish to contact the City about its review process, you may do so by writing to the undersigned or by email to jtmarks@roseville.ca.us. Thank you.

Sincerely,

Jason Marks

Jason Marks, P.E.
Senior Engineer
City of Roseville
Environmental Utilities Department

CITY OF ROSEVILLE CALIFORNIA

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

February 12, 2021

Mr. Daniel York, General Manager
Sacramento Suburban Water District
3701 Marconi Avenue, Suite 100
Sacramento, CA 95821

RE: City of Roseville 2020 Urban Water Management Plan

Dear Mr. York:

The City of Roseville (City) water utility has begun preparing the 2020 Urban Water Management Plan, which must be completed by July 1, 2021. In accordance with California Water Code Section 10642, we are writing to notify you that preparation is underway and to encourage your active input and involvement in the process.

Prior to Board adoption of the plan a public hearing will be held, and we will notify you of the date, time, and location of the meeting. We will also make a draft of the 2020 Urban Water Management Plan available to your agency in advance of the public hearing.

If you wish to contact the City about its review process, you may do so by writing to the undersigned or by email to jtmarks@roseville.ca.us. Thank you.

Sincerely,

Jason Marks

Jason Marks, P.E.
Senior Engineer
City of Roseville
Environmental Utilities Department

CITY OF ROSEVILLE CALIFORNIA

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

February 12, 2021

Mr. Drew Lessard, Area Manager
Central California Area Office
7794 Folsom Dam Road
Folsom, CA 95630

RE: City of Roseville 2020 Urban Water Management Plan

Dear Mr. Lessard:

The City of Roseville (City) water utility has begun preparing the 2020 Urban Water Management Plan, which must be completed by July 1, 2021. In accordance with California Water Code Section 10642, we are writing to notify you that preparation is underway and to encourage your active input and involvement in the process. Additionally, in accordance with California Water Code Section 10631, as we are a retail water supplier receiving water from your agency, we will provide you with projected water use for the next 20 years (up to the year 2040).

Prior to Board adoption of the plan a public hearing will be held, and we will notify you of the date, time, and location of the meeting. We will also make a draft of the 2020 Urban Water Management Plan available to your agency in advance of the public hearing.

If you wish to contact the City about its review process, you may do so by writing to the undersigned or by email to jtmarks@roseville.ca.us. Thank you.

Sincerely,

Jason Marks

Jason Marks, P.E.
Senior Engineer
City of Roseville
Environmental Utilities Department

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

May 25, 2021

Mr. Dominick Casey, City Manager
City of Roseville
311 Vernon Street
Roseville, CA 95678

RE: City of Roseville 2020 Urban Water Management Plan Public Hearing

Dear Mr. Casey:

We sent notice earlier this year to inform you that the City of Roseville Water Utility (Water Utility) had begun preparation of the 2020 Urban Water Management Plan (UWMP). A draft of the UWMP, which is inclusive of the newly required Water Shortage Contingency Plan (WSCP), has been completed and can be accessed at www.roseville.ca.us/UWMP.

Prior to Board adoption, a public hearing of the UWMP and WSCP will be held on June 16th at 6pm. We encourage you to attend the public hearing which will be held through video conferencing. For information regarding broadcasting of the meeting and providing public comment please visit the City's website at https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=16870417.

If you wish to contact the Water Utility regarding either of the plans, you may do so by writing to the undersigned or by email to TJoseph@roseville.ca.us. Thank you.

Sincerely,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
City of Roseville
Environmental Utilities Department

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

May 25, 2021

S. Audie Foster, General Manager
California American Water
4701 Beloit Drive
Sacramento, CA 95838

RE: City of Roseville 2020 Urban Water Management Plan Public Hearing

Dear S. Audie Foster:

We sent notice earlier this year to inform you that the City of Roseville Water Utility (Water Utility) had begun preparation of the 2020 Urban Water Management Plan (UWMP). A draft of the UWMP, which is inclusive of the newly required Water Shortage Contingency Plan (WSCP), has been completed and can be accessed at www.roseville.ca.us/UWMP.

Prior to Board adoption, a public hearing of the UWMP and WSCP will be held on June 16th at 6pm. We encourage you to attend the public hearing which will be held through video conferencing. For information regarding broadcasting of the meeting and providing public comment please visit the City's website at https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=16870417.

If you wish to contact the Water Utility regarding either of the plans, you may do so by writing to the undersigned or by email to TJoseph@roseville.ca.us. Thank you.

Sincerely,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
City of Roseville
Environmental Utilities Department

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

May 25, 2021

Mr. Hilary Straus, General Manager
Citrus Heights Water District
6230 Sylvan Road
Citrus Heights, CA 95610

RE: City of Roseville 2020 Urban Water Management Plan Public Hearing

Dear Mr. Straus:

We sent notice earlier this year to inform you that the City of Roseville Water Utility (Water Utility) had begun preparation of the 2020 Urban Water Management Plan (UWMP). A draft of the UWMP, which is inclusive of the newly required Water Shortage Contingency Plan (WSCP), has been completed and can be accessed at www.roseville.ca.us/UWMP.

Prior to Board adoption, a public hearing of the UWMP and WSCP will be held on June 16th at 6pm. We encourage you to attend the public hearing which will be held through video conferencing. For information regarding broadcasting of the meeting and providing public comment please visit the City's website at https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=16870417.

If you wish to contact the Water Utility regarding either of the plans, you may do so by writing to the undersigned or by email to TJoseph@roseville.ca.us. Thank you.

Sincerely,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
City of Roseville
Environmental Utilities Department

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

May 25, 2021

Peter Kraatz, Assistant Director
Placer County Public Works Department
3901 County Center Drive, Suite 220
Auburn, CA 95603

RE: City of Roseville 2020 Urban Water Management Plan Public Hearing

Dear Mr. Kraatz:

We sent notice earlier this year to inform you that the City of Roseville Water Utility (Water Utility) had begun preparation of the 2020 Urban Water Management Plan (UWMP). A draft of the UWMP, which is inclusive of the newly required Water Shortage Contingency Plan (WSCP), has been completed and can be accessed at www.roseville.ca.us/UWMP.

Prior to Board adoption, a public hearing of the UWMP and WSCP will be held on June 16th at 6pm. We encourage you to attend the public hearing which will be held through video conferencing. For information regarding broadcasting of the meeting and providing public comment please visit the City's website at https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=16870417.

If you wish to contact the Water Utility regarding either of the plans, you may do so by writing to the undersigned or by email to TJoseph@roseville.ca.us. Thank you.

Sincerely,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
City of Roseville
Environmental Utilities Department

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

May 25, 2021

Lehigh Chavez, Environmental Coordinator
Placer County Community Development Resource Agency
3901 County Center Drive
Auburn, CA 95603

RE: City of Roseville 2020 Urban Water Management Plan Public Hearing

Dear Lehigh Chavez:

We sent notice earlier this year to inform you that the City of Roseville Water Utility (Water Utility) had begun preparation of the 2020 Urban Water Management Plan (UWMP). A draft of the UWMP, which is inclusive of the newly required Water Shortage Contingency Plan (WSCP), has been completed and can be accessed at www.roseville.ca.us/UWMP.

Prior to Board adoption, a public hearing of the UWMP and WSCP will be held on June 16th at 6pm. We encourage you to attend the public hearing which will be held through video conferencing. For information regarding broadcasting of the meeting and providing public comment please visit the City's website at https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=16870417.

If you wish to contact the Water Utility regarding either of the plans, you may do so by writing to the undersigned or by email to TJoseph@roseville.ca.us. Thank you.

Sincerely,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
City of Roseville
Environmental Utilities Department

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

May 25, 2021

Regional Water Authority
5620 Birdcage Street, Suite 180
Citrus Heights, CA 95610

RE: City of Roseville 2020 Urban Water Management Plan Public Hearing

Dear RWA Members:

We sent notice earlier this year to inform you that the City of Roseville Water Utility (Water Utility) had begun preparation of the 2020 Urban Water Management Plan (UWMP). A draft of the UWMP, which is inclusive of the newly required Water Shortage Contingency Plan (WSCP), has been completed and can be accessed at www.roseville.ca.us/UWMP.

Prior to Board adoption, a public hearing of the UWMP and WSCP will be held on June 16th at 6pm. We encourage you to attend the public hearing which will be held through video conferencing. For information regarding broadcasting of the meeting and providing public comment please visit the City's website at https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=16870417.

If you wish to contact the Water Utility regarding either of the plans, you may do so by writing to the undersigned or by email to TJoseph@roseville.ca.us. Thank you.

Sincerely,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
City of Roseville
Environmental Utilities Department

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

May 25, 2021

Ansel Lundberg, Water and Power Contract Specialist
Sacramento Municipal Utility District
6201 S Street
Sacramento, CA 95817

RE: City of Roseville 2020 Urban Water Management Plan Public Hearing

Dear Ansel Lundberg:

We sent notice earlier this year to inform you that the City of Roseville Water Utility (Water Utility) had begun preparation of the 2020 Urban Water Management Plan (UWMP). A draft of the UWMP, which is inclusive of the newly required Water Shortage Contingency Plan (WSCP), has been completed and can be accessed at www.roseville.ca.us/UWMP.

Prior to Board adoption, a public hearing of the UWMP and WSCP will be held on June 16th at 6pm. We encourage you to attend the public hearing which will be held through video conferencing. For information regarding broadcasting of the meeting and providing public comment please visit the City's website at https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=16870417.

If you wish to contact the Water Utility regarding either of the plans, you may do so by writing to the undersigned or by email to TJoseph@roseville.ca.us. Thank you.

Sincerely,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
City of Roseville
Environmental Utilities Department

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

May 25, 2021

Mr. Daniel York, General Manager
Sacramento Suburban Water District
3701 Marconi Avenue, Suite 100
Sacramento, CA 95821

RE: City of Roseville 2020 Urban Water Management Plan Public Hearing

Dear Mr. York:

We sent notice earlier this year to inform you that the City of Roseville Water Utility (Water Utility) had begun preparation of the 2020 Urban Water Management Plan (UWMP). A draft of the UWMP, which is inclusive of the newly required Water Shortage Contingency Plan (WSCP), has been completed and can be accessed at www.roseville.ca.us/UWMP.

Prior to Board adoption, a public hearing of the UWMP and WSCP will be held on June 16th at 6pm. We encourage you to attend the public hearing which will be held through video conferencing. For information regarding broadcasting of the meeting and providing public comment please visit the City's website at https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=16870417.

If you wish to contact the Water Utility regarding either of the plans, you may do so by writing to the undersigned or by email to TJoseph@roseville.ca.us. Thank you.

Sincerely,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
City of Roseville
Environmental Utilities Department

From:	Joseph, Trevor
To:	Foster, Stephen (American Water)
Cc:	Bigley, Sean; York, Linda
Subject:	City of Roseville 2020 Urban Water Management Plan Public Hearing
Date:	Tuesday, May 25, 2021 12:35:03 PM
Attachments:	Cal Am General Manager ldy.pdf image001.png

Hello Stephen

Please see the attached letter as part of the Urban Water Management Plan requirements informing Cal Am of a pending public hearing. They City's UWMP will be made available on our website shortly.

Regards,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
Environmental Utilities
c: (916) 517-2578

Corporation Yard | 2005 Hilltop Circle | Roseville, CA | 95747

From:	Joseph, Trevor
To:	York, Linda
Subject:	FW: City of Roseville 2020 Urban Water Management Plan Public Hearing
Date:	Tuesday, May 25, 2021 12:41:00 PM
Attachments:	CHWD_General Manager ldy.pdf image001.png

From: Joseph, Trevor
Sent: Tuesday, May 25, 2021 12:37 PM
To: Hilary Straus <hstraus@chwd.org>
Subject: City of Roseville 2020 Urban Water Management Plan Public Hearing

Hello Hilary

Please see the attached letter as part of the Urban Water Management Plan requirements informing CHWD of a pending public hearing. They City's UWMP will be made available on our website shortly.

Regards,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
Environmental Utilities
c: (916) 517-2578

Corporation Yard | 2005 Hilltop Circle | Roseville, CA | 95747



From:	Joseph, Trevor
To:	pkraatz@placer.ca.gov
Cc:	Bigley, Sean; York, Linda; Hanson, Christina (Placer County)
Subject:	City of Roseville 2020 Urban Water Management Plan Public Hearing
Date:	Tuesday, May 25, 2021 12:40:09 PM
Attachments:	Placer County Public Works_Assistant Director ldy.pdf image001.png

Hello Peter

Please see the attached letter as part of the Urban Water Management Plan requirements informing Placer County Public Works of a pending public hearing. They City's UWMP will be made available on our website shortly.

Regards,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
Environmental Utilities
c: (916) 517-2578

Corporation Yard | 2005 Hilltop Circle | Roseville, CA | 95747

From:	Joseph, Trevor
To:	cdraecs@placer.ca.gov
Cc:	Bigley, Sean; York, Linda; Hanson, Christina (Placer County)
Subject:	City of Roseville 2020 Urban Water Management Plan Public Hearing
Date:	Tuesday, May 25, 2021 12:43:10 PM
Attachments:	Placer County, Environmental Coordinator ldy.pdf image001.png

Hello Leigh

Please see the attached letter as part of the Urban Water Management Plan requirements informing Placer County Environmental Coordinator of a pending public hearing. They City's UWMP will be made available on our website shortly.

Regards,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
Environmental Utilities
c: (916) 517-2578

Corporation Yard | 2005 Hilltop Circle | Roseville, CA | 95747

From: Cecilia Partridge
Subject: City of Roseville 2020 Urban Water Management Plan Public Hearing Notification
Date: Tuesday, May 25, 2021 2:54:37 PM
Attachments: RWA_Membership Idy.pdf

EXTERNAL: This email originated from outside of the organization. Do not click on any links or open attachments unless you recognize the sender and know the content is safe.

Good afternoon RWA members,

Attached is a notice from the City of Roseville regarding an upcoming Public Hearing for their 2020 Urban Water Management Plan.

Any questions please feel free to contact me.

Cecilia Partridge
cpartridge@rwah2o.org
Executive Assistant
Regional Water Authority
5620 Birdcage Street, Suite 180
Citrus Heights, CA 95610
916-213-4631 cell

From:	Joseph, Trevor
To:	"Ansel Lundberg"
Cc:	Bigley, Sean; York, Linda
Subject:	City of Roseville 2020 Urban Water Management Plan Public Hearing
Date:	Tuesday, May 25, 2021 12:46:14 PM
Attachments:	SMUD_Water and Power Contract Specialist Idy.pdf image001.png

Hello Ansel

Please see the attached letter as part of the Urban Water Management Plan requirements informing SMUD of a pending public hearing. They City's UWMP will be made available on our website shortly.

Regards,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
Environmental Utilities
c: (916) 517-2578

Corporation Yard | 2005 Hilltop Circle | Roseville, CA | 95747

From:	Joseph, Trevor
To:	Dan York
Cc:	Bigley, Sean; York, Linda
Subject:	City of Roseville 2020 Urban Water Management Plan Public Hearing
Date:	Tuesday, May 25, 2021 12:45:17 PM
Attachments:	SSWD_General Manager ldy.pdf image001.png

Hello Dan

Please see the attached letter as part of the Urban Water Management Plan requirements informing Sacramento Suburban Water District of a pending public hearing. They City's UWMP will be made available on our website shortly.

Regards,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
Environmental Utilities
c: (916) 517-2578

Corporation Yard | 2005 Hilltop Circle | Roseville, CA | 95747

York, Linda

Subject: FW: Urban Water Management Plan and Water Shortage Contingency Update to Publish in the Press Tribune on May 28, 2021 and June 4, 2021 City of Roseville #1050
Attachments: NOTICE OF PUBLIC HEARING UWMP AND WSCP.docx

From: Rachel White <rachelw@goldcountrymedia.com> on behalf of legals@goldcountrymedia.com <legals@goldcountrymedia.com>
Sent: Friday, May 21, 2021 4:01:49 PM
To: Six, Katrina <KMSix@roseville.ca.us>
Subject: RE: Urban Water Management Plan and Water Shortage Contingency Update to Publish in the Press Tribune on May 28, 2021 and June 4, 2021 City of Roseville #1050

EXTERNAL: This email originated from outside of the organization. Do not click on any links or open attachments unless you recognize the sender and know the content is safe.

Hi, Katrina,

This order has been completed and scheduled as requested for The Roseville Press Tribune on May 28, June 4, 2021. The order is #77551.

If you have any questions on this order, please include the order number in your email to legals@goldcountrymedia.com.

Thank you for your business,

Rachel White
Legals Clerk
Gold Country Media
Direct: (916) 774-7911
Email: legals@goldcountrymedia.com

From: Six, Katrina via Legals [mailto:legals@goldcountrymedia.com]
Sent: Wednesday, May 19, 2021 12:28 PM
To: legals@goldcountrymedia.com
Subject: Urban Water Management Plan and Water Shortage Contingency Update to Publish in the Press Tribune on May 28, 2021 and June 4, 2021 City of Roseville #1050

Urban Water Management Plan and Water Shortage Contingency Update to Publish in the Press Tribune on May 28, 2021 and June 4, 2021 City of Roseville #1050

Katrina Six
Deputy City Clerk
City Clerk Department
o: (916) 774-5267
f: (916) 786-9175

Civic Center | 311 Vernon Street | Roseville, CA | 95678



NOTICE OF PUBLIC HEARING
2020 URBAN WATER MANAGEMENT PLAN
AND 2020 WATER SHORTAGE CONTINGENCY UPDATE
CITY OF ROSEVILLE, PLACER COUNTY, CALIFORNIA

NOTICE IS HEREBY GIVEN that the City of Roseville will hold a public hearing on Wednesday, June 16, 2021 at 6:00 p.m. in the City Council Chambers at 311 Vernon Street, Roseville, California, to consider adoption of the City of Roseville 2020 Urban Water Management Plan. The public hearing will also include consideration for adoption of the 2020 Water Shortage Contingency Plan. The Water Shortage Contingency Plan is included as Chapter 8 of the 2020 Urban Water Management Plan.

The Public Review Draft of these documents is available on the City's website at http://roseville.ca.us/UWMP .

Appendix C – Land Use Element

CITY OF ROSEVILLE CALIFORNIA

II. LAND USE



Table of Contents

II LAND USE ..... II-I
Purpose II-1
Guiding Principles II-2
Organization II-2
Planning Area II-4
Land Use Designations II-7
Development Forecast II-23
Community Form II-25
Community Design II-31
Growth Management II-33

Figures

Figure II-1 | Planning Areas II-5
Figure II-2 | Land Use Map II-9

Tables

Table II-1 | Residential Land Use Characteristics II-12
Table II-2 | Non-Residential Land Use Characteristics II-12
Table II-3 | Residential Land Use Designations II-14
Table II-4 | Non-Residential Land Use Designations: Commercial II-15
Table II-5 | Non-Residential Land Use Designations: Office II-16
Table II-6 | Non-Residential Land Use Designations: Industrial II-16
Table II-6 | Non-Residential Land Use Designations: Industrial (Cont.) II-17
Table II-7 | Special Land Use Designations II-19
Table II-7 | Special Land Use Designations (Cont.) II-20
Table II-8 | Combining Designations II-20
Table II-9 | Compatibility of Adjacent Land Use Designations as Applied on the General Plan Land Use Map II-21
Table II-10 | Land Use Designations, Special Areas, and Combining Designations and Implementing Zones II-22
Table II-11 | Existing and Future Development II-24



LAND USE

PURPOSE

The purpose of the Land Use Element is to set guidelines for managing land use change. Land use designations define allowable density and land uses. The Land Use Map illustrates the location of each of these uses. Goals and policies in this Element guide land use change to achieve many goals: maintaining and enhancing quality of life in neighborhoods; promoting revitalization and economic development; enhancing fiscal sustainability; and ensuring orderly and efficient long-term growth.

A community's ultimate land use distribution and development pattern are influenced by economic development and opportunities, the capacity and location of infrastructure and services, natural and environmental constraints, the periods of time when the community was founded and experienced growth, market opportunities and constraints, and social factors. The implementation of land policies interacts with these and other factors to improve social, economic, and environmental outcomes. Land

use patterns have complex relationships with other key planning considerations. For example, infrastructure capacity and placement can influence the distribution of land uses and the community's overall character. At the same time, the desired community character speaks to the distribution of land uses and the infrastructure necessary to serve these land uses.

It is the overall goal of the Land Use Element to promote a balanced land use pattern that supports innovative land use approaches and retains and enhances the distinct character and identity of Roseville.

GUIDING PRINCIPLES

The City has received input from residents and business owners through surveys, task forces, committee meetings, and other mechanisms. This input was used to develop guiding principles that create the foundation for the goals and policies of the Land Use Element. These guiding principles include:

- Promote and enhance Roseville's unique character and identity.
- Distinguish Roseville from adjacent communities through the quality of development and design and the level of public services and facilities provided.
- Protect and enhance Downtown and the City's established neighborhoods.
- Promote new development and ensure that development is an integrated and connected part of the City's land use pattern.
- Provide a variety of housing types and opportunities to serve the needs and incomes of all households.
- Create a balanced land use pattern with an appropriate mix of uses to accommodate residential, employment, service, and social needs within the community.
- Preserve open space in areas with sensitive environmental resources and provide high-quality, accessible recreational amenities.
- Ensure fiscal responsibility.
- Create a land use mix and development pattern that accommodates and promotes alternative transportation modes for ease of access and improved air quality and public health.
- Proactively manage and plan for growth.

ORGANIZATION

The Land Use Element consists of the Land Use Map and land use goals and policies. The Land Use Map visually illustrates the City's existing and planned land use mix and pattern.[1] Land use decision-making is guided by the goals and policies contained in the text of the Land Use Element, as well as the land use implementation measures outlined in the appendix to the General Plan. While the Land Use Map is an illustration of policy, it only reflects those policies that can be graphically shown. The Land Use Map and land use policies must be used in combination with each other, along with the policies from the other Elements.

[1] A copy of the Land Use Map is available through the Development Services Department - Planning Division at 311 Vernon Street or online at www.roseville.ca.us.

The Land Use Element is organized into the following six components:

1 ***Planning Area*** provides a description of the Planning Area, the Sphere of Influence, and planning subareas.

2 ***Land Use Designations*** identifies and defines the City's land use categories, incorporating general use, development, intensity, and siting and compatibility guidelines.

3 ***Development Forecast*** presents estimates of future development potential within the Planning Area.

4 ***Community Form*** provides goals and policies to define and direct the future form and development pattern of the City.

5 ***Community Design*** includes goals and policies that address aesthetics, integration of the built and natural environments, and community character.

6 ***Growth Management*** focuses on the proactive management of growth in the community, including performance standards to regulate growth and development, as well as policies addressing annexations and expansion of the City's Sphere of Influence.



It is the overall goal of the Land Use Element to promote a balanced land use pattern that supports innovative land use approaches and retains and enhances the distinct character and identity of Roseville.

PLANNING AREA

The focus of the General Plan's land use policy is on the City's "Planning Area" (see Figure II-1), which includes all planning subareas within the City limits, Sphere of Influence, and the City/County Memorandum of Understanding area, as described below.

Sphere of Influence

The City's Planning Area includes 796 acres of land that is within the City's Sphere of Influence, but outside the current City limits. The City does not have jurisdiction over projects proposed within the Sphere of Influence, but will monitor, receive notices, and provide official comments on such projects. The City will use policies of the Growth Management component of this Element to evaluate annexations to the City and expansions of the Sphere of Influence, which would be subject to approval by the Placer County Local Agency Formation Commission (LAFCO).

City/County Memorandum of Understanding Area

The City has an expanded cooperation agreement in place with Placer County, commonly referred to as the City/County Memorandum of Understanding (MOU), which provides guidelines for the City or County to follow to ensure that development within the MOU area is cooperatively planned with input from both agencies.

Planning Subareas

Within the City limits, there are 16 subareas that have been defined for planning purposes. These include the Infill Area, the North Industrial Area, and the City's 14 Specific Plan Areas:

- **Infill Area** – This area has vacant and underutilized properties where the City will encourage infill development, but overall, it is mostly built out. The Infill Area includes the historic core of the community but excludes the Downtown and Riverside Gateway Specific Plan Areas.

- **North Industrial Area** – While not subject to a specific plan, this is a recognized planning subarea of the City that provides a major opportunity for industrial and employment development serving the south Placer region. The North Industrial Area has adopted design guidelines, the North Roseville Design Guidelines, which applies to the majority of the planning area. Other portions of the North Industrial Area are regulated by the Hewlett Packard Master Plan or Campus Oaks Master Plan.

- **Southeast Roseville Specific Plan (1985)** – This mixed-use Specific Plan represents the City's first effort to use the specific plan process to master plan a new development area.

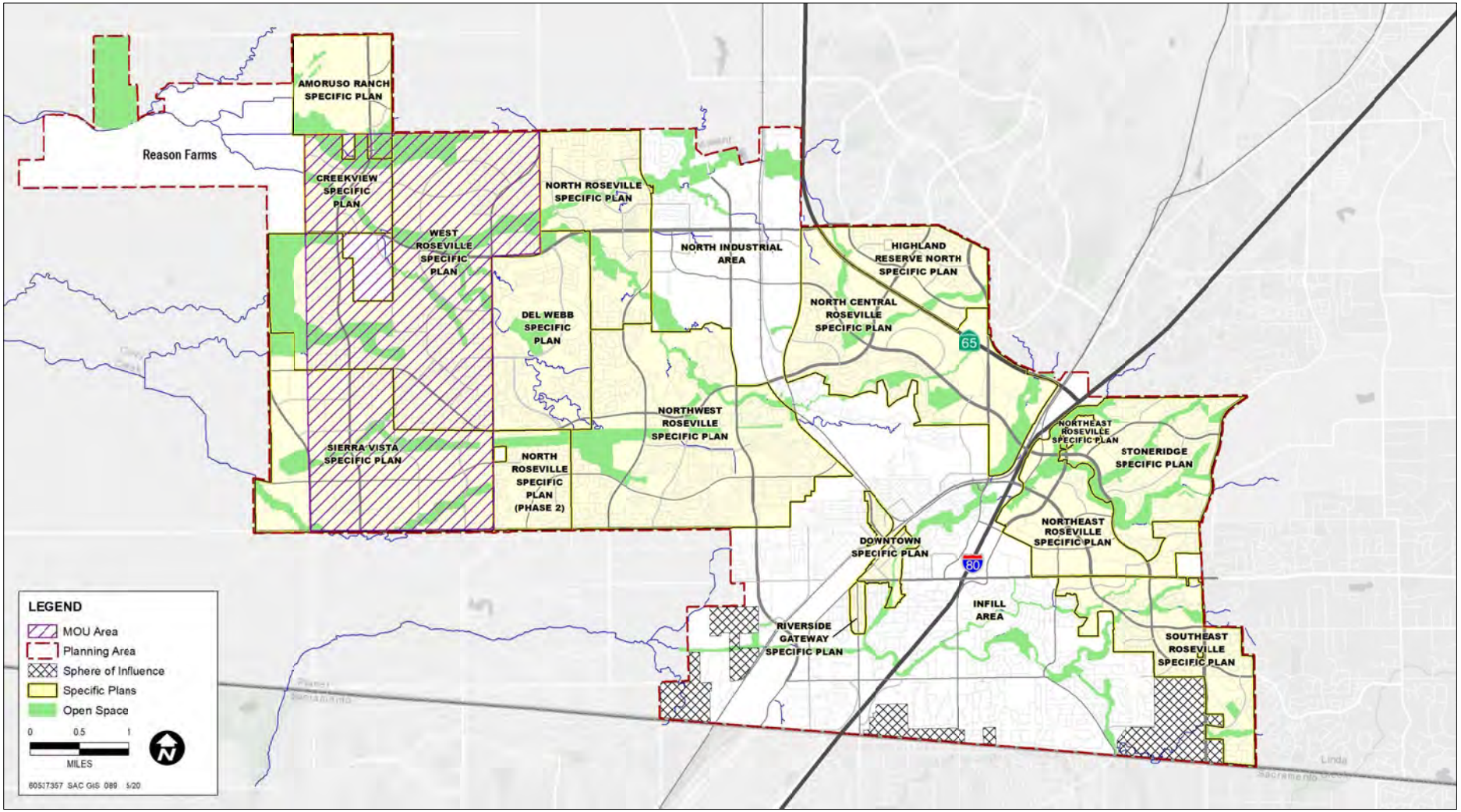
- **Northeast Roseville Specific Plan (1987)** – This Specific Plan is primarily intended for commercial and employment-generating uses but also has significant residential and open space components.

- **Northwest Roseville Specific Plan Area (1989)** – The predominant land uses in this Specific Plan Area are single- and multi-family development, but the Specific Plan also provides for commercial, office, open space, and public uses.

- **North Central Roseville Specific Plan (1990)** – This Specific Plan Area includes residential, commercial, and office uses, along with a large area for wetland preservation and creation.

- **Del Webb Specific Plan (1993)** – This Specific Plan Area is planned as an age-restricted community consisting of single-family homes focused around recreational facilities with supportive private and public uses.

Figure II-1 | Planning Areas



This page intentionally left blank

- **Highland Reserve North Specific Plan (1997)** – This Specific Plan accommodates single- and multi-family residential development, along with commercial and other supportive uses.
- **North Roseville Specific Plan (1997)** – This multi-phase Specific Plan includes single- and multi-family dwelling units, commercial uses, parks and other public facilities, and open space.
- **Stoneridge Specific Plan (1998)** – This Specific Plan accommodates single- and multi-family residential development, commercial and office uses, parks and other public facilities, and open space.
- **West Roseville Specific Plan (2004)** – This Specific Plan accommodates single- and multi-family dwelling units, including age-restricted units, commercial uses, industrial development, parks and other public facilities, and open space.
- **Riverside Gateway Specific Plan (2006)** – The Riverside Gateway Specific Plan is intended to guide public improvements and facilitate commercial and residential infill development between Douglas Boulevard and Darling Way.
- **Downtown Specific Plan (2009)** – This Specific Plan encourages mixed-use infill development throughout the Historic Old Town and the Vernon Street District. The associated Downtown Code implements the Plan, physically applying the Plan's guidance to properties within the Plan Area.
- **Sierra Vista Specific Plan (2010)** – This Specific Plan accommodates single- and multi-family units, including age-restricted units, commercial development, parks and other public facilities, and open space.
- **Creekview Specific Plan (2012)** – This Specific Plan accommodates single- and multi-family dwelling units, commercial and office development, parks and other public facilities, and open space.
- **Amoruso Ranch Specific Plan (2016)** – This Specific Plan accommodates single- and multi-family dwelling units, commercial development, parks and other public facilities, and open space.

Roseville's Specific Plans play an important role in guiding development and conservation. In many areas of the City, the Specific Plans are the primary mechanism for implementing the goals and policies of the General Plan. It is the City's policy to plan for new development and/or reinvestment efforts through the Specific Plan process.

The Specific Plans establish detailed policies and implementation programs for portions of the City, consistent with the goals and policies established in the General Plan. Specific Plan land use designations are reflected on the General Plan Land Use Map, although Specific Plans may also use new land use categories that are more specific or tailored to a particular situation. The City's Specific Plans are consistent with, and are hereby incorporated by this reference, as a component of the Land Use Element of the General Plan. Copies of all of the City's Specific Plans may be obtained through the Development Services Department in the Civic Center at 311 Vernon Street or online at: www.roseville.ca.us.

LAND USE DESIGNATIONS

The City's land use designations define allowable land use, and serve as a guide for zoning, Specific Plans, and other land use regulations. Each land use designation has density and intensity guidelines (Table II-3 and II-4), which are used for planning of facilities (e.g. roadway, utilities, schools, parks, etc.) that support the various land uses, as directed by goals and policies in other Elements. The Land Use Map (Figure II-2) illustrates the location of the City's land use designations. The City's land use designations include:

Residential

- Low-Density Residential (0.5 – 6.9 Dwelling Units/Acre)
- Medium-Density Residential (7.0 – 12.9 Dwelling Units/Acre)
- High-Density Residential (13.0 Dwelling Units/Acre or greater)

Commercial

- Neighborhood Commercial
- Community Commercial
- Regional Commercial

Office

- Business Professional

Industrial

- Light Industrial
- Tech/Business Park
- General Industrial
- Transfer Station

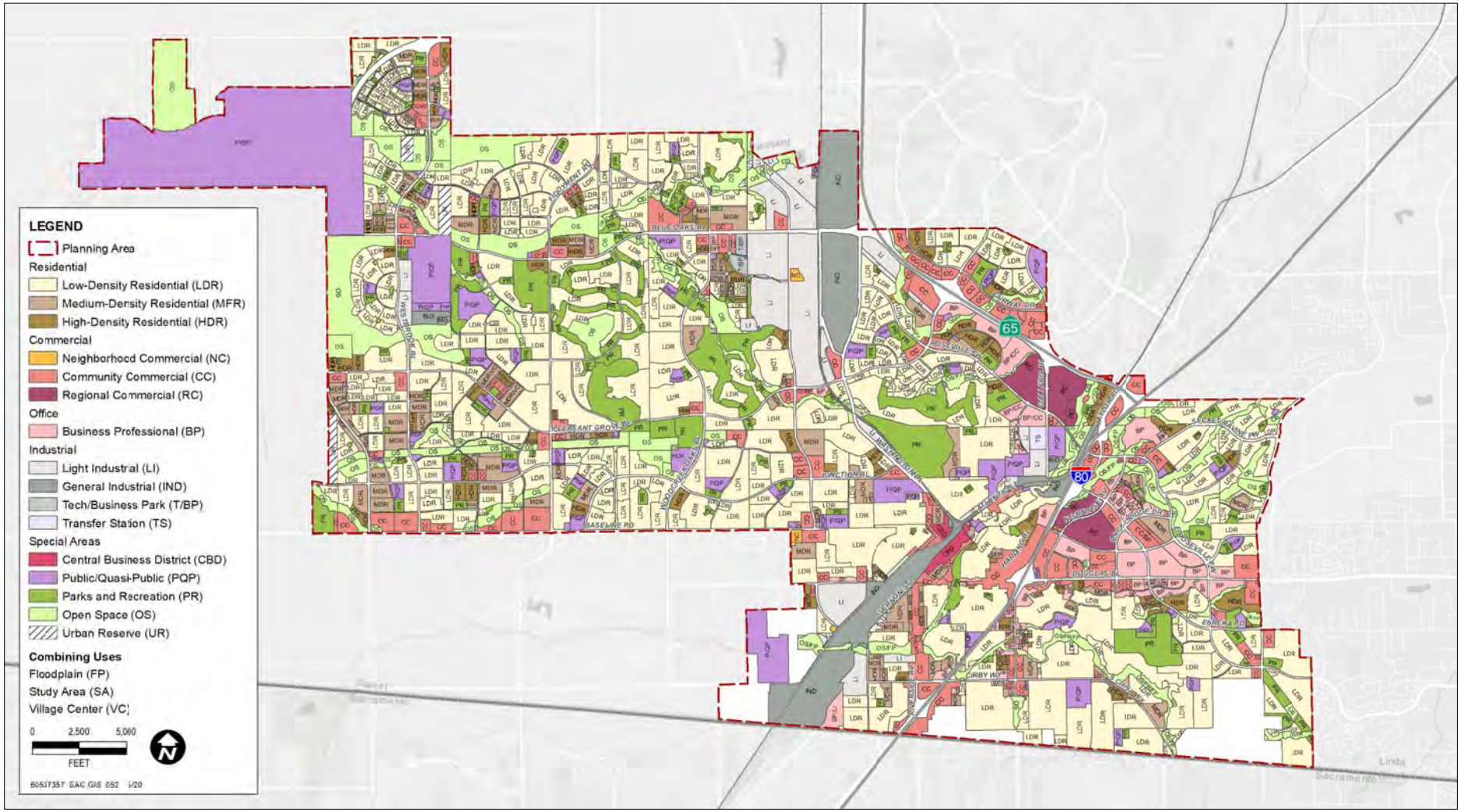
Special Areas

- Central Business District
- Public/Quasi-Public
- Parks and Recreation
- Open Space
- Urban Reserve

Combining Designations

- Floodplain
- Study Area
- Village Center

Figure II-2 | Land Use Map



This page intentionally left blank

Compared to zoning, the City's land use designations define allowable land use broadly, in part to provide the flexibility necessary to achieve the General Plan's policies related to pedestrian orientation and convenience and facilitate mixed-use, infill development. For example, in addition to primary uses, there are permitted secondary uses associated with each land use designation that allow for a more diverse land use mix. The Zoning Ordinance, Specific Plans, and Community Design Guidelines provide more specific standards to ensure compatibility among adjacent land uses. The extent of the secondary uses permitted and conditions related to their use will be as specified in the overlying zoning, Specific Plan, and/or other master plan.

Typically, a single land use designation is applied to a given area. However, to promote mixed-use development, the City may use two or more designations for certain areas that include complementary land uses. Because the Land Use Map provides a guide for future development, it is possible that more than one zoning district may be consistent with any one land use designation.



The City's land use designations define allowable land use broadly, in part to provide the flexibility necessary to achieve the General Plan's policies related to pedestrian orientation and convenience and facilitate mixed-use, infill development.

Use Types, Density, Intensity, and Compatibility

Land use designations contain development guidelines to be applied to each use. These include density guidelines for residential uses, intensity guidelines for non-residential uses, and, where appropriate, land use compatibility guidelines. Tables II-1 and II-2 summarize density and intensity guidelines. Tables II-3 through II-8 describe the purpose, allowable uses, and development guidelines for land use designations. Table II-9 is a compatibility matrix for all land use designations. Table II-10 illustrates the relationship between land use designations and implementing zoning districts.

Table II-1 | Residential Land Use Characteristics

Land Use Category	Dwelling Units Per Acre	Estimated Population Per Gross Acre[1]
Low-Density Residential	0.5 TO 6.9	1.45-20.01
Medium-Density Residential	7.0 TO 12.9	20.3-37.41
High-Density Residential	13.0 +	27.3+

[1] Assumes 2.1 persons per multi-family unit and 2.9 persons per single-family unit based on the American Community Survey (2013 - 2017). The estimated population per gross acre is only an estimate and does not represent City policy.

Table II-2 | Non-Residential Land Use Characteristics

Land Use Category	Floor Area Ratio*	Typical Acreage	Typical Square Footage
Neighborhood Commercial	20% TO 40%	Less than 5	< 50,000
Community Commercial	20% TO 40%	5 to 25	50,000 TO 250,000
Regional Commercial	20% TO 40%	>25	>250,000
Business Professional	20% TO 40%	Varies	Varies
Light Industrial	20% TO 50%	Varies	Varies
Tech/Business Park	20% TO 50%	Varies	Varies
General Industrial	20% TO 50%	Varies	Varies
Transfer Station	Varies	Varies	Varies
Central Business District	Up to 300%	Varies	Varies
Public/Quasi-Public	Varies	Varies	Varies

* Floor Area Ratios (FARs) are intended as guidelines and not as absolute restriction

RESIDENTIAL LAND USES

The residential designations include areas designated for a broad array of housing types with different densities. Each residential designation includes a purpose statement, primary and secondary uses, and development guidelines for each designation.

The Low-, Medium-, and High-Density land use designations are based on the number of allowable dwelling units per gross developable acre. A gross developable acre is defined as the land designated as residential use excluding overhead power lines and their easements, areas within the designated 100-year floodplain, and for the Low- and Medium-Density land use designations, any right-of-way and landscape corridors associated with collector and arterial roadways.

Each residential land use designation is indicated on the Land Use Map as an abbreviation (e.g., LDR) and will be followed by a number, indicating the number of dwelling units per gross developable area (e.g., LDR-6.0). Roseville generally uses the Specific Plan or master planning process to establish land use designations. Minimum and maximum densities for each residential land use designation are included within the development guidelines listed for each designation.

Each residential designation includes both primary and secondary land uses. As expected, the primary land uses are residential in each of these designations, but also include public parks, resource preservation and open space areas, and landscape corridors and other public utility easements. Secondary uses include those uses such as schools, places of worship, private recreation, limited office, and childcare facilities – uses that are normally associated with residential areas and are of such a limited size that a separate or distinct land use designation (e.g., public facility or commercial) is not always warranted.

Table II-3 outlines the purpose, allowable uses, and development guidelines for the residential land designations.

NON-RESIDENTIAL LAND USES

The non-residential designations include areas designated for commercial, office, industrial uses, special areas, and combining districts. Like the residential designations, each non-residential designation includes a purpose statement, primary and secondary uses, and development guidelines for each designation.

Intensity development guidelines for non-residential development are expressed as floor area ratios (FARs). This is a ratio of the total floor area (including all floors and not just the "footprint" of a building) divided by the total lot or parcel area. The City expresses this ratio as a percentage. Typical commercial FARs range from 20 to 50 percent, but may be as high as 300 percent (i.e. a three-story building covering 100 percent of the lot area) in locations such as downtown Roseville.

Intensity and compatibility guidelines for the commercial, office, and industrial land use designations are guidelines and not absolute restrictions. Factors such as General Plan policies, intensity of use, anticipated traffic levels, and availability of public facilities and infrastructure will be assessed as part of the development review or Specific Plan process to determine the appropriate level of floor area to land area ratio.

Unlike the specific secondary uses listed in the residential designations, which are intended to be subordinate and may be permitted only to support neighborhood convenience, the relationship of secondary uses in non-residential areas differ. It is the intention of the non-residential land use designations to permit secondary land uses that support and complement primary uses. These secondary land uses do not need to be subordinate. The size of these areas would typically be limited and would, therefore, not warrant a separate land use designation for the secondary land use. Tables II-4, II-5, and II-6 outline the purpose, allowable uses, and development guidelines for the non-residential land designations.

SPECIAL LAND USE DESIGNATIONS

In addition to the residential, commercial, office, and industrial land use designations, the City has also established Special Land Use Designations for Central Business Districts, Parks and Recreation, Open Space, public uses, and Urban Reserve Areas. Table II-7 outlines the purpose, allowable uses, and development guidelines for the Special Land Use Designations.

COMBINING DESIGNATIONS

These designations are only applied in combination with another land use designation and modify the uses and development guidelines of that designation. Table II-8 outlines the purpose, allowable uses, and development guidelines for the Special Land Use Designations.

Table II-3 | Residential Land Use Designations

Designation	Purpose	Primary Uses	Secondary Uses	Development Guidelines
Low-Density Residential (LDR)	Applies to lands where single-family dwelling units, which comprise the majority of Roseville's housing supply, are located. Assigned to lands with the flexibility to accommodate development constraints (e.g., slopes, trees, etc.). Typically, low-density residential lands should require minimal grading or disturbance of natural features. Avoidance of land use limitations (topography, vegetation, easements, etc.) can be achieved by designing larger or smaller lots or by clustering and attaching units.	Attached and detached single-family residences, public parks, resource preservation and open space areas, landscape corridors, and other public utility easements.	Secondary uses include accessory dwelling units, public and private schools, religious assembly, private recreation, and limited office, commercial childcare facilities, and neighborhood retail and services.	0.5 to 6.9 dwelling units per gross developable acre. Lot sizes average 6,000 to 7,500 square feet but may be larger or smaller.
Medium-Density Residential (MDR)	Applies to lands characterized by small-lot single-family detached dwelling units and attached patio homes, halfplexes, duplexes, townhouses, condominiums, and mobile home parks. Should accommodate a variety of housing types and designs. Often located as a transition between higher-intensity land uses and low-density residential uses.	Attached and detached single-family, halfplexes, duplexes and multi-family residences; and public parks, resource preservation and open space areas, landscape corridors and other public utility easements.	Secondary uses include accessory dwelling units, public and private schools, religious assembly, private recreation, and limited office, commercial childcare facilities, and neighborhood retail and services.	7.0 to 12.9 dwelling units per gross developable acre.
High-Density Residential (HDR)	Provides for apartments or condominiums with multiple-story structures containing multiple attached dwelling units. The broad range of densities in this category will yield a variety of design options. May be combined with commercial uses to form a mixed-use development where higher densities could be desirable and beneficial.	Multiple-family dwellings in attached units and public parks, resource preservation and open space areas, landscape corridors, and other public utility easements.	Secondary uses include public and private schools, religious assembly, private recreation, and limited office, commercial childcare facilities, and neighborhood retail and services.	13.0 and above dwelling units per gross developable acre. Should be applied to lands adjacent to bicycle and transit corridors, and in close proximity to services.

Table II-4 | Non-Residential Land Use Designations: Commercial

Designation	Purpose	Primary Uses	Secondary Uses	Development Guidelines
Neighborhood Commercial (NC)	Provides basic commercial retail and services for the convenience of surrounding neighborhoods within walking distance of major residential areas.	A limited range of goods and services intended for the convenience of the residents in the immediate neighborhood and compatible with adjacent land uses.	Medical offices, veterinary clinics, other professional offices and commercial child care facilities.	Goods and services may be provided in stand-alone buildings or in small centers, typically on parcels less than five (5) acres in size with a floor area ratio between 20% and 40%. Developments will have a pedestrian scale and orientation and provide convenient pedestrian and bicycle access to reduce the need for an automobile trip. Should be adjacent to collector and/or arterial streets, and residential neighborhoods.
Community Commercial (CC)	Provides a broader range of goods and services to an expanded service area.	Retail stores and businesses selling a full range of goods and services including auto sales and repair, and commercial child care facilities.	Professional offices uses, including medical offices and clinics.	Due to the larger service area, the acreages are larger than in the neighborhood commercial land use category. Typically, the acreages range from 5 to 25 acres, the square footage ranges from 50,000 to 250,000 square feet, and the floor area ratio ranges from 20% to 40%. Should be located at intersections of, or adjacent to arterials.
Regional Commercial (RC)	Accommodates the larger shopping centers and commercial activities where uses provide goods and services to a citywide and regional service area.	Major department and discount stores, auto malls, hotels and motels, and commercial recreation or entertainment.	Office and financial institutions.	Typically, Regional Commercial developments would encompass more than 25 acres. Should be located adjacent to and with immediate access to major transit linkages, arterials, regional roadways, and highways. Sites should possess good automobile and truck access. Shopping centers in the regional commercial land use would typically exceed 250,000 square feet with a floor area ratio between 20% and 40%.

Table II-5 | Non-Residential Land Use Designations: Office

Designation	Purpose	Primary Uses	Secondary Uses	Development Guidelines
Business Professional (BP)	Provides areas for small and large office uses, including uses supportive of offices.	Administrative, professional, government, and medical offices, and research and development (not including any manufacturing or assembly). Hospitals, clinics, and general medical may also be permitted.	Limited service commercial uses (e.g., banks, restaurants, commercial day care centers, travel agencies, florists, etc.) are encouraged where they would minimize the need for vehicle travel for convenience trips but only as secondary uses in proximity to large office parks and complexes. In association with clinics and hospitals, general medical, pharmacies and other medical related retail may be permitted.	Offices developed in stand-alone buildings or in a business park or campus setting. The business professional land use designation may be applied to lands that are adjacent to regional and community commercial designated lands. May also be used as a buffer between residential areas and arterials, community commercial, and light industrial. Floor area ratios should range between 20% and 40%.

Table II-6 | Non-Residential Land Use Designations: Industrial

Designation	Purpose	Primary Uses	Secondary Uses	Development Guidelines
Light Industrial (LI)	Applies to lands reserved for office, industrial, and research and development uses that generate very limited noise, vibration, odor, dust, smoke, light, or other pollutants, and are either integrated or compatible with surrounding uses.	Research and development (which may include manufacturing and assembly), electronics assembly, warehousing, intensive commercial uses (e.g., auto body repair, landscaping material sales, retail and wholesale lumberyards), and associated administrative offices.	Limited service commercial uses (e.g., banks, restaurants, commercial day care centers, travel agencies, florist, etc.) are encouraged where they would minimize the need for vehicle travel for convenience trips, but only as secondary uses. Service uses with large space requirements, such as health clubs, religious assembly, dance and gymnastic studios, and off-peak public assembly uses may also be permitted.	Floor area ratios range from 20% to 50%. Should be located adjacent to major roadways with convenient truck access to accommodate the needs of the businesses that require this land use.

Table II-6 | Non-Residential Land Use Designations: Industrial (Cont.)

Designation	Purpose	Primary Uses	Secondary Uses	Development Guidelines
Tech/Business Park (T/BP)	A variant of the LI designation and is envisioned as more of a campus type use. The land use designation provides for a mix of uses that are compatible with and act as a transition between the light industrial use types and commercial and residential uses.	Allowed use types include professional offices, light manufacturing, research services, and light wholesale and distribution.	Limited service commercial uses (e.g., banks, restaurants, commercial day care centers, travel agencies, florist, etc.) are encouraged where they would minimize the need for vehicle travel for convenience trips but only as secondary uses. Service uses with large space requirements such as health clubs, religious assembly, dance and gymnastic studios, and off-peak public assembly uses may also be permitted.	Floor area ratios range from 20% to 50%.
General Industrial (IND)	Provides areas for industrial uses that tend to generate noise, vibration, odor, dust, smoke, light, and an aesthetic appearance not compatible with residential and other sensitive receptors. The intent of this category is to provide a place for industrial uses within the City that is properly buffered from other uses.	A wide range of activities, including manufacturing, wholesale distribution, large storage areas and other industrial uses, are permitted.	Incidental retail and service commercial uses associated with large employment areas and industrial parks.	Areas developed under this designation should be located with direct access to a major or minor arterial or both, freeways, or rail lines. Floor area ratios range from 20% to 50%.

Table II-6 | Non-Residential Land Use Designations: Industrial (Cont.)

Designation	Purpose	Primary Uses	Secondary Uses	Development Guidelines
Transfer Station (TS)	Reserves and protects industrial areas that may be suitable for a solid waste transfer station.	Intermediate waste handling facilities where solid waste is transferred from hauling vehicles to a transfer vehicle where the waste or portion thereof undergoes processing, recycling, or further handling before transport to a disposal site, waste processing facility, or other facility.	None.	Only be applied where all of the following is satisfied: • All adjacent land use designations are General Industrial or Light Industrial; • All areas within 200 feet of the transfer station facility property shall be zoned such that the transfer station facility use is protected from incompatible adjacent uses; • The area has access from major arterials capable of providing access for transfer vehicles and the public; and • The use of the area as a transfer station facility is consistent with the existing or planned character of the area. Transfer stations shall be designed and maintained to, at a minimum, include enclosed processing areas, paved access, fenced and screened storage areas for recycled goods, dust mitigation, and be in compliance with other City, county, state, and federal standards.

Table II-7 | Special Land Use Designations

Designation	Purpose	Primary Uses	Secondary Uses	Development Guidelines
Central Business District (CBD)	Accommodates significantly greater intensities and traditional mixed retail, office, and apartment uses. Limited in its application to Downtown Roseville but may be applied to areas of greater urban intensity.	A mix of retail and office uses, including municipal offices, public assembly, theaters, and restaurants.	Medium-density and high-density residential uses.	Floor area ratios may be as high as 300% (three times the site area).
Park and Recreation (P/R)	Accommodates public parks and public and private recreation facilities.	Public park and recreation facilities, including ball diamonds and fields, golf courses, pools, bike trails and community buildings; and private recreation uses when they include outdoor facilities, such as golf course, tennis courts, and similar uses.	Libraries, child/elder care facilities, resource mitigation, and drainage detention.	For public recreation, the Parks and Recreation Element contains policies and standards that establish locational criteria, acreage requirements, and the types of improvements planned for each of the City parks.
Open Space (OS)	Preserves and protects public and private lands that are significant due to wildlife habitat, natural features, or flood hazard. Within new development areas, the 100-year floodplain will be designated as Open Space. Sensitive or unique natural features, including, but not limited to, wetlands, vernal pools, and oak woodlands are also to be designated as Open Space as part of specific plans and other major development review processes.	Preserved natural lands, passive recreation and minor recreation facilities (picnic tables, restrooms), walking and bike trails, and resource interpretive facilities.	Resource mitigation and drainage detention.	All permitted uses shall be compatible with the preservation and protection of open space values (habitat and visual) and shall comply with the policies and standards contained in the Open Space and Conservation Element.
Public/Quasi-Public (P/QP)	Establishes areas for education, religious assembly, governmental offices, municipal corporation yards, and water treatment plants.	Municipal, governmental or public facilities, places of worship, and related uses.	None.	This land use designation shall apply to all municipal facilities and may also be applied to quasi-public facilities where the size of such facilities warrants an individual land use designation.

Table II-7 | Special Land Use Designations (Cont.)

Designation	Purpose	Primary Uses	Secondary Uses	Development Guidelines
Urban Reserve (UR)	Applies to those lands that are anticipated to receive urban land entitlements, but at the present time, are constrained by growth management policies, availability of services or other limitations.	Agriculture, open space, passive recreation and resource protection.	Caretakers' residence.	A caretaker's residence may be established at a density of 1 unit per 300 acres. Prior to the allocation of any urban land use entitlements, the applicable constraints must be resolved, consistent with the policies contained in the Growth Management component of this Element.

Table II-8 | Combining Designations

Designation	Purpose	Permitted Uses and Guidelines
Floodplain (FP)	Identifies lands that are within the regulatory floodplain boundaries as defined in the Safety Element. Development is strictly regulated by the City. In areas with existing development, the floodplain designation is an overlay or a combining land use. As part of a specific plan, the land use designation may be combined with an open space or parks designation, if found consistent with the policies of the Safety Element.	Uses are limited to those that minimize flooding impacts on upstream and downstream areas and are consistent with both the policies of the Safety Element and the underlying land use designation.
Study Area (SA)	Identifies future General Plan or neighborhood study areas. This combining designation may be applied to any area, in which the City believes that additional land use analysis and amendment of the General Plan may be desirable to resolve specific neighborhood or land use issues.	Concurrent with a Land Use Map amendment to apply this combining designation, the City shall also adopt an ordinance regulating interim land use development. Such regulations shall relate to the land use issue that requires such regulations and shall include an expiration date.
Village Center (VC)	Allows for a mix and density of land uses common to a traditional downtown, urban setting. Allows for flexibility and deviation from the development guidelines and permitted uses contained in the primary land use designation for which it is combined.	Use of this combining designation requires comprehensive land use planning through approval of a Specific Plan. The permitted uses, development guidelines, and extent of deviation are to be defined in the Specific Plan.

Table II-9 | Compatibility of Adjacent Land Use Designations as Applied on the General Plan Land Use Map

	LDR	MDR	HDR	NC	CC	RC	BP	LI	IND	T/BP	CBD	P/QP	P/R	OS	UR	VC
LDR	■	■	▒	▒	▒	□	▒	▒	□	□	▒	▒	■	■	▒	▒
MDR	■	■	■	▒	▒	□	▒	▒	□	▒	▒	▒	■	■	▒	▒
HDR	▒	■	■	▒	▒	▒	▒	▒	□	■	■	▒	■	■	▒	▒
NC	▒	▒	▒	■	■	▒	■	■	▒	■	■	■	▒	▒	▒	▒
CC	▒	▒	▒	■	■	■	■	■	▒	■	■	■	▒	▒	▒	▒
RC	□	□	▒	▒	■	■	■	■	▒	■	▒	▒	▒	▒	▒	▒
BP	▒	▒	▒	■	■	■	■	■	▒	■	■	▒	■	■	▒	▒
LI	▒	▒	▒	■	■	■	■	■	■	■	▒	▒	▒	▒	▒	▒
IND	□	□	□	▒	▒	▒	▒	■	■	▒	□	▒	□	▒	▒	▒
T/BP	▒	▒	■	■	■	■	■	■	■	■	■	■	▒	▒	■	□
CBD	▒	▒	■	■	■	▒	■	▒	□	■	■	■	■	■	▒	▒
P/QP	▒	▒	▒	■	■	▒	▒	▒	▒	■	■	▒	■	■	▒	▒
P/R	■	■	■	▒	▒	▒	■	▒	□	■	■	▒	■	■	▒	▒
OS	■	■	■	▒	▒	▒	■	▒	▒	▒	▒	■	▒	■	▒	▒
UR	▒	▒	▒	▒	▒	▒	▒	▒	▒	■	▒	▒	▒	▒	■	■
VC	▒	▒	▒	▒	▒	▒	▒	▒	▒	■	▒	▒	▒	▒	■	■

■ Compatible
▒ Conditionally Compatible
□ Not Compatible

BP = Business Professional
CBD = Central Business District
CC = Community Commercial
HDR = High Density Residential
IND = General Industrial
LDR = Low Density Residential
LI = Light Industrial
MDR = Medium Density Residential
NC = Neighborhood Commercial
OS = Open Space
P/QP = Public/Quasi Public
P/R = Park and Recreation
RC = Regional Commercial
T/BP = Tech/Business Park
UR = Urban Reserve
VC = Village Center

Note: or purposes of this table, “adjacent” includes land uses separated by collectors and local streets but does not include land uses separated by major arterials or highways or by a buffer greater than 50 feet defined as open space, parks, paseos, or landscape setbacks, provided the adjacent use is not heavy industrial or manufacturing.

Table II-10 | Land Use Designations, Special Areas, and Combining Designations and Implementing Zones

LAND USE DESIGNATION	IMPLEMENTING ZONES
Low-Density Residential (LDR)	R1, R2, RS, RMU, PD
Medium-Density Residential (MDR)	R2, R3, RS, RMU, PD
High-Density Residential (HDR)	R3, RM, PD
Neighborhood Commercial (NC)	NC, PD
Community Commercial (CC)	NC, CC, PD, GC, HC, CMU
Regional Commercial (RC)	CC, RC, GC, PD
Business Professional (BP)	BP, PD
Light Industrial (LI)	M1, MP, MMU, PD, CMU
General Industrial (IND)	M1, M2, MMU, MP, PD, CMU
Central Business District (CBD)	HD, CBD, R3, RMU, P/QP, CMU, BP, NC, PR, OS, PD
Public/Quasi-Public (P/QP)	P/QP, PR, OS, UR, PD
Parks and Recreation (P/R)	PR, P/QP, OS, UR
Open Space (OS)	OS, P/QP, PR, UR
Urban Reserve (UR)	OS, P/QP, PD, UR, PR
Tech/Business Park (T/BP)	BP, MMU, CMU, MP, M1
Village Center (VC)	R1, R2, R3, RS, CC, CMU, PD, NC

Note: Land use designation implementation is not necessarily limited to these zones, especially when combined with an RS or PD zone. Additional zones may be consistent for transitional or interim land uses consistent with General Plan policies. Mixed land use designations may require a variety of land use designations, overlay and/or a PD zone.

Implementing Zones Legend
BP = Business Professional; CBD = Central Business District; CC = Community Commercial; CMU = Commercial Mixed Use; GC = General Commercial; HC = Highway Commercial; HD = Old Town Historic District; M1 = Light Industrial; M2 = General Industrial; MMU = Industrial Mixed Use; MP = Industrial/Business Park; NC = Neighborhood Commercial; OS = Open Space; P/QP = Public/Quasi-Public; PD = Planned Development; PR = Park and Recreation; R1 = Single-Family Residential; R2 = Two-Family Residential; R3 = Multi-Family Housing; RC = Regional Commercial; RMU = Residential Mixed Use; RS = Small Lot Residential; UR = Urban Reserve.

DEVELOPMENT FORECAST

The City can influence the pace of development and the number of dwelling units, building square footage, jobs, population, and other characteristics of development through General Plan policy and implementing actions. The pace and nature of buildout of the General Plan is also dependent on factors outside of the City's control, including, but not limited to:

- Global, national, state, and regional economic conditions
- Federal budget and regulatory actions
- State budget allocations, relevant policy direction, and regulatory actions
- Perceptions about the quality of life in the region
- Housing costs, demographic trends, and community character
- Job and educational opportunities
- Infrastructure, resource, and land availability and cost

While it is difficult to accurately predict the amount and pace of long-term development, it is important for long-range plans to provide such estimates. The location, timing, and financing for infrastructure and public facilities depend on these forecasts. They also allow communities to assess land availability for different housing types and inform updates to plans that are needed as demand and capacity for different housing types change over time. Estimates of development capacity also allow the City to assess whether it can accommodate existing and future needs for non-residential development.[2] Development forecasts are used in the City's environmental impact analysis and inform mitigation measures that are needed to reduce or avoid such impacts.

With buildout of the General Plan, the City is estimated to have a total population of approximately 198,000, with approximately 75,200 dwelling units, 60 million square feet of non-residential building square footage, and between 120,000 and 150,000 local jobs (Table II-11).

The estimates of future population, housing units, local jobs, and square footage of development are not City policy. These assumptions are derived strictly for the purposes of analysis. The General Plan does not specify a maximum growth rate. Certain areas designated for urban use may or may not be developed between the present and 2035. Some areas may be developed at the upper end of the density ranges, while other areas may develop at the lower end. It is likely that, over time, the underlying factors driving these development forecasts will change. The City may update land use change assumptions from time to time, either in the context of a General Plan amendment or update, or as a separate exercise for planning purposes.

The City may also update the General Plan, Specific Plans, or implementing documents for policy purposes based, in part, on development forecasts and changes to these development forecasts in the future. For example, the Land Use Element contains policies that are intended to promote a beneficial jobs/housing balance. The right balance is related to the number of residents that commute, the transportation mode used for that commute, and the commute distance and time required. The relationship between jobs and housing affects and is affected by local employment opportunities, household incomes, housing prices, and non-residential lease rates and land costs. The City could

[2] This includes an assessment of the capacity for both "basic" and "non-basic" activities and services. While there is some overlap, in general, basic activities serve an export market, and are the driver of economic growth, while non-basic activities serve the local market.

consider plan amendments to the General Plan or Specific Plans to ensure an adequate supply of land for housing and economic development purposes.

Table II-11 | Existing and Future Development

Development Factor	2016	2035
Dwelling Units	52,900	75,200
Population	135,800	198,000
Non-Residential Square Footage	33,000,000	60,000,000
Jobs	82,000	120,000 to 150,000
Jobs to Dwelling Units	1.55	1.6 to 2

Notes: The population estimate assumes 2.1 persons per multi-family unit and 2.9 persons per single-family unit based on the American Community Survey (2013 - 2017), 1.8 persons per household for age-restricted dwelling units based on the 2010 Census, and 350 square feet for each resident for congregate care/assisted living facilities. The 2016 jobs estimate is from the Sacramento Area Council of Governments (SACOG) 2020 Metropolitan Transportation Plan/Sustainable Communities Strategy Appendix C – Land Use Forecast. The future non-residential square footage was estimated by the City of Roseville in 2019 and does not include square footage devoted to fairgrounds, schools, or structures within golf courses, parks, or cemeteries. The estimate for local jobs in 2035 is derived using existing jobs-to-housing, jobs-to-population, and employment per square footage ratios applied to 2035 estimates for dwelling units, population, and non-residential square footage.

Achieving the City's planning objectives requires more than the right ratio between housing and local jobs. This is not just a mathematical exercise, but rather, requires both a quantitative and qualitative analysis of commute behavior, employment opportunities by occupation and wage, housing need and income type, and the rate of both job and housing growth in a regional context. Similarly, while the relationship between jobs and housing is important to monitor, Roseville also strives to be a complete community with neighborhoods and districts that offer a diverse array of housing, commercial and public services, recreational and cultural opportunities, and multiple transportation options to reach daily destinations.

COMMUNITY FORM

The Community Form component is intended to go a step beyond the identification of land uses and the rules and regulations for their development. Goals and policies related to community form address the physical characteristics that lend shape, appearance, and identity to a community. A community's character is tied to expressions of familiar physical characteristics - landmarks, streets, buildings, parks, and natural features that create a unique identity. Roseville's policies are intended to influence the shape, form, and appearance of both new development and reinvestment in existing districts and neighborhoods, so that development appropriately reflects the vision and goals of residents and decision makers.

Community form has been the focus of regional long-range planning efforts, particularly since the adoption of the Sacramento Region Blueprint by the Sacramento Area Council of Governments (SACOG) Board of Directors in 2004. The Blueprint Principles focus on high-quality design for compact development that provides walkable communities; compact development that helps preserve open space, allow multi-modal transportation access, and facilitate more efficient infrastructure provision; reinvestment to allow better use of existing infrastructure; mixed-use development that provides for more vibrant neighborhoods; and open space that is incorporated into development and conserved on the fringes of the developed region for agriculture and habitat. These Blueprint Principles are broad and are expected to be applied differently in different parts of the Sacramento region. In 2005, the City went through a process to identify how these Principles, including the following Roseville Blueprint Implementation Strategies, which are embodied in the Community Form and Community Design components of this Element, should be applied locally.[3]

- **Transportation Choices:** Provide a variety of transportation choices. Development should be designed to encourage people to walk, ride bicycles, ride the bus, ride transit and heavy rail, or carpool. Land use concepts are intended to encourage the use of these modes of travel and reduce congestion.

- **Mixed Land Use:** Provide a variety of services in proximity to residential uses to reduce the reliance on automobile travel and give residents transit options… A mix of land uses can be provided within the same building and/or project. There are many examples of this type of development: housing near employment centers; a building with ground-floor retail with housing such as apartments or condominiums above; etc.

- **Compact Development:** Take advantage of compact building design. Creating environments that are more compactly built and that use space in an efficient but aesthetic manner can encourage more walking, biking, and public transit use, and shorten auto trips.

- **Housing Choices:** Create a range of housing opportunities and choices. Providing a variety of places where people can live such as apartments, condominiums, townhouses, and single-family detached homes on varying lot sizes is important in serving all aspects of the community including families, singles, seniors, and people with special needs. This issue is of special concern for residents with very low-, low-, and moderate-incomes (often our teachers, entry-level public safety personnel, and other public employees and professionals) as well as retail employees, service workers, and others for whom finding housing close to work is challenging, especially as land values increase. By providing a mix of housing options, residents will have more choices.

- **Use Existing Assets:** Use of existing assets to strengthen and direct development toward existing development areas. Ongoing public and private investment in the Downtown and historic core is critical to maintaining and enhancing the economic vitality of Roseville. Development of infill or vacant lands, intensification of underutilized parcels, or redevelopment can make better use of existing public

[3] Please see *Smart Choices for Roseville's Future: Implementation Strategies to Achieve Blueprint Project Objectives* (May 2005) for more details.

infrastructure. This can include rehabilitation and reuse of buildings, introduction of mixed-use opportunities, and joint use of existing public facilities, such as parking garages.

- **Natural Resource Conservation:** Natural resource conservation of open space and agricultural land. Encourage the incorporation of public-use open space (such as parks, town squares, trails, greenbelts, paseos, and preserves) within development projects and protect wildlife and plant habitat through open space preservation, agricultural preservation, and promotion of environment-friendly practices, such as energy efficient design, water conservation, and stormwater management. In addition to conserving resources and protecting species, natural resource conservation improves the overall quality of life by providing places for everyone to enjoy the outdoors with family outings and by creating a sense of open space throughout the community.

- **Quality Design:** Foster distinctive, attractive communities with a strong sense of place and use land efficiently. The design details of any land use development, such as the relationship to the street, setbacks, placement of garages, sidewalks, landscaping, the aesthetics of building design, and the design of the public right-of-way (sidewalks, connected streets and paths, bike lanes, and the width of streets), are all factors that can influence the attractiveness of living in a compact development. Design also facilitates the ease of walking and biking to work or neighborhood services. Good site and architectural design are important factors in creating a sense of community and a sense of place.

The Community Form component addresses the following topics:

- ***General*** policies that identify the desired quality of design and public services, along with the connectedness of all neighborhoods and commercial districts of the City.

- ***Development Patterns, Transportation, and Air Quality/Greenhouse Gas Emissions*** provide guidance for land use patterns that allow residents a range of viable transportation options, including walking, bicycling, transit, and vehicular travel.

- ***Downtown and Neighborhoods*** indicates the City's priority in retaining, enhancing, and preserving its historic business district and existing neighborhoods and the development of new areas that provide neighborhood services.

- ***Relationship of New Development*** emphasizes the importance of ensuring that the forms of new development cohere with those of the existing community, and that all portions of the City are linked and compatible with one another.

- ***Jobs/Housing and Economic Development*** establishes policies that support the fiscal viability of the City, focusing on jobs and housing for residents and a prosperous business climate.

- ***Community Involvement and Inter-jurisdictional Cooperation*** addresses the need for community and regional involvement on major development applications, City studies, and regional issues such as air quality, solid waste and transportation. Community involvement will be broad and inclusive and continue to engage the Roseville Coalition of Neighborhood Associations.

GOALS AND POLICIES

COMMUNITY FORM: GENERAL

Goal LU1 **Define Roseville's overall identity and character by the following attributes:**

a. Distinction from other communities through the quality of development and the high level of services provided to citizens.

b. **A commitment to preserving its small-town attributes and cultural heritage and a dedication to promoting a strong sense of community, while preserving individual neighborhoods and promoting a prosperous business community.**

c. **Continuing to be a family-oriented community that offers opportunities to pursue various lifestyles.**

d. **Residential development that includes clusters of high to low densities balanced with large expanses of open space.**

e. **Ensuring high standards of public safety.**

Policy LU1.1 *Ensure high-quality development in new and existing development areas, as defined through specific plans, the development review process, and the Community Design Guidelines.*

Policy LU1.2 *Through both public and private efforts, develop clearly defined entries at major entrances into the City through the use of open space, landscaping, signage, and other distinctive elements as a way of defining the City's boundaries and identity.*

Policy LU1.3 *Continue to provide a full range of public services and maintain high levels of service for public facilities, services, transportation, open space, and parks and recreation.*

Policy LU1.4 *Promote a diversity of residential living options (e.g. density ranges, housing types, affordability ranges), while ensuring community compatibility and well-designed residential development.*

Policy LU1.5 *Promote land use patterns that result in the efficient use of urban lands and preservation of open space, as specified in the Open Space and Conservation Element.*

Policy LU1.6 *Through development approvals and City programs (e.g., revitalization, Capital Improvement Program, parks and recreation programs, etc.), ensure that all portions of the community are linked and integrated.*

Policy LU1.7 *Promote land use patterns that result in the dispersion of secondary or satellite services including libraries, schools, parks, public meeting places, and commercial uses throughout the community through the establishment of neighborhood centers.*

COMMUNITY FORM: DEVELOPMENT PATTERNS, TRANSPORTATION, AND AIR QUALITY/GREENHOUSE GAS EMISSIONS

Goal LU2 **Achieve a community form that supports convenient and safe pedestrian, bicycle, and transit access.**

Policy LU2.1 *Promote development patterns that support a variety of transportation modes and accommodate pedestrian mobility.*

Policy LU2.2 *Allow mixed-use development that integrates residential and non-residential land uses, so that residents may easily walk or bike to shopping, services, employment, and leisure activities.*

Policy LU2.3 *Concentrate higher-intensity uses and appropriate support uses in Pedestrian Districts and within close proximity of transit and bikeway corridors, as identified in the Transit Master Plans and Bicycle Master Plan. Public uses, such as parks, plazas, public buildings, community centers, schools, and/or libraries, should be easily accessible to the public.*

Policy LU2.4 *Promote and encourage the location of employee services, such as child care, restaurants, banking facilities, convenience markets, and other daily needs within major employment centers for the purpose of reducing mid-day vehicle trips.*

Policy LU2.5 *Where feasible, improve existing developed areas to create better pedestrian, bicycle, and transit accessibility.*

Policy LU2.6 *Require proposed neighborhood-serving uses (e.g. neighborhood commercial uses, day care, parks, schools, and other community facilities and services) to be physically linked with adjacent residential neighborhoods through multi-modal transportation connections.*

COMMUNITY FORM: DOWNTOWN AND REVITALIZATION

Goal LU3.1 In partnership with private interests, the City of Roseville will continue to promote a vibrant town center offering government services, social and cultural activities, and commercial opportunities in Downtown Roseville. Roseville will also encourage the creation of additional social, cultural and commercial satellite opportunities throughout the community.

Goal LU3.2 Through the designation of special study areas and revitalization efforts, the City of Roseville will preserve, revitalize, and enhance its business districts, existing neighborhoods, and mixed-use corridors.

Policy LU3.1 *Create and maintain a strong and identifiable Downtown that offers the surrounding community a cluster of municipal offices and services, commercial, retail, and office uses, higher education opportunities, and higher-density residential uses, consistent with the Downtown Specific Plan.*

Policy LU3.2 *Facilitate population and economic growth in areas having the potential for revitalization*

Policy LU3.3 *Direct resources to facilitate revitalization of Downtown, neighborhoods in the Infill Area, and mixed-use corridors.*

Policy LU3.4 *Encourage infill development and reinvestment that:*

- *Upgrades the quality and enhances the character of existing areas;*
- *Enhances the mix of land uses in proximity to one another so that more households can access services, recreation, and jobs without the use of a car;*
- *Facilitates pedestrian activity and public transit use;*
- *Efficiently utilizes and does not overburden existing services and infrastructure; and*

- *Results in land use patterns and densities that provide the opportunity for the construction of a variety of housing types that are affordable to all income groups.*

Policy LU3.5 *Promote active citizen involvement in defining, maintaining, and improving the character and identity of existing neighborhoods, including consideration of cultural and artistic enhancements.*

Policy LU3.6 *Support the maintenance and rehabilitation of existing residential units within established neighborhoods.*

Policy LU3.7 *Identify locations where special study is necessary to develop strategies for preserving, enhancing, and revitalizing existing developed areas.*

COMMUNITY FORM: NEW DEVELOPMENT

Goal LU4 Design new development to be integrated, connected, and related to existing development areas within the City.

Policy LU4.1 *Require new development areas and associated community-wide facilities (open space resources, parks, libraries, etc.) to be linked and oriented to existing developed areas of the community through road networks, public transit systems, open space systems, bikeway and pedestrian systems, and other physical connections.*

Policy LU4.2 *Encourage a development pattern that is contiguous with existing developed areas of the City.*

COMMUNITY FORM: JOBS/HOUSING AND ECONOMIC DEVELOPMENT

Goal LU5.1 Roseville will strive to be a complete community with a mix of land uses, housing types, and job opportunities that meet the diverse needs of its existing and future residents and businesses.

Goal LU5.2 Roseville will promote and encourage the availability of a variety of goods and services and retain a positive business climate in the City.

Policy LU5.1 *Implement a land use mix and pattern of development that provides linkages between residents' jobs and local employment-generating uses, facilitates a match between the number and type of local jobs and the local labor force, and maintains the fiscal viability of the City.*

Policy LU5.2 *Support density bonuses in the construction of affordable housing, in accordance with the Density Bonus Ordinance and the Housing Element, to promote affordable housing options in areas particularly in areas where with few such housing opportunities and where employment centers exist or are planned.*

Policy LU5.3 *Consider the fiscal impacts to the City from projects proposing a General Plan land use change.*

Policy LU5.4 *The City may approve a project that is identified as having a negative fiscal impact on the City if overriding findings are made that the project benefits outweigh its impacts. Such benefits may relate to the provision of affordable housing, significant open space or recreation facilities, job creation, infill development near transit service, or other public benefits.*

Policy LU5.5 *Uphold the City's Affordable Housing Goal by requiring an affordable housing target for projects seeking a General Plan Amendment, Specific Plan Amendment, and/or rezoning to a residential designation proposing 25 or more new dwelling units. For these projects, the target is for a minimum of 10% of all new housing units to cost no more than 30% of the total monthly income of very low-, low-income, and moderate-income households (the City also uses the term "middle" in certain Specific Plans to refer to moderate-income households earning no more than 100% of the Area Median Income- AMI). The breakdown of the affordable units will be, at a minimum, 40% for rental to very low- and 40% for rental to low-income households. The remaining 20% may be reserved for moderate-income purchase (which will be priced to be affordable to households earning 95% of the Area Median Income) or may be distributed equally among the rental obligations, as approved by the City. Variations in affordable housing ratios may be approved through a Development Agreement where the following criteria are met:*

- *A need has been identified for a specific affordable housing type (very low-, low- or moderate-income) and the project meets this need;*
- *The project does not rely on or obtain City subsidies; and*
- *Units proposed within these criteria would allow for individuals to stay within their units as their future income grows.*

Policy LU5.6 *Maintain land use patterns, intensities, and densities that ensure an adequate supply of land for office, commercial, industrial, and other employment-generating development.*

Policy LU5.7 *Support activities that attract employment uses to the City, as identified in the Economic Development Strategy.*

COMMUNITY FORM: COMMUNITY INVOLVEMENT AND INTER-JURISDICTIONAL COOPERATION

Goal LU6.1 Roseville recognizes its role within the Sacramento and Placer County region and is dedicated to exploring regional solutions to regional issues.

Goal LU6.2 Provide inclusive community engagement opportunities for individuals and community groups to produce timely and meaningful input leading to proactive, consensus-driven actions by the City and its partners.

Policy LU6.1 *Encourage active involvement by individuals and citizens in the planning process through ongoing public participation opportunities and informational programs.*

Policy LU6.2 *For major development proposals (e.g. major General Plan amendments, adoption of specific plans and amendments), encourage and provide public participation opportunities at early stages in the process.*

Policy LU6.3 *Coordinate and take a lead role, where feasible, with local, state, federal, and other agencies on regional issues of importance, including but not limited to air quality, climate change mitigation and resiliency, transportation, water supply, sewage treatment, solid waste disposal and recycling, flood control, hazardous waste management, resource protection, and transit.*

Policy LU6.4 *To the extent feasible, coordinate land use planning and public improvements with neighboring jurisdictions.*

Policy LU6.5 *Encourage early consultation with adjacent jurisdictions and refer development proposals that may have an impact to these jurisdictions to the respective agencies for their review and comment. Respond and comment on development proposals in other jurisdictions that may have an impact on Roseville to minimize such impacts and ensure consistency and compatibility with existing and planned development in the City.*

COMMUNITY DESIGN

Design influences the aesthetics, character, desirability, and function of a community. Roseville, through its development review process, promotes high-quality design that balances aesthetic and functional considerations; integrates the natural and built environments; and creates inviting, convenient, safe, and comfortable human-scale connections between different land uses.

The emphasis of the Community Design component of this Element is on presenting a design framework that reflects the City's goal of high-quality, community-wide design. To assist in achieving this goal, the City has developed policies that address aesthetics and function, the integration of the built and the natural environments, art in public places, and community character. The application of these design principles will help to establish an aesthetically pleasing city and a distinct community identity.

The goals and policies in this Element will be implemented through the application of the City's Community Design Guidelines. The Guidelines provide detailed standards that establish common design elements and concepts to be used in the design and review of new development proposals in Roseville. The intent of the Guidelines is to ensure consistent quality, while supporting flexibility and the ability to provide unique solutions that fulfill the intent of the Guidelines through alternative means. The City anticipates that the Community Design Guidelines will need to be updated periodically to implement the General Plan's direction in a dynamic regulatory and economic environment. The design concepts contained in this Element, and further refined by the Community Design Guidelines, indicate Roseville's desire to create a City that has a distinct character notable for its high-quality design.

GOALS AND POLICIES

COMMUNITY DESIGN

Goal LU7.1 **Achieve a consistent level of high-quality aesthetic and functional design through the development of, and adherence to superior design concepts and principles, as defined in the Community Design Guidelines.**

Goal LU7.2 **Encourage, promote, and support the maintenance and expansion of a wide range of programs that serve to increase public understanding, appreciation, and enjoyment of cultural and artistic forms, and the display of artistic expression in public spaces to contribute to the cultural experience and the sense of place and community.**

Goal LU7.3 **Encourage the planning and building of a city that sensitively integrates open space and natural resources, and promotes compatibility within and between the natural and the urban environments.**

Goal LU7.4 Emphasize the preservation and enhancement of historically and culturally significant buildings, native oak trees, woodlands, and other significant features, as a primary element in defining Roseville's community character.

Policy LU7.1 *Through the design review process, apply design standards that promote the use of high-quality building materials, architectural and site designs, landscaping signage, and amenities.*

Policy LU7.2 *Continue to develop and apply design standards that result in efficient site and building designs, pedestrian-friendly projects that stimulate the use of alternative modes of transportation, and compatibility between adjacent developments.*

Policy LU7.3 *Encourage designs that strike a balance between the incorporation of aesthetic and development requirements, and the economic considerations associated with development.*

Policy LU7.4 *Promote flexibility in the design review process to achieve design objectives, and encourage projects with innovative, unique, and creative architectural style and design.*

Policy LU7.5 *Encourage, promote, and support art in public spaces and programs to enhance the design of the City.*

Policy LU7.6 *Encourage project designs that place a high priority and value on open space, and the preservation, enhancement and incorporation of natural resources and other features including consideration of topography, vegetation, wetlands, and water courses.*

Policy LU7.7 *Encourage and promote the preservation of historic and/or unique, culturally and architecturally significant buildings, features, and important visual resources.*

Policy LU7.8. *The location and preservation of native oak trees and oak woodlands shall be a primary factor in determining site design, building location, grading, construction and landscaping, and in establishing the character of projects through their use as a unifying element in both new and existing development.*

Policy LU7.9 *Control artificial lighting to avoid spill-over lighting onto adjacent properties. Use anti-reflective architectural materials and coatings to prevent glare.*

GROWTH MANAGEMENT

In general, growth management can be defined as certain actions taken by local government to influence the location, composition, rate, or total amount of development in a community. The City manages growth to help coordinate development opportunities and constraints, as dictated by the physical, social, and economic characteristics of the areas planned for development, for the City as a whole.

The City recognizes two primary candidates for growth potential. The first is within existing developed parts of the City's corporate boundaries through reinvestment in the community. The second is either inside or outside City limits through new development of "greenfield" areas (non-urbanized or vacant land). "Greenfield" development has been the focus of the City's growth management efforts, but as the City matures and approaches buildout, infill development and reinvestment have an increasing role in meeting the City's needs for housing and economic development.

Inherent in the term "growth management" is the assumption that there will be growth. With growth, there are many potential tangible and intangible benefits, as well as impacts. The right type of growth can be beneficial to the community's economy and quality of life through additional employment opportunities, housing availability, improved delivery and variety of services, opportunity for greater access to destinations without the use of a car, enhanced efficiency of public service provision and fiscal sustainability, and increased commercial, social and cultural opportunities. At the same time, if growth is not well planned and managed, it can have negative impacts on the community. These may include increased reliance on the automobile for reaching destinations, public health effects related to air pollutant emissions, increased costs of construction and maintenance for public infrastructure, impacts to environmental resources, loss of community character, loss of the sense of safety and security, and other adverse effects.

Growth Management Principles

The challenge is to accommodate and manage growth that balances the positive and negative impacts in a fashion that results in an overall benefit to the community. This is best accomplished proactively. To this end, the overarching principles that guide the City's approach to managing growth include:

- Maintain quality of life through a balance of land uses;
- Maintain the City's fiscal health in the long term;
- Continue to add and enhance the value of the built environment;
- Maintain and further define the City's physical form through creation of an open space transition area along the western interface with County lands.

In the recent past, the City has used the Specific Plan process, with appropriate updates to the General Plan, to manage and direct growth in a way that is relatively more comprehensive, compared to a project-by-project approach. This approach allows the City to plan for and finance necessary infrastructure and facilities, address area-wide development opportunities and constraints, and identify key growth management issues that may not be apparent in the context of individual project analysis.

Growth Management Visioning Committee

In 2004, the City Council appointed a 20-member Growth Management Visioning Committee. The Committee was charged with reviewing growth management policies and developing a vision and policy recommendations to guide the City's long-range physical development. The Committee's Vision includes 11 characteristics that define the preferred future:

- A Distinct Community Identity;
- Well-Planned Neighborhoods and Communities;
- A Vibrant Downtown;
- A Balance Between New Growth and Revitalization;
- Abundant Parks and Open Space;
- A Diverse Range of Housing Types;
- Mobility and Transportation Choices;
- Economic Vitality;
- Convenient Access to Higher Education;
- Sustainable Environmental Resources and Infrastructure;
- Innovative Design and Land Use Planning; and,
- On-going Partnerships with Neighboring Communities.

The Committee recommended three additional policy concepts: Maintain Roseville's Identity and Character; Promote Stakeholder Involvement and Ensure Accountability; and Work Aggressively to Address Traffic Generated Outside of Roseville. Further, the Committee recommended that the following Policy Concepts be used to evaluate and influence potential growth that could affect the City within its current boundaries, within its Sphere of Influence, and in unincorporated land where the development will impact the City:

- Maintain an Open Space Transition Buffer;
- Ensure Fiscal Sustainability;
- Encourage High-Quality Infrastructure, Programs, and Services;
- Promote Comprehensive Large-Scale Planning;
- Use Performance-Based Standards to Manage Growth;
- Ensure Community Benefit;
- Maintain Roseville's Identify and Character;
- Promote Stakeholder Involvement and Ensure Accountability; and,
- Work Aggressively to Address Traffic Impacts Generated Outside of Roseville.

Guiding Principles for Growth

The City Council adopted a set of 13 Guiding Principles for new development areas in May of 2001. The intent of the Guiding Principles is to supplement General Plan policies by creating guidelines for new development proposals for areas located outside of City limits. They are intended to articulate the City's expectations relating to any potential development proposals and are to be applied as performance

measures for annexation proposals. These principles are contained as policies of this Growth Management component.

The Growth Management component focuses on the development of performance standards rather than artificial timelines or growth rates for future development. This approach has resulted in goals and policies that emphasize performance (e.g., maintaining levels of service, providing adequate park acreage, financing needed school facilities, etc.) rather than on specific dates, growth rates, or build-out of existing plans. The performance standards provide the criteria for planning and managing growth by requiring the mitigation of growth impacts and the provision of both tangible and intangible benefits to the community.

GOALS AND POLICIES

GROWTH MANAGEMENT - GENERAL

Goal LU8.1 **Proactively manage and plan for growth.**

Goal LU8.2 **Encourage a pattern of development that promotes the efficient and timely provision of urban infrastructure and services, and that preserves valuable natural and environmental resources.**

Goal LU8.3 **Growth shall mitigate its impacts through consistency with the General Plan goals and policies and shall provide a positive benefit to the community.**

Goal LU8.4 **Continue a comprehensive, logical planning process, rather than an incremental, piecemeal approach.**

Goal LU8.5 **Encourage public participation in the development and monitoring of growth management policies and programs.**

Goal LU8.6 **Manage and evaluate growth in a regional context, not in isolation.**

Goal LU8.7 **Potential population growth in Roseville must be based on the long-term carrying capacities and limits of the roadway system, sewer and water treatment facilities, and electrical utility service, as defined in the Circulation Element and the Public Facilities Element.**

Goal LU8.8 **Growth and development must occur at a rate corresponding to the availability of desired facilities' capacity.**

Goal LU8.9 **Growth should be managed to minimize negative impacts to existing businesses and residents within the City.**

Goal LU8.12 **Use growth management as a tool to maintain the City's identity, community form, reputation in the region, to maintain high levels of service for residents, and to influence projects outside the City's boundaries that have the potential to affect the quality of life and/or services that are provided to residents.**

Policy LU8.1 *Growth must provide a strong diversified economic base and a balance between employment and affordable housing.*

Policy LU8.2 *Growth should occur on the basis that projected revenue should be sufficient to meet public costs.*

Policy LU8.3 *Growth shall be managed to ensure that adequate public facilities and services, as defined in the Public Facilities Element, are planned and provided, and public health, safety, and welfare is protected.*

Policy LU8.4 *The City shall accommodate projected population and employment growth in areas where the appropriate level of public infrastructure and services are planned or will be made available concurrent with development.*

Policy LU8.5 *The City shall use the specific plan process to ensure a comprehensive, logical growth process for new development areas (e.g., annexations) or any areas where significant land use changes are considered.*

Policy LU8.6 *The City shall oppose urban density residential, commercial, or industrial development in unincorporated areas unless adequate public facilities and services can be provided and mechanisms to ensure their availability and provision are secured during the land use entitlement process. It is the City's preference that urban development occur within incorporated areas.*

Policy LU8.7 *The City will manage growth in such a way to ensure that significant open space areas will be preserved.*

Policy LU8.8 *Retain and enhance Roseville's identity and character to ensure that Roseville, even as it grows, remains consistent with the Growth Management Visioning Committee's Vision Statement.*

Policy LU8.9 *Work aggressively to address traffic generated outside of Roseville by working in collaboration with neighboring jurisdictions, regional, state, and federal entities to ensure that traffic through Roseville is mitigated by regional solutions. The City will encourage changes in land use mix and community design that promote walking, biking, and transit.*

Policy LU8.10 *In addition to being consistent with the other goals and policies of the General Plan, Specific Plans shall comply with the following:*

a. *Provide a public focal point, community, and/or theme feature. These features shall be specific to each area and be designed to promote and enhance community character. A special feature may include, but is not limited to, a community plaza, central park, or some other type of gathering area; outdoor amphitheater; community garden; regional park with special facilities; sports complex; or cultural facilities.*

b. *Provide entryways at entrances to the City in accordance with the Community Design Guidelines. Where possible, the entryways shall take advantage of and incorporate existing natural resources into the entry treatment. The Specific Plans shall identify the location and treatment of the entryways, and shall consider the use of open space, oak regeneration areas, signage, and/or special landscaping to create a visual edge or buffer that provides a strong definition to entryways into the City.*

c. *The Specific Plan areas shall be planned and oriented to be an integral part of the City consistent with the policies of the Community Form component of this Element.*

d. *Develop design guidelines, specifying screening and a transition between public utilities (e.g. substations, pump stations) and other uses, in conjunction with the public utility departments and agencies. In addition, development along power line and*

pipeline easements shall incorporate design treatment to ensure compatibility and safety. Design guidelines and treatment may include minimum setbacks, building and landscape design standards, and possible limitations on certain types of uses and activities.

e. *Preserve natural resource areas where they exist, and where feasible, along new roadways. Such roadways may create a public boundary between the resource area and other uses. The Specific Plans shall identify locations and standards for the preservation of natural resources along roadways, and shall identify sources of financing for such road segments.*

GROWTH MANAGEMENT – NEW GROWTH AREAS

Goal LU9.10 Growth should be planned in a way that addresses the appropriate interface between City and County lands.

Goal LU9.11 New growth should be designed to meet the Guiding Principles for Growth.

Goal LU9.13 New development shall be consistent with the City's desire to establish an edge along the western boundary of the City that fosters: a physical separation from County lands through a system of connected open space; a well-defined sense of entry to City from the west; opportunities for habitat preservation and recreation; and view preservation corridors that provide an aesthetic and recreational resource for residents.

Policy LU9.1 *The City may consider modification to the General Plan for new growth where adequate public services and facilities and preservation and conservation of natural resources can be provided in conjunction with the following:*

a. *Additional land to accommodate demand for housing or employment uses*

b. *Projects that will provide community benefits, including, but not limited to the provision of public transit services*

c. *Ensure that growth provides benefits to the community as a whole and weigh community benefits against public costs*

Policy LU9.2 *Prior to the consideration of any General Plan amendment to modify land use designations or expand the City's boundaries or Sphere of Influence, the City shall complete or cause to be completed the following City-wide studies/plans:*

a. *Long-range transit plan*

b. *Fiscal studies*

c. *Public facilities and services capacity study*

d. *Transportation system capacity study*

e. *Utility capacity and supply (i.e., water, sewer, drainage, and electric)*

The studies shall define overall holding capacities and identify additional performance standards that will need to be met to ensure the achievement of the goals and policies of the General Plan.

Policy LU9.3 *The City shall require the submittal of a specific plan for the consideration of new development areas or any areas where a significant modification to the General Plan land use allocation is proposed. The specific plan process shall, at a minimum, include the following:*

a. *General Plan Amendment*

b. *Development Agreement*

c. *Zoning Entitlements*

d. *Environmental Impact Report*

e. *Phasing, Financing, Capital Improvements Plan*

f. *Fiscal Impact Analysis*

Policy LU9.4 *Specific plans will be evaluated based on the following minimum criteria:*

a. *Government Code requirements for specific plans*

b. *Demonstrated consistency with General Plan goals and policies*

c. *Demonstrated consistency with the identified City-wide studies and holding capacity analyses*

d. *Justification for proposed specific plan boundaries*

e. *Community benefit (e.g., affordable housing, significant open space or recreation facilities, job creation, infill development near transit service).*

f. *Ability to substantially mitigate impacts*

g. *Impact on the City's growth pattern*

Each specific plan proposal shall include, with its initial submittal, a full analysis of how the plan complies with, and relates to the above factors.

Policy LU9.5 *Apply the City's adopted Guiding Principles for Growth to any new development proposed in and out of City's corporate boundaries that is not already part of an adopted Specific Plan or within the Infill Area:*

1. *Any new development proposal shall, on a stand-alone basis, have an overall net neutral or positive fiscal impact on the City's General Fund Services.*

2. *Any new development proposal shall include logical growth/plan boundaries.*

3. *Any new development proposal shall not create a direct or indirect conflict with the ongoing operations of the Pleasant Grove or Dry Creek Wastewater Treatment Plant operations or any City-owned power generation facilities.*

4. *Any new development proposal shall maintain the integrity of existing neighborhoods and create a sense of place in new neighborhoods.*

5. *Any new development proposal shall include a plan to ensure full funding and maintenance of improvements and services at no cost to existing residents (including increased utility rates). A proposal shall not burden, increase the cost of, or diminish the supply or reliability of public services.*

6. *Any new development proposal shall aid in regional transportation solutions and in right-of-way preservation.*

7. *Any new development proposal that does not have a sufficient supply of surface water shall secure additional supplies above what the City currently has available. New development proposals shall also provide the funding necessary to incorporate the new source of supply into the City's water supply portfolio (surface water, groundwater and recycled water); and new development proposals shall include measures to reduce water demand by implementing the use of conservation best management practices, recycled water, and other off-sets.*

8. *Any new development proposal shall consider development potential within the entire City/County Memorandum of Understanding Area in the design and sizing of infrastructure improvements.*

9. *Any new development proposal shall aid in resolution of regional storm water retention.*

10. *Any new development proposal shall incorporate mechanisms to ensure schools, and, if necessary, new schools, are available to serve residents anticipated for new development and that new development does not adversely affect existing schools.*

11. *Any new development proposal shall include a significant interconnected public open space component/conservation plan consistent with the City of Roseville/U.S. Fish and Wildlife Service Memorandum of Understanding.*

12. *Any new development proposal shall include a public participation component to keep the public informed and solicit feedback throughout the specific plan process.*

13. *Any new development proposal shall provide a community benefit to the City and residents.*

Policy LU9.6 *As new development is proposed in or outside the City's Sphere of Influence, project proponents shall provide a transitional area between City and County lands, through a system of managed interconnecting open space or other buffers, such as separation by arterial roadways.*

Policy LU9.7 *Monitor and participate in development proposals and/or General Plan updates in Placer County to ensure that potential impacts to City residents are minimized, with respect to traffic, service levels, and other quality of life matters.*

Policy LU9.8 *New development proposals to the north and west of the City limits shall meet the objectives and terms of the Memorandum of Understanding between the City of Roseville and the County of Placer.*

Policy LU9.9 *Development proposed on the western edge of the City shall provide a distinctive open space transition to create a physical and visual buffer between the City and County that ensures that the identity and uniqueness of the City and County will be maintained.*

Policy LU9.10 *Consistent with the County/City Memorandum of Understanding, the City shall continue to support and endorse the maintenance of the one-mile buffer zone around landfill operations, as set forth in Policy No. 4.G.11 of the Placer County General Plan. The buffer zone should, consistent with relevant performance criteria, be sufficient to maintain the long-term viability of the landfill, while at the same time protecting City residences from nuisances.*

Policy LU9.11 *Promote stakeholder involvement and ensure accountability between property owners, Placer County, and surrounding jurisdictions on defining and shaping the vision for growth to the west and north of the City.*

GROWTH MANAGEMENT - ANNEXATIONS AND SPHERE OF INFLUENCE

Goal LU10 Evaluate Sphere of Influence amendments and annexations that promote efficient use of land and public service provision and advance General Plan goals.

Policy LU10.1 *The City may initiate studies to investigate the potential of (1) annexing areas within its Sphere of Influence; and (2) expanding its Sphere of Influence boundaries. The studies should be focused on those areas that may affect General Plan goals and policies and would be logically served and planned by the City. The studies shall include the identification, availability, and funding of public services, as well as the costs and impacts to the City and other service providers. Issues to be analyzed include, but are not limited to present and planned land uses, water, sewer, electric, library, parks, schools, circulation, and affordable housing. Based on these studies and resident and property owner input, the City may take steps to annex or expand its Sphere of Influence.*

Policy LU10.2 *The City may consider annexations that:*

- *Are contiguous with City boundaries and provide for a logical expansion of the City;*
- *Create clear and reasonable boundaries;*
- *Are beneficial from a fiscal standpoint to the City and its residents;*
- *Are consistent with state law and Placer County Local Agency Formation Commission (LAFCO) standards and criteria;*
- *Ensure the preservation of open space and agriculture lands; and,*
- *Are consistent with the General Plan.*

Policy LU10.3 *The City may consider expanding its Sphere of Influence to incorporate areas that, in the future, should be logically planned and serviced by Roseville. The City shall consider the following factors, as identified by LAFCO, when making determinations involving Sphere of Influence boundaries:*

- *Present and planned land uses in the area;*
- *Present and probable need for public facilities and services in the area;*
- *Present capacity of public facilities and adequacy of public services;*
- *Existence of any social or economic communities of interest in the area; and,*
- *Open space and agricultural lands.*

Appendix D – AWWA Water Loss Audits

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0

American Water Works Association.
Copyright © 2014, All Rights Reserved.

? Click to access definition
+ Click to add a comment

Water Audit Report for: City of Roseville (3110008)
Reporting Year: 2019 1/2019 - 12/2019

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

Master Meter and Supply Error Adjustments

WATER SUPPLIED

<---------- Enter grading in column 'E' and 'J' ---------->

					Pcnt:	Value:	
Volume from own sources:	7	28,372.970	acre-ft/yr	7		3.744	acre-ft/yr
Water imported:	5	1,264.500	acre-ft/yr	2			acre-ft/yr
Water exported:	3	1,336.300	acre-ft/yr	1			acre-ft/yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: 28,297.426 acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

				Pcnt:	Value:	
Billed metered:	6	26,276.770	acre-ft/yr			
Billed unmetered:	10	132.020	acre-ft/yr			
Unbilled metered:	8	0.080	acre-ft/yr			
Unbilled unmetered:	8	23.320	acre-ft/yr		23.320	acre-ft/yr

Use buttons to select percentage of water supplied OR value

AUTHORIZED CONSUMPTION: ? 26,432.190 acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption) 1,865.236 acre-ft/yr

Apparent Losses

				Pcnt:	Value:	
Unauthorized consumption:		70.744	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	4	265.423	acre-ft/yr	1.00%		acre-ft/yr
Systematic data handling errors:	5	65.692	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: ? 401.858 acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: ? 1,463.378 acre-ft/yr

WATER LOSSES: 1,865.236 acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: ? 1,888.636 acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	9	633.4	miles
Number of active AND inactive service connections:	9	45,395	
Service connection density:		72	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure:	6	83.2	psi

COST DATA

Total annual cost of operating water system:	10	$14,408,821	$/Year	
Customer retail unit cost (applied to Apparent Losses):	9	$1.30	$/100 cubic feet (ccf)	
Variable production cost (applied to Real Losses):	5	$208.00	$/acre-ft	☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 70 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Customer metering inaccuracies
3: Billed metered

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0
American Water Works Association.
Copyright © 2014, All Rights Reserved.

? Click to access definition
+ Click to add a comment

Water Audit Report for: City of Roseville (3110008)
Reporting Year: 2018 1/2018 - 12/2018

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

<---------- Enter grading in column 'E' and 'J' ---------->

Master Meter and Supply Error Adjustments

WATER SUPPLIED

			Pcnt:	Value:	
Volume from own sources:	7	28,312.300 acre-ft/yr	8	1.810	acre-ft/yr
Water imported:	5	1,106.030 acre-ft/yr	1		acre-ft/yr
Water exported:	3	1,123.700 acre-ft/yr	1		acre-ft/yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: 28,292.820 acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

			Pcnt:	Value:	
Billed metered:	5	26,007.220 acre-ft/yr			
Billed unmetered:	10	74.700 acre-ft/yr			
Unbilled metered:	8	47.560 acre-ft/yr			
Unbilled unmetered:	8	22.394 acre-ft/yr		22.394	acre-ft/yr

Use buttons to select percentage of water supplied **OR** value

AUTHORIZED CONSUMPTION: 26,151.874 acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption) 2,140.946 acre-ft/yr

Apparent Losses

			Pcnt:	Value:	
Unauthorized consumption:		70.732 acre-ft/yr	0.25%		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	3	263.180 acre-ft/yr	1.00%		acre-ft/yr
Systematic data handling errors:	5	65.018 acre-ft/yr	0.25%		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: 398.930 acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: 1,742.016 acre-ft/yr

WATER LOSSES: 2,140.946 acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: 2,210.900 acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	9	627.5	miles
Number of active AND inactive service connections:	9	44,467	
Service connection density:		71	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: 6 82.1 psi

COST DATA

Total annual cost of operating water system:	10	$14,859,449	$/Year
Customer retail unit cost (applied to Apparent Losses):	9	$1.17	$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	5	$179.67	$/acre-ft

☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 68 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Customer metering inaccuracies
3: Billed metered

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0
American Water Works Association.
Copyright © 2014, All Rights Reserved.

? Click to access definition
+ Click to add a comment

Water Audit Report for: City of Roseville (3110008)
Reporting Year: 2017 1/2017 - 12/2017

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

<---------- Enter grading in column 'E' and 'J' ---------->

Master Meter and Supply Error Adjustments

WATER SUPPLIED

				Pcnt:	Value:	
Volume from own sources:	7	28,449.624	acre-ft/yr	8	-143.610	acre-ft/yr
Water imported:	5	964.400	acre-ft/yr	1		acre-ft/yr
Water exported:	3	1,207.900	acre-ft/yr	1		acre-ft/yr
WATER SUPPLIED:		**28,349.734**	acre-ft/yr			

Enter negative % or value for under-registration
Enter positive % or value for over-registration

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

				Pcnt:	Value:	
Billed metered:	5	25,483.030	acre-ft/yr			
Billed unmetered:	10	159.840	acre-ft/yr			
Unbilled metered:	n/a		acre-ft/yr			
Unbilled unmetered:	8	23.920	acre-ft/yr		23.920	acre-ft/yr
AUTHORIZED CONSUMPTION:		**25,666.790**	acre-ft/yr			

Use buttons to select percentage of water supplied **OR** value

WATER LOSSES (Water Supplied - Authorized Consumption)

2,682.944 acre-ft/yr

Apparent Losses

				Pcnt:	Value:	
Unauthorized consumption:		70.874	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	3	257.404	acre-ft/yr	1.00%		acre-ft/yr
Systematic data handling errors:	5	63.708	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: **391.986** acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: **2,290.957** acre-ft/yr

WATER LOSSES: **2,682.944** acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: **2,706.864** acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	9	615.0	miles
Number of active AND inactive service connections:	9	43,618	
Service connection density:		71	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure:	5	83.6	psi

COST DATA

Total annual cost of operating water system:	10	$14,825,646	$/Year	
Customer retail unit cost (applied to Apparent Losses):	9	$1.18	$/100 cubic feet (ccf)	
Variable production cost (applied to Real Losses):	5	$112.40	$/acre-ft	☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 67 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Customer metering inaccuracies
3: Billed metered

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0
American Water Works Association.
Copyright © 2014, All Rights Reserved.

? Click to access definition
+ Click to add a comment

Water Audit Report for: City of Roseville
Reporting Year: 2016 1/2016 - 12/2016

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

Master Meter and Supply Error Adjustments

WATER SUPPLIED

<---------- Enter grading in column 'E' and 'J' ---------->

					Pcnt:	Value:	
Volume from own sources:	7	25,813.000	acre-ft/yr	3			acre-ft/yr
Water imported:	3	915.250	acre-ft/yr	1			acre-ft/yr
Water exported:	3	911.700	acre-ft/yr	1			acre-ft/yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: 25,816.550 acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

			Pcnt:	Value:	
Billed metered:	5	22,956.000	acre-ft/yr			
Billed unmetered:	9	212.000	acre-ft/yr			
Unbilled metered:	8	296.200	acre-ft/yr			
Unbilled unmetered:	7	21.880	acre-ft/yr		21.880	acre-ft/yr

Use buttons to select percentage of water supplied OR value

AUTHORIZED CONSUMPTION: 23,486.080 acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption) 2,330.470 acre-ft/yr

Apparent Losses

			Pcnt:	Value:	
Unauthorized consumption:		64.541	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	3	234.871	acre-ft/yr	1.00%	acre-ft/yr
Systematic data handling errors:	5	57.390	acre-ft/yr	0.25%	acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: 356.802 acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: 1,973.668 acre-ft/yr

WATER LOSSES: 2,330.470 acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: 2,648.550 acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	10	600.0	miles
Number of active AND inactive service connections:	8	42,655	
Service connection density:		71	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: 6 86.2 psi

COST DATA

Total annual cost of operating water system:	10	$9,313,891	$/Year	
Customer retail unit cost (applied to Apparent Losses):	8	$1.54	$/100 cubic feet (ccf)	
Variable production cost (applied to Real Losses):	5	$109.00	$/acre-ft	☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 67 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Customer metering inaccuracies
3: Billed metered

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0

American Water Works Association.
Copyright © 2014, All Rights Reserved.

? Click to access definition
+ Click to add a comment

Water Audit Report for: City of Roseville
Reporting Year: 2015 1/2015 - 12/2015

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

<---------- Enter grading in column 'E' and 'J' ---------->

Master Meter and Supply Error Adjustments

WATER SUPPLIED

					Pcnt:	Value:	
Volume from own sources:	7	22,991.000	acre-ft/yr				acre-ft/yr
Water imported:	9	853.500	acre-ft/yr				acre-ft/yr
Water exported:	9	781.900	acre-ft/yr				acre-ft/yr
WATER SUPPLIED:		**23,062.600**	acre-ft/yr				

Enter negative % or value for under-registration
Enter positive % or value for over-registration

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

				Pcnt:	Value:	
Billed metered:	7	20,499.000	acre-ft/yr			
Billed unmetered:	9	222.000	acre-ft/yr			
Unbilled metered:	8	182.000	acre-ft/yr			
Unbilled unmetered:	7	32.080	acre-ft/yr	1.25%	32.080	acre-ft/yr
AUTHORIZED CONSUMPTION:		**20,935.080**	acre-ft/yr			

Use buttons to select percentage of water supplied OR value

				Pcnt:	Value:	
WATER LOSSES (Water Supplied - Authorized Consumption)		**2,127.520**	acre-ft/yr			
Apparent Losses						
Unauthorized consumption:		57.657	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	5	208.899	acre-ft/yr	1.00%		acre-ft/yr
Systematic data handling errors:	5	51.248	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses:		**317.803**	acre-ft/yr
Real Losses (Current Annual Real Losses or CARL)			
Real Losses = Water Losses - Apparent Losses:		**1,809.717**	acre-ft/yr
WATER LOSSES:		**2,127.520**	acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER:		**2,341.600**	acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	10	583.0	miles	
Number of active AND inactive service connections:	8	41,832		
Service connection density:		72	conn./mile main	
Are customer meters typically located at the curbstop or property line?		No		
Average length of customer service line:	10	1.5	ft	(length of service line, beyond the property boundary, that is the responsibility of the utility)
Average operating pressure:	8	78.0	psi	

COST DATA

Total annual cost of operating water system:	8	$5,579,612	$/Year	
Customer retail unit cost (applied to Apparent Losses):	8	$0.72	$/100 cubic feet (ccf)	
Variable production cost (applied to Real Losses):	8	$242.69	$/acre-ft	☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

*** YOUR SCORE IS: 72 out of 100 ***

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Customer metering inaccuracies
3: Billed metered

Appendix E – Proposed Water Loss Standards

Proposed Water Loss Performance Standards

Note: The State Water Board has proposed combined standards for water districts that generally report per other water use efficiency requirements in a combined manner for certain water systems.

Sample combination of standards for water systems reporting in different metrics:

Suppliers with all water systems reporting in gallons per connection per day: Standard in in gallons per connection per day

$$\frac{\text{Standard for system 1} \times \text{Number of connections for system 1} + \text{Standard for system 2} \times \text{Number of connections for system 2}}{\text{Sum total of number of connections for system 1 and system 2}}$$

Suppliers with all water systems reporting in gallons per mile per day: Standard in gallons per mile per day

$$\frac{\text{Standard for system 1} \times \text{Length of mains for system 1} + \text{Standard for system 2} \times \text{Length of mains for system 2}}{\text{Sum total of length of mains for system 1 and system 2}}$$

Suppliers with water systems reporting in a combination of gallons per mile per day and gallons per connection per day:

Standard in gallons per connection per day

$$\frac{\text{Standard for system 1} \times \text{Number of connections for system 1} + \text{Standard for system 2} \times \text{Length of mains for system 2}}{\text{Sum total of number of connections for system 1 and system 2}}$$

Calculated baseline and proposed water loss performance standards

Note: The standards that are combined for certain water districts are in orange text, while the individual system data informing the respective combined standard is in *italics* and grey text in the rows above the standard.

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Adelanto City Of	49.1	N/A	18.5	N/A
Alameda County Water District	21.5	N/A	17.7	N/A
Alco Water Service	15.1	N/A	15.1	N/A
Alhambra City Of	8.6	N/A	8.6	N/A
Amador Water Agency	66.3	N/A	21.0	N/A
American Canyon City Of	30.8	N/A	17.7	N/A
Anaheim City Of	23.5	N/A	19.5	N/A
Anderson City Of	53.4	N/A	16.5	N/A
Antioch City Of	11.9	N/A	11.9	N/A
Apple Valley Ranchos Water Company	23.3	N/A	23.3	N/A
Arcadia City Of	32.1	N/A	18.2	N/A
Arcata City Of	48.7	N/A	20.1	N/A
Arroyo Grande City Of	7.7	N/A	7.7	N/A
Arvin Community Service District	67.9	N/A	14.4	N/A
Atascadero Mutual Water Company	35.9	N/A	35.9	N/A
Atwater City Of	308.8	N/A	11.4	N/A
Azusa Lightand Water	78.5	N/A	13.8	N/A
Bakersfield City Of	19.3	N/A	19.3	N/A
Bakman Water Company	85.3	N/A	15.1	N/A
Banning City Of	63.1	N/A	31.4	N/A
Bear Valley Community Services District	N/A	191.7	N/A	191.7
Beaumont-Cherry Valley Water District	41.0	N/A	20.9	N/A
Bella Vista Water District	N/A	1710.6	N/A	670.4
Bellflower-Somerset Mutual Water Company	12.4	N/A	12.4	N/A
Benicia City Of	46.1	N/A	19.4	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Beverly Hills City Of	30.0	N/A	16.9	N/A
Big Bear Community Services District	12.8	N/A	12.8	N/A
Big Bear Lake City Of	9.5	N/A	9.5	N/A
Blythe City Of	80.3	N/A	15.0	N/A
Brawley City Of	54.8	N/A	12.7	N/A
Brea City Of	15.2	N/A	15.2	N/A
Brentwood City Of	30.5	N/A	14.7	N/A
Buena Park City Of	35.8	N/A	16.4	N/A
Burbank City Of	13.4	N/A	13.4	N/A
Burlingame City Of	19.5	N/A	19.5	N/A
Calaveras County Water District-Ebbetts Pass	*84.8*	*N/A*	*20.9*	*N/A*
Calaveras County Water District-Jenny Lind	*155.9*	*N/A*	*21.3*	*N/A*
Calaveras County Water District	112.6	N/A	21.1	N/A
Calexico City Of	4.2	N/A	4.2	N/A
California American Water Company-Los Angeles Division-Baldwin Hills	*24.6*	*N/A*	*17.5*	*N/A*
California American Water Company-Los Angeles Division-Duarte	*85.9*	*N/A*	*18.5*	*N/A*
California American Water Company-Los Angeles Division-San Marino	*27.4*	*N/A*	*18.1*	*N/A*
California American Water Company-Los Angeles Division	42.3		18.1	
California American Water Company-Monterey District	6.4	N/A	6.4	N/A
California American Water Company-Sacramento District-Antelope	*19.4*	*N/A*	*14.9*	*N/A*
California American Water Company-Sacramento District-Lincoln Oaks	*5.6*	*N/A*	*5.6*	*N/A*

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
California American Water Company-Sacramento District-Parkway	*25.3*	*N/A*	*14.2*	*N/A*
California American Water Company-Sacramento District-Rosemont	*29.4*	*N/A*	*17.8*	*N/A*
California American Water Company-Sacramento District	20.4		13.2	
California American Water Company-San Diego District	25.6	N/A	15.6	N/A
California American Water Company-Ventura District	33.5	N/A	24.5	N/A
California City	N/A	1641.2	N/A	460.4
California Water Service Company Bakersfield-Bakersfield	*74.6*	*N/A*	*17.2*	*N/A*
California Water Service Company Bakersfield-North Garden	*65.7*	*N/A*	*18.5*	*N/A*
California Water Service Company Bakersfield	73.7		17.3	
California Water Service Company Bear Gulch	13.9	N/A	13.9	N/A
California Water Service Company Chico District	28.6	N/A	18.7	N/A
California Water Service Company Dominguez	23.8	N/A	18.4	N/A
California Water Service Company East Los Angeles	4.0	N/A	4.0	N/A
California Water Service Company Hermosa-Redondo	12.4	N/A	12.4	N/A
California Water Service Company Livermore	17.2	N/A	17.2	N/A
California Water Service Company Los Altos-Suburban	24.5	N/A	17.8	N/A
California Water Service Company Marysville	40.6	N/A	15.2	N/A
California Water Service Company Mid Peninsula-San Carlos	*6.2*	*N/A*	*6.2*	*N/A*
California Water Service Company Mid Peninsula-San Mateo	*20.6*	*N/A*	*16.1*	*N/A*
California Water Service Company Mid Peninsula	16.6		13.4	

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
California Water Service Company Oroville	27.4	N/A	18.4	N/A
California Water Service Company Palos Verdes	32.6	N/A	24.0	N/A
California Water Service Company Salinas District	9.2	N/A	9.2	N/A
California Water Service Company Selma	35.1	N/A	14.0	N/A
California Water Service Company South San Francisco	0.6	N/A	0.6	N/A
California Water Service Company Stockton	20.6	N/A	13.5	N/A
California Water Service Company Visalia	10.1	N/A	10.1	N/A
California Water Service Company Westlake	31.7	N/A	24.6	N/A
Camarillo City Of	3.4	N/A	3.4	N/A
Cambria Community Service District	15.5	N/A	15.5	N/A
Camrosa Water District	35.9	N/A	18.8	N/A
Carlsbad Municipal Water District	21.5	N/A	21.5	N/A
Carmichael Water District	36.3	N/A	15.5	N/A
Carpinteria Valley Water District	23.0	N/A	23.0	N/A
Castaic Lake Water Agency Santa Clarita Water Division	47.0	N/A	25.5	N/A
Ceres City Of	14.6	N/A	11.3	N/A
Cerritos City Of	19.9	N/A	19.9	N/A
Chino City Of	37.3	N/A	17.8	N/A
Chino Hills City Of	6.2	N/A	6.2	N/A
Citrus Heights Water District	15.3	N/A	15.3	N/A
Cloverdale City of	30.9	N/A	12.6	N/A
Clovis City Of	7.4	N/A	7.4	N/A
Coachella City Of	31.9	N/A	18.7	N/A
Coachella Valley Water District	43.3	N/A	24.1	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Coalinga City Of	41.0	N/A	20.6	N/A
Coastside County Water District	18.5	N/A	18.5	N/A
Colton City Of	65.5	N/A	16.7	N/A
Contra Costa Water District	21.8	N/A	18.5	N/A
Corcoran City Of	N/A	2415.1	N/A	444.7
Corona City Of	16.1	N/A	16.1	N/A
Covina City Of	30.2	N/A	22.3	N/A
Covina Irrigating Company	37.7	N/A	22.2	N/A
Crescent City	80.2	N/A	21.6	N/A
Crescenta Valley Community Water District	22.4	N/A	22.4	N/A
Crestline Village Water District	4.3	N/A	4.3	N/A
Cucamonga Valley Water District	28.6	N/A	21.2	N/A
Cupertino City Of	25.6	N/A	25.6	N/A
Daly City	12.3	N/A	12.3	N/A
Davis City Of	37.3	N/A	11.1	N/A
Del Oro Water Company	22.0	N/A	22.0	N/A
Delano City Of	56.6	N/A	14.1	N/A
Desert Water Agency	87.1	N/A	21.2	N/A
Diablo Water District	15.5	N/A	15.5	N/A
Dinuba City Of	32.9	N/A	11.6	N/A
Discovery Bay Community Services District	14.0	N/A	14.0	N/A
Downey City Of	27.4	N/A	14.9	N/A
Dublin San Ramon Services District	7.3	N/A	7.3	N/A
East Bay Municipal Utility District	45.6	N/A	21.7	N/A
East Niles Community Services District	47.1	N/A	14.6	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
East Orange County Water District	25.8	N/A	25.8	N/A
East Palo Alto City Of	25.1	N/A	14.2	N/A
East Valley Water District	37.3	N/A	19.8	N/A
Eastern Municipal Water District	28.1	N/A	20.7	N/A
El Centro City Of	128.0	N/A	13.7	N/A
El Dorado Irrigation District	83.2	N/A	42.2	N/A
El Monte City Of	49.9	N/A	13.5	N/A
El Segundo City Of	37.6	N/A	15.4	N/A
El Toro Water District	24.2	N/A	24.2	N/A
Elk Grove Water District	15.9	N/A	15.9	N/A
Elsinore Valley Municipal Water District	20.1	N/A	20.1	N/A
Escondido City Of	22.2	N/A	22.2	N/A
Estero Municipal Improvement District	31.4	N/A	14.1	N/A
Eureka City Of	23.2	N/A	15.0	N/A
Exeter City Of	41.0	N/A	12.6	N/A
Fair Oaks Water District	23.3	N/A	19.6	N/A
Fairfield City Of	73.7	N/A	15.0	N/A
Fallbrook Public Utilities District	62.5	N/A	44.8	N/A
Folsom City Of	133.3	N/A	16.9	N/A
Fortuna City Of	45.4	N/A	26.1	N/A
Fountain Valley City Of	11.9	N/A	11.9	N/A
Fresno City Of	47.7	N/A	13.6	N/A
Fruitridge Vista Water Company	71.4	N/A	10.8	N/A
Fullerton City Of	18.4	N/A	18.4	N/A
Galt City Of	24.4	N/A	11.5	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Garden Grove City Of	22.9	N/A	11.9	N/A
Georgetown Divide Public Utility District	N/A	787.5	N/A	787.5
Gilroy City Of	33.4	N/A	17.0	N/A
Glendale City Of	18.2	N/A	18.2	N/A
Glendora City Of	68.5	N/A	19.8	N/A
Golden State Water Company-Artesia	23.3	N/A	13.3	N/A
Golden State Water Company-Barstow	51.0	N/A	26.0	N/A
Golden State Water Company-Bay Point	24.2	N/A	17.8	N/A
Golden State Water Company-Bell-Bell Gardens	21.7	N/A	13.5	N/A
Golden State Water Company-Claremont	46.9	N/A	23.5	N/A
Golden State Water Company-Cordova	67.3	N/A	12.1	N/A
Golden State Water Company-Culver City	15.2	N/A	15.2	N/A
Golden State Water Company-Florence Graham	25.2	N/A	13.1	N/A
Golden State Water Company-Norwalk	16.3	N/A	13.7	N/A
Golden State Water Company-Orcutt	49.5	N/A	16.7	N/A
Golden State Water Company-Placentia	27.3	N/A	22.5	N/A
Golden State Water Company-San Dimas	16.7	N/A	16.7	N/A
Golden State Water Company-Simi Valley	12.2	N/A	12.2	N/A
Golden State Water Company-South Arcadia	15.2	N/A	15.2	N/A
Golden State Water Company-South San Gabriel	41.7	N/A	13.3	N/A
Golden State Water Company-Southwest	14.7	N/A	14.7	N/A
Golden State Water Company-West Orange	19.5	N/A	19.5	N/A
Goleta Water District	24.3	N/A	24.3	N/A
Great Oaks Water Company Incorporated	22.5	N/A	14.4	N/A
Greenfield City Of	37.3	N/A	13.8	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Groveland Community Services District	14.5	N/A	14.5	N/A
Hawthorne City Of	14.1	N/A	14.1	N/A
Hayward City Of	20.5	N/A	20.5	N/A
Healdsburg City Of	10.4	N/A	10.4	N/A
Helix Water District	18.4	N/A	18.4	N/A
Hemet City Of	5.8	N/A	5.8	N/A
Hesperia Water District	19.2	N/A	19.2	N/A
Hi Desert Water District	23.5	N/A	23.5	N/A
Hillsborough Town Of	26.6	N/A	26.6	N/A
Hollister City Of	30.4	N/A	15.6	N/A
Humboldt Community Services District	59.1	N/A	14.0	N/A
Huntington Beach City Of	14.8	N/A	14.8	N/A
Huntington Park City Of	18.8	N/A	12.4	N/A
Imperial City Of	45.6	N/A	14.8	N/A
Indian Wells Valley Water District	38.7	N/A	16.5	N/A
Indio City Of	30.5	N/A	17.6	N/A
Inglewood City Of	12.6	N/A	12.6	N/A
Irvine Ranch Water District	14.9	N/A	14.9	N/A
Joshua Basin Water District	N/A	507.0	N/A	507.0
Jurupa Community Service District	33.0	N/A	24.8	N/A
Kerman City Of	32.4	N/A	11.2	N/A
Kingsburg City Of	505.3	N/A	12.1	N/A
La Habra City Of	28.0	N/A	20.1	N/A
La Palma City Of	37.2	N/A	15.0	N/A
La Verne City Of	34.2	N/A	18.9	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Laguna Beach County Water District	24.4	N/A	17.5	N/A
Lake Arrowhead Community Services District	20.7	N/A	20.7	N/A
Lake Hemet Municipal Water District	32.2	N/A	19.9	N/A
Lakeside Water District	19.8	N/A	19.8	N/A
Lakewood City Of	12.9	N/A	12.9	N/A
Lamont Public Utility District	79.7	N/A	12.9	N/A
Las Virgenes Municipal Water District	25.1	N/A	25.1	N/A
Lathrop City Of	18.6	N/A	13.3	N/A
Liberty Utilities(Park Water)Corp-Bell Norwalk	*5.8*	*N/A*	*5.8*	*N/A*
Liberty Utilities(Park Water)Corp-Compton Willow	*11.2*	*N/A*	*11.2*	*N/A*
Liberty Utilities(Park Water)Corp-Lynwood	*N/A*	*50.2*	*N/A*	*50.2*
Liberty Utilities (Park Water) Corp			6.5	
Lincoln Avenue Water Company	21.4	N/A	21.4	N/A
Lincoln City Of	35.2	N/A	23.6	N/A
Linda County Water District	88.1	N/A	14.0	N/A
Livermore City Of	27.8	N/A	16.8	N/A
Livingston City Of	67.4	N/A	11.4	N/A
Lodi City Of	10.6	N/A	10.6	N/A
Loma Linda City Of	62.3	N/A	16.8	N/A
Lomita City Of	17.7	N/A	12.8	N/A
Lompoc City Of	15.9	N/A	15.9	N/A
Long Beach City Of	7.0	N/A	7.0	N/A
Los Angeles City Department Of Water And Power	36.9	N/A	33.0	N/A
Los Angeles County Waterworks District29-Malibu&Marina Del Rey	26.7	N/A	26.7	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Los Angeles County Waterworks District40-Antelope Valley	23.3	N/A	20.5	N/A
Los Banos City Of	83.6	N/A	11.5	N/A
Lynwood City Of	22.3	N/A	12.3	N/A
Madera City Of	3.5	N/A	3.5	N/A
Mammoth Community Water District	26.6	N/A	26.6	N/A
Manhattan Beach City Of	3.6	N/A	3.6	N/A
Manteca City Of	22.3	N/A	12.6	N/A
Marin Municipal Water District	24.5	N/A	24.5	N/A
Marina Coast Water District	30.6	N/A	17.4	N/A
Martinez City Of	57.5	N/A	20.3	N/A
Mc Kinleyville Community Services District	19.5	N/A	15.5	N/A
Menlo Park City Of	59.2	N/A	19.3	N/A
Merced City Of	41.9	N/A	11.4	N/A
Mesa Water District	18.0	N/A	18.0	N/A
Mid-Peninsula Water District	14.8	N/A	14.8	N/A
Millbrae City Of	28.4	N/A	17.8	N/A
Milpitas City Of	35.0	N/A	23.5	N/A
Mission Springs Water District	48.1	N/A	19.2	N/A
Modesto City Of	80.9	N/A	14.7	N/A
Monrovia City Of	17.9	N/A	17.9	N/A
Monte Vista Water District	67.3	N/A	21.1	N/A
Montebello Land And Water Company	38.9	N/A	15.3	N/A
Montecito Water District	33.7	N/A	33.7	N/A
Monterey Park City Of	23.6	N/A	18.4	N/A
Morgan Hill City Of	30.4	N/A	17.7	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Morro Bay City Of	2.1	N/A	2.1	N/A
Moulton Niguel Water District	24.7	N/A	24.7	N/A
Mountain House Community Services District	44.9	N/A	14.8	N/A
Mountain View City Of	18.9	N/A	16.4	N/A
Myoma Dunes Mutual Water Company	47.6	N/A	19.8	N/A
Napa City Of	24.9	N/A	16.2	N/A
Nevada Irrigation District-E George	*58.7*	*N/A*	*28.4*	*N/A*
Nevada Irrigation District-Lake Wildwood	*13.5*	*N/A*	*13.5*	*N/A*
Nevada Irrigation District-Loma Rica	*28.1*	*N/A*	*28.1*	*N/A*
Nevada Irrigation District	37.8	N/A	24.9	N/A
Newhall County Water District	36.2	N/A	27.5	N/A
Newman Cityof	61.7	N/A	11.0	N/A
Newport Beach City Of	26.2	N/A	18.4	N/A
Nipomo Community Service District	N/A	755.7	N/A	755.7
Norco City Of	29.3	N/A	24.9	N/A
North Coast County Water District	13.0	N/A	13.0	N/A
North Marin Water District	8.5	N/A	8.5	N/A
North Tahoe Public Utilities District	64.5	N/A	26.9	N/A
Norwalk City Of	0.4	N/A	0.4	N/A
Oakdale City Of	34.6	N/A	11.0	N/A
Oceanside City Of	15.8	N/A	15.8	N/A
Oildale Mutual Water Company	12.2	N/A	12.2	N/A
Olivehurst Public Utilities District	*48.2*	*N/A*	*13.8*	*N/A*
Olivehurst Public Utilities District-Plumas Lake	*51.7*	*N/A*	*13.5*	*N/A*
Olivehurst Public Utilities District	49.4	N/A	13.7	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Olivenhain Municipal Water District	36.2	N/A	36.2	N/A
Ontario City Of	23.0	N/A	23.0	N/A
Orange City Of	31.1	N/A	21.6	N/A
Orangevale Water Company	29.6	N/A	16.4	N/A
Orchard Dale Water District	32.3	N/A	13.7	N/A
Otay Water District	15.9	N/A	15.9	N/A
Oxnard City Of	31.3	N/A	17.0	N/A
Padre Dam Municipal Water District	6.6	N/A	6.6	N/A
Palmdale Water District	44.7	N/A	19.8	N/A
Palo Alto City Of	13.4	N/A	13.4	N/A
Paradise Irrigation District	20.9	N/A	20.9	N/A
Paramount City Of	68.5	N/A	18.9	N/A
Pasadena City Of	31.8	N/A	19.0	N/A
Paso Robles City Of	11.0	N/A	11.0	N/A
Patterson City Of	69.4	N/A	12.6	N/A
Petaluma City Of	23.7	N/A	13.4	N/A
Phelan Pinon Hills Community Services District	N/A	819.7	N/A	819.7
Pico Rivera City Of	10.0	N/A	10.0	N/A
Pico Water District	10.3	N/A	10.3	N/A
Pismo Beach City Of	11.8	N/A	11.8	N/A
Pittsburg City Of	24.9	N/A	15.4	N/A
Placer County Water Agency-Auburn Bowman	*56.9*	*N/A*	*19.9*	*N/A*
Placer County Water Agency-Foothill	*47.0*	*N/A*	*20.2*	*N/A*
Placer County Water Agency	49.5	N/A	20.1	N/A
Pleasanton City Of	49.2	N/A	18.9	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Pomona City Of	25.6	N/A	21.2	N/A
Port Hueneme City Of	8.6	N/A	8.6	N/A
Porterville City Of	47.2	N/A	14.6	N/A
Poway City Of	37.4	N/A	31.8	N/A
Quartz Hill Water District	19.3	N/A	19.3	N/A
Rainbow Municipal Water District	N/A	718.5	N/A	718.5
Ramona Municipal Water District	18.4	N/A	18.4	N/A
Rancho California Water District	41.1	N/A	36.6	N/A
Red Bluff City Of	14.3	N/A	14.3	N/A
Redding City Of	57.1	N/A	23.0	N/A
Redlands City Of	46.8	N/A	24.7	N/A
Redwood City	23.6	N/A	14.5	N/A
Reedley City Of	155.1	N/A	11.9	N/A
Rialto City Of	21.2	N/A	21.2	N/A
Rincon Del Diablo Municipal Water District	31.7	N/A	31.7	N/A
Rio Linda-Elverta Community Water District	37.6	N/A	12.3	N/A
Rio Vista City Of	22.3	N/A	15.0	N/A
Riverbank City Of	19.3	N/A	12.9	N/A
Riverside City Of	54.8	N/A	24.0	N/A
Riverside Highland Water Company	10.5	N/A	10.5	N/A
Rohnert Park City Of	27.0	N/A	13.3	N/A
Rosamond Community Service District	27.2	N/A	22.1	N/A
Roseville City Of	41.0	N/A	22.3	N/A
Rowland Water District	18.6	N/A	18.6	N/A
Rubidoux Community Service District	55.8	N/A	20.5	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Rubio Canyon Land And Water Association	22.4	N/A	18.6	N/A
Sacramento City Of	38.2	N/A	12.0	N/A
Sacramento County Water Agency	54.2	N/A	15.6	N/A
Sacramento Suburban Water District	22.1	N/A	15.1	N/A
San Bernardino City Of	47.6	N/A	21.8	N/A
San Bernardino County Service Area64Spring Valley Lake	69.9	N/A	17.1	N/A
San Bernardino County Service Area70J Oak Hills	N/A	1040.5	N/A	767.2
San Bruno City Of	17.7	N/A	17.7	N/A
San Buenaventura City Of(Ventura)	19.9	N/A	19.9	N/A
San Clemente City Of	36.4	N/A	17.9	N/A
San Diego City Of	31.7	N/A	25.1	N/A
San Dieguito Water District	23.5	N/A	21.0	N/A
San Fernando City Of	28.7	N/A	17.2	N/A
San Francisco Public Utilities Commision	24.9	N/A	18.3	N/A
San Gabriel County Water District	24.5	N/A	18.0	N/A
San Gabriel Valley Water Company	21.2	N/A	18.5	N/A
San Gabriel Valley Water Company Fontana Division	40.4	N/A	21.1	N/A
San Jacinto City Of	39.7	N/A	20.1	N/A
San Jose City Of	38.0	N/A	23.0	N/A
San Jose Water Company	24.0	N/A	18.8	N/A
San Juan Capistrano City Of	13.1	N/A	13.1	N/A
San Juan Water District	77.1	N/A	19.4	N/A
San Lorenzo Valley Water District	49.2	N/A	23.6	N/A
San Luis Obispo City Of	27.3	N/A	17.6	N/A
Santa Ana City Of	13.8	N/A	13.8	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Santa Barbara City Of	27.4	N/A	27.4	N/A
Santa Clara City Of	25.6	N/A	15.4	N/A
Santa Cruz City Of	18.5	N/A	18.5	N/A
Santa Fe Irrigation District	53.2	N/A	22.9	N/A
Santa Fe Springs City Of	31.0	N/A	17.8	N/A
Santa Margarita Water District	16.2	N/A	16.2	N/A
Santa Maria City Of	11.2	N/A	11.2	N/A
Santa Monica City Of	2.2	N/A	2.2	N/A
Santa Paula City Of	10.8	N/A	10.8	N/A
Santa Rosa City Of	16.3	N/A	16.3	N/A
Scotts Valley Water District	19.9	N/A	19.9	N/A
Seal Beach City Of	26.3	N/A	15.4	N/A
Shafter City Of	62.2	N/A	14.8	N/A
Shasta Lake City Of	24.0	N/A	24.0	N/A
Sierra Madre City Of	76.3	N/A	27.2	N/A
Signal Hill City Of	18.6	N/A	18.6	N/A
Soledad City Of	17.6	N/A	10.7	N/A
Sonoma City Of	22.8	N/A	16.6	N/A
Soquel Creek Water District	13.3	N/A	13.3	N/A
South Coast Water District	8.1	N/A	8.1	N/A
South Feather Waterand Power	57.0	N/A	30.4	N/A
South Gate City Of	11.2	N/A	11.2	N/A
South Pasadena City Of	30.1	N/A	18.6	N/A
South Tahoe Public Utility District	71.5	N/A	23.0	N/A
Stockton City Of	35.5	N/A	14.7	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Suburban Water Systems-San Jose Hills	16.8	N/A	16.8	N/A
Suburban Water Systems-Whittier-La Mirada	22.7	N/A	18.4	N/A
Suisun-Solano Water Authority	47.1	N/A	12.3	N/A
Sunny Slope Water Company	27.2	N/A	16.2	N/A
Sunnyslope Community Water District	14.8	N/A	14.8	N/A
Sunnyvale City Of	20.6	N/A	17.1	N/A
Susanville City Of	59.5	N/A	19.5	N/A
Sweetwater Authority	15.4	N/A	15.4	N/A
Sweetwater Springs Water District	29.4	N/A	19.6	N/A
Tehachapi City Of	46.1	N/A	19.5	N/A
Thousand Oaks City Of	14.1	N/A	14.1	N/A
Torrance City Of	6.7	N/A	6.7	N/A
Trabuco Canyon Water District	20.2	N/A	20.2	N/A
Tracy City Of	39.3	N/A	15.4	N/A
Triunfo Sanitation District-Oak Park Water Service	1.6	N/A	1.6	N/A
Truckee-Donner Public Utilities District	63.1	N/A	23.1	N/A
Tulare City Of	18.8	N/A	11.2	N/A
Tuolumne Utilities District-Sonora Jamestown	*75.7*	*N/A*	*25.6*	*N/A*
Tuolumne Utilities District-Upper Basin	*31.6*	*N/A*	*21.7*	*N/A*
Tuolumne Utilties District	56.1	N/A	23.8	N/A
Turlock City Of	58.0	N/A	13.2	N/A
Tustin City Of	37.4	N/A	11.3	N/A
Twentynine Palms Water District	31.3	N/A	27.0	N/A
Ukiah City Of	38.3	N/A	21.2	N/A
Upland City Of	25.2	N/A	25.2	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Vacaville City Of	28.3	N/A	19.5	N/A
Valencia Water Company	30.2	N/A	26.6	N/A
Vallecitos Water District	35.1	N/A	35.1	N/A
Vallejo City Of	57.9	N/A	14.9	N/A
Valley Center Municipal Water District	N/A	834.6	N/A	834.6
Valley County Water District	12.8	N/A	12.8	N/A
Valley Of The Moon Water District	29.0	N/A	15.2	N/A
Valley Water Company	13.4	N/A	13.4	N/A
Vaughn Water Company	31.2	N/A	12.8	N/A
Ventura County Waterworks District No01-Moorpark	35.5	N/A	21.7	N/A
Ventura County Waterworks District No08-Simi Valley	13.4	N/A	13.4	N/A
Vernon City Of	N/A	5234.6	N/A	630.2
Victorville Water District	53.6	N/A	26.5	N/A
Vista Irrigation District	23.8	N/A	23.8	N/A
Walnut Valley Water District	28.3	N/A	28.3	N/A
Wasco City Of	15.3	N/A	12.4	N/A
Watsonville City Of	20.2	N/A	15.0	N/A
West Kern Water District	N/A	5110.3	N/A	506.2
West Sacramento City Of	236.0	N/A	12.8	N/A
West Valley Water District	62.5	N/A	18.1	N/A
Westborough Water District	8.1	N/A	8.1	N/A
Western Municipal Water District Of Riverside	64.6	N/A	32.5	N/A
Westminster City Of	14.5	N/A	14.5	N/A
Whittier City Of	20.0	N/A	15.1	N/A
Windsor Town Of	28.2	N/A	23.9	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Woodland City Of	25.7	N/A	13.5	N/A
Yorba Linda Water District	40.5	N/A	20.9	N/A
Yreka City Of	68.6	N/A	28.3	N/A
Yuba City	35.8	N/A	13.6	N/A
Yucaipa Valley Water District	46.3	N/A	12.0	N/A

Baseline inputs from water loss audits to draft economic model

Note: The data for water systems that are combined into one standard are identified in *italics.*

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
Adelanto City Of	450.3	130.6	8194.3	903.9	73.0
Alameda County Water District	2046.7	920.8	85131.3	606.2	72.8
Alco Water Service	146.2	89.2	8638.3	219.8	67.4
Alhambra City Of	179.5	167.5	18588.0	478.9	60.0
Amador Water Agency	142.2	51.3	1914.0	108.7	70.0
American Canyon City Of	192.7	103.4	5584.0	705.7	68.0
Anaheim City Of	1677.7	799.1	63805.3	643.1	77.0
Anderson City Of	203.1	40.0	3396.0	66.1	70.9
Antioch City Of	431.5	370.7	32401.0	777.2	68.2
Apple Valley Ranchos Water Company	550.3	476.2	21051.0	112.9	93.4
Arcadia City Of	502.4	164.6	13978.7	104.3	77.0
Arcata City Of	349.6	90.6	6414.7	274.2	80.0

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
Arroyo Grande City Of	55.8	88.7	6453.3	1501.9	65.0
Arvin Community Service District	307.9	61.3	4046.3	393.5	60.0
Atascadero Mutual Water Company	430.8	246.0	10700.0	175.0	103.0
Atwater City Of	2592.7	97.6	7495.0	112.4	50.0
Azusa Lightand Water	2068.7	305.2	23526.0	301.8	59.7
Bakersfield City Of	1005.4	569.3	46460.7	176.6	70.0
Bakman Water Company	246.5	73.2	2578.5	318.2	52.5
Banning City Of	760.6	168.2	10756.0	190.8	109.3
Bear Valley Community Services District	38.6	180.0	3602.0	524.0	90.0
Beaumont-Cherry Valley Water District	828.9	376.7	18042.0	462.3	75.0
Bella Vista Water District	463.7	242.0	6328.7	176.3	72.0
Bellflower-Somerset Mutual Water Company	98.4	66.0	7053.0	56.1	56.7
Benicia City Of	504.6	114.6	9763.0	230.9	81.0
Beverly Hills City Of	374.5	171.0	11141.0	1205.8	68.2
Big Bear Community Services District	87.5	82.1	6102.0	377.4	85.0
Big Bear Lake City Of	160.7	165.4	15029.7	257.4	86.3
Blythe City Of	305.8	51.4	3400.0	91.6	62.0
Brawley City Of	459.7	100.0	7487.0	50.9	55.0
Brea City Of	231.7	222.1	13573.0	937.8	75.0
Brentwood City Of	810.2	326.7	23700.7	1130.7	62.2
Buena Park City Of	765.6	236.2	19107.0	619.8	70.0
Burbank City Of	401.2	286.0	26661.0	738.5	115.0
Burlingame City Of	201.0	115.8	9200.7	1745.8	85.0
Calaveras County Water District-Ebbetts Pass	*557.4*	*155.6*	*5869.0*	*238.8*	*70.0*
Calaveras County Water District-Jenny Lind	*656.6*	*103.6*	*3759.0*	*209.4*	*70.0*
Calexico City Of	39.9	55.2	8550.0	244.4	50.0

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
California American Water Company-Los Angeles Division-Baldwin Hills	*180.3*	*69.8*	*6556.3*	*806.3*	*75.8*
California American Water Company-Los Angeles Division-Duarte	*753.7*	*98.8*	*7832.0*	*315.6*	*76.8*
California American Water Company-Los Angeles Division-San Marino	*462.3*	*181.0*	*15085.3*	*366.8*	*76.2*
California American Water Company-Monterey District	279.8	561.4	39097.7	435.1	89.3
California American Water Company-Sacramento District-Antelope	*228.5*	*95.8*	*10496.5*	*277.0*	*68.0*
California American Water Company-Sacramento District-Lincoln Oaks	*91.3*	*143.5*	*14606.0*	*240.2*	*64.5*
California American Water Company-Sacramento District-Parkway	*423.3*	*167.3*	*14912.0*	*167.0*	*63.0*
California American Water Company-Sacramento District-Rosemont	*550.4*	*187.9*	*16725.0*	*169.9*	*76.3*
California American Water Company-San Diego District	629.0	180.8	21939.7	1810.3	71.8
California American Water Company-Ventura District	776.7	256.5	20706.3	1491.7	95.9
California City	576.9	313.8	4858.0	1387.4	65.0
California Water Service Company Bakersfield-Bakersfield	*5510.4*	*856.8*	*65962.7*	*288.6*	*68.3*
California Water Service Company Bakersfield-North Garden	*505.2*	*122.2*	*6859.7*	*288.6*	*71.0*
California Water Service Company Bear Gulch	300.7	347.2	19263.3	1683.7	81.0
California Water Service Company Chico District	934.9	406.0	29204.3	98.9	76.0
California Water Service Company Dominguez	918.6	389.6	34439.7	1380.6	78.0
California Water Service Company East Los Angeles	121.6	277.8	27131.0	574.2	79.0
California Water Service Company Hermosa-Redondo	377.1	217.7	27242.7	1234.7	68.0
California Water Service Company Livermore	365.2	230.4	18935.7	963.9	66.3

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
California Water Service Company Los Altos-Suburban	527.7	300.8	19236.3	1142.6	71.0
California Water Service Company Marysville	178.7	55.9	3929.3	77.2	63.7
California Water Service Company Mid Peninsula-San Carlos	*70.7*	*115.5*	*10139.0*	*1961.3*	*80.0*
California Water Service Company Mid Peninsula-San Mateo	*611.6*	*259.1*	*26497.7*	*1961.3*	*72.0*
California Water Service Company Oroville	117.6	62.4	3834.7	193.6	72.3
California Water Service Company Palos Verdes	887.3	347.3	24292.3	1404.7	91.7
California Water Service Company Salinas District	257.8	279.2	25083.7	138.2	76.0
California Water Service Company Selma	258.8	91.8	6591.3	115.4	59.4
California Water Service Company South San Francisco	11.0	169.0	17224.3	1608.5	76.0
California Water Service Company Stockton	1043.7	562.1	45194.3	684.0	55.0
California Water Service Company Visalia	500.9	588.9	44466.7	66.9	62.7
California Water Service Company Westlake	253.5	118.3	7141.0	1488.2	90.0
Camarillo City Of	51.8	203.0	13706.0	915.8	76.0
Cambria Community Service District	70.1	66.7	4032.0	583.8	85.0
Camrosa Water District	329.7	211.1	8204.7	898.0	65.0
Carlsbad Municipal Water District	777.3	453.7	32204.7	1214.4	81.0
Carmichael Water District	479.5	154.0	11789.7	257.1	66.0
Carpinteria Valley Water District	116.3	88.4	4504.7	386.7	89.0
Castaic Lake Water Agency Santa Clarita Water Division	1633.9	355.0	31054.3	553.3	100.6
Ceres City Of	202.0	154.0	12360.0	66.3	50.0
Cerritos City Of	349.2	186.4	15638.0	439.5	82.5
Chino City Of	843.9	267.0	20204.7	623.0	73.8
Chino Hills City Of	151.4	280.5	21946.3	913.9	80.0

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
Citrus Heights Water District	346.0	271.0	20232.3	250.4	88.3
Cloverdale Cityof	114.6	32.3	3314.3	218.0	57.8
Clovis City Of	289.5	518.0	34901.7	313.4	63.5
Coachella City Of	297.0	121.6	8319.0	117.4	75.0
Coachella Valley Water District	5049.6	1716.7	104047.7	234.8	83.3
Coalinga City Of	177.5	98.5	3861.7	416.0	70.0
Coastside County Water District	158.2	88.9	7624.7	1486.6	78.1
Colton City Of	748.2	165.9	10202.0	160.6	66.7
Contra Costa Water District	1526.0	818.1	62501.3	215.7	73.0
Corcoran City Of	351.7	130.0	3772.0	198.6	50.0
Corona City Of	795.4	802.6	44012.0	609.8	93.6
Covina City Of	292.7	112.7	8650.3	786.0	88.5
Covina Irrigating Company	365.6	111.0	8647.0	794.0	88.4
Crescent City	397.1	104.2	4420.3	89.3	74.2
Crescenta Valley Community Water District	210.7	170.9	8386.3	687.7	93.4
Crestline Village Water District	24.5	72.8	5076.0	1150.0	99.8
Cucamonga Valley Water District	1562.0	710.0	48694.7	487.7	80.0
Cupertino City Of	122.6	59.9	4279.3	1357.8	104.1
Daly City	319.8	198.0	23122.7	1675.7	70.7
Davis City Of	714.0	192.0	17101.7	248.4	50.0
Del Oro Water Company	118.7	64.8	4820.7	470.5	84.2
Delano City Of	595.0	131.0	9390.0	159.9	59.7
Desert Water Agency	2388.3	416.6	24469.0	235.9	79.9
Diablo Water District	207.2	190.0	11903.3	657.4	70.0
Dinuba City Of	221.5	72.5	6016.3	145.9	51.7
Discovery Bay Community Services District	93.4	48.0	5944.3	150.4	60.0

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
Downey City Of	717.1	276.0	23325.0	366.6	65.0
Dublin San Ramon Services District	195.3	319.0	23724.0	1420.3	80.9
East Bay Municipal Utility District	19584.5	4205.9	383229.0	78.2	82.6
East Niles Community Services District	423.5	127.6	8020.3	475.7	60.0
East Orange County Water District	35.2	23.7	1215.0	620.5	101.0
East Palo Alto City Of	115.3	38.6	4102.0	1786.1	65.0
East Valley Water District	974.7	316.6	23319.7	145.9	80.0
Eastern Municipal Water District	5037.5	2390.4	160146.7	871.1	74.7
El Centro City Of	1419.3	120.0	9899.0	76.5	60.0
El Dorado Irrigation District	3863.1	1185.2	41445.3	92.1	109.3
El Monte City Of	209.1	43.0	3738.3	168.9	60.0
El Segundo City Of	217.0	57.5	5152.0	1318.0	67.5
El Toro Water District	272.5	180.2	10044.3	946.0	86.9
Elk Grove Water District	141.9	102.9	7957.0	186.2	61.3
Elsinore Valley Municipal Water District	1019.4	722.7	45313.3	1048.0	84.0
Escondido City Of	665.1	430.7	26710.3	1288.3	96.1
Estero Municipal Improvement District	263.9	120.6	7512.7	1860.5	58.0
Eureka City Of	261.1	160.9	10028.7	1072.5	61.2
Exeter City Of	153.1	43.0	3331.0	537.6	55.0
Fair Oaks Water District	363.1	181.0	13938.7	234.4	80.0
Fairfield City Of	2549.9	370.7	30901.3	113.4	65.0
Fallbrook Public Utilities District	648.0	271.8	9251.3	1139.7	116.6
Folsom City Of	3155.1	335.2	21138.5	112.1	68.0
Fortuna City Of	231.2	65.4	4544.7	216.8	97.3
Fountain Valley City Of	228.0	217.0	17178.0	605.7	70.0
Fresno City Of	7775.7	1839.8	145578.7	168.5	51.1

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
Fruitridge Vista Water Company	386.4	52.0	4830.0	100.6	49.0
Fullerton City Of	656.5	431.3	31894.0	791.6	76.9
Galt City Of	206.6	100.7	7565.0	116.8	50.0
Garden Grove City Of	863.0	440.0	33702.0	656.3	52.0
Georgetown Divide Public Utility District	145.7	165.2	3883.7	93.3	93.0
Gilroy City Of	552.7	209.3	14768.7	626.8	70.0
Glendale City Of	696.4	400.0	34101.0	1212.2	94.3
Glendora City Of	1034.0	225.7	13485.0	383.6	76.0
Golden State Water Company-Artesia	282.4	101.2	10824.7	486.9	61.4
Golden State Water Company-Barstow	527.4	187.3	9232.3	124.0	89.0
Golden State Water Company-Bay Point	138.1	52.1	5105.7	1217.7	77.7
Golden State Water Company-Bell-Bell Gardens	181.3	75.0	7449.7	490.1	61.5
Golden State Water Company-Claremont	595.0	162.8	11328.7	868.6	89.9
Golden State Water Company-Cordova	1144.9	202.7	15185.7	98.4	52.4
Golden State Water Company-Culver City	165.0	109.9	9719.7	1363.8	76.1
Golden State Water Company-Florence Graham	275.7	94.1	9774.7	462.3	60.0
Golden State Water Company-Norwalk	174.0	91.0	9507.3	642.0	62.8
Golden State Water Company-Orcutt	639.7	145.3	11544.0	211.0	70.7
Golden State Water Company-Placentia	400.3	144.3	13075.7	689.2	92.0
Golden State Water Company-San Dimas	302.8	204.7	16219.7	866.5	82.0
Golden State Water Company-Simi Valley	184.7	146.1	13543.0	1289.8	74.6
Golden State Water Company-South Arcadia	127.7	66.3	7493.0	457.8	65.4
Golden State Water Company-South San Gabriel	232.8	40.0	4979.7	364.7	62.8
Golden State Water Company-Southwest	874.7	519.0	52959.0	1119.7	74.3
Golden State Water Company-West Orange	611.0	260.4	27917.3	585.1	79.0
Goleta Water District	457.9	254.7	16842.0	1078.3	83.1

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
Great Oaks Water Company Incorporated	537.1	211.4	21345.7	851.5	65.0
Greenfield City Of	155.8	35.3	3729.7	136.0	63.0
Groveland Community Services District	52.9	71.0	3262.0	887.3	110.0
Hawthorne City Of	102.2	60.8	6477.0	1046.2	58.3
Hayward City Of	838.8	387.0	36459.7	1823.2	94.1
Healdsburg City Of	54.6	59.5	4706.0	152.3	65.0
Helix Water District	1208.9	744.5	58661.3	1046.5	90.0
Hemet City Of	60.5	132.3	9304.0	240.9	80.0
Hesperia Water District	576.8	589.0	26813.0	645.6	85.0
Hi Desert Water District	280.1	308.9	10635.7	172.3	82.0
Hillsborough Town Of	127.8	100.1	4294.0	3069.4	85.0
Hollister City Of	223.8	93.5	6572.5	363.5	65.0
Humboldt Community Services District	525.5	105.6	7932.0	684.3	60.0
Huntington Beach City Of	902.1	607.2	54440.0	665.2	63.3
Huntington Park City Of	118.7	59.8	5649.7	791.1	56.0
Imperial City Of	282.5	63.0	5532.0	388.7	65.0
Indian Wells Valley Water District	534.8	263.9	12351.3	85.8	61.7
Indio City Of	790.0	344.7	23130.0	175.4	71.3
Inglewood City Of	223.9	156.0	15869.3	1441.9	85.0
Irvine Ranch Water District	1976.2	1886.1	118025.0	1330.3	84.1
Joshua Basin Water District	148.7	261.8	5831.0	1039.7	84.0
Jurupa Community Service District	1164.4	481.6	31509.3	838.5	92.5
Kerman City Of	134.8	59.6	3711.0	104.0	47.0
Kingsburg City Of	2082.3	61.0	3679.0	63.5	50.0
La Habra City Of	411.3	165.0	13121.0	676.1	82.0
La Palma City Of	183.6	39.4	4408.0	506.9	68.7

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
La Verne City Of	339.2	178.0	8854.5	1021.2	70.0
Laguna Beach County Water District	237.3	135.0	8670.0	984.7	70.0
Lake Arrowhead Community Services District	194.2	127.7	8356.7	501.5	88.0
Lake Hemet Municipal Water District	516.2	250.0	14332.0	991.5	75.7
Lakeside Water District	157.0	127.0	7080.7	1461.0	90.0
Lakewood City Of	290.1	180.0	20137.0	291.3	57.0
Lamont Public Utility District	281.3	28.5	3152.0	81.5	60.0
Las Virgenes Municipal Water District	599.0	402.9	21318.3	1001.2	121.8
Lathrop City Of	136.1	112.6	6524.0	95.0	54.0
Liberty Utilities(Park Water)Corp-Bell Norwalk	*109.8*	*205.2*	*16895.0*	*785.8*	*75.8*
Liberty Utilities(Park Water)Corp-Compton Willow	*87.6*	*148.8*	*6959.0*	*785.8*	*87.5*
Liberty Utilities(Park Water)Corp-Lynwood	*9.1*	*162.3*	*4520.0*	*785.8*	*68.4*
Lincoln Avenue Water Company	107.6	58.0	4483.3	439.3	92.0
Lincoln City Of	724.9	244.3	18384.0	904.3	92.0
Linda County Water District	454.2	61.3	4603.7	93.8	60.0
Livermore City Of	320.1	160.3	10285.3	1166.0	67.9
Livingston City Of	248.6	36.0	3293.3	128.2	51.7
Lodi City Of	277.5	243.0	23262.7	179.8	57.5
Loma Linda City Of	379.1	77.4	5435.3	642.3	69.3
Lomita City Of	85.5	43.2	4323.0	1129.8	58.3
Lompoc City Of	178.8	140.0	10016.7	369.6	110.0
Long Beach City Of	737.3	923.0	93928.3	1014.7	67.0
Los Angeles City Department Of Water And Power	30602.8	7384.8	740490.7	936.3	109.0
Los Angeles County Waterworks District29-Malibu&Marina Del Rey	229.0	218.1	7646.0	1401.8	79.3
Los Angeles County Waterworks District40-Antelope Valley	1498.7	1008.0	57449.4	385.5	71.3

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
Los Banos City Of	1137.8	175.0	12149.0	93.8	49.4
Lynwood City Of	227.7	95.0	9097.3	1222.2	56.0
Madera City Of	55.8	204.0	14232.0		54.0
Mammoth Community Water District	111.0	66.0	3730.0	129.2	110.0
Manhattan Beach City Of	55.4	106.1	13631.0	1432.6	65.0
Manteca City Of	553.5	285.5	22156.3	156.2	55.0
Marin Municipal Water District	1726.2	869.9	62958.3	335.5	109.3
Marina Coast Water District	255.9	203.0	7474.3	158.1	60.0
Martinez City Of	653.4	139.1	10139.7	195.8	81.2
Mc Kinleyville Community Services District	137.3	87.8	6300.3	710.4	65.0
Menlo Park City Of	299.7	57.7	4520.3	2069.3	79.3
Merced City Of	1011.8	280.0	21545.0	90.6	50.0
Mesa Water District	501.5	328.4	24919.0	728.2	80.0
Mid-Peninsula Water District	132.6	102.3	7988.3	1583.5	102.0
Millbrae City Of	208.8	76.0	6552.7	1970.6	75.8
Milpitas City Of	646.6	194.7	16511.3	695.3	93.8
Mission Springs Water District	708.1	354.1	13138.0	488.3	65.0
Modesto City Of	6525.6	868.0	72015.0	280.4	60.0
Monrovia City Of	194.2	108.6	9678.7	214.9	99.3
Monte Vista Water District	939.9	201.9	12476.3	878.6	80.8
Montebello Land And Water Company	173.8	46.0	3988.3	558.7	66.9
Montecito Water District	175.2	116.5	4643.7	814.9	111.2
Monterey Park City Of	357.2	134.0	13491.0	50.2	80.0
Morgan Hill City Of	478.9	197.2	14060.7	531.5	72.4
Morro Bay City Of	12.7	73.7	5486.0	2573.6	65.0
Moulton Niguel Water District	1483.5	676.3	53674.0	929.5	98.0

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
Mountain House Community Services District	256.2	57.2	5094.0	228.7	65.3
Mountain View City Of	390.3	185.3	18390.0	641.8	72.7
Myoma Dunes Mutual Water Company	134.8	33.8	2525.5	111.4	80.0
Napa City Of	717.4	360.2	25723.0	488.8	67.3
Nevada Irrigation District-E George	*411.8*	*150.7*	*6261.3*	*74.7*	*90.4*
Nevada Irrigation District-Lake Wildwood	*50.3*	*44.8*	*3327.7*	*79.5*	*84.9*
Nevada Irrigation District-Loma Rica	*164.6*	*118.8*	*5224.7*	*87.6*	*88.3*
Newhall County Water District	156.7	65.9	3866.0	273.7	97.1
Newman Cityof	242.6	28.0	3513.0	124.9	52.3
Newport Beach City Of	782.2	302.2	26638.7	1176.7	78.0
Nipomo Community Service District	156.6	185.0	4685.7	173.0	68.0
Norco City Of	249.4	104.7	7586.0	787.7	95.0
North Coast County Water District	175.5	132.6	12091.0	1739.3	83.0
North Marin Water District	196.9	316.6	20768.7	878.5	62.5
North Tahoe Public Utilities District	236.3	46.0	3270.3	157.6	100.0
Norwalk City Of	2.5	57.6	5371.5	955.0	67.5
Oakdale City Of	314.9	75.0	8114.3	123.4	51.0
Oceanside City Of	787.6	591.0	44425.0	1543.7	72.3
Oildale Mutual Water Company	154.3	148.4	11308.3	132.5	60.0
Olivehurst Public Utilities District	*242.8*	*56.5*	*4498.0*	*214.1*	*60.0*
Olivehurst Public Utilities District-Plumas Lake	*129.7*	*25.1*	*2238.5*	*164.9*	*60.0*
Olivenhain Municipal Water District	916.4	466.2	22617.3	1128.4	115.0
Ontario City Of	912.6	595.3	35480.7	346.3	85.0
Orange City Of	1266.2	462.0	36402.0	780.8	86.8
Orangevale Water Company	188.9	82.5	5705.0	167.5	67.5
Orchard Dale Water District	153.8	43.0	4257.0	603.4	62.0

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
Otay Water District	893.5	733.0	50287.7	1756.0	116.6
Oxnard City Of	1481.3	581.4	42312.0	1112.5	67.0
Padre Dam Municipal Water District	177.1	410.0	24072.7	1871.4	107.7
Palmdale Water District	1373.7	433.0	27439.0	278.6	77.2
Palo Alto City Of	395.3	238.5	26404.0	1810.8	71.0
Paradise Irrigation District	201.9	177.9	8640.5	53.1	91.0
Paramount City Of	567.1	161.7	7391.3	441.0	68.3
Pasadena City Of	1357.3	531.5	38048.3	1041.0	73.4
Paso Robles City Of	137.8	228.8	11174.0	569.4	74.2
Patterson City Of	506.2	49.0	6507.7	78.3	60.0
Petaluma City Of	536.6	245.5	20172.7	1056.9	59.0
Phelan Pinon Hills Community Services District	317.7	346.0	7010.0	647.6	100.4
Pico Rivera City Of	107.6	98.0	9562.5	292.7	70.0
Pico Water District	62.5	68.0	5428.7	339.9	66.0
Pismo Beach City Of	62.9	50.0	4759.7	1550.0	72.9
Pittsburg City Of	527.9	254.3	18891.0	806.3	65.0
Placer County Water Agency-Auburn Bowman	*598.1*	*156.1*	*9390.0*	*265.0*	*76.7*
Placer County Water Agency-Foothill	*1481.7*	*413.4*	*28147.0*	*265.0*	*79.7*
Pleasanton City Of	1220.4	329.0	22126.3	858.9	75.3
Pomona City Of	919.8	488.0	32110.0	986.7	82.2
Port Hueneme City Of	56.6	47.3	5838.7	783.2	45.0
Porterville City Of	862.9	260.8	16326.0	182.0	60.0
Poway City Of	584.1	285.5	13949.0	1482.0	102.7
Quartz Hill Water District	126.2	96.9	5824.3	410.3	73.8
Rainbow Municipal Water District	257.5	320.0	8040.0	1312.7	158.0
Ramona Municipal Water District	198.4	226.3	9612.3	1300.0	155.0

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
Rancho California Water District	2057.3	940.8	44734.7	1271.7	110.5
Red Bluff City Of	77.9	81.0	4865.0		63.0
Redding City Of	1872.8	558.5	29263.5	261.7	80.0
Redlands City Of	1100.8	406.2	21017.0	235.3	87.0
Redwood City	650.1	264.6	24605.7	1948.9	64.7
Reedley City Of	1099.4	92.2	6329.0	132.1	50.7
Rialto City Of	280.7	197.3	11833.3	141.1	71.7
Rincon Del Diablo Municipal Water District	255.9	119.0	7218.0	1870.9	106.7
Rio Linda-Elverta Community Water District	195.0	61.9	4631.7	122.7	53.3
Rio Vista City Of	117.6	46.0	4706.0	161.7	67.5
Riverbank City Of	158.6	66.0	7323.3	82.8	60.0
Riverside City Of	4327.2	985.9	70478.3	98.7	89.0
Riverside Highland Water Company	54.1	77.7	4584.3	112.2	72.0
Rohnert Park City Of	280.3	116.1	9283.7	458.2	58.0
Rosamond Community Service District	153.0	97.3	5030.0	958.2	80.0
Roseville City Of	2002.2	614.2	43580.0	133.7	84.0
Rowland Water District	287.6	207.0	13771.7	1037.3	85.5
Rubidoux Community Service District	393.1	71.6	6284.0	91.9	85.0
Rubio Canyon Land And Water Association	78.6	60.0	3129.3	378.1	70.0
Sacramento City Of	6465.0	1708.3	150898.0	100.7	45.0
Sacramento County Water Agency	2202.3	544.7	36264.3	176.5	60.7
Sacramento Suburban Water District	1168.4	706.9	47238.7	156.7	58.9
San Bernardino City Of	2556.1	755.8	47915.3	158.5	80.3
San Bernardino County Service Area64Spring Valley Lake	305.5	40.4	3901.3	156.7	75.0
San Bernardino County Service Area70J Oak Hills	181.8	156.0	3285.3	637.1	85.0

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
San Bruno City Of	231.8	120.3	11699.0	622.7	81.3
San Buenaventura City Of(Ventura)	671.0	394.5	30104.0	465.8	93.0
San Clemente City Of	709.5	212.6	17403.3	1063.1	75.3
San Diego City Of	10519.5	3370.2	296100.3	1289.7	93.4
San Dieguito Water District	314.4	176.4	11966.0	1323.6	82.0
San Fernando City Of	165.0	67.1	5132.7	164.3	72.0
San Francisco Public Utilities Commision	4970.3	1257.6	178166.0	90.3	76.1
San Gabriel County Water District	253.2	82.0	9215.7	84.9	80.0
San Gabriel Valley Water Company	1169.1	566.2	49312.3	880.8	75.0
San Gabriel Valley Water Company Fontana Division	2189.7	692.1	48373.3	812.5	80.0
San Jacinto City Of	186.6	126.7	4197.3	518.0	65.0
San Jose City Of	1157.9	343.0	27182.0	1579.6	91.0
San Jose Water Company	6292.5	2477.7	234386.3	1226.1	73.6
San Juan Capistrano City Of	172.6	207.3	11734.3	884.7	60.0
San Juan Water District	922.4	209.9	10687.3	266.6	72.0
San Lorenzo Valley Water District	441.6	185.0	8014.0	224.1	80.0
San Luis Obispo City Of	338.2	177.6	11043.0	270.4	70.0
Santa Ana City Of	670.9	505.3	43250.0	617.5	73.9
Santa Barbara City Of	832.4	323.0	27121.0	482.5	120.8
Santa Clara City Of	755.9	312.9	26406.0	1301.4	66.9
Santa Cruz City Of	507.5	271.2	24524.0	183.8	91.1
Santa Fe Irrigation District	447.5	160.0	7509.0	1223.9	80.0
Santa Fe Springs City Of	218.4	108.0	6283.5	812.5	69.5
Santa Margarita Water District	1012.1	625.1	55648.3	952.1	90.0
Santa Maria City Of	284.2	337.5	22709.3	232.5	79.3
Santa Monica City Of	43.6	206.8	18109.3	994.1	74.5

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
Santa Paula City Of	91.7	97.8	7572.3	216.4	66.4
Santa Rosa City Of	992.2	644.3	54388.3	851.6	69.0
Scotts Valley Water District	92.0	65.1	4132.0	426.2	100.0
Seal Beach City Of	162.4	74.8	5513.3	513.5	65.0
Shafter City Of	327.3	108.6	4699.3	136.9	55.0
Shasta Lake City Of	100.5	79.4	3740.3	158.8	83.0
Sierra Madre City Of	317.5	47.6	3715.5	160.0	103.0
Signal Hill City Of	69.6	50.0	3331.0	921.0	78.5
Soledad City Of	76.5	14.6	3884.0	155.5	55.3
Sonoma City Of	112.3	54.3	4404.7	866.6	70.7
Soquel Creek Water District	235.8	172.4	15863.7	176.6	76.4
South Coast Water District	119.4	163.3	13114.0	1012.9	87.5
South Feather Waterand Power	446.6	200.0	7000.0		90.0
South Gate City Of	180.9	169.0	14408.5	418.5	65.0
South Pasadena City Of	210.5	67.8	6239.0	1044.0	79.3
South Tahoe Public Utility District	1134.6	253.0	14173.7	164.2	84.0
Stockton City Of	1938.8	601.5	48791.3	564.5	60.0
Suburban Water Systems-San Jose Hills	805.4	483.9	42870.3	566.5	77.9
Suburban Water Systems-Whittier-La Mirada	861.9	376.7	33874.7	471.3	78.5
Suisun-Solano Water Authority	447.3	95.8	8475.0	108.2	55.0
Sunny Slope Water Company	192.1	60.2	6300.0	165.5	72.5
Sunnyslope Community Water District	98.2	80.2	5921.3	95.6	72.0
Sunnyvale City Of	667.0	347.7	28926.7	1560.4	72.7
Susanville City Of	253.8	43.5	3808.3	70.2	81.8
Sweetwater Authority	592.3	408.0	34363.0	1554.9	74.3
Sweetwater Springs Water District	125.2	65.0	3800.0	272.9	75.0

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
Tehachapi City Of	170.8	55.5	3307.0	142.5	75.2
Thousand Oaks City Of	269.2	229.9	17050.3	1525.8	80.5
Torrance City Of	201.6	320.0	27041.7	993.3	75.0
Trabuco Canyon Water District	90.5	66.5	3989.7	885.1	90.0
Tracy City Of	1062.6	458.3	24121.7	485.0	60.0
Triunfo Sanitation District-Oak Park Water Service	8.5	46.0	4700.0	1646.8	80.0
Truckee-Donner Public Utilities District	909.6	231.7	12871.0	294.4	84.3
Tulare City Of	417.1	227.0	19839.0	87.0	50.0
Tuolumne Utilities District-Sonora Jamestown	*422.7*	*102.4*	*4984.7*	*155.2*	*87.7*
Tuolumne Utilities District-Upper Basin	*141.4*	*105.6*	*3995.0*	*155.2*	*72.0*
Turlock City Of	1241.8	305.0	19100.3	57.2	54.7
Tustin City Of	593.1	172.0	14165.0	633.9	50.0
Twentynine Palms Water District	283.6	211.0	8087.3	185.7	85.0
Ukiah City Of	205.2	62.0	4779.0	108.5	85.0
Upland City Of	584.8	255.6	20733.0	805.0	100.0
Vacaville City Of	896.7	359.4	28254.7	644.0	80.0
Valencia Water Company	1101.2	367.2	32598.7	535.2	103.9
Vallecitos Water District	882.2	376.6	22469.7	2030.6	117.4
Vallejo City Of	2638.3	483.3	40646.0	227.0	65.0
Valley Center Municipal Water District	320.4	342.7	10066.7	1444.2	120.0
Valley County Water District	180.8	126.0	12649.3	492.0	63.0
Valley Of The Moon Water District	230.9	92.5	7108.0	1609.6	65.0
Valley Water Company	54.9	55.0	3657.0	1578.0	70.0
Vaughn Water Company	375.0	220.4	10727.7	0.5	50.0
Ventura County Waterworks District No01-Moorpark	434.1	171.0	10912.7	1289.3	83.0

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
Ventura County Waterworks District No08-Simi Valley	387.4	350.3	25762.0	1081.0	100.0
Vernon City Of	295.6	50.4	1022.0	589.4	75.0
Victorville Water District	2135.2	752.0	35561.0	424.0	86.8
Vista Irrigation District	765.4	467.4	28706.7	994.2	97.7
Walnut Valley Water District	869.4	482.0	27471.0	1032.0	103.0
Wasco City Of	86.0	79.0	5009.3	208.0	51.8
Watsonville City Of	335.0	178.0	14806.3	116.6	65.0
West Kern Water District	1820.3	318.0	7733.3	156.1	60.0
West Sacramento City Of	3797.5	200.0	14367.3	89.5	55.0
West Valley Water District	1502.0	375.1	21441.3	291.9	70.0
Westborough Water District	35.7	24.5	3928.7	1904.1	77.7
Western Municipal Water District Of Riverside	1507.1	493.4	20839.3	1048.8	100.0
Westminster City Of	335.8	251.0	20638.0	317.0	63.7
Whittier City Of	258.2	143.0	11516.0	433.6	65.0
Windsor Town Of	174.6	139.1	5524.0	428.3	78.6
Woodland City Of	462.6	277.1	16049.7	820.4	55.0
Yorba Linda Water District	1134.0	366.3	25013.0	725.8	82.0
Yreka City Of	234.3	90.8	3047.3	137.6	84.3
Yuba City	754.4	299.3	18813.7	86.2	56.1
Yucaipa Valley Water District	668.2	209.0	12893.0	202.7	50.0

Appendix F – 2015 SBX7-7 Verification Form

SB X7-7 Table 0: Units of Measure Used in UWMP* *(select one from the drop down list)*
Acre Feet
**The unit of measure must be consistent with Table 2-3*
NOTES:

SB X7-7 Table-1: Baseline Period Ranges

Baseline	Parameter	Value	Units
10- to 15-year baseline period	2008 total water deliveries	34,052	Acre Feet
	2008 total volume of delivered recycled water	2,985	Acre Feet
	2008 recycled water as a percent of total deliveries	8.77%	Percent
	Number of years in baseline period[1,2]	10	Years
	Year beginning baseline period range	1995	
	Year ending baseline period range[3]	2004	
5-year baseline period	Number of years in baseline period	5	Years
	Year beginning baseline period range	2003	
	Year ending baseline period range[4]	2007	

[1] If the 2008 recycled water percent is less than 10 percent, then the first baseline period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first baseline period is a continuous 10- to 15-year period. *[2] The Water Code requires that the baseline period is between 10 and 15 years. However, DWR recognizes that some water suppliers may not have the minimum 10 years of baseline data.*

[3] The ending year must be between December 31, 2004 and December 31, 2010.

[4] The ending year must be between December 31, 2007 and December 31, 2010.

NOTES:

SB X7-7 Table 2: Method for Population Estimates	
Method Used to Determine Population (may check more than one)	
☑	**1. Department of Finance** (DOF) DOF Table E-8 (1990 - 2000) and (2000-2010) and DOF Table E-5 (2011 - 2015) when available
☐	**2. Persons-per-Connection Method**
☐	**3. DWR Population Tool**
☐	**4. Other** DWR recommends pre-review
NOTES:	

SB X7-7 Table 3: Service Area Population		
Year		Population
10 to 15 Year Baseline Population		
Year 1	1995	54,602
Year 2	1996	58,424
Year 3	1997	62,619
Year 4	1998	66,761
Year 5	1999	71,824
Year 6	2000	74,562
Year 7	2001	78,420
Year 8	2002	83,167
Year 9	2003	89,289
Year 10	2004	94,561
5 Year Baseline Population		
Year 1	2003	89,289
Year 2	2004	94,561
Year 3	2005	99,295
Year 4	2006	101,641
Year 5	2007	103,693
2015 Compliance Year Population		
2015		123,572
NOTES: Does not include approximately 4,810 person living within City limits, but outside the water service area.		

SB X7-7 Table 4-A: Volume Entering the Distribution System(s)

Complete one table for each source.

Name of Source	All Sources
This water source is:	
☑	The supplier's own water source
☑	A purchased or imported source

Baseline Year *Fm SB X7-7 Table 3*		Volume Entering Distribution System	Meter Error Adjustment* *Optional (+/-)*	Corrected Volume Entering Distribution System
10 to 15 Year Baseline - Water into Distribution System				
Year 1	1995	18,841		18,841
Year 2	1996	21,254		21,254
Year 3	1997	23,001		23,001
Year 4	1998	20,462		20,462
Year 5	1999	24,179		24,179
Year 6	2000	25,646		25,646
Year 7	2001	28,100		28,100
Year 8	2002	29,853		29,853
Year 9	2003	29,714		29,714
Year 10	2004	32,468		32,468
5 Year Baseline - Water into Distribution System				
Year 1	2003	29,714		29,714
Year 2	2004	32,468		32,468
Year 3	2005	31,481		31,481
Year 4	2006	33,637		33,637
Year 5	2007	33,864		33,864
2015 Compliance Year - Water into Distribution System				
2015		22,881		22,881

** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 4: Annual Gross Water Use *

Baseline Year *Fm SB X7-7 Table 3*		Volume Into Distribution System *This column will remain blank until SB X7-7 Table 4-A is completed.*	Deductions					Annual Gross Water Use
			Exported Water	Change in Dist. System Storage (+/-)	Indirect Recycled Water *This column will remain blank until SB X7-7 Table 4-B is completed.*	Water Delivered for Agricultural Use	Process Water *This column will remain blank until SB X7-7 Table 4-D is completed.*	
10 to 15 Year Baseline - Gross Water Use								
Year 1	1995	18,841			-		-	18,841
Year 2	1996	21,254			-		-	21,254
Year 3	1997	23,001			-		-	23,001
Year 4	1998	20,462			-		-	20,462
Year 5	1999	24,179			-		-	24,179
Year 6	2000	25,646			-		-	25,646
Year 7	2001	28,100			-		-	28,100
Year 8	2002	29,853			-		-	29,853
Year 9	2003	29,714			-		-	29,714
Year 10	2004	32,468			-		-	32,468
10 - 15 year baseline average gross water use								**25,352**
5 Year Baseline - Gross Water Use								
Year 1	2003	29,714			-		-	29,714
Year 2	2004	32,468			-		-	32,468
Year 3	2005	31,481			-		-	31,481
Year 4	2006	33,637			-		-	33,637
Year 5	2007	33,864			-		-	33,864
5 year baseline average gross water use								**32,233**
2015 Compliance Year - Gross Water Use								
2015		22,881	-		-		-	**22,881**

* NOTE that the units of measure must remain consistent throughout the UWMP, as reported in Table 2-3

NOTES:

SB X7-7 Table 5: Gallons Per Capita Per Day (GPCD)				
Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Annual Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use (GPCD)
10 to 15 Year Baseline GPCD				
Year 1	1995	54,602	18,841	308
Year 2	1996	58,424	21,254	325
Year 3	1997	62,619	23,001	328
Year 4	1998	66,761	20,462	274
Year 5	1999	71,824	24,179	301
Year 6	2000	74,562	25,646	307
Year 7	2001	78,420	28,100	320
Year 8	2002	83,167	29,853	320
Year 9	2003	89,289	29,714	297
Year 10	2004	94,561	32,468	307
10-15 Year Average Baseline GPCD				**309**
5 Year Baseline GPCD				
Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use
Year 1	2003	89,289	29,714	297
Year 2	2004	94,561	32,468	307
Year 3	2005	99,295	31,481	283
Year 4	2006	101,641	33,637	295
Year 5	2007	103,693	33,864	292
5 Year Average Baseline GPCD				**295**
2015 Compliance Year GPCD				
2015		123,572	22,881	**165**
NOTES:				

SB X7-7 Table 6: Gallons per Capita per Day *Summary From Table SB X7-7 Table 5*	
10-15 Year Baseline GPCD	309
5 Year Baseline GPCD	295
2015 Compliance Year GPCD	165
NOTES:	

SB X7-7 Table 7: 2020 Target Method *Select Only One*		
Target Method		Supporting Documentation
☑	Method 1	SB X7-7 Table 7A
☐	Method 2	SB X7-7 Tables 7B, 7C, and 7D *Contact DWR for these tables*
☐	Method 3	SB X7-7 Table 7-E
☐	Method 4	Method 4 Calculator
NOTES:		

SB X7-7 Table 7-A: Target Method 1 20% Reduction	
10-15 Year Baseline GPCD	**2020 Target GPCD**
309	**247**
NOTES:	

SB X7-7 Table 7-F: Confirm Minimum Reduction for 2020 Target			
5 Year Baseline GPCD *From SB X7-7 Table 5*	Maximum 2020 Target[1]	Calculated 2020 Target[2]	**Confirmed 2020 Target**
295	280	247	**247**

[1] Maximum 2020 Target is 95% of the 5 Year Baseline GPCD *[2] 2020 Target is calculated based on the selected Target Method, see SB X7-7 Table 7 and corresponding tables for agency's calculated target.*

NOTES:

SB X7-7 Table 8: 2015 Interim Target GPCD		
Confirmed 2020 Target *Fm SB X7-7 Table 7-F*	10-15 year Baseline GPCD *Fm SB X7-7 Table 5*	**2015 Interim Target GPCD**
247	309	**278**

NOTES:

SB X7-7 Table 9: 2015 Compliance								
Actual 2015 GPCD	2015 Interim Target GPCD	Optional Adjustments *(In GPCD)* Enter "0" if Adjustment Not Used: Extraordinary Events	Weather Normalization	Economic Adjustment	TOTAL Adjustments	Adjusted 2015 GPCD	2015 GPCD *(Adjusted if applicable)*	**Did Supplier Achieve Targeted Reduction for 2015?**
165	278	*From Methodology 8 (Optional)*	*From Methodology 8 (Optional)*	*From Methodology 8 (Optional)*	-	165	165	**YES**

NOTES:

Appendix G – 2020 SBX7-7 Compliance Form

SB X7-7 Table 0: Units of Measure Used in 2020 UWMP* *(select one from the drop down list)*
Acre Feet
**The unit of measure must be consistent throughout the UWMP, as reported in Submittal Table 2-3.*
NOTES:

SB X7-7 Table 2: Method for 2020 Population Estimate	
Method Used to Determine 2020 Population (may check more than one)	
☑	**1. Department of Finance** (DOF) or **American Community Survey** (ACS)
☐	**2. Persons-per-Connection Method**
☐	**3. DWR Population Tool**
☑	**4. Other** DWR recommends pre-review
NOTES: The population for areas in the City of Roseville boundary not served by the City of Roseville Water Utility was subtracted from the total 2020 DOF population.	

SB X7-7 Table 3: 2020 Service Area Population	
2020 Compliance Year Population	
2020	140,187
NOTES:	

SB X7-7 Table 4: 2020 Gross Water Use							
		2020 Deductions					
Compliance Year 2020	2020 Volume Into Distribution System *This column will remain blank until SB X7-7 Table 4-A is completed.*	Exported Water *	Change in Dist. System Storage* (+/-)	Indirect Recycled Water *This column will remain blank until SB X7-7 Table 4-B is completed.*	Water Delivered for Agricultural Use*	Process Water *This column will remain blank until SB X7-7 Table 4-D is completed.*	2020 Gross Water Use
	33,263	1,451	-	-	-	-	**31,813**
* **Units of measure (AF, MG , or CCF)** must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.							
NOTES:							

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment

Complete one table for each source.

Name of Source	Folsom Lake
This water source is *(check one)* **:**	
☑	The supplier's own water source
☐	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
	31,711	-	31,711

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.*

[2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES: Total volume excludes raw water delivered to Linda Creek.

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s) Meter Error Adjustment

Complete one table for each source.

Name of Source	Ground Water
This water source is *(check one)* **:**	
☑	The supplier's own water source
☐	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
	201	0	201

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.*

[2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment

Complete one table for each source.

Name of Source	Total water delivered from other suppliers to Roseville
This water source is *(check one)* **:**	
☐	The supplier's own water source
☑	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
	1,352	0	1,352

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.*

[2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 5: 2020 Gallons Per Capita Per Day (GPCD)		
2020 Gross Water *Fm SB X7-7 Table 4*	**2020 Population** *Fm SB X7-7 Table 3*	**2020 GPCD**
31,813	140,187	**203**
NOTES:		

SB X7-7 Table 9: 2020 Compliance							
Actual 2020 GPCD[1]	Optional Adjustments to 2020 GPCD Enter "0" if Adjustment Not Used			TOTAL Adjustments[1]	Adjusted 2020 GPCD [1] *(Adjusted if applicable)*	2020 Confirmed Target GPCD [1, 2]	**Did Supplier Achieve Targeted Reduction for 2020?**
	Extraordinary Events[1]	Weather Normalization[1]	Economic Adjustment[1]				
203	-	-	-	-	203	247	**YES**
[1] *All values are reported in GPCD*							
[2] ***2020 Confirmed Target GPCD*** *is taken from the Supplier's SB X7-7 Verification Form Table SB X7-7, 7-F.*							
NOTES:							

Appendix H – Intent to Retain Control of Conserved Water

RESOLUTION NO. 09-64

DECLARING AN INTENT TO RETAIN CONTROL OF CONSERVED WATER

WHEREAS, the City has contractual entitlements to divert water from Folsom Reservoir, under which the City diverts and treats water for distribution to its residents and water users; and

WHEREAS, the City plans to implement a series of water conservation projects and programs for the purpose of eliminating losses of water within its water transmission and distribution system and for reducing consumption of water by its customers through on-site efficiency improvements and curtailment of water waste; and

WHEREAS, Water Code section 1011 provides that water is deemed conserved when less water is used to accomplish the same purposes of use allowed under a water right and that such cessation or reduction in use is deemed a beneficial use of a water right to the extent of such cessation or reduction in use; and

WHEREAS, Water Code section 1011 and the City's CVP water service contract authorizes the City to make water conserved as a result of such water conservation projects and programs available for use, sale, lease, exchange or short- or long-term transfers inside and outside of the City; and

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Roseville as follows:

1. The foregoing recitals are true and are incorporated into this Resolution by this reference.

2. The City Council finds and determines that: (a) making significant investments in infrastructure and administrative resources protects the City's water supplies for the benefit of all residents and water users in the City; (b) protecting all of the City's water supplies is of paramount importance to the health and welfare of the City's residents and water users; (c) conserving water through reductions in use is intended to promote statewide policies mandating and encouraging beneficial use of water; and (d) preserving conserved water supplies and making those supplies available for use, sale or transfer is in the best interests of the City and its residents and water users.

3. The City Council declares that, by instituting programs to conserve water, it abandons no right, title or interest in or to any City water rights, contractual entitlements or any appurtenant rights necessary to exercise such water rights or entitlements.

4. In accordance with Water Code section 1011 and any contractual rights, the City reserves the right to sell, lease, exchange, or otherwise transfer for use within or outside of the City's boundaries all water that has been conserved as a result of its water conservation projects and programs.

5. The Environmental Utilities Director and staff are directed to take all actions necessary to implement this Resolution, including the filing of annual reports of reductions in water use resulting from any water conservation projects and programs carried out under this Resolution with the State Water Resources Control Board.

PASSED AND ADOPTED by the City Council of the City of Roseville on the 18th day of February 2009, by the following vote:

AYES COUNCILMEMBERS: Allard, Gray, Garcia, Roccucci, Garbolino

NOES COUNCILMEMBERS: None

ABSENT COUNCILMEMBERS: None

MAYOR

Attest:

City Clerk

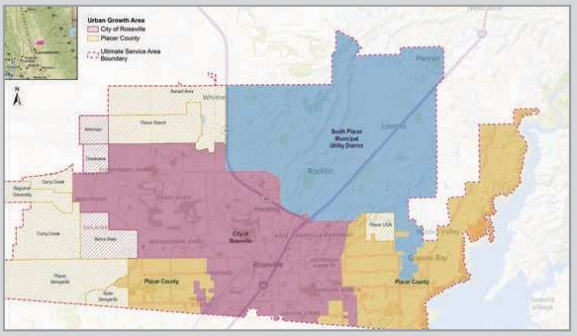
Appendix I – Regional 2020 Wastewater Systems Evaluation Report

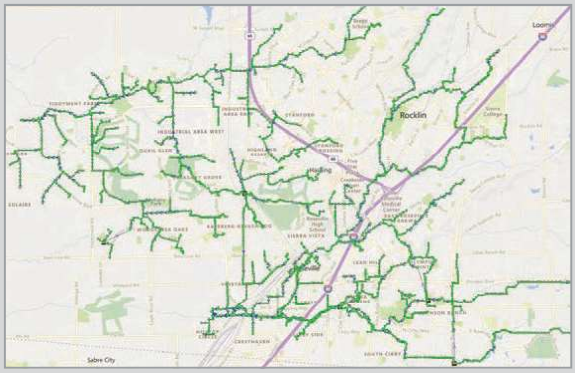
SOUTH PLACER WASTEWATER AUTHORITY

Partners: City of Roseville, Placer County, South Placer Municipal Utility District

South Placer Regional Wastewater 2020 Systems Evaluation Report









December 2020

Prepared by

WOODARD &CURRAN

SOUTH PLACER REGIONAL WASTEWATER 2020 SYSTEMS EVALUATION REPORT



WOODARD &CURRAN
2175 North California Blvd., Suite 315
Walnut Creek, CA 94596
925-627-4100

woodardcurran.com
COMMITMENT & INTEGRITY DRIVE RESULTS

0011183.00
South Placer Wastewater Authority
December 2020

TABLE OF CONTENTS

SECTION **PAGE NO.**

EXECUTIVE SUMMARY **ES-1**

1. INTRODUCTION **1-1**

1.1 Objectives of the Systems Evaluation 1-1
1.2 Project Scope 1-3
1.3 Report Organization 1-4

2. BASIS OF FLOW PROJECTIONS **2-1**

2.1 Introduction 2-1
2.2 Average Dry Weather Flow 2-2
2.2.1 Diurnal Base Wastewater Flow Curves 2-3
2.2.2 Groundwater Infiltration 2-4
2.2.3 Existing Base Wastewater Flows 2-5
2.2.3.1 City of Roseville 2-5
2.2.3.2 Placer County and SPMUD 2-7
2.2.3.3 Drought Rebound 2-7
2.2.4 Future Average Dry Weather Flow 2-7
2.2.4.1 City of Roseville 2-9
2.2.4.2 Placer County and SPMUD 2-10
2.2.4.3 Urban Growth Areas 2-10
2.2.5 Dry Weather Flow Summary 2-11
2.3 Rainfall-Dependent Infiltration and Inflow 2-12

3. TRUNK SEWER EVALUATION **3-1**

3.1 Introduction 3-1
3.2 Model Network Development 3-1
3.2.1 Modeling Terminology 3-1
3.2.2 Modeled System 3-2
3.2.3 Flow Monitoring Program 3-4
3.2.3.1 Radar Rainfall Data 3-8
3.2.4 Model Loading 3-8
3.2.5 Model Calibration 3-8
3.2.6 Dry Weather Calibration 3-9
3.3 Wet Weather Flow Projections 3-14
3.3.1 Wet Weather Calibration 3-14
3.4 Capacity Analysis 3-18
3.4.1 Design Flow Criteria 3-18
3.4.1.1 Summary of Flows Under Design Storm 3-19
3.4.2 Hydraulic Capacity Criteria 3-19
3.4.3 Capacity Analysis Results 3-19
3.5 Proposed Improvements 3-23
3.5.1 Design Criteria for New Sewer Facilities 3-23
3.5.1.1 Gravity Sewers 3-23
3.5.1.2 Pump Stations and Force Mains 3-24
3.5.2 Cost Criteria 3-24

3.5.3 Proposed Capacity Improvement Project Descriptions 3-25
3.5.3.1 Improvement Project 1 3-25
3.5.3.2 Improvement Project 2 3-25
3.5.3.3 Improvement Project 3 3-26
3.5.4 Timing of Proposed Improvement Projects 3-29

4. WASTEWATER TREATMENT PLANT EXPANSION EVALUATION 4-1

4.1 Introduction 4-1
4.1.1 Dry Creek Wastewater Treatment Plant 4-1
4.1.2 Pleasant Grove Wastewater Treatment Plant 4-2
4.2 Flows and Loadings 4-3
4.2.1 Current Flows and Peaking Factors 4-3
4.2.2 Projected Plant Influent Flows 4-4
4.2.3 Current BOD Loadings 4-5
4.2.4 Current and Projected Plant Influent Loadings 4-6
4.3 Plant Capacity Comparison and Expansion Phasing 4-7
4.3.1 Dry Creek Wastewater Treatment Plant 4-9
4.3.1.1 Hydraulic Capacity and Phasing 4-9
4.3.1.2 Biological Capacity and Phasing 4-9
4.3.2 Pleasant Grove Wastewater Treatment Plant 4-9
4.3.2.1 Hydraulic Capacity and Phasing 4-9
4.3.2.2 Biological Capacity and Phasing 4-10
4.4 Conceptual Capital Cost Estimates 4-15
4.4.1 Cost Estimation Approach 4-15
4.4.2 Dry Creek WWTP Cost Estimates 4-17
4.4.3 PGWWTP Cost Estimates 4-19

5. CAPACITY IMPROVEMENT PROJECT SUMMARY & NEXT STEPS 5-1

5.1 Next Steps 5-2

TABLES

Table ES-1: Estimated Dry Weather Flows[a] by Agency 7
Table ES-2: Modeled ADWF And Peak WW Flow Summary 7
Table ES-3: Sewer Capacity Results under Existing and Buildout Land Use Scenarios 8
Table ES-4: Proposed Capacity Improvement Projects 8
Table ES-5: Current and Projected Flows and Organic (BOD) Loadings 12
Table ES-6: DCWWTP Phase 1 and Phase 2 Capital Cost Estimates (ENR CCI: 12115)[a] 18
Table ES-7: PGWWTP Phase 1 and Phase 2 Capital Cost Estimates (ENR CCI: 12115)[a] 19
Table ES-8: Proposed Capacity Improvement Projects 20

Table 2-1: Average Dry Weather Flow Factors 2-9
Table 2-2: ADWF from UGAs 2-11
Table 2-3: Estimated Dry Weather Flows[a] by Agency 2-12
Table 3-1: Regional Pump Station Facilities 3-4
Table 3-2: Permanent Flow Meters 3-4
Table 3-3: Temporary Flow Meter Locations 3-5

Table 3-4: Dry Weather Flow Loading Parameters 3-10
Table 3-5: Calibration Rainfall Events 3-14
Table 3-6: Wet Weather Calibration Parameters 3-15
Table 3-7: Modeled ADWF and Peak Wet Weather Flow Summary 3-19
Table 3-8: Capacity Results under Existing and Buildout Land Use Scenarios 3-20
Table 3-9: Cost Estimate Classification Matrix (AACE International) 3-24
Table 3-10: Proposed Capacity Improvement Projects 3-27
Table 3-11: Timing of Proposed Capacity Improvement Projects 3-29
Table 4-1: Current Flows and Peaking Factors 4-4
Table 4-2: Projected FY 59/60 and Buildout EDUs and Flows at DCWWTP 4-4
Table 4-3: Projected FY 59/60 and Buildout EDUs and Flows at PGWWTP 4-5
Table 4-4: Current and Projected Influent Loading at DCWWTP 4-7
Table 4-5: Current and Projected Influent Loading at PGWWTP 4-7
Table 4-6: Current Hydraulic and Organic (BOD) Capacities at DCWWTP and PGWWTP 4-8
Table 4-7: Revised Current Hydraulic and Organic (BOD) Capacities at DCWWTP and PGWWTP 4-8
Table 4-8: Cost Estimate Classification Matrix (AACE International) 4-15
Table 4-9: Direct Construction Cost Allowances 4-16
Table 4-10: DCWWTP Phase 1 and Phase 2 Capital Cost Estimates (ENR CCI: 12115)[a] 4-18
Table 4-11: PGWWTP Phase 1 and Phase 2 Capital Cost Estimates (ENR CCI: 12115)[a] 4-20
Table 5-1: Proposed Capacity Improvement Projects 5-1

FIGURES

Figure ES-1: SPWA Service Area 2
Figure ES-2: Modeled Trunk System 3
Figure ES-3: Existing Connected Parcels 5
Figure ES-4: Future Developments and Urban Growth Areas 6
Figure ES-5: Model Results (Buildout and Buildout-Sensitivity PWWF) 9
Figure ES-6: Proposed Improvement Locations 10
Figure ES-7: DCWWTP Biological Capacity Comparison 14
Figure ES-8: PGWWTP Hydraulic Capacity Comparison 15
Figure ES-9: PGWWTP Biological Capacity Comparison 16

Figure 1-1: SPWA Service Area 1-2
Figure 2-1: Wastewater Flow Components 2-2
Figure 2-2: Residential Diurnal Curves 2-3
Figure 2-3: Non-Residential Diurnal Curves 2-4
Figure 2-4: Existing Connected Parcels 2-6
Figure 2-5: Future Developments and Urban Growth Areas 2-8
Figure 2-6: RDI/I Hydrograph Components 2-13
Figure 3-1: Modeled Trunk System 3-3
Figure 3-2: Flow Monitoring Locations 3-6
Figure 3-3: Flow Meter Schematic 3-7

Figure 3-4: Example DWF Model Calibration Graph (Site 155) 3-11
Figure 3-5: Calibrated Unit Flow Factors 3-12
Figure 3-6: Calibrated GWI Rates by Flow Meter Area 3-13
Figure 3-7: Example WWF Model Calibration Graph (Site 155) 3-16
Figure 3-8: Calibrated R Values by Flow Meter Area 3-17
Figure 3-9: SPWA 10-year Design Storm Event 3-18
Figure 3-10: Model Results (Existing PWWF) 3-21
Figure 3-11: Model Results (Buildout and Buildout-Sensitivity PWWF) 3-22
Figure 3-12: Proposed Improvement Locations 3-28
Figure 4-1: DCWWTP Treatment Schematic 4-2
Figure 4-2: PGWWTP Treatment Schematic 4-3
Figure 4-3: Influent BOD Concentrations at DCWWTP 4-5
Figure 4-4: Influent BOD Concentrations at PGWWTP 4-6
Figure 4-5: DCWWTP Hydraulic Capacity Comparison 4-11
Figure 4-6: DCWWTP Biological Capacity Comparison 4-12
Figure 4-7: PGWWTP Hydraulic Capacity Comparison 4-13
Figure 4-8: PGWWTP Biological Capacity Comparison 4-14

APPENDICES

Appendix A – Placer County General Plan Densities
Appendix B – Urban Growth Area Land use Summaries
Appendix C – Flow Monitoring Data
Appendix D – Calibration Graphs
Appendix E – Modeled Hydraulic Profiles
Appendix F – Proposed Capacity Improvement Project Details

Acknowledgements

This report represents a collaborative effort between Woodard & Curran, V&A Consulting Engineers, the South Placer Wastewater Authority, the City of Roseville, the South Placer Municipal Utility District, and Placer County. We would like to take an opportunity to thank the following key individuals:

Ken Glotzbach	City of Roseville
Todd Jordan	City of Roseville
Chris Bracco	City of Roseville
Kevin Bell	Placer County
Robin Mahoney	Placer County
Jared Deck	Placer County
Eric Nielsen	South Placer Municipal Utility District
Carie Huff	South Placer Municipal Utility District
Herb Niederberger	South Placer Municipal Utility District
Dave Richardson	Woodard & Curran
Chris van Lienden	Woodard & Curran
Jim Graydon	Woodard & Curran
Gisa Ju	Woodard & Curran
Ian Jaffe	Woodard & Curran
Athena Pervissian	Woodard & Curran
James Kohne	Woodard & Curran
Kevin Krajewski	V&A Consulting Engineers

List of Abbreviations

AA	average annual
ac	acres
ADWF	average dry weather flow
AFY	acre feet per year
APN	assessor parcel number
BOD	biochemical oxygen demand
BSF	base sanitary flow
CIP	Capital Improvement Program
DC	Dry Creek
DCWWTP	Dry Creek Wastewater Treatment Plant
du, DU	dwelling unit
DWF	dry weather flow
ea	each
EDU	Equivalent Dwelling Unit
ENR-CCI	Engineering News Record Construction Cost Index
ft	feet
FY	fiscal year
GIS	Geographical Information System
gpd	gallons per day
gpm	gallons per minute
GWI	groundwater infiltration
I/I	inflow and infiltration
in	inches
lb/day	pounds per day
MCRT	mean cell residence time
MG	million gallons
mgd	million gallons per day
MM	maximum month
NPDES	National Pollutant Discharge Elimination System
PDWWF	peak day wet weather flow
PG	Pleasant Grove
PGWWTP	Pleasant Grove Wastewater Treatment Plant
PHWWF	peak hour wet weather flow
PMF	peak month flow
PS	pump station
PWWF	peak wet weather flow
RAS	return activated sludge
RDI/I	rainfall dependent infiltration/inflow

RWQCB	Regional Water Quality Control Board
SMD-2	Placer County Sewer Maintenance District 2
SMD-3	Placer County Sewer Maintenance District 3
SPMUD	South Placer Municipal Utility District
SPWA	South Placer Wastewater Authority
SWRCB	State Water Resources Control Board
Systems Evaluation	Regional Wastewater and Recycled Water Systems Evaluation
TM	technical memorandum
TSS	total suspended solids
UGA	Urban Growth Area
UV	ultraviolet
WAS	waste activated sludge
WWF	wet weather flow
WWTP	wastewater treatment plant

EXECUTIVE SUMMARY

This report summarizes the results and recommendations of the Systems Evaluation prepared for the South Placer Wastewater Authority (SPWA), which is a Joint Powers Authority comprised of the City of Roseville (City), South Placer Municipal Utility District (SPMUD), and the County of Placer (Placer County). The Systems Evaluation was prepared by Woodard & Curran in close coordination with City, County and District staff. The Systems Evaluation will be used to guide improvements to the regional wastewater collection system and wastewater treatment plants to accommodate current and future development and ensure that SPWA's customers continue to receive a high level of service.

Background and Purpose of the Systems Evaluation

The South Placer Wastewater Authority (SPWA) was created under a Joint Powers Agreement in October 2000 and comprises the City of Roseville (City), South Placer Municipal Utility District (SPMUD), and the County of Placer (Placer County). Flow from SPMUD and portions of Placer County discharge into the City's sewer collection system. The City of Roseville, on behalf of the regional partners, owns and operates two regional wastewater treatment facilities: the Pleasant Grove Wastewater Treatment Plant (PGWWTP), and the older Dry Creek Wastewater Treatment Plant (DCWWTP). Additionally, the City of Roseville owns and operates the network of gravity sewers, pump stations, and force mains that serve customers within the City's limits, including the joint (regional) facilities that convey flow from the SPWA partners. SPMUD owns and operates gravity sewers, pump stations, and force mains in Rocklin, Loomis, and portions of southern Placer County. Placer County owns and operates gravity sewers, pump stations, and force mains in unincorporated areas of Placer County that are not served by other agencies.

The South Placer Regional Wastewater and Recycled Water Systems Evaluation prepared in 2009 (2009 Systems Evaluation), defined the SPWA service area boundary; evaluated the wastewater collection, wastewater treatment, and recycled water distribution systems; and identified existing and potential future improvement needs. Since that study was completed, the recycled water distribution system has been "removed" from the SPWA system (reallocated as an asset) and is now wholly managed by the City of Roseville. SPWA is now updating the Systems Evaluation to better evaluate future wastewater collection and treatment capacity needs that may have changed since 2009. This report documents the evaluation of the wastewater collection system capacity and the capacity of the wastewater treatment plants versus projected flows and loads.

This South Placer Regional Wastewater Systems Evaluation (Systems Evaluation) has been conducted to accomplish the following:

- Document the existing (2020) capacity and the flows and loadings on regional trunk sewer and wastewater treatment infrastructure and facilities present in 2020;
- Project buildout conditions based upon regional planning documents and planned regional developments in southwestern Placer County; and,
- Present a Regional Systems evaluation, with system deficiencies identified, and capital projects forecasted, which will inform the SPWA partners in identifying their ability to provide service for planned and proposed development both presently and for buildout conditions.

The service area is shown in **Figure 1-1**, and the regional collection system is shown in **Figure ES-2**. Figure 1-1 also indicates the location of the Urban Growth Areas (UGAs) within the service area, which are included in this study. Note that Creekview has been incorporated into the City of Roseville service area as of January 2019, while Amoruso and Sierra Vista are anticipated to be incorporated into the City's service area in early 2021.

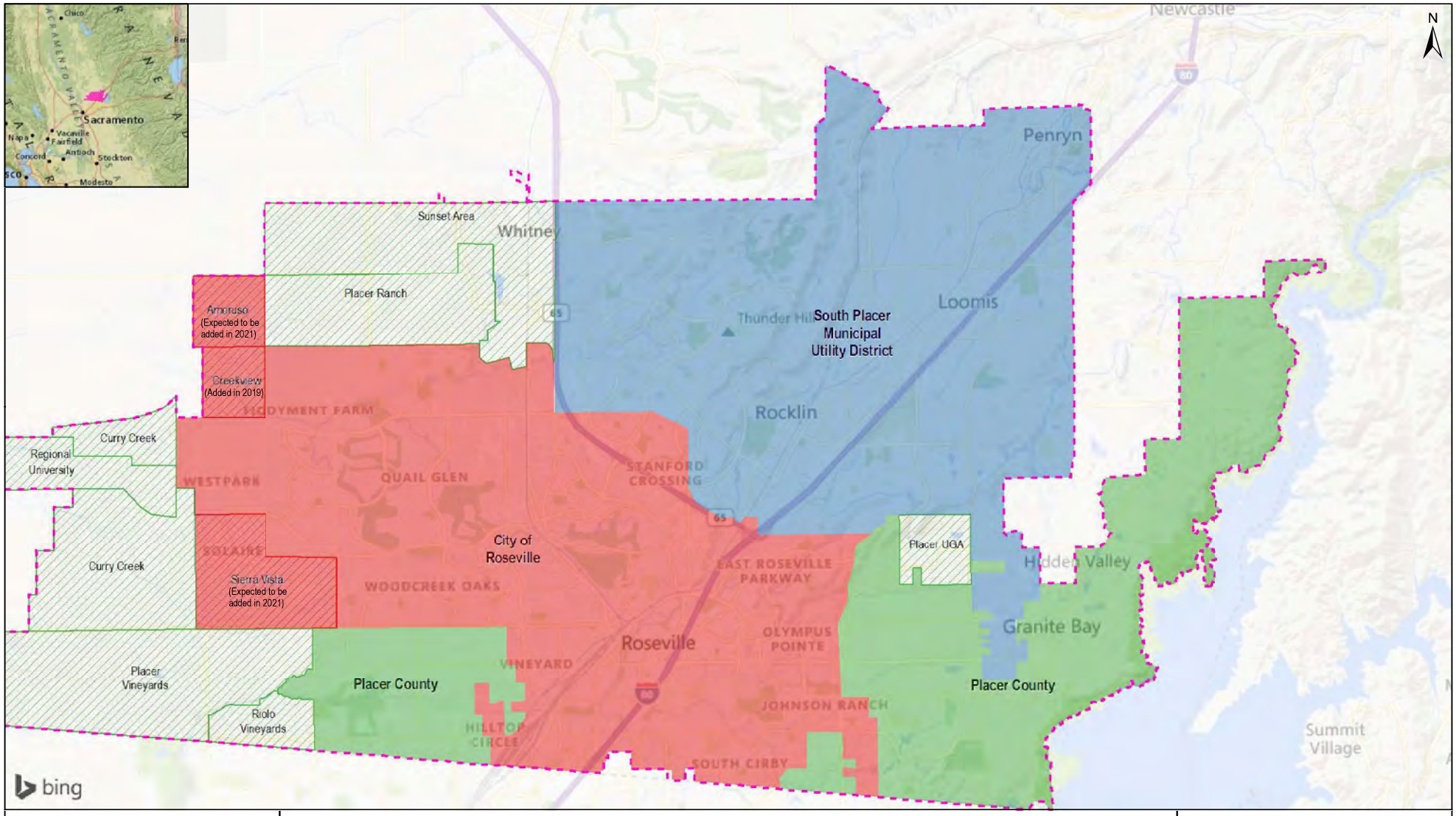


Figure ES-1
2021 Service Area Boundary

South Placer Wastewater Authority
2020 Systems Evaluation

0 ½ 1 2 Miles

2021 Partner Agency Service Area
- City of Roseville
- Placer County
- SPMUD

Urban Growth Area
- City of Roseville UGA
- Placer County UGA

Ultimate Service Area Boundary

Project #: 0011183.00
Map Created: December 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources:** SPWA Agencies, ESRI, W&C

Figure Exported: 12/21/2020 By: evanjlander Using: \\woodardcurran.net\shared\Projects\RMC\WCR\0091 Roseville, City of\0011183.00 SPWA Systems Evaluation\G. GIS\3 MXDs\Report Figures\1-1_SPWA_Service_Area.mxd

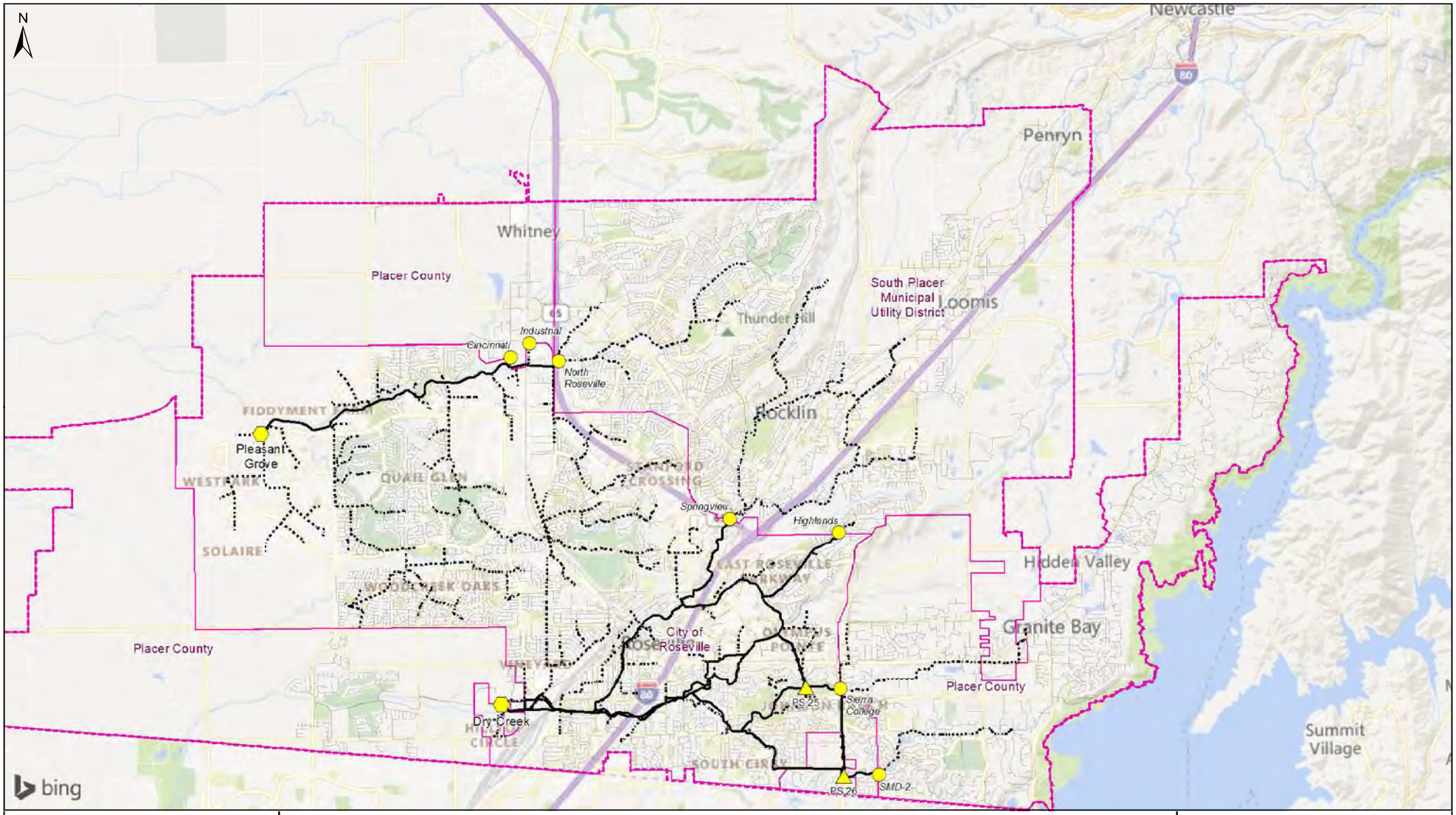


Figure ES-2
Modeled Trunk System

South Placer Wastewater Authority
2020 Systems Evaluation

0 ½ 1 2 Miles

- Regional Gravity Sewer
- Regional Force Main
- Non-Regional Modeled Sewer
- Non-Modeled Sewer
- Wastewater Treatment Plant
- Pump Station
- Permanent Flow Meters
- Partner Agency Boundary
- Ultimate Service Area Boundary

Project #: 0011183.00
Map Created: December 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources:** SPWA Agencies, ESRI, W&C

Figure Exported: 12/21/2020 By: evanlienden Using: \\woodardcurran.net\shared\Projects\RMC\WCR\0091 Roseville, City of\0011183.00 SPWA Systems Evaluation\G. GIS\3 MXDs\Report Figures\ES-2_Modeled_Trunk_System.mxd

Modeled Flow Projections

The flow projections developed for this Systems Evaluation were based on the information collected for the system's hydraulic model updates, including the updates performed for the current study. In 2007, a hydraulic model of the City's sewer collection system was developed using the H2OMap Sewer modeling platform (2007 Model Development Project), in parallel with a trunk sewer model for the combined Roseville, SPMUD, and Placer County systems. The models were later updated as part of the 2009 Systems Evaluation. Subsequently, the City's sewer model was updated in 2017 to reflect existing and future demands within the City, and to upgrade the modeling platform to the fully dynamic InfoWorks ICM software. For the current Systems Evaluation Update, the City's model was updated to reflect existing and future projected flows from Placer County and SPMUD.

Existing base wastewater flows were developed based on the assumptions summarized below; currently connected parcels are indicated in **Figure ES-3**. Note that flow projections (referred herein as loads) are intended to represent the level of development present during the flow monitoring periods used to calibrate the hydraulic model. Buildout loads were based on projected development within the service area. Two buildout scenarios were developed: (1) Buildout scenario representing the currently anticipated development density, and (2) Buildout-Sensitivity scenario, representing higher density development and some potential redevelopment areas.

For the City of Roseville, existing loads were developed based on water consumption data, and calibrated during the 2017 model update. A 15% rebound to reflect drought conditions was assumed for existing sewer loads. A buildout scenario was developed based on infill of currently vacant parcels using land use information from the City's General Plan or provided by the City's planning department, and development of UGAs within the City. The Buildout-Sensitivity scenario considers potential intensification and redevelopment in the downtown Roseville area.

Placer County provided spreadsheets summarizing existing equivalent dwelling units (EDUs) for each APN[1], which formed the basis of the existing model loads. (Note: an EDU is defined as the flow equivalent of one single-family residence.) For the Buildout scenario, flows were based on a spreadsheet provided by Placer County that summarized the anticipated EDUs for all entitled projects in Placer County[2], development of other currently vacant parcels (based on general plan data[2]), and development of the Placer County UGAs. For the Buildout scenario, an average development density for vacant parcels was assumed within the General Plan limits. For the Buildout-Sensitivity scenario, the development density was assumed to be at the maximum range allowed by the General Plan. A Base Wastewater Flowrate (BWF) of 180 gpd per EDU was assumed for Placer County and SPMUD.

SPMUD provided a shapefile[3] which provided EDUs for the year 2020 (which was identified as "existing" land use by SPMUD staff), and 2060 (which was identified as "Buildout" by SPMUD staff). This shapefile formed the basis of the Existing and Buildout scenarios.

For the UGAs, land use and flow projections were based on the most recent wastewater master plans for each UGA.

The locations of future developments, including urban growth areas, are indicated in **Figure ES-4.**

[1] Spreadsheets included: Existing dry creek EDU-7-24-19.xls, Existing SMD 2- EDU-2018-12-12.xlsx, Existing SMD 3- EDU-2018-12-12.xlsx, Existing Sunset EDU-7-24-19.xls

[2] 2018-12-18-Entitled-Planned Project.xlsx (provided December, 2018) and GeneralPlans_CommPlans.shp (downloaded from Placer County website, dated October 20, 2019)

[3] SPMUD_SewerLoading_AddressPoints, provided August 7, 2019.

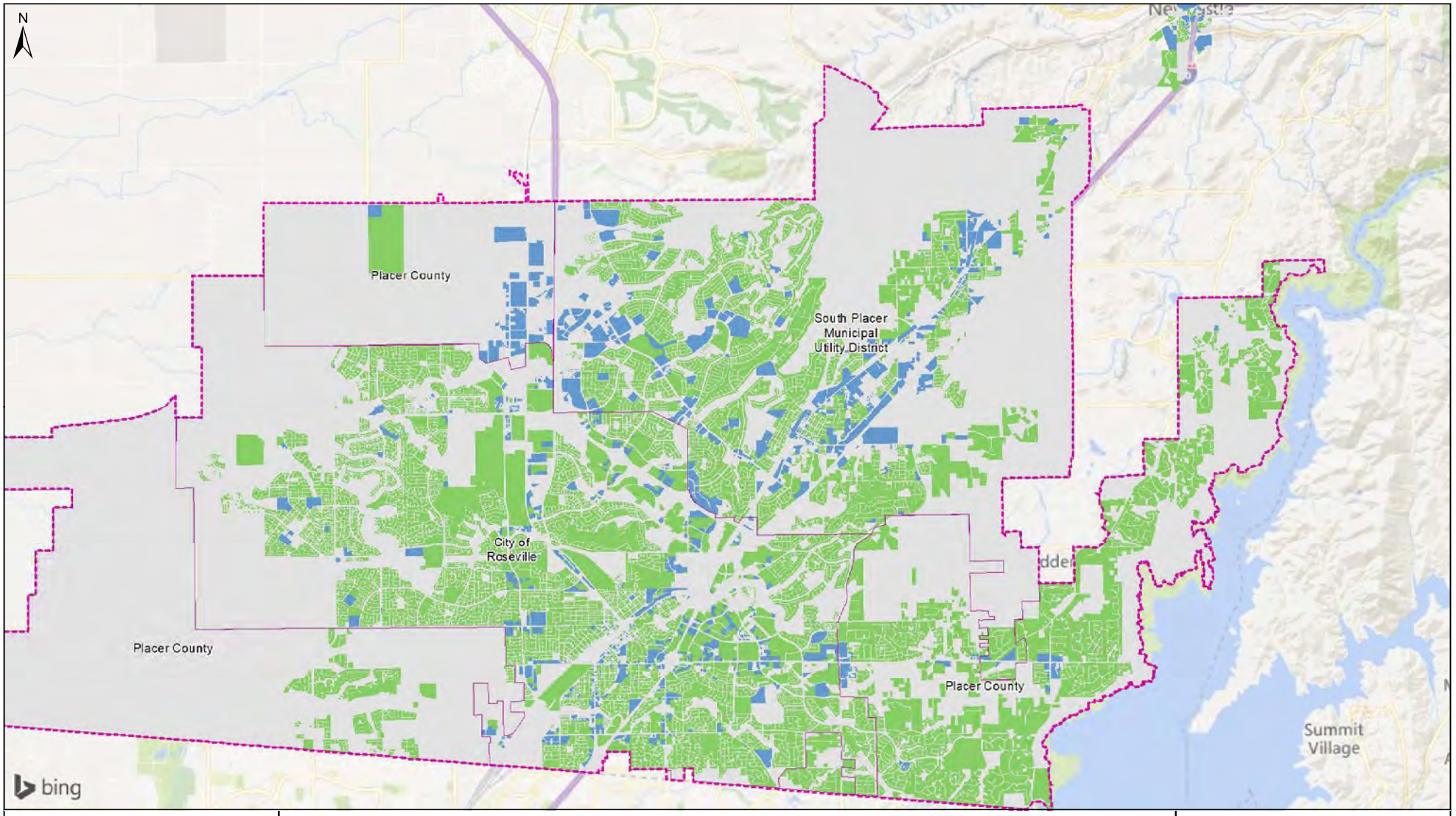


Figure ES-3

Existing Connected Parcels

South Placer Wastewater Authority
2020 Systems Evaluation

0 ½ 1 2 Miles

Parcel Land Use

- Commercial/Industrial
- Residential
- Unconnected

- Service Area Boundary
- Partner Agency Boundary

Project #: 0011183.00
Map Created: December 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources:** SPWA Agencies, ESRI, W&C

Figure Exported: 12/21/2020 By: cvanlaenden Using: \\woodardcurran.net\shared\Projects\RMC\WCR\0091 Roseville, City of\0011183.00 SPWA Systems Evaluation\G. GIS\3 MXDs\Report Figures\ES-3_Existing_Connected_Parcels.mxd

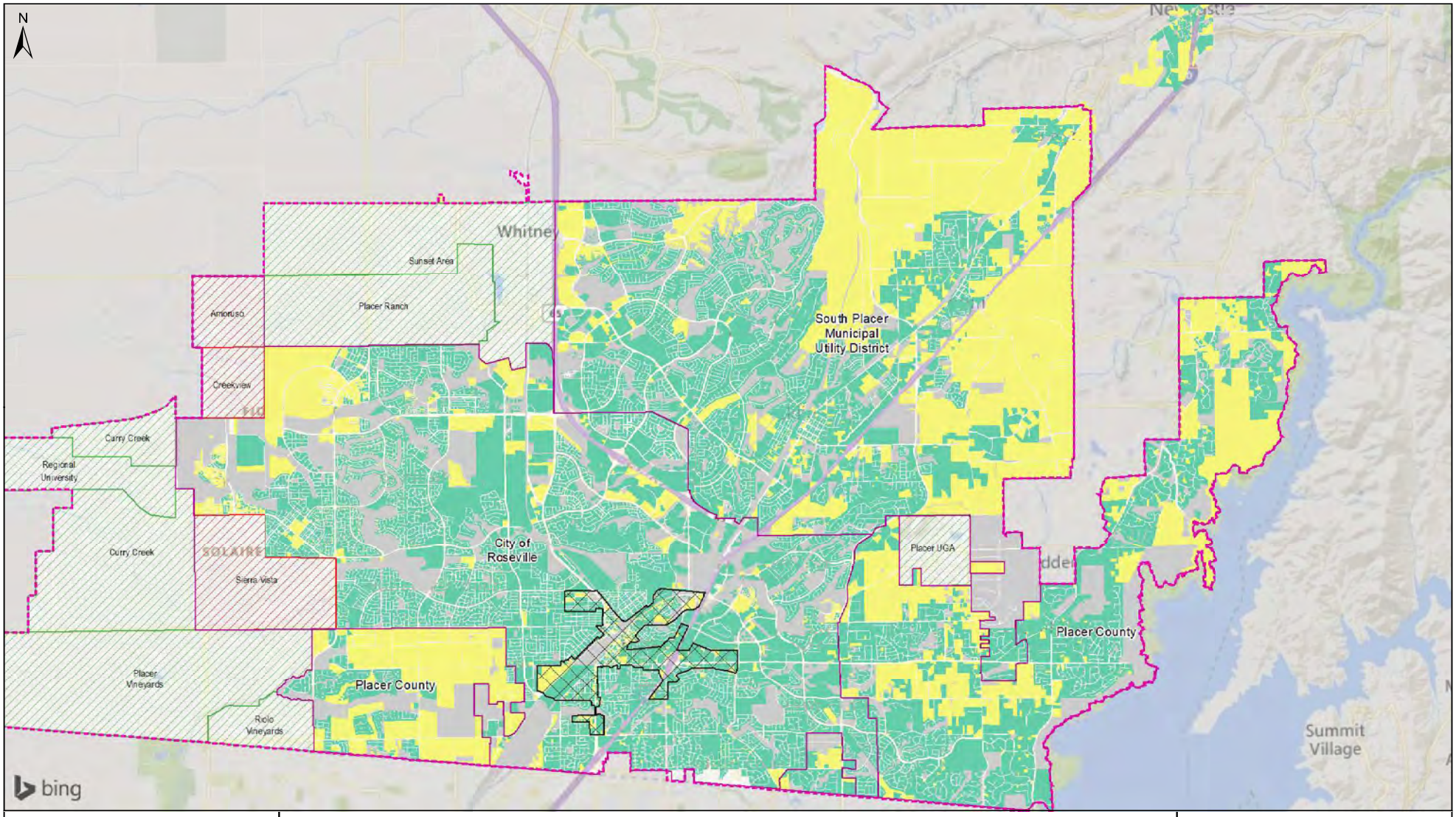


Figure ES-4

Future Development and Urban Growth Areas

South Placer Wastewater Authority
2020 Systems Evaluation

0 ½ 1 2 Miles

Buildout Status
- Existing
- Future Connection
- Unconnected
- Redevelopment Area

Urban Growth Area
- City of Roseville UGA
- Placer County UGA

Service Area Boundary

Partner Agency Boundary

Project #: 0011183.00
Map Created: December 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources:** SPWA Agencies, ESRI, W&C

Figure Exported: 12/21/2020 By: evanlienden Using: \\woodardcurran.net\shared\Projects\RMC\WCR\0091 Roseville, City of\0011183.00 SPWA Systems Evaluation\G. GIS\3 MXD\Report Figures\ES-4 Future Developments and Urban Growth Areas.mxd

Model loads were calibrated based on temporary monitoring programs for the 2015/2016 wet weather season (30 meters for the City's 2017 Model Update) and 12 meters during the 2018/2019 wet weather season (for SPMUD and Placer County). V&A Consulting Engineers, under subcontract to Woodard & Curran, conducted the monitoring. As part of the calibration process, rates of wet season groundwater infiltration (GWI, observed as a constant additional flow throughout the monitoring period), and rainfall-dependent inflow and infiltration (RDI/I) were calculated. Existing and projected flows predicted by the model are summarized in **Table ES-1** and **Table ES-2**.

Table ES-1: Estimated Dry Weather Flows[a] by Agency

WWTP	Agency	Existing Calibration ADWF (mgd)	Existing ADWF with Drought Rebound	Buildout ADWF (mgd)	Buildout-Sensitivity[b] ADWF (mgd)
Pleasant Grove	Roseville	5.87	6.70	13.01	13.04
	Placer County	0.18	0.20	9.85	9.85
	SPMUD	2.25	2.97	3.63	3.63
	Total	**8.30**	**9.87**	**26.49**	**26.52**
Dry Creek	Roseville	5.60	6.27	6.89	8.23
	Placer County	2.57	2.81	7.19	7.42
	SPMUD	2.90	3.64	5.16	5.16
	Total	**11.06**	**12.72**	**19.24**	**20.81**

Notes:
a. Includes wet season GWI.
b. For the Buildout-Sensitivity scenario, the development density was assumed to be at the maximum range allowed by the General Plan. A Base Wastewater Flowrate (BWF) of 180 gpd per EDU was assumed for Placer County and SPMUD

Table ES-2: Modeled ADWF And Peak WW Flow Summary

	Existing (Rebound)			Buildout			Buildout-Sensitivity		
WWTP	BWF[a] (mgd)	ADWF (mgd)	PWWF[b] (mgd)	BWF[a] (mgd)	ADWF (mgd)	PWWF[b] (mgd)	BWF[a]	ADWF (mgd)	PWWF[b] (mgd)
Pleasant Grove	9.5	9.9	27.4	26.1	26.5	55.8	26.2	26.5	56.0
Dry Creek	10.1	12.7	41.9	16.7	19.2	59.2	18.2	20.8	60.6

Notes:
a. Does not include wet season groundwater infiltration (GWI).
b. Modeled PWWF assumes improvements have been implemented to eliminate overflows and significant surcharging.

Trunk Sewer Evaluation

The calibrated model was run for Existing, Buildout, and Buildout-Sensitive land use scenarios under the design event described above. Several deficiencies were identified in non-regional facilities which resulted in model-predicted overflows for one or more of the scenarios; to ensure flows were conveyed to regional sewers, pipes were upsized in this analysis to eliminate any overflows. As the current model is a calibrated fully-dynamic model, the design condition represents a relatively infrequent storm event, and many of SPWA's sewers are relatively deep, surcharging up to within 5 feet of the manhole rims (ground surface) was considered acceptable under 10-year design storm PWWF, as long as the surcharge (flow height in the manhole) does not exceed 4 feet from the top of pipe up the manhole.

Model results under Existing and Buildout conditions are summarized in **Table ES-3** and results for the Buildout scenario are shown in **Figure ES-5**. Within the regional system, seven deficiency areas have been identified as indicated in **Figure ES-5**. There was no significant difference in modeled surcharge between the Buildout and Buildout-Sensitivity scenarios.

Table ES-3: Sewer Capacity Results under Existing and Buildout Land Use Scenarios[a]

Area	Existing (with Rebound)			Buildout and Buildout-Sensitivity		
	Length of Throttle Surcharge (ft)	Maximum Surcharge Depth (ft)	Minimum Freeboard (ft)	Length of Throttle Surcharge (ft)	Maximum Surcharge Depth (ft)	Minimum Freeboard (ft)
A	5,530	7.3	0.0	5,530	7.8	0.0
B	3,369	1.9	2.0	3,948	7.7	0.0
C	522	1.0	7.4	6,009	6.4	2.8
D	700	1.1	8.6	4,220	3.3	6.4
E	--	--	--	2,223	3.1	5.6
F	--	0.9	12.2	1,716	7.3	2.2
G	--	--	--	0	2.3	6.3

Notes:

a. Areas that exceed the hydraulic capacity criteria but do not have modeled overflows are highlighted yellow, while areas with modeled overflows are highlighted orange.

Based on these model results, improvement projects have been identified to relieve the capacity deficiencies. Improvement Project 1 would relieve existing deficiencies, while Improvement Project 2 and 3 would relieve deficiencies identified in the Buildout system. Improvement Project 2 and 3 would largely be triggered by additional growth in Placer County's SMD2 and SMD3 service areas. Subsequent model runs were performed to estimate the number of EDUs that would trigger the need for these additional projects; based on this analysis, the projects would be needed after approximately 1,800 additional EDUs (compared to 2018 development). Based on the EDU projections provided by Placer County, this additional growth is not anticipated until after Fiscal Year (FY) 2059/2060. Note that this estimate is based on dry weather flows and rainfall response estimated as part of the model update; changes in these projected flows may occur (in the future with additional flow monitoring and model updates) which would trigger the need for the projects earlier, or delay or eliminate the need for the projects.

The proposed capacity improvement projects are summarized in **Table ES-4** and the locations are shown in **Figure ES-6**.

Table ES-4: Proposed Capacity Improvement Projects

Project	Description	Estimated Capital Improvement Cost	Approximate Additional EDUs in SMD2/SMD3 to Trigger Project[a]
1	Increased Capacity of PS 26 and sewers on Sierra College Blvd directly downstream of PS 26 to relieve Old Auburn Trunk sewer (Area A)	$1,606,000	Existing
2	Redirect flows from PS 26 and Sierra College Blvd down Eureka Road to relieve Area E.	$1,831,000	~1,800[b]
3	Increased Firm capacity of PS 25 to meet Buildout PWWF. New weir structure or adjustments to existing structure at PS 25 to convey the maximum potential flow through PS 25 without any dry weather flows.	$758,000	~1,800[c]

Notes:

a. Based on a percentage of buildout factor applied to future model loads. Represents approximately 60% of buildout.

b. There are approximately 8,400 Existing EDUs upstream of the deficiency triggering Improvement Project 2, and approximately 10,200 EDUs would trigger the need for improvement. Represents approximately 60% of buildout.

c. There are approximately 11,900 Existing EDUs upstream of the deficiency triggering Improvement Project 3, including 7,600 in Placer County, 4,200 in Roseville, and less than 100 in SPMUD. Approximately 13,700 EDUs would trigger the need for the improvement.

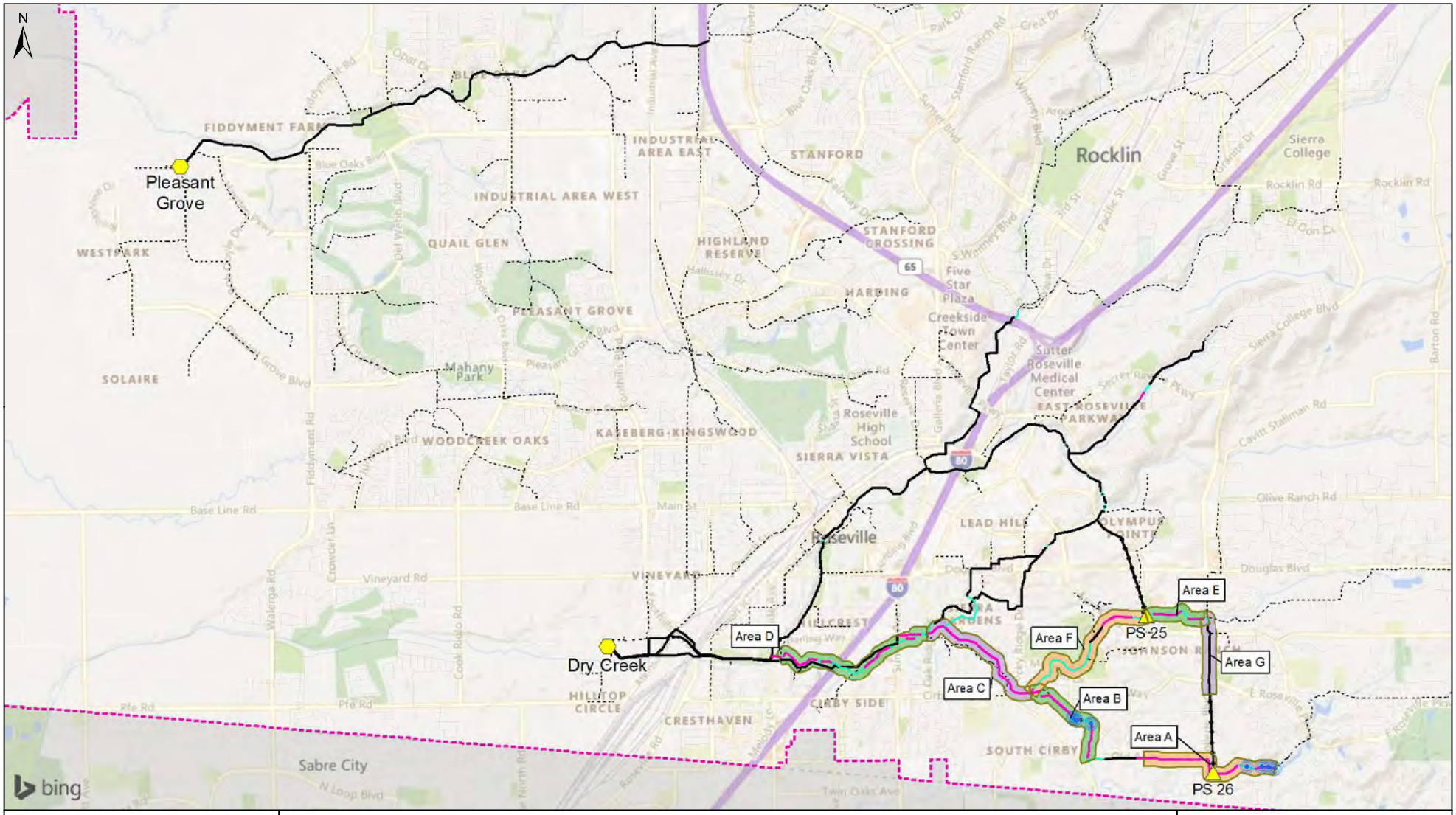


Figure ES-5

Model Results (Buildout and Buildout Sensitivity PWWF)

South Placer Wastewater Authority
2020 Systems Evaluation

0 ¼ ½ 1 Miles

- Regional Gravity Sewer
- Force Main
- Non-Regional Modeled Sewer
- Backwater Surcharge
- Throttle Surcharge
- Modeled Sewer Overflow
- Deficiency Area
- Ultimate Service Area Boundary

Project #: 0011183.00
Map Created: December 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources:** SPWA Agencies, ESRI, W&C

Figure Exported: 12/21/2020 By: cvanlaenden Using: \\woodardcurran.net\shared\Projects\RMC\WCR\0091 Roseville, City of\0011183.00 SPWA Systems Evaluation\G. GIS\3 MXD\eReport Figures\ES-5 Model Results Buildout and Buildout Sensitivity PWWF.mxd

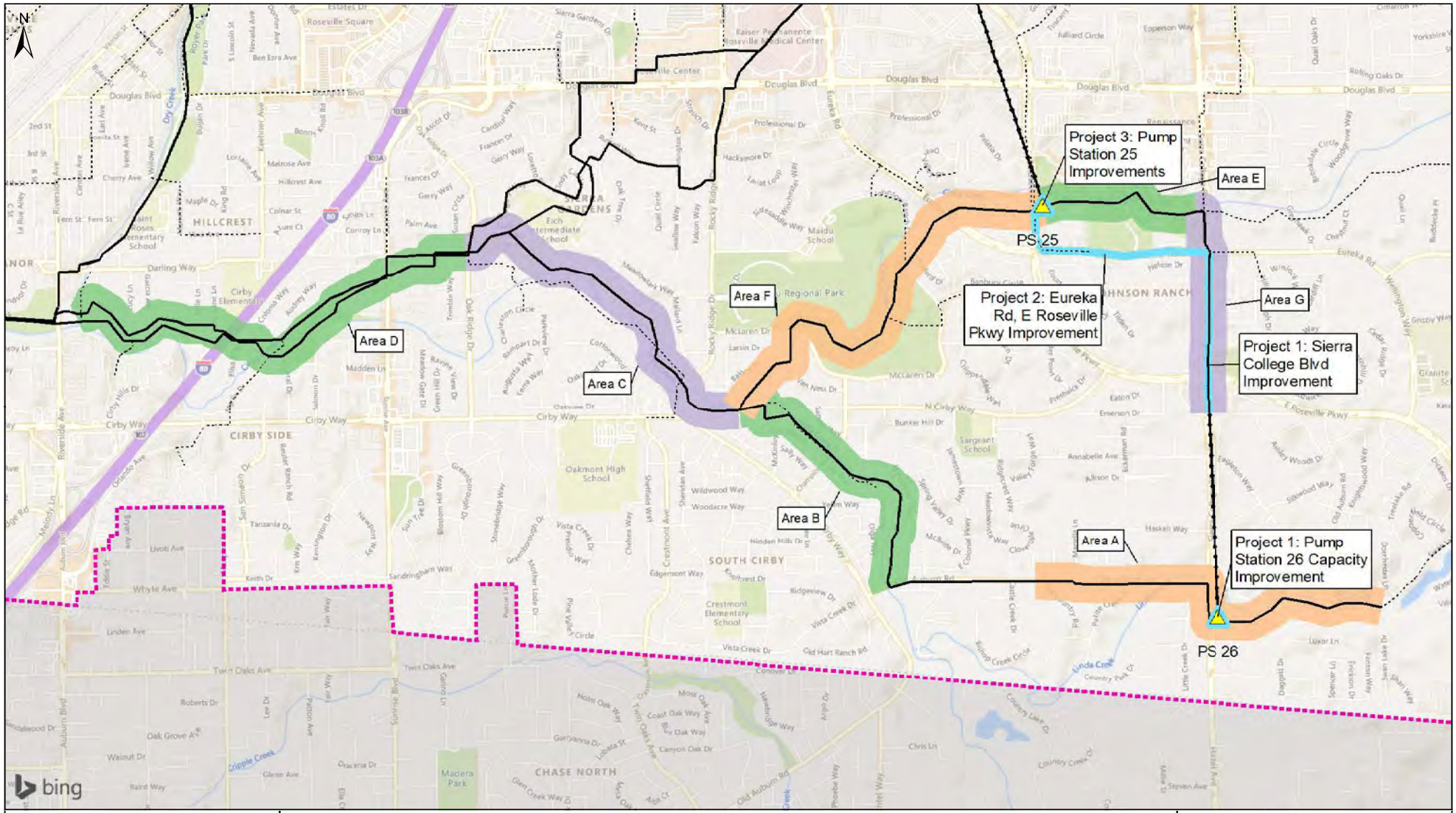


Figure ES-6
Proposed Improvement Locations

South Placer Wastewater Authority
2020 Systems Evaluation

0 0.125 0.25 0.5 Miles

- Regional Gravity Sewer
- Force Main
- Non-Regional Modeled Sewer
- Pump Station
- Preliminary Capacity Improvement Area
- Deficiency Area
- Service Area Boundary

Project #: 0011183.00
Map Created: December 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources:** SPWA Agencies, ESRI, W&C

Figure Exported: 12/21/2020 By: cvanlaenden Using: \\woodardcurran.net\shared\Projects\RMC\WCR\0091 Roseville, City of\0011183.00 SPWA Systems Evaluation\G. GIS\3 MXDs\Report Figures\ES-6 Proposed Improvement Projects.mxd

Wastewater Treatment Plant Expansion Evaluation

Based on the updated growth projections provided by the SPWA partners, wastewater flow and loading (organic loading as measured by Biochemical Oxygen Demand, or BOD, and solids loading as measured by Total Suspended Solids, or TSS) projections were developed for the Dry Creek Wastewater Treatment Plant (DCWWTP) and Pleasant Grove Wastewater Treatment Plant (PGWWTP). The flow and loading projections were compared to the most recent evaluations of treatment plant capacity from 2009 for DCWWTP and from 2016 for PGWWTP. Projected shortfalls in hydraulic capacity or biological treatment capacity were identified and preliminary recommendations for expansion and upgrade projects were proposed. The recommendations address phasing, timing, and preliminary conceptual costs of the expansions required through buildout to address both flows and loads, as well as identifying next steps for confirming current plant capacity and refining expansion and upgrade projects.

Wastewater Flow and Loading Evaluation

Current influent flows and loadings for both plants were established by analyzing daily plant influent data provided by the City of Roseville for the period from January 1, 2016 through September 19, 2019 for influent flow and from January 1, 2013 through September 19, 2019 for wastewater loadings. Notably, the waste loadings for biochemical oxygen demand (BOD) over the past 6 years have been significantly higher than documented for prior studies and design projects. In previous studies, average BOD concentrations of 248 mg/L at DCWWTP and 285 mg/L at PGWWTP were documented. The 2013-2019 data set shows an average influent BOD concentration of 425 mg/L at DCWWTP and 358 mg/L at PGWWTP. These higher concentrations may be a result of water conservation efforts over the past decade combined with the drought conditions that were experienced throughout California from 2011-2016, but should be confirmed through additional testing. While TSS and nutrient loadings were also calculated, now that the Roseville WWTPs are addressing nutrient removal in their water quality strategies, the focus herein is on organic loading, as measured by BOD, because that is where the capacity constraints present themselves.

Projected flows were calculated based on population and non-residential growth, normalized to account for diversity in land uses by establishing equivalent dwelling units (EDUs). EDU projection data were provided by each of the SPWA partners. Flow projections were developed by multiplying the projected EDUs by an ADWF contribution of 190 gallons per day (gpd) per EDU, in accordance with the estimate developed in the 2009 Systems Evaluation (a conservative value used for regional treatment capacity planning).

The plant data show that current BOD loadings are higher than the BOD treatment capacities estimated in the prior reference documents for both plants. However, according to City staff, the plants have consistently been in compliance with their NPDES discharge permits. This suggests that the **actual** plant capacities are beyond their **nomina**l design capacity with respect to BOD. Additionally, it is unclear to what extent interim improvements such as the Nitrate Reduction Improvements project at DCWWTP have affected the plant capacity. For the purposes of this Systems Evaluation, it is assumed that the annual average BOD removal capacity at each plant is, at minimum, the same as the current BOD loadings. It is recommended that process-specific sampling, process modeling, and, if needed, stress testing be performed to determine the actual plant capacity, the limiting processes, and corresponding process improvements needed at each plant. While this evaluation will be immediately helpful at Pleasant Grove, it is immediately essential at Dry Creek because of the large discrepancy between current loading and nominal capacity.

The current and projected flows and loadings to the treatment plants are summarized in **Table ES-5** along with the treatment capacities based on current operating conditions. This comparison of current plant capacity and projected future flows and loads accounts for only hydraulic and carbonaceous BOD treatment capacity because these parameters have driven capacity expansion timing in the past (vs. TSS and nutrient treatment capacity). Potential nutrient removal requirements have not been considered in expansion timing and phasing. Evaluation of plant capacity with respect to TSS and nutrient removal should be incorporated into the subsequent analysis of plant capacity.

Table ES-5: Current and Projected Flows and Organic (BOD) Loadings

Parameter	Condition	Unit	Capacity			
				Current	FY59/60	Buildout
Dry Creek Wastewater Treatment Plant						
EDU		#		57,747	87,772	96,000
Flow	Average Dry Weather Flow	mgd	18	8.6	16.7	18.2
BOD	Annual Average Loading	lbs/day	33,900[1]	33,900	52,000	56,000
Pleasant Grove Wastewater Treatment Plant						
EDU		#		54,907	92,864	145,000
Flow	Average Dry Weather Flow	mgd	12[2]	7.6	17.6	27.6
BOD	Annual Average Loading	lbs/day	22,400[1]	22,400	38,000	60,000

Notes:

1. Current BOD loadings based on plant data from January 2013 through September 2019.
2. Plant improvements that expand treatment capacity at PGWWTP are currently under construction and are expected to be in service by FY 22-23.

Recommended Expansion Phasing

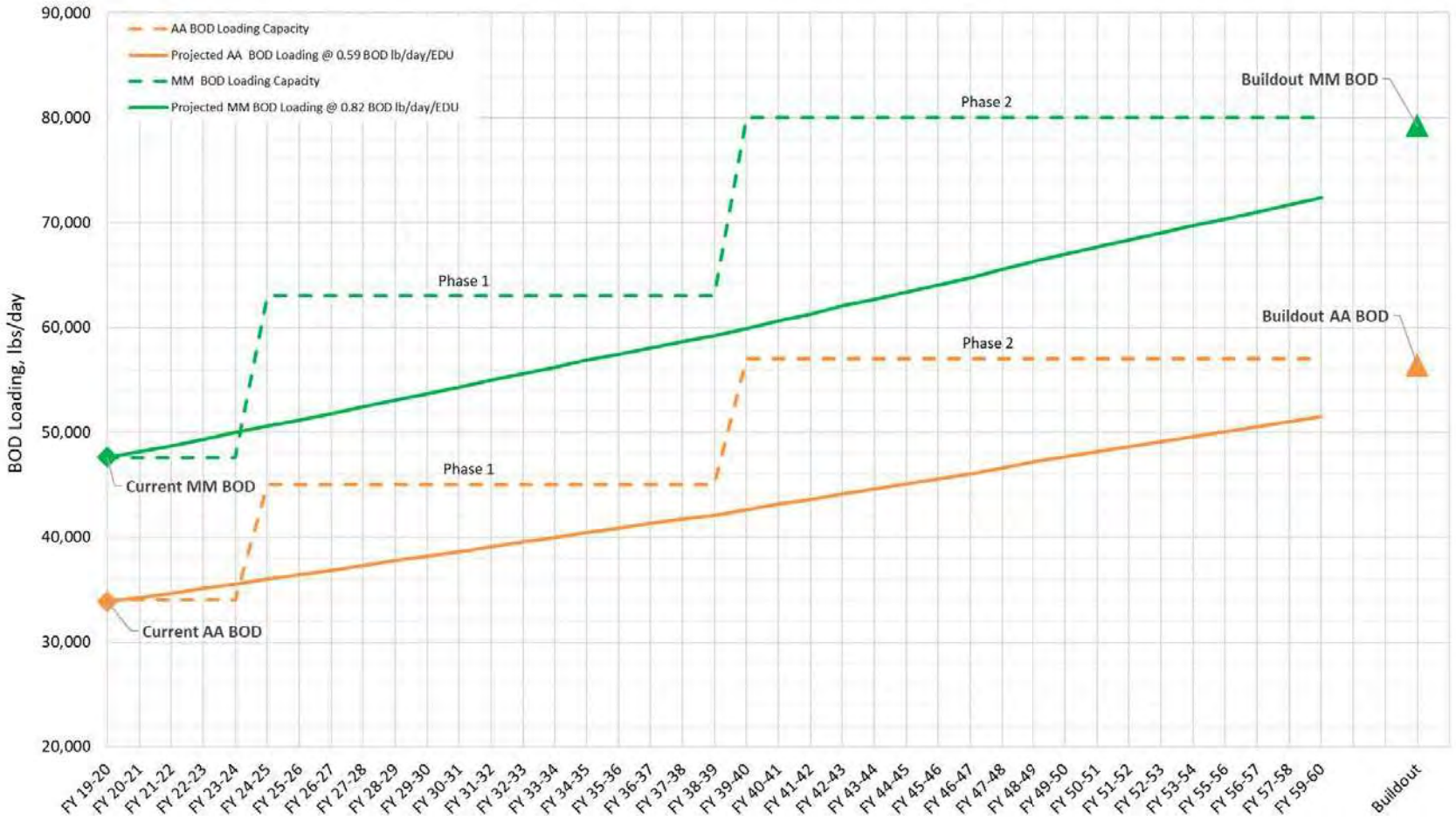
Prior to implementing any further improvements, it is recommended that process-specific sampling, process modeling, and if needed, stress testing be performed to determine the actual plant capacity, the limiting process, and corresponding process improvements needed at each plant.

Dry Creek Wastewater Treatment Plant. Based on the projected ADWF of 16.7 for FY 59/60 and 18.2 mgd for buildout, the current ADWF hydraulic capacity of 18 mgd is effectively sufficient through buildout. As shown in **Table ES-5**, DCWWTP appears to be currently running at or beyond its nominal design capacity with respect to BOD loading. **Figure ES-7** shows annual average (AA) and maximum monthly (MM) biological treatment capacities plotted against the loadings projected over the planning period and the anticipated expansion phasing. Depending on the results of the capacity testing, a Phase 1 expansion project may be necessary in approximately FY 24/25, which is the earliest practical time frame considering planning, design, and construction duration. The plant will reach 94% of the expanded Phase 1 AA and MM BOD loading capacity in FY 39/40. Therefore, it is recommended to implement Phase 2 biological improvements at this time. Phase 2 improvements in FY 39/40 are recommended to bring the plant BOD loading capacity to its buildout AA and MM projections of 56,000 and 79,000 lbs/day, respectively. The timing and magnitude of the recommended projects should be refined after additional capacity analysis and facility planning is completed, as described in the 3rd paragraph in the Wastewater Flow and Loading Evaluation section above.

Pleasant Grove Wastewater Treatment Plant. The improvements currently under construction will expand PGWWTP's treatment capacity to 12 mgd by FY 22-23. Based on the ADWF projections, this capacity expansion should be sufficient to handle flows through FY 28-29, though timing would depend on whether any rebound in sewer flows occurs.. Based on current estimates of capacity, Phase 1 hydraulic expansion at PGWWTP may be needed by approximately FY 28-29 to expand the plant ADWF to 15 mgd. Phase 1 expansion would carry the PGWWTP through FY 40-41. At that point, Phase 2 improvements may be needed to increase the plant ADWF capacity to the FY 59/60 flow projections of 17.6 mgd. Figure ES-8 shows ADWF plotted against the flow projected over the planning period and the anticipated phasing for improvements.

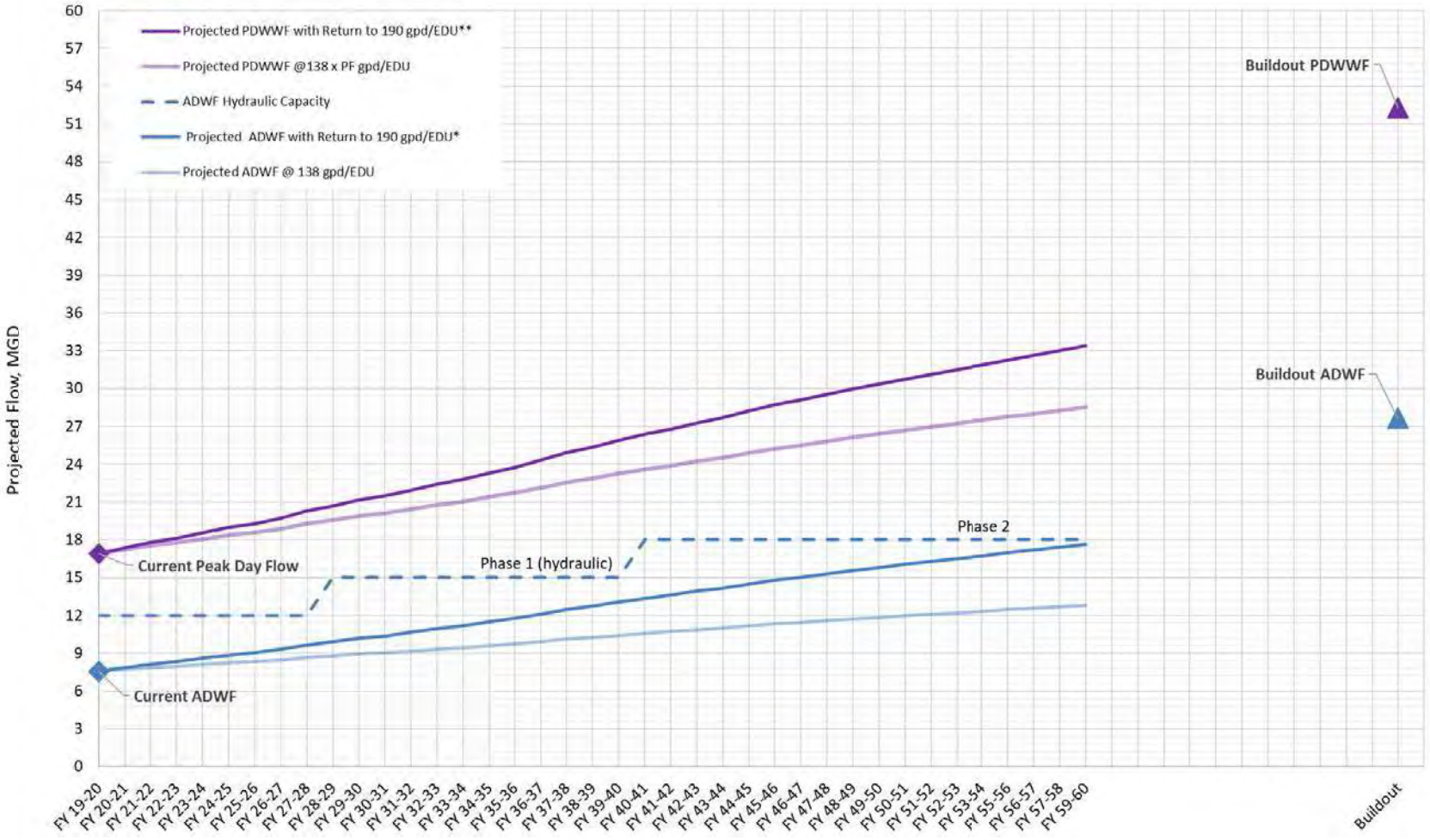
As shown in **Table ES-5**, PGWWTP is currently running at or beyond its nominal design capacity with respect to BOD loading. **Figure ES-9** shows AA and MM biological treatment capacities plotted against the loadings projected over the planning period and the anticipated expansion phasing. The improvements currently under construction will expand the plant's AA and MM BOD loading capacities to 34,500 lbs/day and 40,100 lbs/day, respectively. These improvements should be sufficient to meet projected BOD loadings through FY 40/41 when Phase 2 hydraulic capacity improvements are recommended at PGWWTP. During Phase 2 expansion, it is recommended that plant capacity be increased to accommodate projected FY59/60 AA and MM BOD loadings of 38,000 lbs/day and 48,000 lbs/day, respectively. The timing and magnitude of the recommended projects should be refined after additional capacity analysis and facility planning is completed, as described in the Wastewater Flow and Loading Evaluation section above.

Figure ES-7: DCWWTP Biological Capacity Comparison



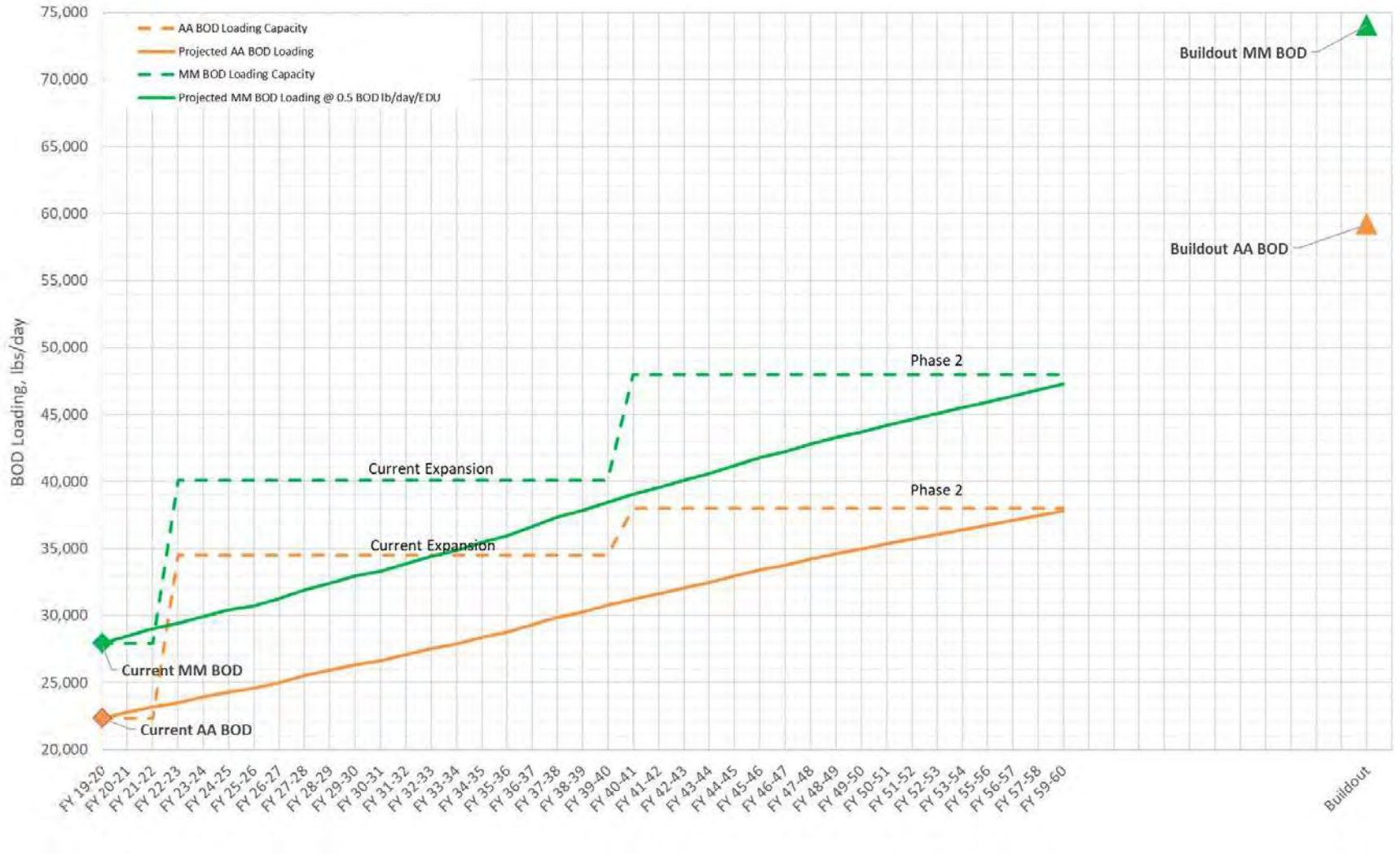
* Buildout date is currently unknown and is shown for graphical purposes only.

Figure ES-8: PGWWTP Hydraulic Capacity Comparison



* ADWF GPD/EDU factor is assumed to reach 190 gpd/EDU by FY 59/60, with a linear increase from 138 gpd/EDU at FY 19/20
**PDWWF is assumed to be ADWF flow plus 170 gpd/EDU of wet weather flow, based on current wet weather flowrates
*** Buildout date is currently unknown and is shown for graphical purposes only.

Figure ES-9: PGWWTP Biological Capacity Comparison



* Buildout date is currently unknown and is shown for graphical purposes only.

Conceptual Level Capital Cost Estimates

Preliminary opinions of probable cost at the conceptual level were developed for the recommended expansion phases. Estimates were developed by extrapolating from process unit cost estimates found in prior plant studies and applying appropriate escalation factors, allowances, and contingencies. Improvements that may be required after the FY 59/60 planning horizon have not been estimated.

Dry Creek Wastewater Treatment Plant. The preliminary phased improvements on a process basis are provided in **Table ES-6.** The listed improvements in Phase 1 (FY 24/25) will increase the AA BOD treatment capacity from 34,000 to 45,000 lbs/day (an equivalent increase in plant ADWF capacity from 11.5 mgd to 14.5 mgd). In Phase 2 (FY 39/40), the improvements will increase the AA BOD treatment capacity from 45,000 to 57,000 lbs/day (an equivalent increase in plant ADWF capacity from 14.5 mgd to 18 mgd). It should be emphasized that the cost estimates provided below are conceptual level costs for capacity expansion projects and do not include rehabilitation and replacement projects or discretionary projects. More detailed cost estimating should be developed when the plant capacity is determined and phased improvement projects are updated accordingly.

Pleasant Grove Wastewater Treatment Plant. The preliminary phased improvements on a process basis are provided in **Table ES-7.** The recommended phased improvements in Phase 1 (FY 28-29) increase the plant ADWF capacity from 12 mgd to 15 mgd. Phase 2 improvements will increase the ADWF capacity from 15 mgd to 18 mgd and the AA BOD treatment capacity from 35,000 to 38,000 lbs per day. It should be emphasized that the cost estimates provided below are conceptual level costs for capacity expansion projects and do not include rehabilitation and replacement projects or discretionary projects. More detailed cost estimating should be developed when the plant capacity is determined, and phased improvement projects are updated accordingly.

Table ES-6: DCWWTP Phase 1 and Phase 2 Capital Cost Estimates (ENR CCI: 12115)[a]

Process	Process Unit Cost	Phase 1 FY 24/25	Phase 2 FY 39/40
		# of units	# of units
Coarse Screens	$280,000	-	1
Influent Pump Station	$2,000,000	-	1
Fine Screens	$170,000	2	1
Odor Control	$210,000	1	1
Grit Basins	$290,000	-	1
Primary Sedimentation	$3,400,000	-	2
Aeration Basins	$2,600,000	4	6
Blowers	$290,000	1	-
Mixed Liquor Return Pumps	$150,000	4	6
Rehab Existing Anoxic Zones	$290,000	1	
Secondary Clarifiers	$4,100,000	4	2
RAS/WAS Pump Station	$860,000	1	1
Tertiary Filtration	$730,000		2
Waste Backwash Pumps	$100,000		1
UV Disinfection	$2,100,000		1
Anaerobic Digesters	$3,300,000	1	1
Centrifuges	$650,000	2	
Cooling Units	$290,000		2
Total Unit Process Costs		$34,000,000	$43,000,000
Site Yard Piping & Mechanical (5%)		$1,700,000	$2,200,000
Site Electrical / I&C/SCADA (15%)		$5,100,000	$6,500,000
Site Civil (5%)		$1,700,000	$2,200,000
Subtotal of Direct Construction Costs		$43,000,000	$54,000,000
Mobilization/Demobilization (5%)		$2,200,000	$2,700,000
Contractor Overhead & Profit (20%)		$8,600,000	$10,800,000
Subtotal of Direct and Indirect Costs		$54,000,000	$68,000,000
Contingency (30%)		$16,000,000	$20,000,000
Total Estimated Construction Cost		$70,000,000	$88,000,000
Engineering, Permitting, CM, ESDC (25%)		$18,000,000	$22,000,000
Total Estimated Capital Cost		**$88,000,000**	**$110,000,000**

Notes:

a. Costs based on Average of SF and "20 Cities" ENR for April 2020: 12115

Table ES-7: PGWWTP Phase 1 and Phase 2 Capital Cost Estimates (ENR CCI: 12115)[a]

Process	Process Unit Cost	Phase 1 FY 24/25	Phase 2 FY 39/40
		# of units	# of units
Influent Pumps	$120,000	1	-
Grit Basins	$290,000	1	-
Fine Screens	$170,000	2	-
Primary Sedimentation	$3,400,000	-	1
Oxidation Ditches	$7,100,000	-	1
Secondary Clarifiers	$4,100,000	1	1
RAS/WAS Pump Station	$860,000	1	-
Tertiary Filtration	$730,000	2	1
UV Disinfection	$2,100,000	3	-
Thickeners Building Modification	$490,000	-	1
Digesters Building Modification	$490,000	-	1
Total		**$13,000,000**	**$16,000,000**
Site Yard Piping & Mechanical (5%)		$650,000	$800,000
Site Electrical / I&C/SCADA (15%)		$2,000,000	$2,400,000
Site Civil (5%)		$650,000	$800,000
Subtotal of Direct Costs		**$16,000,000**	**$20,000,000**
Mobilization/Demobilization (5%)		$800,000	$1,000,000
Contractor Overhead & Profit (20%)		$3,200,000	$4,000,000
Subtotal of Direct and Indirect Costs		$20,000,000	$25,000,000
Contingency (30%)		$6,000,000	$7,500,000
Total Estimated Construction Cost		$26,000,000	$33,000,000
Engineering, Permitting, CM, ESDC (25%)		$6,500,000	$8,300,000
Total Estimated Capital Cost		**$33,000,000**	**$41,000,000**

Notes:

a. Costs based on Average of SF and "20 Cities" ENR for April 2020: 12115

Capacity Improvement Project Summary

Table ES-8 summarizes the capacity improvements identified in this systems evaluation. Note that the improvement needs projected for Dry Creek and Pleasant Grove WWTPs are significantly larger and more expensive than the improvement projects projected for the collection system, but are based on limited available data. The estimated costs for Dry Creek WWTP are especially high because of the size and age of that plant; when it was designed, the organic loading in Roseville was far lower than when Pleasant Grove was designed; since the mid 2000's organic loading to both plants has continued to increase. Further studies, as described in the Wastewater Flow and Loadings Section should be undertaken for both treatment plants, and the capacity improvement projects should be refined based on those findings.

Table ES-8: Proposed Capacity Improvement Projects

		Existing	FY 24/25 or FY 28/29	FY 39/40	After FY 59/60
Collection System	**Description**	Improvement Project 1 (Increased Capacity of PS 26 and sewers on Sierra College Blvd)	None	None	Improvement Project 2 (Redirect flows from PS 26 and Sierra College Blvd down Eureka Road) Improvement Project 3 (Increased Firm capacity of PS 25 with diversion structure improvements)
	Estimated Capital Cost	$1,610,000	-	-	$2,590,000
Dry Creek WWTP	**Description**	Plant Capacity, Condition Assessment, and Facilities Plan	Phase 1 (Increase AA BOD Capacity to ~45,000 lbs/day)	Phase 2 (Increase AA BOD Capacity to ~57,000 lbs/day)	Phase 3: Increase BOD Capacity and Hydraulic Capacity (not estimated)
	Estimated Capital Cost	$550,000	$88,000,000	$110,000,000	Not Estimated
Pleasant Grove WWTP	**Description**	Plant Capacity, Condition Assessment, and Facilities Plan	Increase ADWF hydraulic capacity to 15 mgd	Increase ADWF hydraulic capacity to 18 mgd. Increase AA BOD Loading Capacity to 38,000 lbs/day	Phase 3: Increase BOD Capacity and Hydraulic Capacity (not estimated)
	Estimated Capital Cost	$450,000	$33,000,000	$41,000,000	Not Estimated

Next Steps

Based on the findings of this preliminary evaluation, and discussions with the project team the following next steps are recommended for consideration by SPWA:

- Conduct an analysis of process performance and current biological treatment and hydraulic capacity at both DCWWTP and PGWWTP. This will likely require process-specific sampling and development of calibrated process models. Biological treatment capacity should consider both BOD and nitrate plus nitrite permit limitations set forth within each plant's respective NPDES permit. Results of this study should determine a capacity rating for each unit process at the plant and the limiting processes. This analysis will provide a sound basis for the planning of new facilities and is integral to determining required future capital improvement projects during phased expansions. It is recommended that DCWWTP capacity analysis take precedence over PGWWTP considering DCWWTP appears to be currently operating beyond its nominal BOD removal capacity.

- Review previous condition assessment work conducted on the plant assets and perform additional assessment needed to identify and prioritize repair and replacement (R&R) projects. This effort would include a risk assessment to identify likelihood of failure and criticality of each asset. Results of this study would identify R&R projects which may need to be implemented prior to or concurrent with phased expansions.

- Based on the capacity analysis and R&R project planning, develop Facilities Plans for DCWWTP and PGWWTP. Considering both plants could be running at or above their nominal design capacities, it is recommended that facilities planning begin immediately after the capacity analysis. This effort would evaluate various process optimization steps and upgrade alternatives and provide recommended improvements for phased expansions. The Facilities Plans would include review of the 190 gpd/EDU flow factor that is critical to the timing and magnitude of any hydraulic capacity improvements.

- Develop Class 4 cost estimates for recommended improvements at the WWTPs under each expansion phase and for R&R projects to assist SPWA partners in assessing capital needs in the future.

- For the collection system, periodically update the model network based on any configuration changes, perform re-calibration to confirm the actual and anticipated flows, and to update future loads into the model network. An update frequency of every 5-10 years is recommended, depending on changes in development planning and/or system configuration.

We also recommend that SPWA evaluate funding and financing options to support implementation of the recommended capital improvements, especially Phase 1 at Dry Creek given its size and relative immediacy. With the implementation of the steps above, and the ongoing high level performance of the SPWA Regional System, SPWA will be able to continue its excellent level of service to the Regional Partners.

1. INTRODUCTION

The South Placer Wastewater Authority (SPWA) was created under a Joint Powers Agreement in October 2000 and comprises the City of Roseville (City), South Placer Municipal Utility District (SPMUD), and the County of Placer (Placer County). Flow from SPMUD and portions of Placer County discharge into the City's sewer collection system. The City of Roseville, on behalf of the regional partners, owns and operates two regional wastewater treatment facilities: the Pleasant Grove Wastewater Treatment Plant (PGWWTP), and the older Dry Creek Wastewater Treatment Plant (DCWWTP). Additionally, the City of Roseville owns and operates the network of gravity sewers, pump stations, and force mains that serve customers within the City's limits, including the joint (regional) facilities that convey flow from the SPWA partners. SPMUD owns and operates gravity sewers, pump stations, and force mains in Rocklin, Loomis, and portions of southern Placer County. Placer County owns and operates gravity sewers, pump stations, and force mains in unincorporated areas of Placer County that are not served by other agencies.

Figure 1-1 shows the service area boundaries of the SPWA partner agencies and the overall SPWA service area. **Figure 1-1** also indicates the location of several Urban Growth Areas (UGAs), both inside and outside the City, which have significant development plans under varying stages of progress.

The South Placer Regional Wastewater and Recycled Water Systems Evaluation prepared in 2009 (2009 Systems Evaluation), defined the SPWA service area boundary; evaluated the wastewater collection, wastewater treatment, and recycled water distribution systems; and identified existing and potential future improvement needs. Since that study was completed, the recycled water distribution system has been removed from the SPWA system (reallocated as an asset) and is now wholly managed by the City of Roseville. SPWA is now updating the Systems Evaluation to better evaluate future wastewater collection and treatment capacity needs that may have changed since 2009. This report documents the evaluation of the regional wastewater collection system capacity and the capacity of the wastewater treatment plants versus projected flows and loads.

1.1 Objectives of the Systems Evaluation

The specific need for this Systems Evaluation was precipitated by several factors, including:

- Recent annexations of land by SPWA partner agencies;
- Changes in water consumption rates and associated dry weather flow rates;
- Planned development and redevelopment within the 2005 SPWA service area;
- Revisions in the planning for proposed Urban Growth Areas (UGAs) in the vicinity of the 2005 SPWA service area;
- Wastewater characteristics (i.e., flow and strength) that have changed since the 2009 Systems Evaluation.

This South Placer Regional Wastewater Systems Evaluation (Systems Evaluation) has been conducted to accomplish the following:

- Document the existing (2020) capacity and the flows and loadings on regional trunk sewer and wastewater treatment infrastructure and facilities present in 2020;
- Project buildout conditions based upon regional planning documents and planned regional developments in southwestern Placer County; and,
- Present a Regional Systems evaluation, with system deficiencies identified, and capital projects forecasted, which will inform the SPWA partners in identifying their ability to provide service for planned and proposed development, both presently and for buildout conditions.

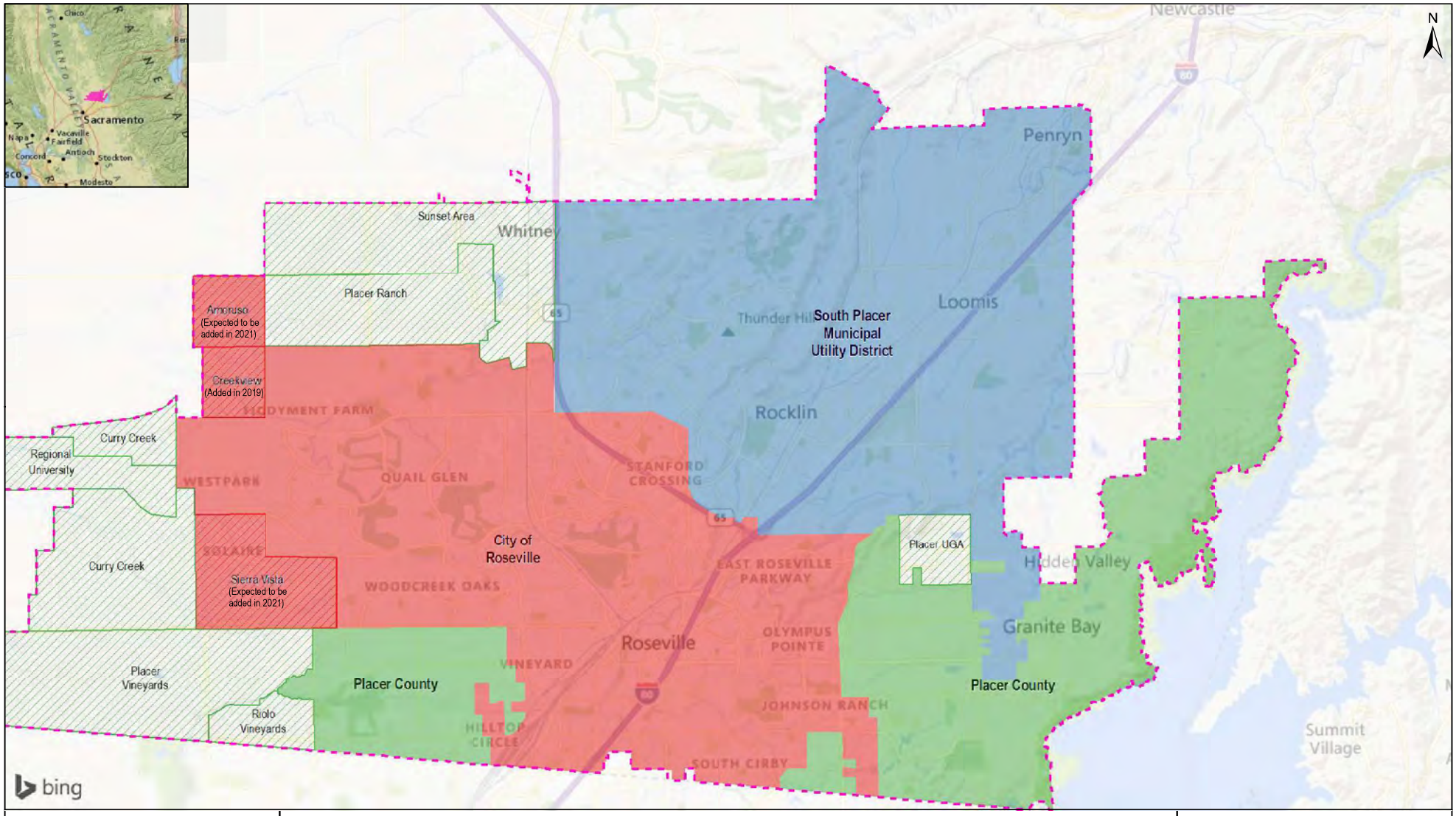


Figure 1-1
2021 Service Area Boundary

South Placer Wastewater Authority
2020 Systems Evaluation

0 ½ 1 2 Miles

2021 Partner Agency Service Area
- City of Roseville
- Placer County
- SPMUD

Urban Growth Area
- City of Roseville UGA
- Placer County UGA

Ultimate Service Area Boundary

Project #: 0011183.00
Map Created: December 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. Data Sources: SPWA Agencies, ESRI, W&C

Figure Exported: 12/21/2020 By: evanjlanden Using: \\woodardcurran.net\shared\Projects\RMC\WCR\0091 Roseville, City of\0011183.00 SPWA Systems Evaluation\G. GIS\3 MXDs\Report Figures\1-1_SPWA_Service_Area.mxd

1.2 Project Scope

The scope of the Systems Evaluation, as well as a brief discussion of work conducted under each task, is described below.

- **Task 1 – Project Management.**

  Periodic progress meetings were held with City staff to review project status and discuss project issues, and monthly status reports were prepared to document the work completed.

- **Task 2 – Data Collection and Review.**

  This task involved assembling, organizing, and reviewing information and data related to the sewer system, including previous reports; maps and drawings of sewer system facilities and recent sewer improvement projects; water use and customer account data; the City's General Plan and other relevant planning information; and sewer design standards and specifications. This task also included meetings with City Planning staff, Placer County and SPMUD to confirm growth and future land use assumptions within the City of Roseville as well as from the SPWA partners outside the City.

- **Task 3 – Flow Monitoring.**

  A plan for flow and rainfall monitoring in the collection system during the 2015/16 wet weather season was developed. The program included 30 temporary flow meters (including 5 meters authorized by Task 5) and two rain gauges installed for a period of approximately two months (mid-January through mid-March). Gauge adjusted radar rainfall (GARR) data was also obtained for the rainfall periods. The monitoring was conducted by Woodard & Curran's subconsultant, V&A Consulting Engineers, and the GARR data was provided by OneRain, Inc.

- **Task 4 – Model Update and Calibration.**

  A hydraulic model of the City's trunk sewer system was developed using InfoWorks™ ICM software. The model network was developed using as-builts, the City's GIS data, and information from the 2005 Model Development Project. Flow loads to the model were compiled using water use and land use data and flow factors representing unit base wastewater flow (BWF) rates, diurnal BWF patterns, and infiltration/inflow (I/I). The model was calibrated for dry and wet weather conditions using the flow monitoring data collected under Task 2.

- **Task 5 – Update Flow Projections.**

  Based on data collected under Task 2 and discussions with SPWA and partner agencies' staff, existing and projected flows were developed. As part of this task, the best available planning information was collected and documented, including plans for Urban Growth Areas and parcel based data within the agencies' current service areas. A database of parcel-based projections within the SPMUD and Placer County Service areas was also prepared in this task. This information was used to estimate future flows and potential capacity needs.

- **Task 6 – Trunk Sewer Evaluation**

  In this task, the existing trunk sewers were evaluated against hydraulic performance criteria under the design storm conditions identified for the 2009 System Evaluation. Using the calibrated model and the selected design storm, existing and future model runs were performed to identify capacity deficiencies in the trunk sewer system. For those deficiencies, capacity improvement projects were developed.

- **Task 7 – Wastewater Treatment Plant Expansion Evaluations**

Based on the flow projections developed in Task 5 and buildout timeline information provided by City of Roseville, Placer County, and SPMUD, design flows and biological loading for both the Dry Creek and Pleasant Grove Wastewater Treatment Plants were developed. Based on these design flows and work completed by the City of Roseville, phased WWTP capacity expansions were identified considering current and future changes in regulatory requirements, and preliminary cost estimates were developed.

- **Task 8 – Prepare Systems Evaluation**

  This report was prepared to summarize and present the results and recommendations of the study.

1.3 Report Organization

This report includes five chapters, which are described below

- **Chapter 1, Introduction,** presents the background, objectives, and scope of the System Evaluation.
- **Chapter 2, Modeled Flow Projections,** discusses the service area land use projections, the basis for developing estimates for each component of wastewater flows, and the base wastewater flow projections for the service area.
- **Chapter 3, Trunk Sewer Evaluation,** describes the modeled trunk sewer system, development of the model network and model loads, flow monitoring program, and model calibration. This chapter also identifies the results of the capacity analysis, including preliminary solutions for the identified capacity deficiencies.
- **Chapter 4, Wastewater Treatment System Evaluation,** summarizes the wastewater treatment upgrade and expansion analyses performed for the Systems Evaluation, including the development of flow and loading peaking factors, facility expansion recommendations to handle projected flows and loadings at buildout, and a timeline for phasing the construction of the improvements.
- **Chapter 5, Capacity Improvement Summary,** summarizes the recommended capacity improvements, including project costs, phasing, and implementation recommendations.

2. BASIS OF FLOW PROJECTIONS

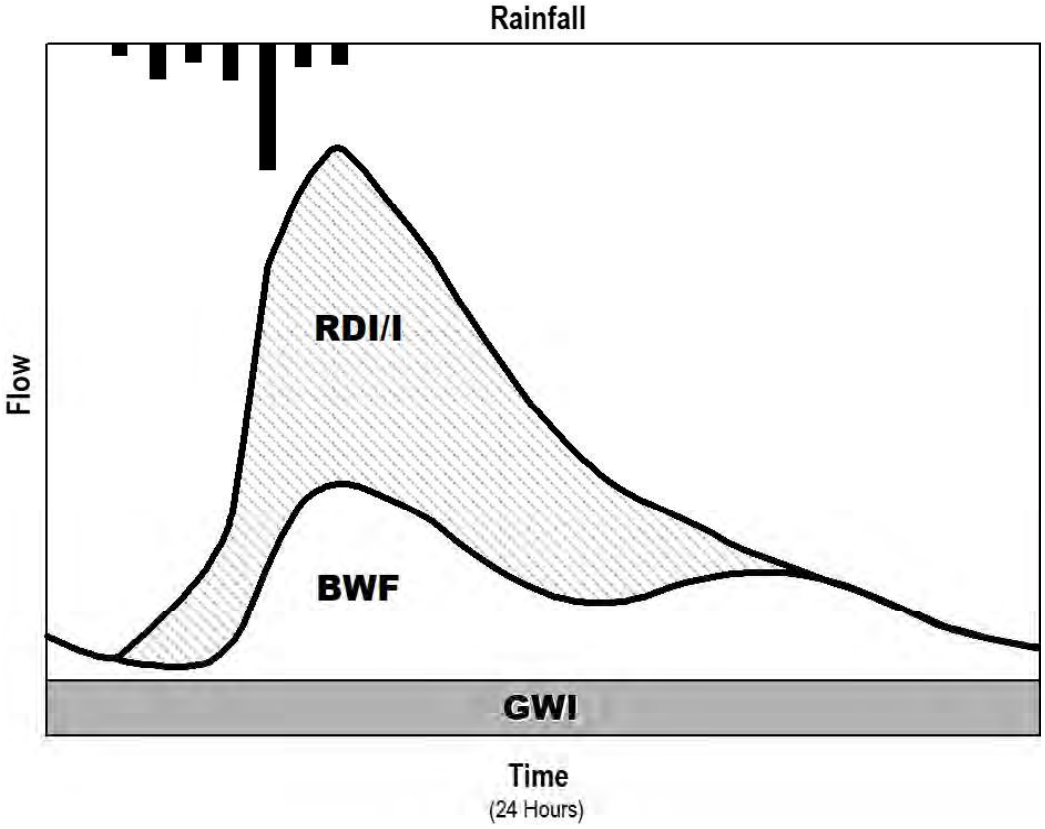
2.1 Introduction

The flow projections developed for this Systems Evaluation were based on the information collected for the system's hydraulic model updates, including the updates performed for the current study. In 2007, a hydraulic model of the City's sewer collection system was developed using the H2OMap Sewer modeling platform (2007 Model Development Project), in parallel with a trunk sewer model for the combined Roseville, SPMUD, and Placer County systems. The models were later updated as part of the 2009 Systems Evaluation. Subsequently, the City's sewer model was updated in 2017 to reflect existing and future demands within the City, and to upgrade the modeling platform to the fully dynamic InfoWorks ICM software. For the current Systems Evaluation Update, the City's model was updated to reflect existing and future projected flows from Placer County and SPMUD.

This section describes the flow components used in the hydraulic model and the existing and projected future land uses for the service area, which form the basis for generating base wastewater flows, in the current hydraulic model. Note that flow projections (referred herein as loads) are intended to represent the level of development present during the flow monitoring periods used to calibrate the hydraulic model. Design flow estimates were developed based on criteria developed for each component of wastewater flows: base wastewater flow (BWF), groundwater infiltration (GWI), and rainfall-dependent infiltration and inflow (RDI/I), and confirmed through model calibration, as described in Chapter 3. Average dry weather flow (ADWF) projections for each treatment plant area discussed in the Wastewater Treatment Plant Expansion Evaluations TM.

The three components of wastewater flows are illustrated conceptually in **Figure 2-1**. BWF represents the sanitary and process flow contributions from residential, commercial, institutional, and industrial users of the system. GWI is groundwater that infiltrates into defects in sewer pipes and manholes, particularly in winter and springtime in low-lying areas. GWI is typically seasonal in nature and remains relatively constant during specific periods of the year. ADWF represents the average flows at each WWTP from July to September. The source of these flows is a combination of BWF and GWI. RDI/I is storm water inflow and infiltration that enter the system in direct response to rainfall events, through direct connections such as holes in manhole covers or illegally connected roof leaders or area drains, or, more commonly, through defects in sewer pipes, manholes, and service laterals. RDI/I typically results in short term peak flows that recede quickly after the rainfall ends.

Figure 2-1: Wastewater Flow Components
(Not to scale)



2.2 Average Dry Weather Flow

ADWF has been estimated for four development scenarios: (1) Existing loads for model calibration; (2) Existing loads for capacity analysis; (3) Buildout; and (4) Buildout Sensitivity, which includes some additional densification and redevelopment assumptions based on feedback from the SPWA partners. As part of this Systems Evaluation, a database of existing and future loads for each parcel in Placer County and SPMUD service areas has been developed and provided to the City. As noted above, ADWF includes two components: GWI and BWF.

In 2007, a hydraulic model of the City's sewer collection system was developed using the H2OMap Sewer modeling platform (2007 Model Development Project), in parallel with a trunk sewer model for the combined Roseville, SPMUD, and Placer County systems. The models were later updated as part of the 2009 Systems Evaluation. Subsequently, the City's sewer model was updated in 2017 to reflect existing and future demands within the City, and to upgrade the modeling platform to the fully dynamic InfoWorks ICM software. For the current Systems Evaluation Update, the City's model was updated to reflect existing and future projected flows from Placer County and SPMUD.

This section describes the flow projections and model development process used to evaluate the SPWA collection system (sewers conveying flows from more than one partner agency), as well as findings from that effort.

2.2.1 Diurnal Base Wastewater Flow Curves

BWF varies throughout the day in a typical way, generally peaking early in the morning in upstream sewers and later and less sharply in larger downstream sewers. Typical hourly peak flows from small residential areas tend to be about twice the average flow (or even higher for very small areas), whereas peak flows further downstream may be less than 1.5 times average flows due to flow attenuation in the collection system. Higher peaks can occur on atypical days of the year (e.g., on major holidays such as Thanksgiving or at halftime on Super Bowl Sunday).

For the current Systems Evaluation Update, typical diurnal profiles were developed for residential and commercial/industrial (non-residential) wastewater flow, for both weekend and weekday conditions. These hydraulic profiles are shown in **Figure 2-2** and **Figure 2-3.** The residential profiles were developed based on monitored flows for smaller, primarily residential meter areas and refined during calibration. Two non-residential profiles were developed to represent flow patterns from two different types of uses: commercial/retail pattern, and an industrial/professional pattern. For parcels inside the City, each non-residential parcel was assigned a non-residential diurnal profile according to the land use code in the parcel database; a summary of the diurnal profile assigned to each land use code is provided in Appendix A. For non-residential parcels in Placer County and SPMUD, the commercial/retail pattern was used.

For UGAs, the residential profile was used for all residential uses, and the retail/commercial diurnal profile was used for all non-residential and mixed use land uses.

Figure 2-2: Residential Diurnal Curves

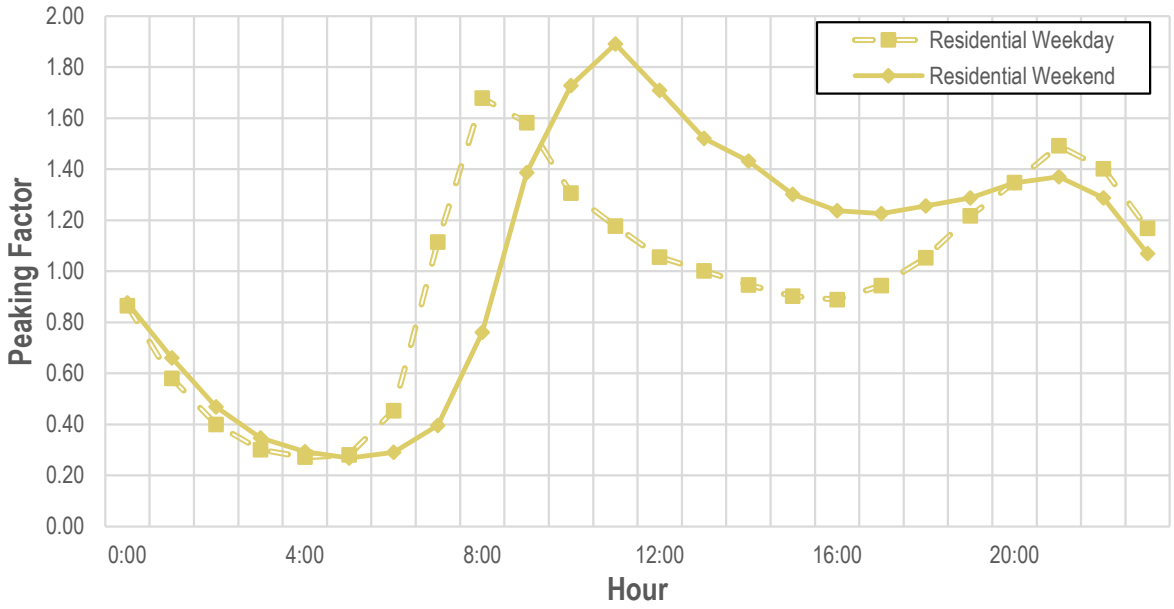
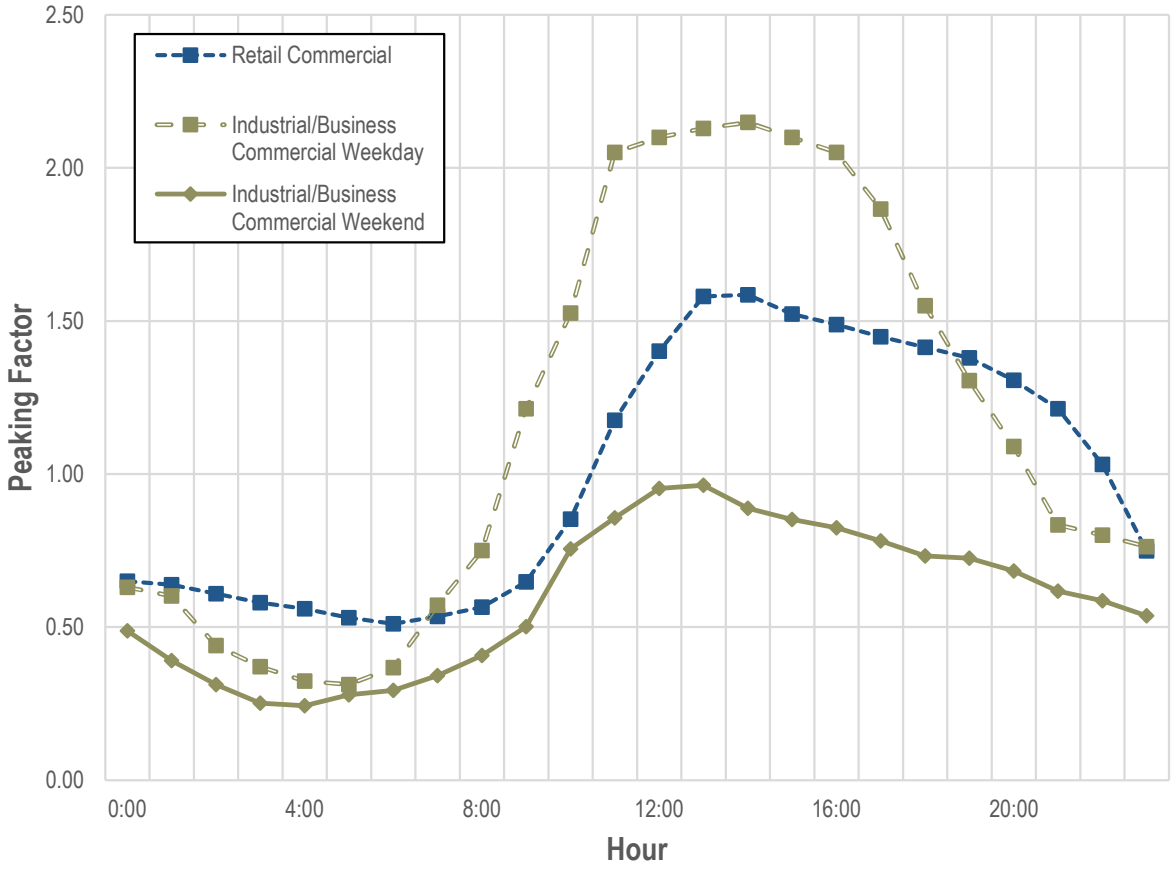


Figure 2-3: Non-Residential Diurnal Curves



2.2.2 Groundwater Infiltration

Groundwater infiltration is generally quantified based on actual flow monitoring data, since it is difficult to predict GWI rates based on physical system data alone. In the context of design flow criteria, GWI represents the incremental groundwater infiltration that occurs during the wet weather season above the "baseline" infiltration level during the driest months of the year.

GWI can be estimated based on minimum flows during non-rainfall periods within a wet weather flow monitoring period. Minimum flows typical occur during the nighttime or early morning hours when base wastewater flows are at a low. Alternatively, GWI can be estimated as the difference between average metered flow during non-rainfall periods and computed average BWF. In either case, the resulting GWI, is expressed on a unit basis (gpd/acre or gpad) by dividing by the sewered acreage of the monitored area. Typical GWI rates may range from 100 to over 1,000 gpad.

GWI flows for existing connected parcels were estimated through the model calibration process (see Chapter 3) by comparing model-simulated BWF to actual flow measurements from the temporary flow monitoring program. Cases where model-predicted BWF was noticeably lower than monitored flow indicated the possible occurrence of GWI.

2.2.3 Existing Base Wastewater Flows

Existing base wastewater flows were developed based on the assumptions summarized below; currently connected parcels are indicated in **Figure 2-4**. Note that loads are intended to represent the level of development present during the flow monitoring periods used to calibrate the hydraulic model.

2.2.3.1 City of Roseville

As noted previously, flows within City limits were estimated as part of the 2017 Sewer Model Update. As part of that study, existing residential and non-residential BWF within the City was determined based on water billing data provided by the City. The City has relatively complete water use records for all parcels within the City; billing data from December 2013 through April 2016 was provided for use in developing BWF estimates for the model. Metered water use during the winter months is assumed to most closely approximate wastewater generation, since outdoor water use is at a minimum. As data for the City of Roseville came from work done in 2016, existing BWF estimates for the City of Roseville represents 2016 land use.

December 2015 through March 2016 data was selected to represent winter water use, as it was generally wetter than prior years and therefore less irrigation was employed. This data also coincides with the flow monitoring period for the 2017 Sewer Model Update and should therefore correlate better with the recorded data during model calibration. It was assumed that all water use during these months was returned to the sewer; this assumption was validated during calibration. Note that the 2015/2016 wet season occurred after several years of drought. Therefore, water use levels may be lower than non-drought years due to conservation.

Where water use data was not available (limited portions of the City), sewer generation rates were estimated based on existing dwelling units indicated in the parcel database. For purposes of calibration, a single family rate of 160 gpd per DU and a multi-family rate of 120 gpd per DU were assumed, based on average rates from the December 2015 through March 2016 billing data. Using GIS processes, BWF loads from each parcel were then allocated to the nearest City sewer.

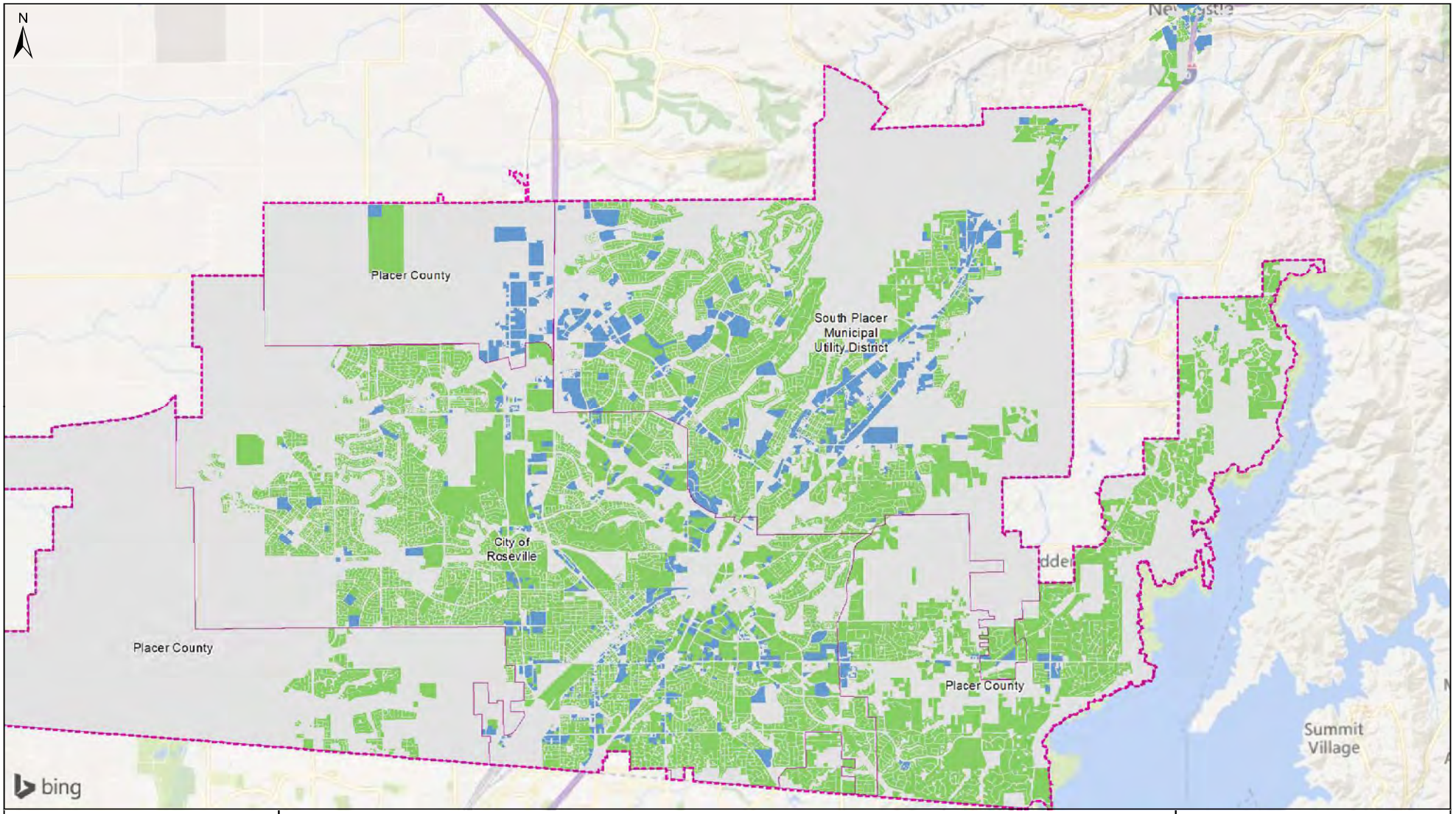


Figure 2-4

Existing[1] Connected Parcels

South Placer Wastewater Authority
2020 Systems Evaluation

0 ½ 1 2 Miles

Parcel Land Use

- Commercial/Industrial
- Residential
- Unconnected

- Service Area Boundary
- Partner Agency Boundary

1. "Existing" represents 2015/2016 connections within the City of Roseville and 2019 connections for Placer County and SPMUD.

Project #: 0011183.00
Map Created: December 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources:** SPWA Agencies, ESRI, W&C

Figure Exported: 12/21/2020 By: cvanlaenden Using: \\woodardcurran.net\shared\Projects\RMC\WCR\0091 Roseville, City of\0011183.00 SPWA Systems Evaluation\G. GIS\3 MXDs\Report Figures\2-4 Existing Connected Parcels.mxd

2.2.3.2 Placer County and SPMUD

Placer County provided spreadsheets summarizing equivalent dwelling units (EDUs) for each APN[1]. (Note: an EDU is defined as the flow equivalent of one single-family residence.) This dataset was then joined to a parcel dataset downloaded from the County website (downloaded March 20th, 2019), and then allocated to the nearest Placer County sewer. Since not all Placer County sewers are included in the model, GIS processes were used to identify the modeled manhole downstream of the parcel. All of the EDUs included in the spreadsheets were assigned to parcels and allocated to modeled manholes in this way. Each parcel was assigned either a residential or commercial loading pattern based on its general plan category as summarized in Appendix A.

SPMUD provided a shapefile[2] which provided EDUs for the year 2020 (which was identified as "existing" land use by SPMUD staff), an associated SPMUD manhole, and a type of use (residential or commercial) for each parcel. As for Placer County, GIS processes were used to identify the modeled manhole downstream of the parcel.

During calibration, a base wastewater flowrate of 160 gpd per EDU was typically applied, but this factor was adjusted down in some cases by 15 or 20 percent based on data from wastewater flow meters in the collection system.

2.2.3.3 Drought Rebound

The calibration period occurred during the third year of an ongoing drought. Billing data and flow records indicate a general decline in water use, likely due to the drought-induced conservation primarily limiting irrigation water use but also reducing indoor water use. Analysis of billing data indicates that on a per dwelling unit basis, water use was reduced by approximately 15 percent between 2014 and 2016. Therefore, for capacity analysis purposes of the existing system and for all future scenarios, it has been assumed that base wastewater flows within the City would increase by 15 percent.

For Placer County and SPMUD, BWF was increased to 180 gpd per EDU, which is consistent with the BWF assumptions used in the 2009 Systems Evaluation and is approximately a 15 percent increase compared to calibrated flow factors overall, though specific flow meter basins assume a higher rebound percentage (wherever the flowrate per EDU was decreased during calibration).

2.2.4 Future Average Dry Weather Flow

Future BWF from the City, SPMUD, and Placer County have been estimated for a Buildout scenario (representing likely future land use based on current data) as well as a Buildout-Sensitivity scenario (representing higher potential growth) using the factors summarized in **Table 2-1**. For consistency with WWTP flow projections, ADWF flow factors are used, which includes some dry season GWI.

The locations of future developments, including urban growth areas, are indicated in **Figure 2-5**, and discussed further in the next sections.

[1] Spreadsheets included: Existing dry creek EDU-7-24-19.xls, Existing SMD 2- EDU-2018-12-12.xlsx, Existing SMD 3- EDU-2018-12-12.xlsx, Existing Sunset EDU-7-24-19.xls

[2] SPMUD_SewerLoading_AddressPoints, provided August 7, 2019.

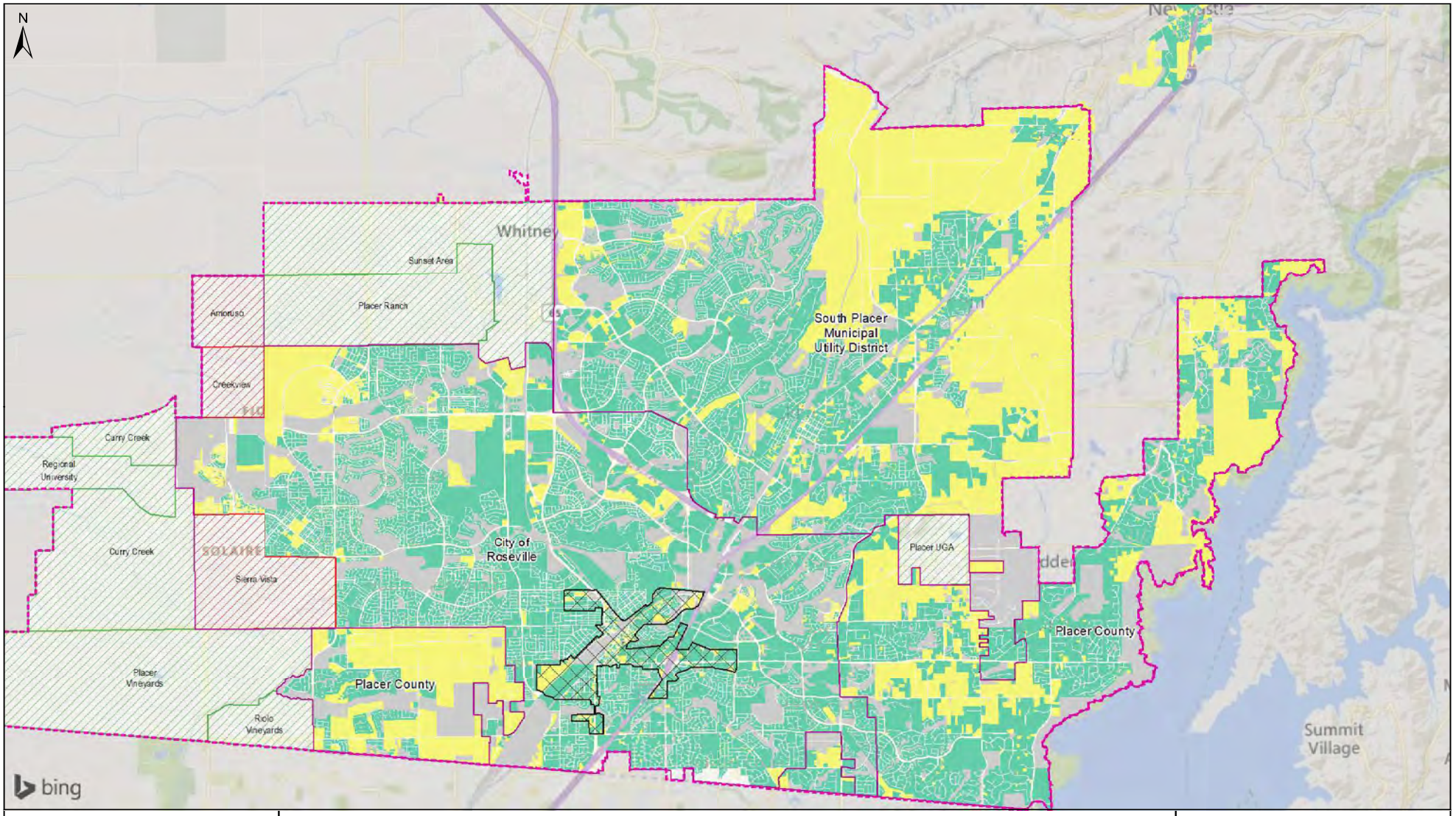


Figure 2-5
Future Development and Urban Growth Areas

South Placer Wastewater Authority
2020 Systems Evaluation

0 ½ 1 2 Miles

Buildout Status
- Existing
- Future Connection
- Unconnected
- Redevelopment Area

Urban Growth Area
- City of Roseville UGA
- Placer County UGA

Service Area Boundary

Partner Agency Boundary

Project #: 0011183.00
Map Created: December 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources:** SPWA Agencies, ESRI, W&C

Figure Exported: 12/21/2020 By: evanjlanden Using: \\woodardcurran.net\shared\Projects\RMC\WCR\0091 Roseville, City of\0011183.00 SPWA Systems Evaluation\G. GIS\3 MXD\Report Figures\2-5 Future Developments and Urban Growth Areas.mxd

Table 2-1: Average Dry Weather Flow Factors

Land Use Designation	Units	Unit Flow Factors [a]
Commercial	gpd per acre	850
Heavy Industrial	gpd per acre	850
Light Industrial	gpd per acre	850
Mixed Use	gpd per acre	2,300
Public/Quasi-Public	gpd per acre	660
Schools	gpd per acre	170
Residential Single DU (or EDU)	gpd per du	190
Residential Mult. DU [b]	gpd per acre	2,040
Parks > 10 Acres	gpd per acre	10
Vacant/Open Space	gpd per acre	0

Notes:
a. Includes allowance for GWI.
b. The Residential Multiple DU unit flow factor can also be represented as 130 gpd per du

2.2.4.1 City of Roseville

For the City of Roseville, the Buildout scenario is based on infill of currently vacant parcels, using land use information from the City's General Plan or provided by the City's planning department, and development of the Sierra Vista, Creekview, and Amoruso UGAs. Sources of data included the following:

- Parcel data downloaded from the City's website (download dated 8/25/2016). The parcel data has the following fields that were used for to estimate future demands:
    - PotUnits: The total number of units allocated to the parcel, prior to any development. Once development beings, potential units is reduced to zero.
    - Undevunits: Once development commences, undeveloped units are the number of vacant lots in the subdivision that do not have a single family unit
    - PotArea: the total developable square footage of the parcel upon its creation. Once development begins, the area is reduced to zero.
    - UndevArea: Once development commences, if the parcel is not fully developed, the number refers to the remaining available square footage of land available to be developed
- The West Roseville Specific Plan (*West Roseville Specific Plan*, EIP Associates, dated February 4, 2004) was used to confirm future units within the West Roseville Specific Plan area.
- Land use data for several specific developments was provided by City Planning, where that data was likely to be more current and more detailed than available in the current GIS.

Infill locations are indicated in **Figure 2-5**.

2.2.4.1.1 Redevelopment (Buildout-Sensitivity Scenario)

The Buildout-Sensitivity scenario includes redevelopment of a portion of the City, as indicated in **Figure 2-5**. Redevelopment occurs where existing land uses are removed and replaced with new, typically more intensive land

uses (and associated sewer flows). Redevelopment land uses are based on parcel-based classifications developed for the 2009 Systems Evaluation. It was assumed that existing land uses for the parcels in the redevelopment area would be replaced by the land uses in the redevelopment plan. Overall, redevelopment results in an increase in ADWF of about 1.5 mgd from the Buildout Scenario. More detailed information on the redevelopment land uses inside the City is included in TM 9C of the 2009 Systems Evaluation.

2.2.4.2 Placer County and SPMUD

Placer County provided a spreadsheet that summarized the anticipated EDUs for all entitled projects in Placer County[1]. EDUs for other currently vacant parcels were estimated using general plan data[1]. Specifically, the general plan shapefile indicated a minimum and maximum density for each category; the categories used for this study, and the associated density and diurnal curve used are summarized in Appendix A. For the Buildout-Sensitivity scenario, Placer County staff suggested an assumption that 60 percent of parcels zoned for residential development would densify to 30 percent higher than the maximum density allowed in the general plan. GIS processes were used to allocate each parcel to the nearest Placer County sewer, and then associated with the modeled manhole downstream of the parcel.

The shapefile provided by SPMUD specified the EDUs in 2060 for each parcel, as well as an associated SPMUD manhole. As for assignment of existing loads, GIS processes were used to identify the modeled manhole downstream of the parcel.

Locations of future development in Placer County and SPMUD are indicated on **Figure 2-5.**

2.2.4.3 Urban Growth Areas

Several UGAs were identified in the 2009 Systems Evaluation and have been included in this evaluation. Locations of the UGAs are shown in **Figure 2-5**. Placer County UGAs include Placer Ranch, Sunset Area, Placer Vineyards, Regional University, Riolo Vineyards, and Curry Creek; the SMD-3 UGA has been incorporated into the current Service Area Boundary. UGAs within the City identified for included Sierra Vista, Creekview, and Amoruso; these UGAs either have already been added to the current Service Area Boundary or are expected to be added in early 2021 (as shown in Figure 1-1) but are included here for consistency with the City's 2017 Model Update. Land use and flow projections were based on the most recent wastewater master plans for each UGA, as indicated below. Flows associated with each UGA are summarized in **Table 2-2**. A more detailed summary of land uses for each UGA broken out by sewershed is included in Appendix B.

- Sierra Vista (*Sierra Vista Specific Plan Sanitary Sewer Master Plan*, Mackay & Somps Civil Engineers, July 2009)
- Creekview (*Creekview Specific Plan Sanitary Sewer Master Plan*, Mackay & Somps Civil Engineers, November 2010)
- Amoruso (*Amoruso Ranch Specific Plan Area Wastewater Master Plan*, Kimley Horn, September 2015)
- Placer Ranch (*Placer Ranch Sewer Master Plan,* Mackay & Somps, July 2017*)*

[1] 2018-12-18-Entitled-Planned Project.xlsx (provided December, 2018) and GeneralPlans_CommPlans.shp (downloaded from Placer County website, dated October 20, 2019)

- Sunset Area (*Sunset Area Water, Wastewater, and Recycled Water Technical Report,* Psomas, October 2017)
- Placer Vineyards (*Placer Vineyards Specific Plan; Sanitary Sewer Master Plan Addendum 1,* Mackay & Somps, May 2019)
- Regional University (*Regional University Specific Plan, Sanitary Sewer Demand*, Mackay & Somps, September 1, 2017)
- Riolo Vineyards (*Riolo Vineyards Sanitary Sewer Master Plan Update*, Unico Engineering, April 2016)
- Curry Creek (*2009 SPWA Systems Evaluation*, RMC Water & Environment, 2009). No current planning information is available for Curry Creek. Preliminary land use estimates were developed for the 2009 Systems Evaluation and used again for this evaluation.
- Placer UGA (*Hawk Homestead Sewer Analysis – Supplementary Information Requested by Placer County Environmental Engineering,* Derrick Whitehead, Municipal Consulting Group, January 29, 2016)

Table 2-2: ADWF from UGAs

UGA	Agency	WWTP	Total Area (ac)	Buildout ADWF (mgd)
Sierra Vista	Roseville	Pleasant Grove	2,064	1.83
Creekview	Roseville	Pleasant Grove	501	0.43
Amoruso[a]	Roseville	Pleasant Grove	694	0.61
Placer Ranch	Placer County	Pleasant Grove	2,213	2.15
Sunset Area[b]	Placer County	Pleasant Grove	2,888	3.80
Placer Vineyards	Placer County	Dry Creek	5,230	2.89
Regional University	Placer County	Pleasant Grove	1,159	1.17
Riolo Vineyards	Placer County	Pleasant Grove	879	0.23
Curry Creek	Placer County	Pleasant Grove	3,212	2.74
Placer UGA	Placer County	Pleasant Grove	617	0.04

Notes:
a. Includes 274 units north of Amoruso that would contribute flow through sewers in Amoruso (Toad Hill)
b. Does not include the Placer Ranch subset of the Sunset Area Plan

2.2.5 Dry Weather Flow Summary

Existing and Projected Future Dry Weather Flows are summarized in **Table 2-3**. Note that these estimates include wet season GWI, which may be higher than dry season GWI.

Table 2-3: Estimated Dry Weather Flows[a] by Agency

WWTP	Agency	Existing Calibration ADWF (mgd)	Existing ADWF with Drought Rebound	Buildout ADWF (mgd)	Buildout-Sensitivity[b] ADWF (mgd)
Pleasant Grove	Roseville	5.87	6.70	13.01	13.04
	Placer County	0.18	0.20	9.85	9.85
	SPMUD	2.25	2.97	3.63	3.63
	Total	**8.30**	**9.87**	**26.49**	**26.52**
Dry Creek	Roseville	5.60	6.27	6.89	8.23
	Placer County	2.57	2.81	7.19	7.42
	SPMUD	2.90	3.64	5.16	5.16
	Total	**11.06**	**12.72**	**19.24**	**20.81**

Notes:

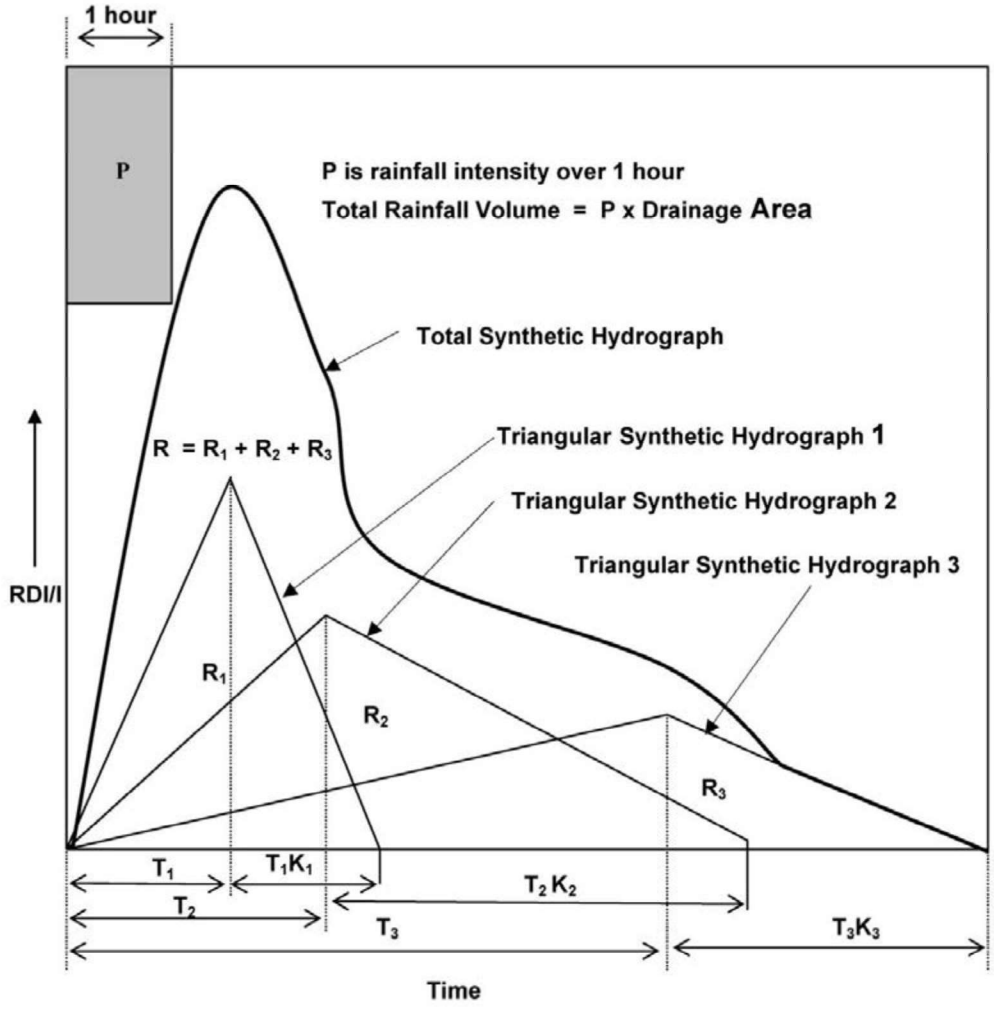
a. Includes wet season GWI.

b. For the Buildout-Sensitivity scenario, the development density was assumed to be at the maximum range allowed by the General Plan. A Base Wastewater Flowrate (BWF) of 180 gpd per EDU was assumed for Placer County and SPMUD.

2.3 Rainfall-Dependent Infiltration and Inflow

RDI/I flows result from rainfall events that produce infiltration and inflow of storm water runoff into the sewer system. RDI/I flows are defined by the magnitude, shape, and timing of the RDI/I response. RDI/I varies depending on many factors, including the magnitude and intensity of the storm event, area topography, type of soil, and the condition of the sewers, manholes, and sewer service laterals. In a dynamic model, RDI/I is typically computed as a percentage of the rainfall (sometimes referred to as the "R value") falling on the contributing area of a subcatchment for each of three or more hydrograph components, representing different response times to rainfall, e.g., fast, medium, and slow, as illustrated in **Figure 2-6**. The contributing area is assumed to be the sum of the area of all developed parcels, except for large open areas such as parks and parking lots. Summing all of the component hydrographs for the entire duration of the rainfall event results in the total RDI/I hydrograph for the event for that subcatchment. Note that although the "slow" RDI/I component can contribute significantly to the total RDI/I volume, the "fast" component has the biggest impact on the magnitude of the peak wet weather flow.

Figure 2-6: RDI/I Hydrograph Components



3. TRUNK SEWER EVALUATION

3.1 Introduction

This section describes the hydraulic analysis and design criteria used to evaluate system performance and size capacity relief projects in the trunk sewer system and identifies the capacity deficiencies based on the results of model runs.

3.2 Model Network Development

This section describes the development of the hydraulic model used for the capacity assessment of the SPWA trunk sewers. The modeling software used for this study was InfoWorks ICM by Innovyze, a fully dynamic hydraulic modeling program that has been used for many other collection systems in California, including Sacramento Area Sewer District, Regional San, and the City of Folsom. This section provides an overview of the model development process, including description of the modeled sewer network, the flow monitoring program, and the calibration of the model.

3.2.1 Modeling Terminology

Key modeling terms are defined below.

- **Network** refers to the representation of the physical facilities being modeled. Modeled network components include pipes, manholes, and pump stations.
- **Nodes** are primarily manholes, but also include pump station wet wells and outfalls (discharge points from the modeled system). Key data associated with nodes include manhole ground elevations and pump station wet well elevations and cross-sectional areas.
- **Pipes** or **conduits** are connections (links) between nodes, and include both gravity sewers, force mains and conduits. Key data associated with pipes are upstream and downstream node IDs, pipe length, diameter, roughness factor, and upstream and downstream invert elevations.
- **Pumps, gates, and overflow weirs** are represented in the model as links between nodes. Data associated with these facilities depend on the structure type. For example, data for weirs include width, elevation, and weir discharge coefficient.
- **Subcatchments** are areas that contribute flow to the modeled sewer network. They may represent parcels, or an area comprised of multiple parcels that are collected by unmodeled sewers in the collection system (sewershed). Data associated with subcatchments include BWF (computed based on population, water use, or other available data), type of diurnal BWF profile (which is a function of land use), I/I parameters, and the node at which the flow from the subcatchment enters the modeled system.
- **Model loads** are the flows entering the modeled sewer system from each subcatchment. Model loads include residential and commercial sanitary or BWF, GWI, and RDI/I. As a sum, they represent the total wastewater flow applied to the model.
- **Models** are the combination of a modeled network, its associated subcatchments and loads, and other data (e.g., rainfall, diurnal profiles, inflows from other areas, etc.) that comprise a specific model scenario.

3.2.2 Modeled System

The model network for this Systems Evaluation included trunk sewers from the City's model, as well as selected pipe reaches in SPMUD and Placer County. The extent of the modeled sewers in SPMUD and Placer County is consistent with the extent used in the 2009 Systems Evaluation, and generally includes 15-inch and larger trunk sewers. The existing modeled network is shown in **Figure 3-1**. **Figure 3-1** also highlights the trunk sewers within Roseville that convey flow from multiple SPWA partners and are the focus of the capacity analysis.

As noted previously, the model network was based on the model developed for the City's 2017 Sewer Model Update. For the trunk sewers in that model update, the City's GIS data was updated with rim and invert elevation data extracted from record drawings or, in some cases, ground elevation data from other datasets. In a few cases (e.g. at all flow splits) additional data was collected through survey or field inspection by City staff.

For the current Systems Evaluation Update, that model was extended into Placer County and SPMUD service areas to provide a more complete analysis of the regional trunk sewer system. GIS data provided by Placer County and SPMUD was used as the basis for extending the network into their respective systems. The model extent was limited to the extent used for the 2009 Systems Evaluation, but generally includes most 15-inch and larger sewers, as well as selected smaller diameter sewers. A model validation process was undertaken, similar to the process used in the City's 2017 Sewer Model Update.

Model validation generally includes the following:

- **Connectivity checks.** The modeled networks were checked for connectivity, which includes verifying that correct upstream/downstream manholes were identified for each pipe, with no missing links or nodes in the network. A connected network means that all pipes and manholes will be selected when the network is traced upstream from the model outfalls.
- **Missing data checks.** Key data required for modeling were reviewed to identify missing values. Missing data were inferred where reasonable (e.g., where one or two invert elevations were missing between populated values, the data could be interpolated), or populated based on data from the 2009 Systems Evaluation.
- **Profile review.** Profiles were plotted for each series of pipe segments in the modeled network to visually check for suspect data. Examples of suspect data include negative pipe slopes, abrupt steps up or down in pipe inverts, and pipe diameters that conflict with surrounding pipes. Where appropriate, corrections to suspect data were inferred. Otherwise, verification in the form of as-built drawings or field investigations were requested.
- **Special structures.** Flow splits (manholes with more than one outlet pipe) were identified for further verification of outlet pipe elevations and/or the existence of weir overflows or other control structures. Field verification and/or as-built drawings were requested as needed.

In all, the model includes approximately 83 miles of gravity trunk sewers, of which about 32 miles are considered SPWA facilities. All gravity pipelines are modeled assuming a Manning's n of 0.013.

The modeled system includes two pump stations that can convey regional flows as summarized in **Table 3-1**. PS 25 and PS 26 were designed to operate during high wet weather conditions by transferring flow between trunk sewers, thereby alleviating downstream capacity issues. Flow enters the pump station wet well when surcharge conditions in the adjacent gravity sewer overtops an associated weir. PS 25 is designed to limit surcharging in the trunk sewer on Old Auburn Road and conveys flows (mostly originating in Placer County) north towards the 21-inch trunk sewer downstream of Placer County's Sierra College Meter. PS 26 is designed to limit surcharging in that 21-inch easement sewer by conveying flows further north on East Roseville Parkway. City operations staff note that PS 26 is used regularly during wet weather conditions, but PS 25 has not been used in a number of years.

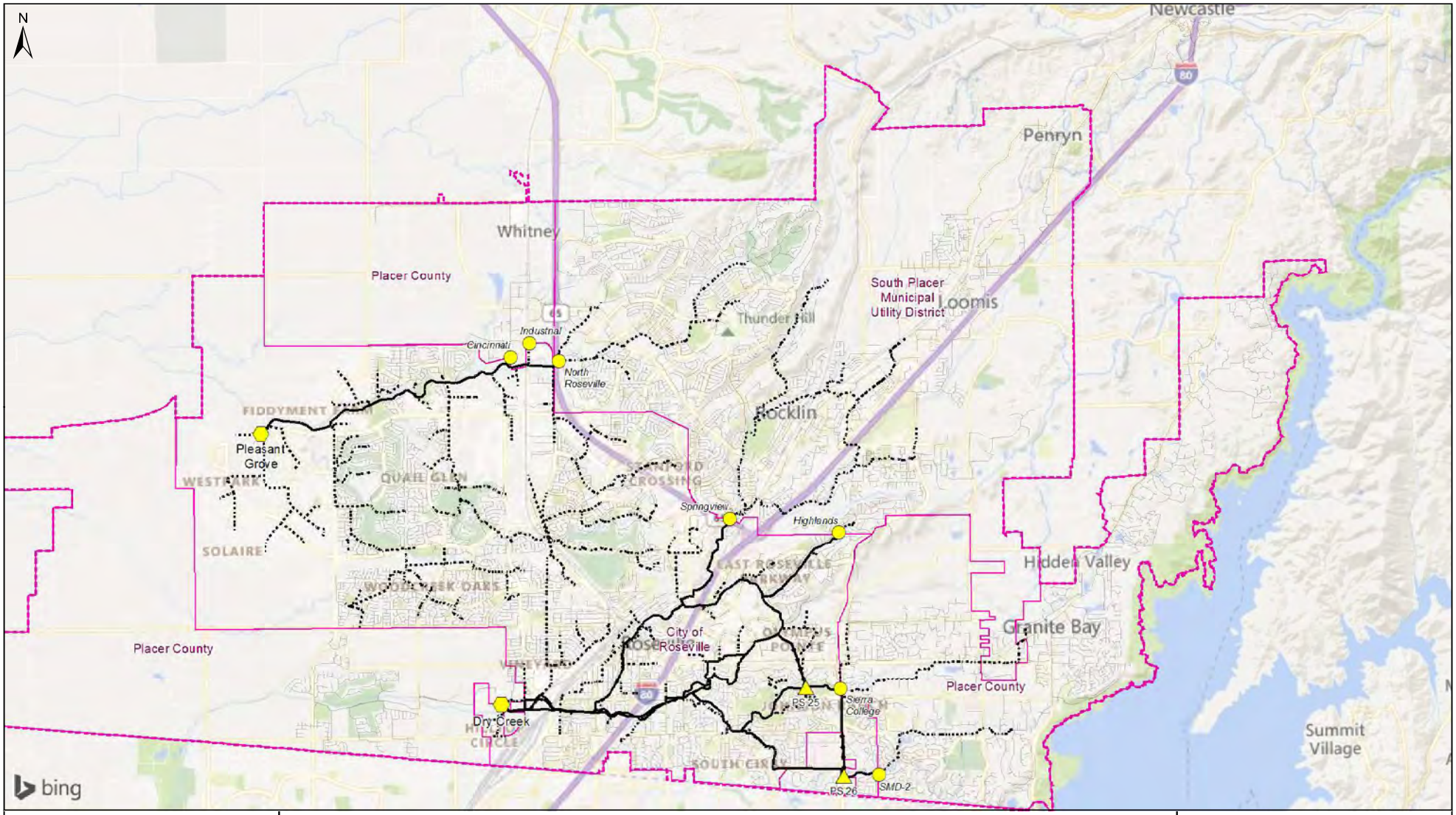


Figure 3-1
Modeled Trunk System

South Placer Wastewater Authority
2020 Systems Evaluation

0 ½ 1 2 Miles

- Regional Gravity Sewer
- Regional Force Main
- Non-Regional Modeled Sewer
- Non-Modeled Sewer
- Wastewater Treatment Plant
- Pump Station
- Permanent Flow Meters
- Partner Agency Boundary
- Ultimate Service Area Boundary

Project #: 0011183.00
Map Created: December 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources:** SPWA Agencies, ESRI, W&C

Placer ROSEVILLE

Figure Exported: 12/21/2020 By: evanlienden Using: \\woodardcurran.net\shared\Projects\RMC\WCR\0091 Roseville, City of\0011183.00 SPWA Systems Evaluation\G. GIS\3 MXDs\Report Figures\3-1 Modeled Trunk System.mxd

Table 3-1: Regional Pump Station Facilities

Pump Station	No. of Pumps	Firm Capacity[a] (mgd)	Total Capacity (mgd)	Force Main Dia. (in.)
PS 25[b] (Johnson Ranch)	2	2.02	3.20	12
PS 26 (Old Auburn)	2	0.43	0.68	8

Notes:

a. Capacity with one pump out of service.
b. Capacity of PS 25 is based on information collected as part of the 2009 Systems Evaluation. Capacity has not been evaluated for this study. Based on reports from City operations, PS 26 has not been used in several years.

3.2.3 Flow Monitoring Program

To support the development of the hydraulic model and flow projections for the Systems Evaluation Update, a temporary flow monitoring program was conducted as part of this study, including 30 meters during the 2015/2016 wet weather season (for the City's 2017 Model Update) and 12 meters during the 2018/2019 wet weather season (for SPMUD and Placer County). V&A Consulting Engineers, under subcontract to Woodard & Curran, conducted the monitoring. The meters and rain gauges were installed for a 2-month period from early January through early March for each wet weather season to capture the flow from the tributary areas. In addition, two recording rain gauges were also installed during both seasons and used for calibration of gauge-adjusted radar rainfall data. The locations of the flow monitoring sites are shown in **Figure 3-2.** The figure also shows the associated tributary area (basin) for each flow meter.

The locations of the flow meters relative to each other and to flow splits within the collection system are shown schematically in **Figure 3-3**. Note that many of the meters were located downstream of other meters; therefore, the tributary areas shown for each of these meters in **Figure 3-2** are the "incremental" areas between the flow meter and tributary basins of the upstream flow meters. Flow meter locations, pipe diameters, and upstream meters are listed in **Table 3-2** and **Table 3-3** for the permanent meters and temporary meters, respectively. Data for all meters during both flow monitoring periods are included in Appendix C.

The purpose of the flow monitoring program was to quantify the flows in the system to provide data with which to calibrate the hydraulic model (discussed later in this section), and to quantify the I/I response to storm events in various areas of the system.

Table 3-2: Permanent Flow Meters

Flow Meter ID (FM ID)	Agency	Downstream Meters	Upstream Meters
Cincinnati	Placer County	22	
Industrial	Placer County	22	
SMD-2	Placer County	11	161
Sierra College	Placer County	18	159, 160
Highlands	SPMUD	19	
North Roseville	SPMUD	22	151, 152, 153, 154, 155
Springview	SPMUD	14	156, 157, 158

Table 3-3: Temporary Flow Meter Locations

Flow Meter ID (FM ID)	Manhole ID	Diameter (in)[a]	Downstream Meters	Upstream Meters
1	E04-042	18	25	
2	E01-180	15	23	
3	D02-280	15	21	
4	B06-195	15	16, 17	
5	B04-003	12	15	
5A	B04-225	21	15	
6	C06-161	18	14	
7	D02-354	23.5	21	7A
7A	D03-115	12	7	
8	D04-201	24	24	
9	D02-068	18	21	
10	B06-341	18	16	
11[b]	A08-034	14.5	PS 26, 16, 17	SMD-2
12	B03-029	21	DC WWTP	
13[c]	B03-042	42	DC WWTP	16
14	B03-024	66	DC WWTP	6, 19, Springview
15	B03-053	36	DC WWTP	5, 5A, 15A, 17
15A	B04-082	12	15	
16	B04-151	30	13	4, 10, 11, 16A, 18
16A	B06-161	15	16, 17	
17	B05-258	21	15	4,1 6A, 11
18	B07-242	22.5	16	11, Sierra College
19	C06-024	35.5	14	20, Highlands
20	C07-003	24	19	
21	E01-149	33	23	3, 7, 9
22	F01-136	72	PG WWTP	24, 25, Cincinnati, Industrial, North Roseville
23	F01-147	36	PG WWTP	2, 21
24	F02-074	41.5	22	8
25	G04-041	21	22	1
26	F99-035	42	PG WWTP	
151	L02-001	24	North Roseville	
152	K02-005	18	North Roseville	
153	L03-014	18	North Roseville	
154	M06-004	18	North Roseville	
155	M06-003	21	North Roseville	
156	J07-058	15	Springview	
157	J07-060	18	Springview	
158	I10-037	18	Springview	
159	C9-02	17.4	Sierra College	161
160	C9-04	14.4	Sierra College	
161	B12-03	14.4	SMD-2	
162	D14-03	14.4	159	

Notes:

a. Actual measured diameter used for meter flow calculations (may be slightly different than pipe nominal diameter).
b. Meter located directly downstream of SMD-2 meter to confirm SMD-2 flows and for consistency with 2005 Flow Monitoring Program. Meter confirmed accuracy of flows at SMD-2 meter.
c. Meter placed for consistency with 2005 Flow Monitoring Program and to confirm measured flows to DC WWTP.

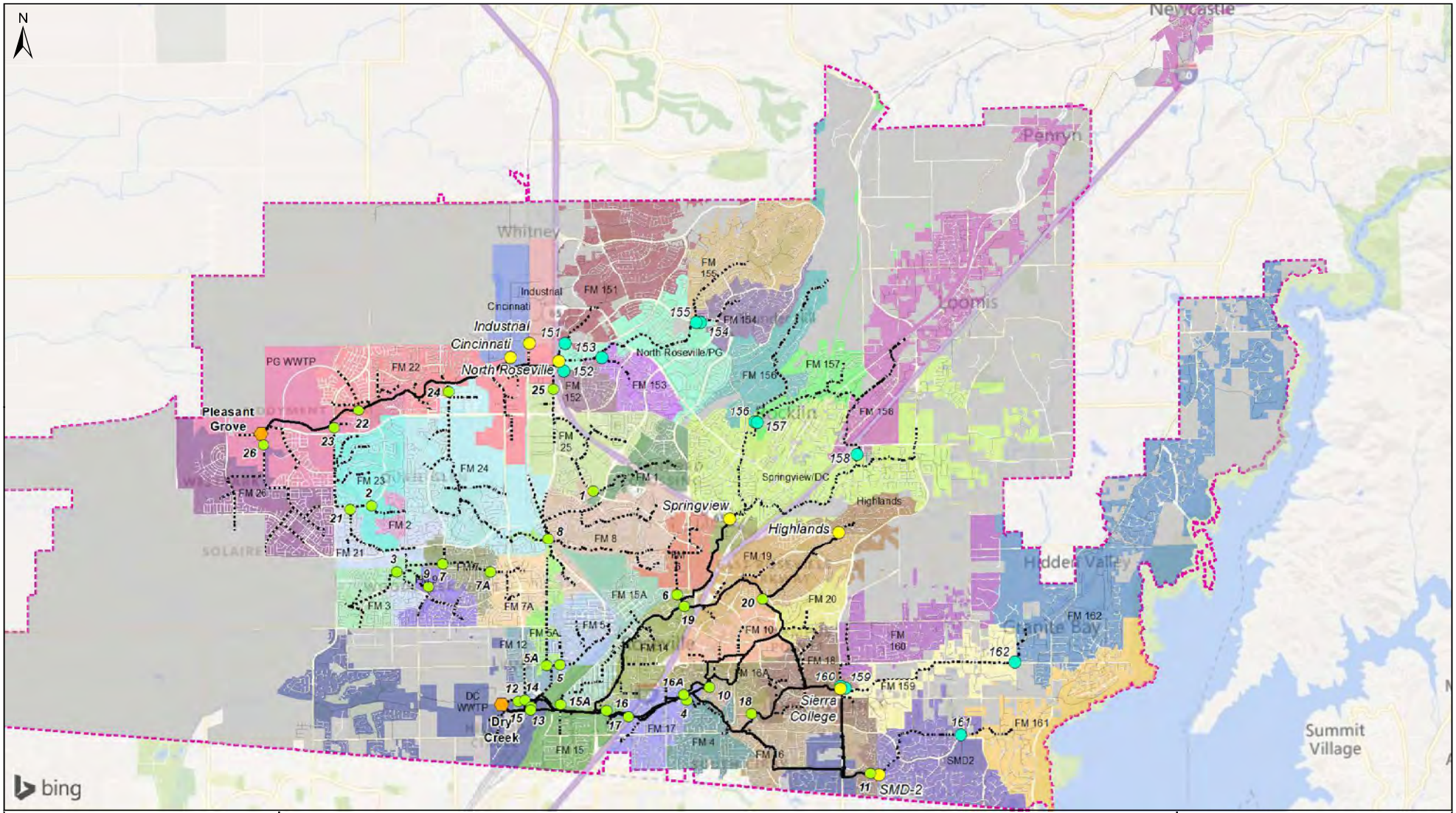


Figure 3-2

Flow Monitoring Locations

South Placer Wastewater Authority
2020 Systems Evaluation

0 ½ 1 2 Miles

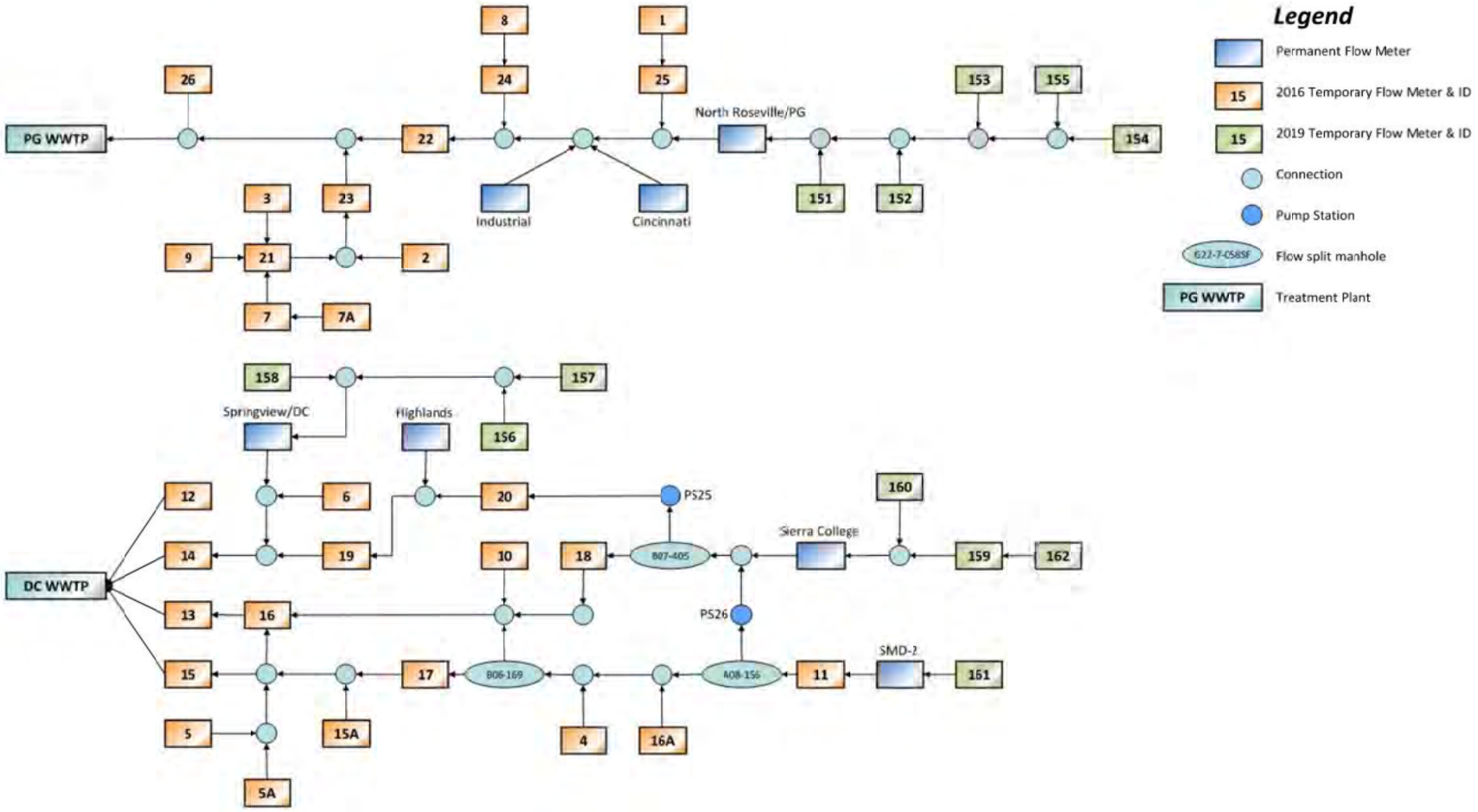
- Regional Gravity Sewer
- Regional Force Main
- Non-Regional Modeled Sewer
- Non-Modeled Sewer
- Permanent Flow Meters
- 152 2018/2019 Temporary Flow Meter
- 5 2015/2016 Temporary Flow Meter
- Wastewater Treatment Plant
- FM 152 Flow Meter Basin
- Ultimate Service Area Boundary

Project #: 0011183.00
Map Created: December 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources:** SPWA Agencies, ESRI, W&C

Figure Exported: 12/21/2020 By: cvanlaenden Using: \\woodardcurran.net\shared\Projects\RMC\WCR\0091 Roseville, City of\0011183.00 SPWA Systems Evaluation\G. GIS\3 MXD\Report Figures\3-2 Flow Monitoring Locations v2.mxd

Figure 3-3: Flow Meter Schematic



3.2.3.1 Radar Rainfall Data

To obtain the most accurate spatial rainfall data for use in model calibration, gauge-adjusted radar rainfall (GARR) data was obtained for the rainfall events that occurred during both monitoring periods. GARR data combines the use of spatial rainfall estimates from radar data with point rainfall measurements from rain gauges located on the ground. The radar measures the reflected signals from falling raindrops in the atmosphere, which can then be translated into estimates of rainfall rates using mathematical and empirical relationships. However, the conversion of the reflected signals to rainfall rates is not sufficiently accurate to consistently estimate actual rainfall amounts at a given location, but does provide good information about the relative rainfall amounts at different locations (i.e., the spatial variation of rainfall). Therefore, the radar rainfall estimates are calibrated to (i.e., adjusted to match) more accurate rainfall measurements from rain gauges located on the ground in the area of study.

The process of converting radar images to GARR estimates is complex and must be conducted by trained and experienced radar rainfall specialists. There are several providers of GARR data throughout U.S. Each uses its own data processing techniques and proprietary algorithms to generate the gauge-adjusted radar rainfall estimates. For this study, Woodard & Curran contracted with OneRain, Inc. to provide the GARR data. The rainfall collected by the two V&A temporary rain gauges was provided to OneRain for use in their GARR calibration to supplement data available from permanent rain gauges owned by the City for its Flood Alert System.

OneRain developed the GARR data for the flow monitoring period in 5-minute time increments for 1 kilometer by 1 kilometer pixels (each approximately 250 acres in size) covering the entire SPWA service area (including SPMUD and Placer County). Approximately 200 pixels cover the sewered portions of the service area. The data was aggregated to 15-minute intervals for use in the model. The pixel containing the centroid of each model subcatchment defines the rainfall for that subcatchment for each rainfall event.

3.2.4 Model Loading

Section 4.4 described how BWF model loads were developed from water use and land use and growth projections. GWI and RDI/I flows were also loaded to the model by parcel by associating each parcel with a flow meter area. For each parcel, a sewershed ("contributing") area (i.e., area that potentially contributes I/I) was determined based on land use. Contributing areas for non-open space land uses, including residential, commercial, industrial, and institutional uses, were based on the full parcel area. Contributing areas for parks and other land uses that may contribute sewer flows but are likely to have significant open space were limited to 1 acre. Parcels comprised of open space, drainage channels, and large roadways such as freeways not likely to contribute sewer flows were assigned zero contributing area. I/I flows for each parcel were computed in the model by applying the appropriate meter area GWI and RDI/I parameters (determined during the model calibration process described below) to the contributing area of the parcel.

Parcels loading to the same modeled manhole are grouped into subcatchments. All BWF loads associated with each parcel in the subcatchment are then summed to calculate the overall BWF loading from the subcatchment. The contributing areas are also summed, and the appropriate meter area GWI and RDI/I parameters are assigned to calculate I/I flows for each subcatchment.

3.2.5 Model Calibration

Model calibration is the process of comparing model-computed flows to observed (monitored) flows to verify that the model is accurately simulating flows in the sewer system. The model is calibrated for both dry and wet weather conditions.

As described above, temporary flow monitoring programs were conducted during the late January through mid-March 2016 and 2018 wet weather periods. The data collected during these flow monitoring programs, as well as data from the permanent meters, were used for model calibration.

3.2.6 Dry Weather Calibration

The dry period in early to mid-February 2016 (for flow meters in the City) and late January 2019 (for flow meters in SPMUD and Placer County) were used as the dry weather calibration periods for the model. The dry weather calibration process was used to verify BWF loads and diurnal curves, and to quantify GWI (as indicated by monitored flows that were higher than estimated BWF). The dry period immediately prior to the wet weather calibration period in early March was also used to confirm the calibration.

Figure 3-4 shows an example plot of model vs. metered flow for one meter location (Site 155). In this graph, the green line represents the monitored (observed) flow, and the red line is the model-simulated flow. Calibration graphs for all meters throughout the monitoring program are included in Appendix D. Note that the Sierra College permanent meter was not operational during much of the 2019 season; however, nearly all tributary flows to this meter were measured as part of the temporary metering program. While most meters calibrated well for both 2016 and 2019 data, there were a few meters with discrepancies. The discrepancies are mostly due to differences in GWI observed in the temporary meters upstream of the Springview and Sierra College meters during the 2019 flow monitoring program versus the 2016 program. As 2016 had significantly less rainfall preceding the flow monitoring program, this GWI was likely not present during the 2016 flow monitoring program.

Table 3-4 summarizes the dry weather loading parameters determined for each flowmeter area during calibration. Calibrated unit flow factors are indicated on **Figure 3-5**, while estimated GWI rates for each flowmeter area are indicated on **Figure 3-6.**

The model calibration resulted in a reasonably good match of modeled to metered flow at most locations, but some differences at others. These differences may be due to inaccuracies in the meter data, inaccuracies in the water consumption data, or in the configuration of the system (e.g., upstream flow splits). The calibration process also resulted in further investigation and adjustments at the major flow split locations in the model (manholes SMH B06-169, SMH A08-156, SMH B07-405 and SMH D04-442). To ensure accuracy during calibration, sewers in the City's trunk model were updated based on survey, field investigation and City drawings to capture the physical structures of the flow splits and then adjusted as needed to better calibrate to the flow meter data.

For a few of the meters (FM 6, 10, and 16A), the water consumption data was not sufficient to account for all of the apparent flow observed by the flowmeter. This could be due to water use not in the water consumption database (e.g. water from another source, or error in the water consumption database), or an error in the flow meter data. To be conservative, some residential flow (less than 0.1 mgd) was distributed in each of the meter areas across all parcels to improve calibration.

Table 3-4: Dry Weather Flow Loading Parameters

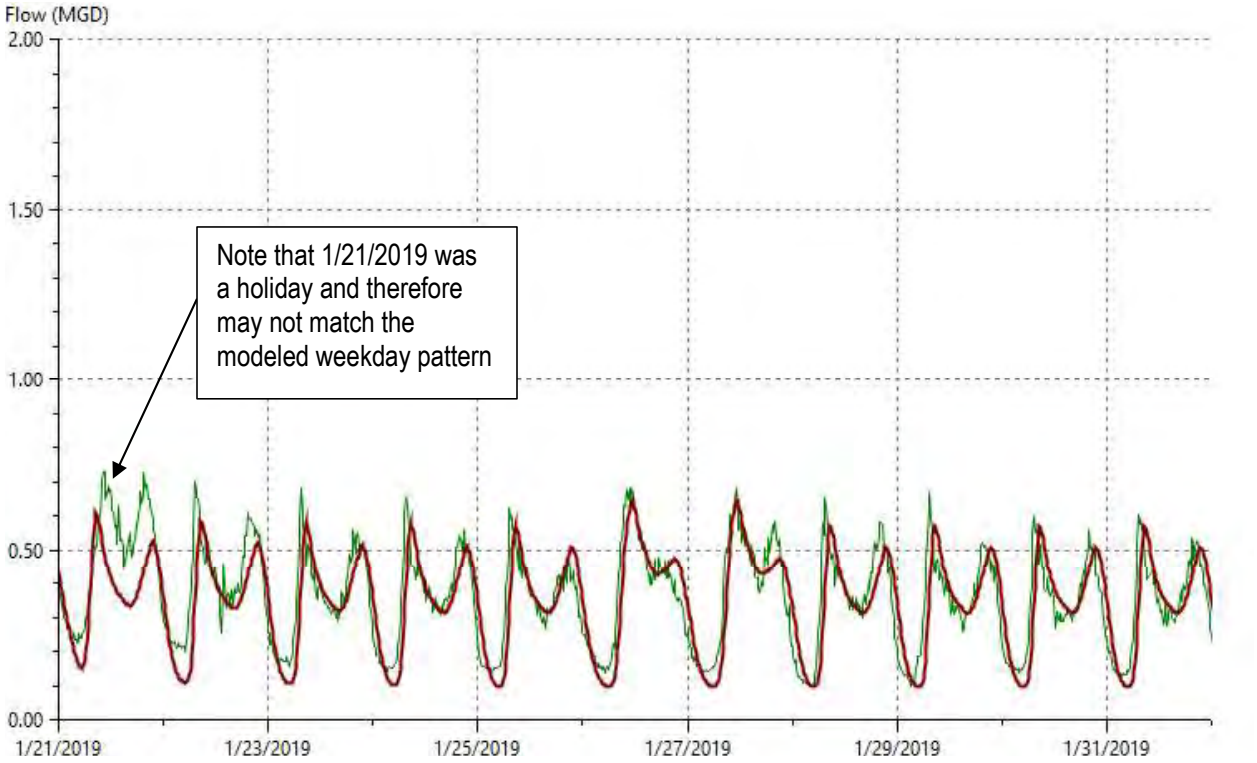
Flow Meter ID (FM ID)	Contributing Area[a] (acres)	Incremental Calibrated ABWF[a] (mgd)	Calibration ABWF Reduction Factor[b]	GWI (gpd/ac.)	GWI[a] (mgd)	Incremental Calibrated ADWF[a] (mgd)
1	297	0.28	0%	--	--	0.28
2	174	0.14	0%	--	--	0.14
3	270	0.29	0%	--	--	0.29
4	397	0.30	0%	--	--	0.30
5	241	0.30	0%	373	0.09	0.39
5A	181	0.14	0%	441	0.08	0.22
6	209	0.23	0%	192	0.04	0.27
7	181	0.19	0%	--	--	0.19
7A	349	0.42	0%	--	--	0.42
8	588	0.51	0%	425	0.25	0.76
9	209	0.22	0%	--	--	0.22
10	363	0.32	0%	--	--	0.32
11	0[b]	0.00	0%	--	--	0.00
12	157	0.15	0%	--	--	0.15
13	0[c]	0.00	0%	--	--	0.00
14	428	0.43	0%	--	--	0.43
15	328	0.31	0%	--	--	0.31
15A	326	0.30	0%	--	--	0.30
16	470	0.41	0%	1064	0.50	0.91
16A	219	0.27	0%	593	0.13	0.40
17	352	0.31	0%	--	--	0.31
18	364	0.34	0%	302	0.11	0.45
19	374	0.51	0%	561	0.21	0.72
20	172	0.18	0%	--	--	0.18
21	327	0.26	0%	--	--	0.26
22	857	0.58	0%	--	--	0.58
23	283	0.20	0%	--	--	0.20
24	932	1.38	0%	--	--	1.38
25	589	0.53	0%	170	0.10	0.53
26	423	0.34	0%	--	--	0.34
151	757	0.64	15%	--	--	0.64
152	218	0.25	0%	--	--	0.25
153	280	0.23	20%	--	--	0.23
154	384	0.23	20%	--	--	0.23
155	521	0.35	15%	--	--	0.35
156	562	0.21	15%	302	0.17	0.38
157	314	0.16	0%	96	0.03	0.19
158	1766	0.74	15%	130	0.23	0.97
159	497	0.11	0%	80	0.04	0.15
160	570	0.17	20%	175	0.1	0.27
161	818	0.21	0%	342	0.28	0.49
162	2124	0.44	0%	311	0.66	1.10
Cincinnati[d]	204	0.09	0%	--	--	0.09
Industrial[d]	121	0.06	0%	--	--	0.06
SMD-2	783	0.28	0%	--	--	0.28
Sierra College	14	0.01	0%	--	--	0.01
Highlands	344	0.11	0%	--	--	0.11

Flow Meter ID (FM ID)	Contributing Area[a] (acres)	Incremental Calibrated ABWF[a] (mgd)	Calibration ABWF Reduction Factor[b]	GWI (gpd/ac.)	GWI[a] (mgd)	Incremental Calibrated ADWF[a] (mgd)
North Roseville (Pleasant Grove)	1997	1.25	15%	--	--	1.25
Springview (Dry Creek)	605	0.55	15%	--	--	0.55

Notes:

a. For meters with upstream basins, represents the incremental meter basin area or flow, as shown on Figure 3-2.
b. Meter located directly downstream of SMD-2 meter to confirm SMD-2 flows and for consistency with 2005 Flow Monitoring Program
c. Meter placed for consistency with 2005 Flow Monitoring Program and to confirm measured flows to DC WWTP.
d. Due to highly variable and relatively small industrial flows, calibration of Cincinnati and Industrial meters was limited.

Figure 3-4: Example DWF Model Calibration Graph (Site 155)



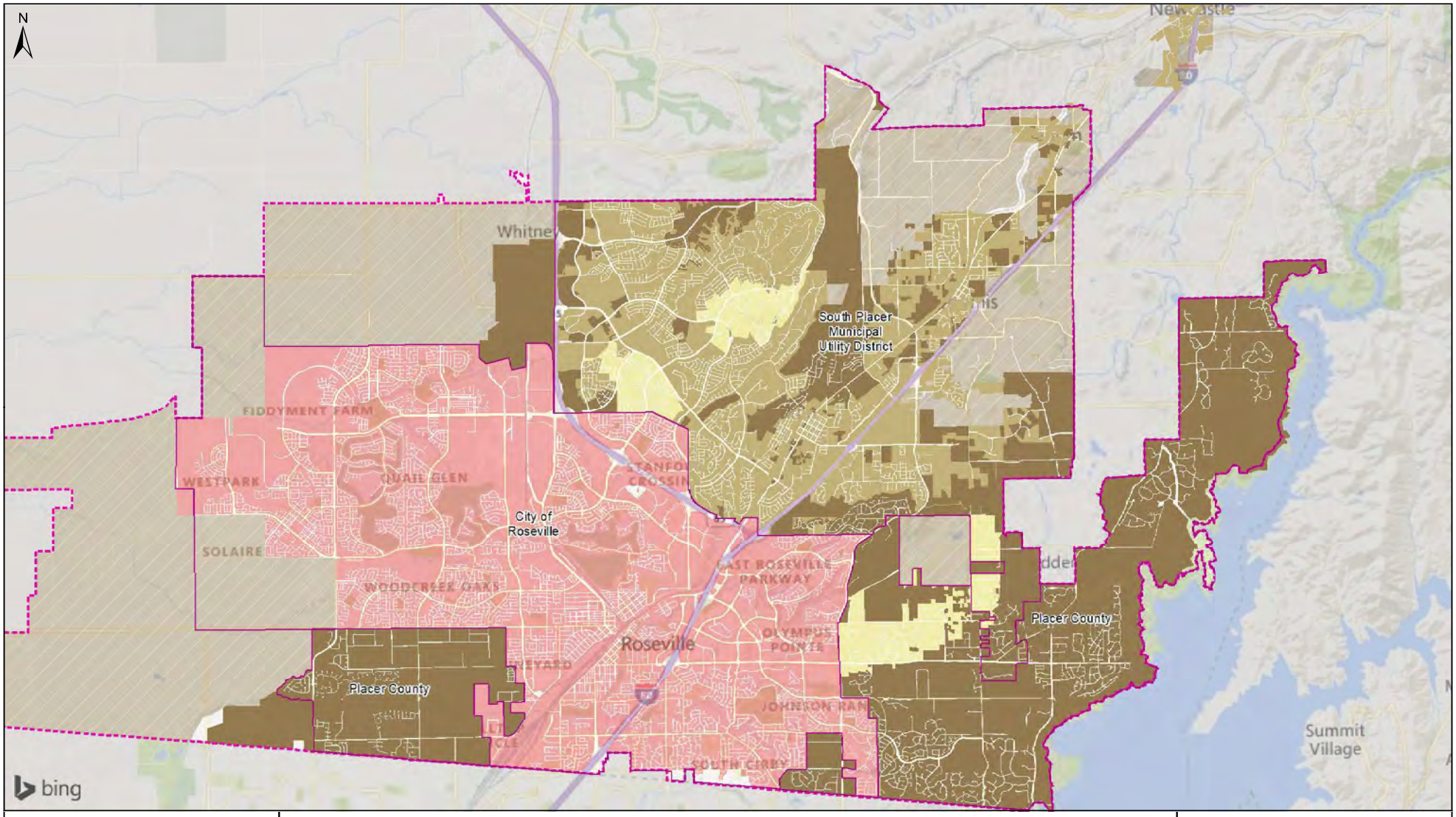


Figure 3-5

Calibrated Unit Flow Factors

South Placer Wastewater Authority
2020 Systems Evaluation

0 ½ 1 2 Miles

Flow Factor (gpd/EDU)

- 128
- 136
- 160

- City of Roseville (Water Billing Data)
- Future Connection
- Ultimate Service Area Boundary
- Partner Agency Boundary

Project #: 0011183.00
Map Created: December 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources:** SPWA Agencies, ESRI, W&C

Figure Exported: 12/21/2020 By: cvanlaenden Using: \\woodardcurran.net\shared\Projects\RMC\WCR\0091 Roseville, City of\0011183.00 SPWA Systems Evaluation\G. GIS\3 MXDs\Report Figures\3-5 Unit Flow Factors.mxd

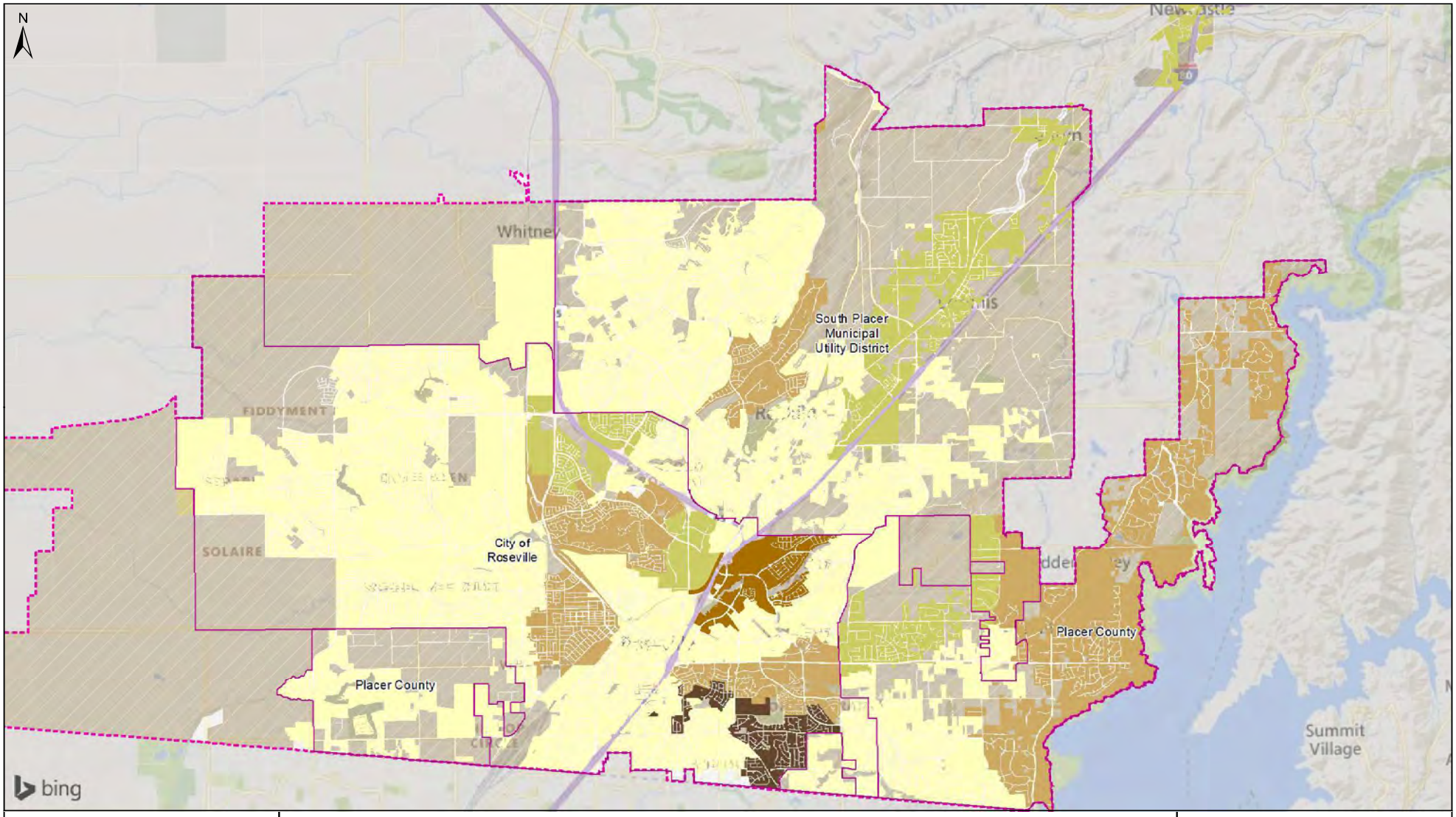


Figure 3-6

Calibrated GWI Rates

South Placer Wastewater Authority
2020 Systems Evaluation

0 ½ 1 2 Miles

Partner Agency Boundary

Ultimate Service Area Boundary

GWI (gpd/acre)

- < 100
- 100 - 200
- 200 - 500
- 500 - 1,000
- > 1,000
- Unconnected

Project #: 0011183.00
Map Created: December 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources:** SPWA Agencies, ESRI, W&C

Figure Exported: 12/21/2020 By: cvanlaenden Using: \\woodardcurran.net\shared\Projects\RMC\WCR\0091 Roseville, City of\0011183.00 SPWA Systems Evaluation\G. GIS\3 MXDs\Report Figures\3-6 Calibrated GWI Rates.mxd

3.3 Wet Weather Flow Projections

3.3.1 Wet Weather Calibration

During wet weather calibration, parameters are adjusted to simulate the volume and timing of RDI/I for monitored storm events. Rainfall was assigned to each parcel or subcatchment using data from the GARR pixel at the centroid of the parcel or subcatchment. Through the wet weather calibration process, RDI/I hydrograph parameters were developed for each metered area. For calibration of the City's meters, the rainfall period from March 4th through March 15th, 2016 was used to determine RDI/I parameters. This period had two storms: the first storm occurring around March 5th-6th generally had the highest rainfall totals; the second storm on March 12th-13th generally had the highest peak flows. The soils for the second storm were more saturated, and generated a larger response. For a conservative calibration, RDI/I parameters were selected to best match the response to the March 12th-13th storm. These conservative calibration conditions should be considered when using this model to evaluate capacity.

For meters in Placer County and SPMUD, two storms were used for wet weather calibration: one event occurring January 15th through January 17th, and another event February 25th through 27th, 2019. The January event was generally higher peak intensity but lower total volume, while the February event was less intense but had more total rain. Both events had similar (generally wet) antecedent conditions. Some meters had higher peak flows during the January event, while others had higher peak flows during the February event; in general, an attempt was made to calibrate for both events. Storm information for the calibration events are summarized in **Table 3-5**.

Table 3-5: Calibration Rainfall Events

Start Date/Time	Storm Duration (hours)	Total Storm Rainfall (in.)			Peak Hour (in.)		
		DC WWTP	Rocklin (Site 157)	Granite Bay (Site 162)	DC WWTP	Rocklin (Site 157)	Granite Bay (Site 162)
2016 Calibration Events							
3/5/2016 13:00	69	2.68	3.16	2.84	0.15	0.21	0.22
3/12/2016 14:00	86	2.29	2.52	2.70	0.21	0.22	0.25
2019 Calibration Events							
1/16/2019 12:00	12	1.55	1.71	1.83	0.36	0.34	0.44
2/24/2019 17:00	44	3.59	3.78	3.49	0.23	0.19	0.19

Table 3-6 summarizes the results of the wet weather calibration in terms of the R values assigned to each flow meter basin. An example wet weather calibration graph is presented in **Figure 3-7**. Calibration graphs for all meters are included in Appendix D.

Overall, most meters had relatively low R values, indicative of a tight system with newer pipes (see **Figure 3-8)**. The FM 5 and FM 7 areas exhibited more significant peak flow response. Further investigations, such as smoke tests or CCTV, may be appropriate in these area or others with higher R factors to identify potential sources of I/I (such as unauthorized stormwater discharge or leaking pipes or manholes) and any capacity concerns.

A few areas did not exhibit enough response to rainfall to develop calibration parameters; a minimum R volume response of 0.6 percent was assumed, distributed evenly between the fast, medium, and slow response R factors. For future growth areas, a minimum R volume response of 0.6 percent was also assumed, which results in a peak RDI/I under the design storm of approximately 700 gallons per acre per day (consistent with criteria for new development documented in TM 3A of the 2009 Systems Evaluation).

Table 3-6: Wet Weather Calibration Parameters

Flow Meter ID (FM ID)	R1 RDI/I Vol (%)	R2 RDI/I Vol (%)	R3 RDI/I Vol (%)	Rtot RDI/I Vol (%)
1	0.2	0.4	4.0	4.6
2	1.2	1.0	3.0	5.2
3	0.2	0.2	2.0	2.4
4	0.8	0.5	2.0	3.3
5	3.0	6.0	8.0	17.0
5A	0.2	2.0	3.5	5.7
6	0.5	1.5	1.0	3.0
7	2.5	2.0	12.0	16.5
7A	1.0	0.7	3.0	4.7
8	0.2	2.0	6.0	8.2
9	0.5	3.0	5.0	8.5
10	0.2	0.4	0.5	1.1
11	0.8	2.0	2.2	5.0
12	0.2	0.2	4.0	4.4
13	0.5	1.0	3.0	4.5
14	0.3	1.3	3.8	5.4
15	3.0	2.5	0.3	5.8
15A	0.8	0.3	0.3	1.4
16	0.5	1.0	3.0	4.5
16A	1.5	1.0	6.0	8.5
17[a]	0.2	0.2	0.2	0.8
18	0.3	2.0	5.0	7.3
19	0.3	1.3	3.8	5.4
20	0.2	0.6	3.0	3.8
21	0.2	2.0	2.0	4.2
22	0.2	0.4	4.0	4.6
23[a]	0.2	0.2	0.2	0.6
24	0.2	1.0	0.5	1.7
25	0.2	1.5	6.0	7.7
26[a]	0.2	0.2	0.2	0.6
151	0.6	0.7	0.2	1.5
152	0.7	0.3	0.1	1.1
153	1.0	0.5	0.2	1.7
154	0.4	0.5	0.1	1.0
155	1.3	1.0	1.0	3.3
156	1.0	1.3	2.0	4.3
157	0.7	0.4	0.4	1.5

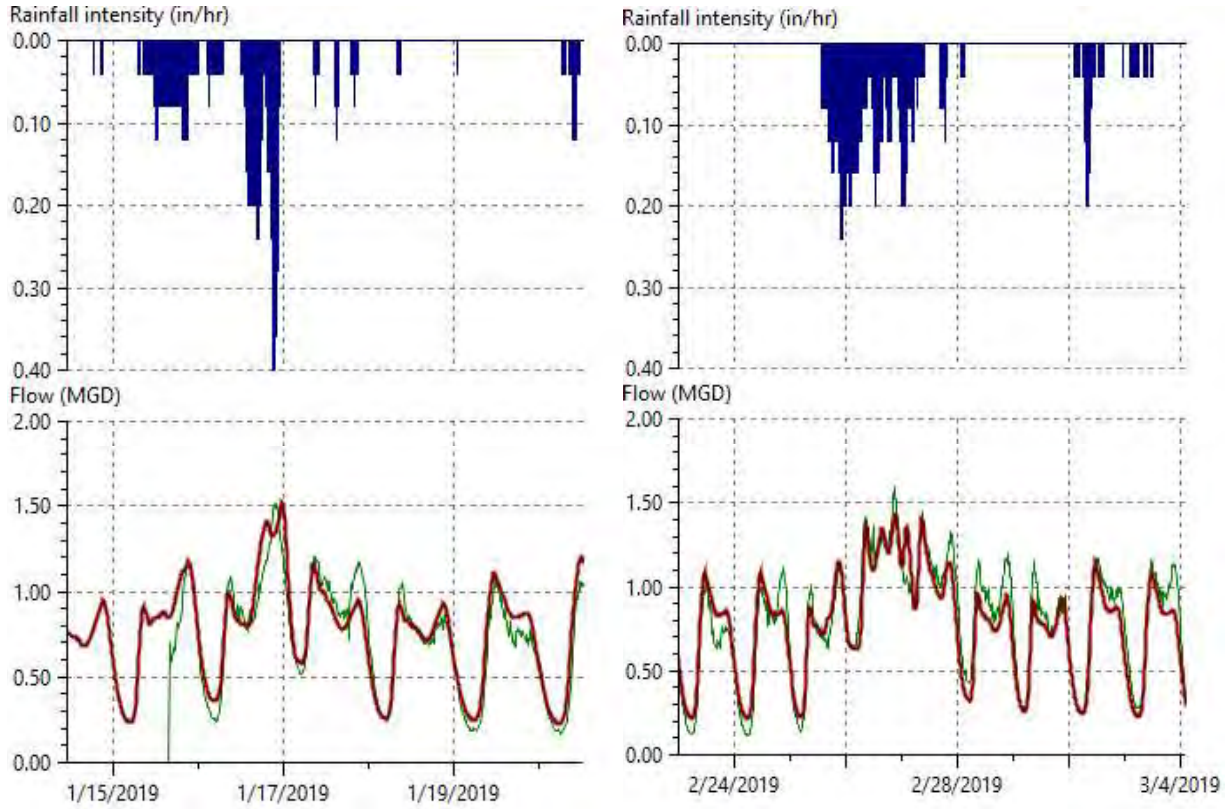
Flow Meter ID (FM ID)	R1 RDI/I Vol (%)	R2 RDI/I Vol (%)	R3 RDI/I Vol (%)	Rtot RDI/I Vol (%)
158	0.3	1.1	3.0	4.4
159	0.2	0.5	1.3	2.0
160	0.9	1.3	2.5	4.7
161	0.6	1.0	2.0	3.6
162	0.2	0.5	1.3	2.0
Cincinnati[b]	0.1	0.1	1.3	1.5
Industrial[b]	0.1	0.1	0.3	0.5
SMD-2	0.6	1.0	2.0	3.6
Sierra College	0.5	0.9	1.9	3.3
Highlands	0.7	1.0	0.4	2.1
North Roseville (Pleasant Grove)	1.3	1.3	0.3	2.9
Springview (Dry Creek)	0.7	2.0	10.0	12.7

Notes:

a. Where flowmeters did not indicate a significant response to rainfall, a minimum response of 0.6% was assumed, disbributed evenly between R1, R2, and R3. A minimum response of 0.6% was also assumed for areas of future growth.

b. Due to highly variable and relatively low industrial flows, calibration of Cincinnati and Industrial meters was limited.

Figure 3-7: Example WWF Model Calibration Graph (Site 155)



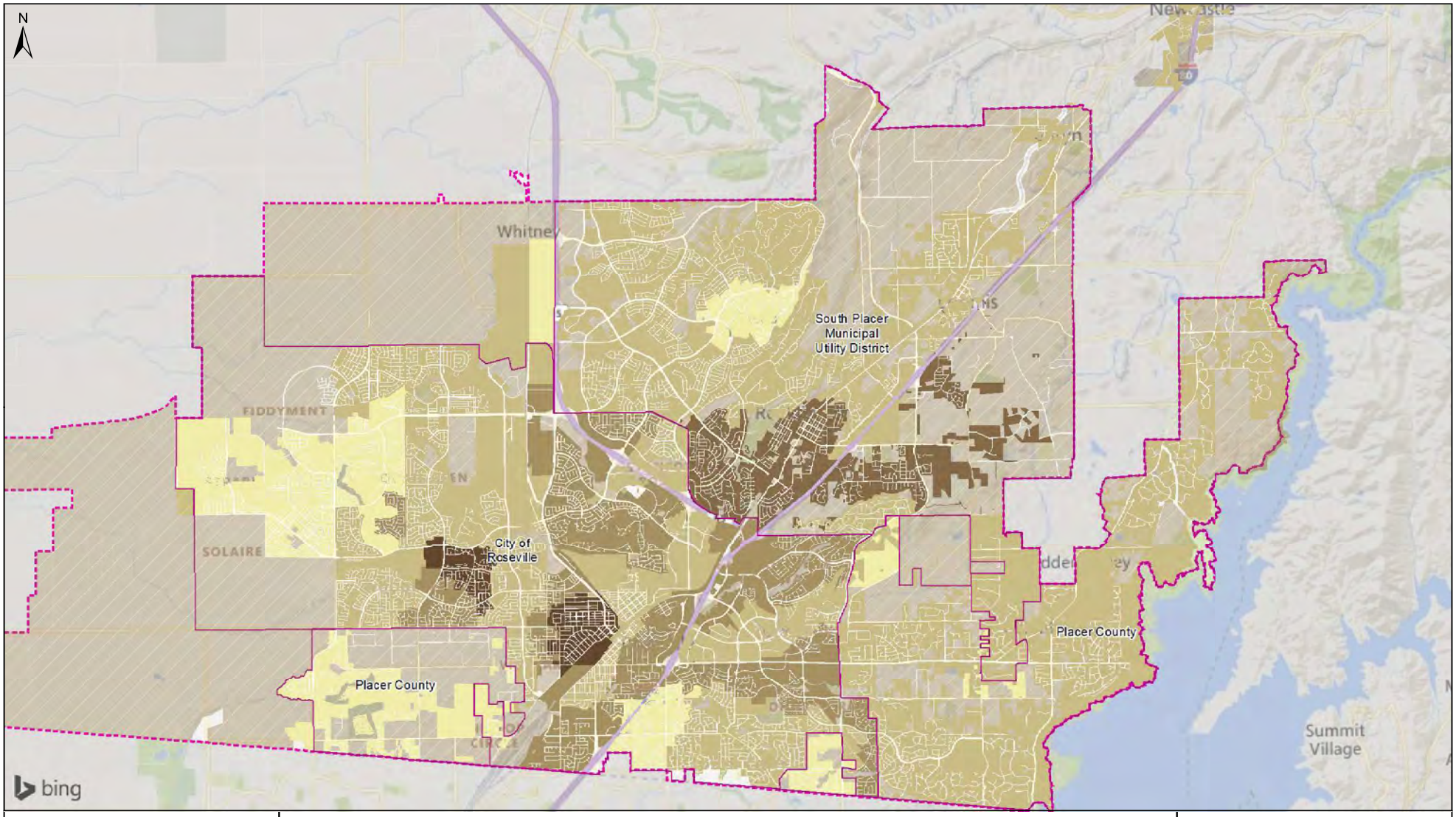


Figure 3-8

Calibrated R Values

South Placer Wastewater Authority
2020 Systems Evaluation

0 ½ 1 2 Miles

Unconnected

Partner Agency Boundary

Ultimate Service Area Boundary

Total R

0.3% - 1%

1% - 5%

5% - 10%

11% - 15%

> 15%

Project #: 0011183.00
Map Created: December 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources:** SPWA Agencies, ESRI, W&C

Placer ROSEVILLE CALIFORNIA

Figure Exported: 12/21/2020 By: evanjlanden Using: \\woodardcurran.net\shared\Projects\RMC\WCR\0091 Roseville, City of\0011183.00 SPWA Systems Evaluation\G. GIS\3 MXDs\Report Figures\3-8 Calibrated R Values.mxd

3.4 Capacity Analysis

This section describes the hydraulic analysis and capacity criteria used to evaluate system performance and size capacity relief projects in the trunk sewer system, and identifies the capacity deficiencies based on the results of model runs.

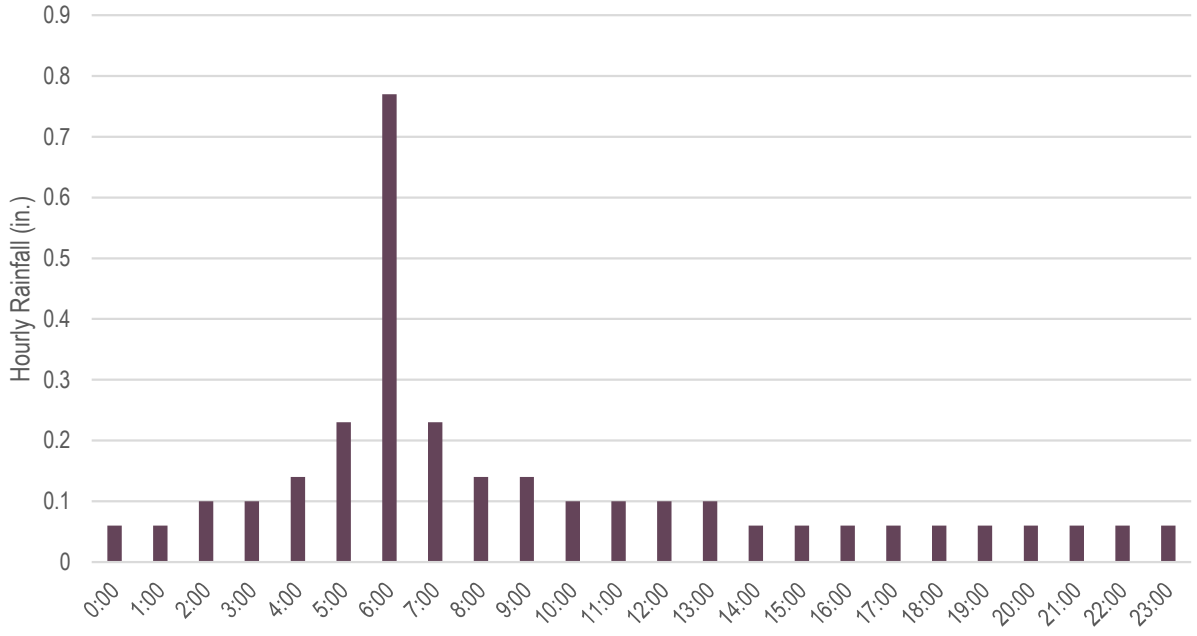
3.4.1 Design Flow Criteria

Design flows for sewer systems consist of BWF, GWI, and RDI/I. Criteria for computing existing BWF, GWI, and RDI/I (developed as part of model calibration), and flow assumptions for future development were discussed in the previous chapters. Note that for capacity analysis purposes, base wastewater flows assume rebound of approximately 15 percent from current flows.

For this Systems Evaluation Update, design RDI/I is based on a 10-year 24-hour synthetic rainfall pattern that occurs uniformly across the entire service area. The event used is the same event as used for the previous 2009 Systems Evaluation. The design storm hyetograph was developed utilizing Table 5-A-1 (elevation (h) = 150 feet) from the 1990 Placer County Flood Control and Water Conservation District Stormwater Management Manual (1990 Placer County Stormwater Management Manual). This event has a 1 hour peak intensity of 0.77 inches and a 24-hour rainfall depth of 2.97 inches. The peak rainfall hour was set at 6 a.m. so that the peak RDI/I response (which would normally occur about 1-2 hours after the rainfall for a typical basin) roughly coincides with the peak hour of the dry weather profiles to give a conservative flow response in the collection system. The intensity and timing of the design storm is presented in **Figure 3-9**.

It should be noted that current NOAA statistics (NOAA Atlas 14, updated in 2014) have a somewhat lower peak hour rainfall intensity, though slightly higher 24-hour rainfall depth (1 hour peak intensity of 0.65 and 24-hour depth of 3.35 inches). As the design event developed from the 1990 Placer County Stormwater Management Manual was likely to result in higher peak flows, and therefore more conservative estimate of system capacity, that design event was selected for this evaluation. NOAA Atlas 14 data confirms that design rainfall intensity does not vary significantly across the SPWA service area.

Figure 3-9: SPWA 10-year Design Storm Event



3.4.1.1 Summary of Flows Under Design Storm

A summary of modeled flows based on the design flow criteria is included in **Table 3-7.**

Table 3-7: Modeled ADWF and Peak Wet Weather Flow Summary

	Existing (Rebound)			Buildout			Buildout-Sensitivity		
WWTP	BWF[a] (mgd)	ADWF (mgd)	PWWF[b] (mgd)	BWF[a] (mgd)	ADWF (mgd)	PWWF[b] (mgd)	BWF[a]	ADWF (mgd)	PWWF[b] (mgd)
Pleasant Grove	9.5	9.9	27.4	26.1	26.5	55.8	26.2	26.5	56.0
Dry Creek	10.1	12.7	41.9	16.7	19.2	59.2	18.2	20.8	60.6

Notes:
a. Does not include wet season groundwater infiltration (GWI).
b. Modeled PWWF assumes improvements have been implemented to eliminate overflows and significant surcharging.

3.4.2 Hydraulic Capacity Criteria

Capacity deficiency or performance criteria are used to determine when the capacity of a sewer pipeline is exceeded to the extent that a capacity improvement project (e.g., a relief sewer or larger replacement sewer) is required. Capacity deficiency criteria are sometimes called "trigger" criteria in that they trigger the need for a capacity improvement project. These criteria may differ from "design criteria" that are applied to determine the size of a new facility, which may be more conservative than the performance criteria. The 2009 Systems Evaluation identified several hydraulic capacity criteria:

- No surcharging in SPWA sewers, though exceptions were made where limited surcharging may occur in relatively deep pipes. Note that surcharging due to downstream conditions (i.e. backwater conditions) may not be considered a deficiency.
- Pump stations are considered capacity deficient if the design storm PWWF exceeds the pump station capacity with the largest pumping unit out of service (i.e. firm capacity).
- Force mains with velocities exceeding 7 feet per second under PWWF may require further investigation, though would not trigger a project unless the pump station required additional capacity.

As the current model is a calibrated fully-dynamic model, the design condition represents a relatively infrequent storm event, and many of SPWA's sewers are relatively deep, a less conservative surcharge criteria was applied, with surcharging up to within 5 feet of the manhole rims (ground surface) considered acceptable under 10-year design storm PWWF, as long as the surcharge (flow height in the manhole) does not exceed 4 feet from the top of pipe up the manhole. The pump station and force main criteria from the 2009 Systems Evaluation were unchanged.

3.4.3 Capacity Analysis Results

The calibrated model was run for Existing, Buildout, and Buildout-Sensitive land use scenarios under the design event described above. Several deficiencies were identified in non-regional facilities which resulted in model-predicted overflows for one or more of the scenarios; to ensure flows were conveyed to regional sewers, pipes were upsized in this analysis to eliminate any overflows.

Within the regional system, seven areas have been identified that either have deficiencies or could be impacted when upstream deficiencies are relieved. Note that not all areas have been identified as having capacity deficiencies.

- **Area A** includes the sewers on Old Auburn Road immediately downstream and upstream of PS 26. This area is designed to divert flows above the springline of the sewer into PS 26. However, since PS 26 has insufficient firm capacity during peak wet weather flows, the sewers back up into the upstream sewers and results in a modeled overflow. This is an area of known capacity concerns. If flows through PS 26 were increased, the capacity issues in this area would be relieved.

- **Area B** includes the trunk sewer downstream of Area A from Old Auburn Road to SMH A06-257, which is where flow from PS 26 rejoins this trunk sewer. Note that there are two shallow manholes in this area that have less than 5 feet of cover (SMH A07-234 and SMH A07-091). Sewer depths should be investigated, and, if depths are confirmed, bolting manhole covers should be considered.

- **Area C** includes the trunk sewer downstream of Area B (from SMH A06-257) to the junction structure at Oak Ridge Drive. The junction structure at Oak Ridge Drive connects a 15-inch trunk (modeled, but not part of the regional system) to the main 33-inch trunk, but allows high flows to overtop a weir into a parallel 15-inch trunk sewer.

- **Area D** includes the 30-inch and 33-inch trunk sewer downstream of the Area C (from Oak Ridge Drive), to the 42-inch sewer near Riverside Age.

- **Area E** includes the 15 and 21-inch sewers from the Sierra College permanent meter to the weir structure adjacent to PS 25.

- **Area F** includes the area downstream of Area E, extending from PS 25 to the upstream manhole of Area C (SMH A06-257).

- **Area G** includes the gravity sewer downstream of PS 26, extending to the intersection with Area E.

Model results under Existing and Buildout conditions are summarized in **Table 3-8** and shown in **Figure 3-10** and **Figure 3-11**, respectively. The figures indicate existing trunk sewers that were predicted by the model to be surcharged (water levels in manholes above the crowns of the pipes) due to "throttle" conditions (peak flow exceeding full pipe capacity) or due to backwater from a downstream throttle condition, and locations of model-predicted overflows. Note that **Figure 3-11** shows the results for both the Buildout and Buildout-Sensitivity scenarios (i.e. there is no difference in surcharge locations between the scenarios). In **Table 3-8**, areas that exceed the hydraulic capacity criteria but do not have modeled overflows are highlighted yellow, while areas with modeled overflows are highlighted orange. Hydraulic profiles for each area under existing and Buildout land use conditions are included in Appendix E.

Table 3-8: Capacity Results under Existing and Buildout Land Use Scenarios[a]

Area	Existing (with Rebound)			Buildout and Buildout-Sensitivity		
	Length of Throttle Surcharge (ft)	Maximum Surcharge Depth (ft)	Minimum Freeboard (ft)	Length of Throttle Surcharge (ft)	Maximum Surcharge Depth (ft)	Minimum Freeboard (ft)
A	5,530	7.3	0.0	5,530	7.8	0.0
B	3,369	1.9	2.0	3,948	7.7	0.0
C	522	1.0	7.4	6,009	6.4	2.8
D	700	1.1	8.6	4,220	3.3	6.4
E	--	--	--	2,223	3.1	5.6
F	--	0.9	12.2	1,716	7.3	2.2
G	--	--	--	0	2.3	3.3

a. Areas that exceed the hydraulic capacity criteria but do not have modeled overflows are highlighted yellow, while areas with modeled overflows are highlighted orange.

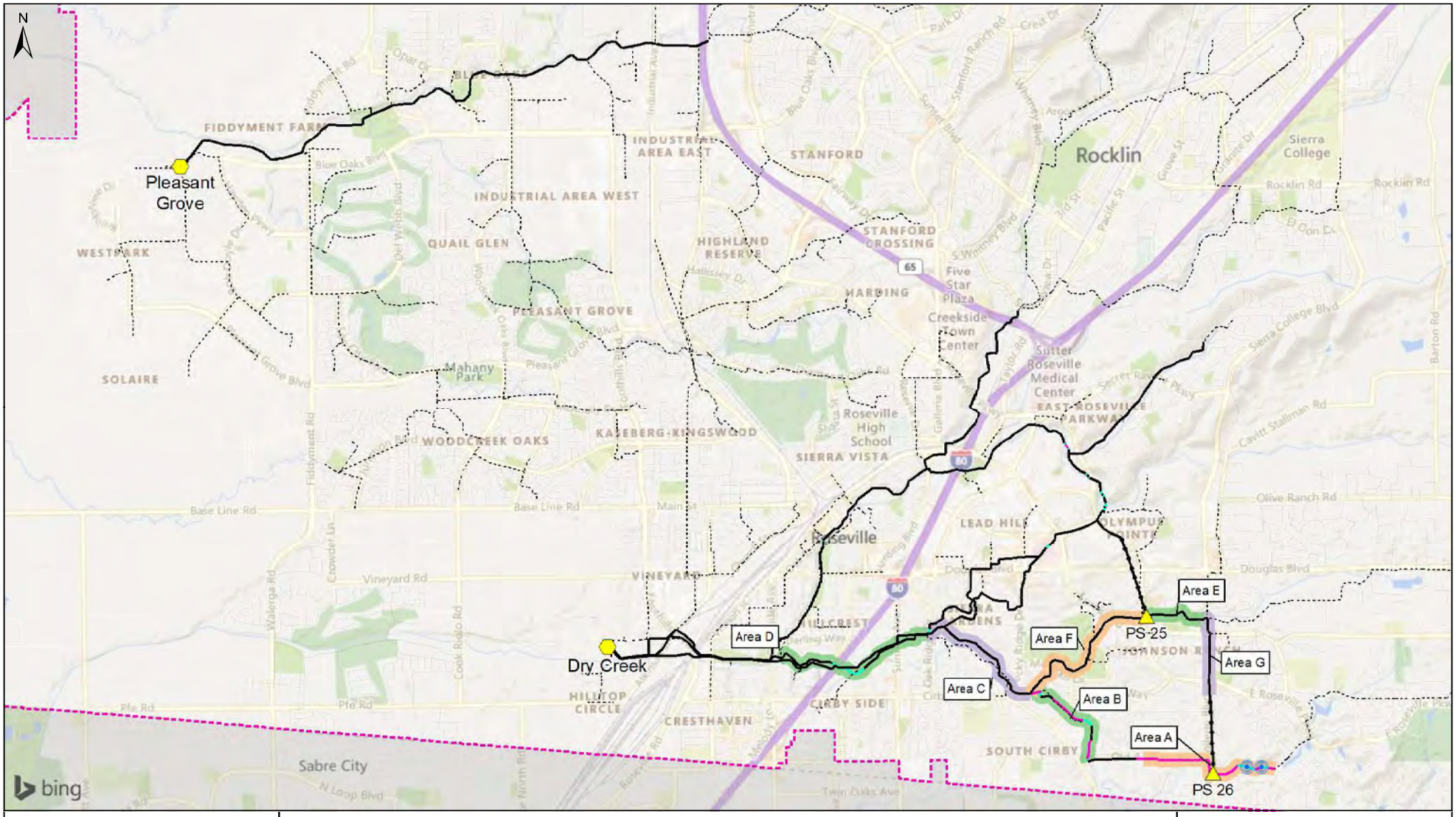


Figure 3-10
Model Results (Existing PWWF)

South Placer Wastewater Authority
2020 Systems Evaluation

0 ¼ ½ 1 Miles

- Regional Gravity Sewer
- Force Main
- Non-Regional Modeled Sewer
- Backwater Surcharge
- Throttle Surcharge
- Modeled Sewer Overflow
- Deficiency Area
- Ultimate Service Area Boundary

Project #: 0011183.00
Map Created: December 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources:** SPWA Agencies, ESRI, W&C

Figure Exported: 12/21/2020 By: evanljenden Using: \\woodardcurran.net\shared\Projects\RMC\WCR\0091 Roseville, City of\0011183.00 SPWA Systems Evaluation\G. GIS\3 MXD\ReportFigures\3-10_Model_Results_Existing_PWWF.mxd

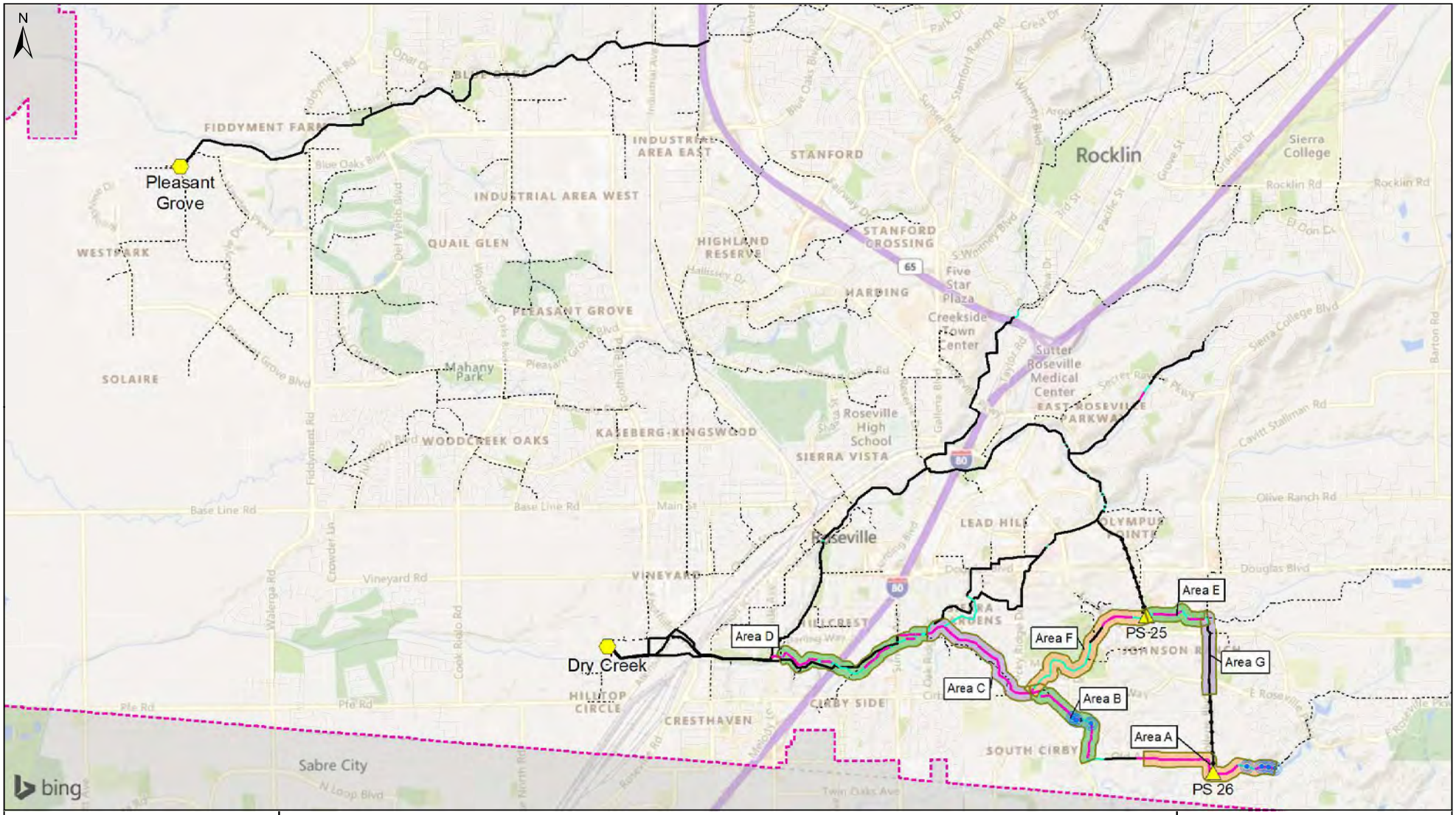


Figure 3-11

Model Results (Buildout and Buildout Sensitivity PWWF)

South Placer Wastewater Authority
2020 Systems Evaluation

0 ¼ ½ 1 Miles

- Regional Gravity Sewer
- Force Main
- Non-Regional Modeled Sewer
- Backwater Surcharge
- Throttle Surcharge
- Modeled Sewer Overflow
- Deficiency Area
- Ultimate Service Area Boundary

Project #: 0011183.00
Map Created: December 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources:** SPWA Agencies, ESRI, W&C

3.5 Proposed Improvements

Proposed improvement projects have been developed, and verified using the hydraulic model, to alleviate surcharge in the areas described in the previous section. Each proposed project was reviewed on aerial mapping to identify potential design and constructability issues. Preliminary estimates of probable construction costs were prepared.

This section discusses these proposed improvements as well as the criteria used to develop them and estimate costs. The projects are considered planning level, and further pre-design of each project is recommended prior to implementation.

3.5.1 Design Criteria for New Sewer Facilities

Section 9 of the City of Roseville Design Standards (January 2019) details criteria for Sanitary Sewer Design. These criteria are used during the development of new standards and applied to any new infrastructure.

3.5.1.1 Gravity Sewers

Below is a list of select City design standards for gravity sewers. See Section 9 of the Design Standards for a full listing of criteria.

- Minimum slopes and flow capacities summarized below

Pipe Diameter (in)	Slope (ft/ft)	Capacity (at 0.7 Depth)	Capacity Flowing Full
6	0.0050	0.22 MGD	
8	0.0035	0.38 MGD	
10	0.0025	0.58 MGD	
12	0.0020	0.85 MGD	1.00 MGD
15	0.0015	1.32 MGD	1.60 MGD
18	0.0012	1.95 MGD	2.35 MGD

- Maximum allowable depth-to-diameter ratio (d/D) of 0.7 at design flow for laterals 10 inches or less. Pipes 12" or greater may be designed to flow full unless connections are planned, in which case the 0.7 depth-to-diameter ratio governs.
- Flow velocities must be between 2 feet per second and 10 feet per second.
- Maximum bury depth of main with lateral connection shall be 15 feet. Minimum slope of lateral connection shall be ¼ inch per foot with a minimum bury depth of 12 inches at any buildable location within the properties to be served.
- Maximum spacing of manholes shall be 500 feet for all straight lines of 10 inches in diameter or less. Manhole spacing for mains 12 inches and larger shall be considered on a case by case basis.
- The invert elevation for pipe of the same diameter entering a manhole shall have a 0.10-foot drop between the entering and exiting pipe and invert elevations for pipe of different diameters shall match crown of exiting pipe. The crown of the entering pipe shall be at the same elevation or higher than the exit pipe.
- Drop connections shall be permitted under special conditions and with the approval of the Environmental Utilities Director

3.5.1.2 Pump Stations and Force Mains

Below is a list of select City design standards for pump stations and force mains. See Section 9 of the Design Standards for a full listing of criteria.

- A sufficient number of centrifugal pumping units shall be installed such that station capacity can be maintained with any one unit out of service.
- Provisions for 4 hour storage capacity shall be provided.
- Planning level criteria as follows:

Pump Stations	
Capacity	PWWF (hydraulic modeling required for pipes 18 inches and larger)
Storage	4 hours
Operation	Lead/lag for duty pump(s), plus 1 standby pump
Maximum Pump Cycles	6 cycles/hour (3 cycles per pump)
Force Mains	
Headloss	Hazen-Williams roughness coefficient (C-factor) of 120
Maximum Velocity	7-10 feet per second
Minimum Velocity	3.0 feet per second

3.5.2 Cost Criteria

Opinions of probable costs for proposed capacity improvement projects were developed based on Woodard & Curran's experience with similar projects and discussions with product vendors. The estimated construction costs are based on a Class 4 estimate as defined by the Association for the Advancement of Cost Engineering (AACE) International cost estimate classification system. **Table 3-9** provides a summary of the estimate classes and expected accuracy range. For Class 4 estimates, the expected accuracy range is -15% to -30% on the low end and +20% to +50% on the high end.

Table 3-9: Cost Estimate Classification Matrix (AACE International)

Estimate Class	Level of Project Definition	Purpose of Estimate	Methodology	Expected Accuracy Range
Class 5	0% to 2%	Concept screening	Capacity factored, parametric models, judgement, or analogy	Low: -20% to -50% High: +30% to +100%
Class 4	1% to 15%	Study or feasibility	Equipment factored or parametric models	Low: -15% to -30% High: +20% to +50%
Class 3	10% to 40%	Budget authorization or control	Semi-detailed unit costs with assembly level line items	Low: -10% to -20% High: +10% to +30%
Class 2	30% to 75%	Control or bid/tender	Detailed unit cost with forced detailed take-off	Low: -5% to -15% High: +5% to +20%
Class 1	65% to 100%	Check estimate or bid/tender	Detailed unit cost with detailed take-cost	Low: -3% to -10% High: +3% to +15%

Source: AACE International Recommended Practice No. 18R-97

These estimates are suitable for use for budget forecasting, CIP development, and project evaluations, with the understanding that refinements to the project details and costs would be necessary as projects proceed into the design and construction phases. All costs have been adjusted to an Engineering News Record Construction Cost Index (ENR CCI) of approximately 12,115, which represents the average of the April 2020 ENR CCI for "20 Cities Average" and "San Francisco" indices.

Cost criteria include baseline unit construction costs for gravity sewers using open-cut methods. Pipe bursting is sometimes a more cost-effective option for projects that involve upsizing existing sewers to 15-inch diameter or smaller; this construction method could be considered during design. Costs for gravity trunk sewers vary with pipe diameter and depth (in the case of open-cut construction). Allowances added to the baseline construction cost include mobilization/demobilization and project-specific for remove and replace construction and traffic control for work in roadways. A 30 percent allowance for contingencies for unknown conditions was also included for all projects, as well as an allowance of 25 percent of construction cost for engineering, administration, and legal costs. For pump stations, costs include site work, mechanical and electrical equipment specific to each station.

3.5.3 Proposed Capacity Improvement Project Descriptions

Improvement projects were developed as a series of improvements that sequentially decrease surcharging in downstream sewers. These improvement projects, including estimated capital improvement costs, are discussed below and summarized in **Table 3-10** and shown in **Figure 3-12**. Individual improvement project cost estimate details as well as detailed project figures are provided in Appendix F.

3.5.3.1 Improvement Project 1

Improvement Project 1 would increase the capacity of PS 26 (Sierra College Boulevard PS) as needed to limit surcharging in the Old Auburn Trunk sewer (Area A and Area B). The weir leading to PS 26 would be unchanged and would divert flows when depth in the sewer exceeds half the sewer diameter. Because this project would substantially increase flows through the sewer on Sierra College Boulevard (Area G), this project also includes upsizing those pipelines to 10, 12, and 15-inch sewers to eliminate surcharging in that line.

PS 26 will need to be modified to meet the increased firm capacity, from 0.43 mgd to 1.6mgd. If the existing wet well is large enough, it could be retrofitted with new, higher flow pumps. The existing wet well at PS 26 is 8 feet in internal diameter. Updated design criteria were provided to a Flygt pump representative and, based on the minimum wet well sizing for their recommended pump selection, the existing wet well is sufficiently large to be reused with a larger pump.

The pump selection provided should be considered preliminary. Given the high total pump station head and large motor of the resulting pump selection, an evaluation of alternatives to reduce the pump size, via upsizing the discharge force main for example, should be considered during pre-design. A life cycle cost analysis may be appropriate to compare the difference between the additional headloss and resulting pumping costs versus the cost to upsize the force main.

3.5.3.2 Improvement Project 2

Improvement Project 2 would re-route the sewer on Sierra College Boulevard east on Eureka and reconnect to the regional trunk at East Roseville Parkway (Area F). This would relieve surcharge in Area E. Excess flows resulting in surcharge in Area F would be diverted through PS 25 to the northern sewershed, which does not have capacity concerns. The preliminary project would upsize existing 8 and 10-inch sewer on Eureka Road and E Roseville Parkway. Since the connection is about 100 feet downstream of the PS 25 diversion structure, this improvement project may increase flows (and associated surcharge) in Area F (unless adjustments are made to the PS 25 diversion structure, as discussed in Improvement Project 3).

3.5.3.3 Improvement Project 3

Improvement Project 3 would alter the piping and diversion structure in the vicinity of PS 25 (Rollingwood PS) to convey additional flow away from Area C, Area D, and Area F, and increase the capacity of PS 25 as needed to accommodate the additional flow. For this improvement project, the diversion structure would be converted to divert any flows exceeding peak dry weather flow (up to approximately 2.6 mgd with buildout land uses under peak wet weather conditions),. It should be noted that the 2009 Systems Evaluation assumed diversion of 3.2 mgd through PS 25 with buildout land uses under peak wet weather conditions.

A new junction structure would need to be installed at E Roseville Parkway (or the existing junction structure would need to be relocated) in order to capture the additional flows.

PS 25 would need to be modified to meet the increased firm capacity. If the existing wet well is large enough, it could be retrofitted with new, higher flow pumps. The existing wet well at PS 25 is 10 feet in internal diameter. Updated design criteria were provided to a Flygt pump representative and, based on the minimum wet well sizing for their recommended pump selection, the existing wet well could be reused.

Table 3-10: Proposed Capacity Improvement Projects

Project	Location	Existing Sizes	Improved Sizes[a]	Description	Estimated Capital Improvement Cost
1	PS 26	0.43 mgd firm capacity	1.6 mgd PWWF at Buildout	Increased Capacity of PS 26 and sewers on Sierra College Blvd directly downstream of PS 26 to relieve Old Auburn Trunk sewer (Area A)	$1,606,000
	Sierra College Blvd (Area G)	500 ft of 8-inch 1,900 ft of 10-inch	500 ft of 10-inch (upsized from 8-inch) 900 ft of 12-inch (upsized from 10-inch) 1,000 ft of 15-inch (upsized from 10-inch)		
2	Eureka Road and E. Roseville Parkway	800 ft of 8-inch 1,400 ft of 10-inch	2,200 of 15-inch (upsized from 8 or 10-inch) 1,200 ft of new 15-inch.	Redirect flows from PS 26 and Sierra College Blvd down Eureka Road to relieve Area E.	$1,831,000
3	PS 25 (pumps)	2.02 mgd firm capacity	2.6 mgd PWWF at Buildout	Increased Firm capacity of PS 25 to meet Buildout PWWF (depends on alternative). New weir structure or adjustments to existing structure at PS 25 to convey the maximum potential flow through PS 25 without any dry weather flows.	$758,000
	PS 25 diversion structure	N/A	New diversion structure and related piping		

Notes:

a. Note that pipeline capacity increases could be accomplished through parallel pipes, rather than upsizes.

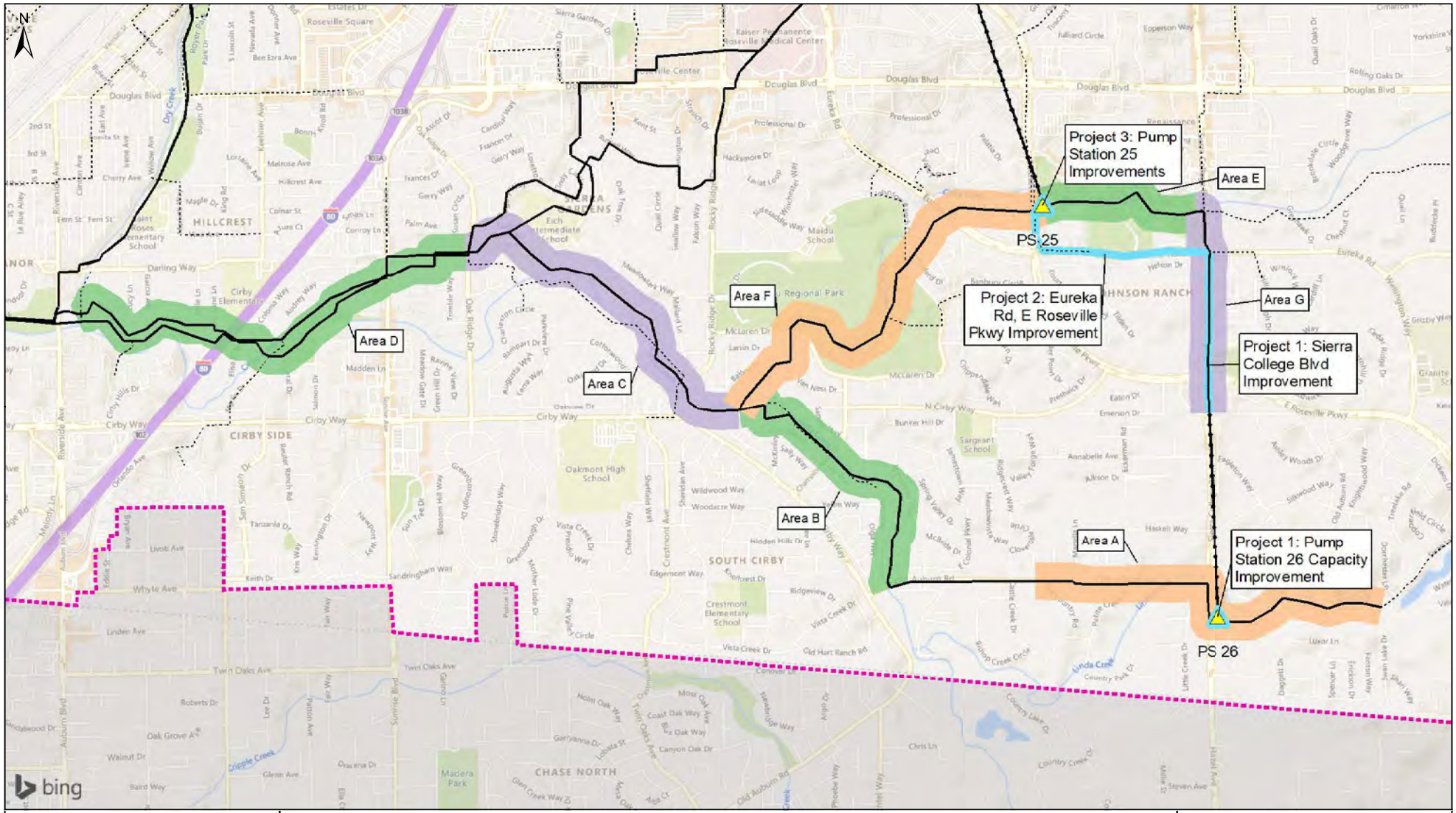


Figure 3-12
Proposed Improvement Locations

South Placer Wastewater Authority
2020 Systems Evaluation

0 0.125 0.25 0.5 Miles

- Regional Gravity Sewer
- Force Main
- Non-Regional Modeled Sewer
- Pump Station
- Preliminary Capacity Improvement Area
- Deficiency Area
- Service Area Boundary

Project #: 0011183.00
Map Created: December 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources:** SPWA Agencies, ESRI, W&C

Figure Exported: 12/21/2020 By: evanlienden Using: \\woodardcurran.net\shared\Projects\RMC\WCR\0091 Roseville, City of\0011183.00 SPWA Systems Evaluation\G. GIS\3 MXDs\Report Figures\3-12 Proposed Improvement Projects.mxd

3.5.4 Timing of Proposed Improvement Projects

While Project 1 is needed for current demands, Project 2 and Project 3 are expected to be triggered by future development. For the purpose of this Systems Evaluation, an approximate number of equivalent dwelling units upstream of the capacity deficiency that would trigger the need for a project has been estimated by applying a reduction factor to future flows to represent percentage of buildout. Nearly all of the future growth that would trigger the projects would occur in SMD-2 and SMD-3 (with less than 100 EDUs of future growth anticipated for SPMUD and Roseville). Based on the SMD2 and SMD3 growth projections provided by Placer County, this would occur beyond the 2060 planning horizon provided.

The timing estimated here is subject to change, and could be impacted by the following assumptions:

- Inflow and Infiltration rates for existing sewers are assumed to remain approximately the same. These rates could change based on pipe condition and maintenance activities (such as rehabilitation and repair) in the collection system.
- Inflow and Infiltration rates for new sewers are assumed based on typical values. Actual I/I rates could be higher or lower than assumed.
- The estimates are based on an assumed rebound of dry weather flows to 190 gpd per EDU. If dry weather flows do not rebound, the timing for Project 2 and Project 3 could be somewhat delayed.

Future studies should monitor the I/I rates and update these estimates as needed. The number of EDUs in SMD2/SMD3 that would trigger the proposed project are summarized in **Table 3-11**.

Table 3-11: Timing of Proposed Capacity Improvement Projects

Project	Description	Estimated Capital Improvement Cost	Approximate Additional EDUs in SMD2/SMD3 to Trigger Project[a]
1	Increased Capacity of PS 26 and sewers on Sierra College Blvd directly downstream of PS 26 to relieve Old Auburn Trunk sewer (Area A)	$1,606,000	Existing
2	Redirect flows from PS 26 and Sierra College Blvd down Eureka Road to relieve Area E.	$1,831,000	~1,800[b]
3	Increased Firm capacity of PS 25 to meet Buildout PWWF (depends on alternative). New weir structure or adjustments to existing structure at PS 25 to convey the maximum potential flow through PS 25 without any dry weather flows.	$758,000	~1,800[c]

Notes:

a. Based on a percentage of buildout factor applied to future model loads.
b. Represents approximately 60% of buildout. There are approximately 8,400 Existing EDUs upstream of the deficiency triggering Improvement Project 2, and approximately 10,200 EDUs would trigger the need for improvement.
c. Represents approximately 60% of buildout. There are approximately 11,900 Existing EDUs upstream of the deficiency triggering Improvement Project 3, including 7,600 in Placer County, 4,200 in Roseville, and less than 100 in SPMUD. Approximately 13,700 EDUs would trigger the need for the improvement.

4. WASTEWATER TREATMENT PLANT EXPANSION EVALUATION

4.1 Introduction

Based on the updated growth projections provided by the SPWA partners through fiscal year 2059-2060 and at buildout, this section provides facility expansion recommendations for Dry Creek Wastewater Treatment Plant (DCWWTP) and Pleasant Grove Wastewater Treatment Plant (PGWWTP), which treat the entirety of flows from the SPWA service area. The recommendations address timing, phasing, and preliminary conceptual costs of the expansions required through buildout to address both flows and loads, as well as identifying next steps for confirming current plant capacity to accurately reflect recent and ongoing capital improvements.

The analysis provides updates to the following flow and loading parameters for DCWWTP and PGWWTP:

- Flows: existing and projected influent flow through buildout:
    - Average Dry Weather Flow (ADWF)
    - Average Annual flow (AA)
    - Peak Month Flow (PMF)
    - Peak Day Wet Weather Flow (PDWWF)
    - Peak Hour Wet Weather Flow (PHWWF)
- Loads: existing and projected influent loads through buildout:
    - Biochemical Oxygen Demand (BOD), Annual Average (AA) and Maximum Month (MM)
    - Total Suspended Solids (TSS), AA and MM
    - Ammonia (NH_3), AA and MM

4.1.1 Dry Creek Wastewater Treatment Plant

Much of the DCWWTP was constructed in 1974 and was expanded in 1991 to treat an ADWF of 18 mgd. In June of 2004, a portion of the influent flow was diverted to the newly constructed PGWWTP, freeing up some treatment capacity at the time. Recently, nutrient removal upgrades were completed at DCWWTP to ensure reliable compliance with the NPDES permit limits (including the 10 mg/L average monthly limit for nitrate plus nitrite).[1] Currently, the flow meter on the discharge of the Influent Pump Station is being modified to increase the PHWWF hydraulic capacity to 36 mgd.

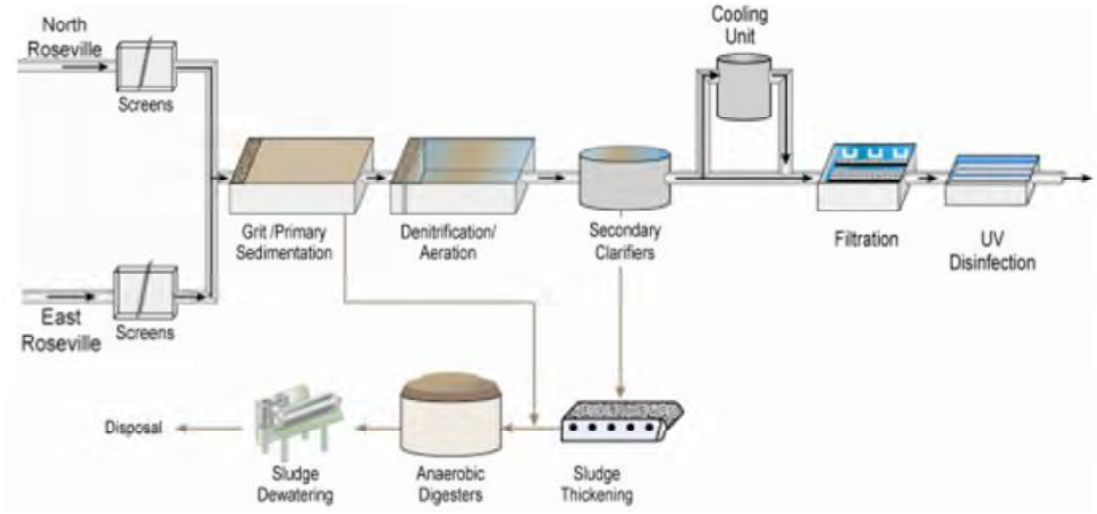
Population in the SPWA service area has continued to grow steadily, with loadings increasing substantially while ADWF decreased. The ADWF at DWWTP has decreased from 10.5 mgd in 2009to approximately 8.6 mgd as of 2019.

Equally as important as the hydraulic capacity of a plant is its biological treatment capacity. Design of the 1991 expansion of the plant was based on an influent BOD concentration of 160 mg/L, and the corresponding AA and MM loadings of 24,000 lbs/day and 36,000 lbs/day. Since 1991, the influent BOD concentration has increased to 425 mg/L, resulting in much higher BOD loadings than in previous projections. The impact of higher influent BOD concentration and loadings is discussed in Section 4.3.1.

A schematic of the DCWWTP liquid and solids treatment train is shown in **Figure 4-1**.

[1] Source: City of Roseville, DCWWTP Nitrate Reduction Improvements Project, Basis of Design Report (May 2017).

Figure 4-1: DCWWTP Treatment Schematic



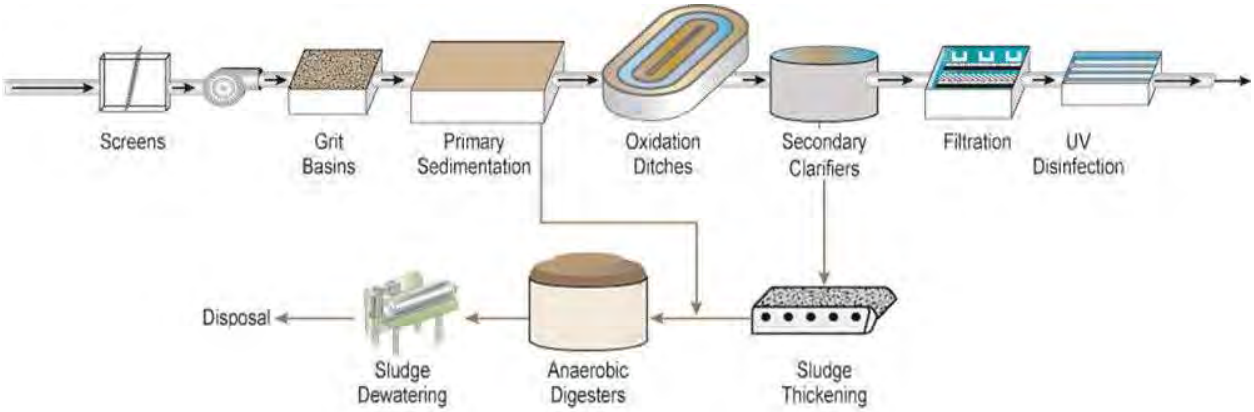
4.1.2 Pleasant Grove Wastewater Treatment Plant

Construction of the PGWWTP was completed in 2004. It was designed for an ADWF of 12 mgd, assuming historical domestic strength wastewater, similar to the Dry Creek Plant. Subsequent study of the plant's treatment processes and influent loading resulted in PGWWTP's capacity being lowered to an equivalent flow of 9.5 mgd. Like the DCWWTP, this was partially a result of influent BOD concentrations trending much higher over time than anticipated in the initial design. Current ADWF is approximately 7.6 mgd with an average influent BOD concentration of 358 mg/L.

To ensure the plant can reliably treat 12 mgd ADWF at the current higher loadings, an expansion project is currently underway, with anticipated completion/commissioning by fiscal year (FY) 22/23.[1] The expansion will add a primary sedimentation process to the liquid treatment train, which currently includes influent screening and grit removal, secondary treatment/denitrification in oxidation ditches, secondary clarification, filtration, and disinfection. The solids treatment process is being upgraded with sludge thickening using rotary drum thickeners and anaerobic digestion of the combined thickened secondary sludge and primary sludge, upstream of the existing dewatering centrifuges (which currently dewater only the secondary sludge). These upgrades will provide additional solids treatment capacity as well as biological treatment capacity. **Figure 4-2** shows a schematic of the PGWWTP treatment train reflecting the upgrades currently under construction.

[1] Source: City of Roseville, PGWWTP Expansion Basis of Design Report (March 2016).

Figure 4-2: PGWWTP Treatment Schematic



4.2 Flows and Loadings

Influent flows and loading (organic loading as measured by BOD and solids loading as measured by TSS) for both the DCWWTP and PGWWTP were established by analyzing daily plant influent data provided by the City of Roseville for the period from January 1, 2016 through September 19, 2019 for influent flow and from January 1, 2013 through September 19, 2019 for loadings. In addition, hourly flow data from December 1, 2016 to September 17, 2019 (which incorporated high winter flow periods) was used to establish peak hour flows.

Projected flows for both the DCWWTP and PGWWTP were calculated based on population and non-residential growth, normalized to account for diversity in land uses by establishing equivalent dwelling units (EDUs). EDU projection data were provided by each of the SPWA JPA Partners (City of Roseville, Placer County, and South Placer Municipal Utility District)[1]. Flow projections were developed by multiplying the projected EDUs by an ADWF contribution of 190 gallons per day (gpd) per EDU, in accordance with the estimate developed in the 2009 Systems Evaluation.

4.2.1 Current Flows and Peaking Factors

Current ADWF was established by averaging flows observed at each plant for the period of July through September. While the ADWF is usually thought of as the rated capacity of a treatment plant, the design of treatment systems must also accommodate significant seasonal and diurnal variations in influent flow. A treatment plant must be designed to prevent hydraulic overloads and wash out of solids during peak day and peak hour events. Generally, preliminary and primary treatment systems are sized for peak day or peak hour flow, while secondary treatment systems must meet maximum month organic loading peaks. Sizing treatment processes appropriately aids treatment plants in meeting discharge limits during the higher flows and loading periods that can otherwise stress or overwhelm the plant processes.

Current flow conditions and the associated peaking factors for both plants are summarized in **Table 4-1**.

[1] Data provided on July 2019 for Placer County, August 2019 for SPMUD, and November 2016 for the City of Roseville

Table 4-1: Current Flows and Peaking Factors

Flow Condition	DCWWTP		PGWWTP	
	Current Flow, mgd	Peaking Factor	Current Flow, mgd	Peaking Factor
ADWF	8.6	1.0	7.6	1.0
AA	10.8	1.2	8.1	1.07
PMF	18.4	2.12	10.3	1.36
PDWWF	27.9	3.22	16.9	2.23
PHWWF	36.0	4.19	20.4	2.69

It should be noted that the current plant data reflect a significantly lower flow contribution per EDU than the previously established unit flow factor of 190 gpd/EDU. Approximately 57,747 EDUs are tributary to DCWWTP for FY 19/20. Based on the current ADWF, the equivalent unit flow contribution is approximately 150 gpd/EDU. At PGWWTP, there are approximately 54,907 EDU tributary to the plant for FY19/20, which reflects a flow contribution of 138 gpd/EDU. This is likely the result of several factors, including water conservation efforts over the past decade, drought conditions that were experienced throughout California from 2011-2016, and lower levels of development than previously anticipated prior to the impacts of the recession in 2008-2009.

These flow contributions per EDU may rebound back to historical levels and, to provide a safety factor, the 190 gpd/EDU will continue to be used for this analysis. This unit flow factor should be tracked closely and, if warranted, the per EDU value adjusted accordingly over time.

4.2.2 Projected Plant Influent Flows

Future plant flows were projected over the planning horizon to fiscal year 2059-2060 (FY 59/60)[1] and to ultimate buildout conditions, based on the information provided in Chapter 2. ADWF projections at FY 59/60 and buildout are calculated by multiplying the EDU projection by the flow contribution per EDU. Peaking factors from **Table 4-1** were then applied to established ADWF per EDU based on current flows (138 gpd/EDU at PGWWTP and 150 gpd/EDU at DCWWTP) and added to ADWFs difference calculated from 190 gpd/EDU and current ADWF/EDU to project the additional flow conditions. This approach avoids using peaking factors on projected ADWF calculated from 190 gpd/EDU for a more realistic flow estimate. These flows are summarized in **Table 4-2** and **Table 4-3**.

Table 4-2: Projected FY 59/60 and Buildout EDUs and Flows at DCWWTP

Condition	DCWWTP			
	FY 59/60 EDU	FY 59/60 Flow, mgd	Buildout EDU	Buildout Flow, mgd
ADWF	87,772	16.7	96,000	18.2
AA	---	19.9	---	21.8
PMF	---	31.5	---	34.4
PDWWF	---	45.9	---	50.2
PHWWF	---	58.6	---	64.1

[1]SPWA's fiscal year runs from July 1 to June 30.

Table 4-3: Projected FY 59/60 and Buildout EDUs and Flows at PGWWTP

Condition	PGWWTP			
	FY 59/60 EDU	FY 59/60 Flow, mgd	Buildout EDU	Buildout Flow, mgd
ADWF	92,864	17.6	145,000	27.6
AA	---	18.6	---	29.0
PMF	---	22.2	---	34.8
PDWWF	---	33.4	---	52.3
PHWWF	---	39.3	---	61.5

4.2.3 Current BOD Loadings

In previous studies, design parameters were established based on much lower influent BOD concentrations, ranging from 248 mg/L at DCWWTP to 285 mg/L at PGWWTP. The plant data set provided for this TM (which is an extended data set from 2013-2019) indicates an average influent BOD concentration of 425 mg/L at DCWWTP, and 358 mg/L at PGWWTP. The range in influent BOD concentrations at both plants are shown in **Figure 4-3** and **Figure 4-4**.

Figure 4-3: Influent BOD Concentrations at DCWWTP

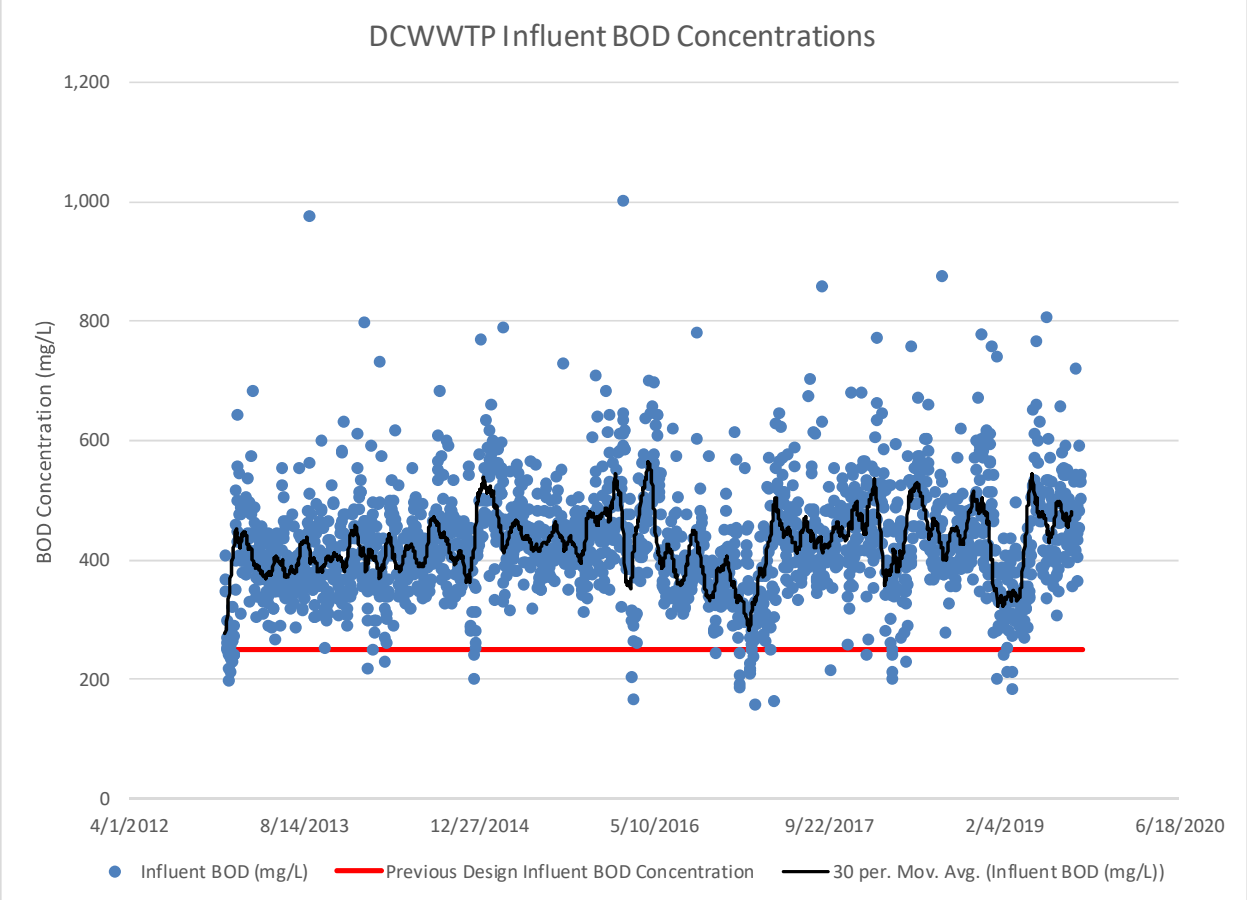
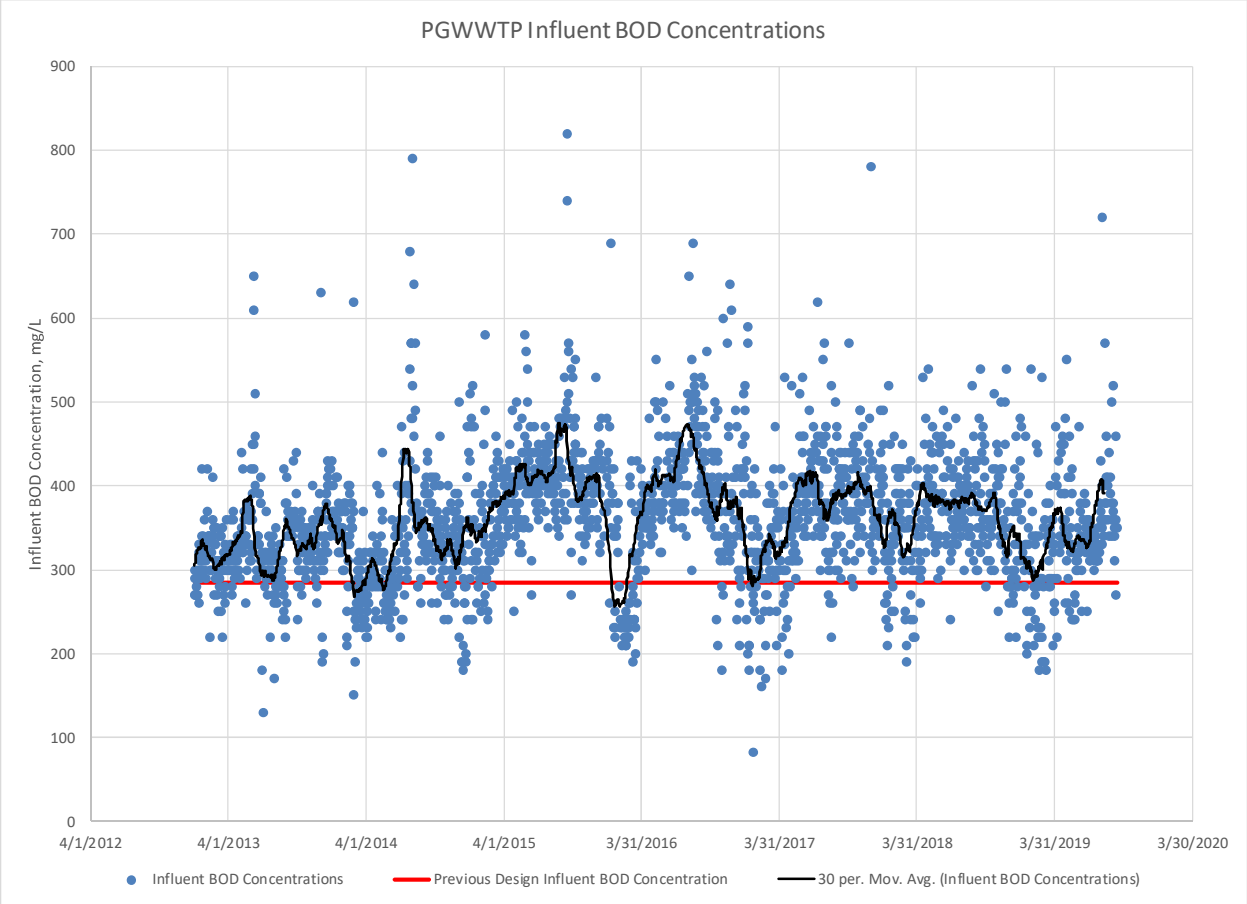


Figure 4-4: Influent BOD Concentrations at PGWWTP



These higher concentrations are likely a result of water conservation efforts over the past decade, combined with the drought conditions that were experienced throughout California from 2011-2016, though the relatively high concentrations at DCWWTP should be confirmed. The effect of conservation is on top of the demographic changes in the SPWA service area since the treatment plants were designed that brought much more commercial flows and loadings along with changing development patterns, such that the strength of the wastewater at both plants evolved from low strength domestic wastewater to moderate strength commercial wastewater, influenced by more food service, restaurant, brewery and other contributions.

A 30-day moving average of influent BOD concentrations is also shown on these figures. This moving average shows that current influent concentrations are now holding relatively constant, though they are higher than previous designs accounted for. This is an indication that influent BOD concentrations have now leveled off, however we recommend the SPWA monitor this parameter in the long term. When the State experiences another drought or there are changes to land use within the service area such as densification, influent loading concentrations may increase further.

4.2.4 Current and Projected Plant Influent Loadings

The January 1, 2013 through September 19, 2019 data set also included daily influent plant loadings for BOD, TSS, and NH_3. These data were analyzed to establish current annual average (AA) and maximum month (MM) pollutant loadings. Current MM loadings were established by taking the maximum value of a 30-day running average of the daily influent data provided. The peaking factors for each parameter were established by dividing the MM loading by the AA loading.

Projected loads, shown in **Table 4-4** and **Table 4-5,** were calculated by using the average loadings from the data set provided and establishing AA loading per EDU. Peaking factors were then applied to establish the FY 59/60 and buildout MM loads.

Table 4-4: Current and Projected Influent Loading at DCWWTP

Parameter	Condition	Unit	DCWWTP			
			Current	FY59/60	Buildout	Peaking Factor
BOD	Average Concentration	mg/L	425	---	---	---
	AA Loading	lbs/day	33,900	52,000	56,000	---
	MM Loading	lbs/day	47,600	73,000	79,000	1.41
TSS	Average Concentration	mg/L	540	---	---	---
	AA Loading	lbs/day	42,800	65,000	71,000	---
	MM Loading	lbs/day	60,800	92,000	101,000	1.42
NH_3	Average Concentration	mg/L	23	---	---	---
	AA Loading	lbs/day	1,800	2,800	3,100	---
	MM Loading	lbs/day	2,500	4,000	4,200	1.35

Table 4-5: Current and Projected Influent Loading at PGWWTP

Parameter	Condition	Unit	PGWWTP			
			Current	FY59/60	Buildout	Peaking Factor
BOD	Average Concentration	mg/L	358	---	---	---
	AA Loading	lbs/day	22,400	38,000	60,000	---
	MM Loading	lbs/day	28,000	48,000	75,000	1.25
TSS	Average Concentration	mg/L	291	---	---	---
	AA Loading	lbs/day	18,100	31,000	48,000	---
	MM Loading	lbs/day	26,400	45,000	70,000	1.46
NH_3	Average Concentration	mg/L	40	---	---	---
	AA Loading	lbs/day	2,400	4,100	6,400	---
	MM Loading	lbs/day	2,700	4,600	7,100	1.11

4.3 Plant Capacity Comparison and Expansion Phasing

This comparison of current plant capacity and projected future flows and loads accounts for only hydraulic and carbonaceous BOD treatment capacity because these parameters have driven capacity expansion timing in the past. Potential nutrient removal requirements have not been considered in expansion timing and phasing. Evaluation of plant capacity with respect to TSS and ammonia removal should be incorporated into a subsequent analysis of plant capacity. Existing plant capacity was provided in the following documents:

- South Placer Regional Wastewater and Recycled Water Systems Evaluation, RMC Water and Environment, December, 2009
- Technical Memorandum 4b: Wastewater Treatment Plants Expansion Requirements (TM 4b), RMC Water and Environment, March 28, 2006
- DCWWTP Initial Assessment Final Report, CH2M Hill, Inc, August 2008
- Final Pleasant Grove Wastewater Treatment Expansion Basis of Design Report, Kennedy/Jenks Consultants, March 2016
    - Executive Summary
    - Technical Memorandum No. 1: Influent Flow and Load Characteristics and Projections, Pleasant Grove Wastewater Treatment Plant

- City of Roseville, Dry Creek Wastewater Treatment Plant, Influent Pump Station Hydraulic Analysis, Waterworks Engineers, March 2018.

Current loading capacities at each plant based on these documents are summarized in **Table 4-6.**

Table 4-6: Current Hydraulic and Organic (BOD) Capacities at DCWWTP and PGWWTP

Plant	DCWWTP Existing	PGWWTP Existing	PGWWTP FY 22-23[a]
ADWF Hydraulic Treatment Capacity, mgd	18[b]	12[b]	12[a,c]
Biological Treatment Capacity, AA BOD Loading, lbs/day	26,200[d]	22,000[b]	34,500[c]
Biological Treatment Capacity, MM BOD loading, lbs/day	32,500[d]	N/A	40,100[c]

Notes:

a. Plant improvements that expand treatment capacity at PGWWTP are currently under construction and are expected to be in service by FY 22-23. Capacity comparisons in this TM take this into consideration.
b. Permitted plant capacity and capacity documented in the South Placer Regional Wastewater and Recycled Water Systems Evaluation, RMC Water and Environment, December 2009.
c. Source: Table 1.1, Technical Memorandum No. 1: Influent Flow and Load Characteristics and Projections. Final Pleasant Grove Wastewater Treatment Expansion Basis of Design Report, Kennedy/Jenks Consultants, March 2016
d. Source: Table 5-1, DCWWTP Initial Assessment Final Report, CH2M Hill, Inc, August 2008

The plant data show that current BOD loadings are higher than the BOD treatment capacities estimated in the reference documents at both plants (marginally higher at Pleasant Grove). However, according to City staff, the plants have consistently been in compliance with their NPDES discharge permits. This suggests that the **actual** plant capacities are beyond their nominal design capacity with respect to BOD. Additionally, it is unclear to what extent interim improvements such as the Nitrate Reduction Improvements project at DCWWTP have affected the plant capacity. For the purposes of this TM, it is assumed that the AA and MM BOD removal capacity at each plant are, at minimum, the same as their current BOD loadings. **Table 4-7** shows the revised treatment capacities based on current AA and MM BOD loadings. It is recommended that process-specific sampling, process modeling, and, if needed, stress testing be performed to determine the actual plant capacity, the limiting processes, and corresponding process improvements needed at each plant. While this evaluation will be immediately helpful at Pleasant Grove, it is essential at Dry Creek because of the large discrepancy between current loading and nominal capacity.

Table 4-7: Revised Current Hydraulic and Organic (BOD) Capacities at DCWWTP and PGWWTP

Plant	DCWWTP	PGWWTP Existing	PGWWTP FY 22-23[a]
ADWF Hydraulic Treatment Capacity, mgd	18[b]	12[b]	12[a,c]
Biological Treatment Capacity AA BOD Loading, lbs/day	33,900[d]	22,400[d]	34,500[c]
Biological Treatment Capacity, MM BOD Loading, lbs/day	48,000[d]	28,000[d]	40,100[c]

Notes:

a. Plant improvements that expand treatment capacity at PGWWTP are currently under construction and are expected to be in service by FY 22-23. Capacity comparisons in this TM take this into consideration.
b. Permitted plant capacity and capacity documented in the South Placer Regional Wastewater and Recycled Water Systems Evaluation, RMC Water and Environment, December, 2009.
c. Source: Table 1.1, Technical Memorandum No. 1: Influent Flow and Load Characteristics and Projections. Final Pleasant Grove Wastewater Treatment Expansion Basis of Design Report, Kennedy/Jenks Consultants, March 2016
d. Current BOD loadings based on plant data from January 2013 through September 2019.

4.3.1 Dry Creek Wastewater Treatment Plant

This section discusses the hydraulic and biological capacity of the DCWWTP and preliminary phasing of future improvements. Based on the estimated plant capacity and projected flow and loading requirements, two phases of improvements are recommended.

4.3.1.1 Hydraulic Capacity and Phasing

Based on the projected ADWF of 16.7 for FY 59/60 and 18.2 mgd for buildout, the current DCWWTP ADWF hydraulic capacity of 18 mgd is effectively sufficient through buildout. **Figure 4-5** shows ADWF capacity plotted against the flow projected over the planning period. **Figure 4-5** also presents graphs for ADWF and PDWWF rebound based on a linear interpolation from 150 gpd/EDU calculated based on current flows in FY 19/20 to a potential flow factor of 190 gpd/EDU in FY 59/60. This is not to say that all unit processes are sufficient to handle future peak flows associated with wet weather; assuming peaking factors hold steady over time, or increase, unit processes based upon flow criteria (as opposed to loading) will need to be expanded as presented below.

4.3.1.2 Biological Capacity and Phasing

Preliminary biological capacity improvements for DCWWTP have been identified, which should be confirmed and refined when additional capacity testing has been completed. Based on **Table 4-7**, DCWWTP is currently running at or beyond its nominal design capacity with respect to BOD loading. It is recommended that SPWA implement Phase 1 expansion in approximately FY 24/25 which is the earliest practical time frame it could be implemented considering planning, design, and construction duration. The plant will reach 94% of the expanded Phase 1 AA and MM BOD loading capacity in FY 39/40. Therefore, it is recommended to implement Phase 2 biological improvements at this time concurrent with necessary wet weather hydraulic improvements. Phase 2 improvements in FY 39/40 are recommended to bring the plant BOD loading capacity to its buildout AA and MM projections of 56,000 and 79,000 lbs/day, respectively. Figure 4-6 shows AA and MM biological treatment capacities plotted against the loadings projected over the planning period and the anticipated phasing. As discussed in Chapter 5, the timing and size of the recommended projects should be reviewed after additional capacity analysis and facility planning is completed.

4.3.2 Pleasant Grove Wastewater Treatment Plant

This section discusses the hydraulic and biological capacity of the PGWWTP and the recommended phasing of future improvements. This phasing includes improvements that are currently under design and are expected to be in service by FY 22-23. Based on the estimated plant capacity and projected flow and loading requirements, two phases of improvements beyond the FY 22-23 project are recommended.

4.3.2.1 Hydraulic Capacity and Phasing

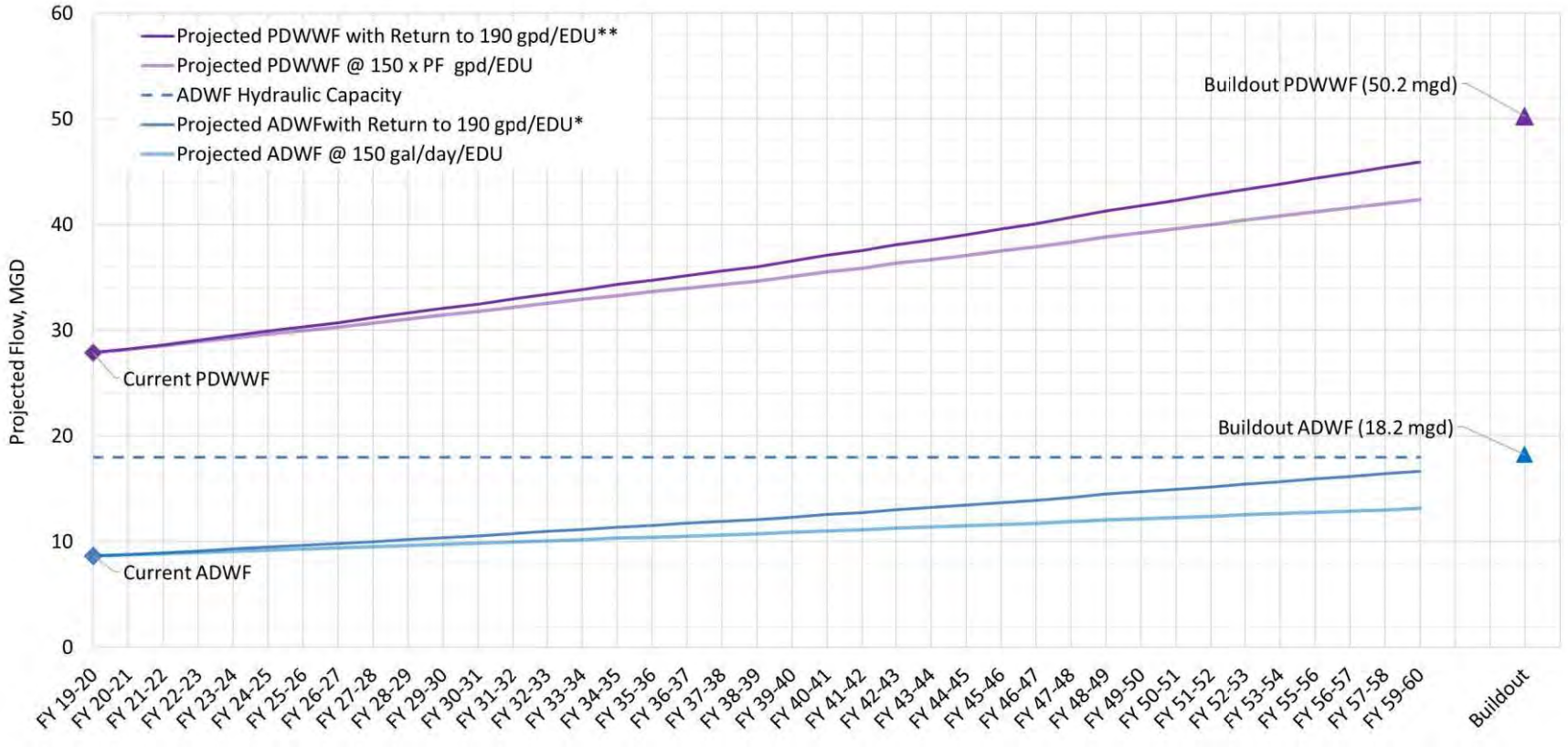
Although the PGWWTP hydraulic capacity is 12 mgd, based on the references above, the current ADWF treatment capacity at the PGWWTP is rated at 9.5 mgd. The improvements currently under construction will expand PGWWTP's treatment capacity to its hydraulic capacity rating of 12 mgd. Based on the ADWF projections calculated from a linear interpolation between current flow of 138 gpd/EDU and historic 190 gpd/EDU flow contribution, this capacity expansion should be sufficient to handle flows through approximately FY 28-29, though timing would depend on the rate of any rebound in sewer flows. It is currently recommended that Phase 1 hydraulic expansion be implemented in FY 28-29 to expand the plant ADWF to 15 mgd. Phase 1 expansion would carry the PGWWTP through FY 40-41. At that point, Phase 2 improvements may be needed to increase the plant ADWF capacity to FY 59/60 flow projections of 18 mgd. **Figure 4-7** shows ADWF plotted against the flow projected over the planning period and the anticipated phasing for improvements. **Figure 4-7** presents graphs for ADWF and PDWWF rebound based on linear interpolation from 138 gpd/EDU calculated based on current flows in FY 19/20 to a potential flow factor of 190 gpd/EDU in FY 59/60. As discussed in Chapter 5, the timing and size of the recommended projects should be reviewed after additional facility planning is completed and the gpd/EDU assumption is confirmed.

4.3.2.2 Biological Capacity and Phasing

Based on Table 4-7, PGWWTP is currently running at or beyond its nominal design capacity with respect to BOD loading. The improvements currently under design will expand the plant's AA and MM BOD loading capacities to 34,500 lbs/day and 40,100 lbs/day. These improvements should be sufficient to meet projected BOD loadings through FY 40/41 when Phase 2 hydraulic capacity improvements are recommended. During Phase 2 expansion, it is recommended that plant capacity be increased to accommodate projected FY59/60 AA and MM BOD loadings of 38,000 lbs/day and 48,000 lbs/day, respectively. The timing and magnitude of additional expansion to accommodate buildout will be determined in subsequent planning documents.

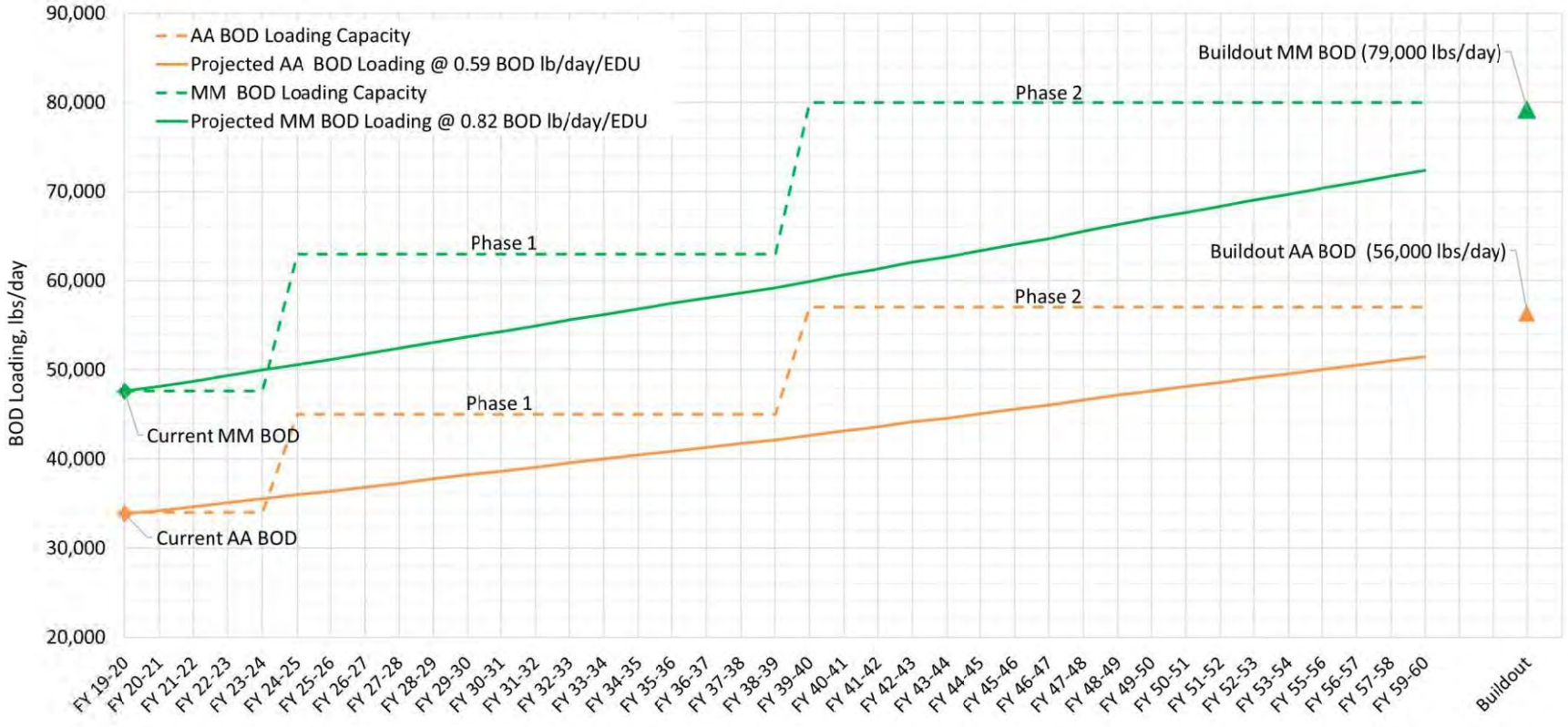
Figure 4-8 shows AA and MM biological treatment capacities plotted against the loadings projected over the planning period and the anticipated phasing.

Figure 4-5: DCWWTP Hydraulic Capacity Comparison



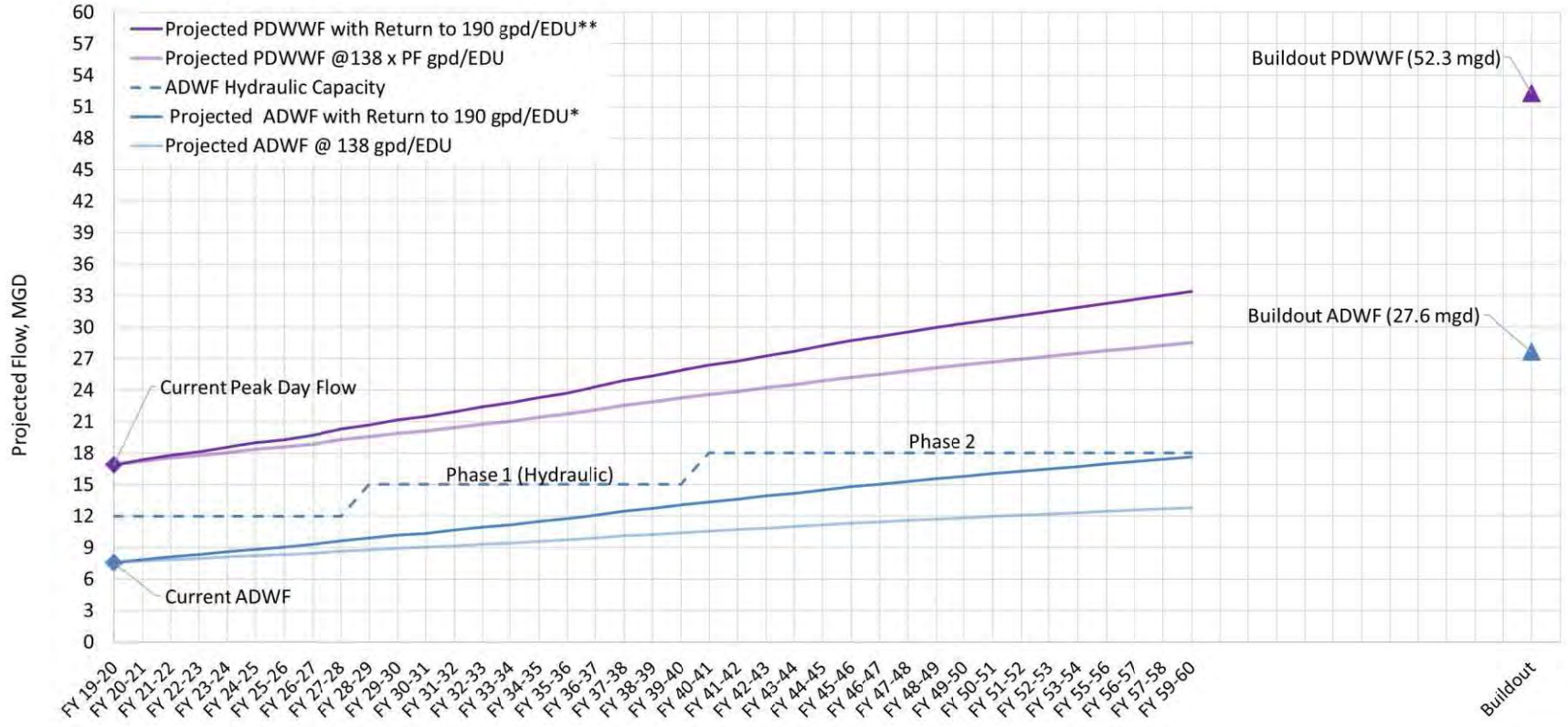
* ADWF gpd/EDU flow factor is assumed to reach 190 gpd/EDU by FY 59/60, with a linear increase from 150 gpd/EDU at FY 19/20
**PDWWF is assumed to be ADWF flow plus 330 gpd/EDU of wet weather flow, based on current wet weather flowrates
*** Buildout date is currently unknown and is shown for graphical purposes only.

Figure 4-6: DCWWTP Biological Capacity Comparison



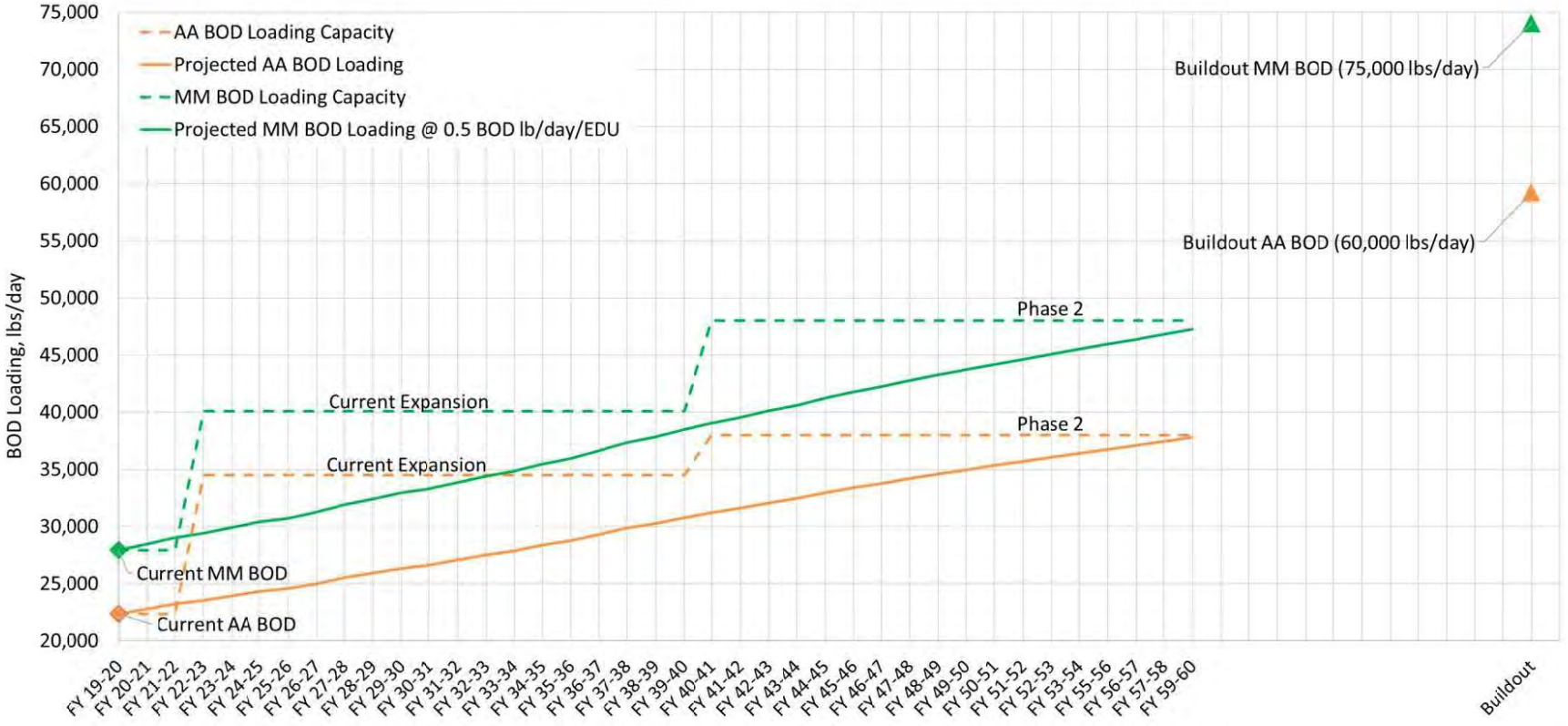
* Buildout date is currently unknown and is shown for graphical purposes only.

Figure 4-7: PGWWTP Hydraulic Capacity Comparison



* ADWF GPD/EDU factor is assumed to reach 190 gpd/EDU by FY 59/60, with a linear increase from 138 gpd/EDU at FY 19/20
**PDWWF is assumed to be ADWF flow plus 170 gpd/EDU of wet weather flow, based on current wet weather flowrates
*** Buildout date is currently unknown and is shown for graphical purposes only.

Figure 4-8: PGWWTP Biological Capacity Comparison



* Buildout date is currently unknown and is shown for graphical purposes only.

4.4 Conceptual Capital Cost Estimates

Opinions of probable cost were developed for the recommendations of this TM and are presented in this section. This section also provides the procedures and methodology used for developing planning-level capital cost estimates for PGWWTP and DCWWTP phased improvement projects. Note that improvements that would be required after the FY 59/60 planning horizon have not been estimated.

4.4.1 Cost Estimation Approach

This section describes the assumptions and procedures used to develop cost estimates for phased improvements at PGWWTP and DCWWTP. The cost estimates provided in this TM include improvements that would increase the plant capacity to treat the projected flows and loadings but does not include repair and replacement (R&R) projects or discretionary projects such as resource recovery improvements.

The estimated construction costs are based on a Class 5 estimate as defined by the Association for the Advancement of Cost Engineering (AACE) International cost estimate classification system. **Table 4-8** provides a summary of the estimate classes and expected accuracy range. For Class 5 estimates, the expected accuracy range is -20% to -50% on the low end and +30% to +100% on the high end.

Table 4-8: Cost Estimate Classification Matrix (AACE International)

Estimate Class	Level of Project Definition	Purpose of Estimate	Methodology	Expected Accuracy Range
Class 5	0% to 2%	Concept screening	Capacity factored, parametric models, judgement, or analogy	Low: -20% to -50% High: +30% to +100%
Class 4	1% to 15%	Study or feasibility	Equipment factored or parametric models	Low: -15% to -30% High: +20% to +50%
Class 3	10% to 40%	Budget authorization or control	Semi-detailed unit costs with assembly level line items	Low: -10% to -20% High: +10% to +30%
Class 2	30% to 75%	Control or bid/tender	Detailed unit cost with forced detailed take-off	Low: -5% to -15% High: +5% to +20%
Class 1	65% to 100%	Check estimate or bid/tender	Detailed unit cost with detailed take-cost	Low: -3% to -10% High: +3% to +15%

Source: AACE International Recommended Practice No. 18R-97

Construction costs were developed based on the improvements and unit costs provided in the prior planning documents listed below:

- Technical Memorandum 4b: Wastewater Treatment Plants Expansion Requirements, RMC Water and Environment, March 28, 2006 (TM 4b).
- DCWWTP Initial Assessment Final Report, CH2M Hill, Inc, August 2008 (CH2M Hill, 2008)
- Final Pleasant Grove Wastewater Treatment Expansion Basis of Design Report, Kennedy/Jenks Consultants, March 2016

Raw construction costs are estimated for each component based on estimated unit costs multiplied by quantity.

Construction cost factors were used to develop and escalate unit costs to reflect the current bid environment, industry trends, and project location as well as plant capacity increase. These factors are incorporated into the unit costs and are represented in two categories:

- **Engineering News Record's (ENR) Construction Cost Index (CCI) –** All project construction cost estimates are indexed to an ENR CCI of 12115 which represents the average of the April 2020 indices for San Francisco (SF) ENR and the "20-Cities" ENR, to account for the greater Sacramento area construction market.
- **Capacity Adjustment Factor –** The number of units listed in TM 4b were associated with different capacity increases than required in proposed improvement phasing in this Systems Evaluation. Proportional adjustment factors were used to account for these capacity increase differences. Further discussion is provided below.

Based on the level of detail available for Class 5 estimates, allowances are used for some of the direct construction elements including the site electrical, and instrumentation and control (I&C), site yard piping and mechanical, and site civil work estimates (i.e. direct construction costs). Allowance estimates are made using the percentages listed in **Table 4-9.**

Table 4-9: Direct Construction Cost Allowances

Construction Cost Allowance Types	Percent
Site Yard Piping & Mechanical	5%
Site Electrical / I&C/SCADA	15%
Site Civil	5%

From the direct construction cost subtotal, indirect construction cost factors are applied to develop an estimated total construction cost. These construction cost markups include the following:

- **Overhead and Profit –** Contractor overhead and profit (O&P) represents the general contractor's operating costs and estimated profit levels. The O&P factor typically varies between 10% and 25% of the direct construction cost subtotal, depending on the size of the project and market conditions, with larger projects typically having lower O&P factors. For this Systems Evaluation, an O&P factor of 20% was used.
- **Estimating Contingency –** The estimating contingency is defined as unknown costs due to lack of detailed engineering during the planning phase that are estimated as a percentage of defined project costs (i.e. direct and indirect construction cost subtotal). For this Systems Evaluation, a contingency factor of 30% was used since the projects are at conceptual planning level.

The estimated total construction cost is then multiplied by an allowance of 25% for Engineering, Permitting, Construction Management, and Engineering Services during Construction.

4.4.2 Dry Creek WWTP Cost Estimates

The proposed Phase 1 and 2 improvements and process unit cost estimates in TM 4b were used as the basis of the cost estimate. Several revisions and updates were made to the TM 4b improvements to develop the new phased improvements list and cost estimates in this Systems Evaluation, including the following:

- **Influent Pump Station –**Several improvements have been completed at East Roseville influent pump station including installation of new pumps and emergency generator, demolition of the old East Roseville Pump Station and Pump Station Annex, and replacement of PLCs. Therefore, TM 4b Phase 1 improvements were updated to remove the influent pump installation.
- **Influent Coarse Screen –** The existing two coarse screens have a PHWWF capacity of 30 mgd each. The existing screens provide sufficient capacity through buildout with project PHWWF of 54.7 mgd with two screens in service and using the existing bypass channel in the event that one of the screens is out of service. Therefore, it is recommended that a third screen be installed in Phase 2.
- **Aeration Tanks –** TM 4b proposed installation of ten new aeration tanks including replacement of four of the exiting smaller size aeration tanks constructed in 1974 with larger tanks (same size as tanks constructed in 1991) in Phase 1. The CH2M Hill, 2008 report evaluation indicated existing aeration basin volumes were sufficient for Phase 1 improvements which assumed a projected AA BOD loading capacity about the same as the current plant loading and recommended providing additional aeration and mixed liquor recycle (MLR) pumping capacity. New MLR pumps were installed at the plant per the Nitrate Removal Project Basis of Design Report (B&C, 2017). A rough evaluation of the aeration tank sizes indicated that replacement of two aeration tanks and construction of two new ones (total of four) in Phase 1 and replacement of the remaining 2 aeration tanks and construction of 4 new ones in Phase 2 (total of six) would provide sufficient capacity at each of the 2 phases.
- **Capacity Increase Adjustment Factor –** Biological treatment capacity increases for AA BOD loading were used to calculate the DCWWTP adjustment factor. The Adjustment Factor was obtained from the ratio between incremental capacity increases proposed in TM 4b and in this TM.

  BOD loading increase in Phase 1 based on TM 4b was 10,500 lb/day and the required capacity increase per this TM is 11,100. An adjustment factor of 1.06 was calculated and applied to the number of units.

  BOD loading increase in Phase 2 based on TM 4b was 13,700 lb/day and the required capacity increase per this TM is 12,000 lb/day. An adjustment factor of 0.88 was calculated and applied to the number of units.

The preliminary phased improvements are provided in **Table 4-10.** The listed improvements increase the plant ADWF capacity based on AA BOD loading from 11.5 mgd to 14.5 mgd in Phase 1 and to 18 mgd in Phase 2. It should be emphasized that the cost estimates provided below are conceptual level costs for capacity expansion projects and do not include rehabilitation and replacement projects or discretionary projects. More detailed cost estimating should be developed when the plant capacity is determined, and phased improvement projects are updated accordingly.

Table 4-10: DCWWTP Phase 1 and Phase 2 Capital Cost Estimates (ENR CCI: 12115)[a]

Process	Process Unit Cost	Phase 1 FY 24/25	Phase 2 FY 39/40
		# of units	# of units
Coarse Screens	$280,000	-	1
Influent Pump Station	$2,000,000	-	1
Fine Screens	$170,000	2	1
Odor Control	$210,000	1	1
Grit Basins	$290,000	-	1
Primary Sedimentation	$3,400,000	-	2
Aeration Basins	$2,600,000	4	6
Blower	$290,000	1	-
Mixed Liquor Return Pumps	$150,000	4	6
Rehab Existing Anoxic Zones	$290,000	1	
Secondary Clarifiers	$4,100,000	4	2
RAS/WAS Pump Station	$860,000	1	1
Tertiary Filtration	$730,000		2
Waste Backwash Pumps	$100,000		1
UV Disinfection	$2,100,000		1
Anaerobic Digesters	$3,300,000	1	1
Centrifuges	$650,000	2	
Cooling Units	$290,000		2
Total Unit Process Costs		**$34,000,000**	**$43,000,000**
Site Yard Piping & Mechanical (5%)		$1,700,000	$2,200,000
Site Electrical / I&C/SCADA (15%)		$5,100,000	$6,500,000
Site Civil (5%)		$1,700,000	$2,200,000
Subtotal of Direct Construction Costs		**$43,000,000**	**$54,000,000**
Mobilization/Demobilization (5%)		$2,200,000	$2,700,000
Contractor Overhead & Profit (20%)		$8,600,000	$10,800,000
Subtotal of Direct and Indirect Costs		**$54,000,000**	**$68,000,000**
Contingency (30%)		$16,000,000	$20,000,000
Total Estimated Construction Cost		**$70,000,000**	**$88,000,000**
Engineering, Permitting, CM, ESDC (25%)		$18,000,000	$22,000,000
Total Estimated Capital Cost		**$88,000,000**	**$110,000,000**

Notes:

a. Costs based on Average of SF and "20 Cities" ENR for April 2020: 12115

4.4.3 PGWWTP Cost Estimates

The proposed Phase 1 and 2 improvements and cost estimates in TM 4b were used as the basis of the cost estimate. Several revisions and updates were implemented on these proposed improvements for Phase 1 and Phase 2 to develop the new phased improvements cost estimates, including the following:

- **Current Expansion –** As described in 1.2, several improvements are currently being constructed at PGWWTP per the Pleasant Grove Wastewater Treatment Plant Expansion BODR (Kennedy/Jenks, 2016). Therefore, TM 4b Phase 1 improvements were updated by removing the current expansion projects from Phase 1 scope, including the following:
    - Installation of four new primary sedimentation basins
    - Installation of 1 odor control system
    - Installation of 2 new solid thickening systems and building
    - Installation of 2 new digesters and building
    - Installation of 1 new co-generation system
- **Hydraulic Capacity Increase –** Proposed Phase 1 improvements in this TM are to increase PGWWTP peak day hydraulic capacity. Therefore, proposed projects in Phase 1 improvements in TM 4b were revised to include only improvements to unit process that increase the plant hydraulic capacity and the remaining projects associated with BOD removal capacity including installation of one digester and one oxidation ditch, and construction of associated buildings were moved to Phase 2 improvements .
- **Capacity Increase Adjustment Factor –** For Phase 1, since only hydraulic capacity increase is required, an Adjustment Factor was obtained from the ratio between the hydraulic capacity increase in TM 4b and in this TM. Both TMs propose 3 mgd hydraulic capacity increases in Phase 1, therefore the adjustment factor of 1 was multiplied by the number of units proposed in TM 4b.

  For Phase 2, biological treatment capacity increases for AA BOD loading were used. The Phase 2 BOD loading capacity increase in TM 4b was 21,000 lb/day and the proposed capacity increase in this TM is 3,500 lb/day. An adjustment Factor of 0.17 was calculated from TM 4b and proposed capacity increase ratio and was multiplied by the number of units proposed in TM 4b.

  An adjustment factor was not applied to building modifications.

The updated opinion of probable cost for the phased improvements is provided in **Table 4-11**. The recommended phased improvements increase the plant ADWF capacity from 12 mgd to 15 mgd in Phase 1 and from 15 mgd to 18 mgd in Phase 2. It should be emphasized that the cost estimates provided below are conceptual level costs for capacity expansion projects and do not include rehabilitation and replacement projects or discretionary projects. More detailed cost estimating should be developed when the plant capacity is determined, and phased improvement projects are updated accordingly.

Table 4-11: PGWWTP Phase 1 and Phase 2 Capital Cost Estimates (ENR CCI: 12115)[a]

Process	Process Unit Cost	Phase 1 FY 28/29	Phase 2 FY 39/40
		# of units	# of units
Influent Pumps	$120,000	1	-
Grit Basins	$290,000	1	-
Fine Screens	$170,000	2	-
Primary Sedimentation	$3,400,000	-	1
Oxidation Ditches	$7,100,000	-	1
Secondary Clarifiers	$4,100,000	1	1
RAS/WAS Pump Station	$860,000	1	-
Tertiary Filtration	$730,000	2	1
UV Disinfection	$2,100,000	3	-
Thickeners Building Modification	$490,000	-	1
Digesters Building Modification	$490,000	-	1
Total		**$13,000,000**	**$16,000,000**
Site Yard Piping & Mechanical (5%)		$650,000	$800,000
Site Electrical / I&C/SCADA (15%)		$2,000,000	$2,400,000
Site Civil (5%)		$650,000	$800,000
Subtotal of Direct Costs		**$16,000,000**	**$20,000,000**
Mobilization/Demobilization (5%)		$800,000	$1,000,000
Contractor Overhead & Profit (20%)		$3,200,000	$4,000,000
Subtotal of Direct and Indirect Costs		**$20,000,000**	**$25,000,000**
Contingency (30%)		$6,000,000	$7,500,000
Total Estimated Construction Cost		**$26,000,000**	**$33,000,000**
Engineering, Permitting, CM, ESDC (25%)		$6,500,000	$8,300,000
Total Estimated Capital Cost		**$33,000,000**	**$41,000,000**

Notes:

a. Costs based on Average of SF and "20 Cities" ENR for April 2020: 12115

5. CAPACITY IMPROVEMENT PROJECT SUMMARY & NEXT STEPS

Table 5-1 summarizes the capacity improvements identified in this systems evaluation. Note that the improvement needs projected for Dry Creek and Pleasant Grove WWTPs are significantly larger and more expensive than the improvement projects projected for the collection system, but are based on limited available data. The estimated costs for Dry Creek WWTP are especially high because of the size and age of that plant; when it was designed, the organic loading in Roseville was far lower than when Pleasant Grove was designed; since the mid 2000's organic loading to both plants has continued to increase. Further studies, as described in Chapter 4, should be undertaken for both treatment plants, and the capacity improvement projects should be refined based on those findings.

Note that only capacity improvement projects have been identified; condition and reliability related improvement needs have not been evaluated in this study.

Table 5-1: Proposed Capacity Improvement Projects

		Existing	FY 24/25	FY 39/40	After FY 59/60
Collection System	**Description**	Improvement Project 1 (Increased Capacity of PS 26 and sewers on Sierra College Blvd)	None	None	Improvement Project 2 (Redirect flows from PS 26 and Sierra College Blvd down Eureka Road) Improvement Project 3 (Increased Firm capacity of PS 25 with diversion structure improvements)
	Estimated Capital Cost	$1,610,000	-	-	$2,590,000
Dry Creek WWTP	**Description**	Plant Capacity Analysis, Condition Assessment, and Facilities Plan	Phase 1 (Increase AA BOD Capacity to ~45,000 lbs/day)	Phase 2 (Increase AA BOD Capacity to ~57,000 lbs/day)	Phase 3: Increase BOD Capacity and Hydraulic Capacity (not estimated)
	Estimated Capital Cost	$550,000	$88,000,000	$110,000,000	Not Estimated
Pleasant Grove WWTP	**Description**	Plant Capacity Analysis, Condition Assessment, and Facilities Plan	Increase ADWF hydraulic capacity to 15 mgd	Increase ADWF hydraulic capacity to 18 mgd. Increase AA BOD Loading Capacity to 38,000 lbs/day	Phase 3: Increase BOD Capacity and Hydraulic Capacity (not estimated)
	Estimated Capital Cost	$450,000	$33,000,000	$41,000,000	Not Estimated

5.1 Next Steps

Based on the findings of this preliminary evaluation, and discussions with the project team, the following next steps are recommended for consideration by SPWA:

- Conduct an analysis of process performance and current biological treatment and hydraulic capacity at both DCWWTP and PGWWTP. This will likely require process-specific sampling and development of calibrated process models. Biological treatment capacity should consider both BOD and nitrate plus nitrite permit limitations set forth within each plant's respective NPDES permit. Results of this study should determine a capacity rating for each unit process at the plant and the limiting processes. This analysis will provide a sound basis for the planning of new facilities and is integral to determining required future capital improvement projects during phased expansions. It is recommended that DCWWTP capacity analysis take precedence over PGWWTP considering DCWWTP is currently operating well beyond its nominal BOD removal capacity.

- Review previous condition assessment work conducted on the plant assets and perform additional assessment needed to identify and prioritize repair and replacement (R&R) projects. This effort would include a risk assessment to identify likelihood of failure and criticality of each asset. Results of this study would identify R&R projects which may need to be implemented prior to or concurrent with phased expansions.

- Based on the capacity analysis and R&R project planning, develop Facilities Plans for DCWWTP and PGWWTP. Considering both plants are running at or above their nominal design capacities, it is recommended that facilities planning begin immediately after the capacity analysis. This effort would evaluate various process optimization steps and upgrade alternatives and provide recommended improvements for phased expansions. The Facilities Plans would include review of the 190 gpd/EDU flow factor that is critical to the timing and magnitude of any hydraulic capacity improvements.

- Develop Class 4 cost estimates for recommended improvements at the WWTPs under each expansion phase and for R&R projects to assist SPWA partners in assessing capital needs in the future.

- For the collection system, periodically update the model network based on any configuration changes, perform re-calibration to confirm the actual and anticipated flows, and to update future loads into the model network. An update frequency of every 5-10 years is recommended, depending on changes in development planning and/or system configuration.

We also recommend that SPWA evaluate funding and financing options to support implementation of the recommended capital improvements, especially Phase 1 at Dry Creek, given its size and relative immediacy. With the implementation of the steps above, and the ongoing high level performance of the SPWA Regional System, SPWA will be able to continue its excellent level of service to the Regional Partners.

APPENDIX A – PLACER COUNTY GENERAL PLAN DENSITIES

General Plan Designation	Maximum Density (EDU/Acre)	Diurnal Profile
Commercial	21	Commercial
Greenbelt & Open Space	0	Residential
High Density Residential 4 - 10 DU/Ac.	10	Residential
Industrial	4.356	Commercial
Low Density Residential 0.4 - 0.9 Ac. M	2.5	Residential
Low Density Residential 1 - 2 DU./Ac.	2	Residential
Low Density Residential Density Transf	2.5	Residential
Low Density Residential Development	2	Residential
Medium Density Residential 2 - 4 DU/A	4	Residential
Open Space	0	Residential
Professional Office	4.356	Commercial
Public Facility	0	Commercial
Rural Estate 4.6 - 20 Ac. Min.	0.21739	Residential
Rural Low Density Residential 0.9 - 2.3	1.11	Residential
Rural Low Density Residential 0.9 - 2.3	1.11	Residential
Rural Low Density Residential 0.9 - 2.3	1.11	Residential
Rural Low Density Residential 0.9 - 2.3	1.39	Residential
Rural Low Density Residential 1 - 2.3 A	1	Residential
Rural Residential 2.3 - 4.6 Ac. Min.	0.43478	Residential
Public Facility/Agricultural 80 Ac. Min.	0	Residential
Low Density Residential 0.4 - 2.3 Ac. M	1.11	Residential
Riparian Drainage	0	Residential
Agriculture/Timberland - 20 Ac. Min.	0	Residential
Rural Residential 1 - 10 Ac. Min.	1	Residential

APPENDIX B – URBAN GROWTH AREA LAND USE SUMMARIES

PLACER COUNTY URBAN GROWTH AREAS

Placer Ranch UGA[a]

Land Use	Flow Factor	Land Use Quantities		
		Western Shed	Central Shed	Eastern Shed
Single Family Residential (Units)	190 gpd/DU	2,244	1,254	320
Multi Family Residential (Units)	130 gpd/DU	397	782	831
Mixed Use (acres)	2,300 gpd/ac	-	33.8	15.1
Commercial (acres)	850 gpd/ac	73.2	309.9	38.0
Parks > 10 acres (acres)	10 gpd/ac	37.8	17.1	-
Public/Quasi-Public (acres)	660 gpd/ac	0.8	0.8	3.9
Schools (acres)	170 gpd/ac	32.0	-	-
Total ADWF (mgd)		**0.55**	**1.95**	**0.24**

Footnotes:

a. See Exhibit D of the Placer Ranch Sewer Master Plan (Mackay & Somps, 2017). Approximately 1,300 acres in the Sunset Industrial Area outside of Placer Ranch are anticipated to drain through Placer Ranch sewers, when fully developed.

Sunset Industrial Area[a]

Land Use	Flow Factor	Land Use Quantities			
		PR-POC 1	PR-POC 2	Existing POC 1	Existing POC 2
Single Family Residential (Units)	190 gpd/DU	2,361	297	0	0
Multi Family Residential (Units)	130 gpd/DU	0	0	0	0
Mixed Use (acres)	2,300 gpd/ac	257	161	0	0
Commercial/ Industrial (acres)	850 gpd/ac	1,287	85	531	277
Parks > 10 acres (acres)	10 gpd/ac	0	0	0	0
Public/Quasi-Public (acres)	660 gpd/ac	0	0	0	0
Schools (acres)	170 gpd/ac	0	0	0	0
Point Sources[d]	gpd	480,000	0	0	0
Total ADWF (mgd)		**2.61**	**0.50**	**0.45**	**0.24**

Footnotes:

a. Sunset Area Water, Wastewater, and Recycled Water Technical Report (Psomas, October 2017)
b. Includes low density residential and medium density residential units.
c. Approximately 1,300 acres in the Sunset Industrial Area outside of Placer Ranch are anticipated to drain through Placer Ranch sewers, when fully developed.
d. Includes Thunder Valley Casino and Area L270 (County area east of the Sunset Area proposed to drain through the Sunset Area)

Placer Vineyards[a]

Land Use	Flow Factor	Land Use Quantities		
		Shed A1	Shed A2	Shed B
Single Family Residential (Units)	190 gpd/DU	1,723	7,051	1,951
Multi Family Residential (Units)	130 gpd/DU	0	2,822	270
Mixed Use (acres)	2,300 gpd/ac	0	50.5	0
Commercial/ Industrial (acres)	850 gpd/ac	0	234.2	25.0
Parks > 10 acres (acres)	10 gpd/ac	0	30	12.0
Public/Quasi-Public (acres)	660 gpd/ac	0	113	27.2
Schools (acres)	170 gpd/ac	12	155	0
Total ADWF (mgd)		**0.33**	**2.12**	**0.45**

Footnotes:

a. Placer Vineyards Specific Plan; Sanitary Sewer Master Plan Addendum 1 (Mackay & Somps, May 20, 2019)

Table 0-1: Regional University[a]

Land Use	Flow Factor	Land Use Quantities
Single Family Residential (Units)	190 gpd/DU	1,845
Multi Family Residential (Units)	130 gpd/DU	349
Mixed Use (acres)	2,300 gpd/ac	10.98
Commercial/ Industrial (acres)	850 gpd/ac	25
Parks > 10 acres (acres)	10 gpd/ac	27.3
Public/Quasi-Public (acres)	660 gpd/ac	5.0
Schools (acres)	170 gpd/ac	32.6
University	mgd	0.725
Total ADWF (mgd)		**1.18**

Footnotes:

a. Regional University Specific Plan, Sanitary Sewer Demand (Mackay & Somps, September 1, 2017)

Riolo Vineyards[a]

Land Use	Flow Factor	Land Use Quantities		
		Lift Station Shed	Gravity Shed 1	Gravity Shed 2
Single Family Residential (Units)	190 gpd/DU	673[b]	172	153
Multi Family Residential (Units)	130 gpd/DU	0	0	0
Mixed Use (acres)	2,300 gpd/ac	0	0	0
Commercial/ Industrial (acres)	850 gpd/ac	26.5[b]	0	10
Parks > 10 acres (acres)	10 gpd/ac	0	0	0
Public/Quasi-Public (acres)	660 gpd/ac	0	0	11
Schools (acres)	170 gpd/ac	0	16	0
Total ADWF (mgd)		**0.15**	**0.035**	**0.045**

Footnotes:

a. Riolo Vineyards Sanitary Sewer Master Plan Update (Unico Engineering, April 2016)
b. Includes flows from offsite draining through these sheds

Placer UGA[a]

Land Use	Flow Factor	Land Use Quantities	
		North Shed	South Shed
Single Family Residential (Units)	190 gpd/DU	147	41.7
Multi Family Residential (Units)	130 gpd/DU	0	0
Mixed Use (acres)	2,300 gpd/ac	0	0
Commercial/ Industrial (acres)	850 gpd/ac	0	0
Parks > 10 acres (acres)	10 gpd/ac	0	0
Public/Quasi-Public (acres)	660 gpd/ac	0	0
Schools (acres)	170 gpd/ac	0	0
Total ADWF (mgd)		**0.028**	**0.008**

Footnotes:

a. *Hawk Homestead Sewer Analysis – Supplementary Information Requested by Placer County Environmental Engineering,* Derrick Whitehead, Municipal Consulting Group, January 29, 2016

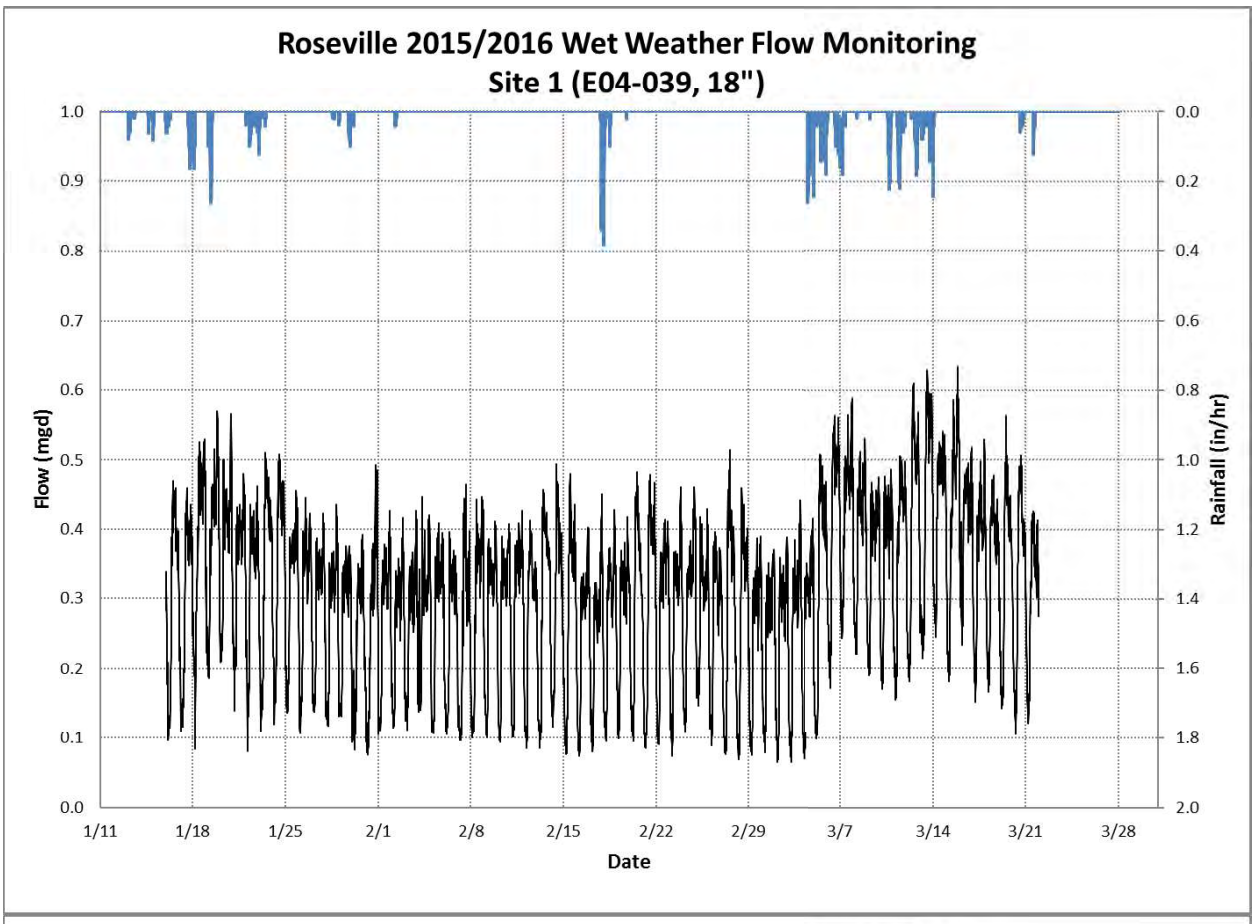
CITY OF ROSEVILLE URBAN GROWTH AREAS

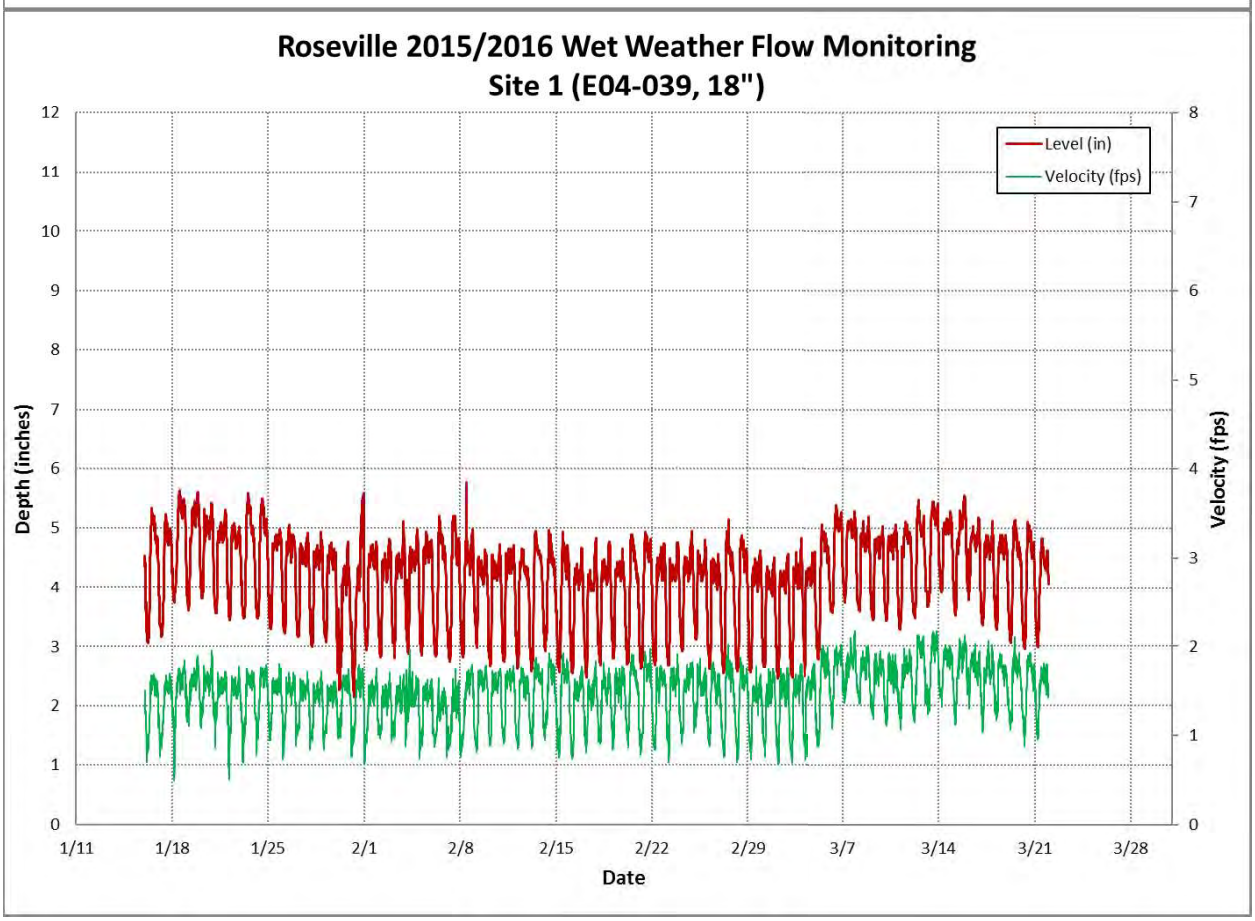
Land Use	Flow Factor	Creekview[a]	Amoruso[b]	Sierra Vista[c]	
				North Shed[d]	South Shed
Single Family Residential (Units)	190 gpd/DU	2,019	4,239[e]	1,658	2,118
Multi Family Residential (Units)	130 gpd/DU	758	873	1,058	1,478
Mixed Use (acres)	2,300 gpd/ac	0.0	27.3	13.3	34.9
Commercial (acres)	850 gpd/ac	15.5	23.9	37.7	181.0
Parks > 10 acres (acres)	10 gpd/ac	0.0	0.0	10.0	39.9
Public/Quasi-Public (acres)	660 gpd/ac	2.6	7.6	10.1	6.6
Schools (acres)	170 gpd/ac	7.0	9.6	10.0	45.6
Total ADWF (mgd)		**0.43**	**0.61**	**0.59**	**1.24**

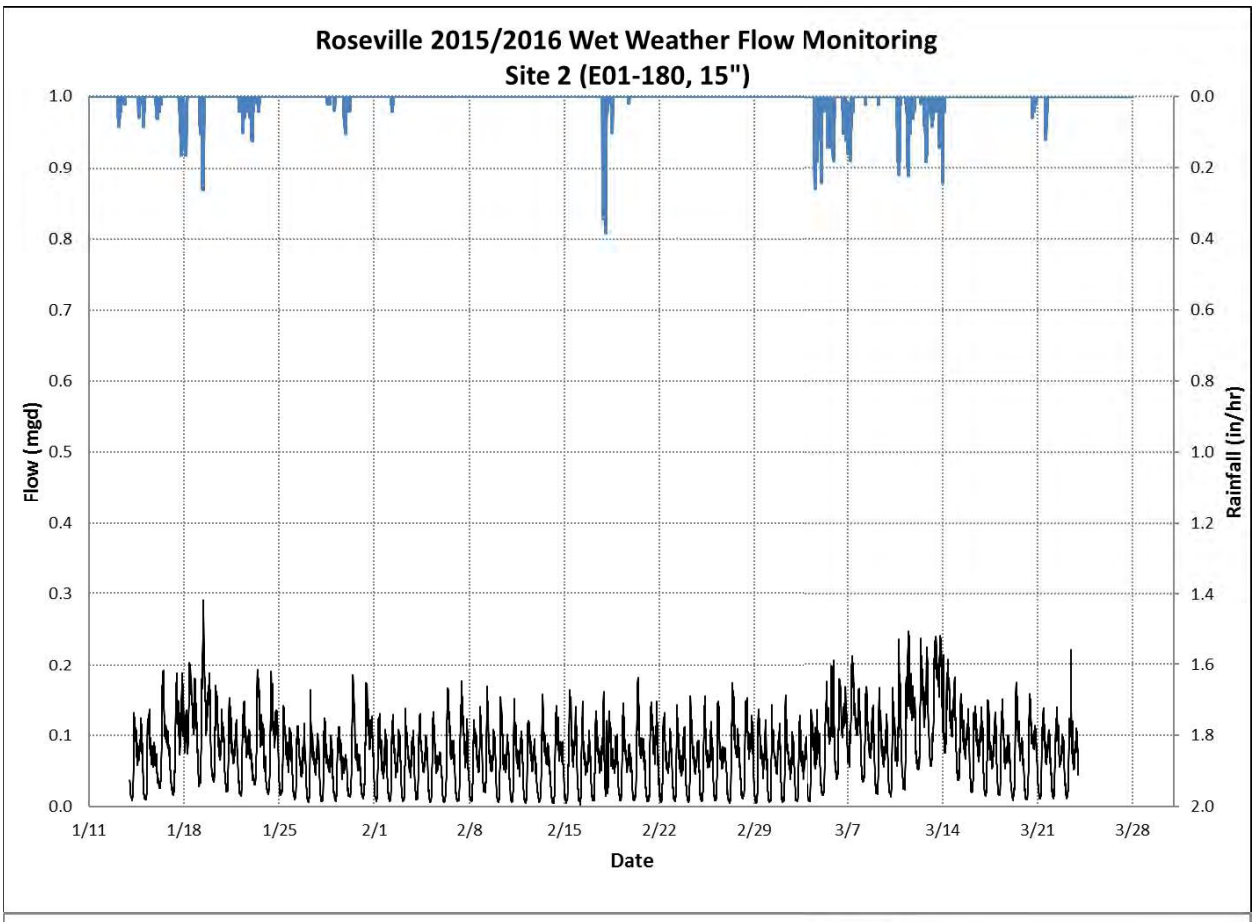
Footnotes:

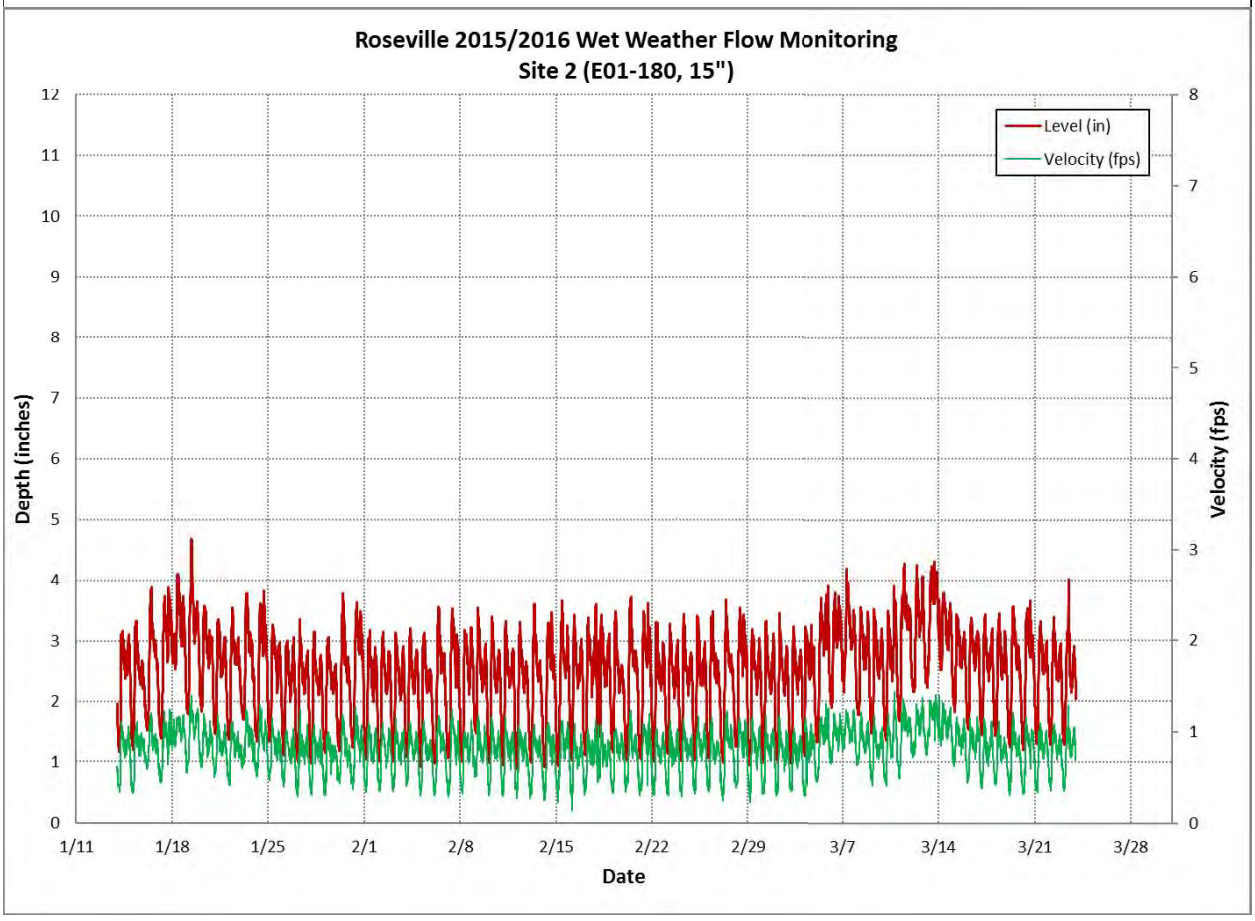
a. *Creekview Specific Plan Sanitary Sewer Master Plan*, Mackay & Somps Civil Engineers, November 2010
b. *Amoruso Ranch Specific Plan Area Wastewater Master Plan*, Kimley Horn, September 2015
c. *Sierra Vista Specific Plan Sanitary Sewer Master Plan*, Mackay & Somps Civil Engineers, July 2009
d. Includes the Westbrook portion of Sierra Vista
e. Includes 274 units north of Amoruso that would contribute flow through sewers in Amoruso (Toad Hill)

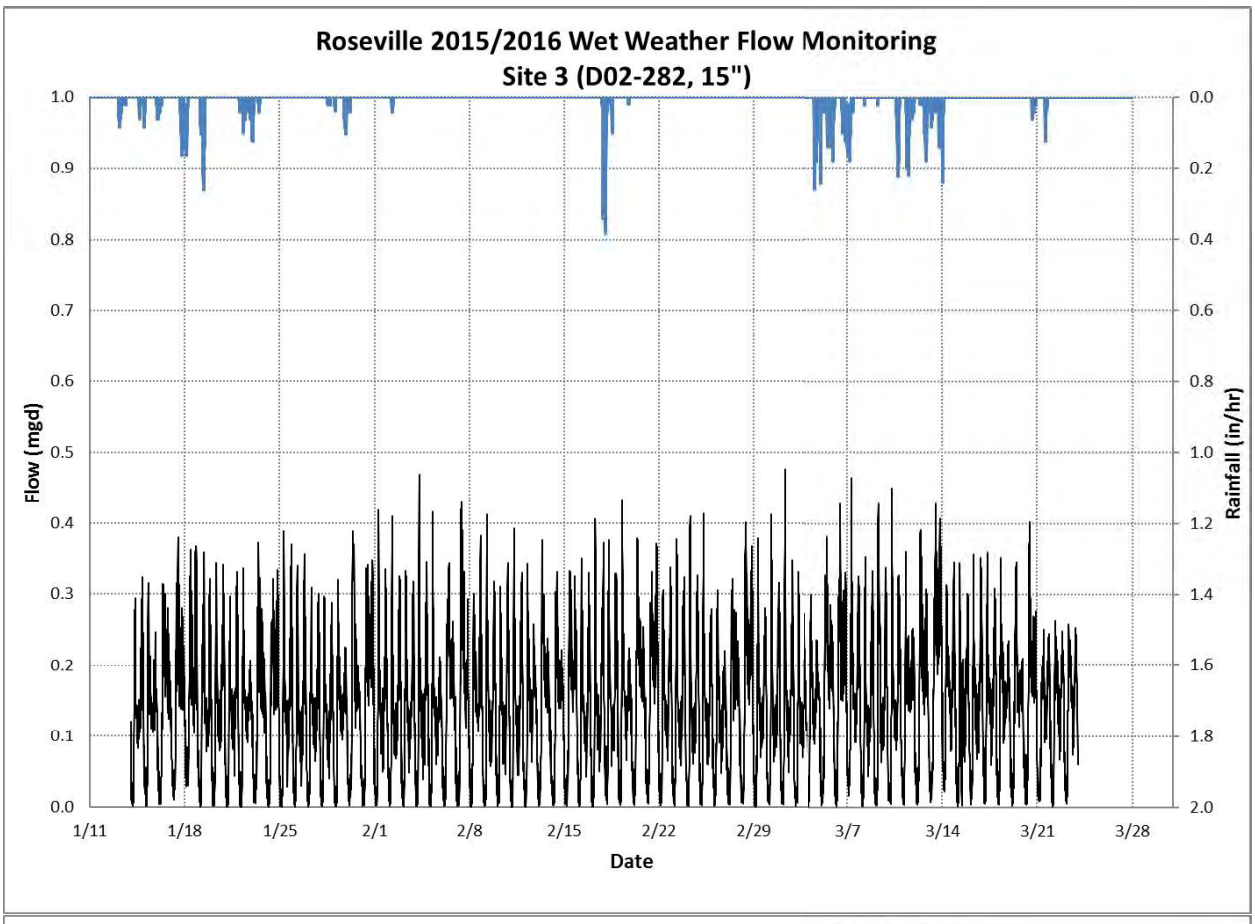
APPENDIX C – FLOW MONITORING DATA

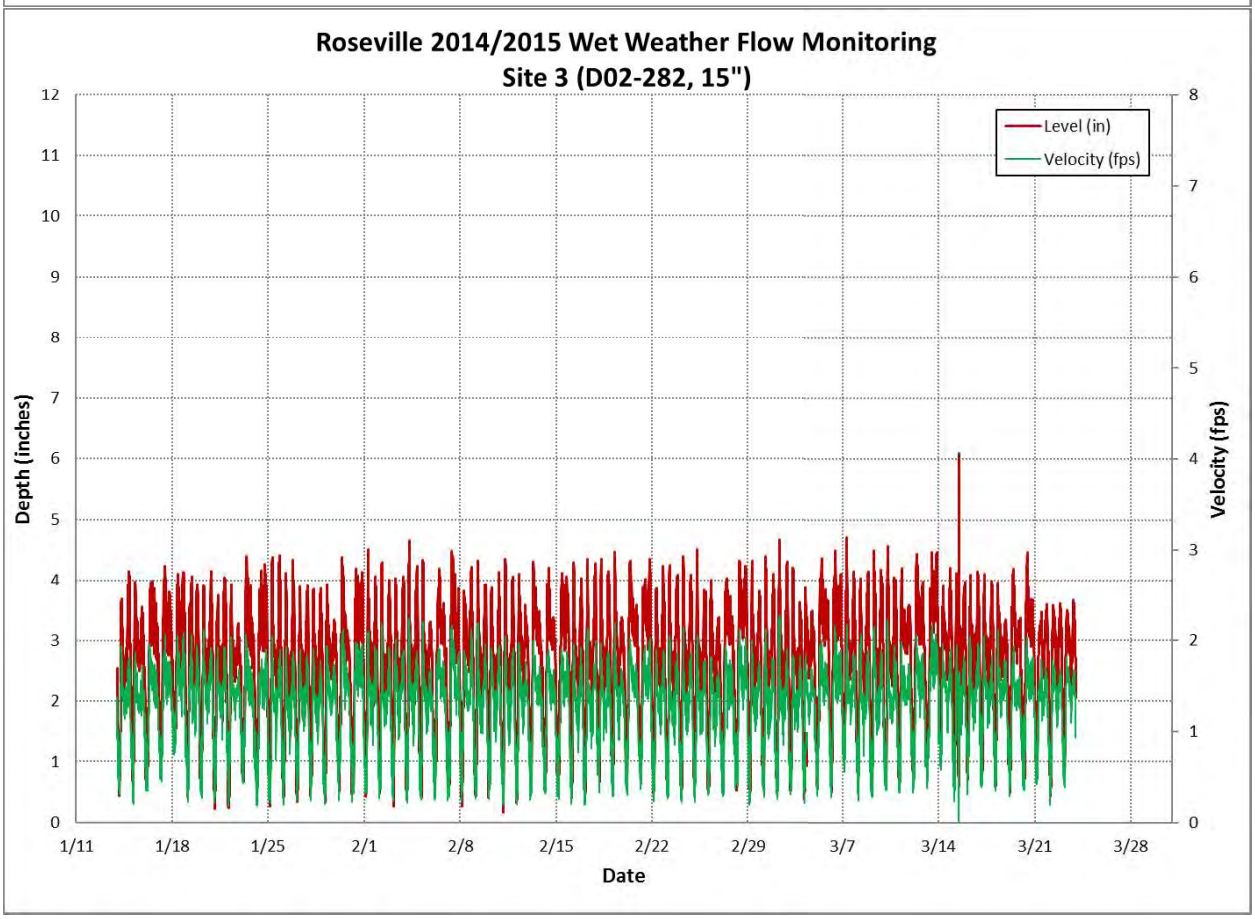

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 1 (E04-039, 18")
Flow (mgd)
Rainfall (in/hr)
Date
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

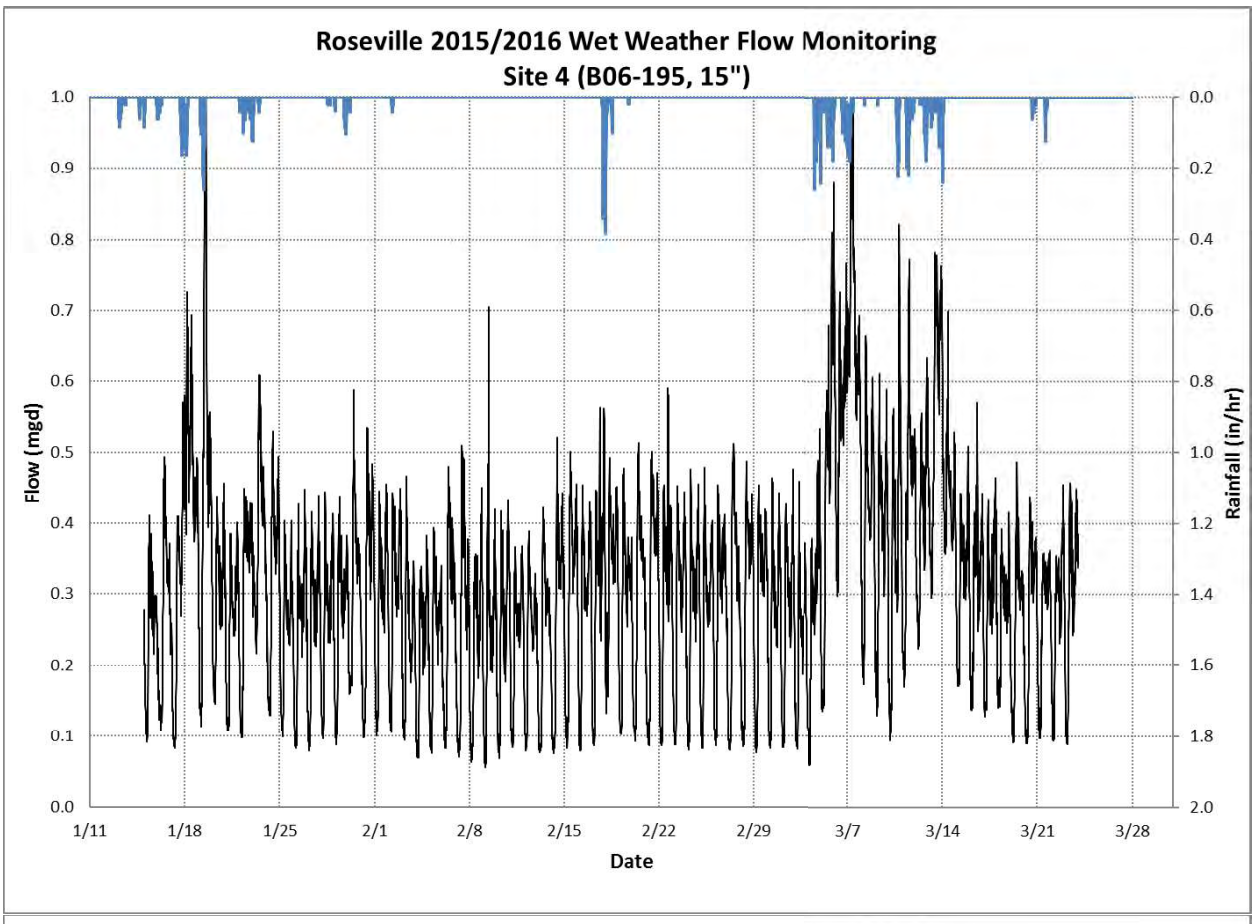

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 1 (E04-039, 18")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
12
11
10
9
8
7
6
5
4
3
2
1
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

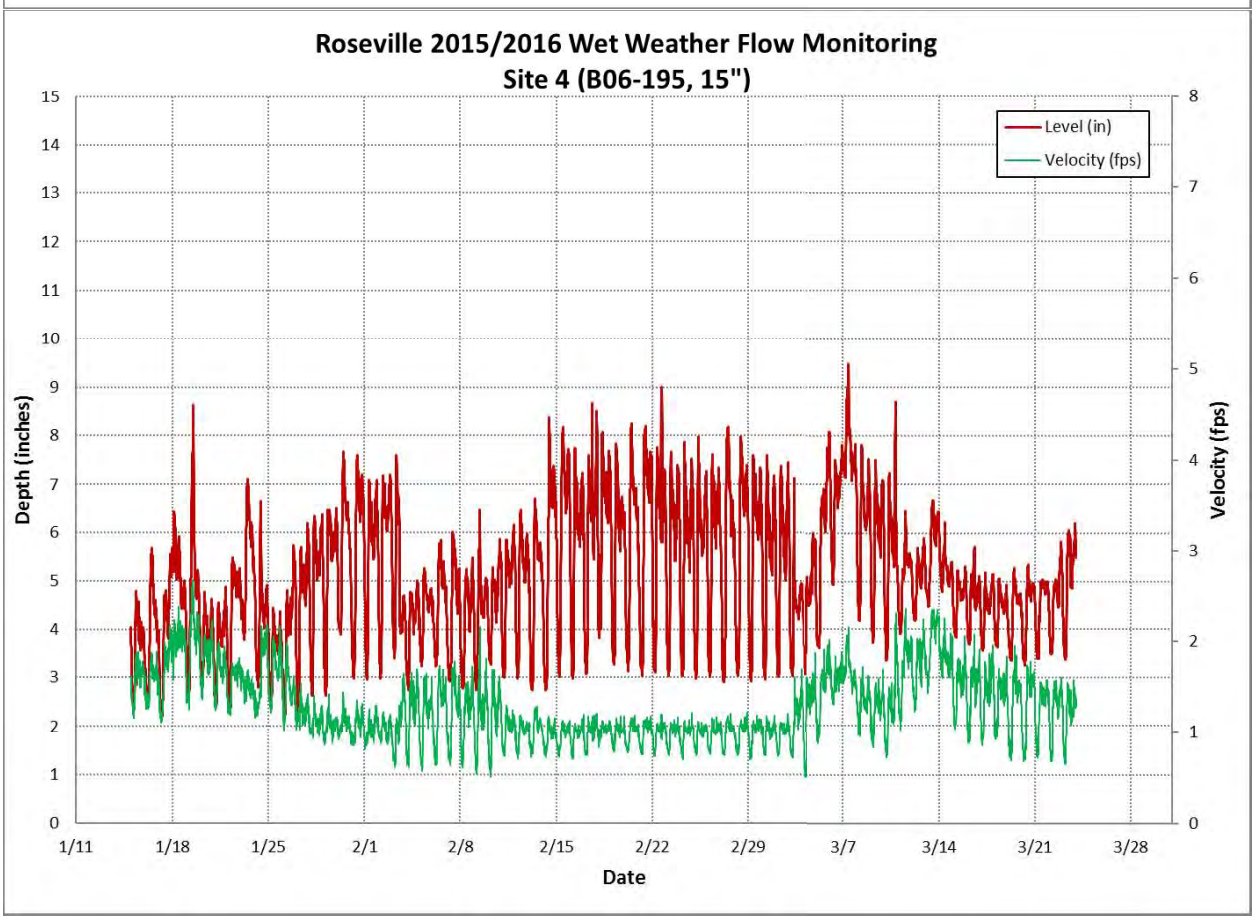

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 2 (E01-180, 15")
Flow (mgd)
Rainfall (in/hr)
Date
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

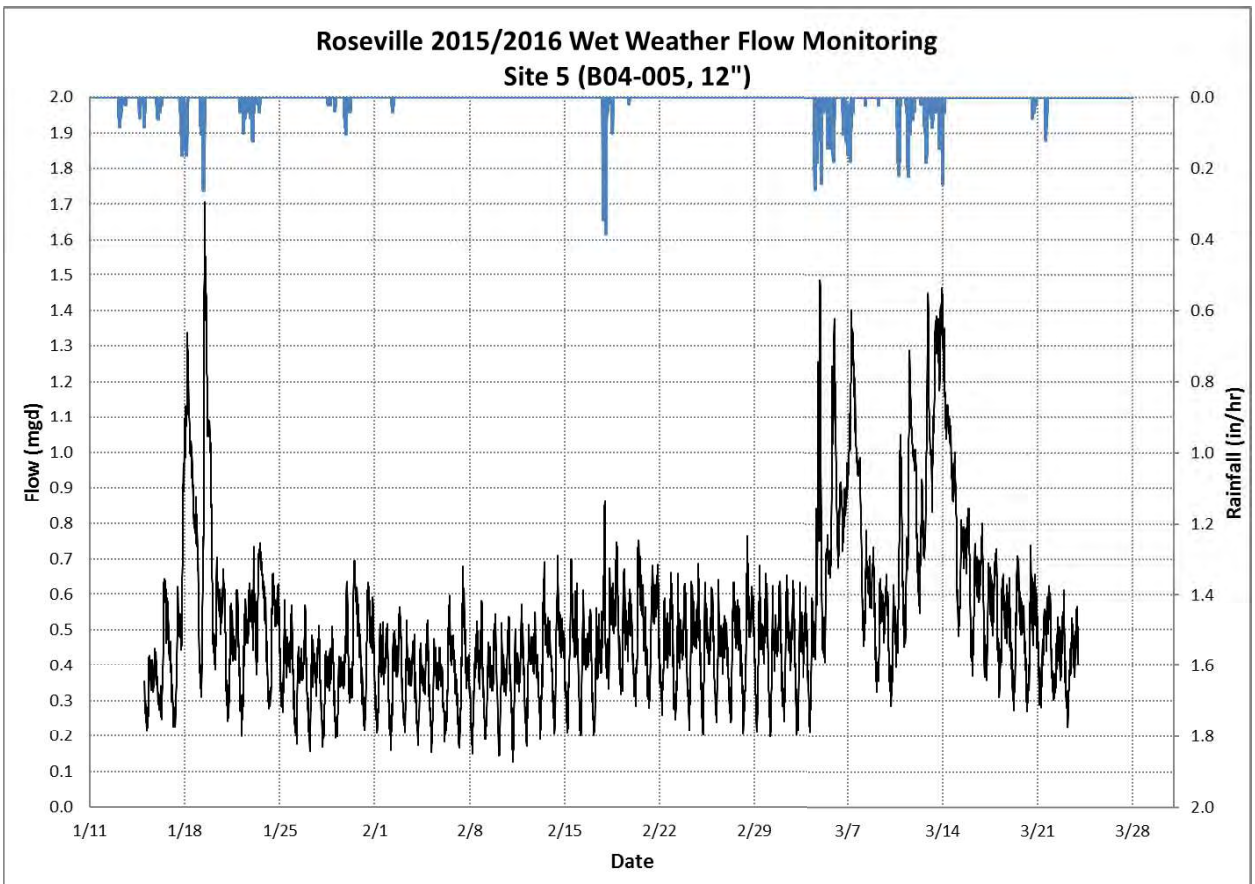

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 2 (E01-180, 15")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
12
11
10
9
8
7
6
5
4
3
2
1
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

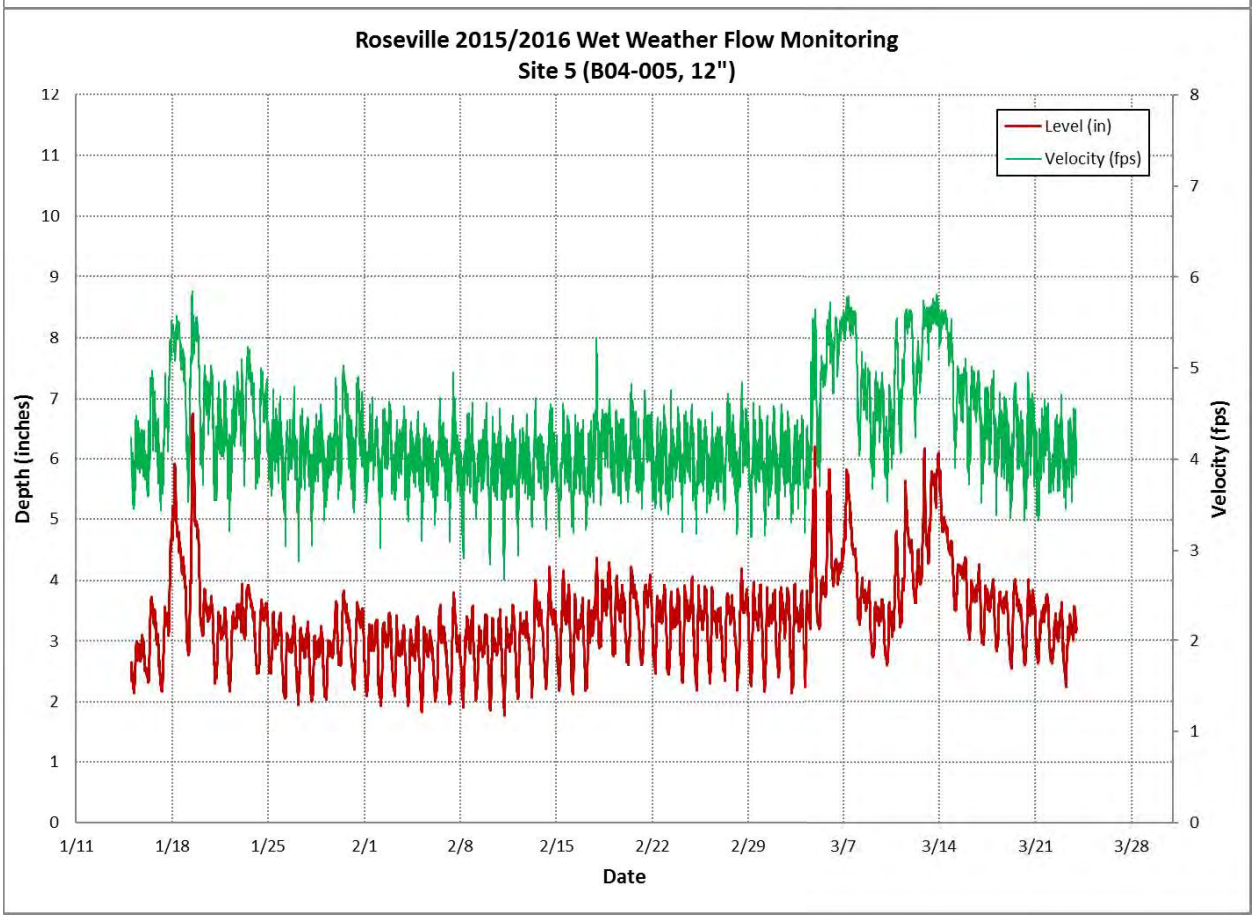

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 3 (D02-282, 15")
Flow (mgd)
Rainfall (in/hr)
Date
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

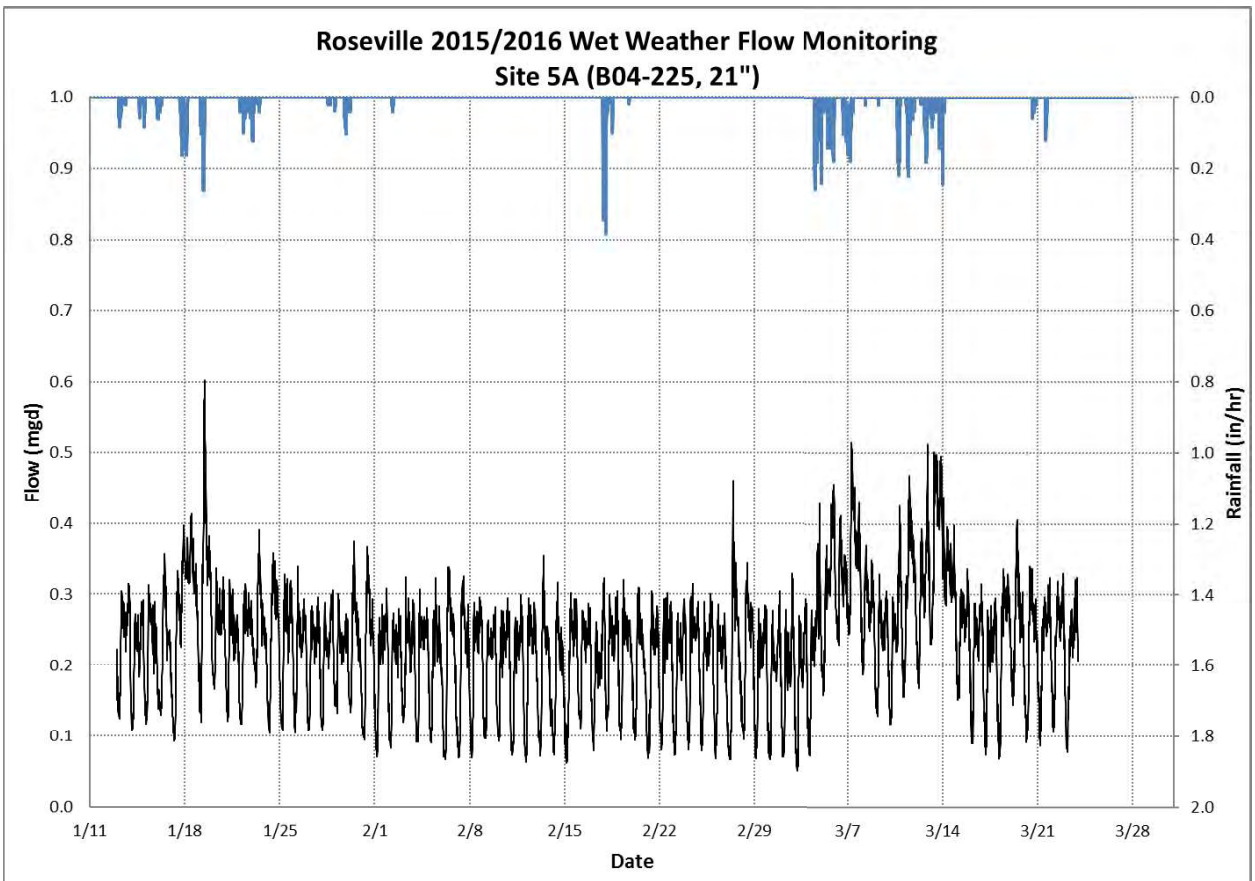

Roseville 2014/2015 Wet Weather Flow Monitoring
Site 3 (D02-282, 15")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
12
11
10
9
8
7
6
5
4
3
2
1
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

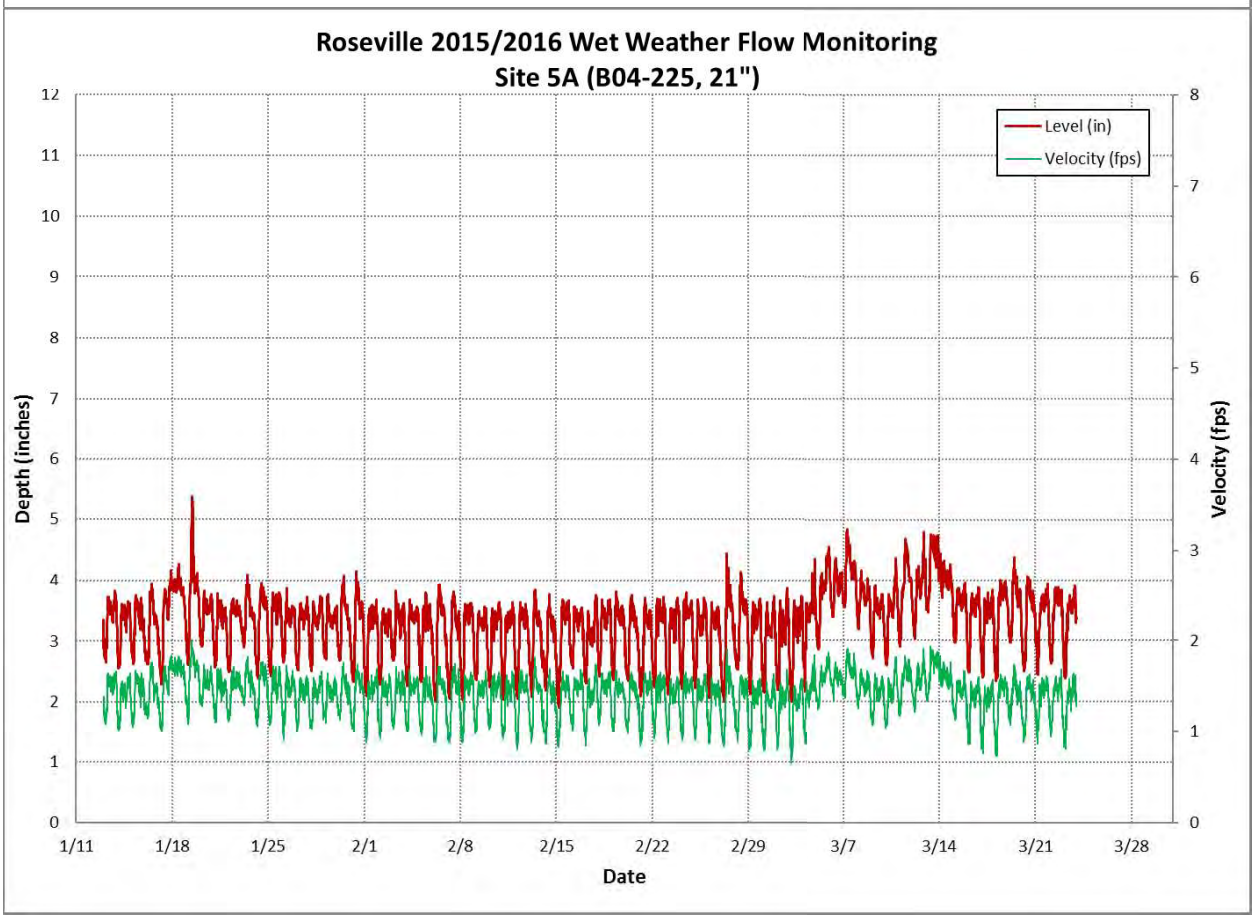

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 4 (B06-195, 15")
Flow (mgd)
Rainfall (in/hr)
Date
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

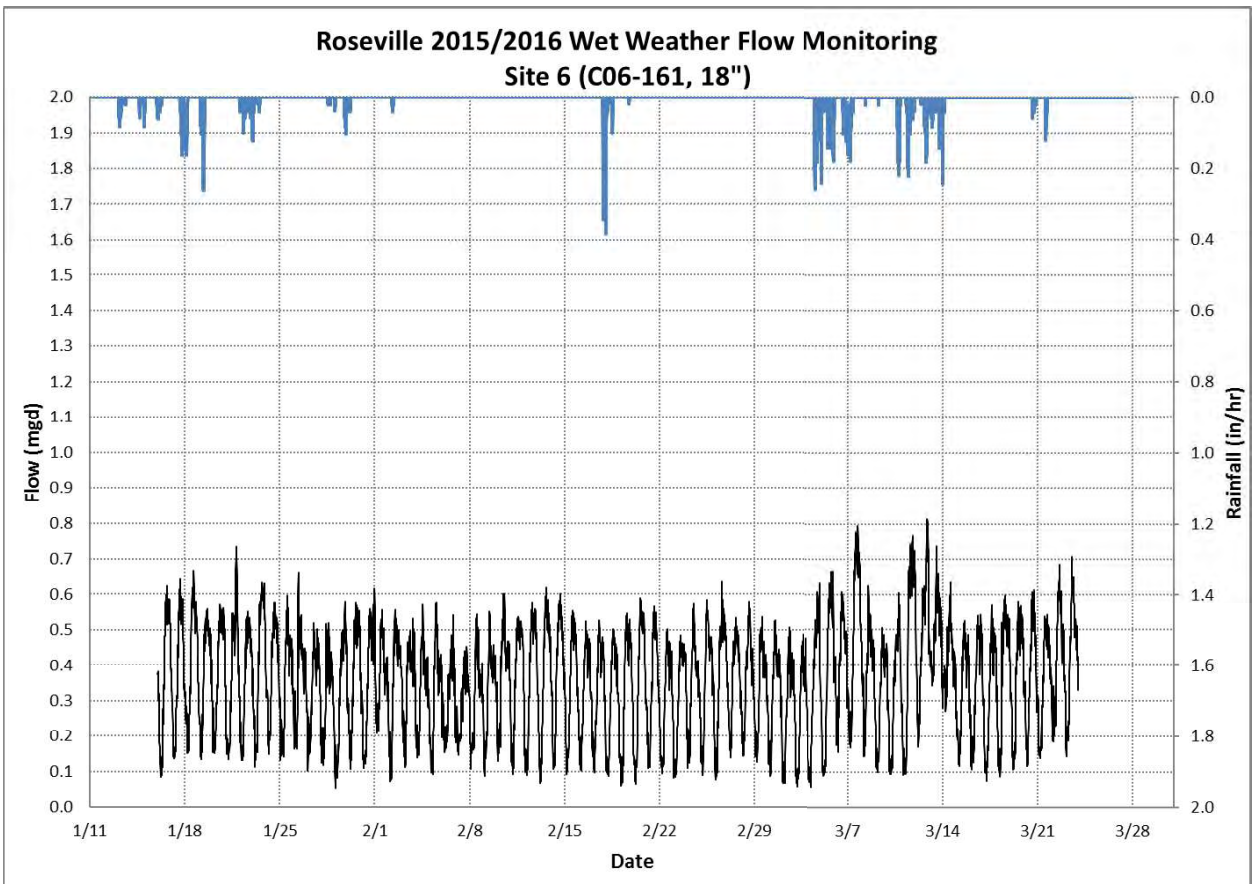

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 4 (B06-195, 15")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

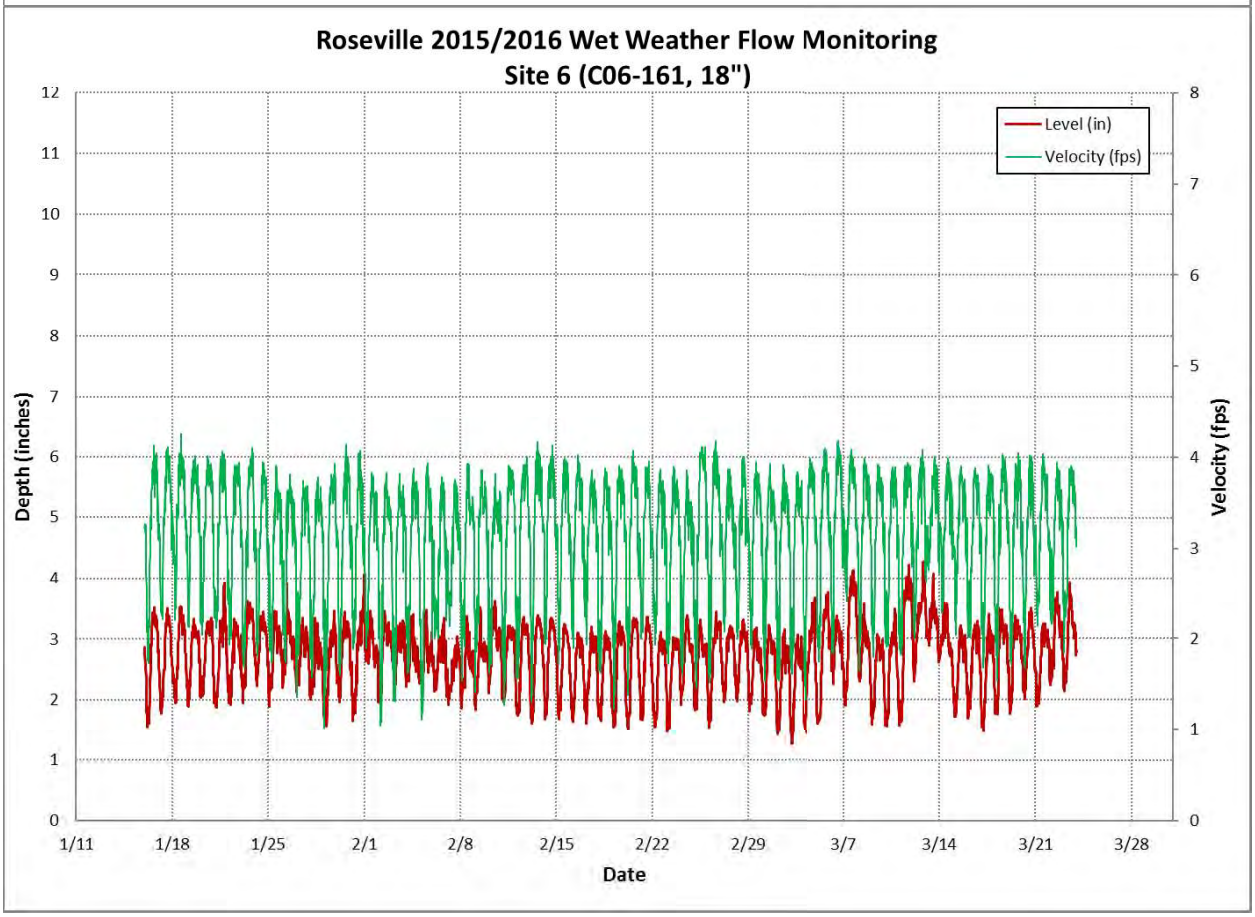

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 5 (B04-005, 12")
Flow (mgd)
Rainfall (in/hr)
Date
2.0
1.9
1.8
1.7
1.6
1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

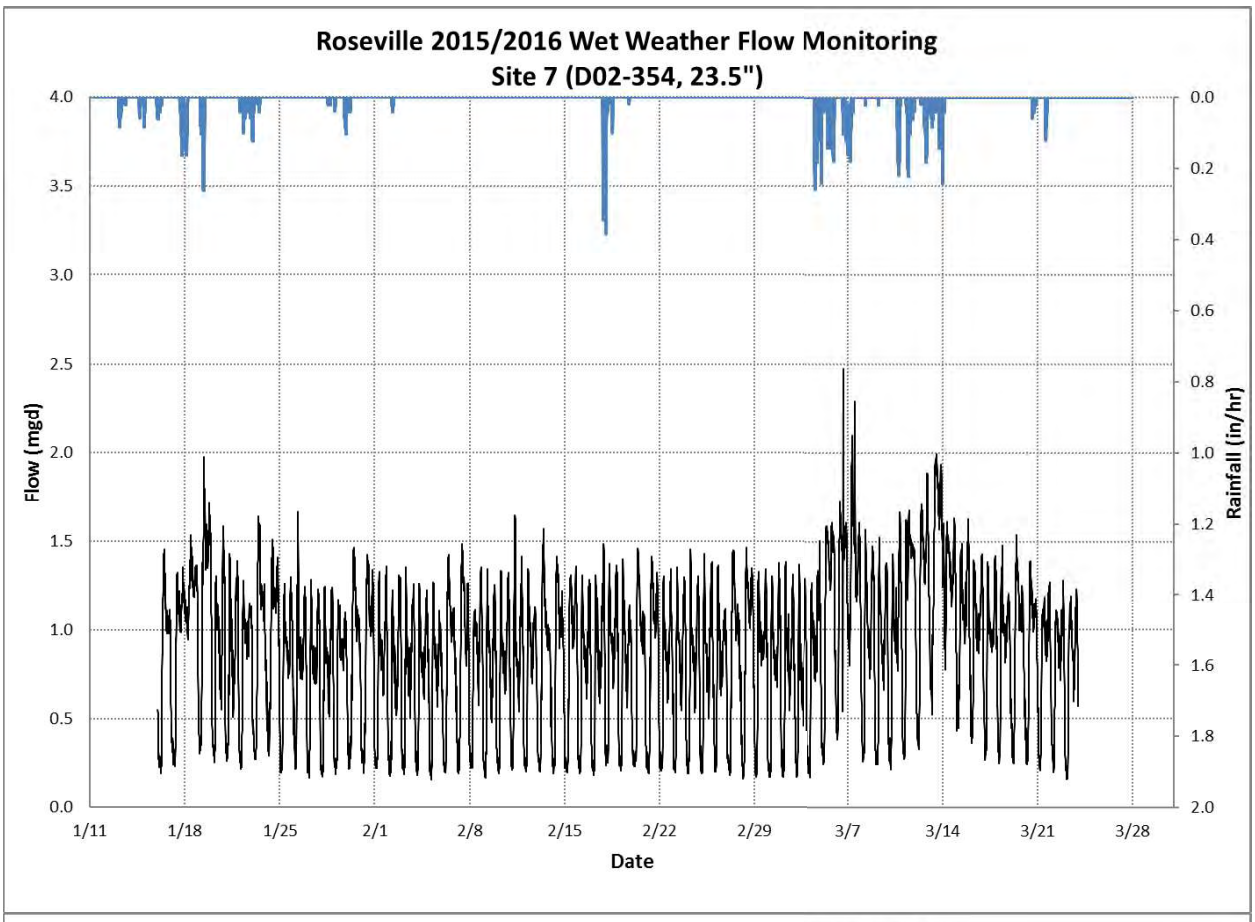

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 5 (B04-005, 12")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
12
11
10
9
8
7
6
5
4
3
2
1
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

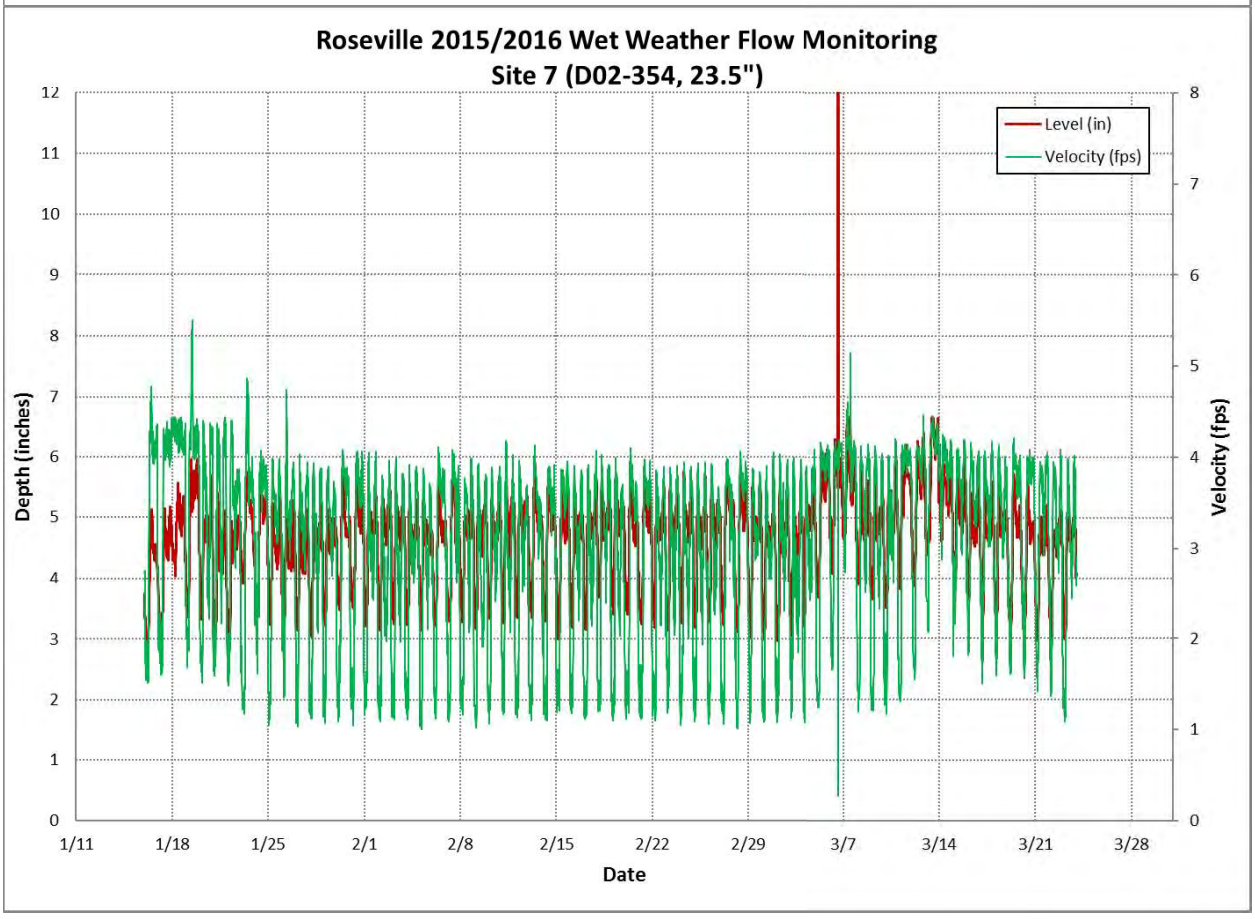

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 5A (B04-225, 21")
Flow (mgd)
Rainfall (in/hr)
Date
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

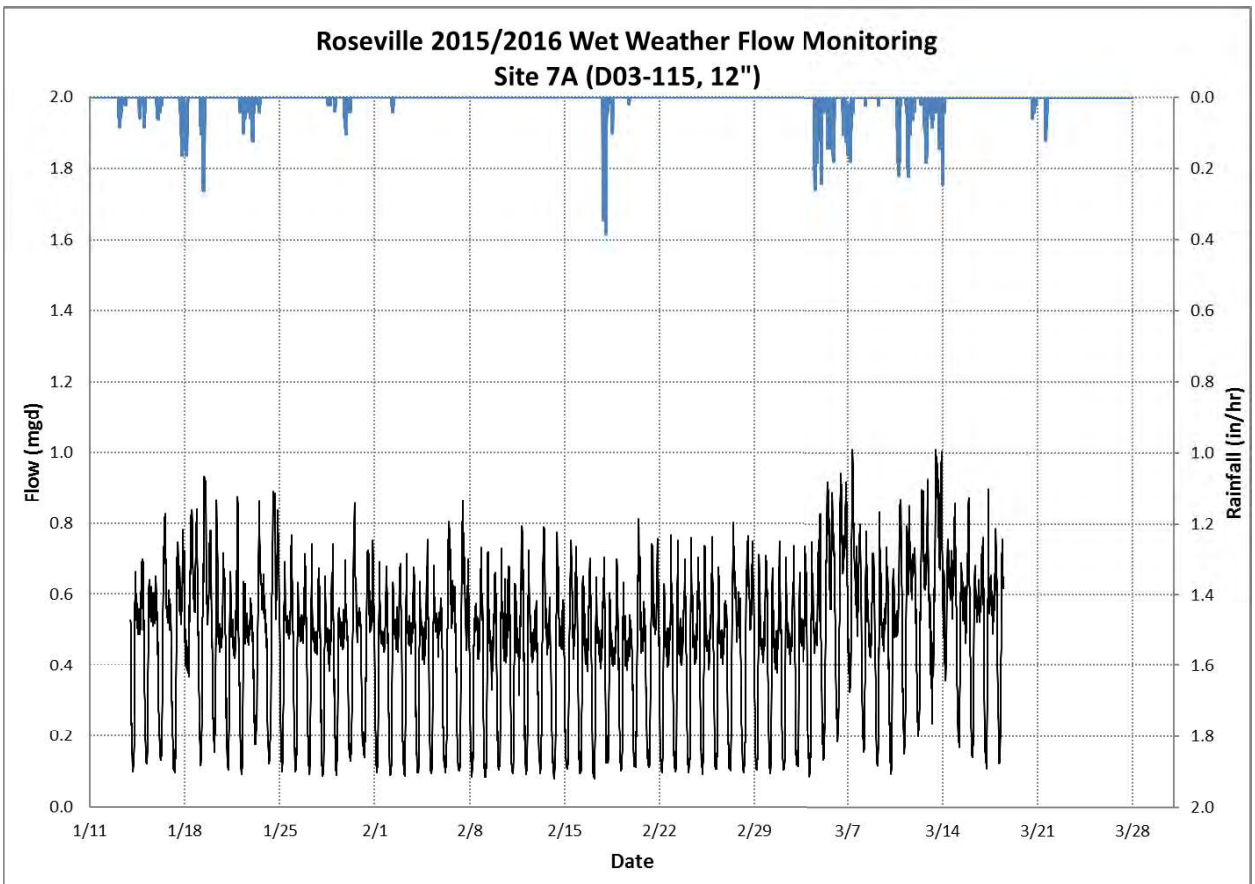

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 5A (B04-225, 21")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
12
11
10
9
8
7
6
5
4
3
2
1
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

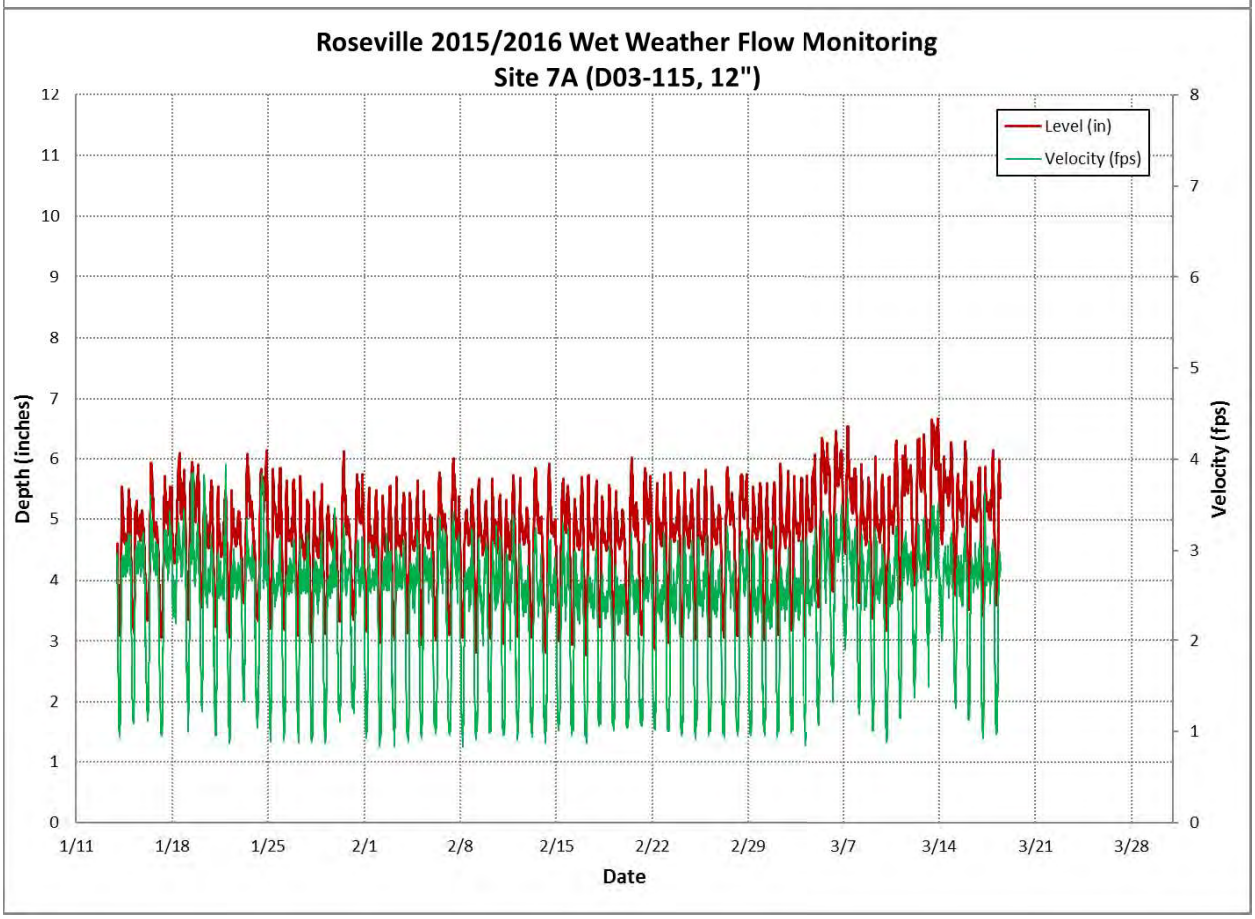

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 6 (C06-161, 18")
Flow (mgd)
Rainfall (in/hr)
Date
2.0
1.9
1.8
1.7
1.6
1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

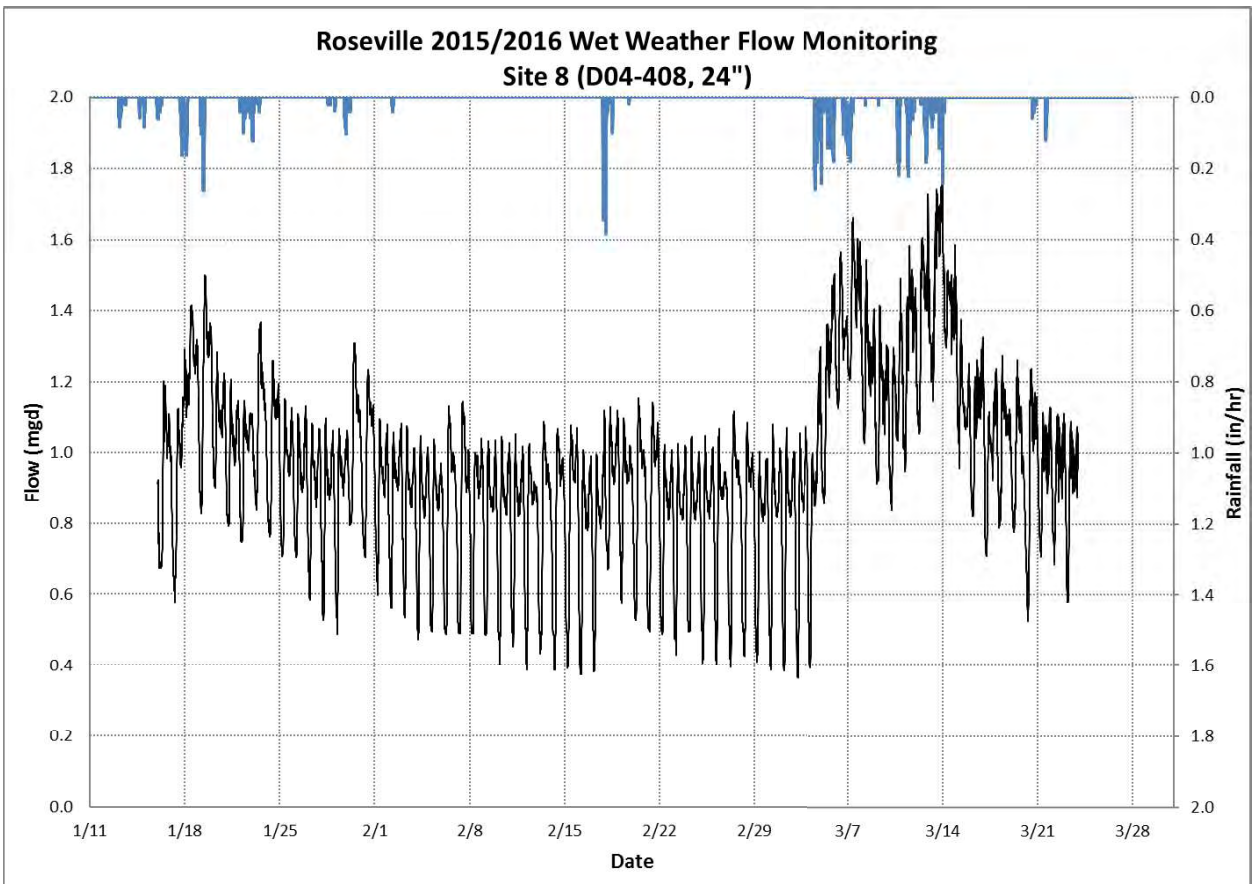

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 6 (C06-161, 18")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
12
11
10
9
8
7
6
5
4
3
2
1
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

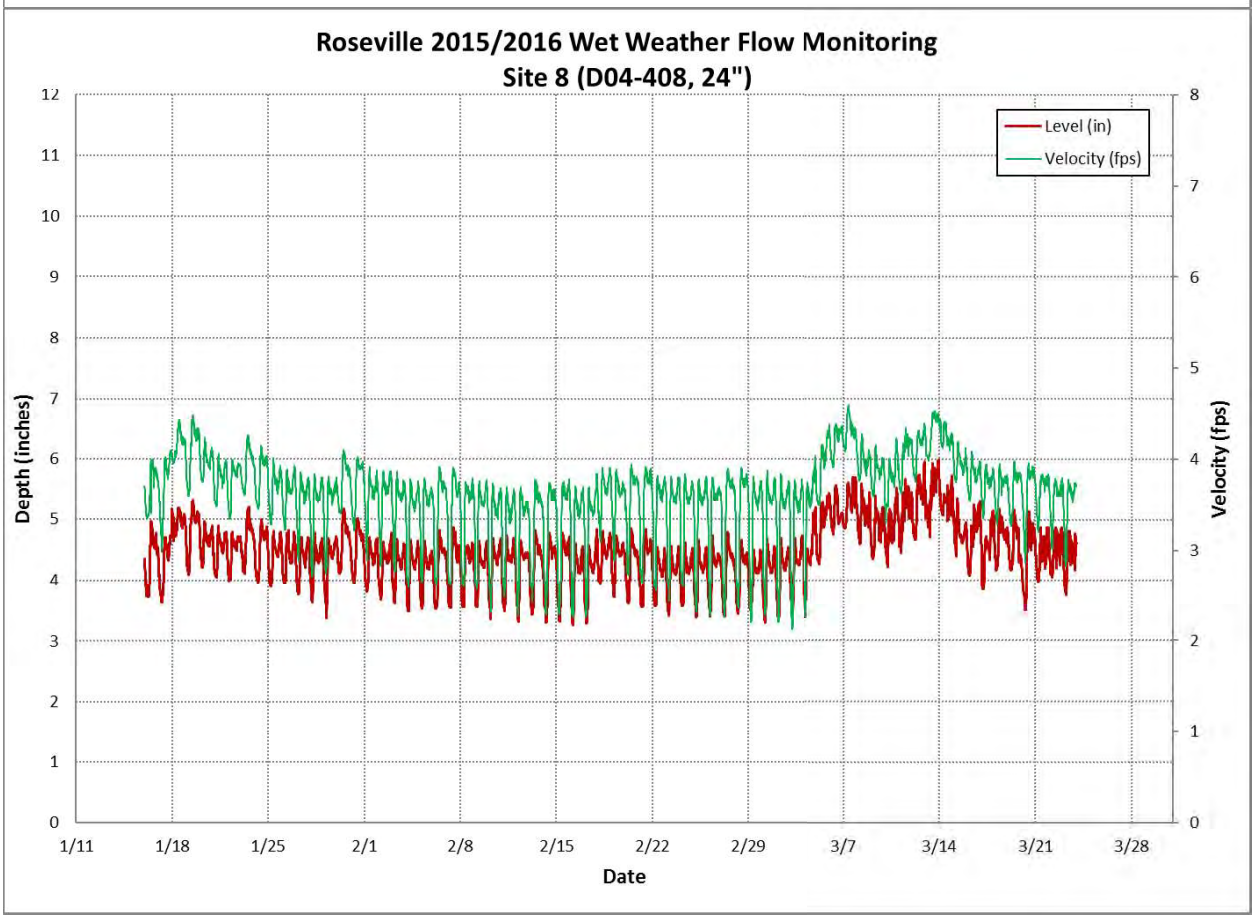

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 7 (D02-354, 23.5")
Flow (mgd)
Rainfall (in/hr)
Date
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

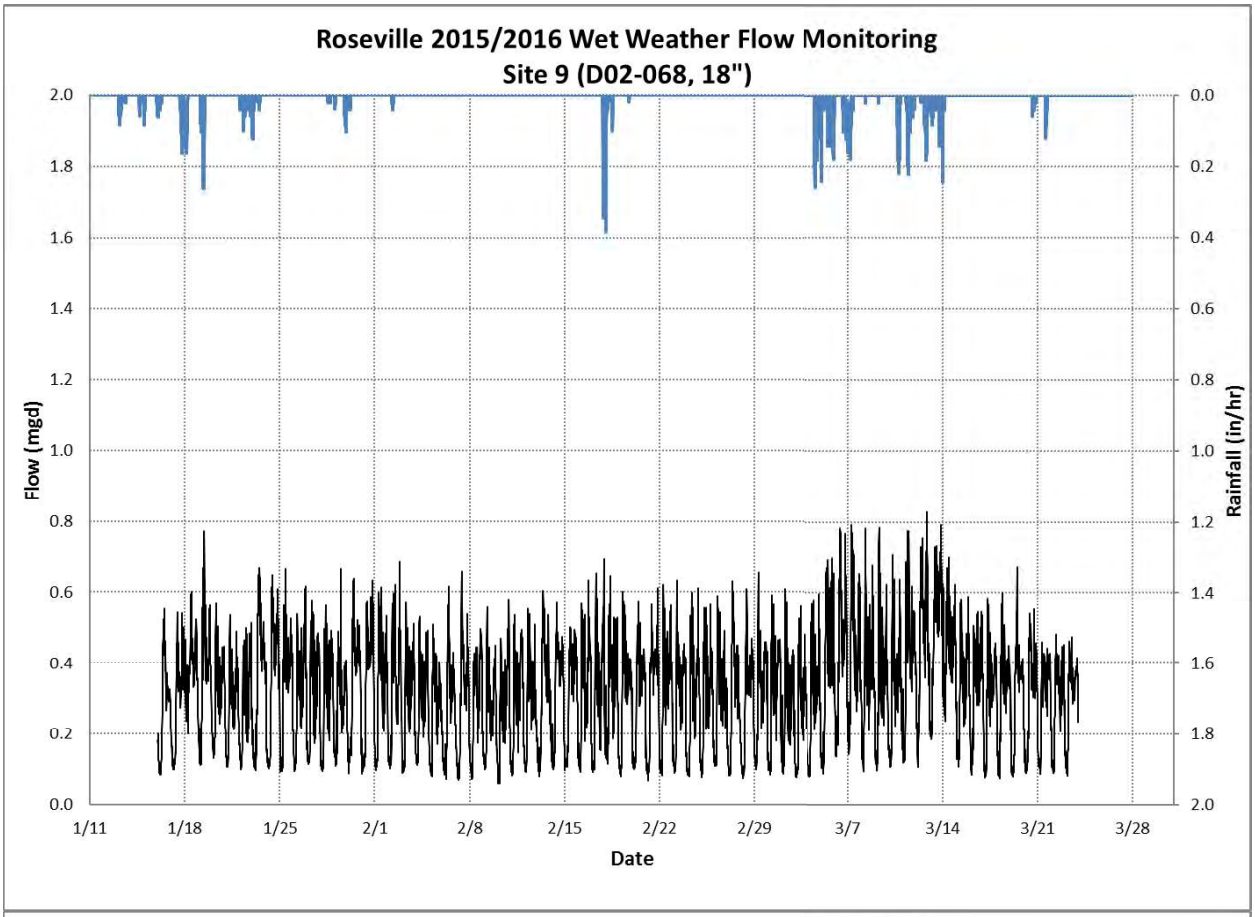

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 7 (D02-354, 23.5")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
12
11
10
9
8
7
6
5
4
3
2
1
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

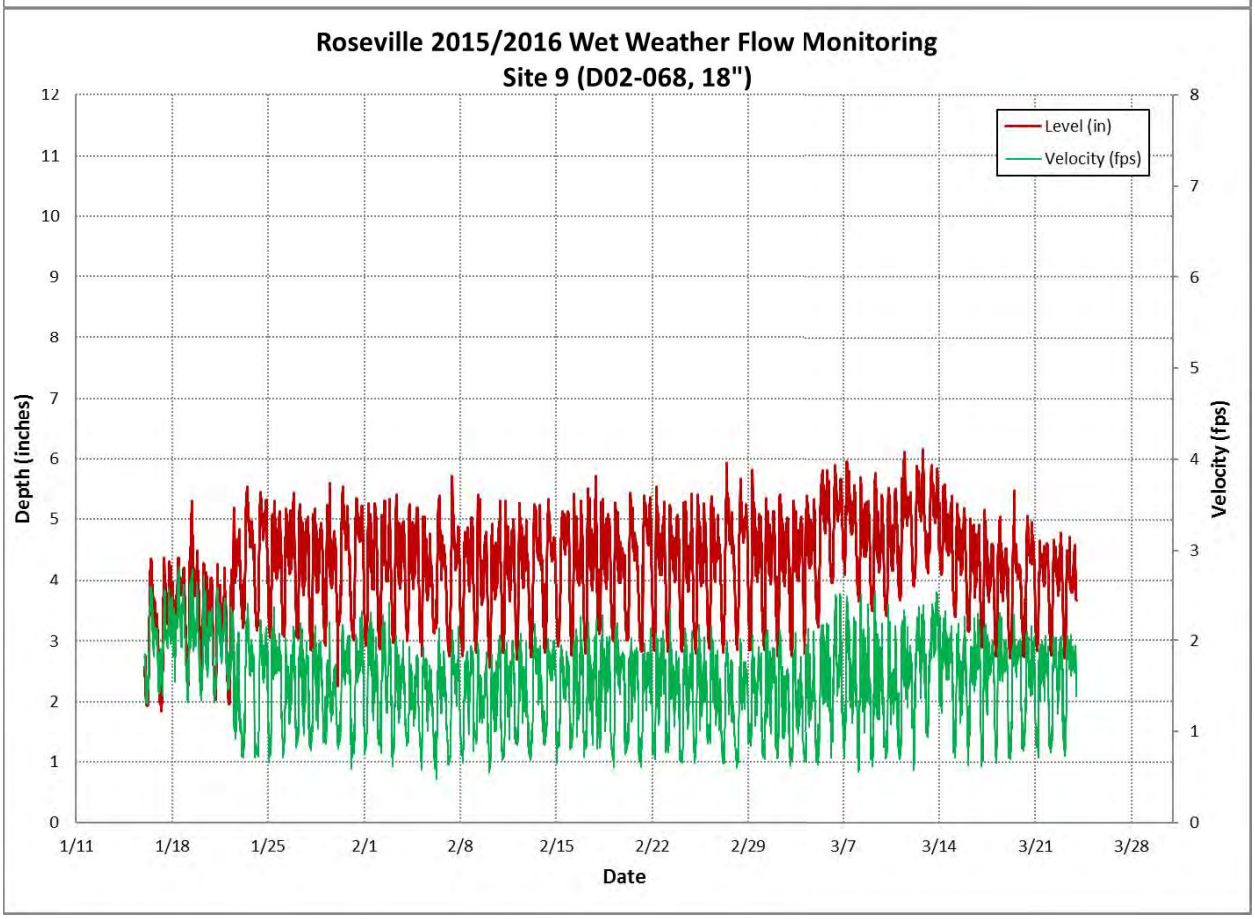

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 7A (D03-115, 12")
Flow (mgd)
Rainfall (in/hr)
Date
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

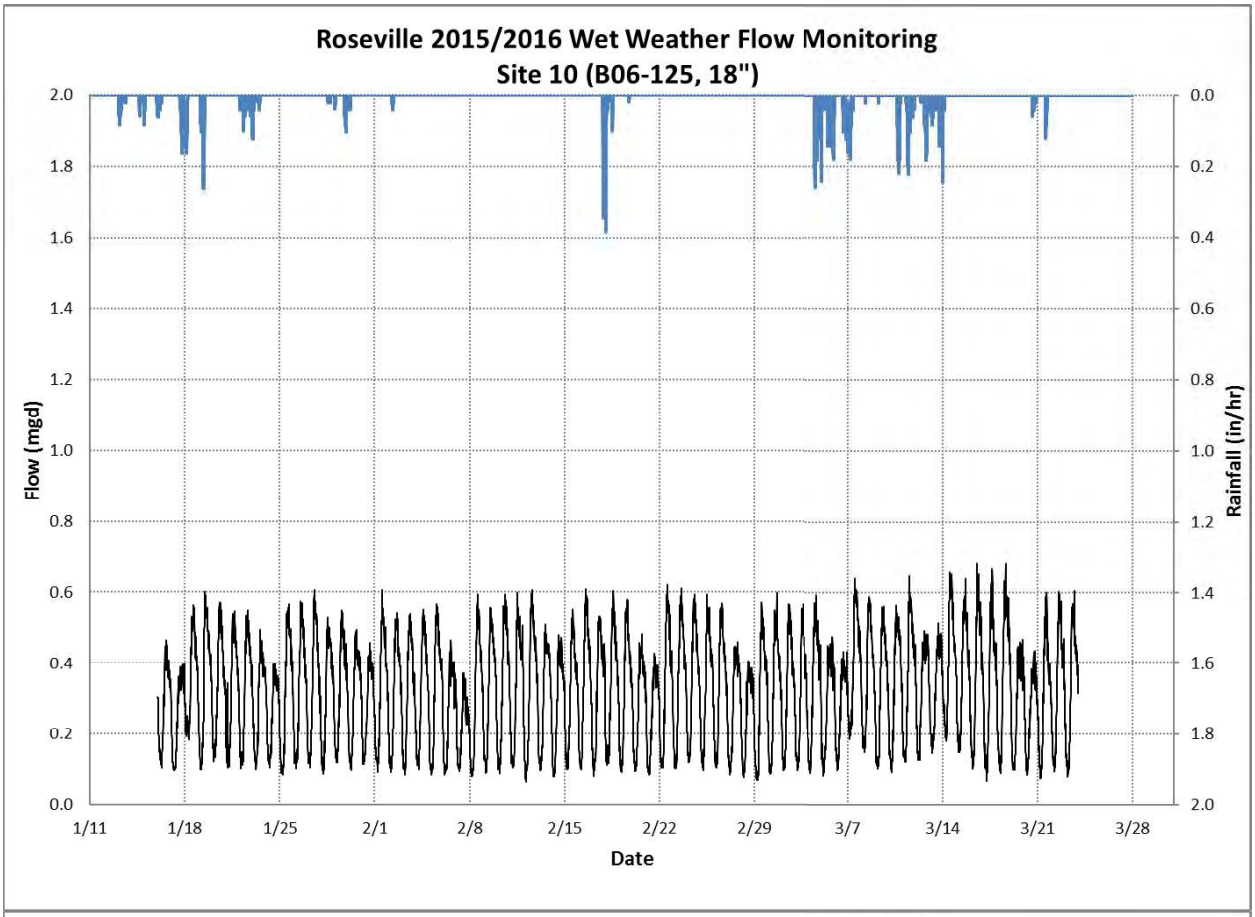

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 7A (D03-115, 12")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
12
11
10
9
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

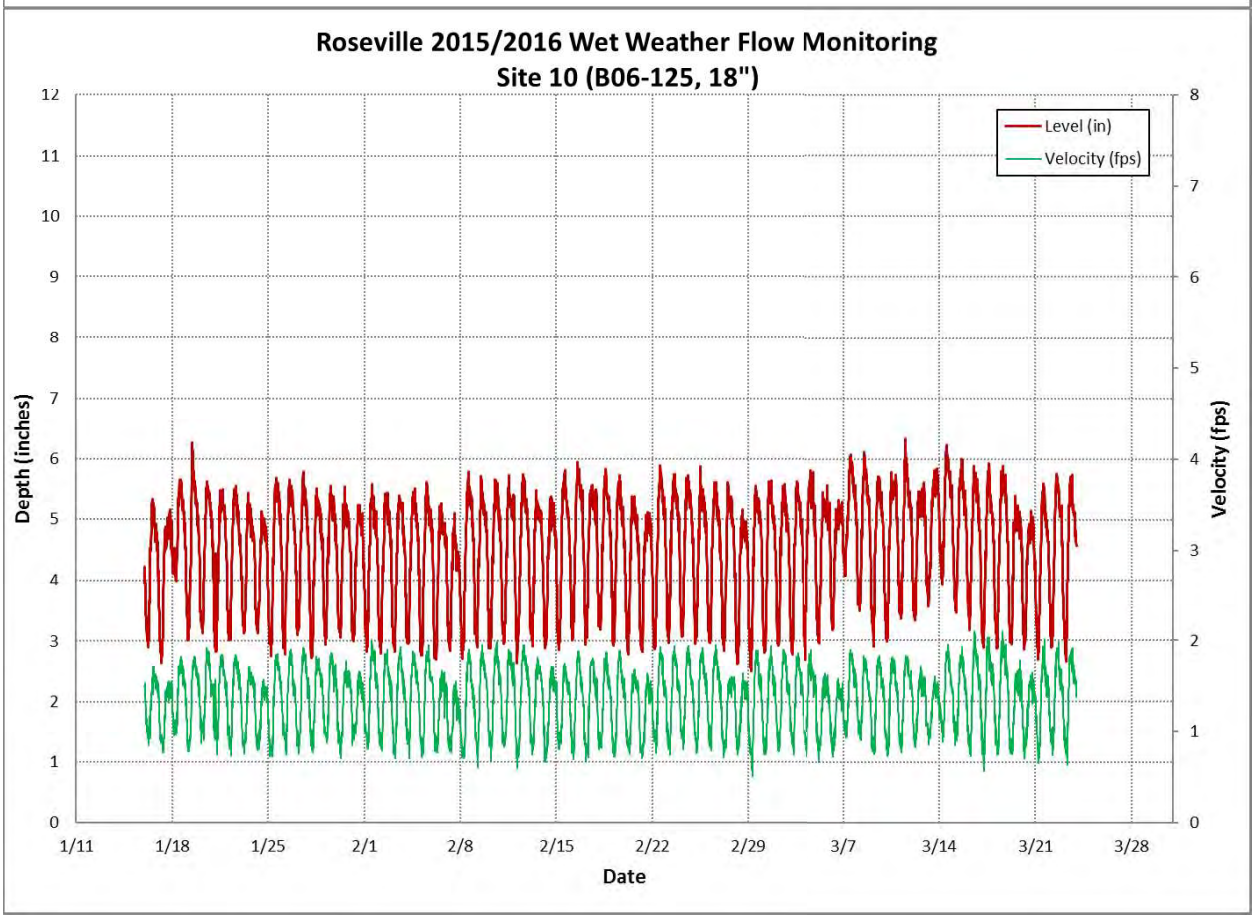

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 8 (D04-408, 24")
Flow (mgd)
Rainfall (in/hr)
Date
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

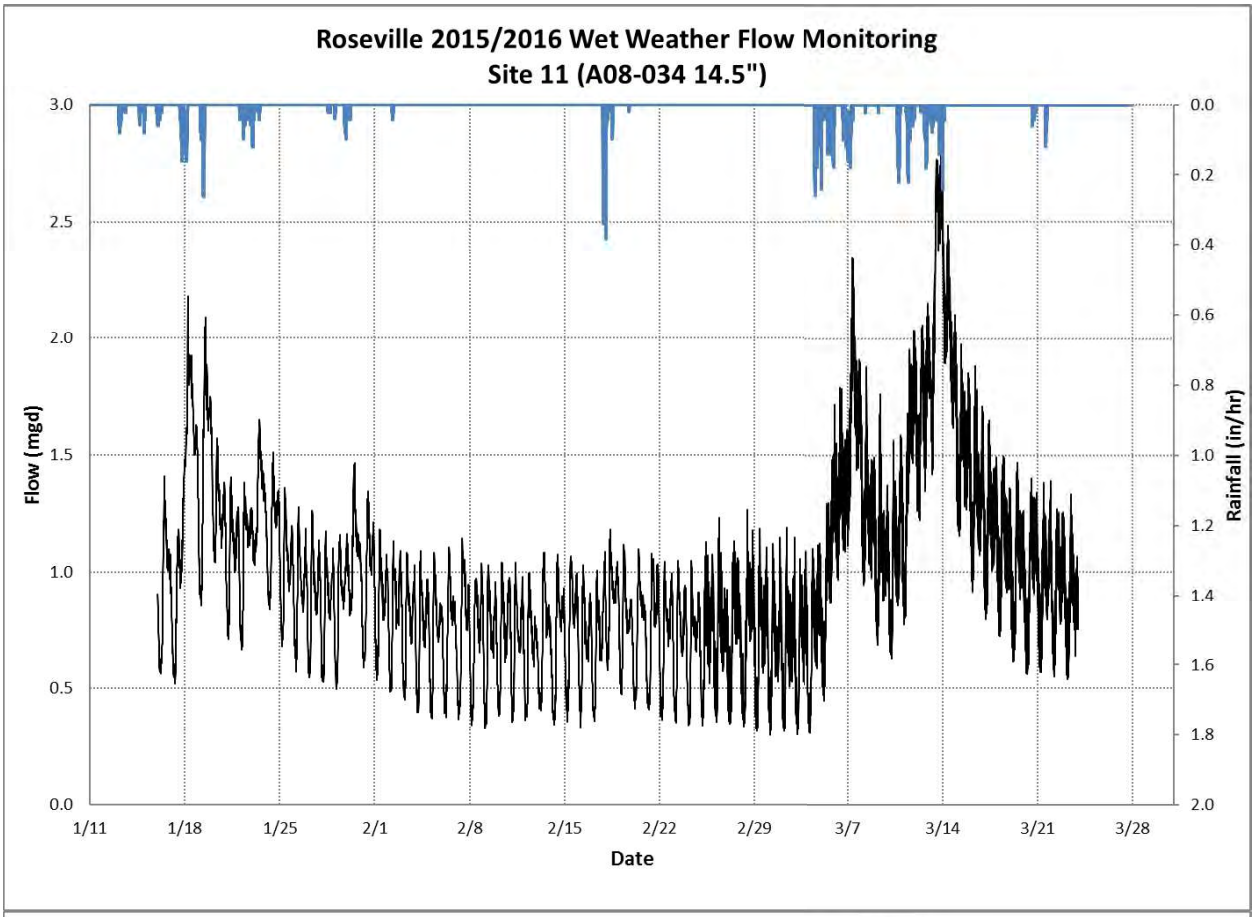

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 8 (D04-408, 24")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
12
11
10
9
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

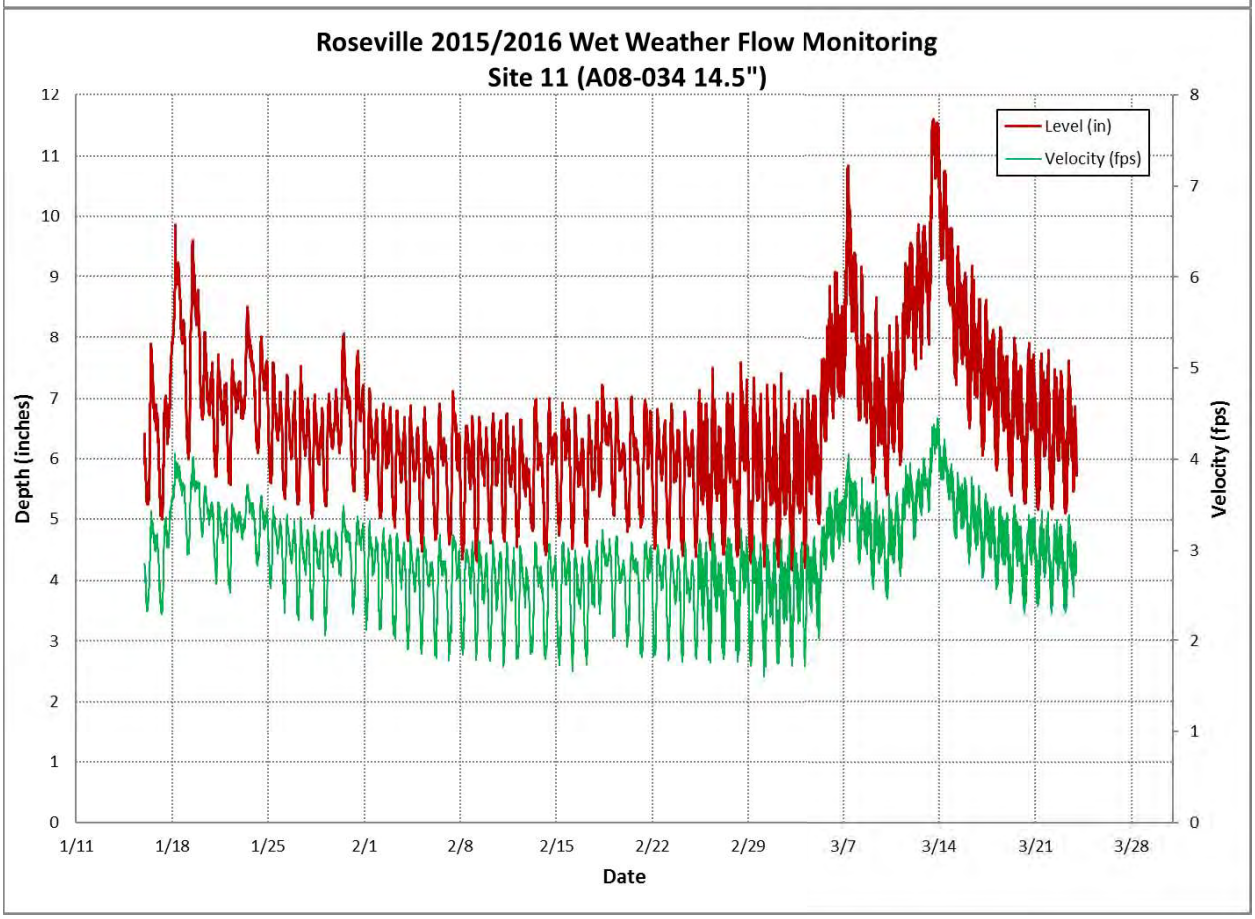

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 9 (D02-068, 18")
Flow (mgd)
Rainfall (in/hr)
Date
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

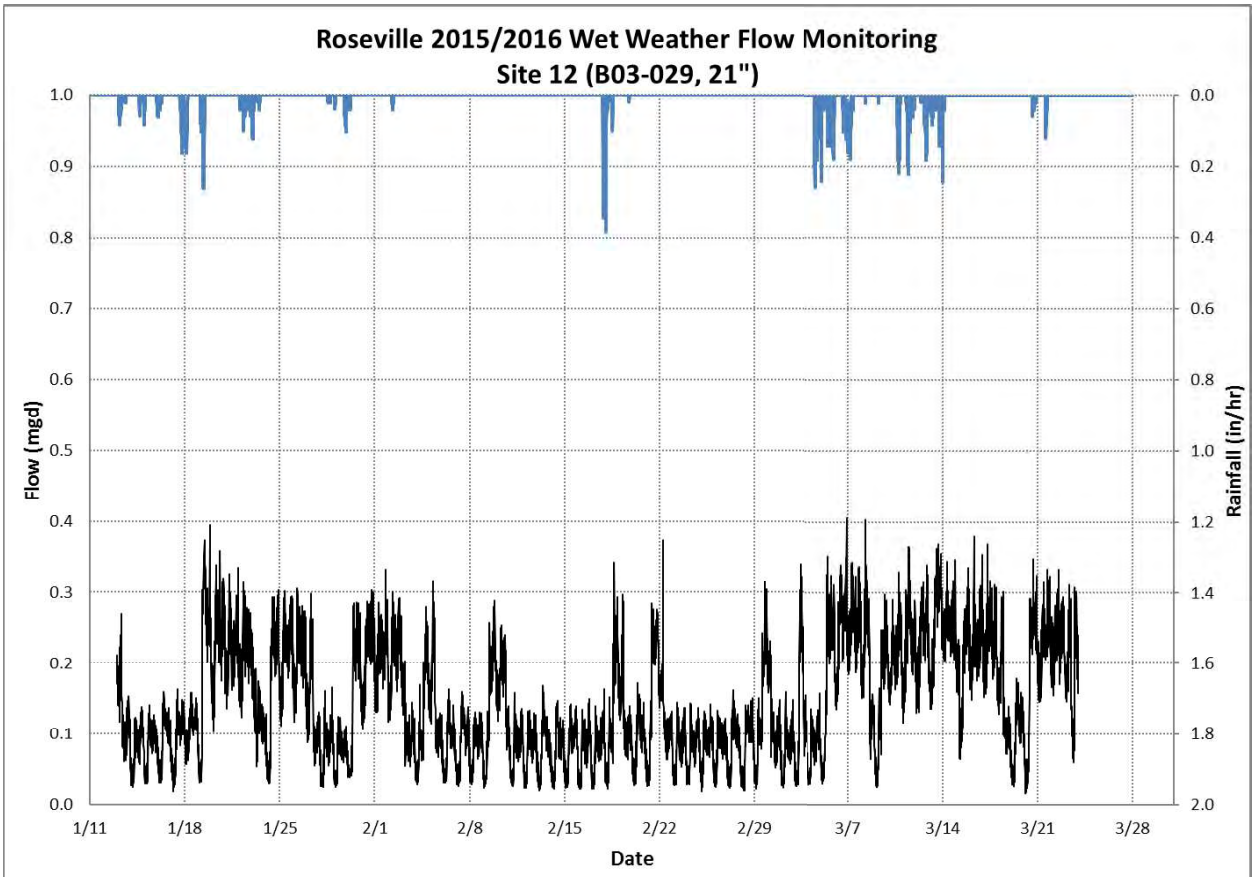

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 9 (D02-068, 18")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
12
11
10
9
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

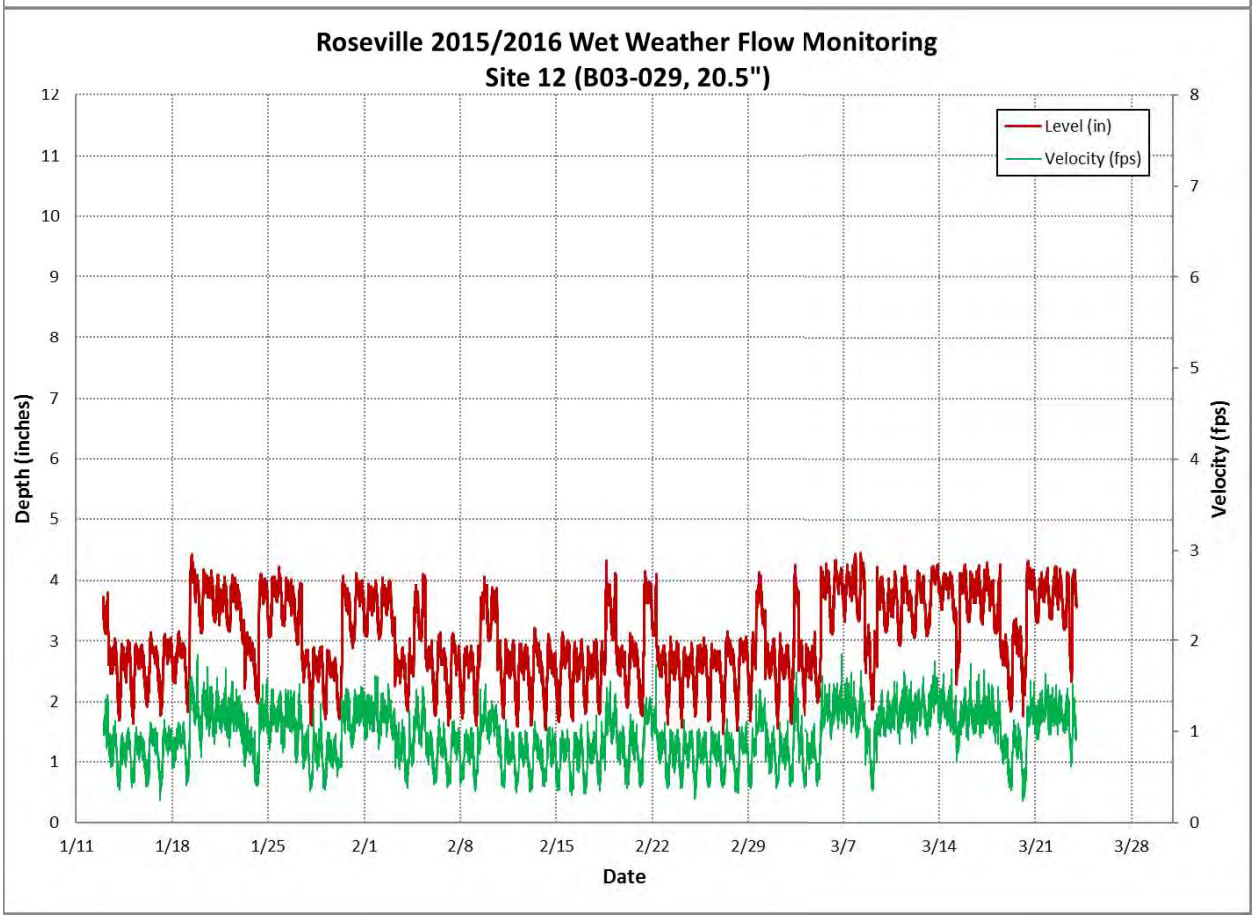

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 10 (B06-125, 18")
Flow (mgd)
Rainfall (in/hr)
Date
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

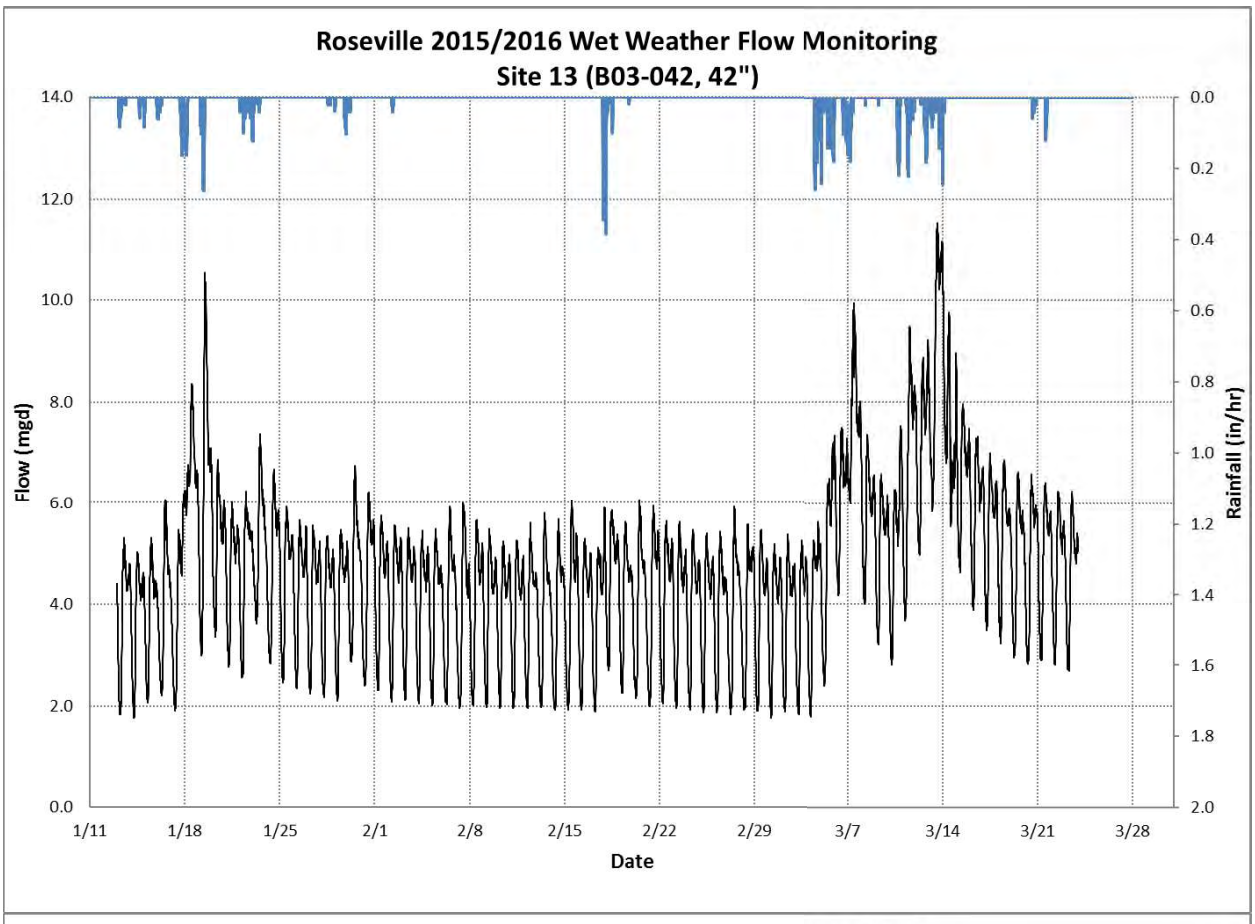

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 10 (B06-125, 18")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
12
11
10
9
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

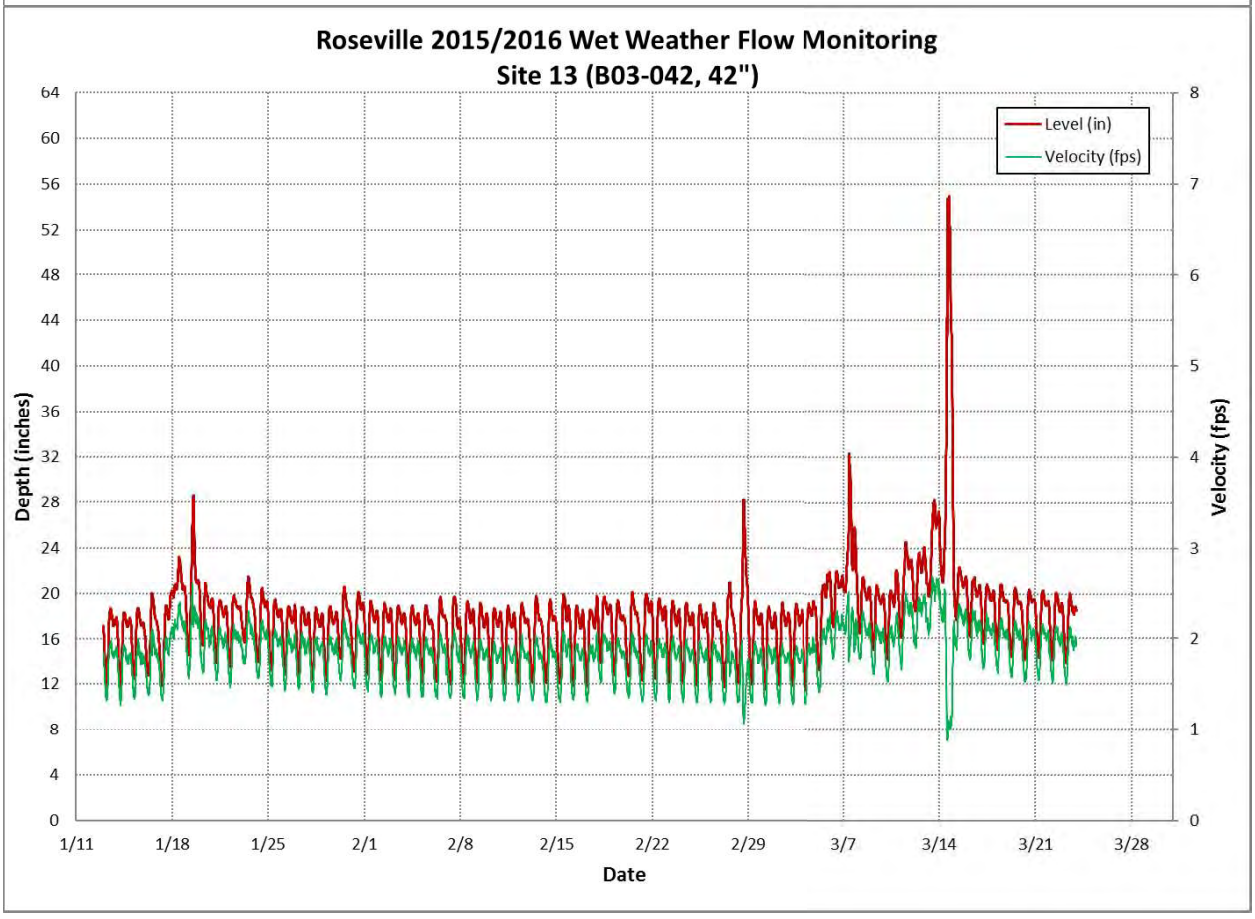

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 11 (A08-034 14.5")
Flow (mgd)
Rainfall (in/hr)
Date
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

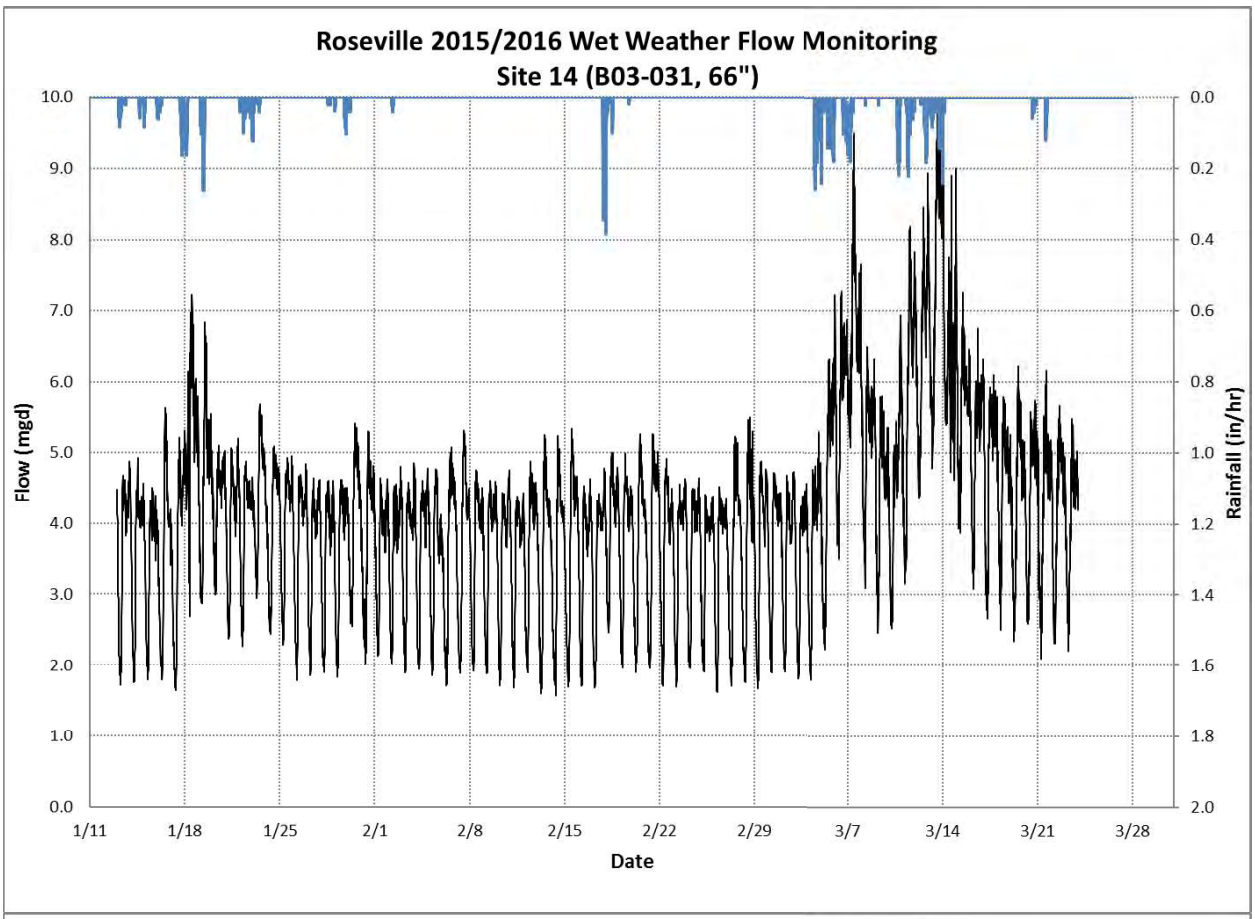

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 11 (A08-034 14.5")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
12
11
10
9
8
7
6
5
4
3
2
1
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

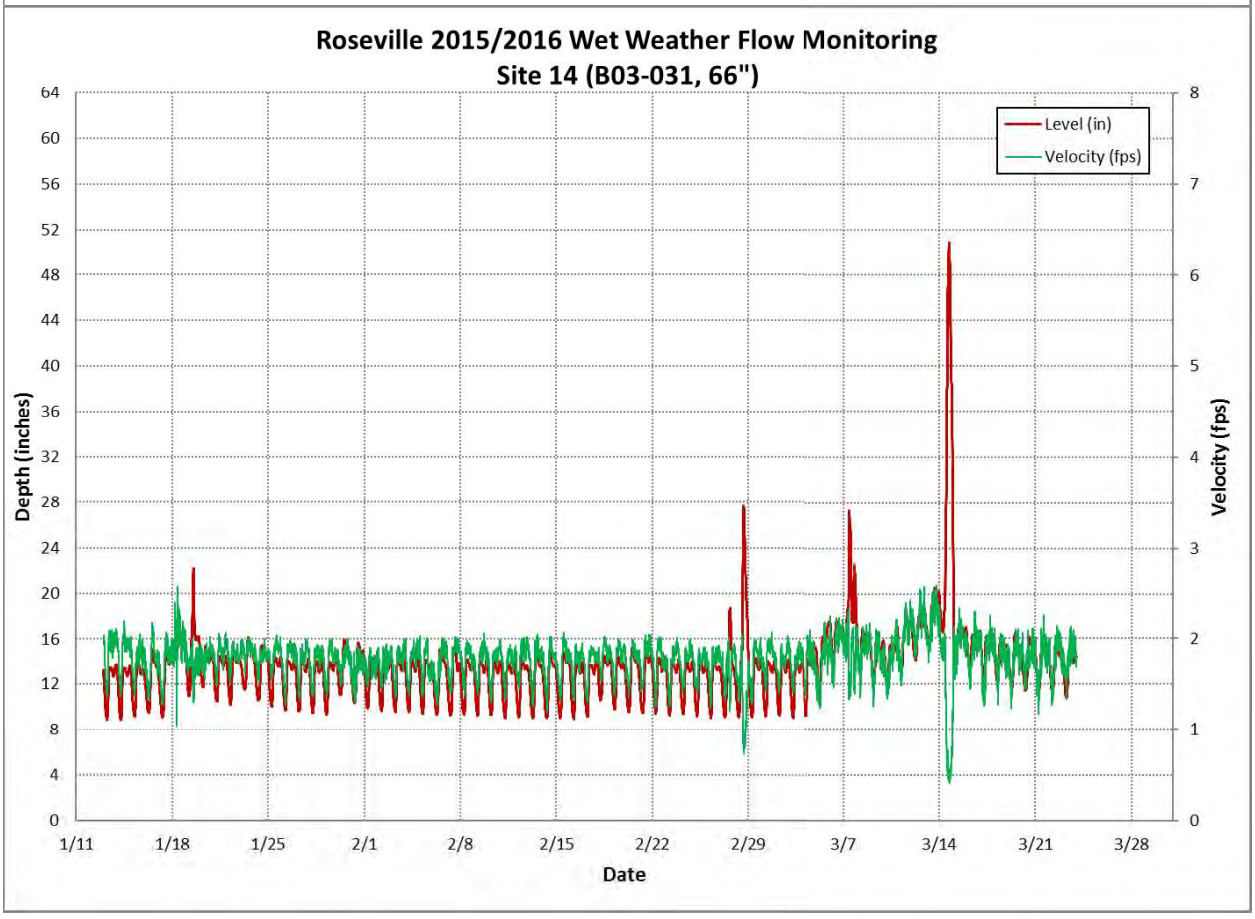

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 12 (B03-029, 21")
Flow (mgd)
Rainfall (in/hr)
Date
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

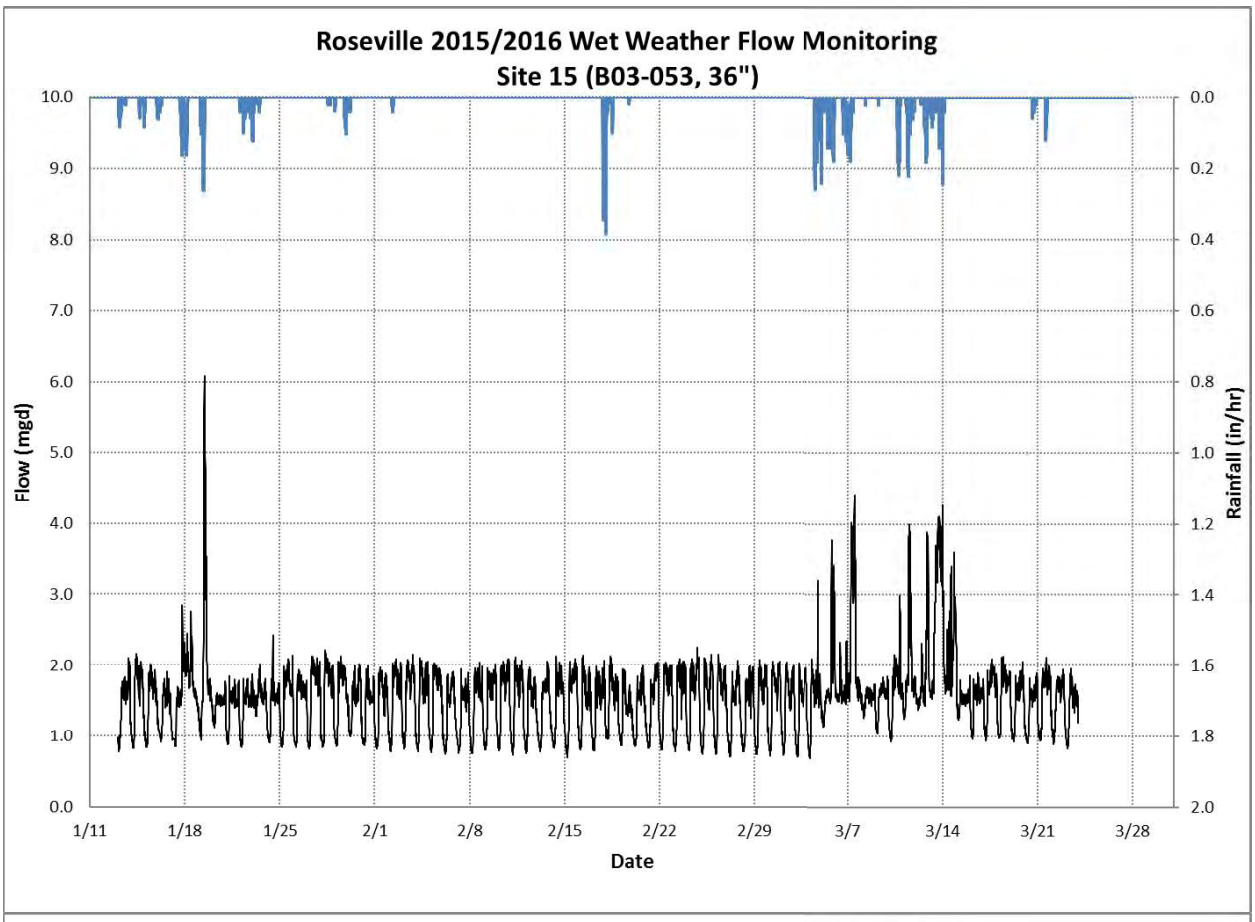

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 12 (B03-029, 20.5")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
12
11
10
9
8
7
6
5
4
3
2
1
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

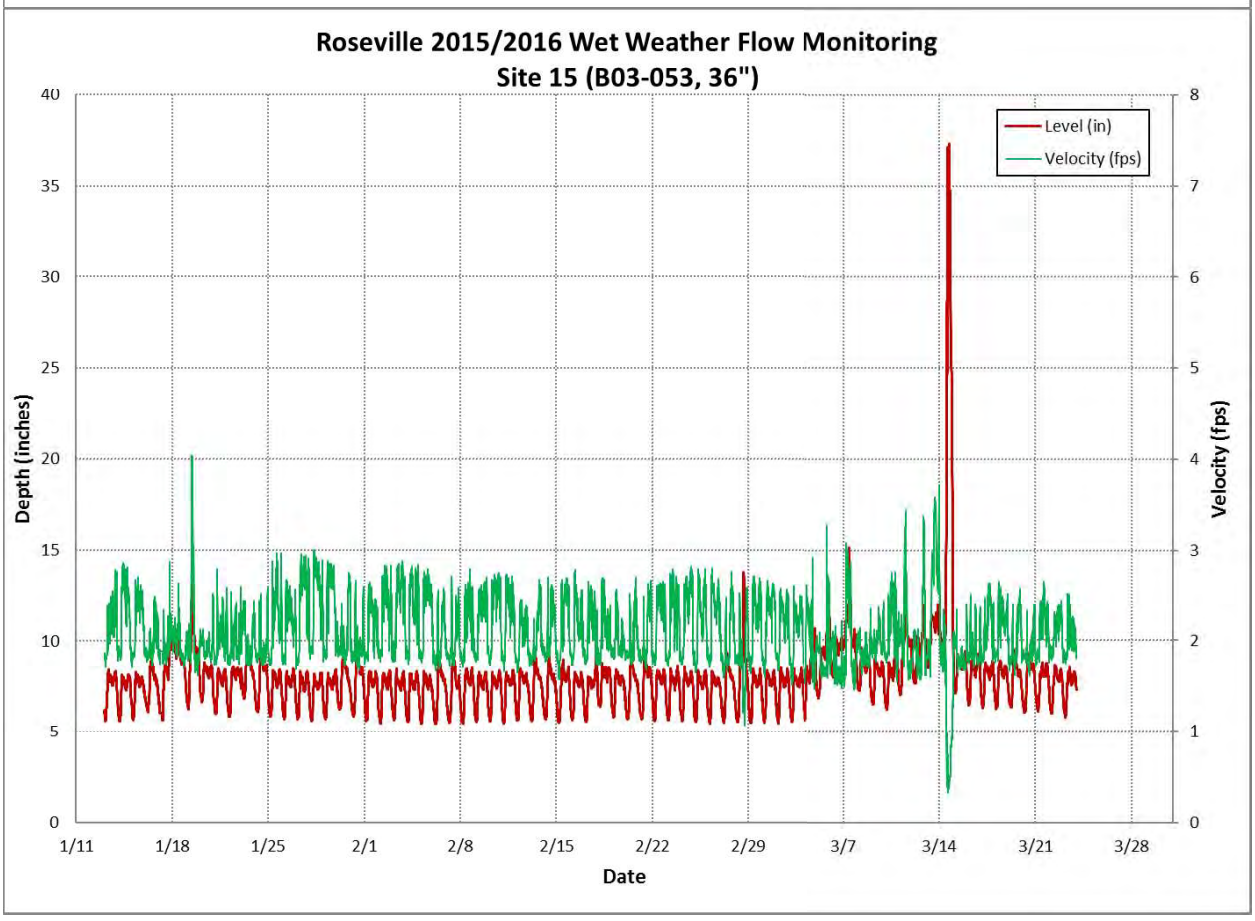

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 13 (B03-042, 42")
Flow (mgd)
Rainfall (in/hr)
Date
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

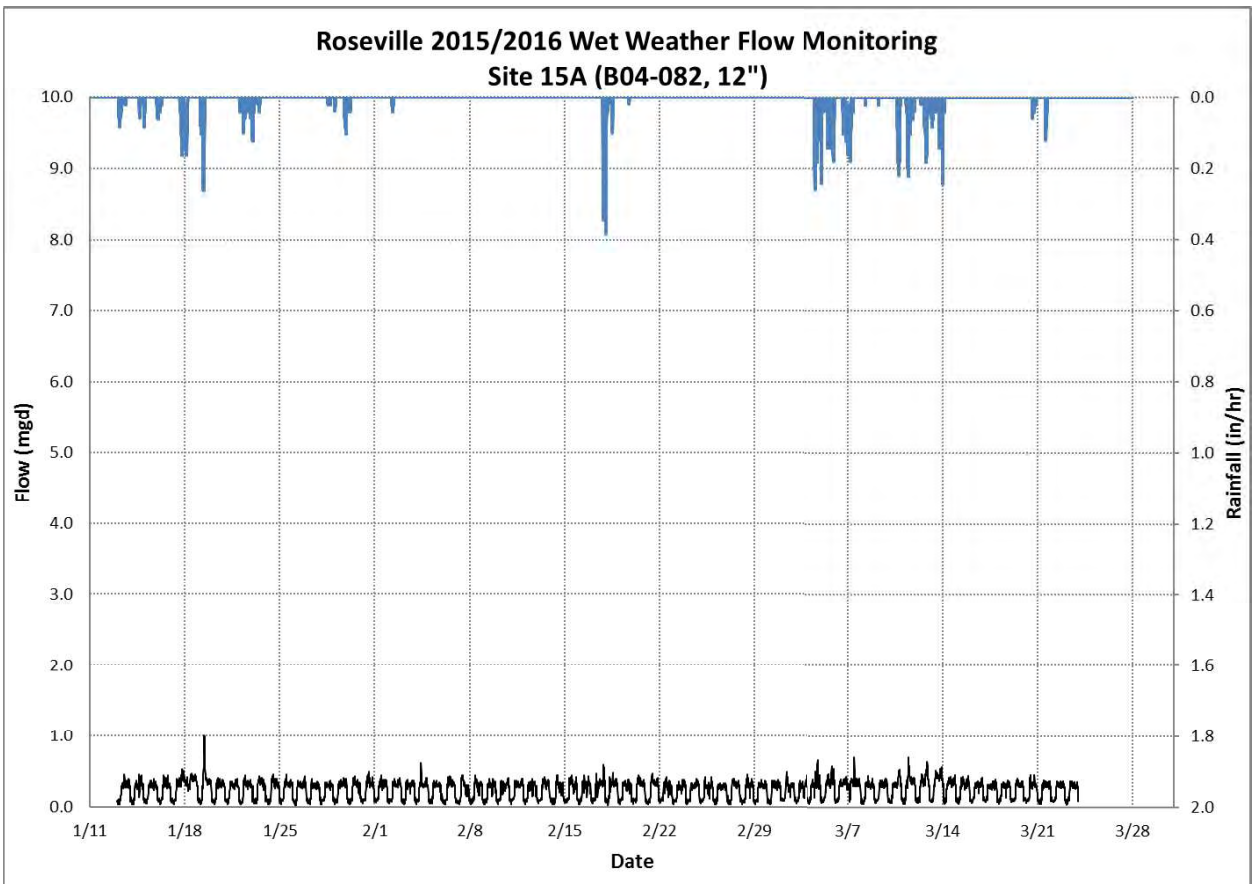

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 13 (B03-042, 42")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
64
60
56
52
48
44
40
36
32
28
24
20
16
12
8
4
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

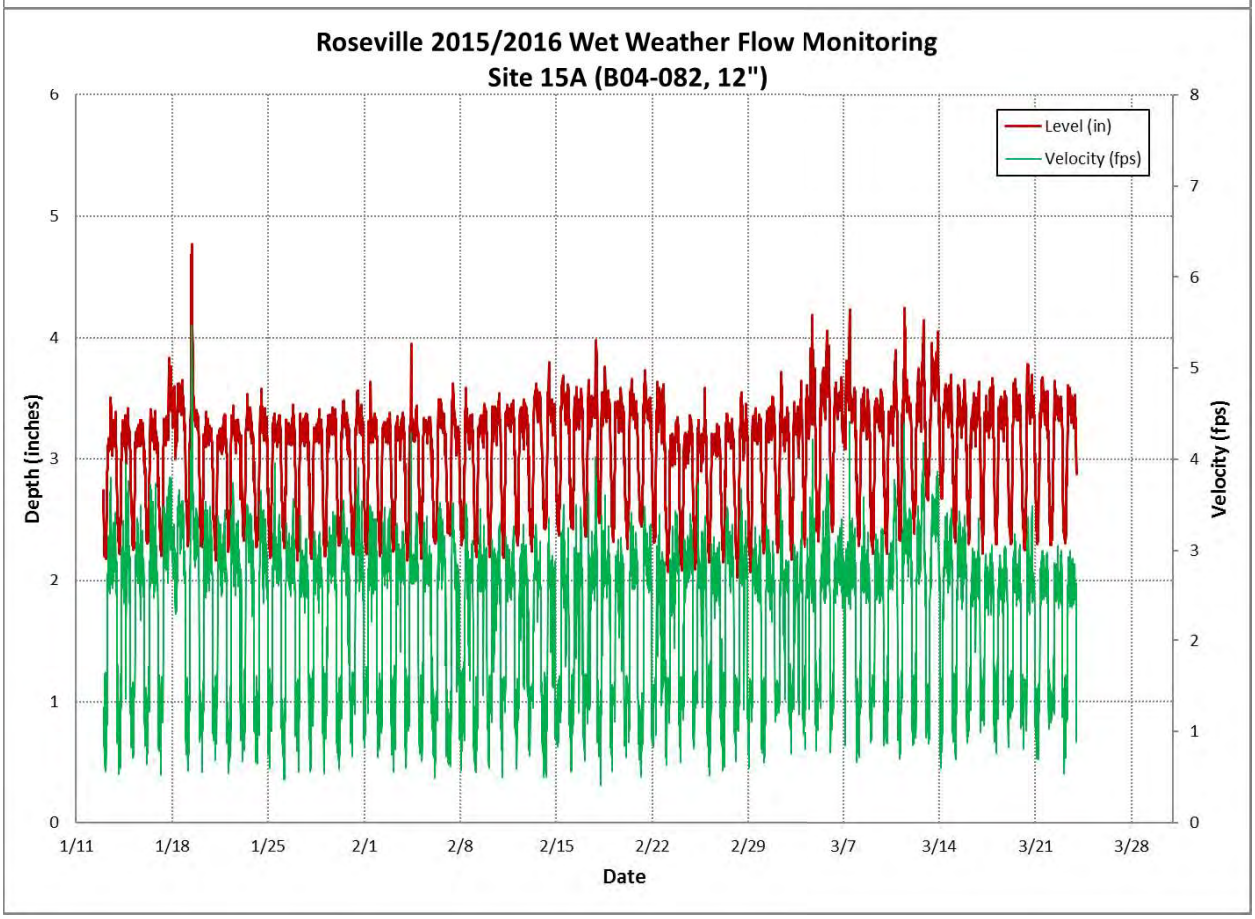

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 14 (B03-031, 66")
Flow (mgd)
Rainfall (in/hr)
Date
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

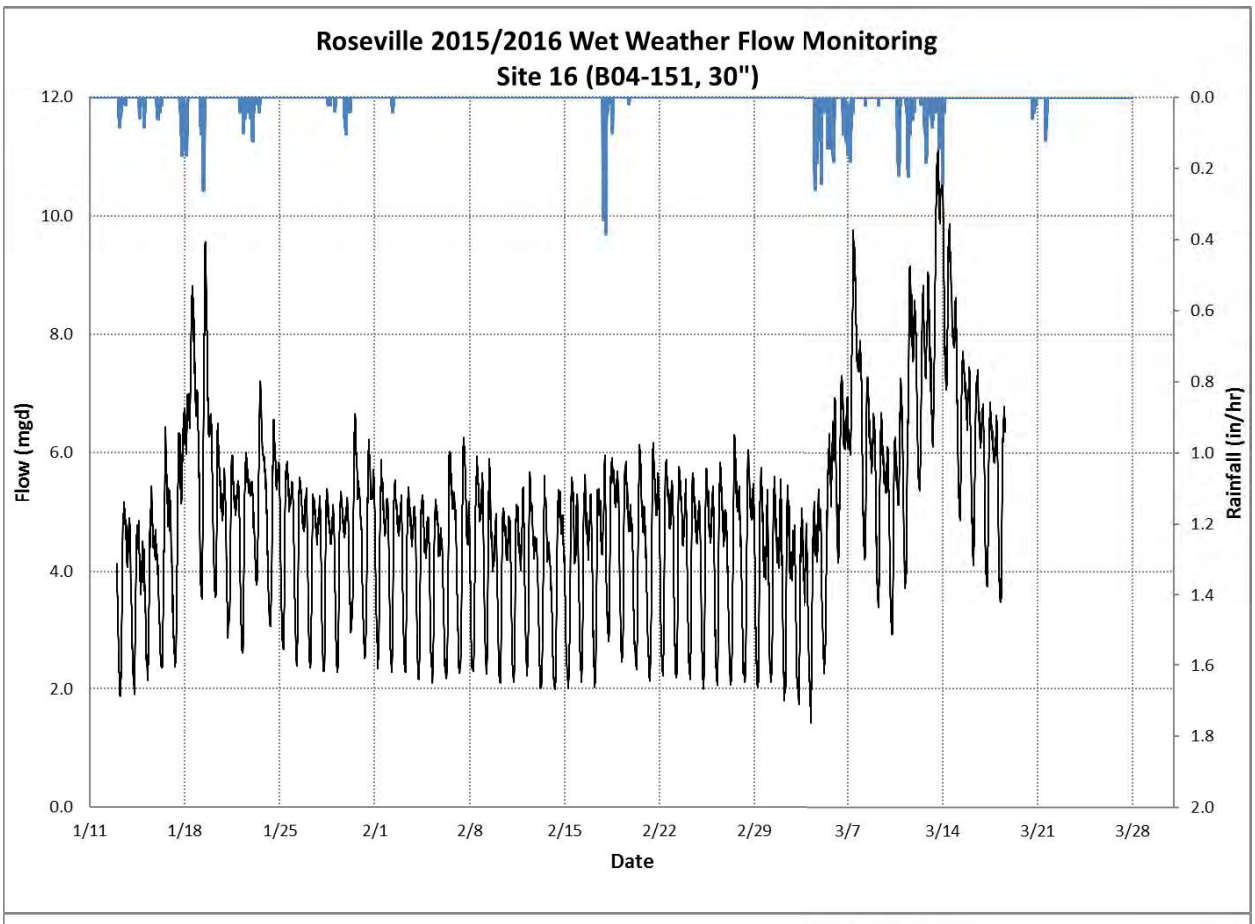

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 14 (B03-031, 66")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
64
60
56
52
48
44
40
36
32
28
24
20
16
12
8
4
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

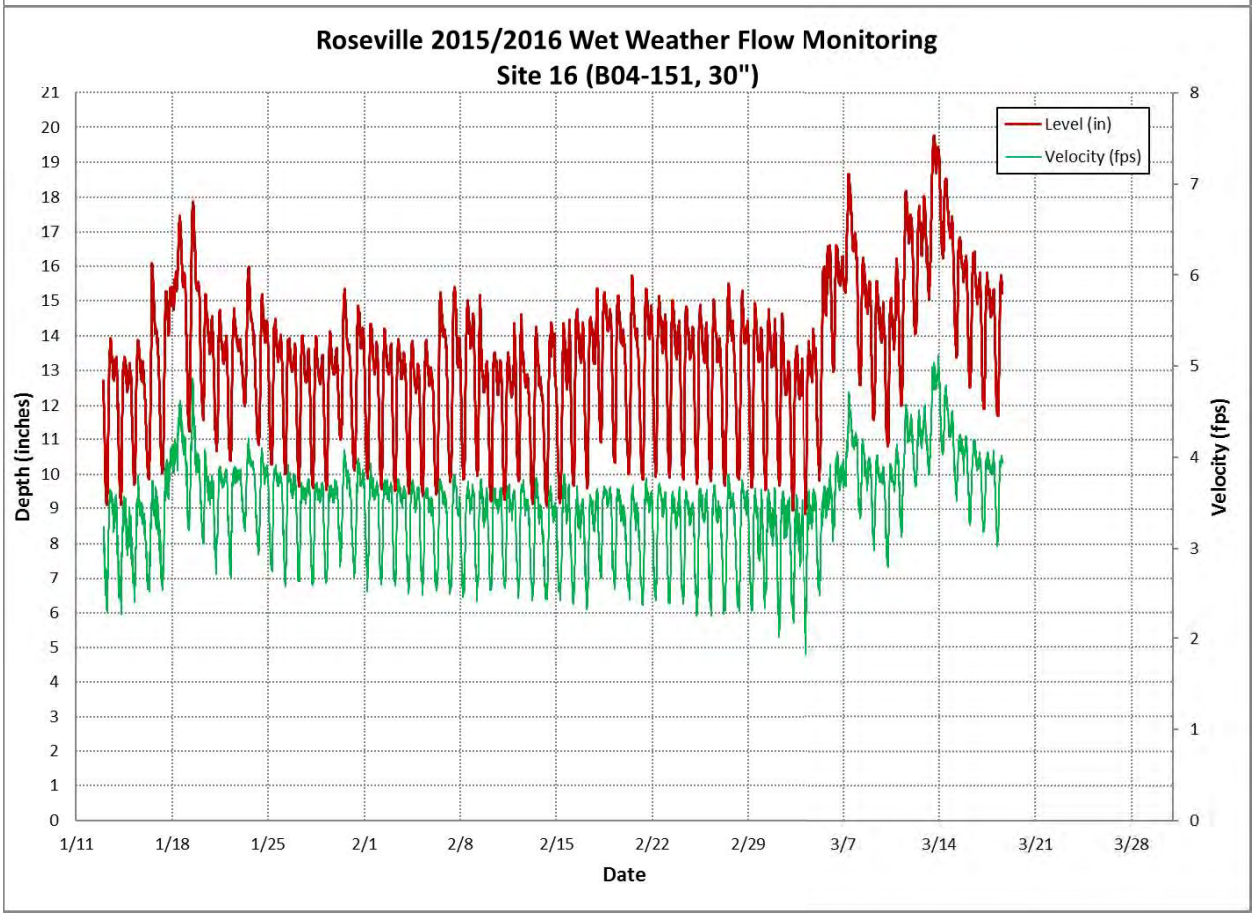

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 15 (B03-053, 36")
Flow (mgd)
Rainfall (in/hr)
Date
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

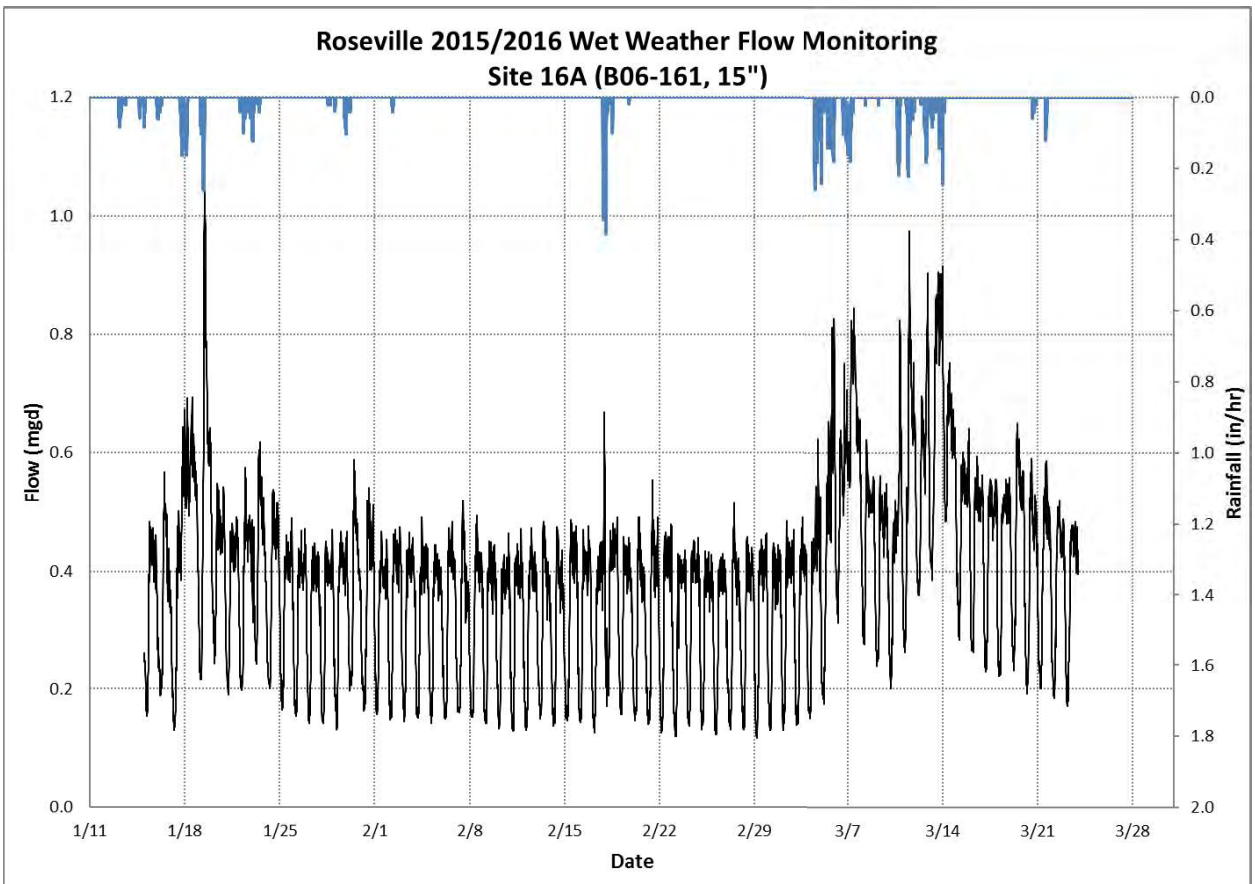

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 15 (B03-053, 36")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
40
35
30
25
20
15
10
5
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

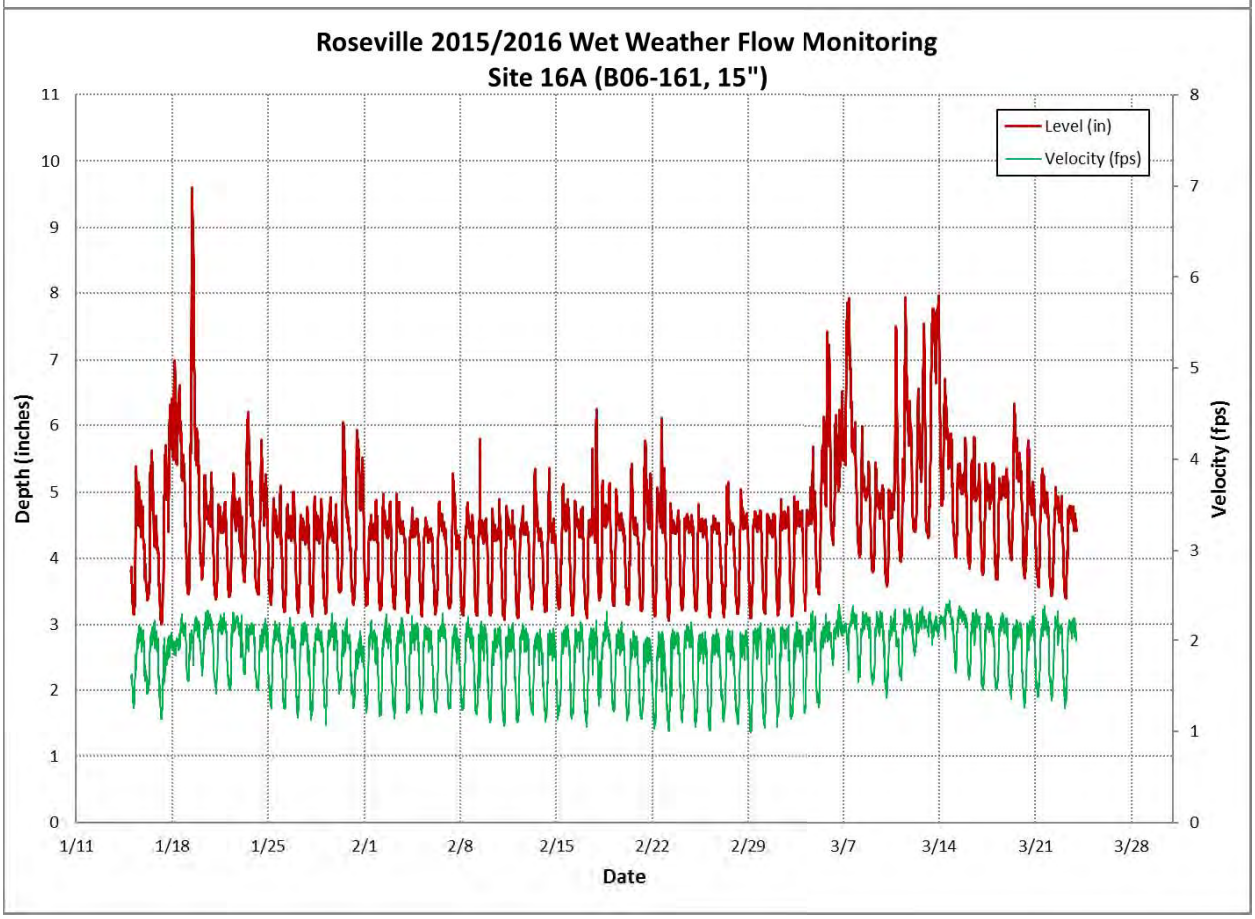

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 15A (B04-082, 12")
Flow (mgd)
Rainfall (in/hr)
Date
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

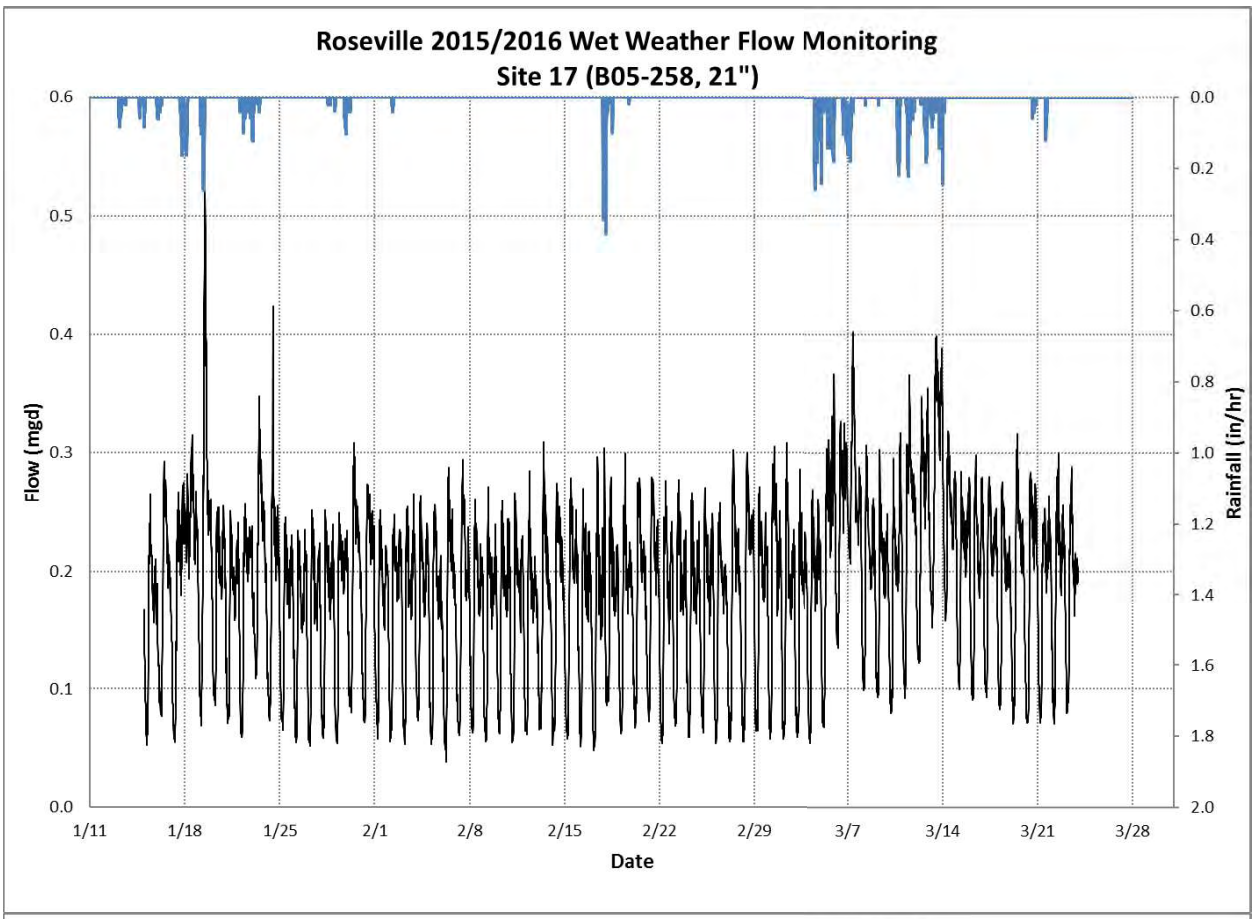

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 15A (B04-082, 12")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
6
5
4
3
2
1
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

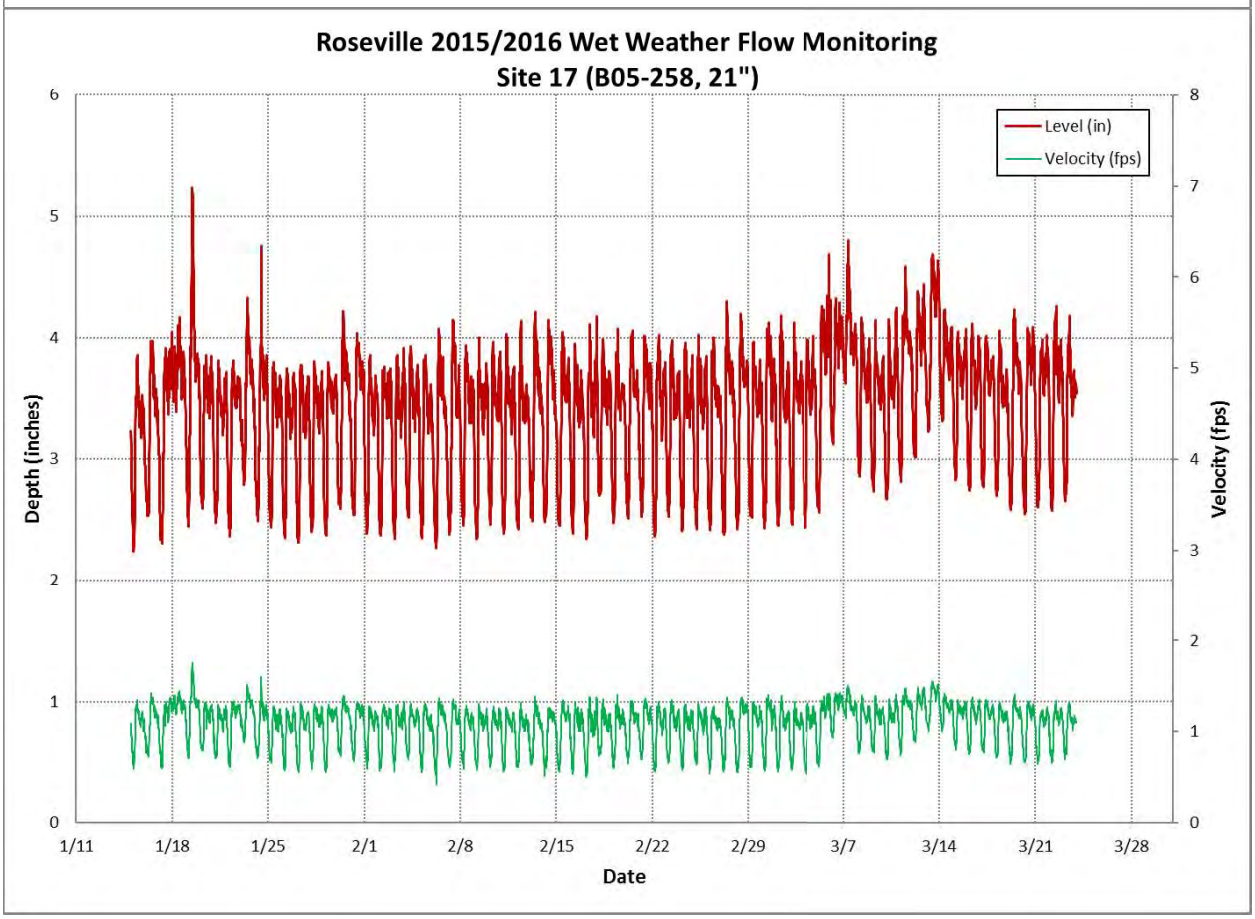

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 16 (B04-151, 30")
Flow (mgd)
Rainfall (in/hr)
Date
12.0
10.0
8.0
6.0
4.0
2.0
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

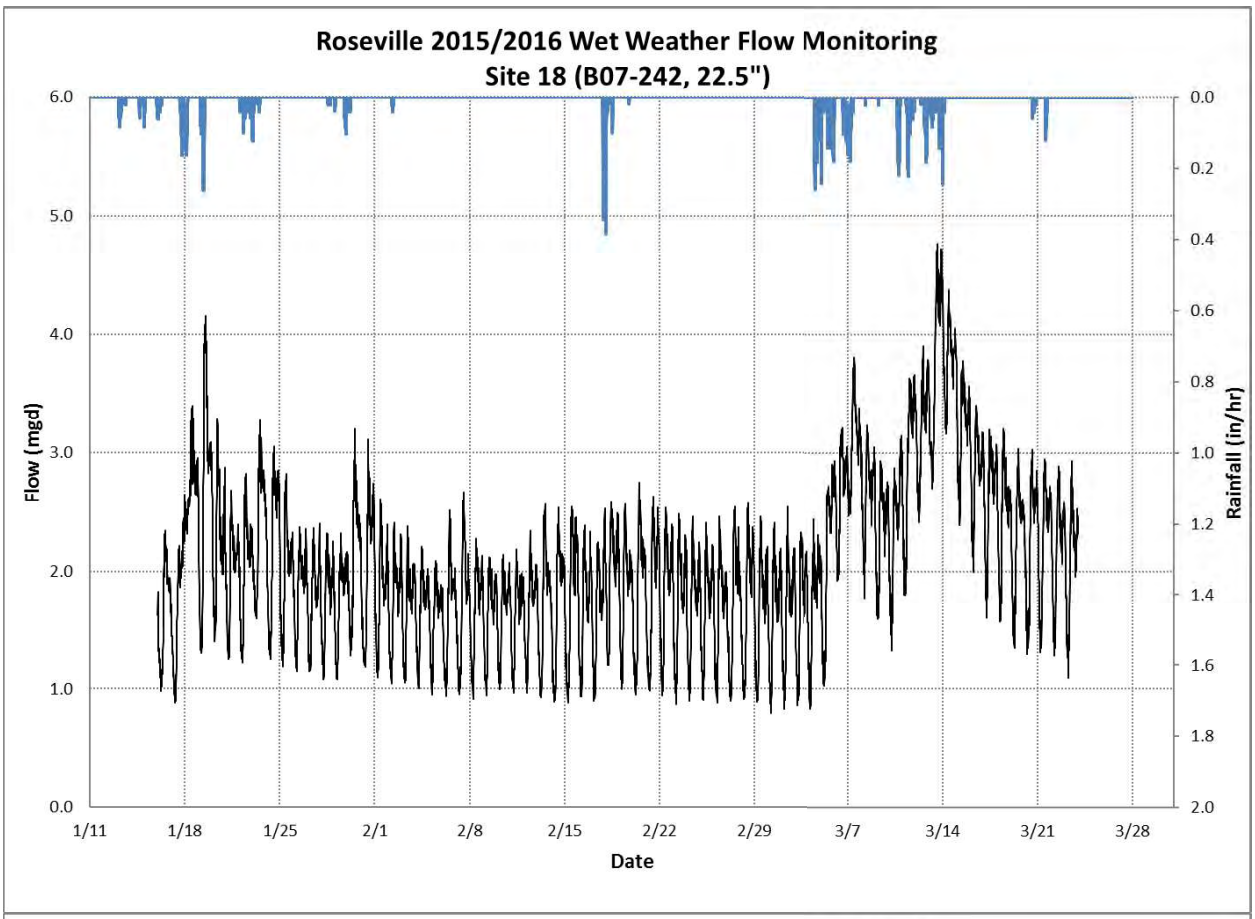

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 16 (B04-151, 30")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

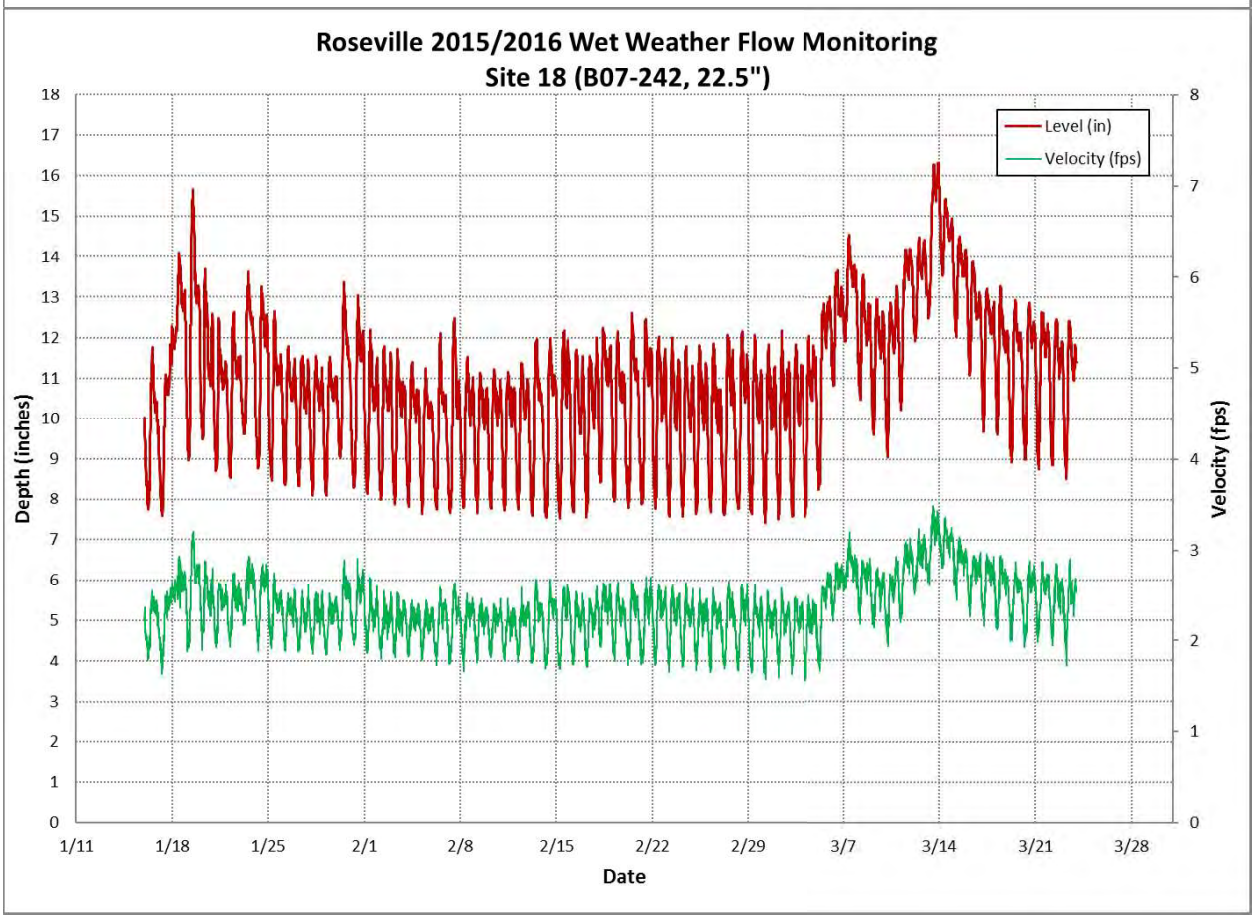

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 16A (B06-161, 15")
Flow (mgd)
Rainfall (in/hr)
Date
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

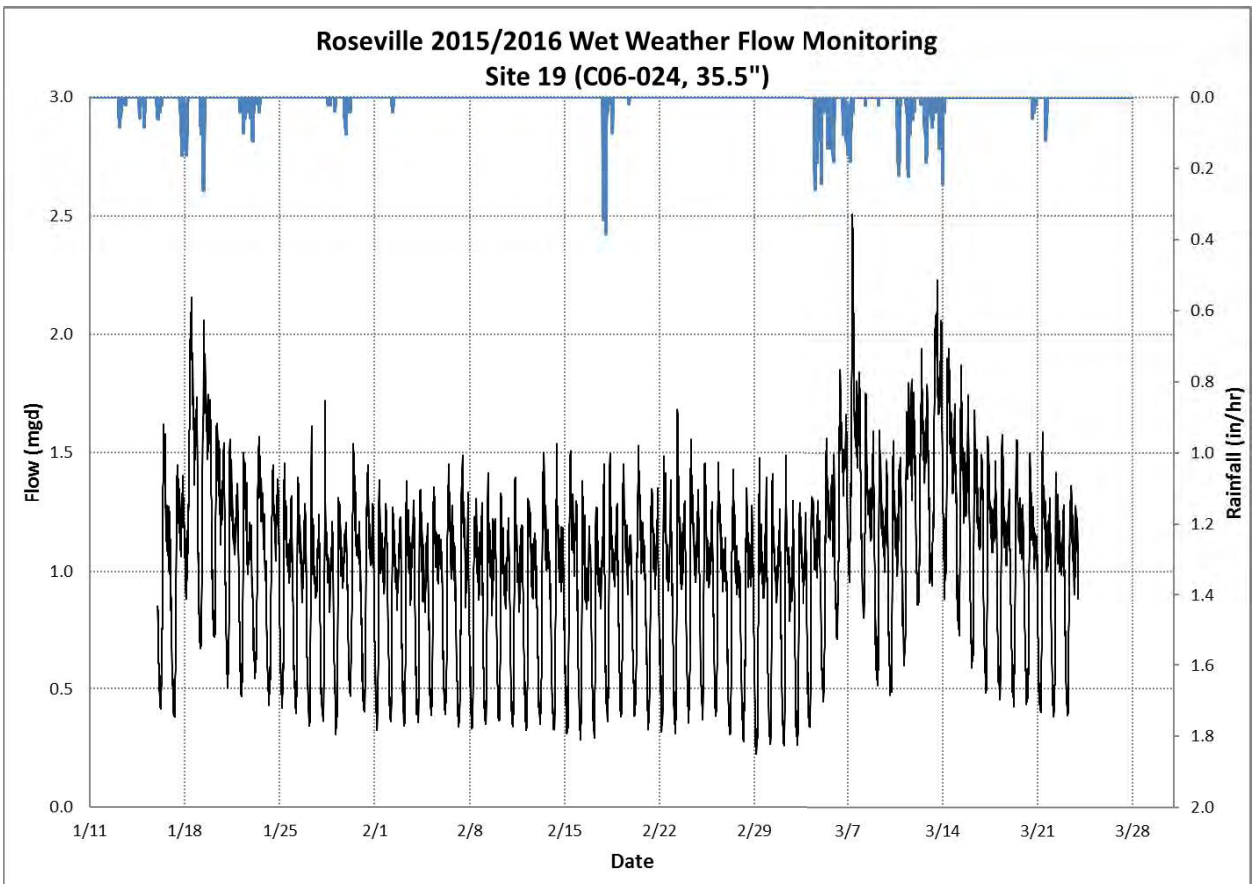

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 16A (B06-161, 15")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
11
10
9
8
7
6
5
4
3
2
1
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

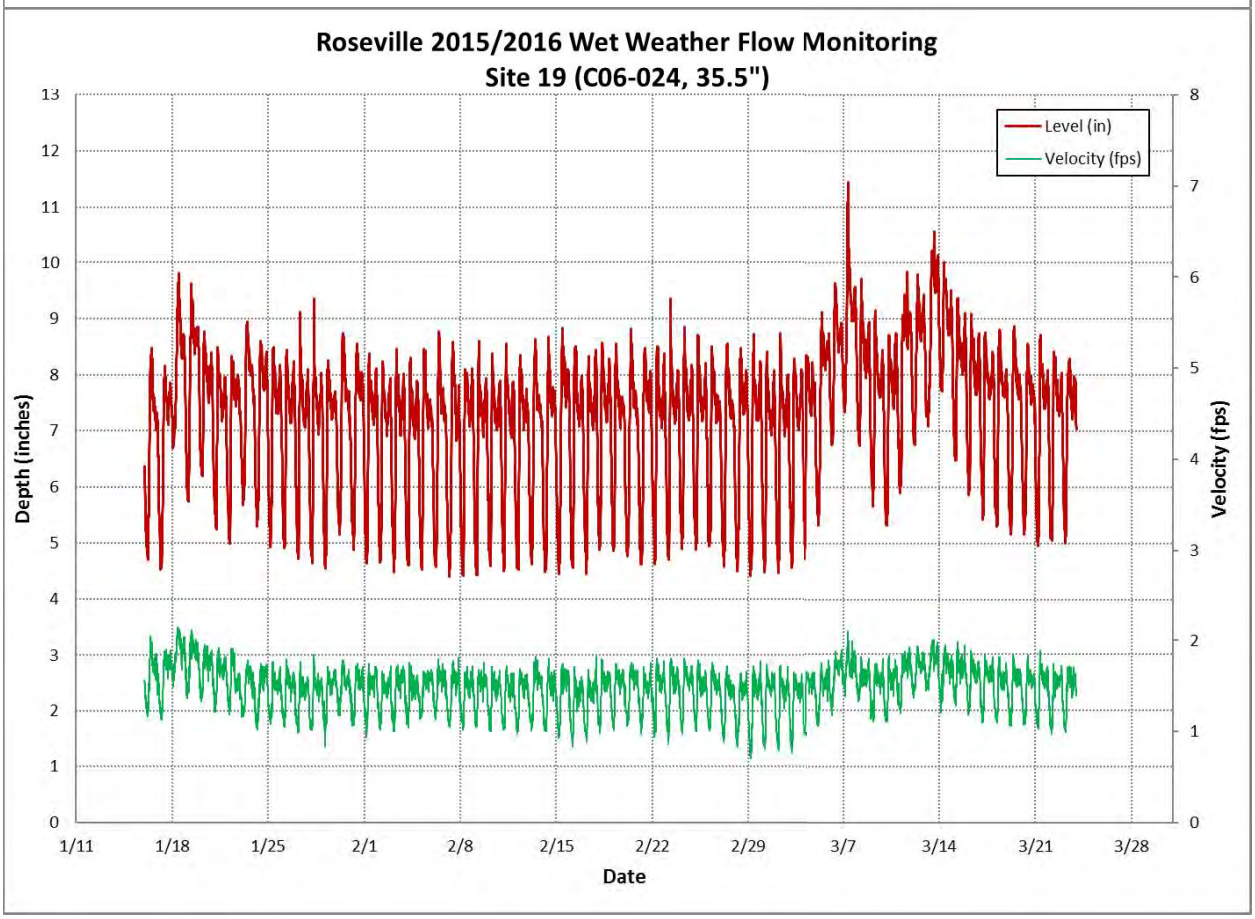

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 17 (B05-258, 21")
Flow (mgd)
Rainfall (in/hr)
Date
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

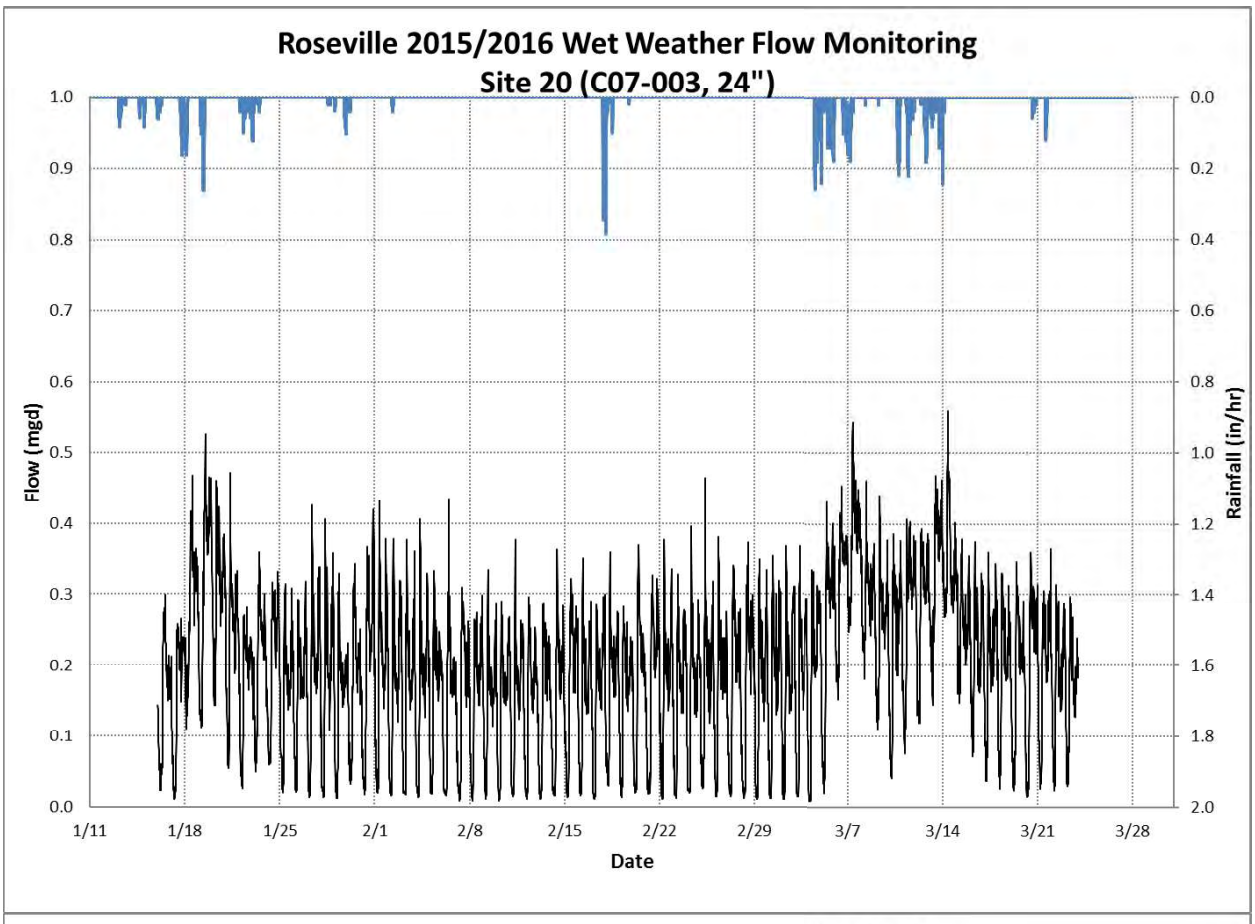

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 17 (B05-258, 21")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
6
5
4
3
2
1
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

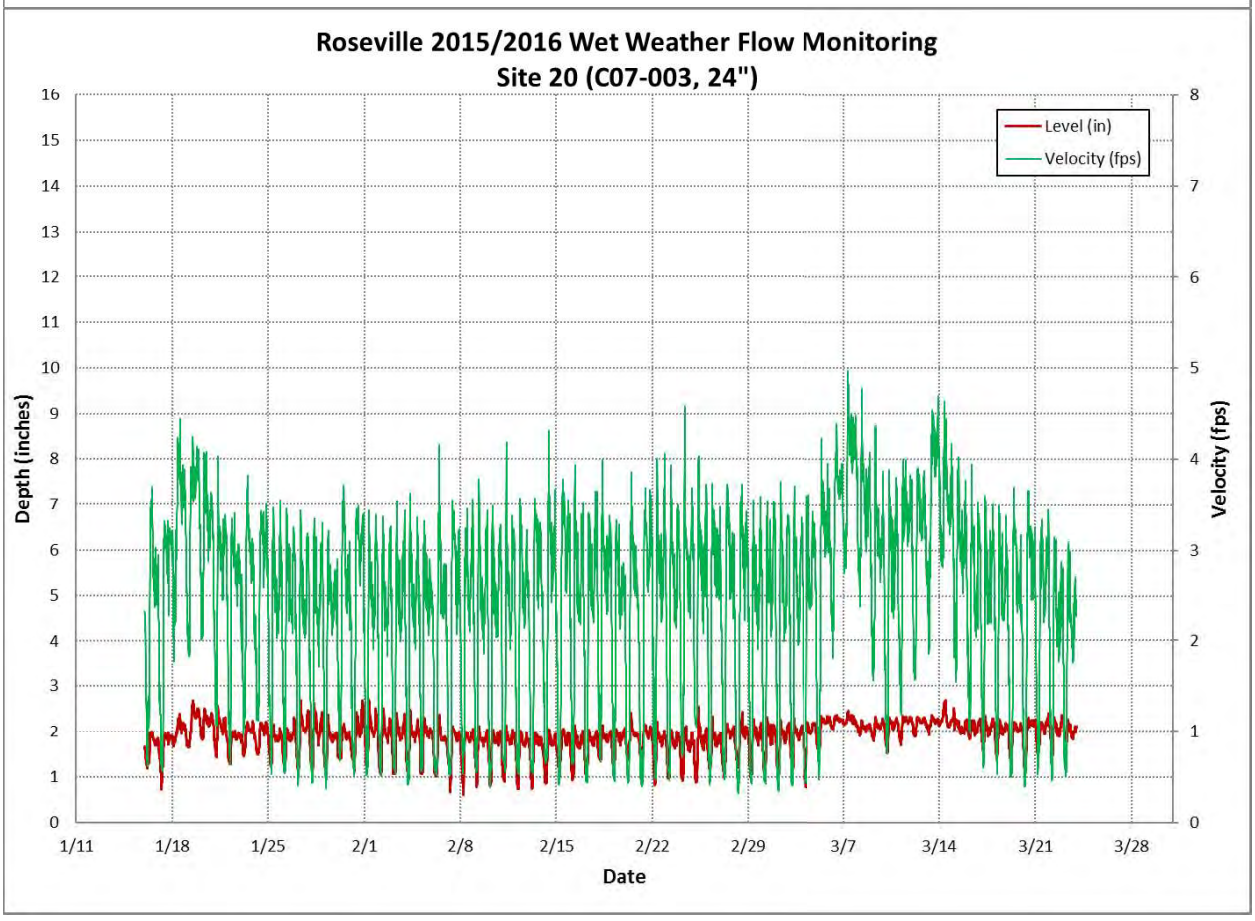

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 18 (B07-242, 22.5")
Flow (mgd)
Rainfall (in/hr)
Date
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

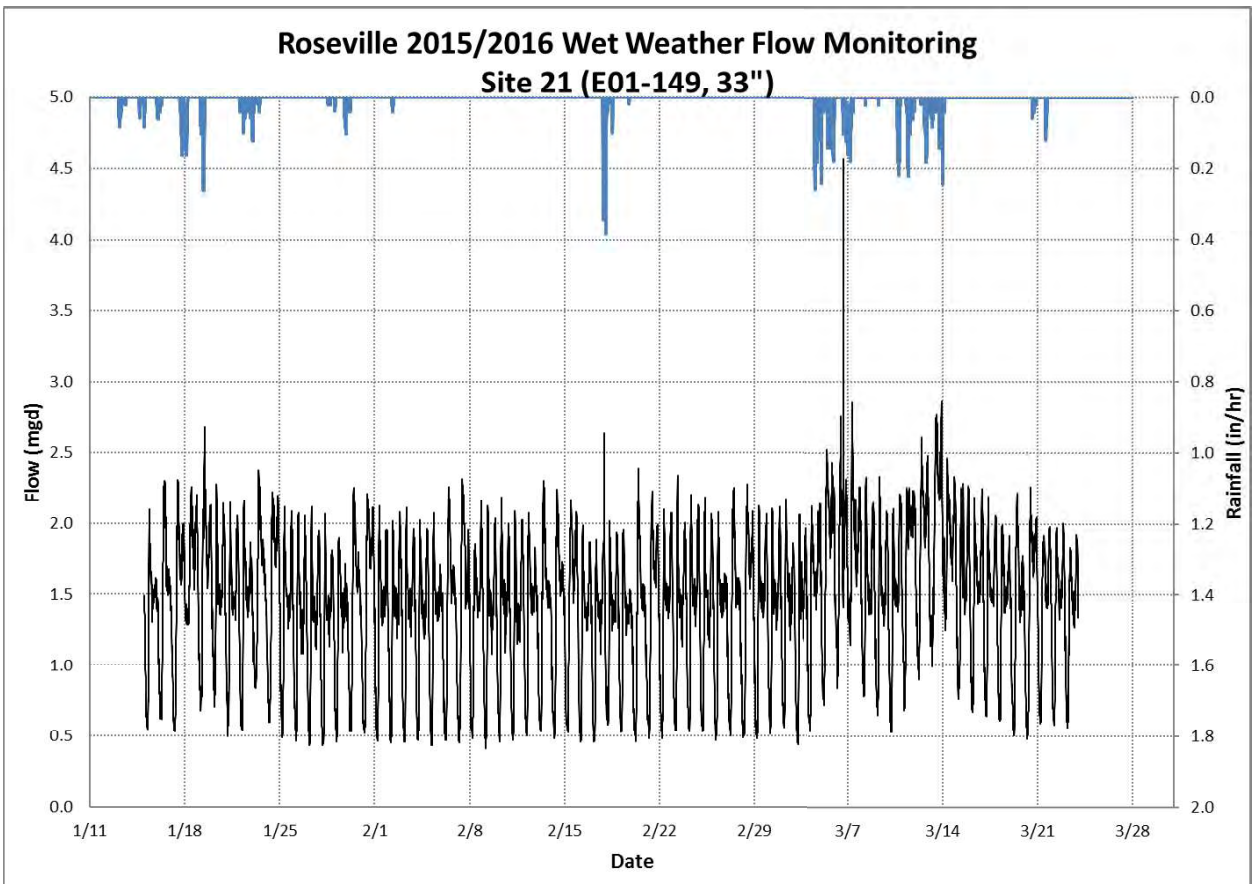

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 18 (B07-242, 22.5")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

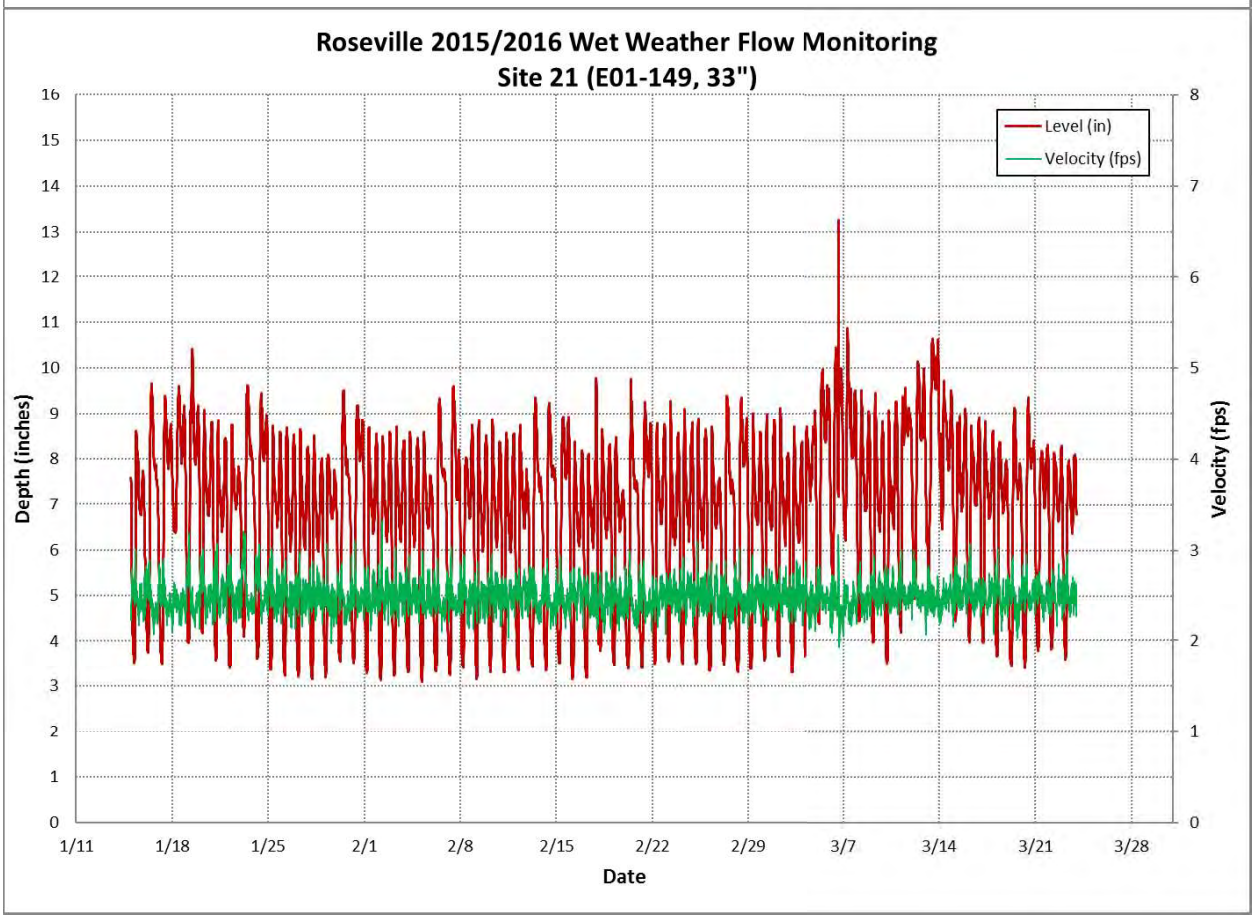

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 19 (C06-024, 35.5")
Flow (mgd)
Rainfall (in/hr)
Date
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

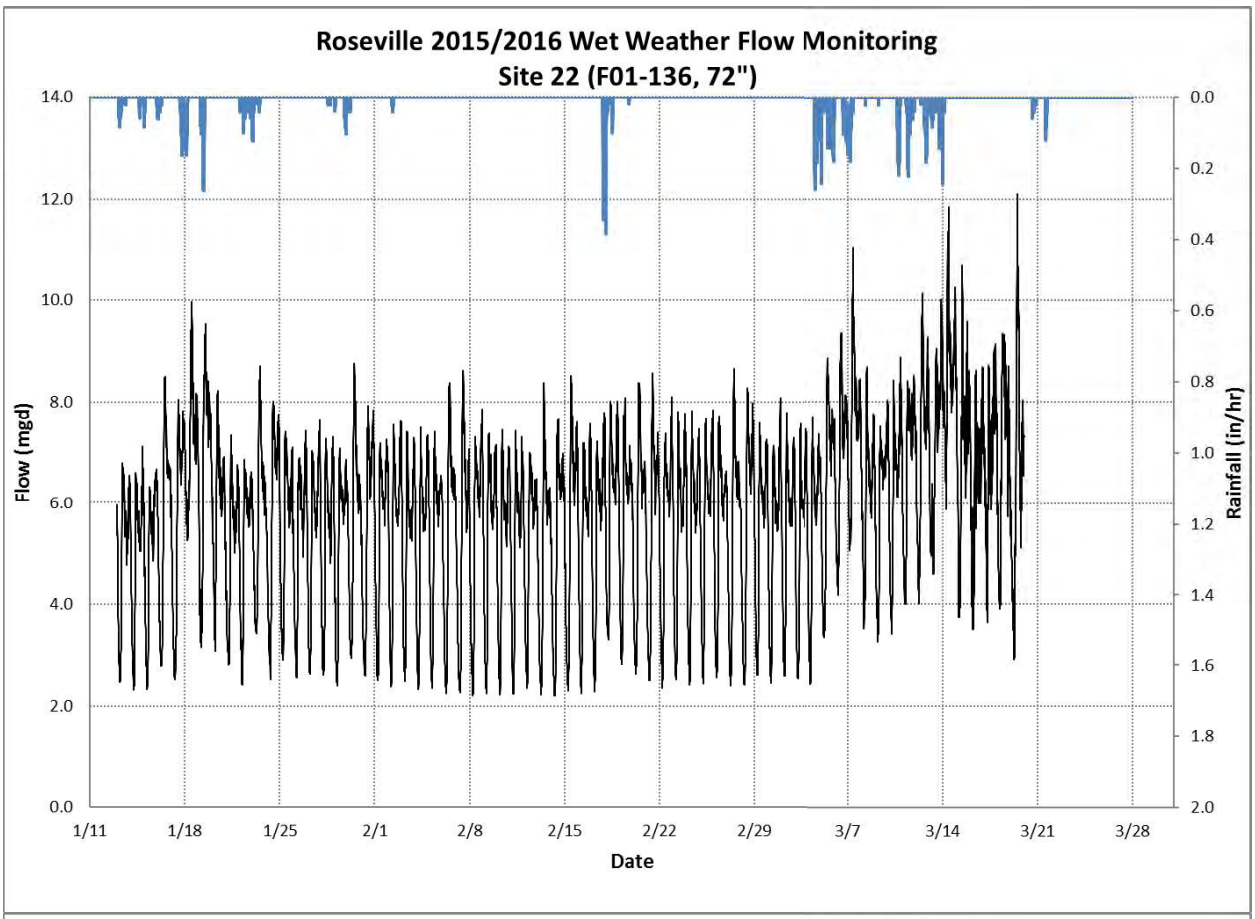

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 19 (C06-024, 35.5")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
13
12
11
10
9
8
7
6
5
4
3
2
1
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

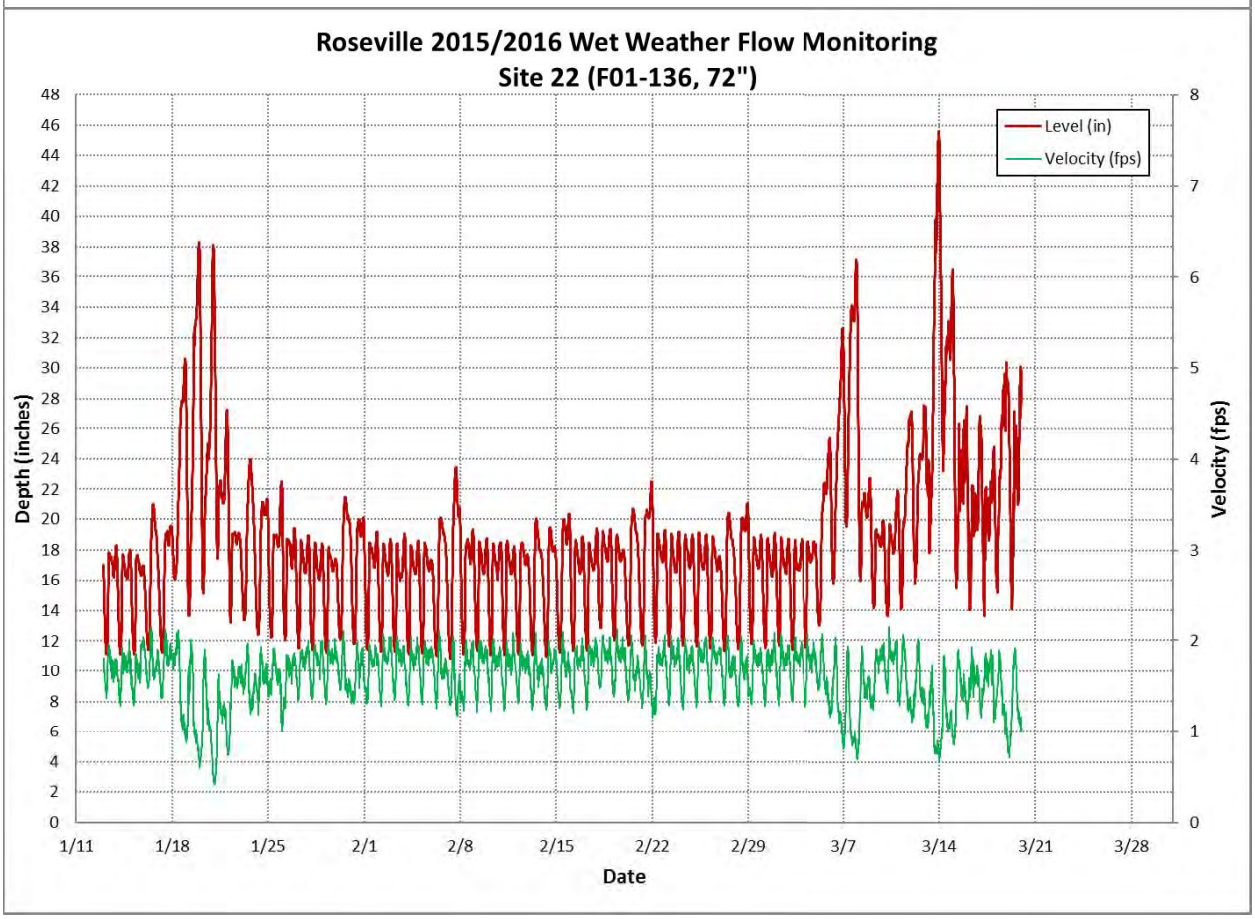

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 20 (C07-003, 24")
Flow (mgd)
Rainfall (in/hr)
Date
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

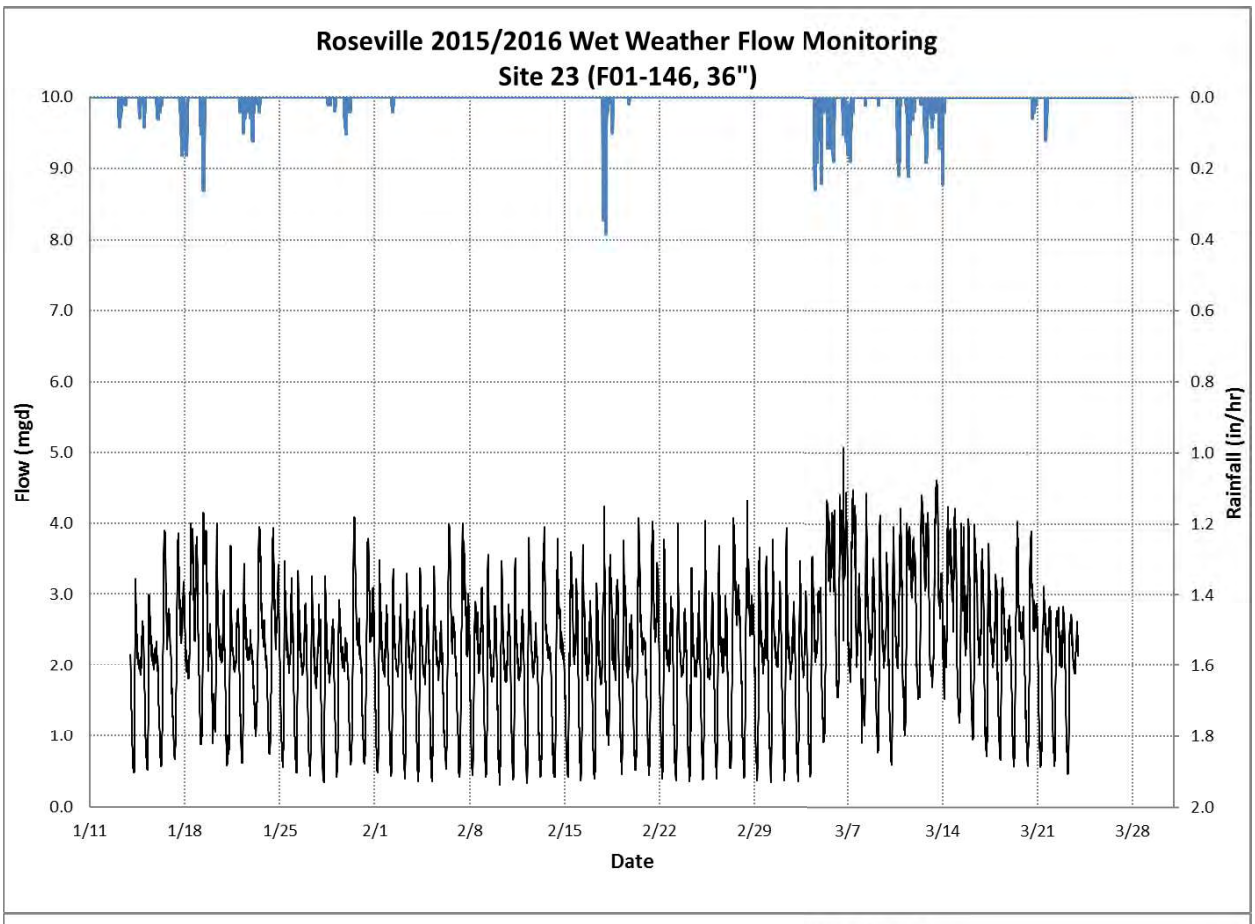

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 20 (C07-003, 24")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

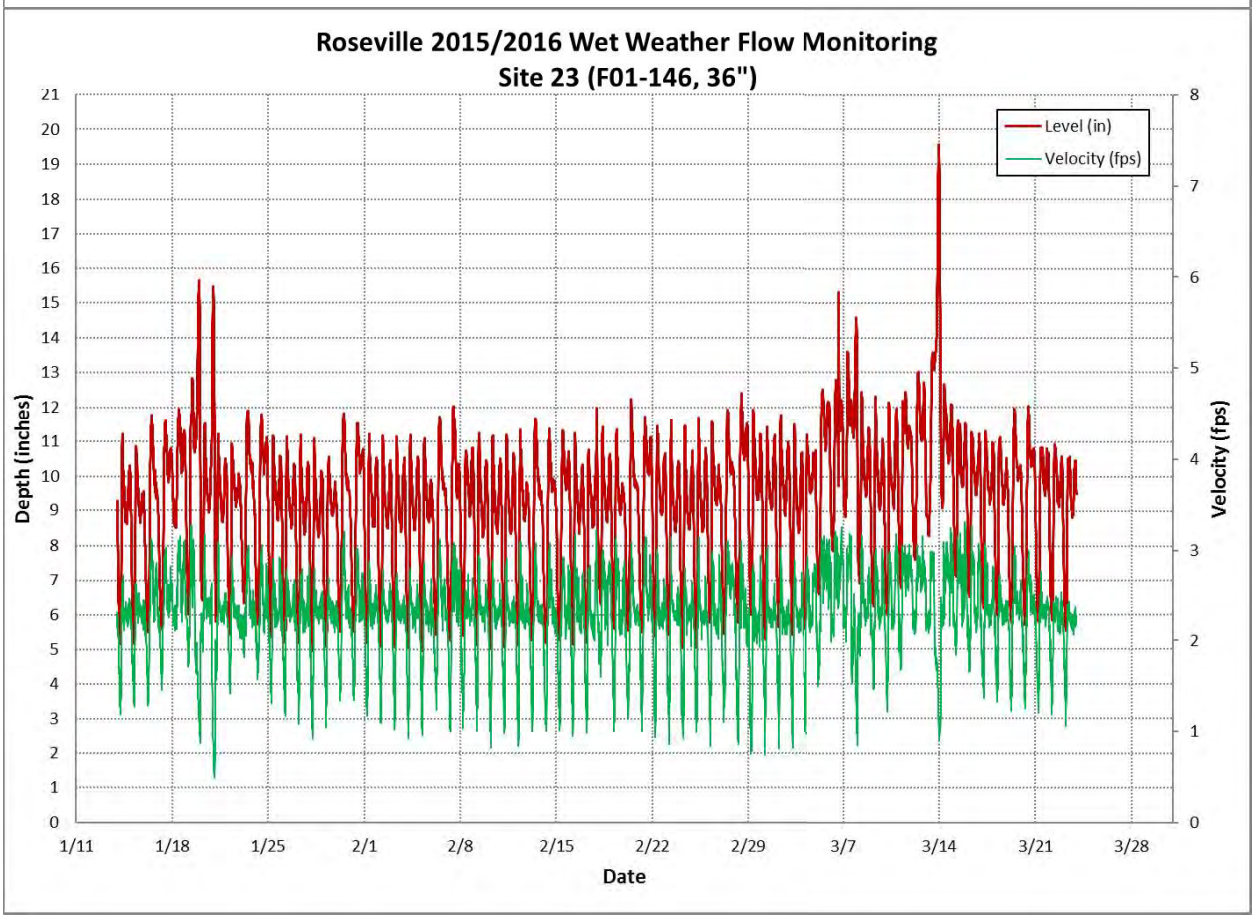

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 21 (E01-149, 33")
Flow (mgd)
Rainfall (in/hr)
Date
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

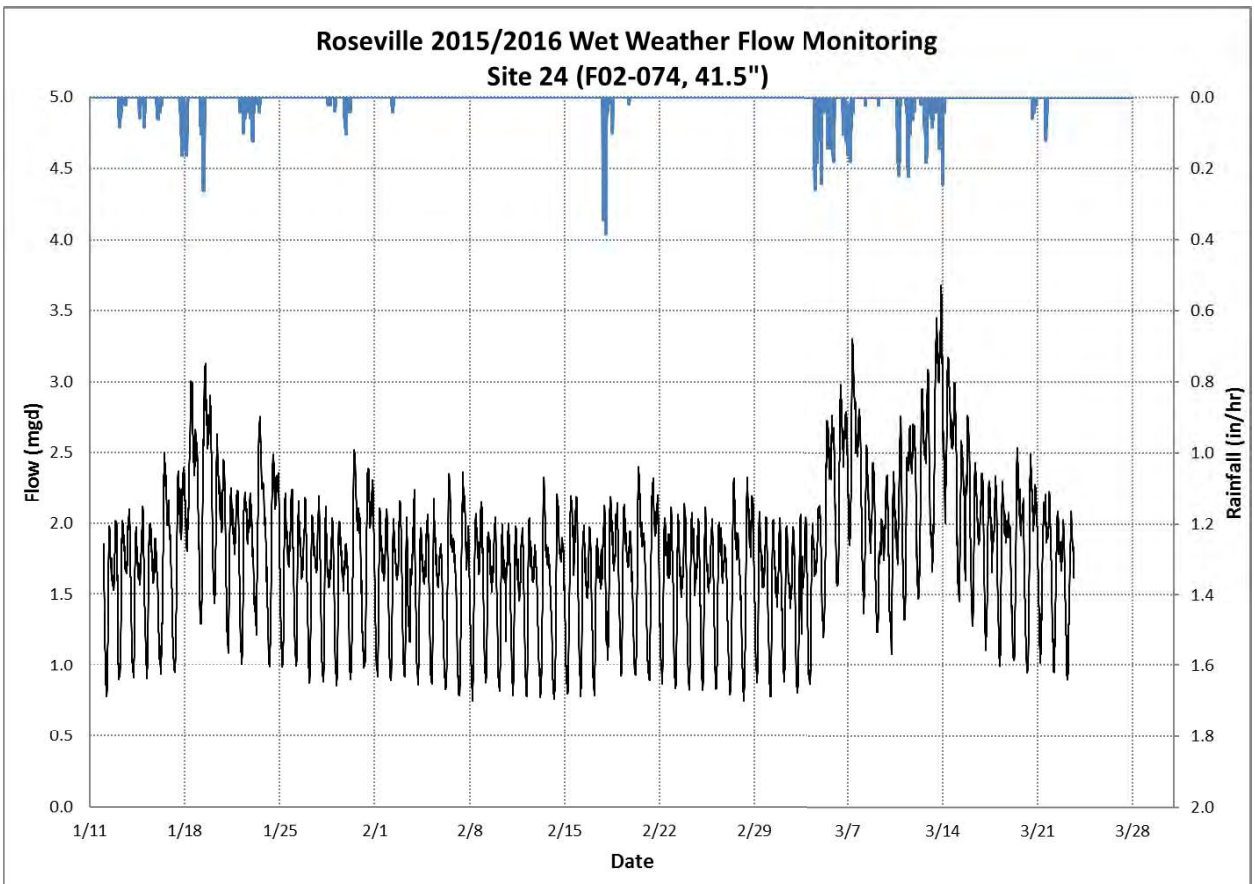

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 21 (E01-149, 33")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

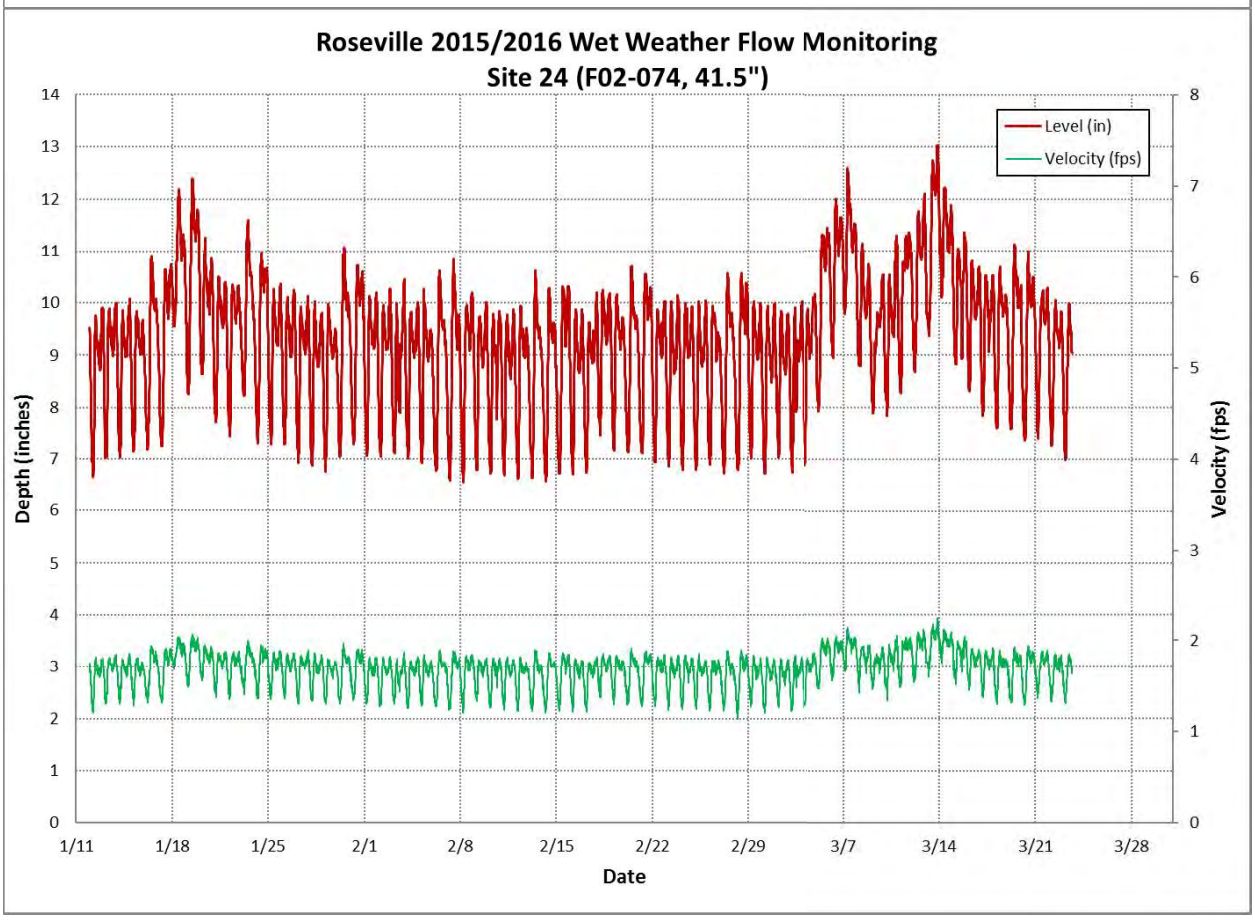

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 22 (F01-136, 72")
Flow (mgd)
Rainfall (in/hr)
Date
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

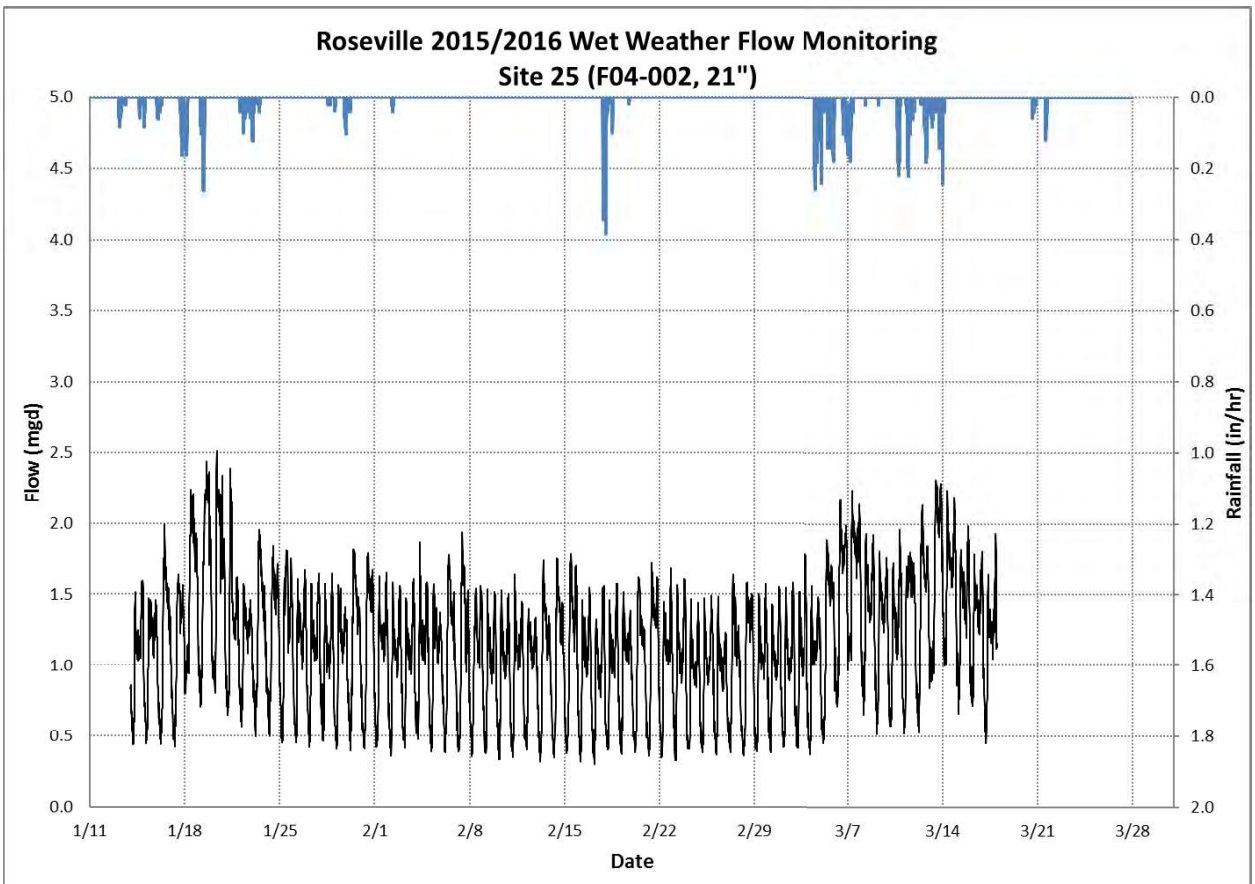

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 22 (F01-136, 72")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
48
46
44
42
40
38
36
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

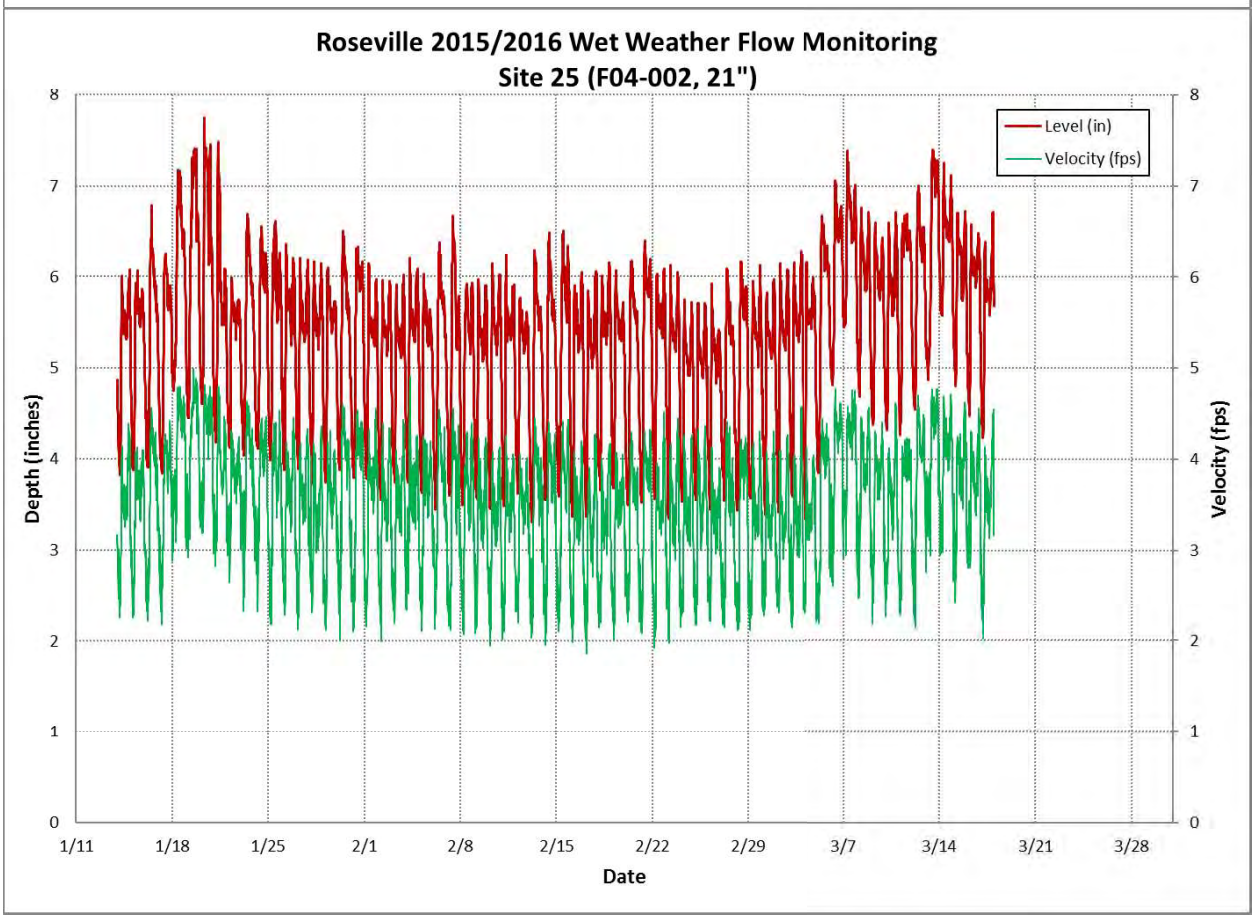

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 23 (F01-146, 36")
Flow (mgd)
Rainfall (in/hr)
Date
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

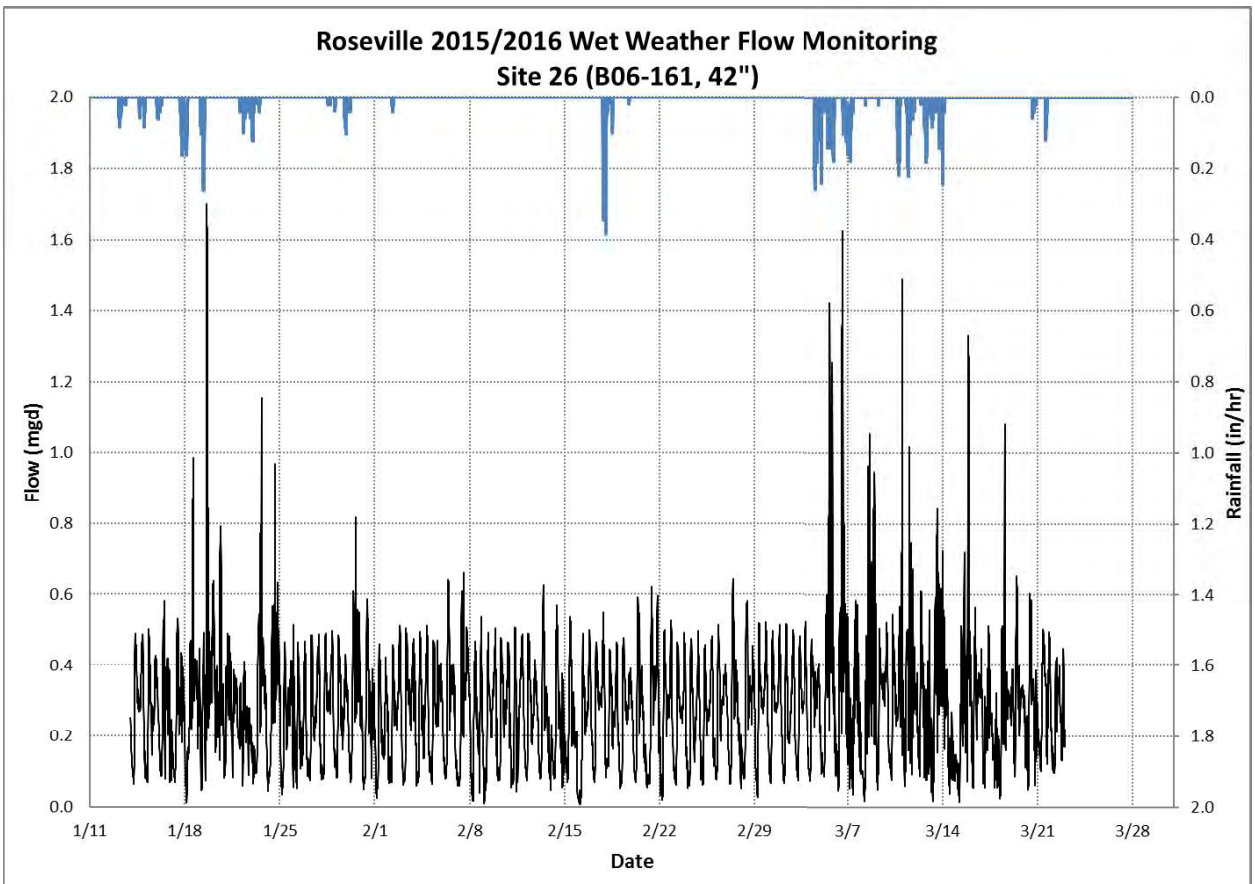

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 23 (F01-146, 36")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

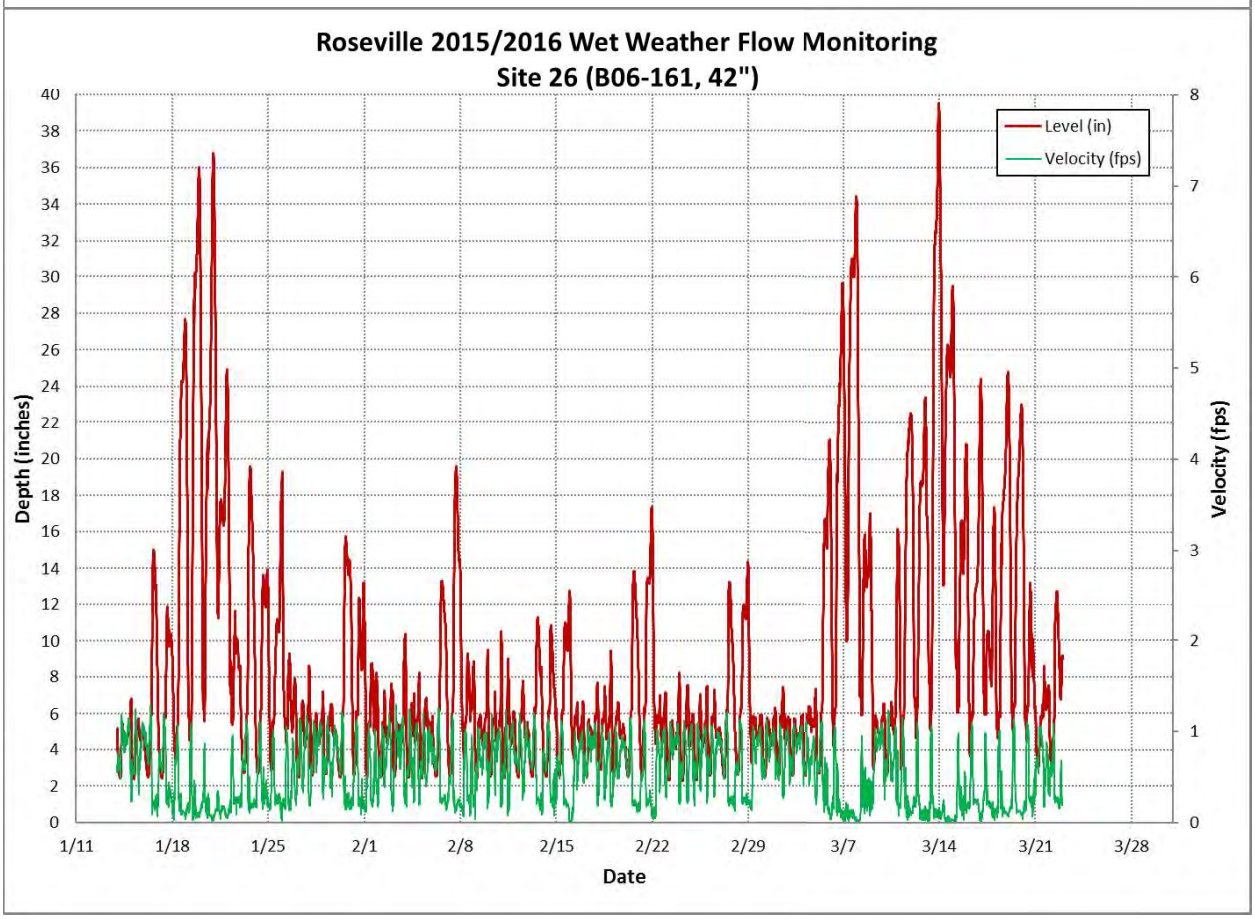

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 24 (F02-074, 41.5")
Flow (mgd)
Rainfall (in/hr)
Date
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

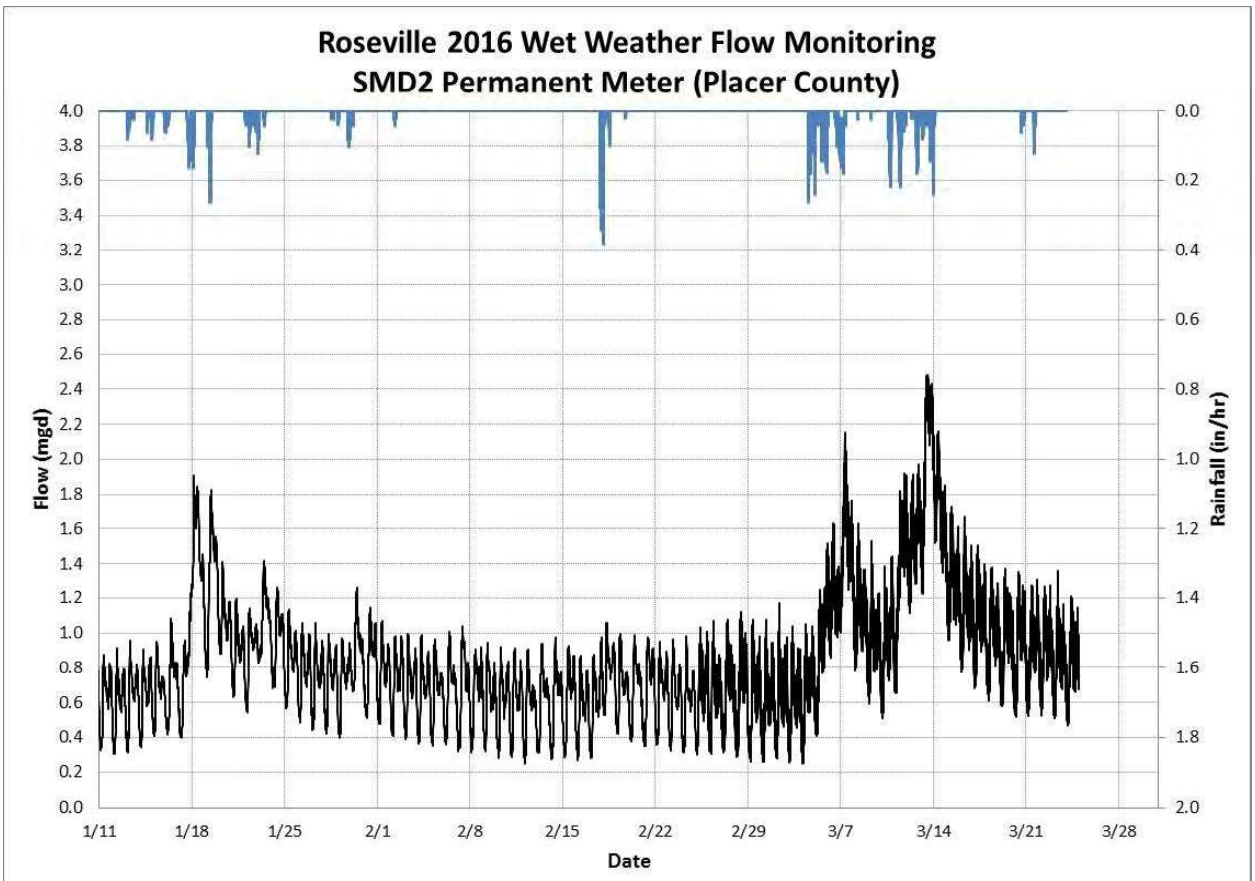

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 24 (F02-074, 41.5")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

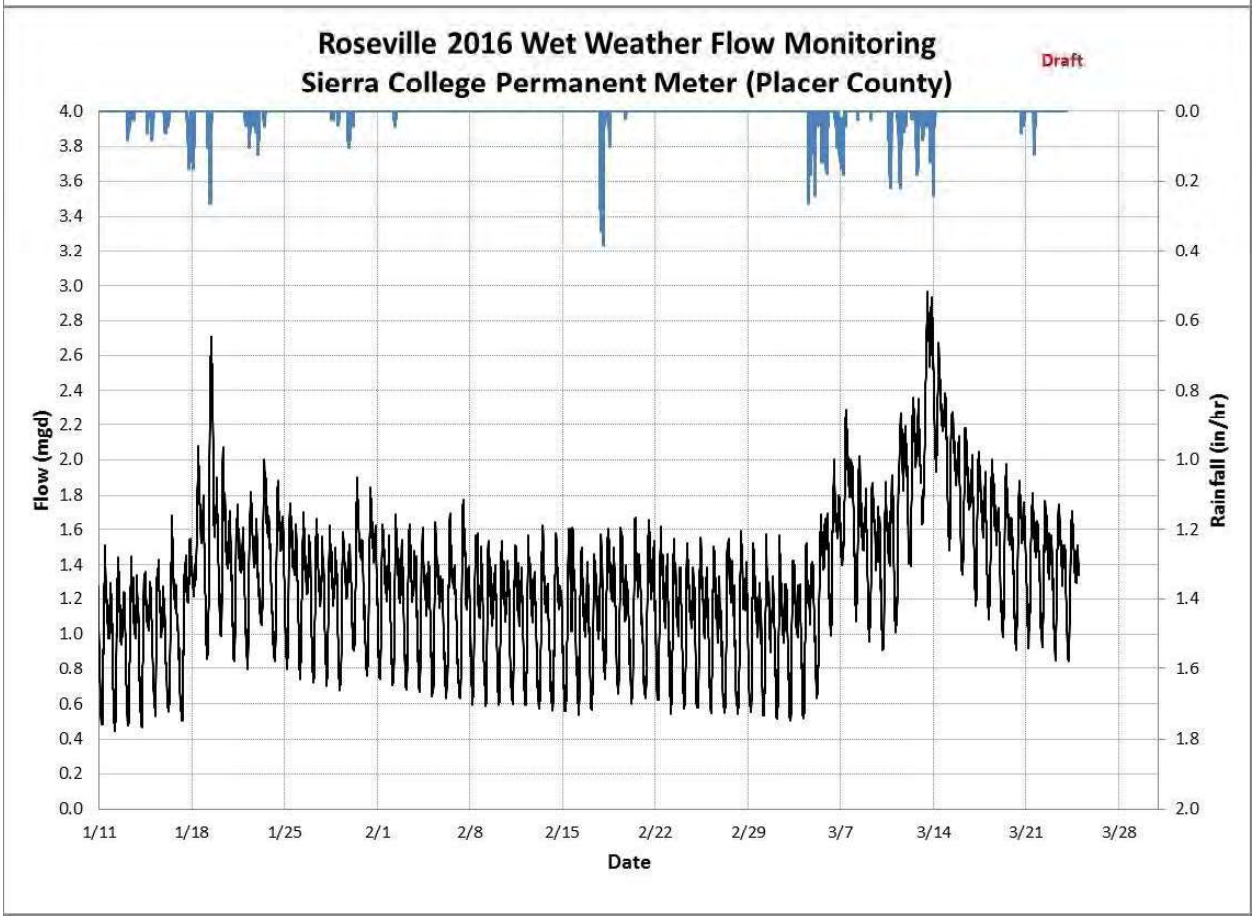

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 25 (F04-002, 21")
Flow (mgd)
Rainfall (in/hr)
Date
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

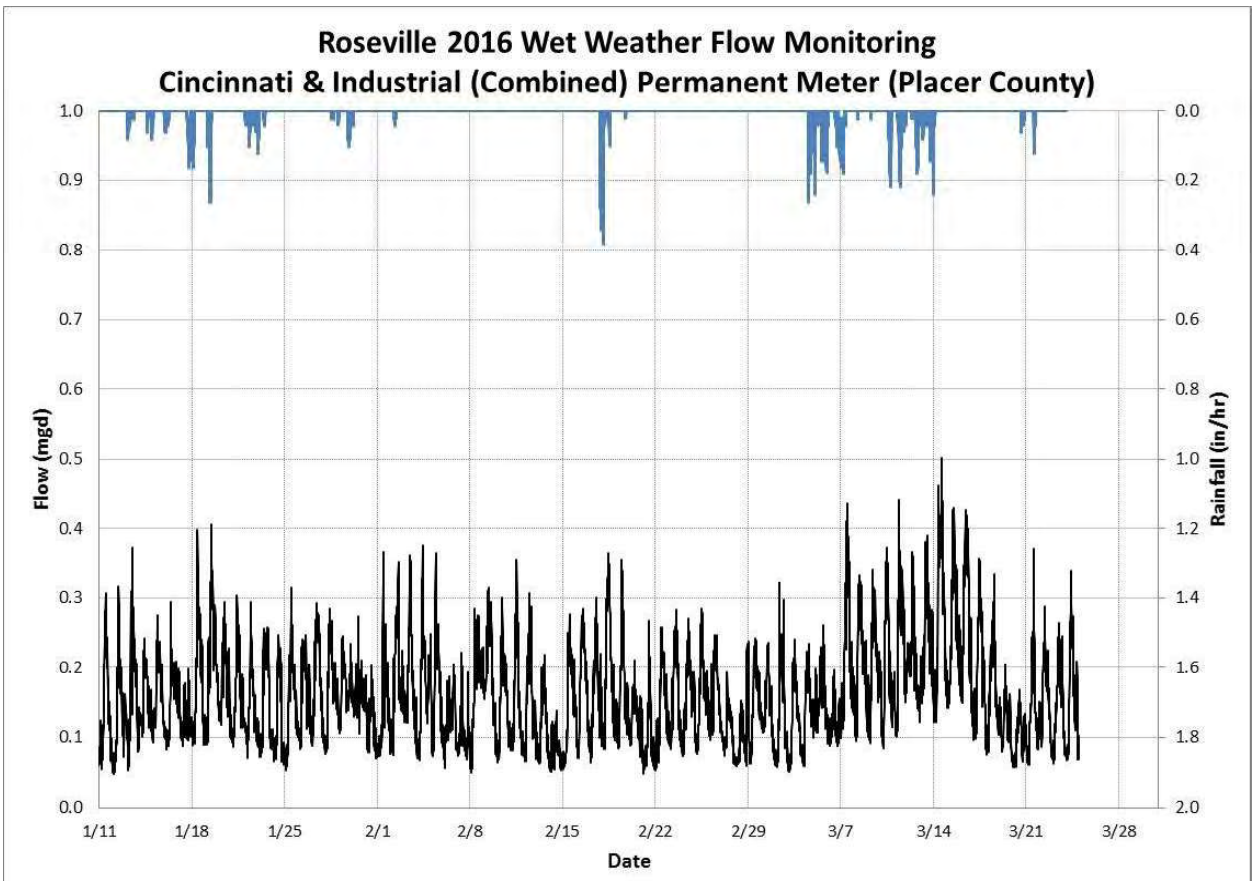

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 25 (F04-002, 21")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

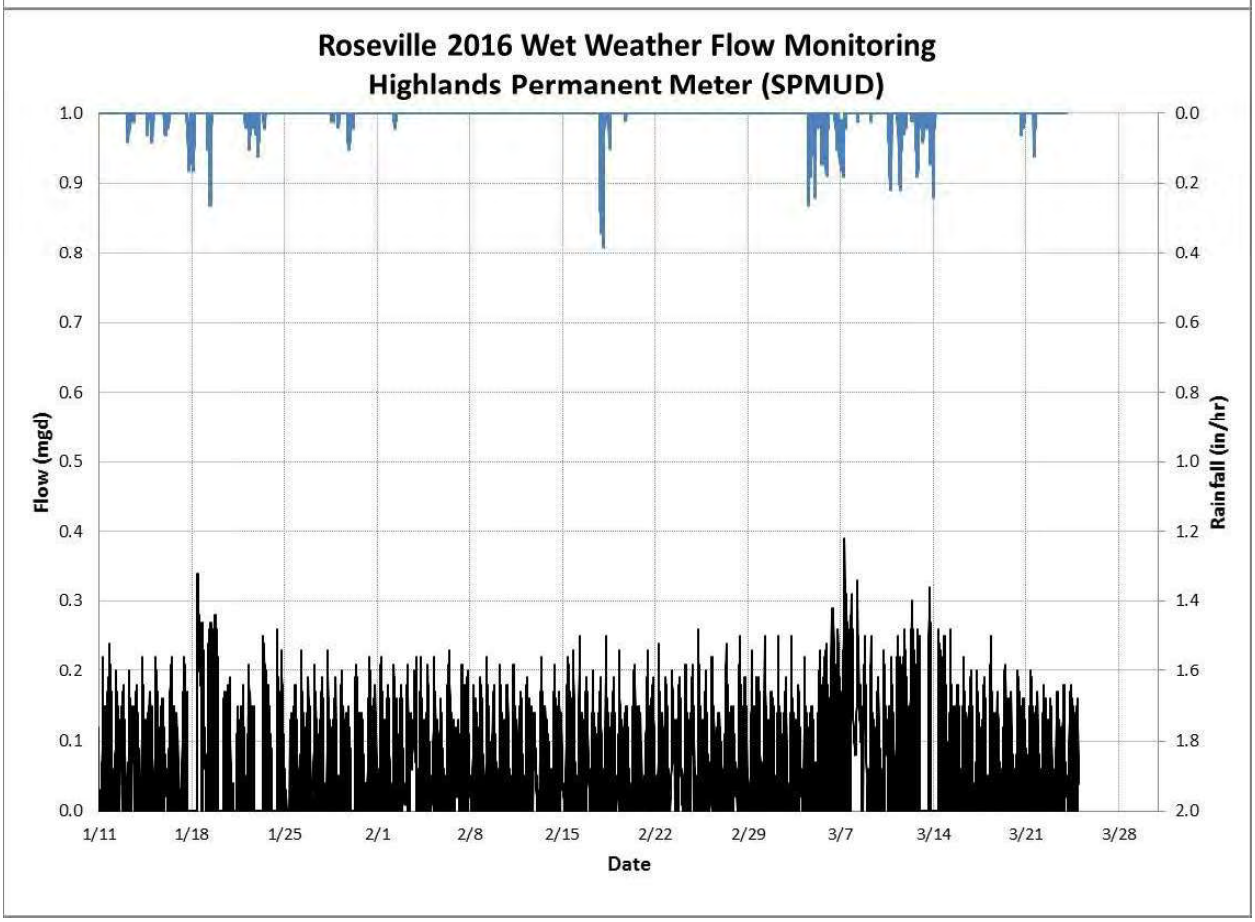

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 26 (B06-161, 42")
Flow (mgd)
Rainfall (in/hr)
Date
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

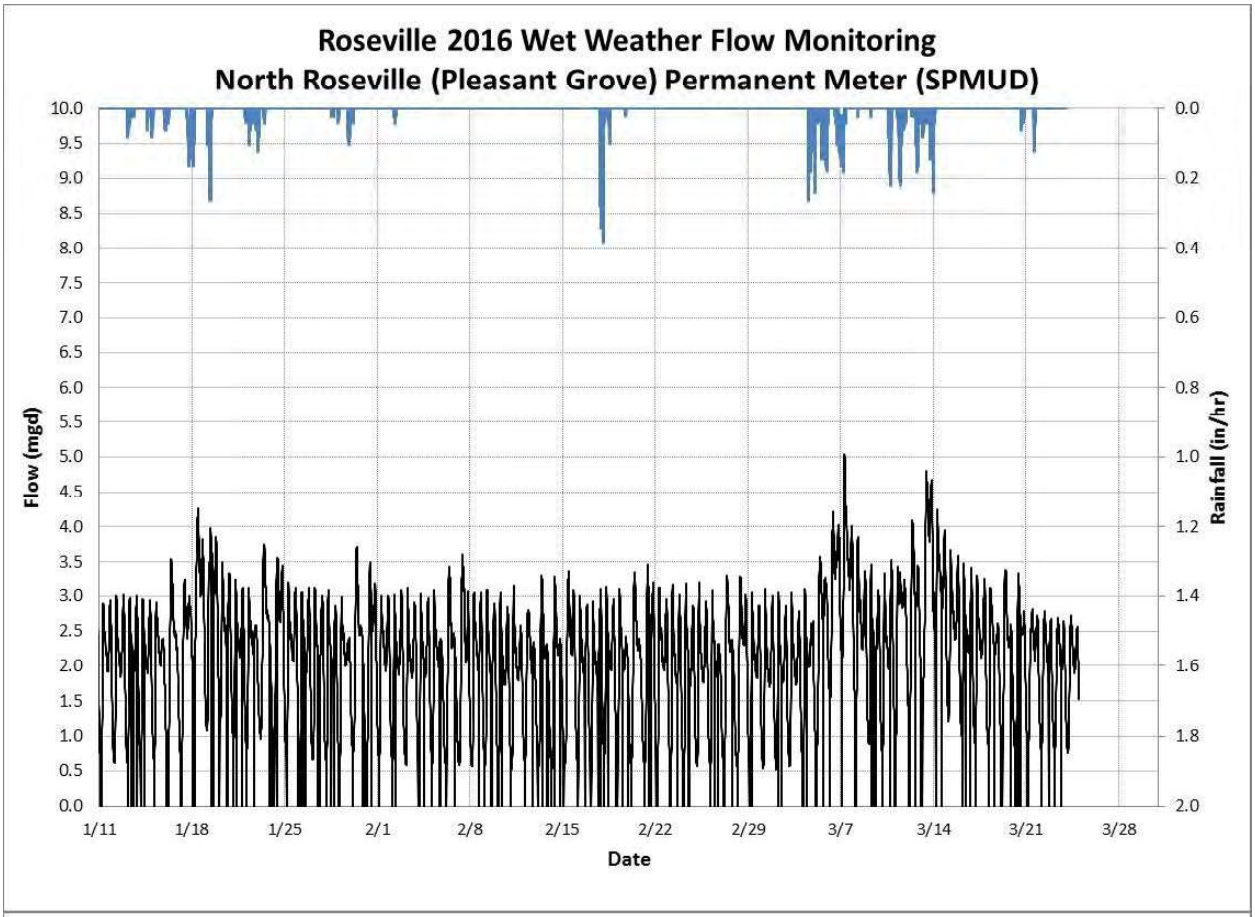

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 26 (B06-161, 42")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
40
38
36
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

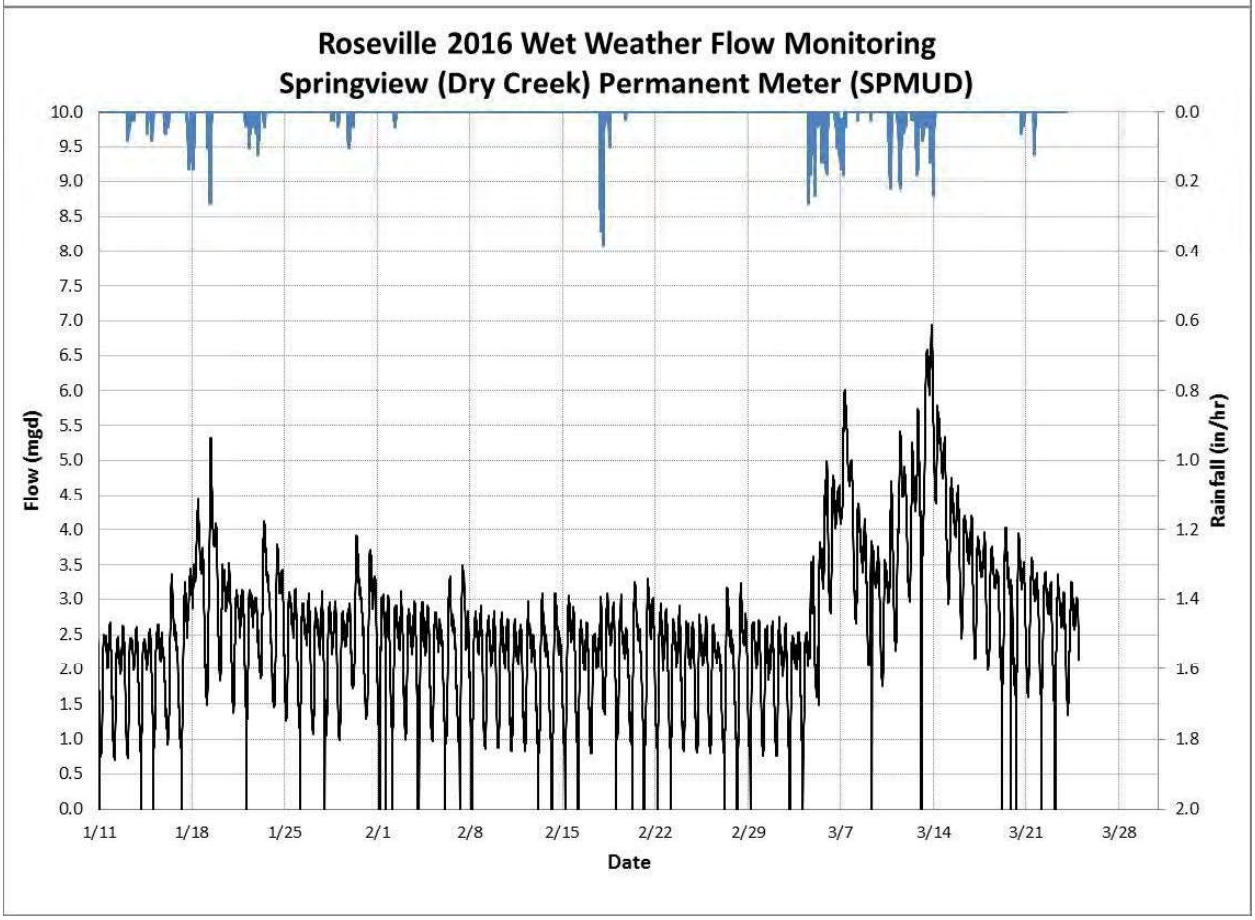

Roseville 2016 Wet Weather Flow Monitoring
SMD2 Permanent Meter (Placer County)
Flow (mgd)
Rainfall (in/hr)
Date
4.0
3.8
3.6
3.4
3.2
3.0
2.8
2.6
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

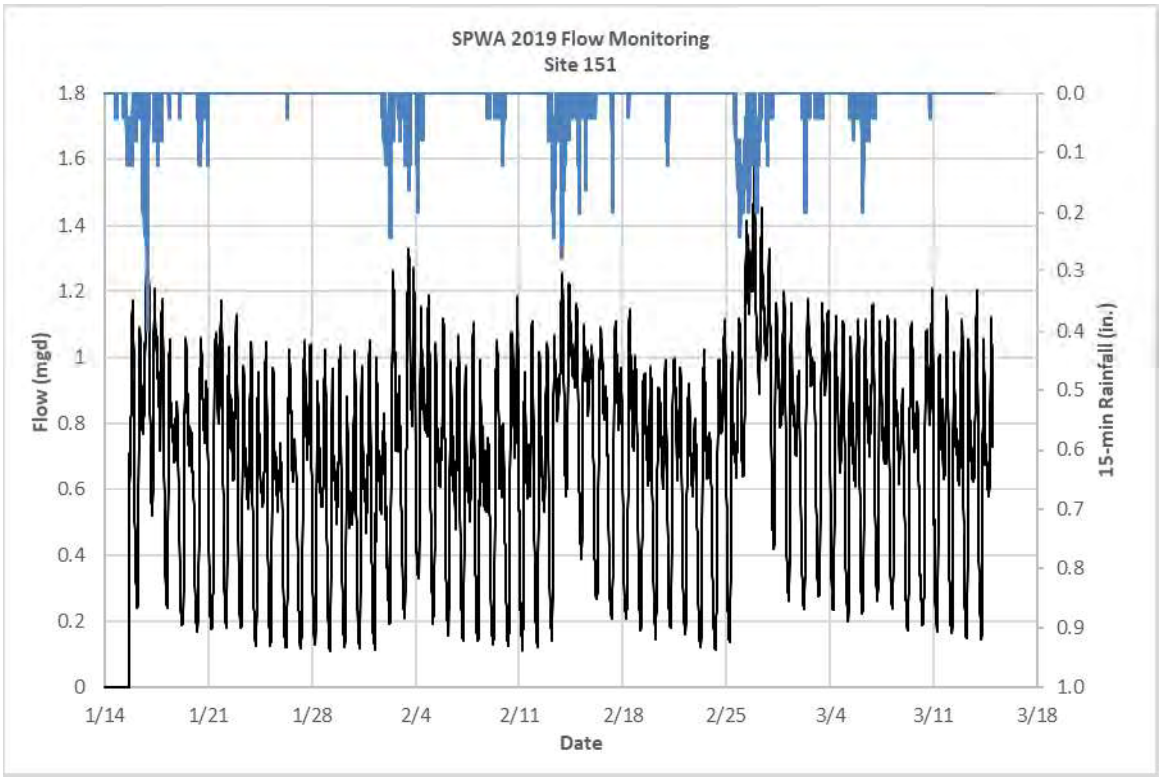

Roseville 2016 Wet Weather Flow Monitoring
Sierra College Permanent Meter (Placer County)
Draft
Flow (mgd)
Rainfall (in/hr)
Date
4.0
3.8
3.6
3.4
3.2
3.0
2.8
2.6
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

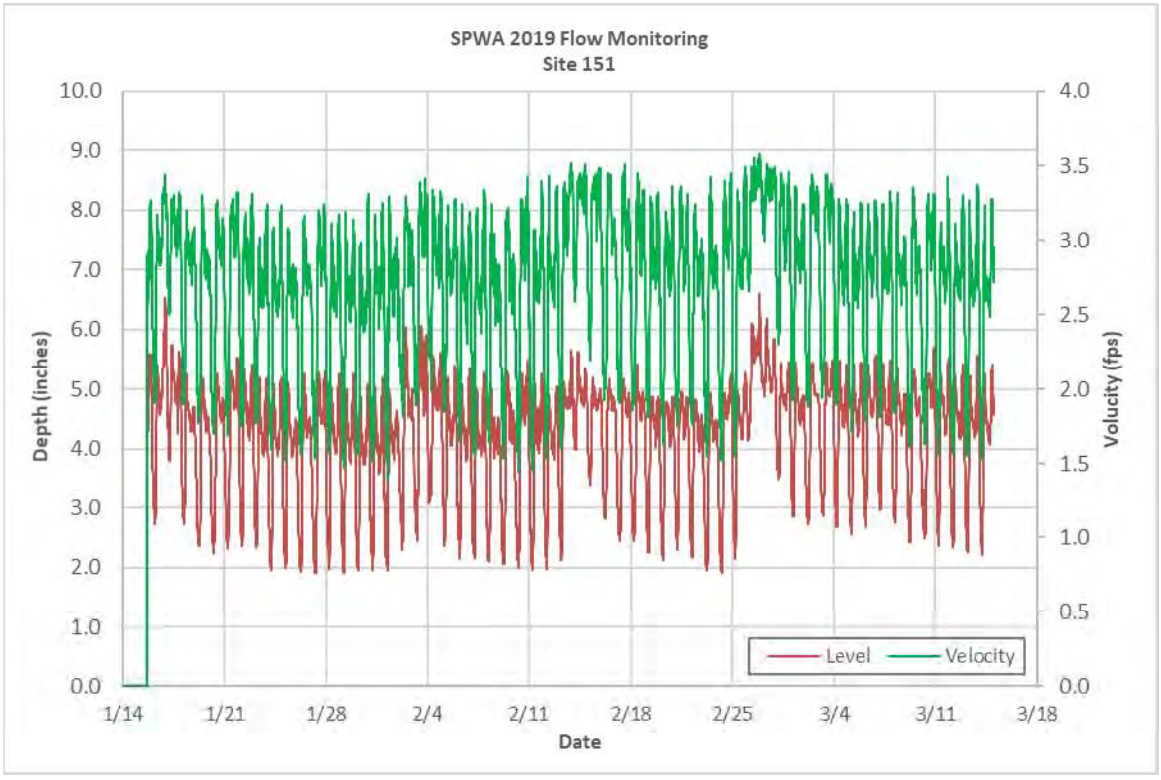

Roseville 2016 Wet Weather Flow Monitoring
Cincinnati & Industrial (Combined) Permanent Meter (Placer County)
Flow (mgd)
Rainfall (in/hr)
Date
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

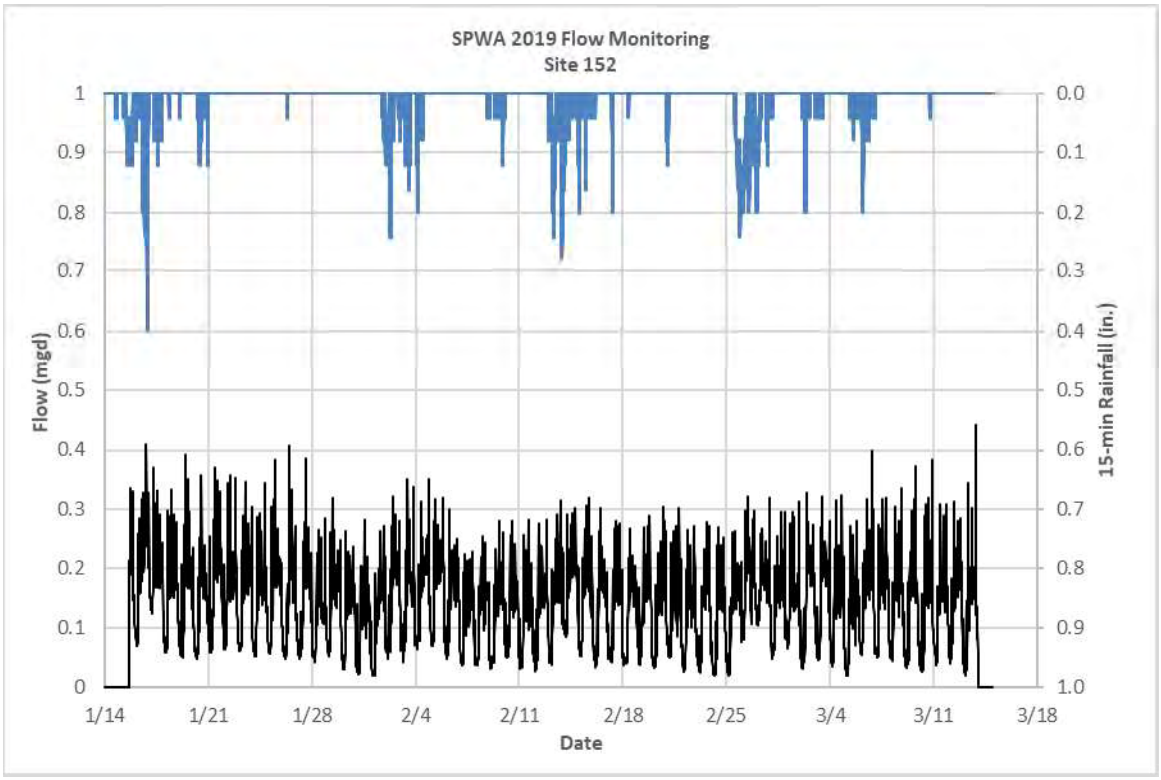

Roseville 2016 Wet Weather Flow Monitoring
Highlands Permanent Meter (SPMUD)
Flow (mgd)
Rainfall (in/hr)
Date
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

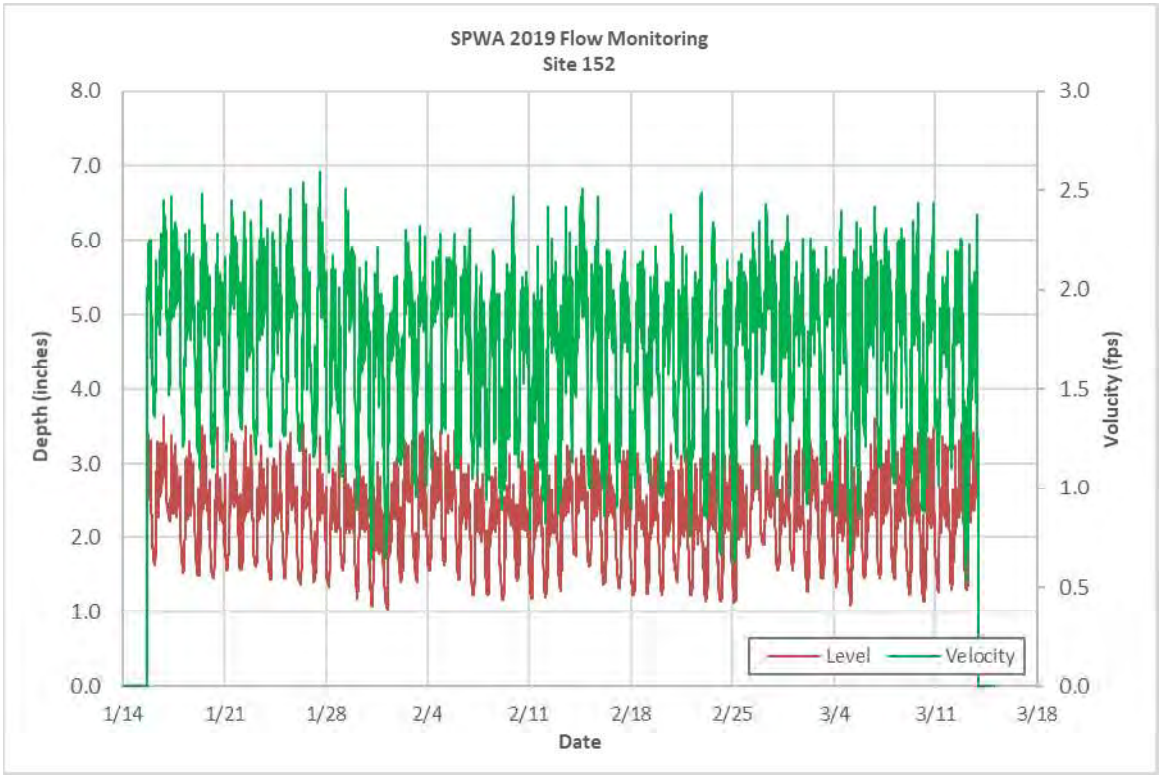

Roseville 2016 Wet Weather Flow Monitoring
North Roseville (Pleasant Grove) Permanent Meter (SPMUD)
Flow (mgd)
Rainfall (in/hr)
Date
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

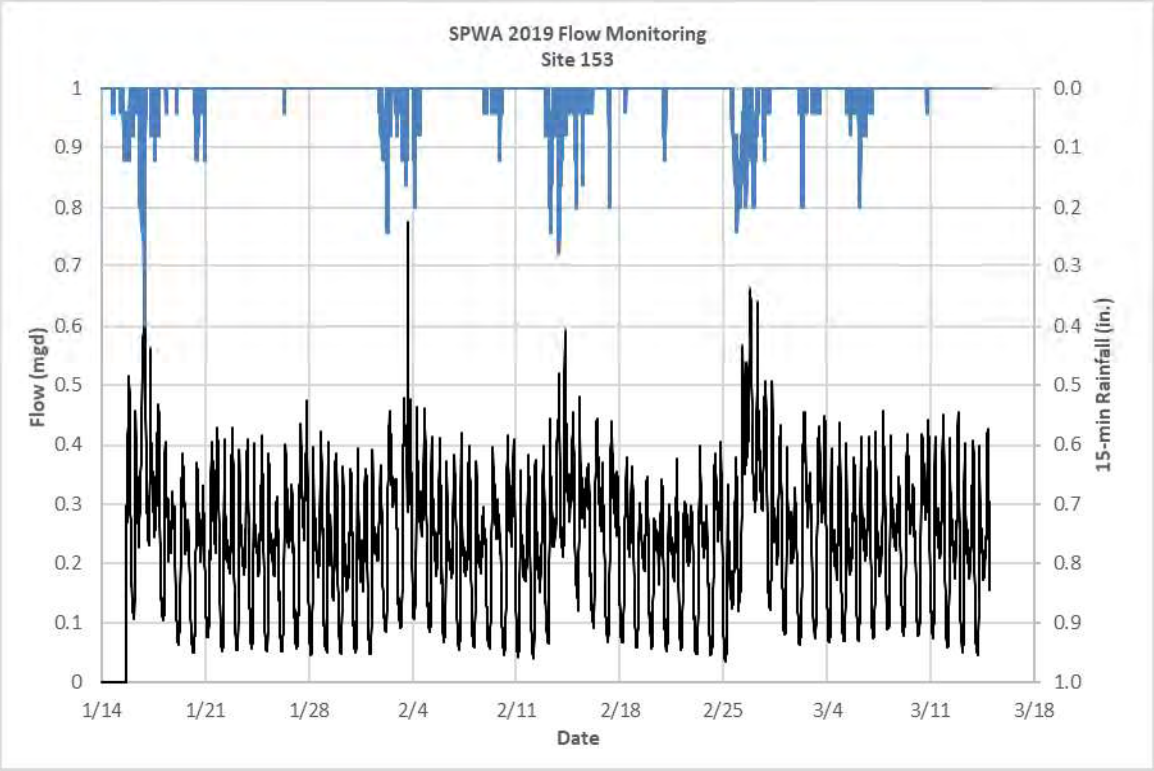

Roseville 2016 Wet Weather Flow Monitoring
Springview (Dry Creek) Permanent Meter (SPMUD)
Flow (mgd)
Rainfall (in/hr)
Date
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

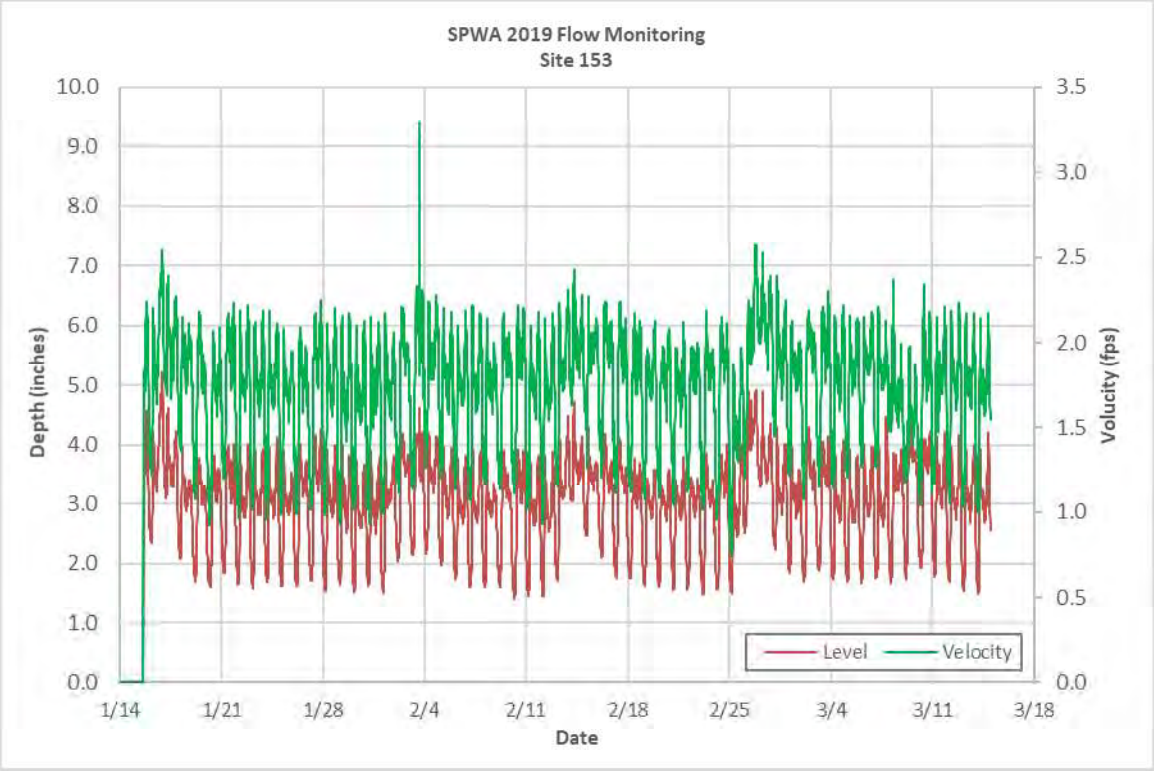

SPWA 2019 Flow Monitoring
Site 151
Flow (mgd)
15-min Rainfall (in.)
Date
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

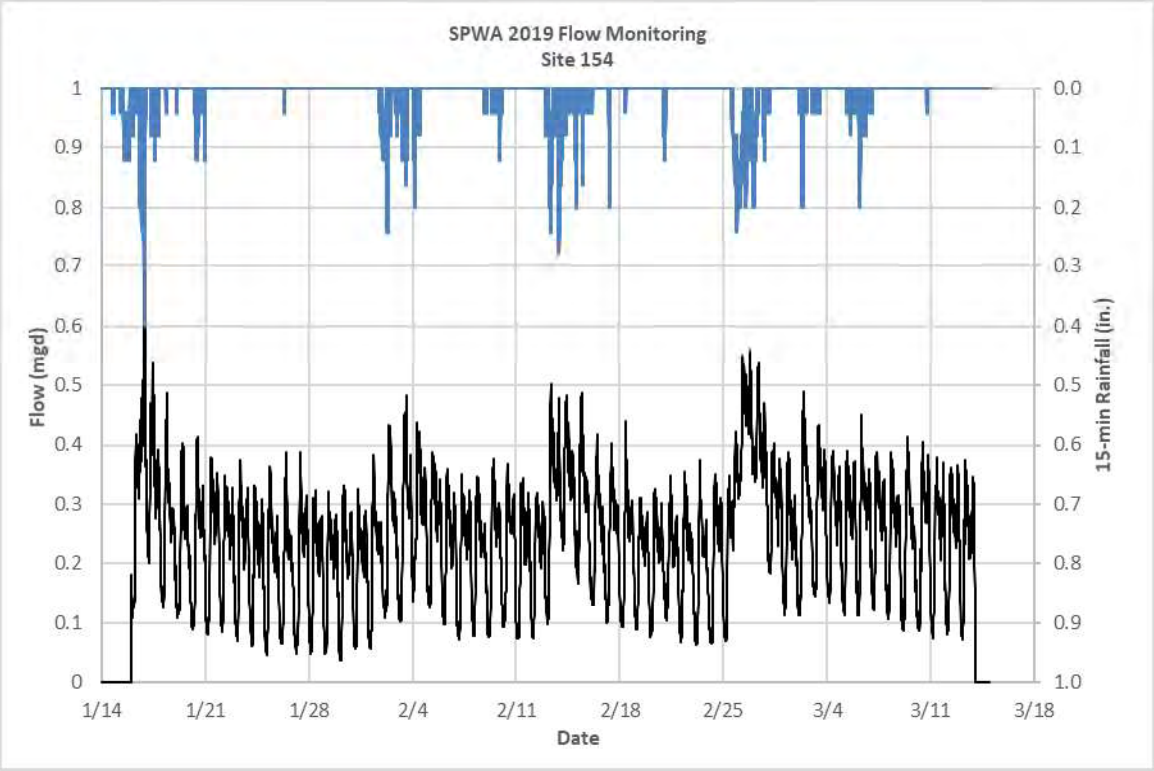

SPWA 2019 Flow Monitoring
Site 151
Depth (inches)
Volucity (fps)
Date
Level
Velocity
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

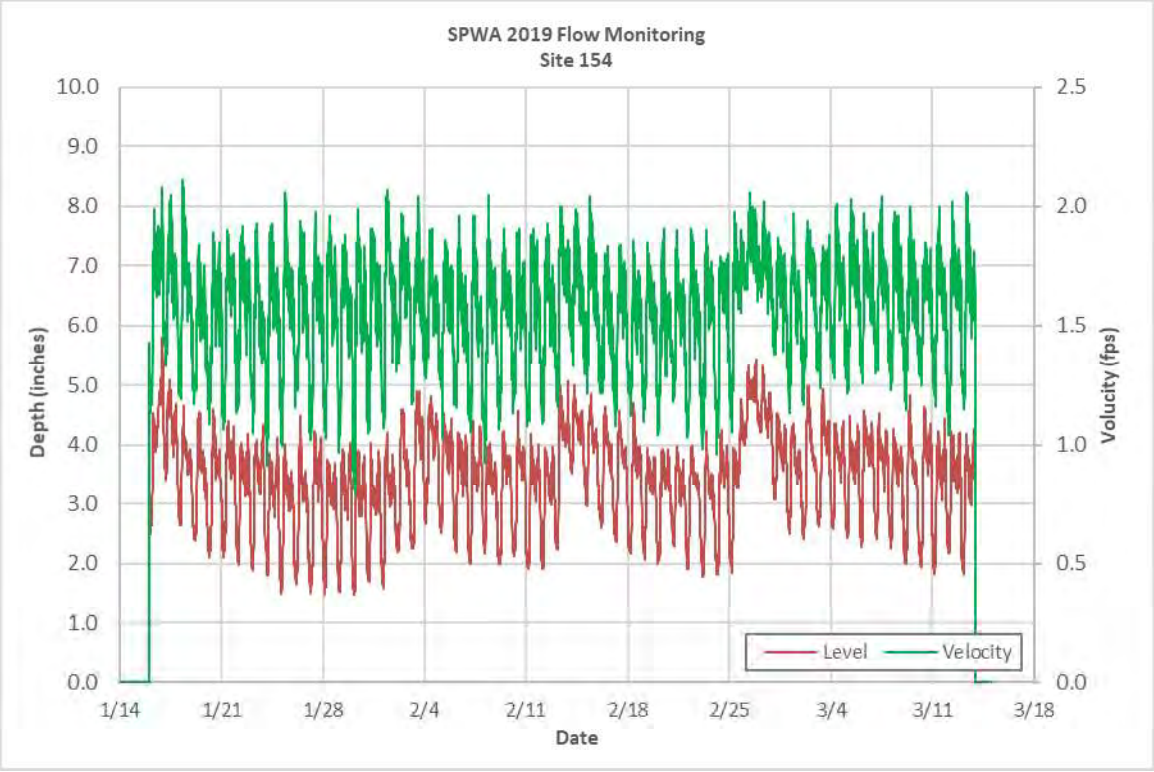

SPWA 2019 Flow Monitoring
Site 152
Flow (mgd)
15-min Rainfall (in.)
Date
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

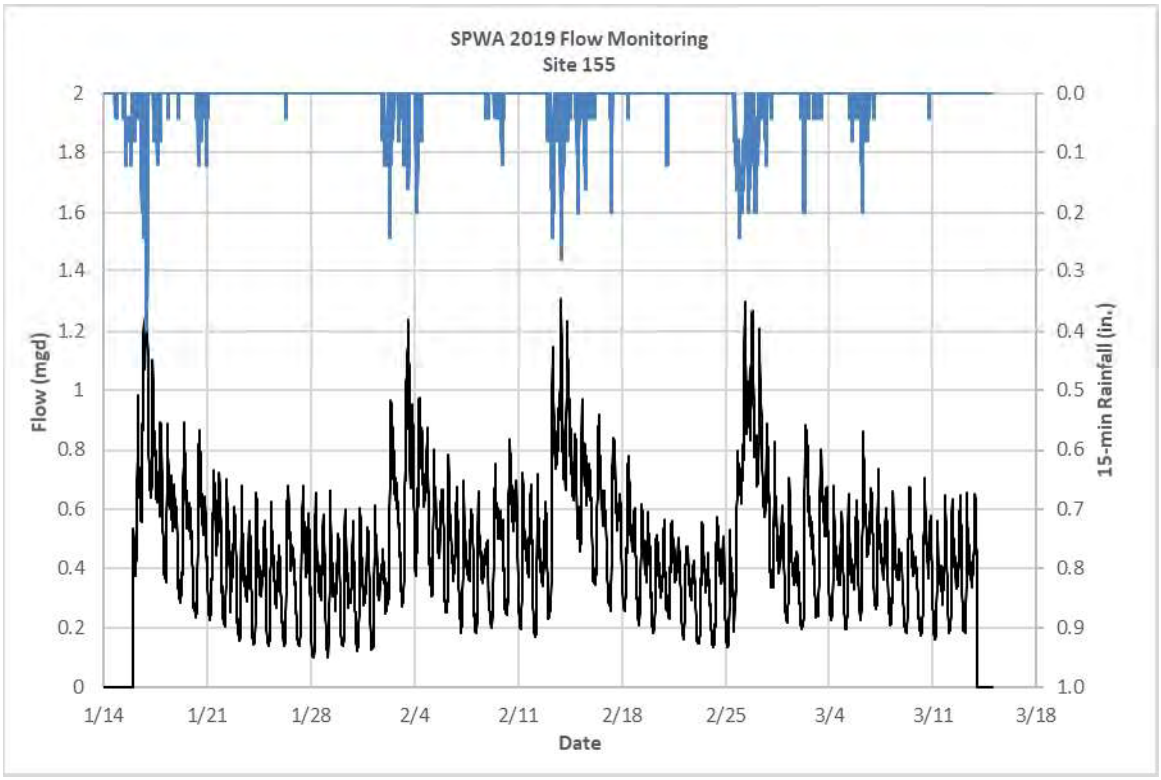

SPWA 2019 Flow Monitoring
Site 152
Depth (inches)
Volucity (fps)
Date
Level
Velocity
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18


SPWA 2019 Flow Monitoring
Site 153
Flow (mgd)
15-min Rainfall (in.)
Date
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

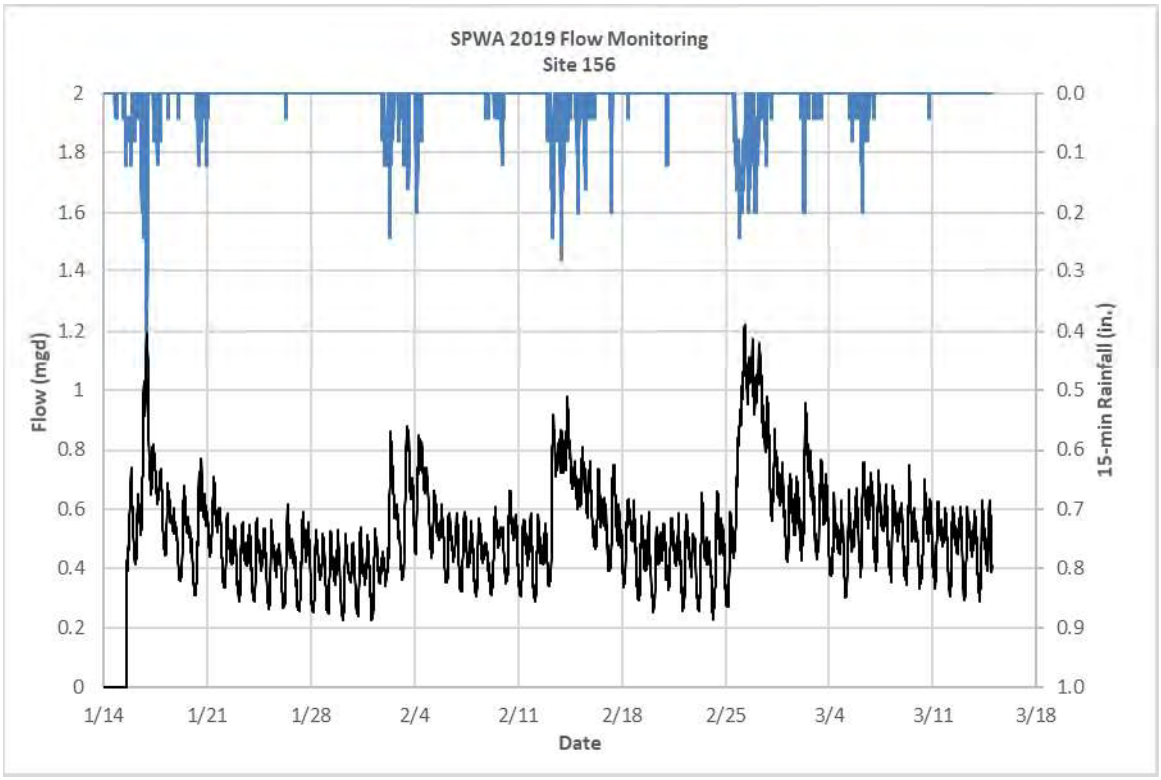

SPWA 2019 Flow Monitoring
Site 153
Depth (inches)
Volucity (fps)
Date
Level
Velocity
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18


SPWA 2019 Flow Monitoring
Site 154
Flow (mgd)
15-min Rainfall (in.)
Date
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

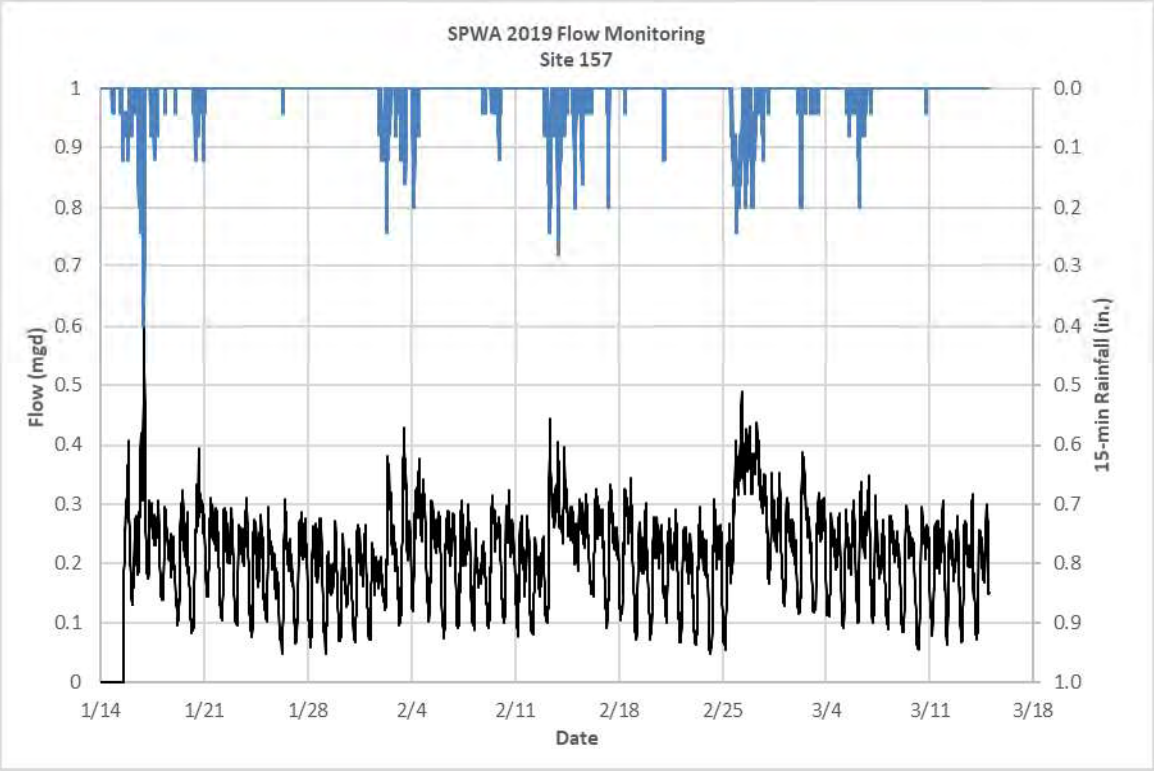

SPWA 2019 Flow Monitoring
Site 154
Depth (inches)
Volucity (fps)
Date
Level
Velocity
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2.5
2.0
1.5
1.0
0.5
0.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

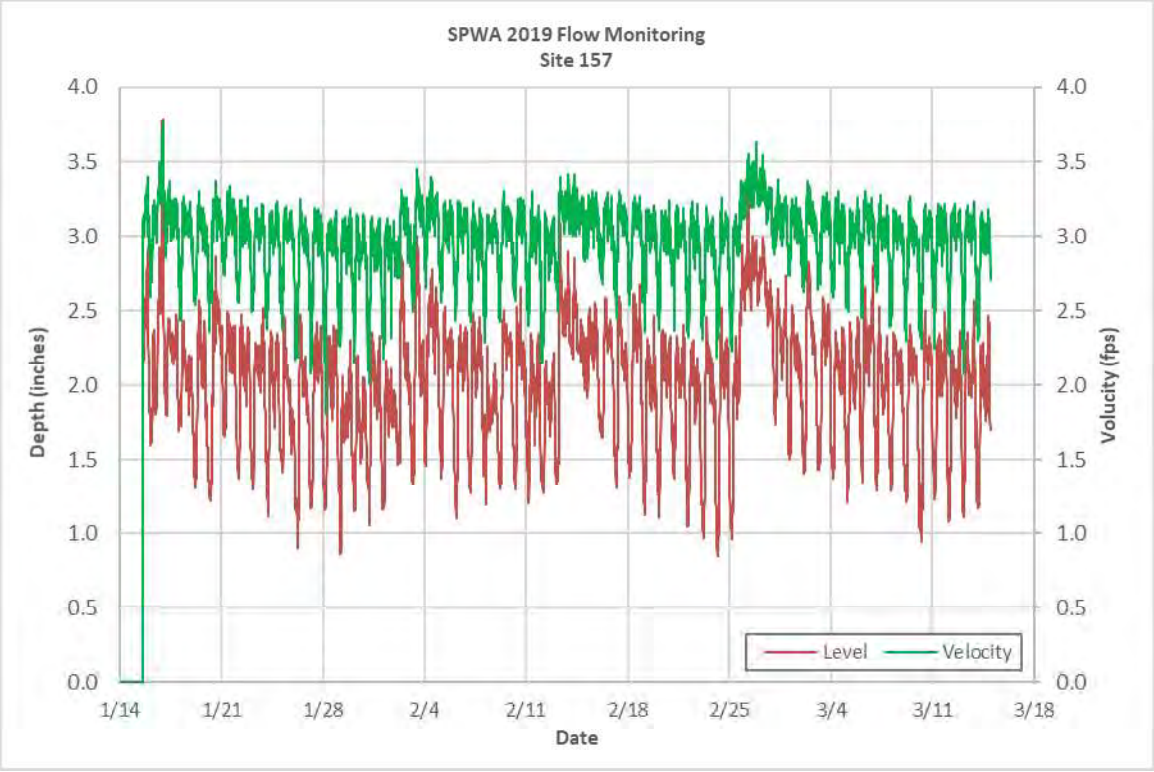

SPWA 2019 Flow Monitoring
Site 155
Flow (mgd)
15-min Rainfall (in.)
Date
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

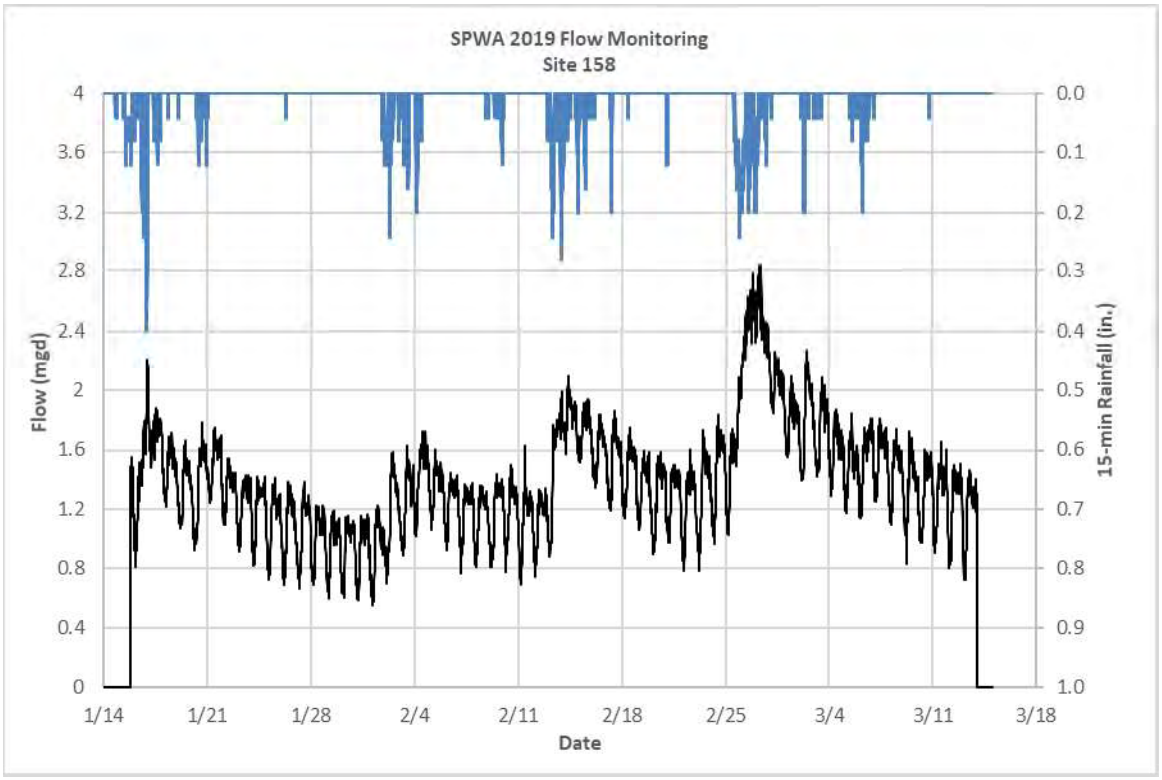

SPWA 2019 Flow Monitoring
Site 155
Depth (inches)
Volucity (fps)
Date
Level
Velocity
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

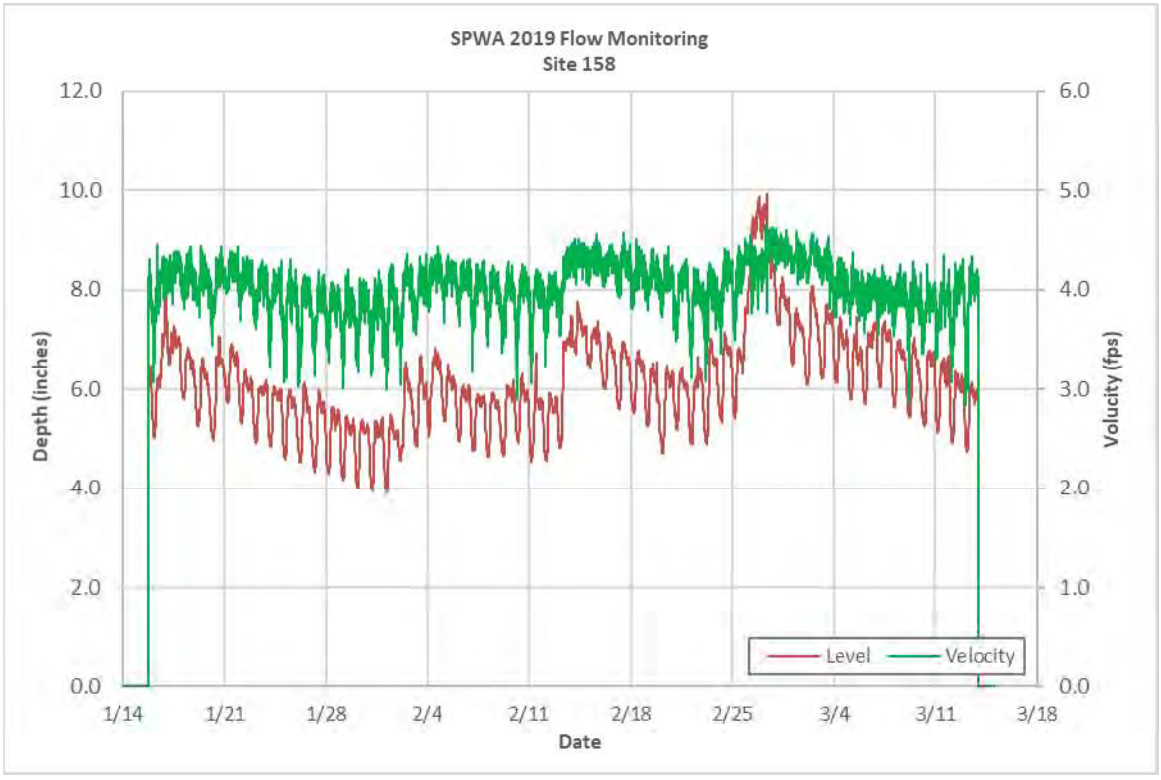

SPWA 2019 Flow Monitoring
Site 156
Flow (mgd)
15-min Rainfall (in.)
Date
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

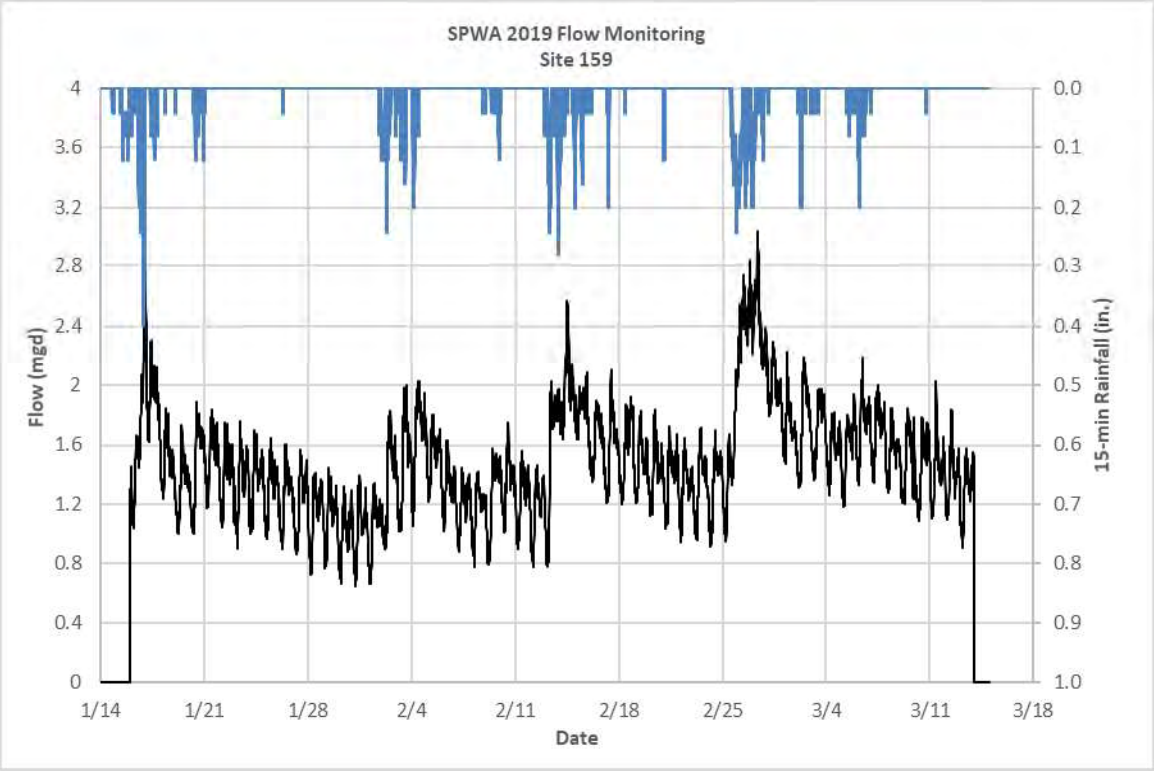

SPWA 2019 Flow Monitoring
Site 156
Depth (inches)
Volucity (fps)
Date
15.0
12.5
10.0
7.5
5.0
2.5
0.0
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Level
Velocity
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

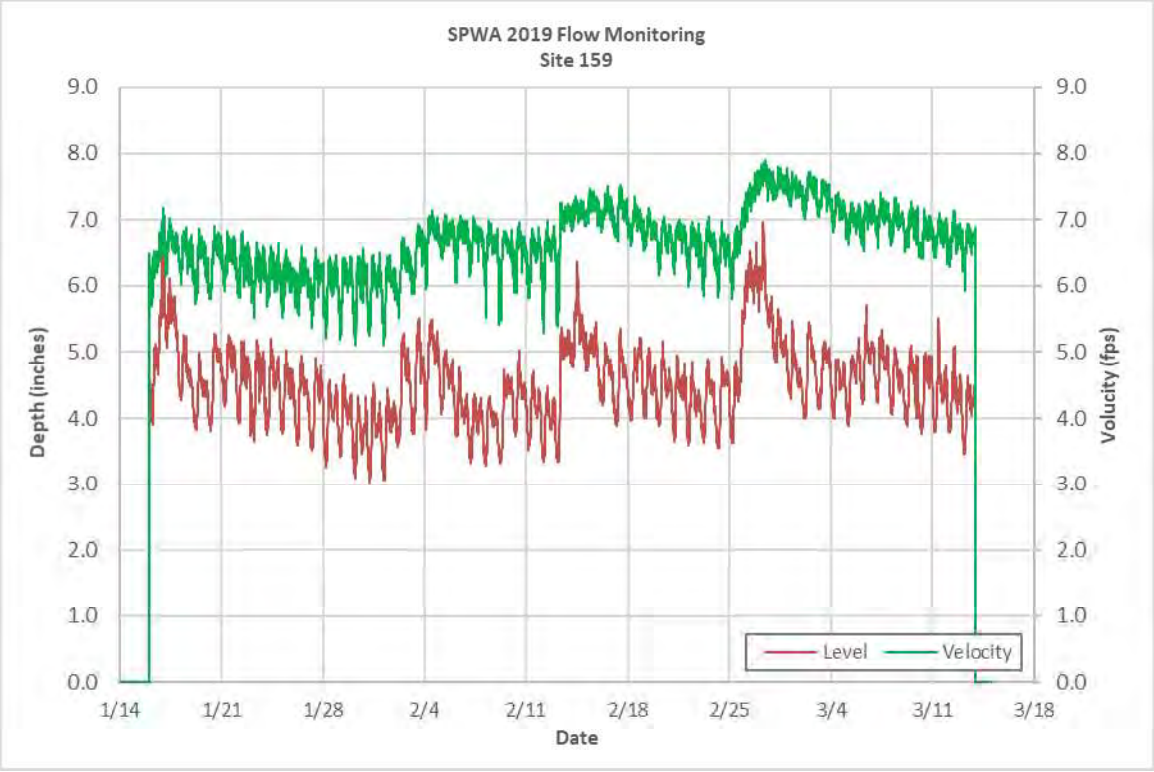

SPWA 2019 Flow Monitoring
Site 157
Flow (mgd)
15-min Rainfall (in.)
Date
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

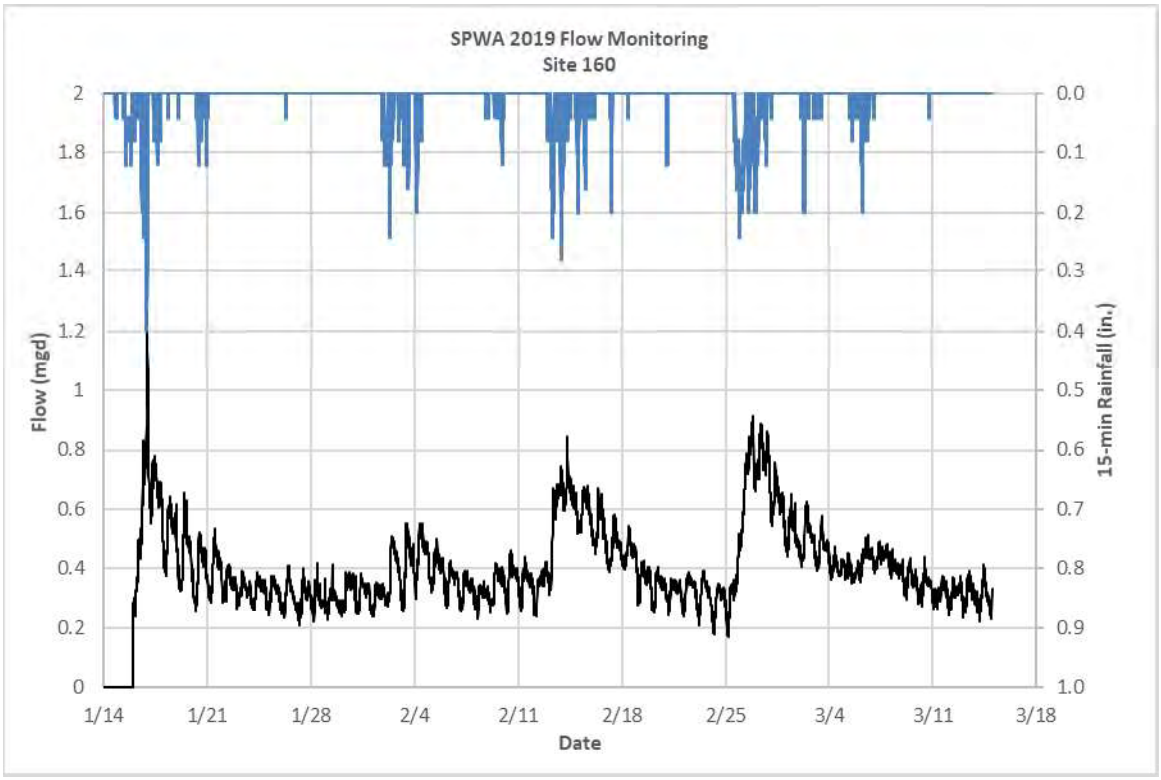

SPWA 2019 Flow Monitoring
Site 157
Depth (inches)
Volucity (fps)
Date
Level
Velocity
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

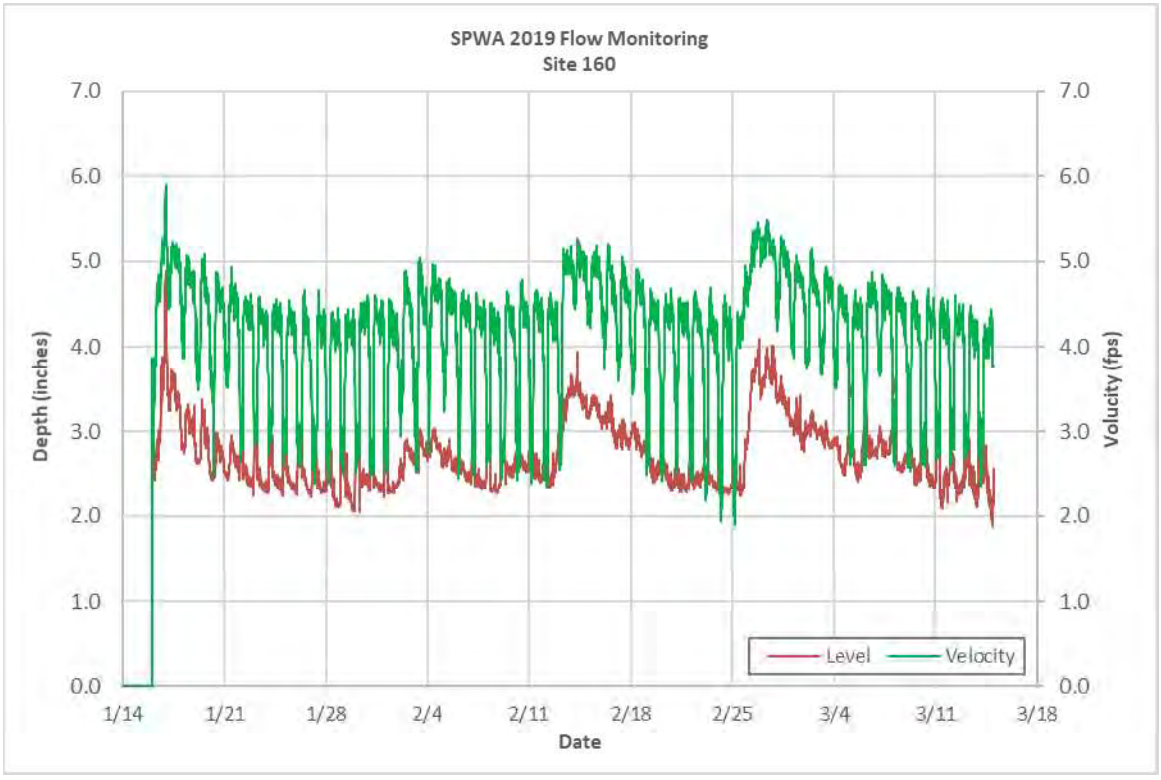

SPWA 2019 Flow Monitoring
Site 158
Flow (mgd)
15-min Rainfall (in.)
Date
4
3.6
3.2
2.8
2.4
2
1.6
1.2
0.8
0.4
0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

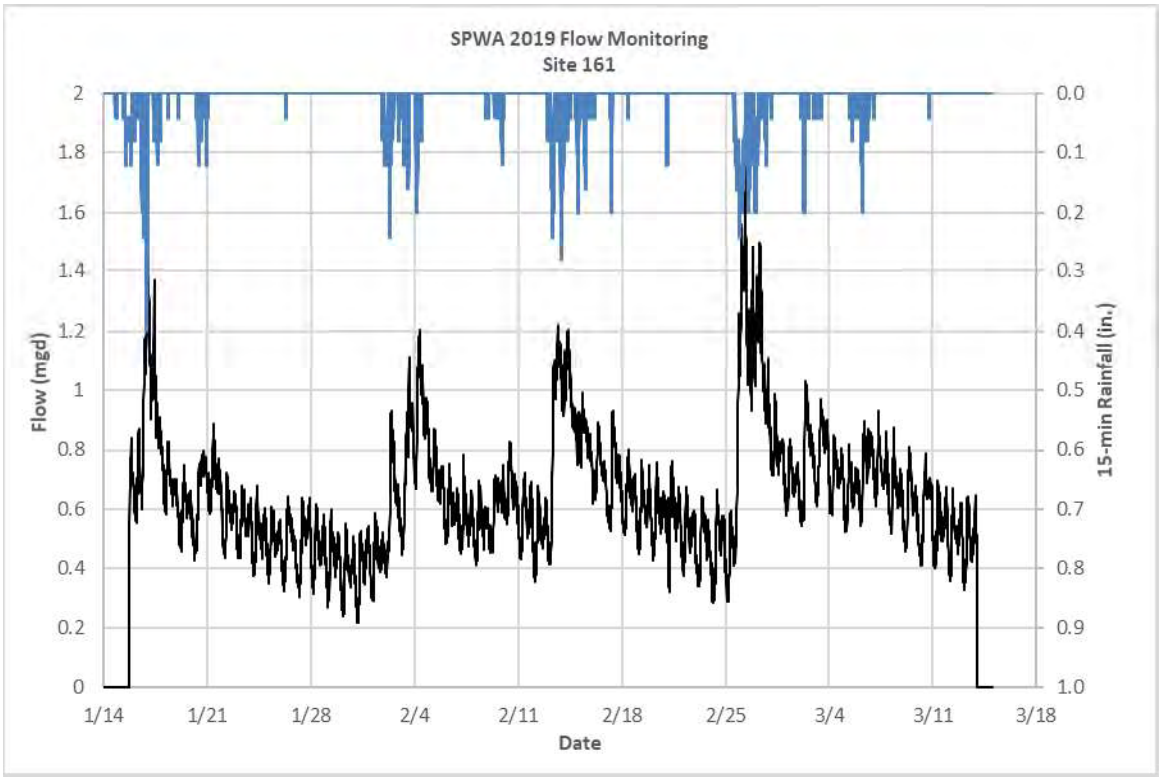

SPWA 2019 Flow Monitoring
Site 158
Depth (inches)
Volucity (fps)
Date
Level
Velocity
12.0
10.0
8.0
6.0
4.0
2.0
0.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18


SPWA 2019 Flow Monitoring
Site 159
Flow (mgd)
15-min Rainfall (in.)
Date
4
3.6
3.2
2.8
2.4
2
1.6
1.2
0.8
0.4
0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

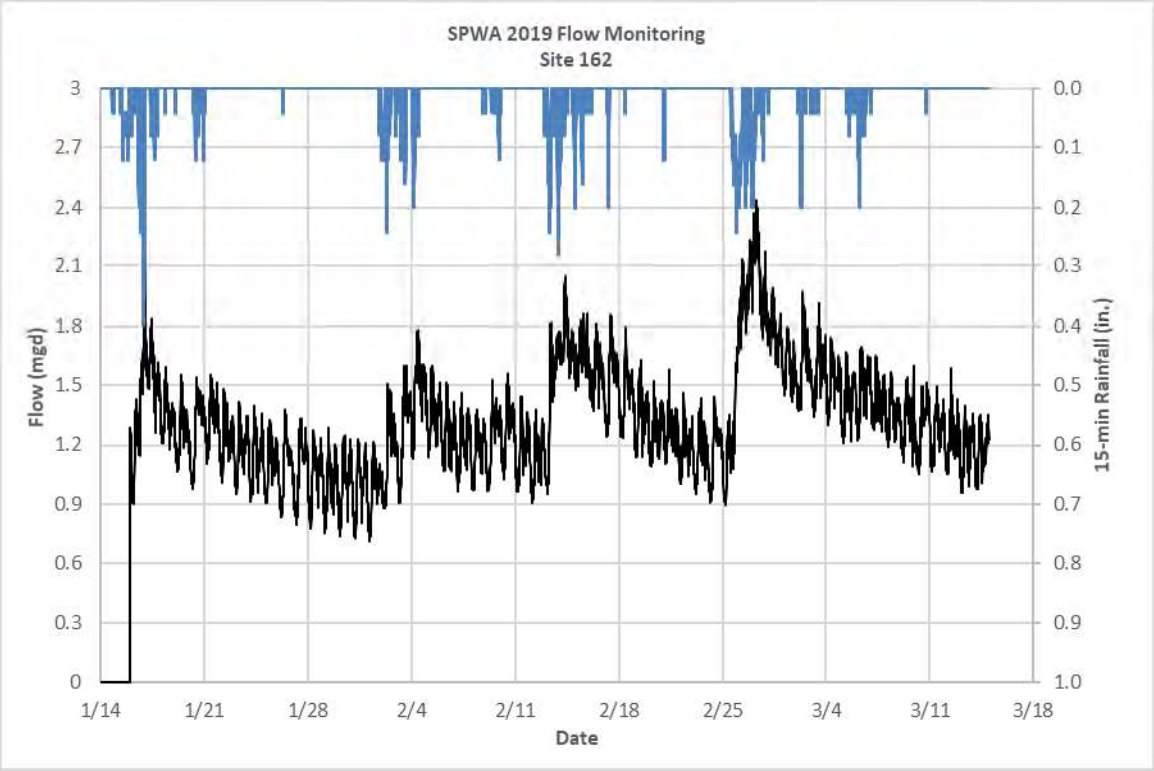

SPWA 2019 Flow Monitoring
Site 159
Depth (inches)
Volucity (fps)
Date
Level
Velocity
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

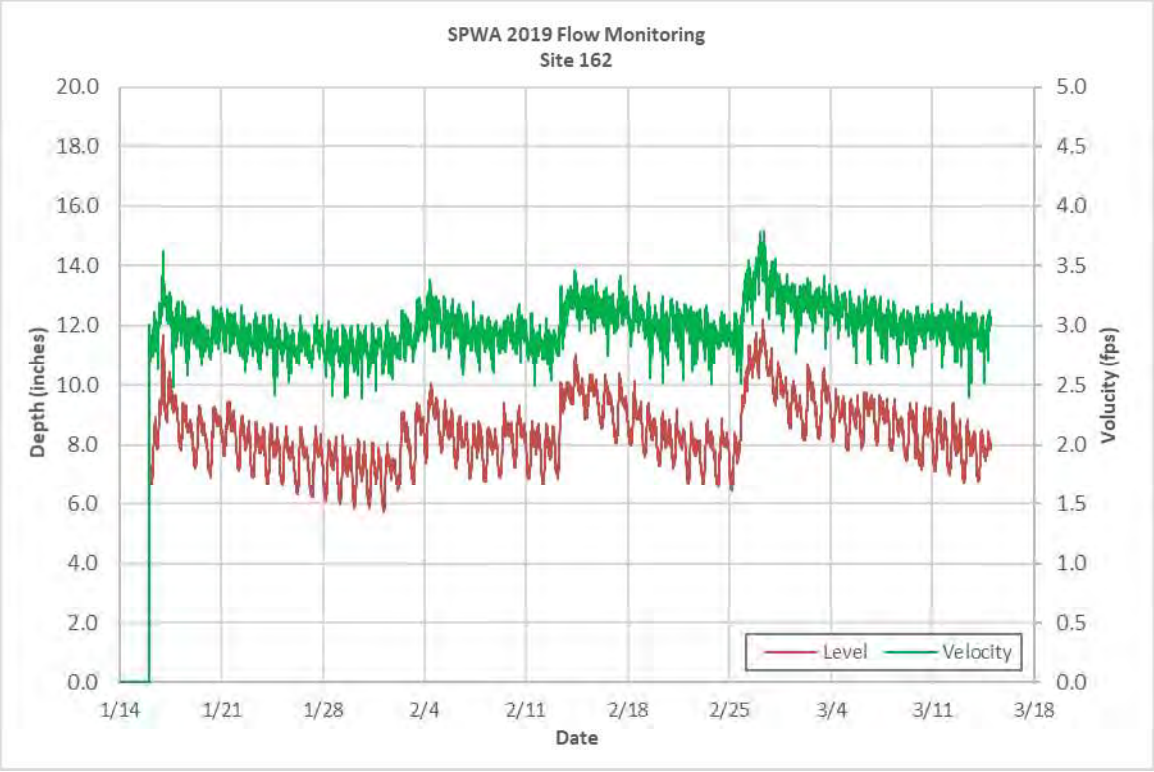

SPWA 2019 Flow Monitoring
Site 160
Flow (mgd)
15-min Rainfall (in.)
Date
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

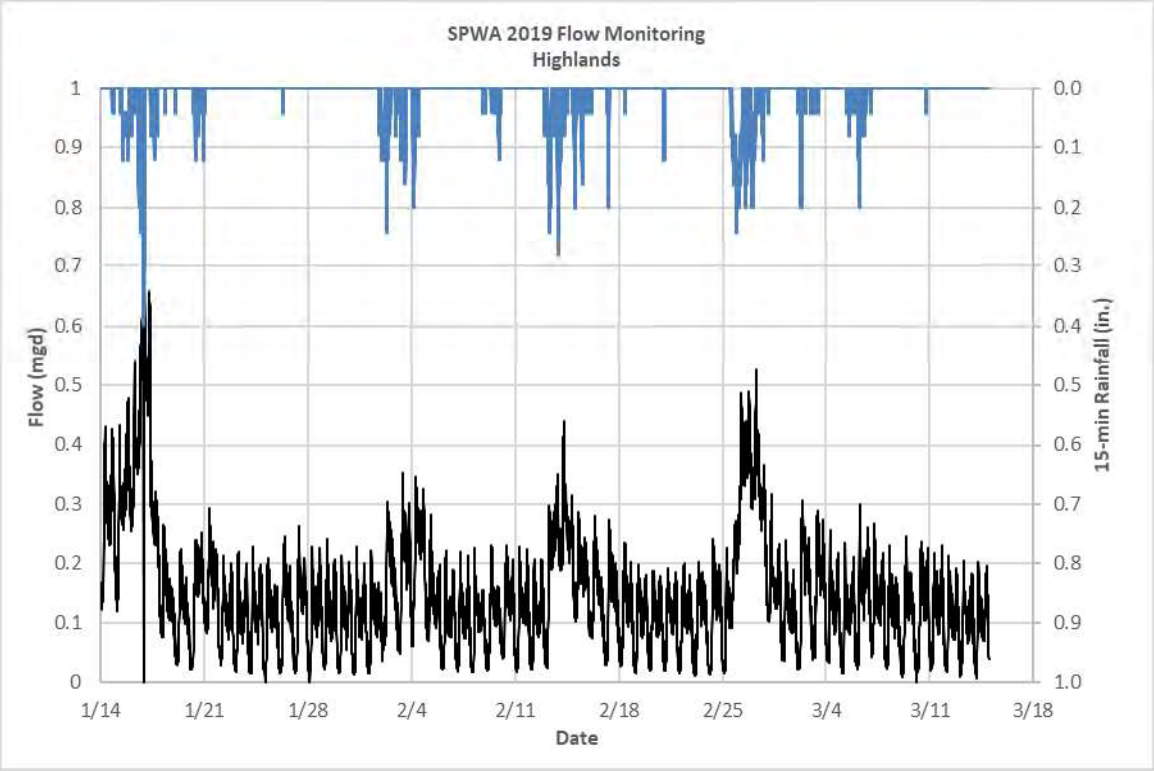

SPWA 2019 Flow Monitoring
Site 160
Depth (inches)
Volucity (fps)
Date
Level
Velocity
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

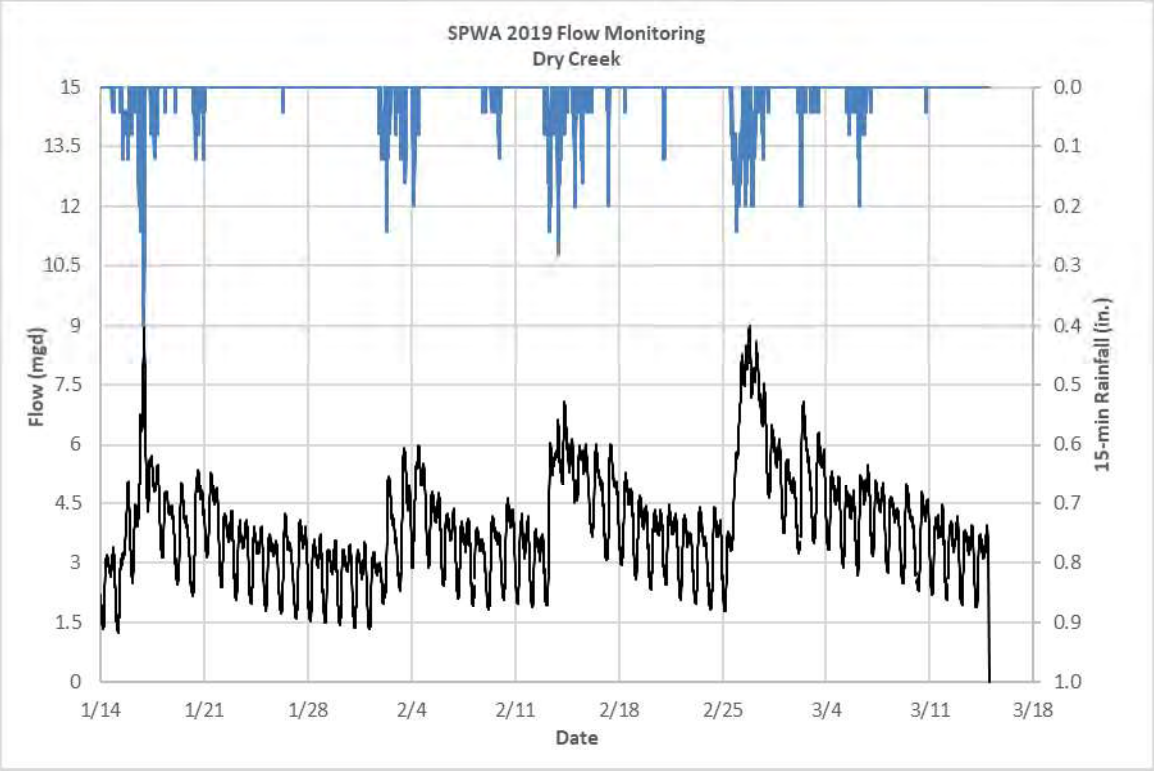

SPWA 2019 Flow Monitoring
Site 161
Flow (mgd)
15-min Rainfall (in.)
Date
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

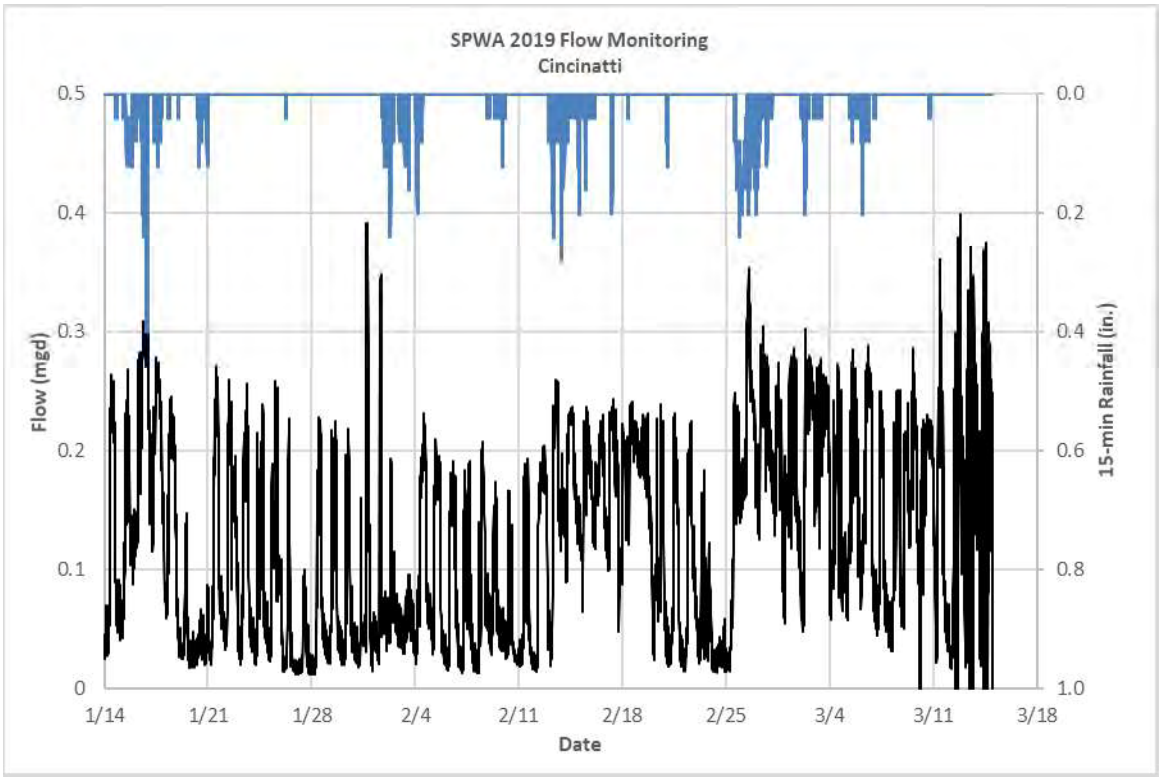

SPWA 2019 Flow Monitoring
Site 161
Depth (inches)
Volucity (fps)
Date
Level
Velocity
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

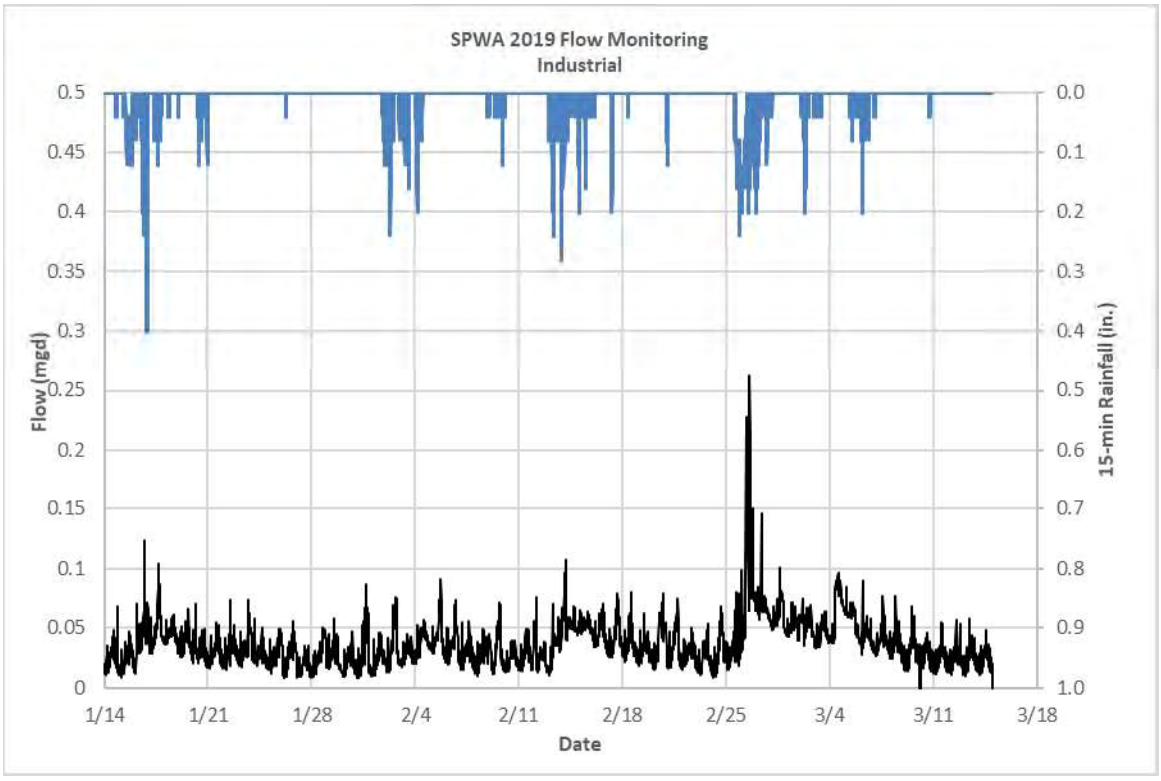

SPWA 2019 Flow Monitoring
Site 162
Flow (mgd)
15-min Rainfall (in.)
Date
3
2.7
2.4
2.1
1.8
1.5
1.2
0.9
0.6
0.3
0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

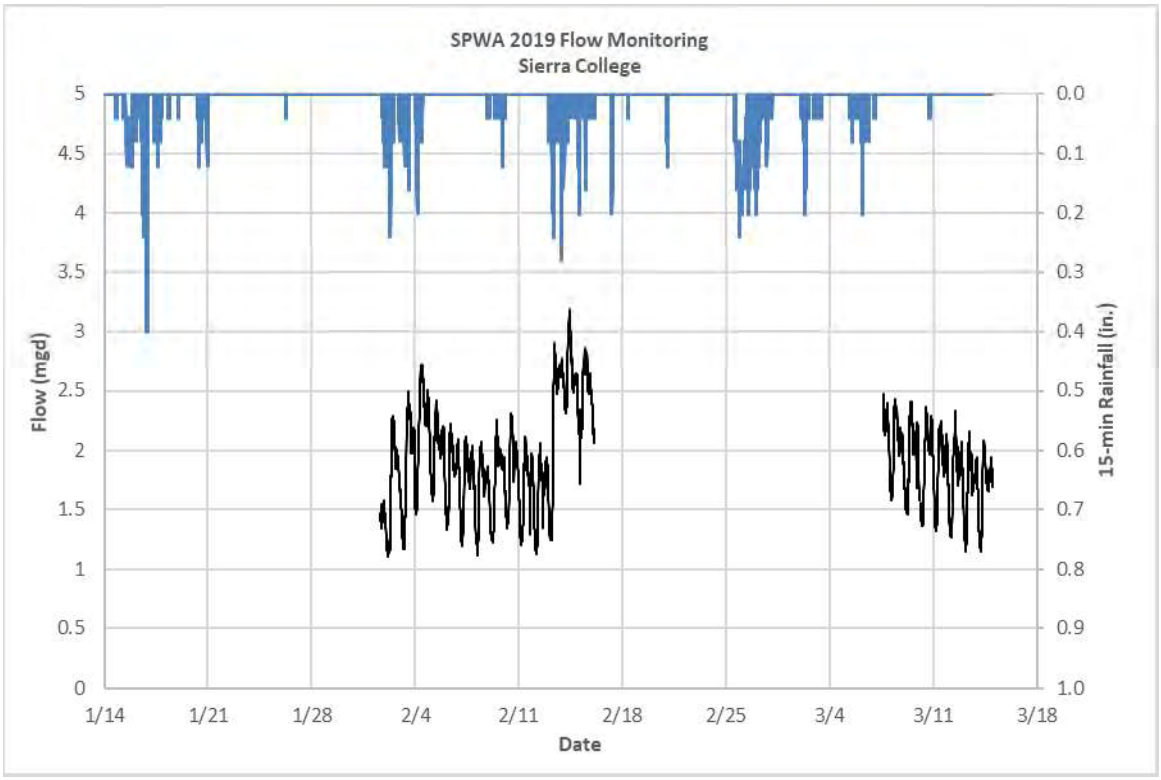

SPWA 2019 Flow Monitoring
Site 162
Depth (inches)
Volucity (fps)
Date
Level
Velocity
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

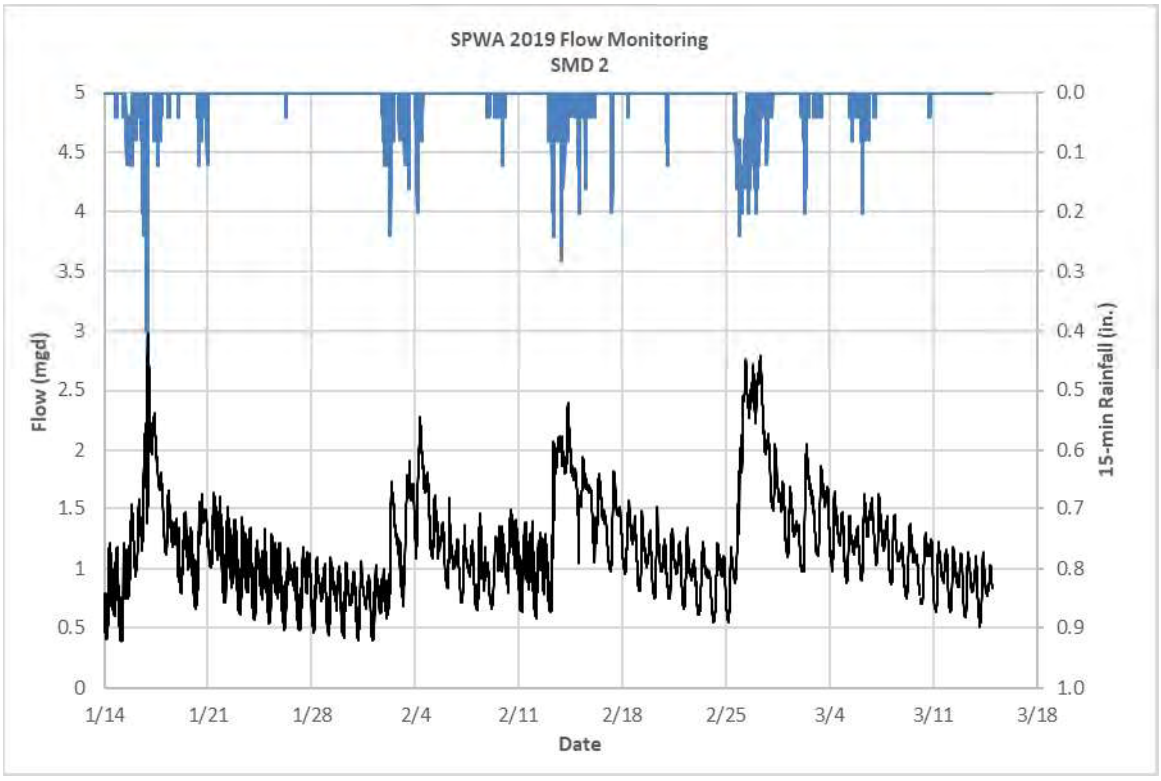

SPWA 2019 Flow Monitoring
Highlands
Flow (mgd)
15-min Rainfall (in.)
Date
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18


SPWA 2019 Flow Monitoring
Dry Creek
Flow (mgd)
15-min Rainfall (in.)
Date
15
13.5
12
10.5
9
7.5
6
4.5
3
1.5
0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18


SPWA 2019 Flow Monitoring
Cincinatti
Flow (mgd)
15-min Rainfall (in.)
Date
0.5
0.4
0.3
0.2
0.1
0
0.0
0.2
0.4
0.6
0.8
1.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18


SPWA 2019 Flow Monitoring
Industrial
Flow (mgd)
15-min Rainfall (in.)
Date
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

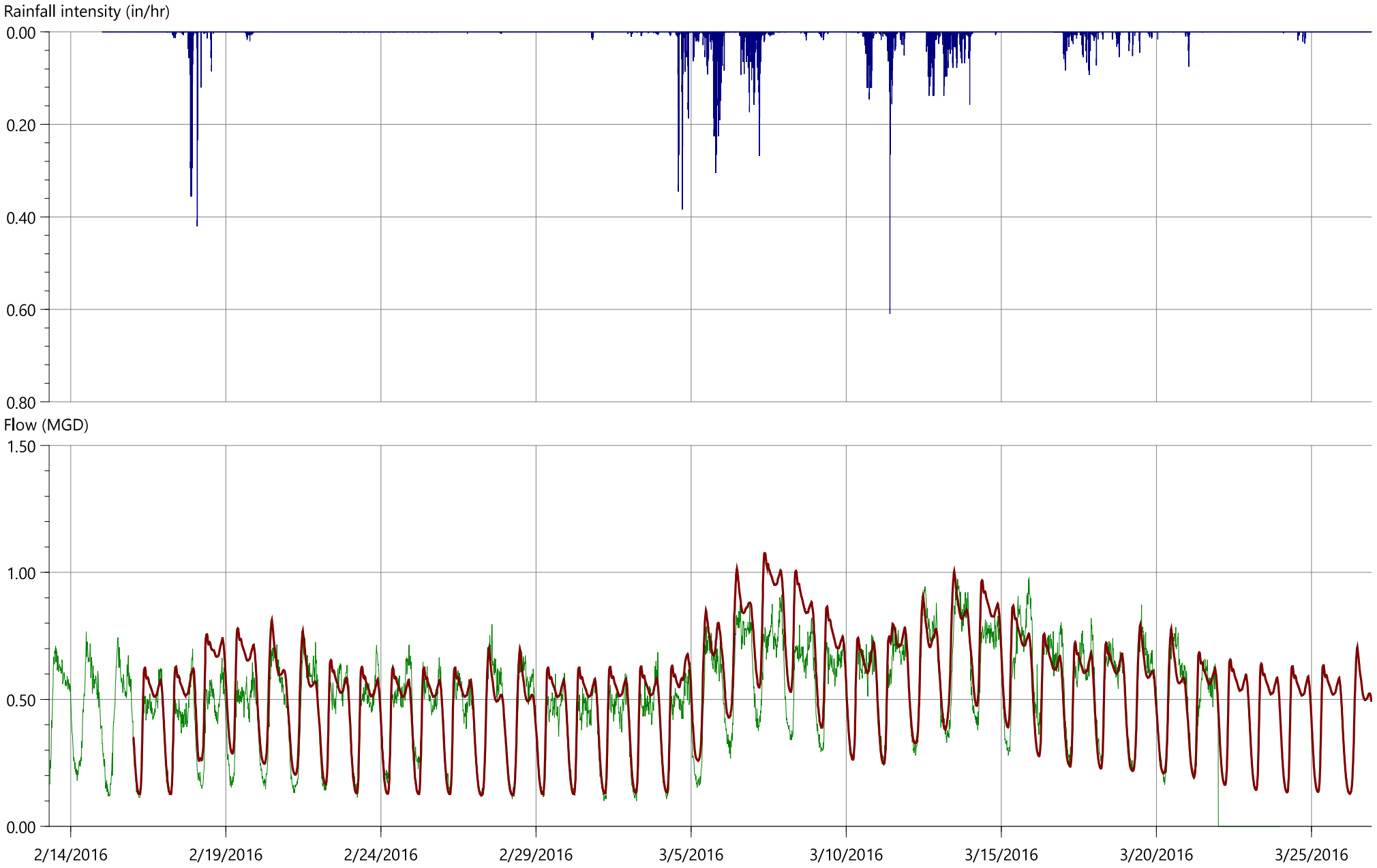

SPWA 2019 Flow Monitoring
Sierra College
Flow (mgd)
15-min Rainfall (in.)
Date
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18


SPWA 2019 Flow Monitoring
SMD 2
Flow (mgd)
15-min Rainfall (in.)
Date
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

APPENDIX D – CALIBRATION GRAPHS

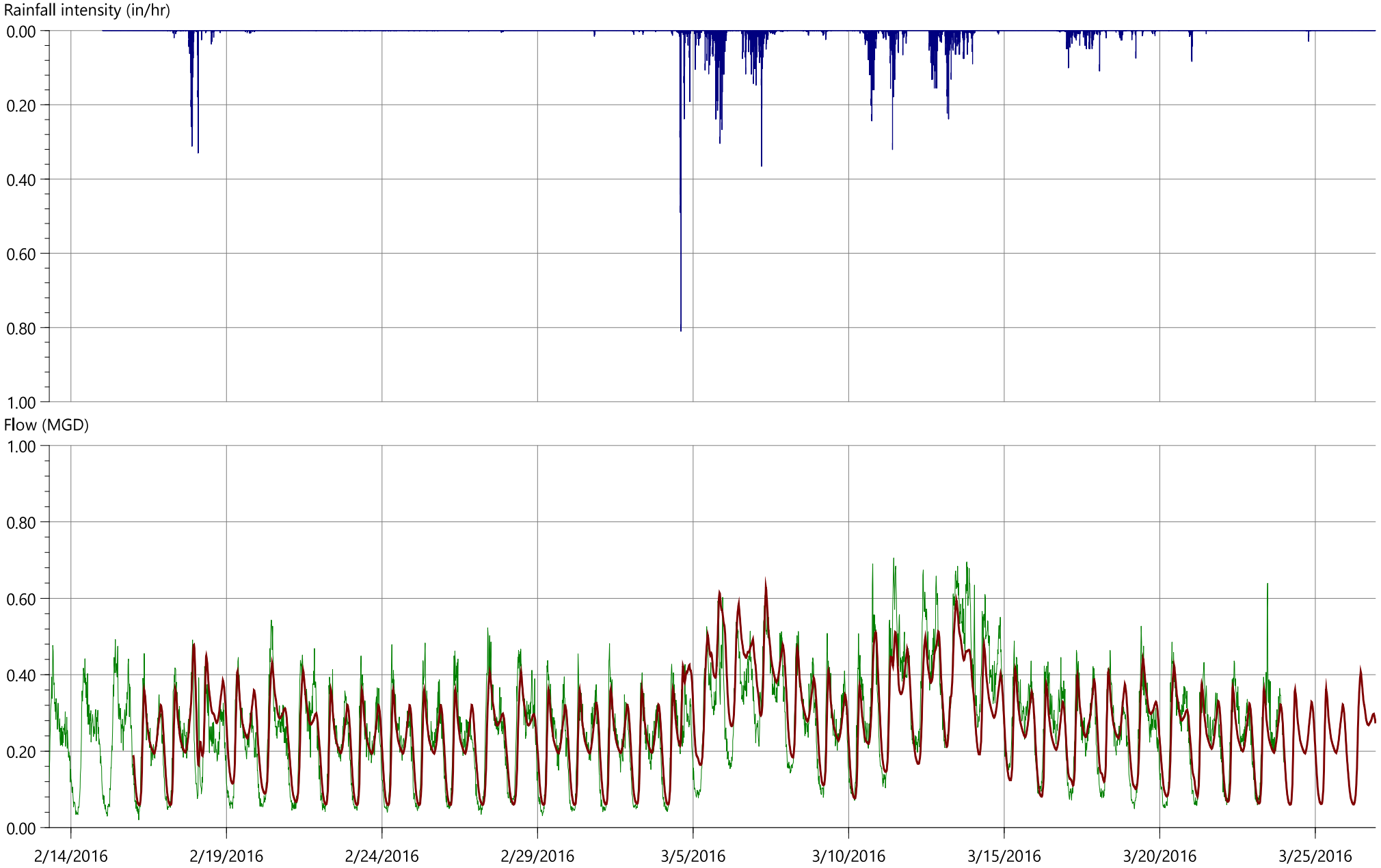
Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)

Flow Survey Location (Obs.) FM 1, Model Location (Pred.) D/S SMH E04-043.1, Rainfall Profile: 311



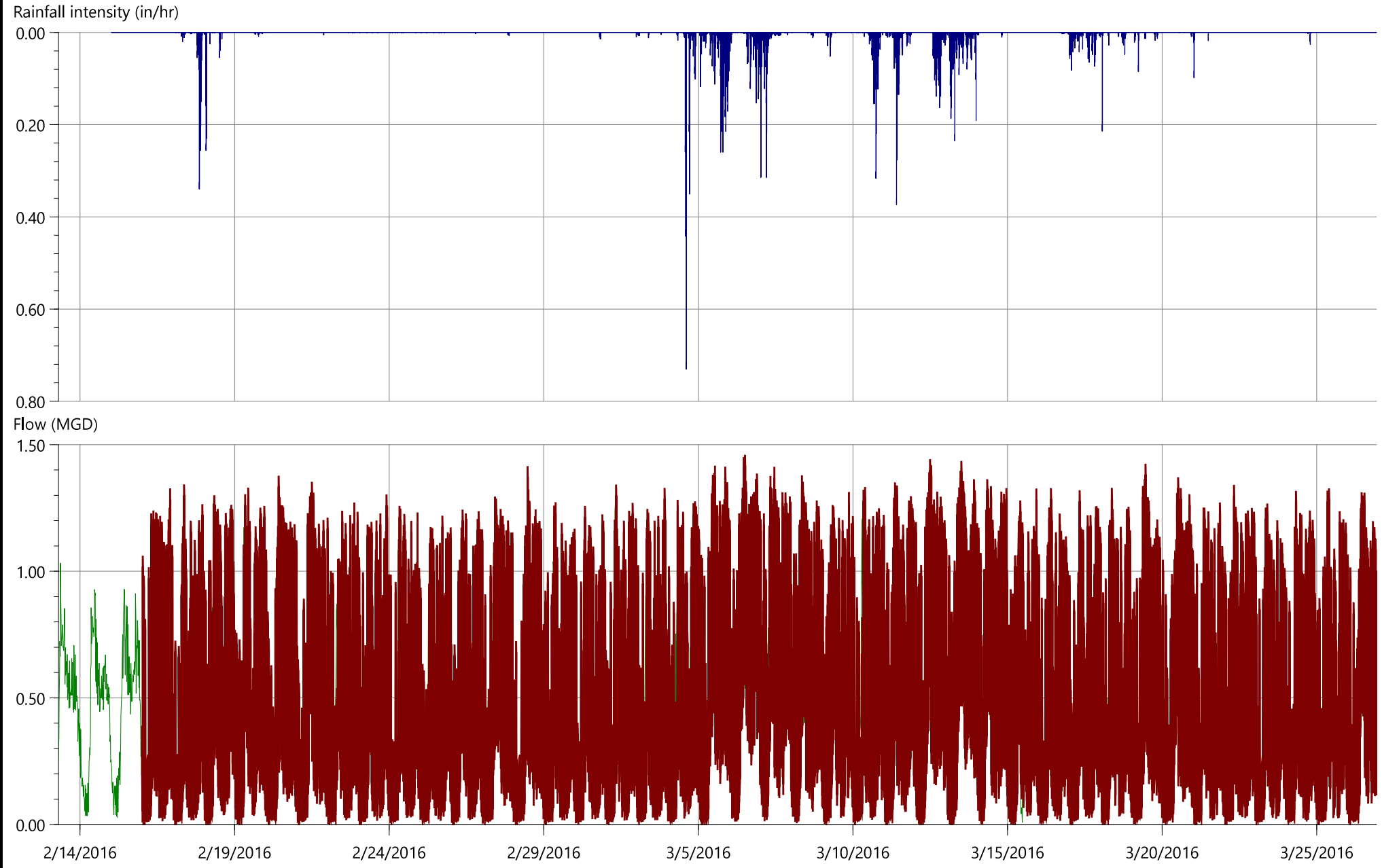
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.950	0.609	0.007			
Observed				0.000	0.981	1628041.595
...ta20160215_20160315				0.121	1.076	1849194.017

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 2, Model Location (Pred.) D/S SMH E01-166.1, Rainfall Profile: 305



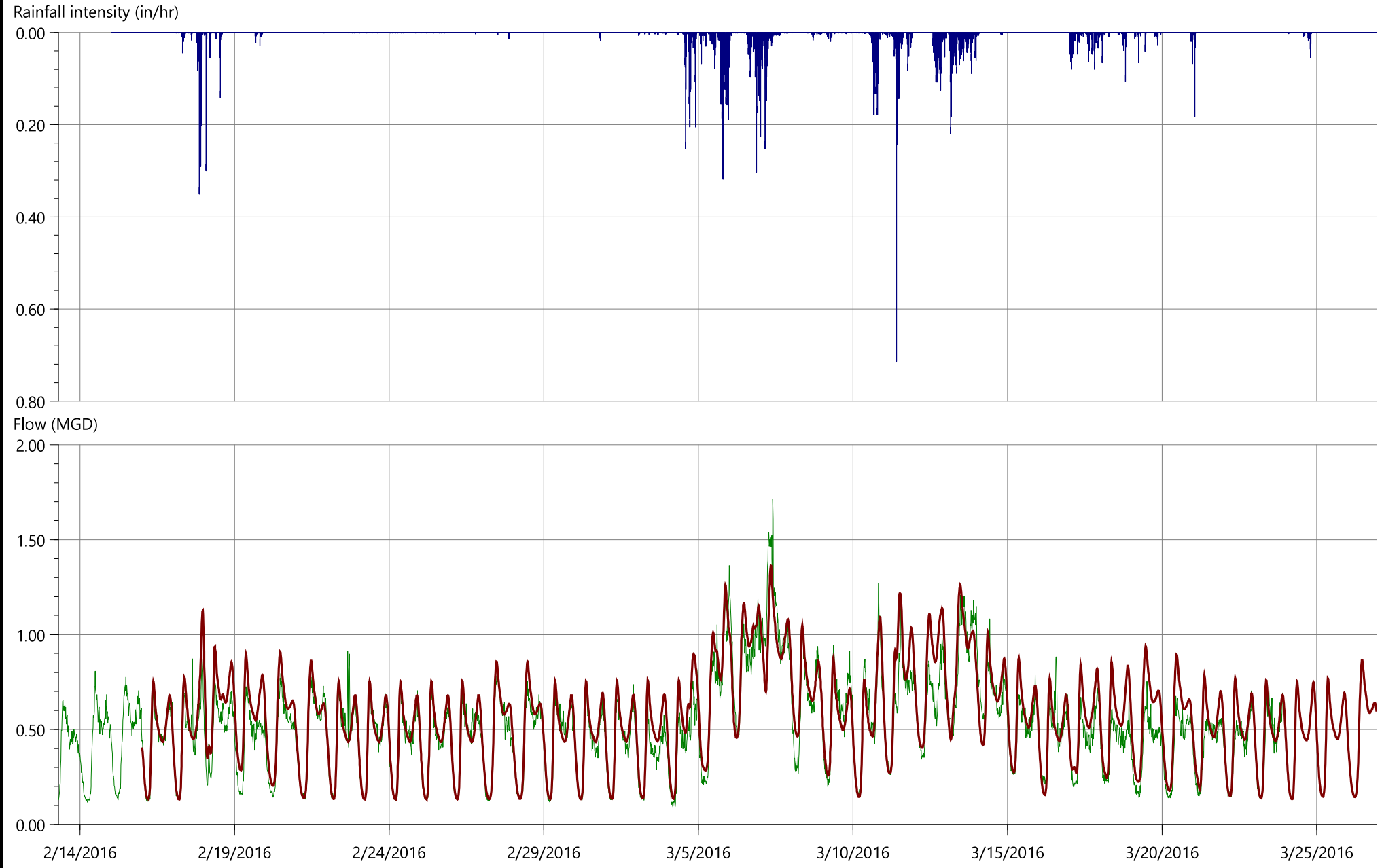
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.168	0.810	0.007			
Observed				0.020	0.706	914240.023
...ta20160215_20160315				0.059	0.629	906202.549

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 3, Model Location (Pred.) D/S SMH D01-090.1, Rainfall Profile: 273



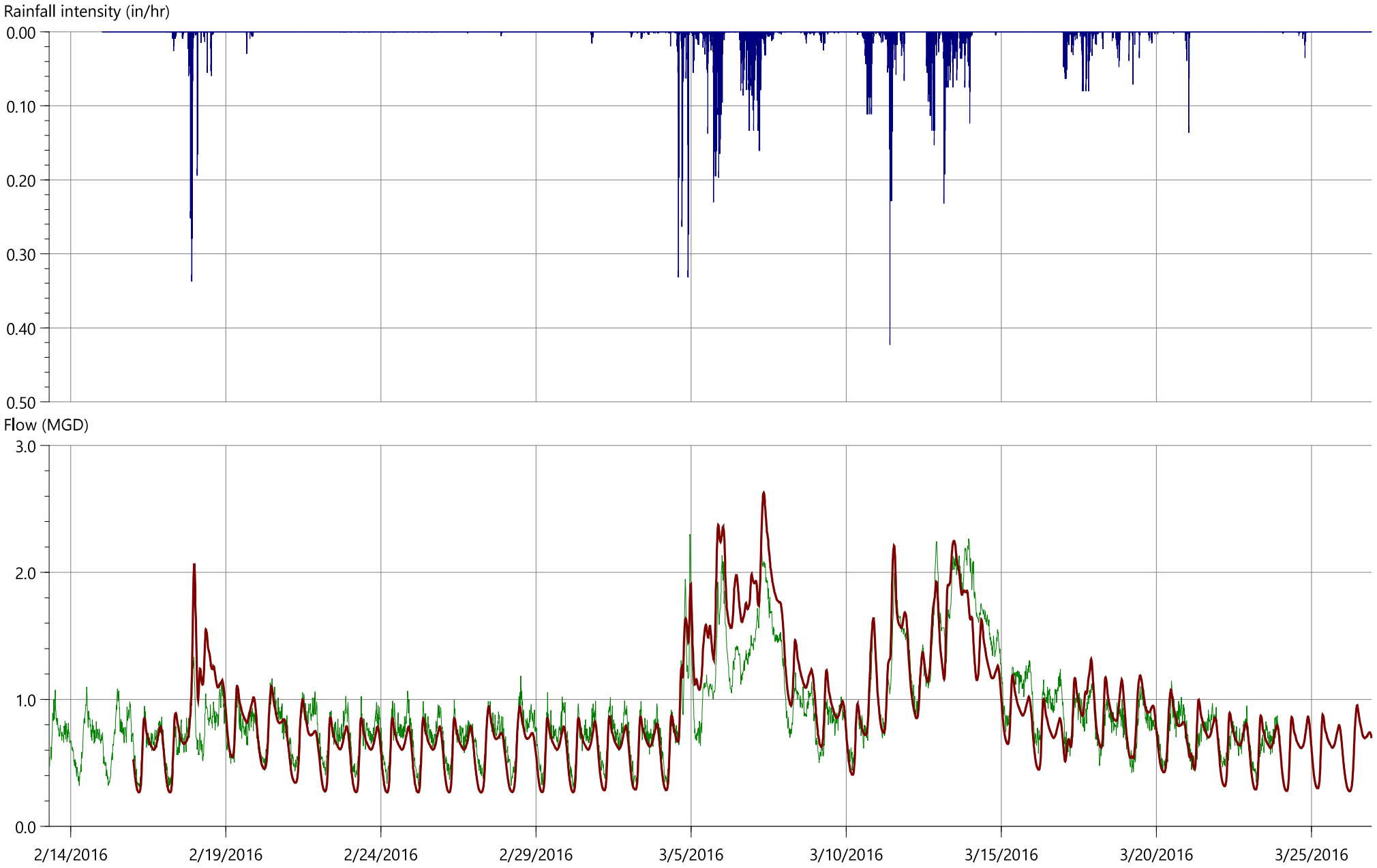
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.131	0.730	0.007			
Observed				0.007	1.272	1577879.095
...ta20160215_20160315				0.014	1.417	1694134.628

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 4, Model Location (Pred.) D/S SMH B06-185.1, Rainfall Profile: 182



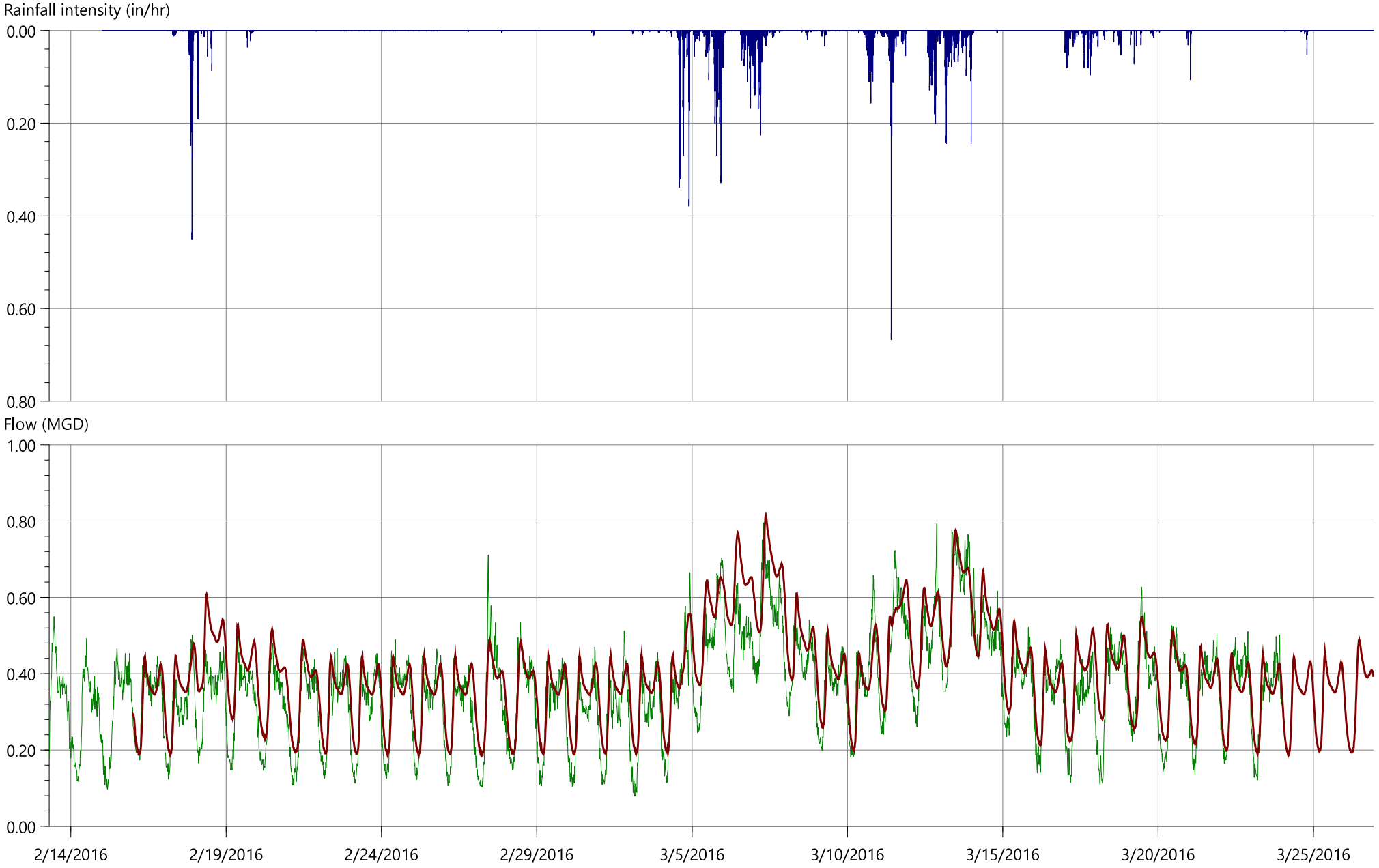
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.006	0.714	0.007			
Observed				0.092	1.713	1767988.571
...ta20160215_20160315				0.132	1.364	1962773.049

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 5, Model Location (Pred.) D/S SMH B04-006.1, Rainfall Profile: 179



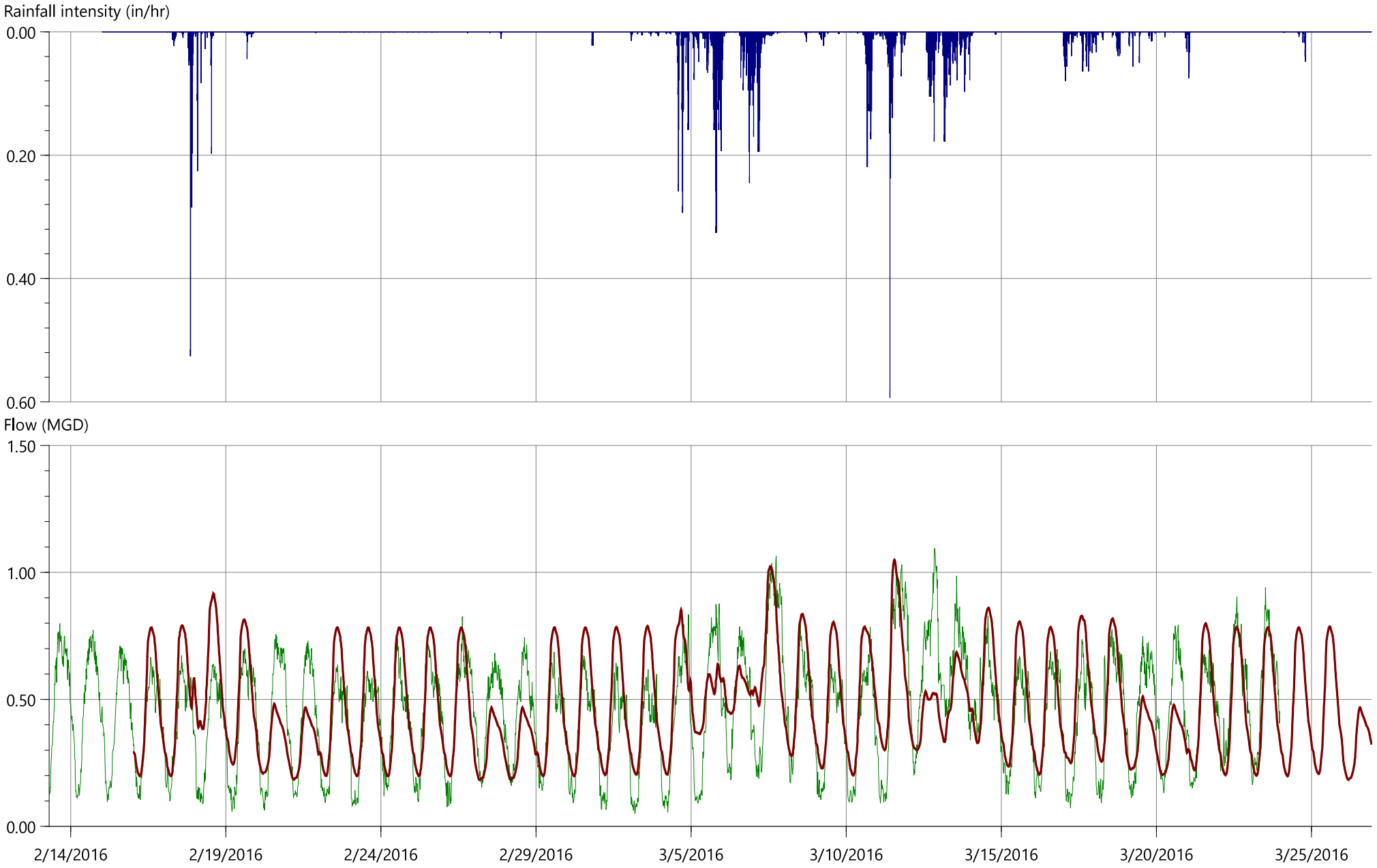
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.524	0.423	0.007			
Observed				0.308	2.299	3030867.347
...ta20160215_20160315				0.267	2.627	3046741.062

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 5A, Model Location (Pred.) D/S SMH B04-001.1, Rainfall Profile: 178



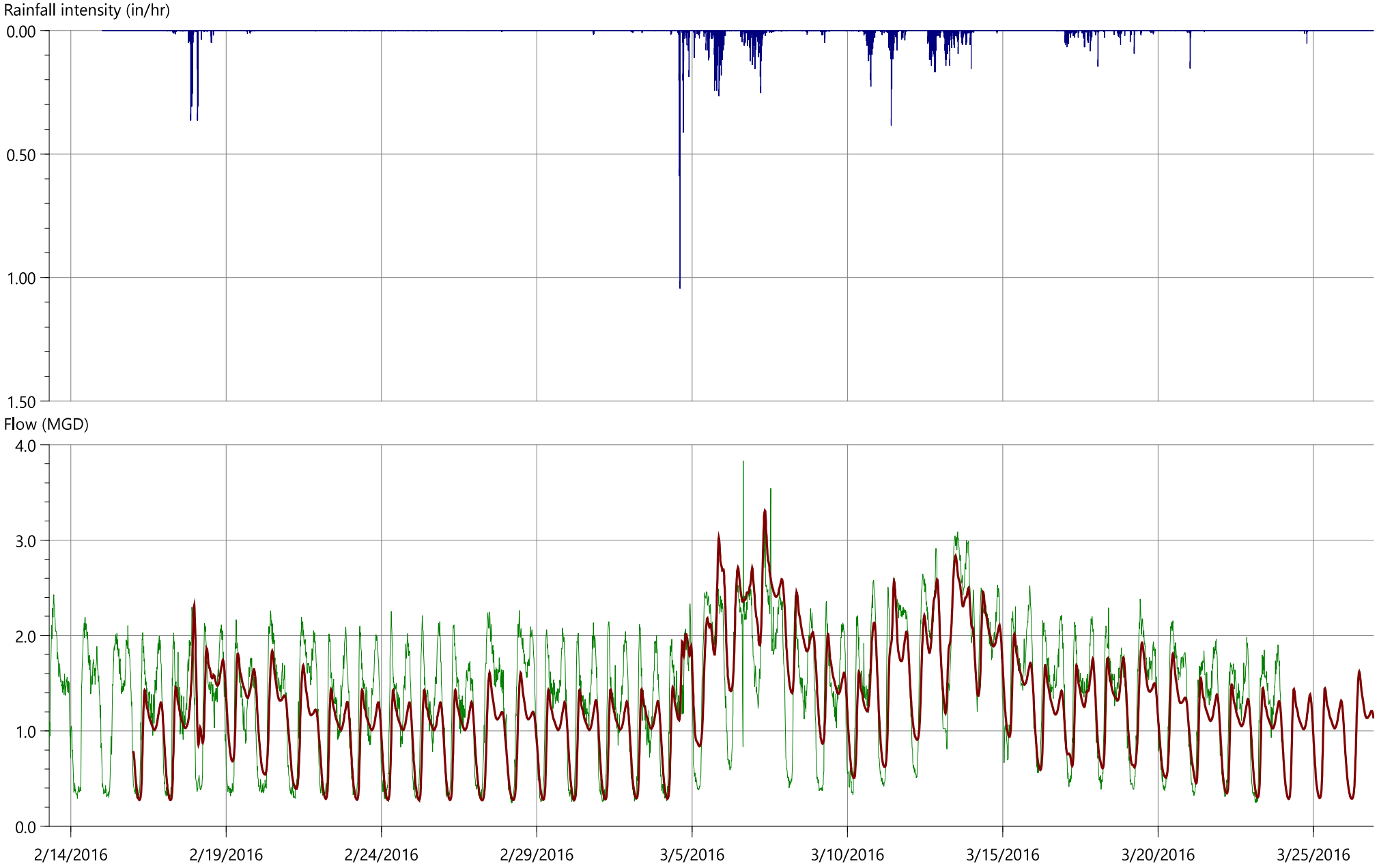
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.650	0.666	0.007			
Observed				0.078	0.796	1250814.058
...ta20160215_20160315				0.189	0.815	1385997.841

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 6, Model Location (Pred.) D/S SMH C06-160.1, Rainfall Profile: 248



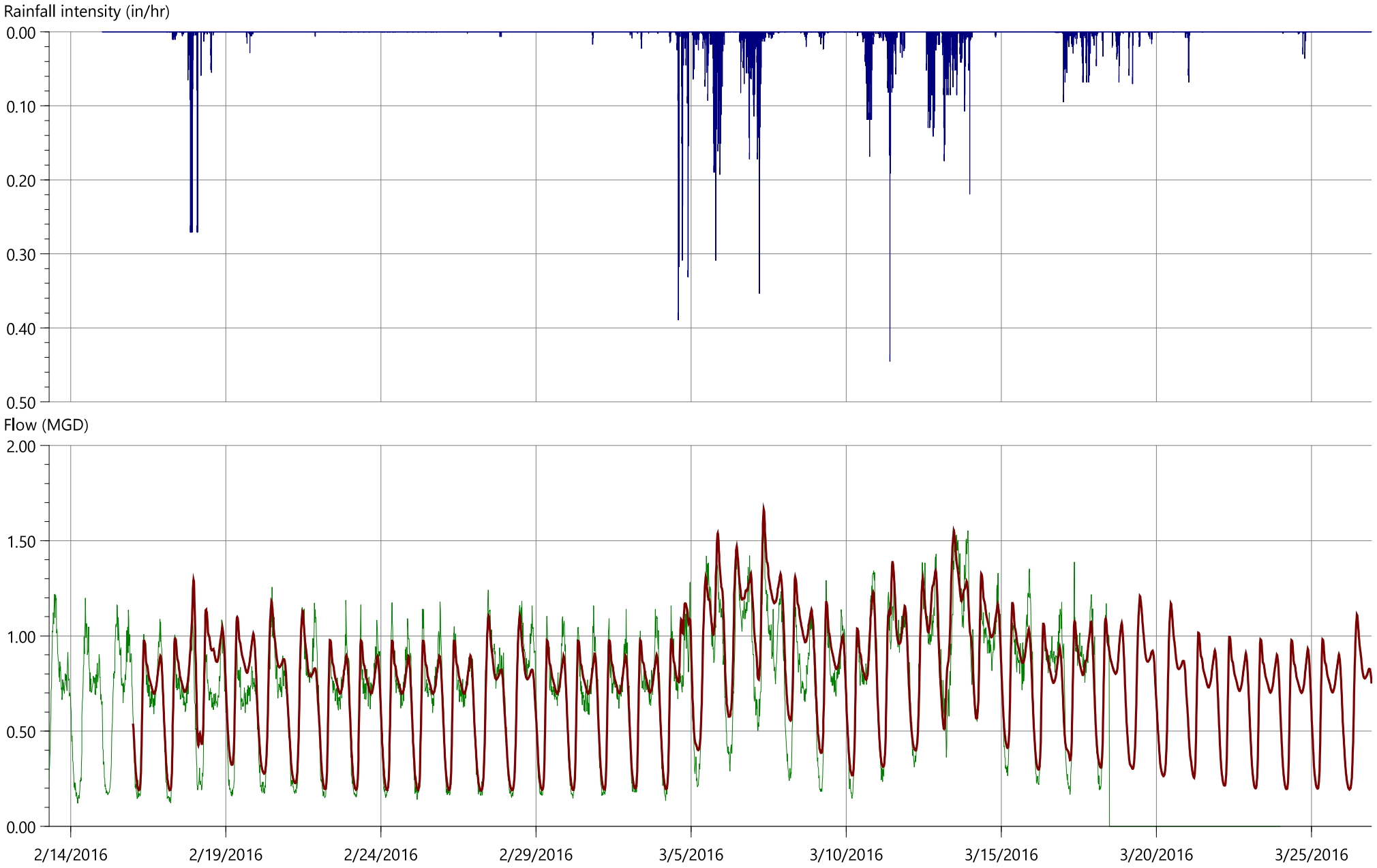
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.748	0.593	0.007			
Observed				0.050	1.095	1561247.890
...ta20160215_20160315				0.182	1.050	1627844.217

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 7, Model Location (Pred.) D/S SMH D02-353.1, Rainfall Profile: 274



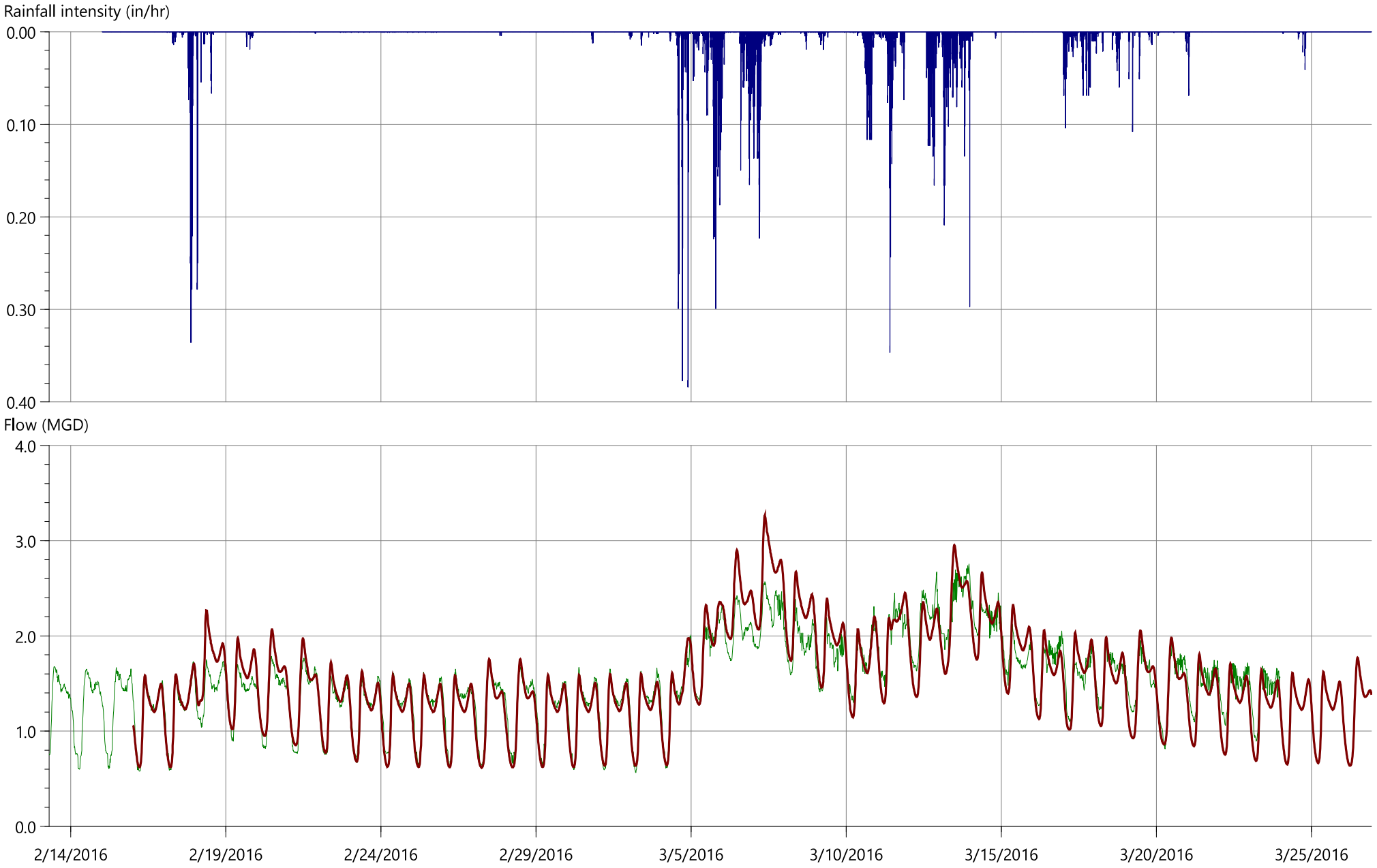
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.005	1.043	0.007			
Observed				0.243	3.830	4848161.759
...ta20160215_20160315				0.272	3.309	4389105.386

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 7A, Model Location (Pred.) D/S SMH D03-116.1, Rainfall Profile: 276



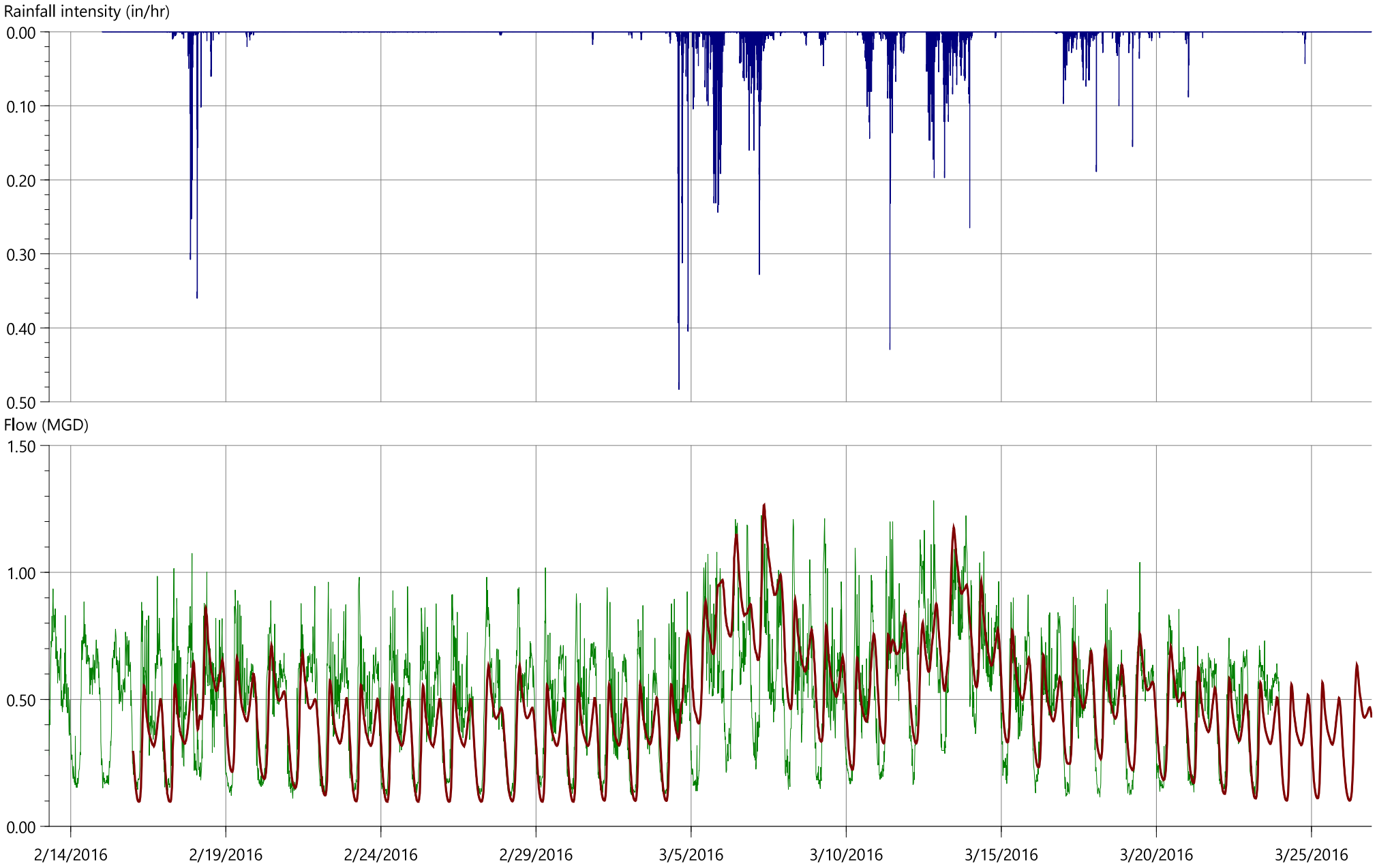
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.644	0.445	0.007			
Observed				0.000	1.560	2175152.424
...ta20160215_20160315				0.188	1.664	2640259.610

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 8, Model Location (Pred.) D/S SMH D04-201.1, Rainfall Profile: 277



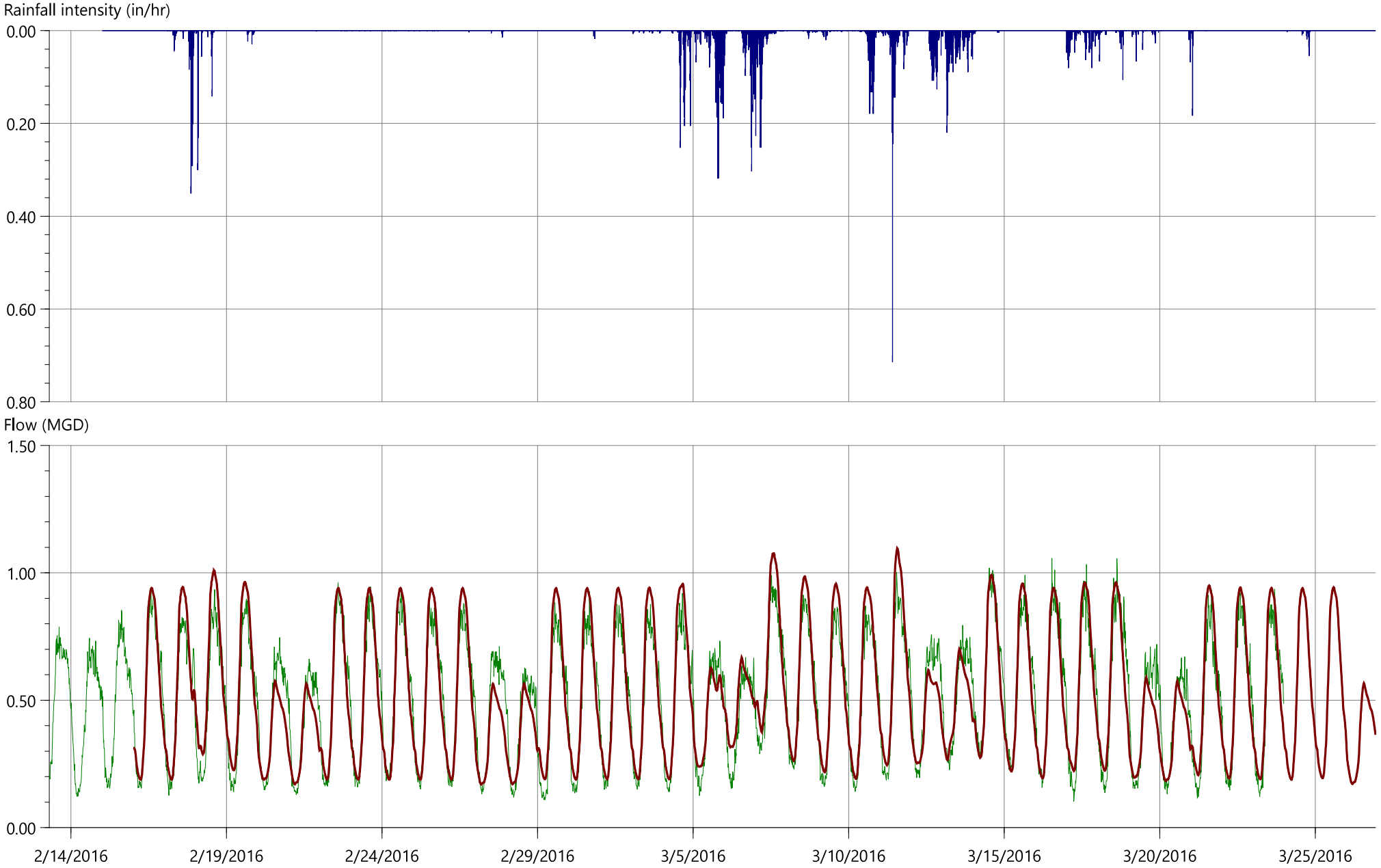
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.750	0.384	0.007			
Observed				0.563	2.756	5257075.125
...ta20160215_20160315				0.617	3.265	5297174.358

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 9, Model Location (Pred.) D/S SMH D02-069.1, Rainfall Profile: 241



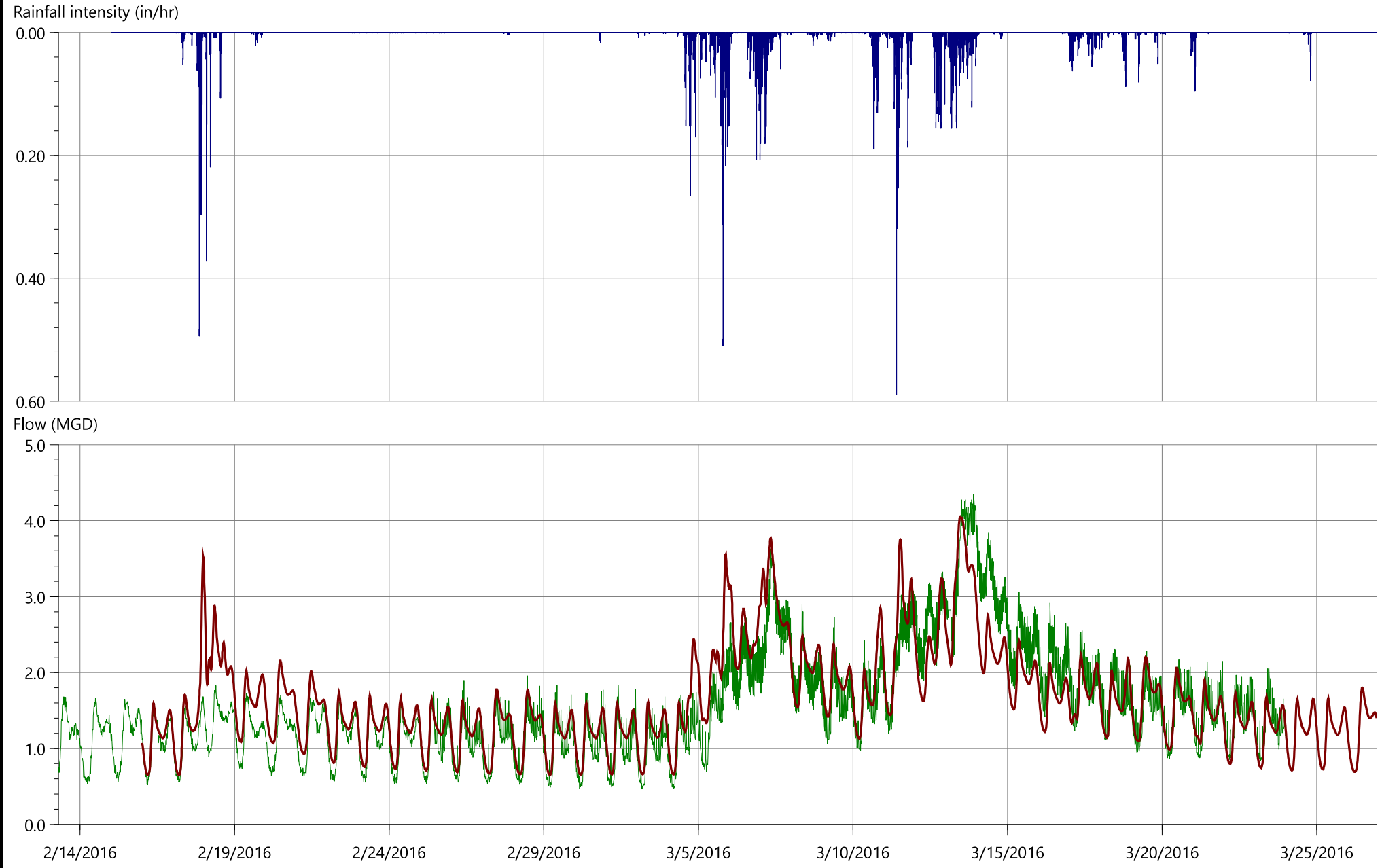
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.982	0.483	0.007			
Observed				0.110	1.283	1753822.349
...ta20160215_20160315				0.097	1.266	1626219.910

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 10, Model Location (Pred.) D/S SMH B06-340.1, Rainfall Profile: 182



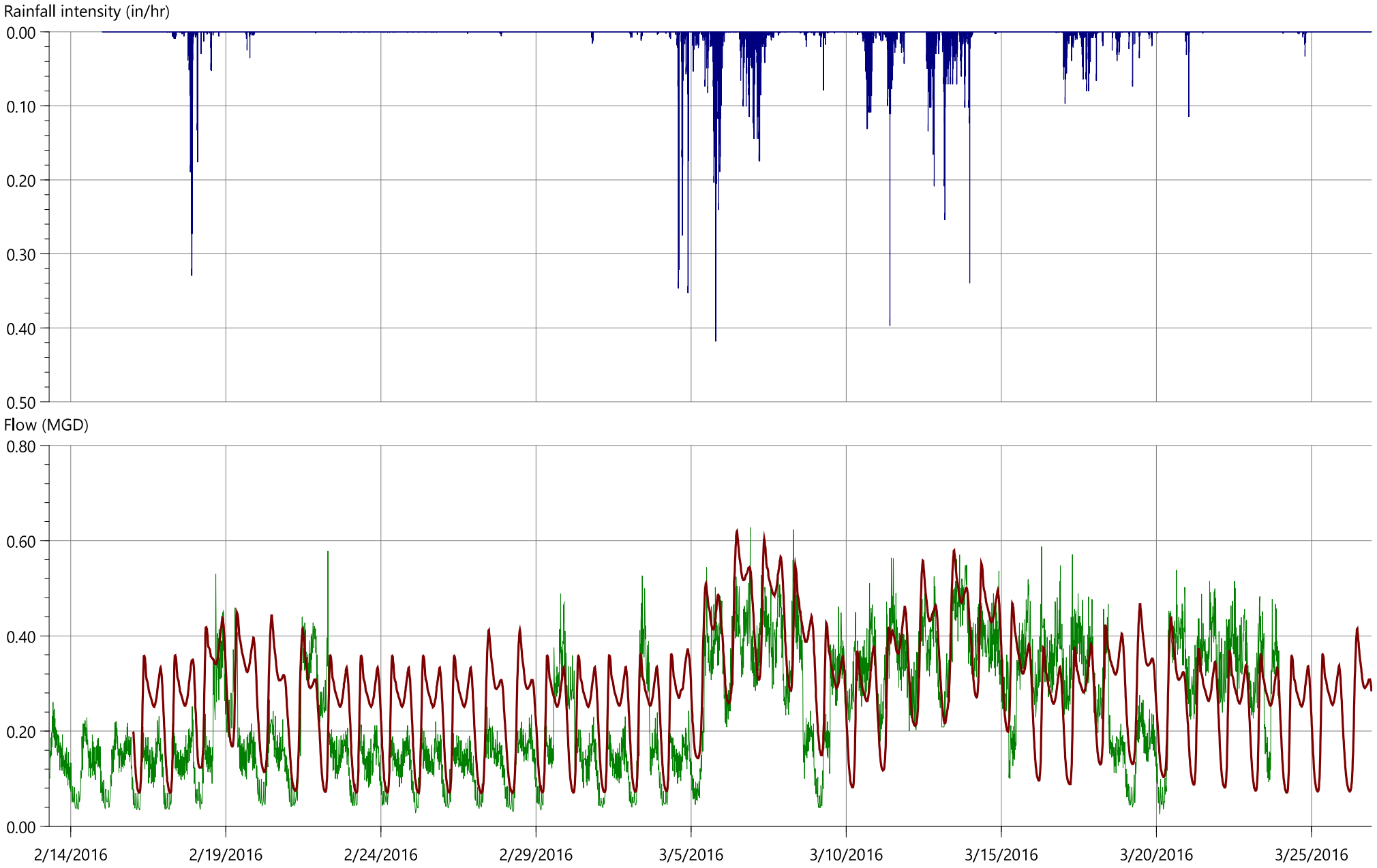
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.006	0.714	0.007			
Observed				0.103	1.057	1756657.949
...ta20160215_20160315				0.169	1.096	1787262.390

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 11, Model Location (Pred.) D/S SMH A08-019.1, Rainfall Profile: 121



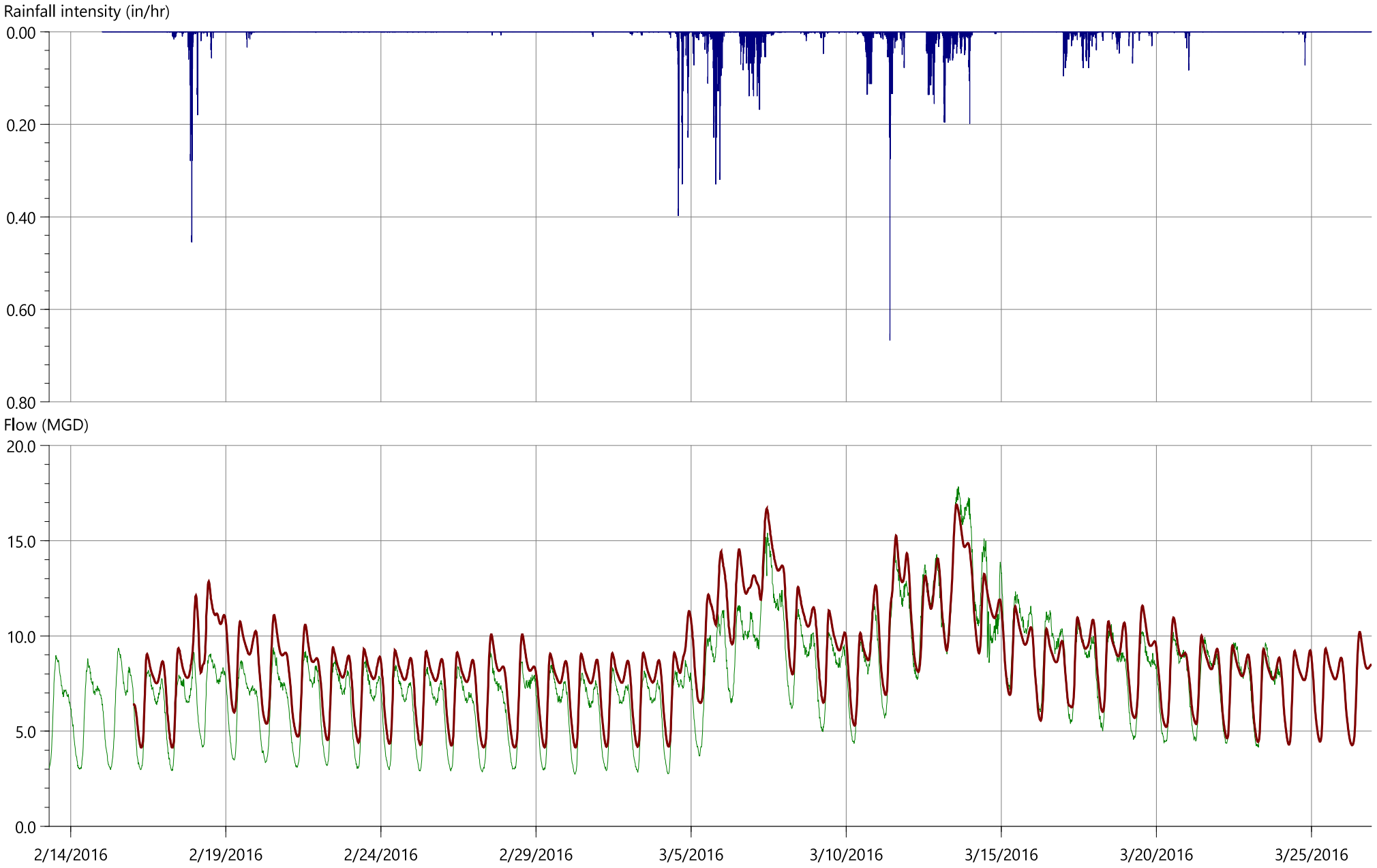
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.634	0.590	0.008			
Observed				0.468	4.351	5269869.468
...ta20160215_20160315				0.651	4.054	5683303.761

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 12, Model Location (Pred.) D/S SMH B03-030.1, Rainfall Profile: 177



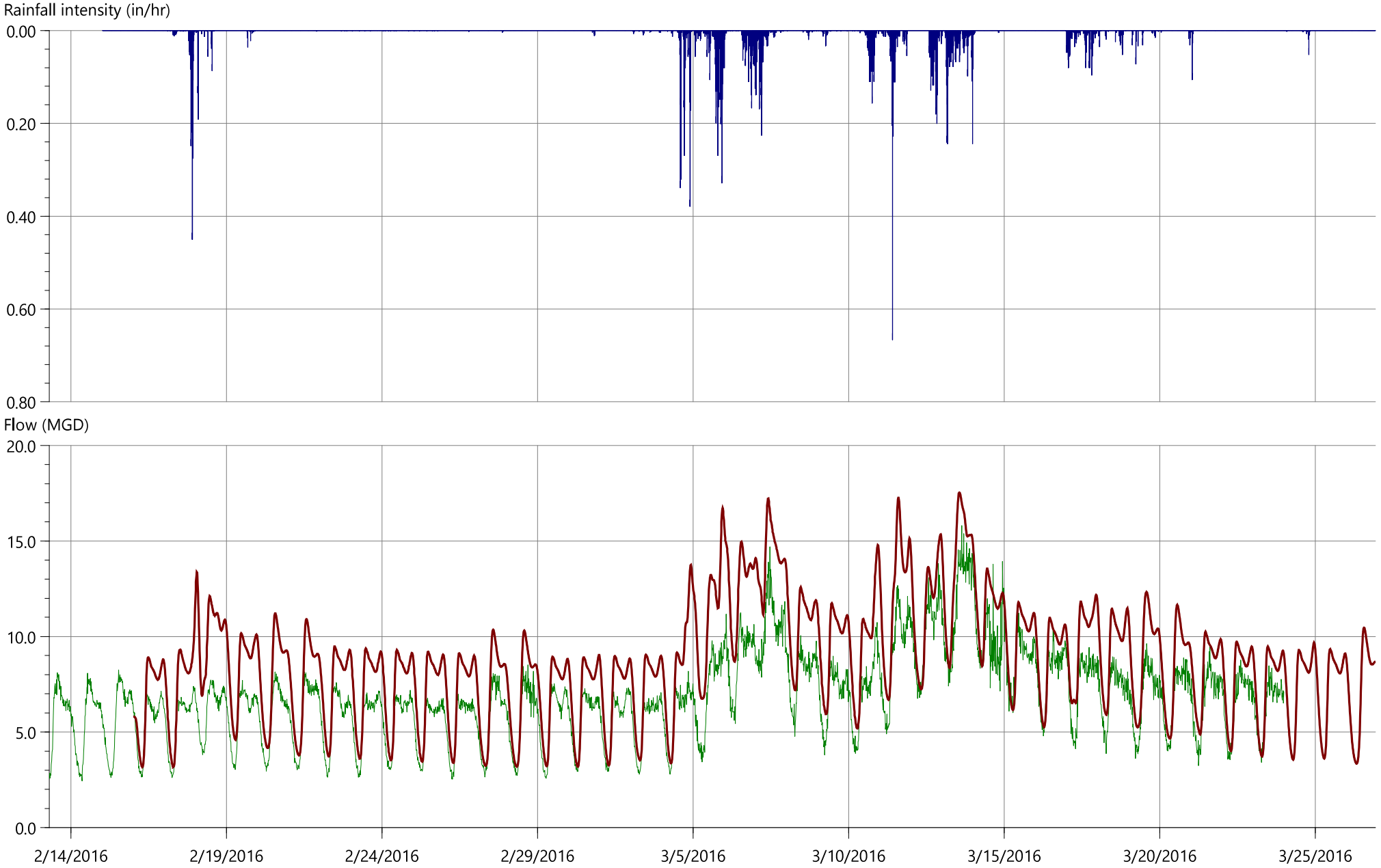
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.394	0.418	0.007			
Observed				0.025	0.627	798653.119
...ta20160215_20160315				0.070	0.620	991725.521

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 13, Model Location (Pred.) D/S SMH B03-043.1, Rainfall Profile: 145



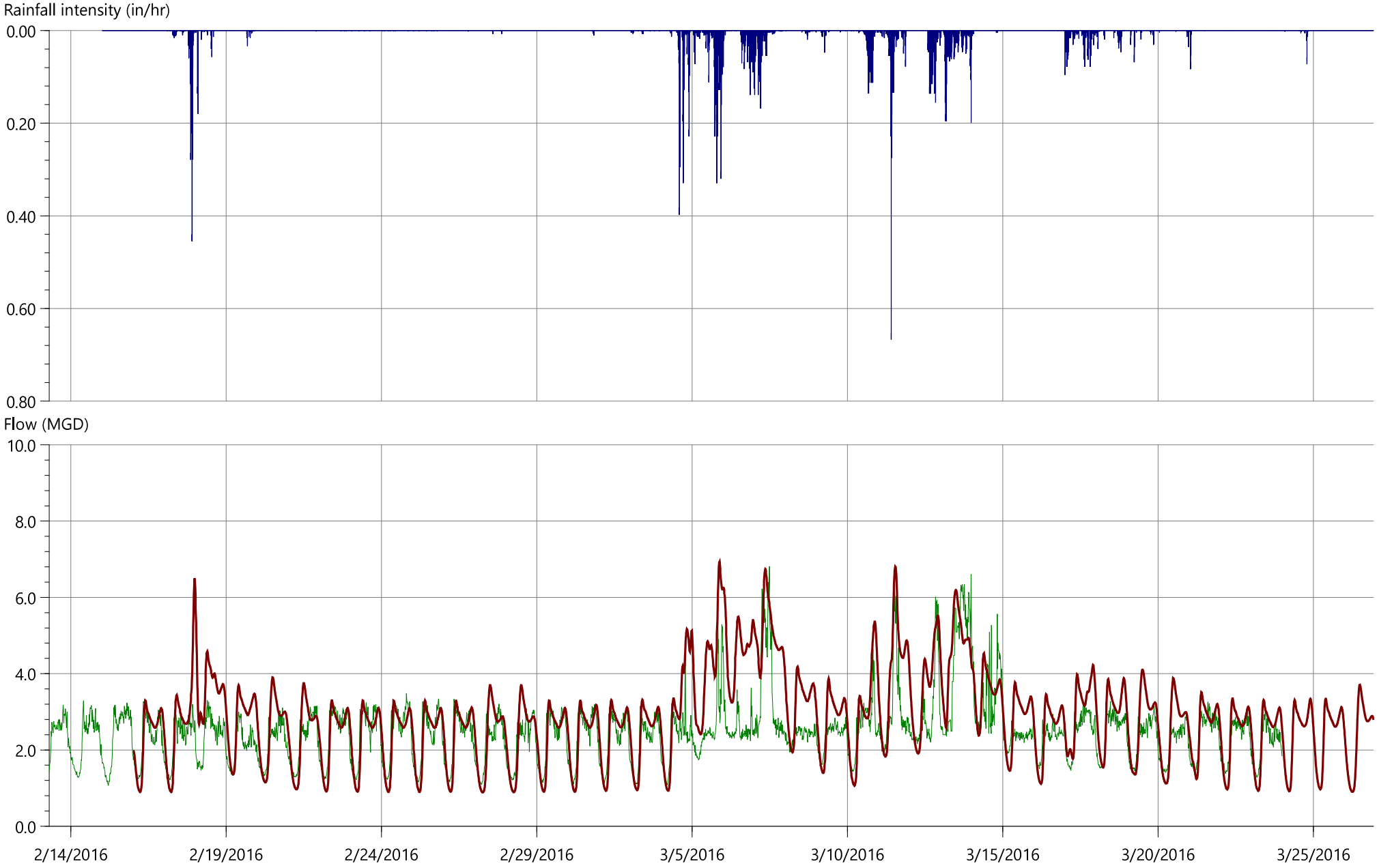
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.618	0.666	0.007			
Observed				2.731	17.837	26538612.826
...ta20160215_20160315				4.129	16.903	30158188.130

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 14, Model Location (Pred.) D/S SMH B03-024.1, Rainfall Profile: 178



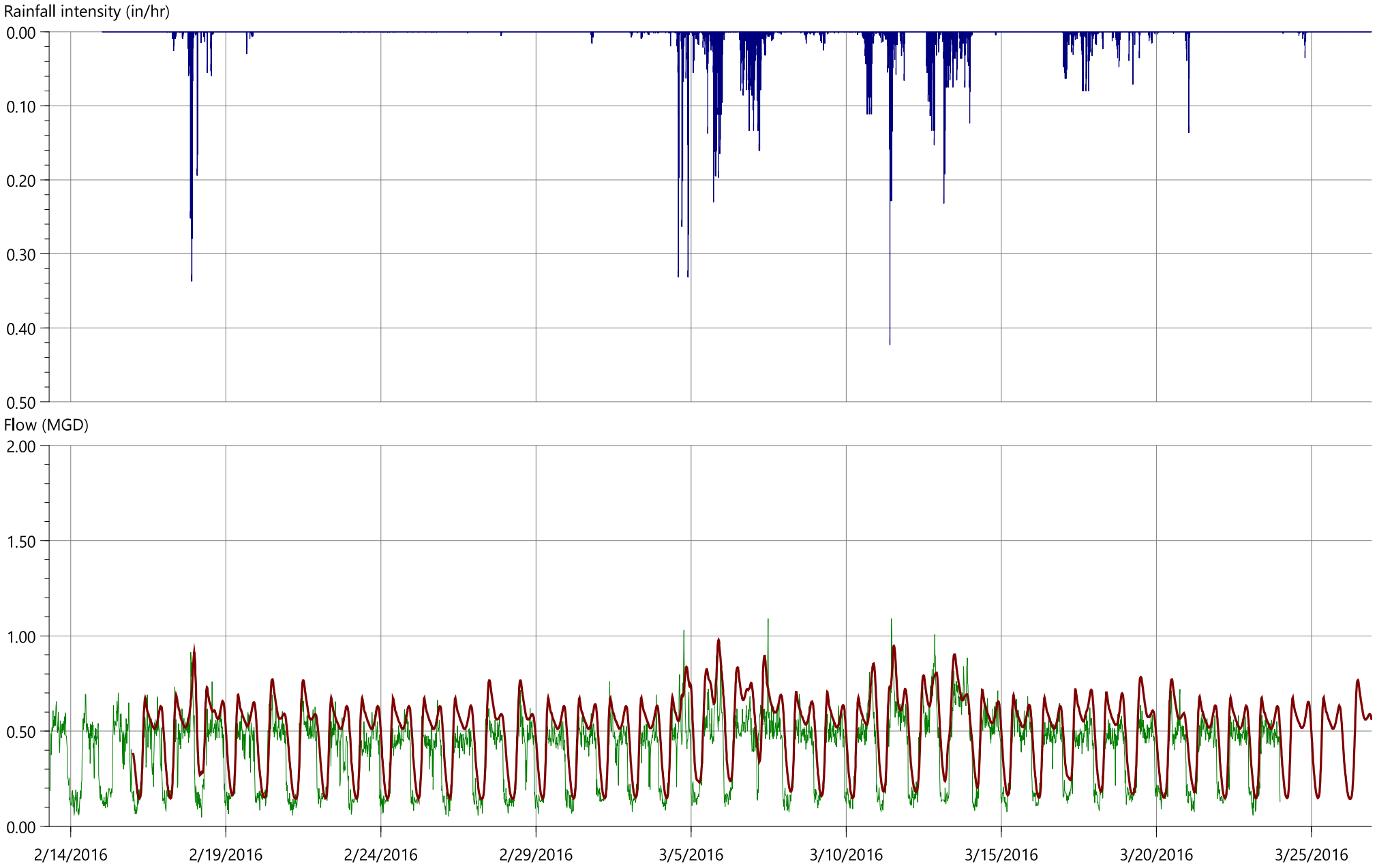
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.650	0.666	0.007			
Observed				2.435	15.807	23553734.551
...ta20160215_20160315				3.164	17.544	30549718.631

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 15, Model Location (Pred.) D/S SMH B03-053.1, Rainfall Profile: 145



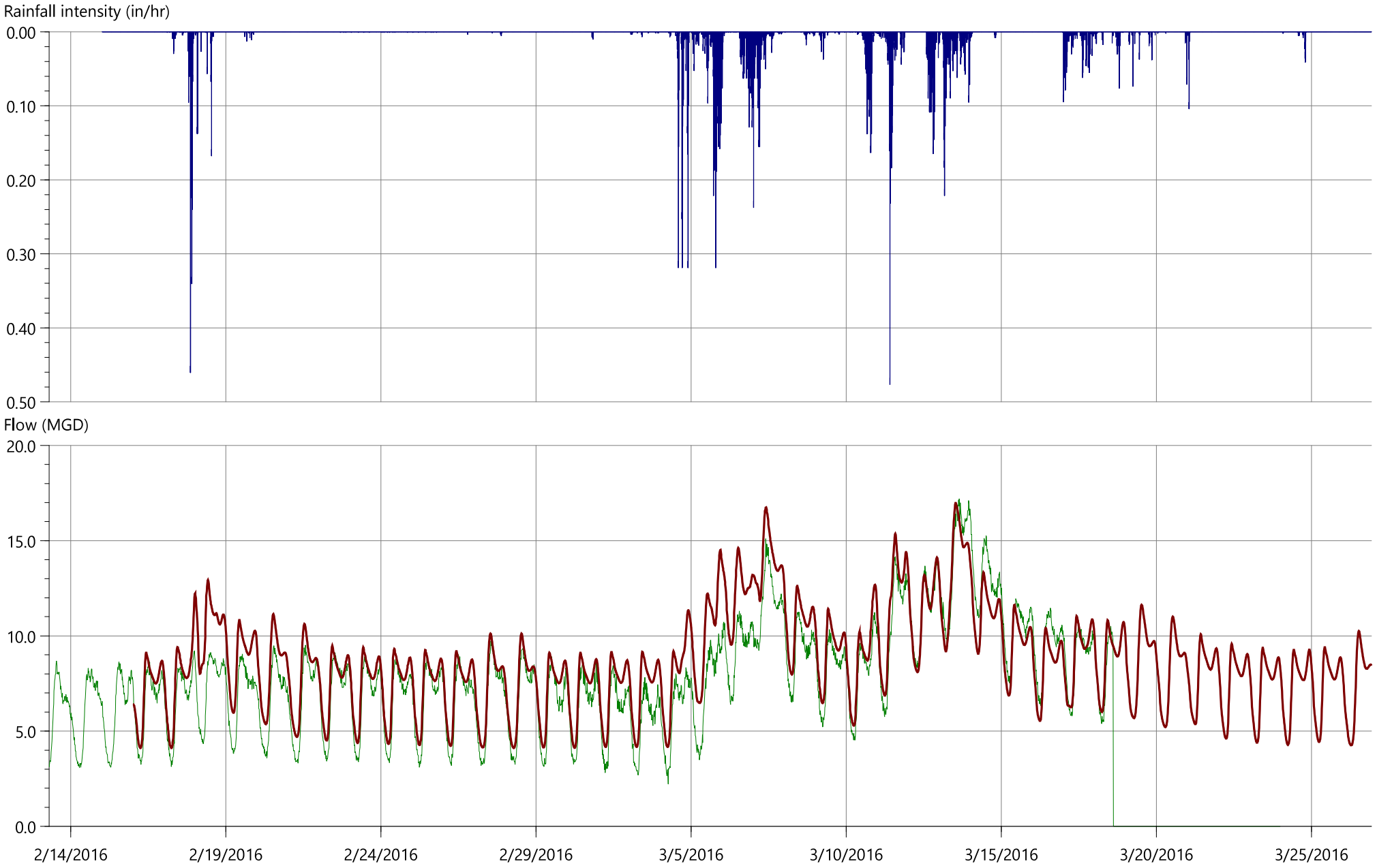
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.618	0.666	0.007			
Observed				1.071	6.810	8508039.397
...ta20160215_20160315				0.886	6.940	9988758.893

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 15A, Model Location (Pred.) D/S SMH B04-061.1, Rainfall Profile: 179



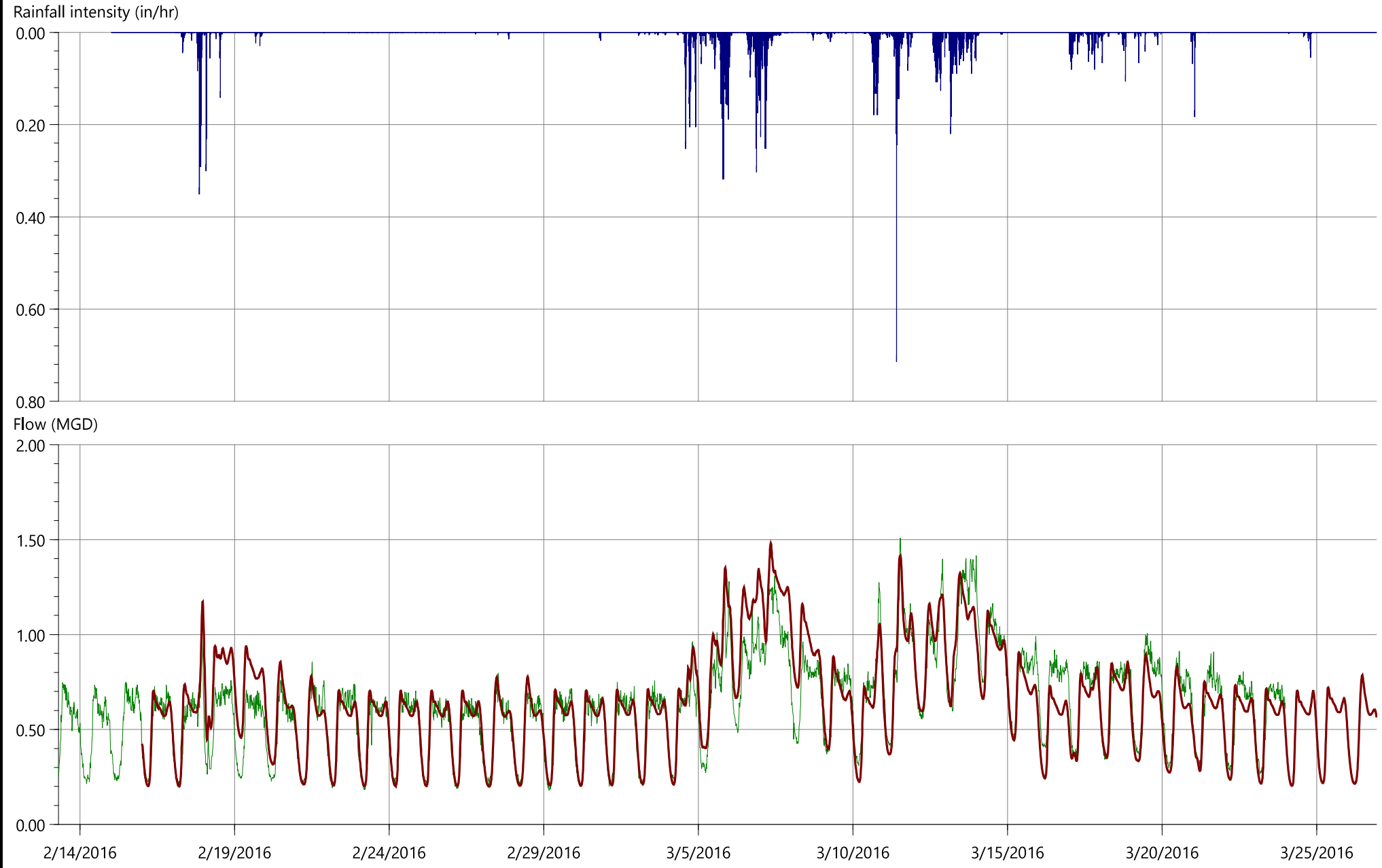
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.524	0.423	0.007			
Observed				0.048	1.091	1332963.500
...ta20160215_20160315				0.143	0.978	1724557.621

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 16, Model Location (Pred.) D/S SMH B05-230.1, Rainfall Profile: 147



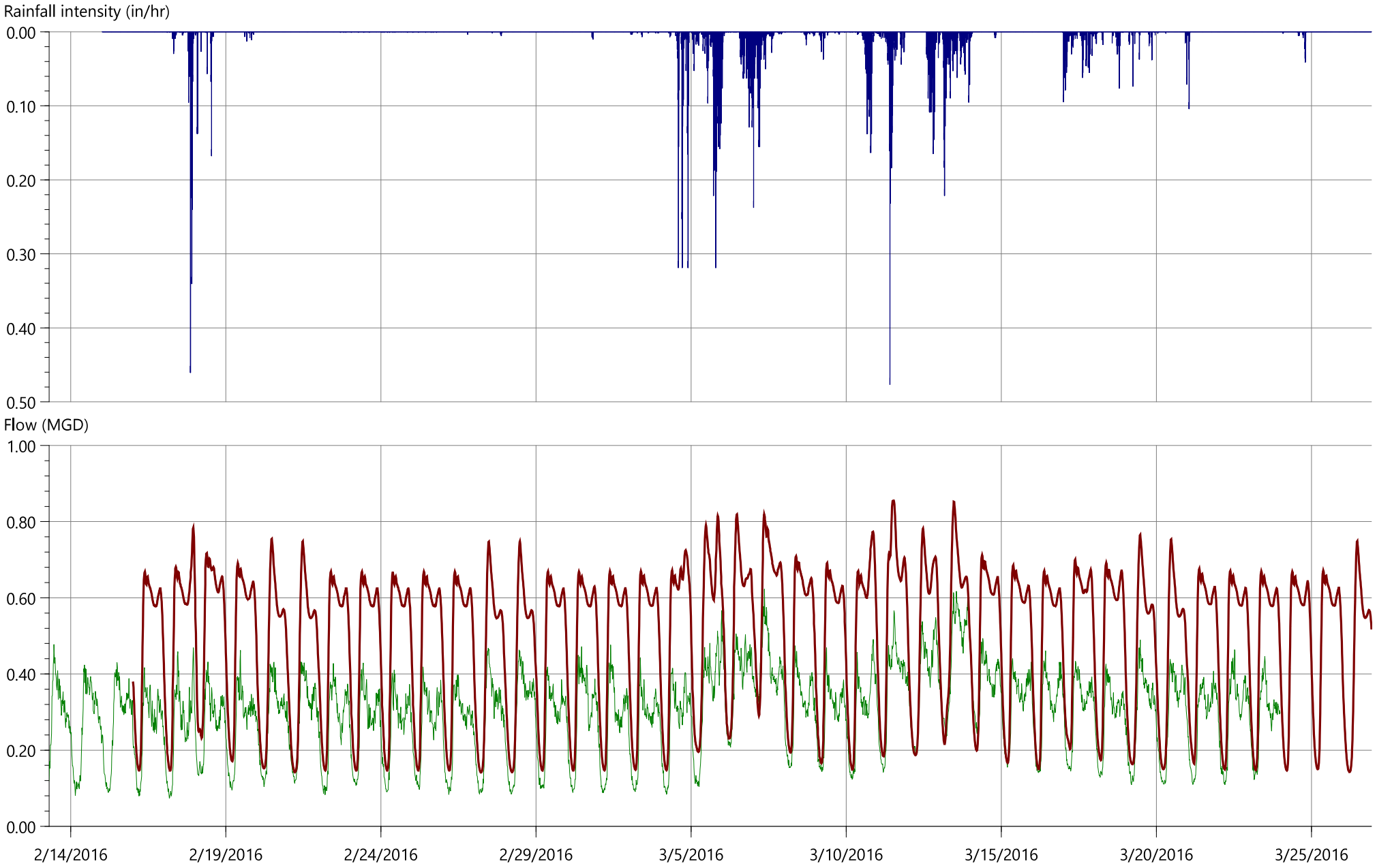
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.581	0.476	0.007			
Observed				0.000	17.190	23376320.562
...ta20160215_20160315				4.111	16.980	30162930.049

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 16A, Model Location (Pred.) D/S SMH B06-148.1, Rainfall Profile: 182



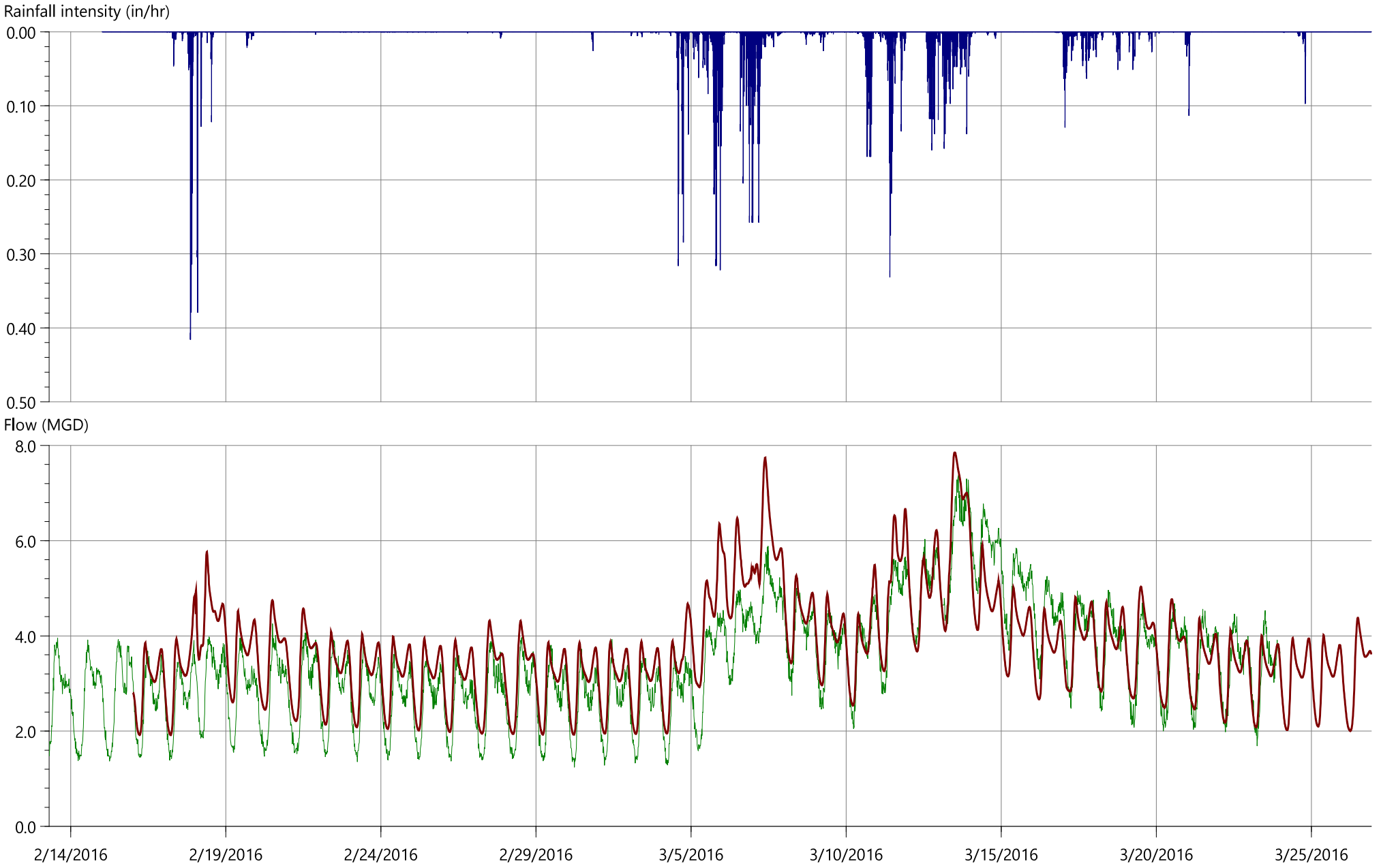
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.006	0.714	0.007			
Observed				0.179	1.509	2154876.607
...ta20160215_20160315				0.200	1.482	2224728.980

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 17, Model Location (Pred.) D/S SMH B05-448.1, Rainfall Profile: 147



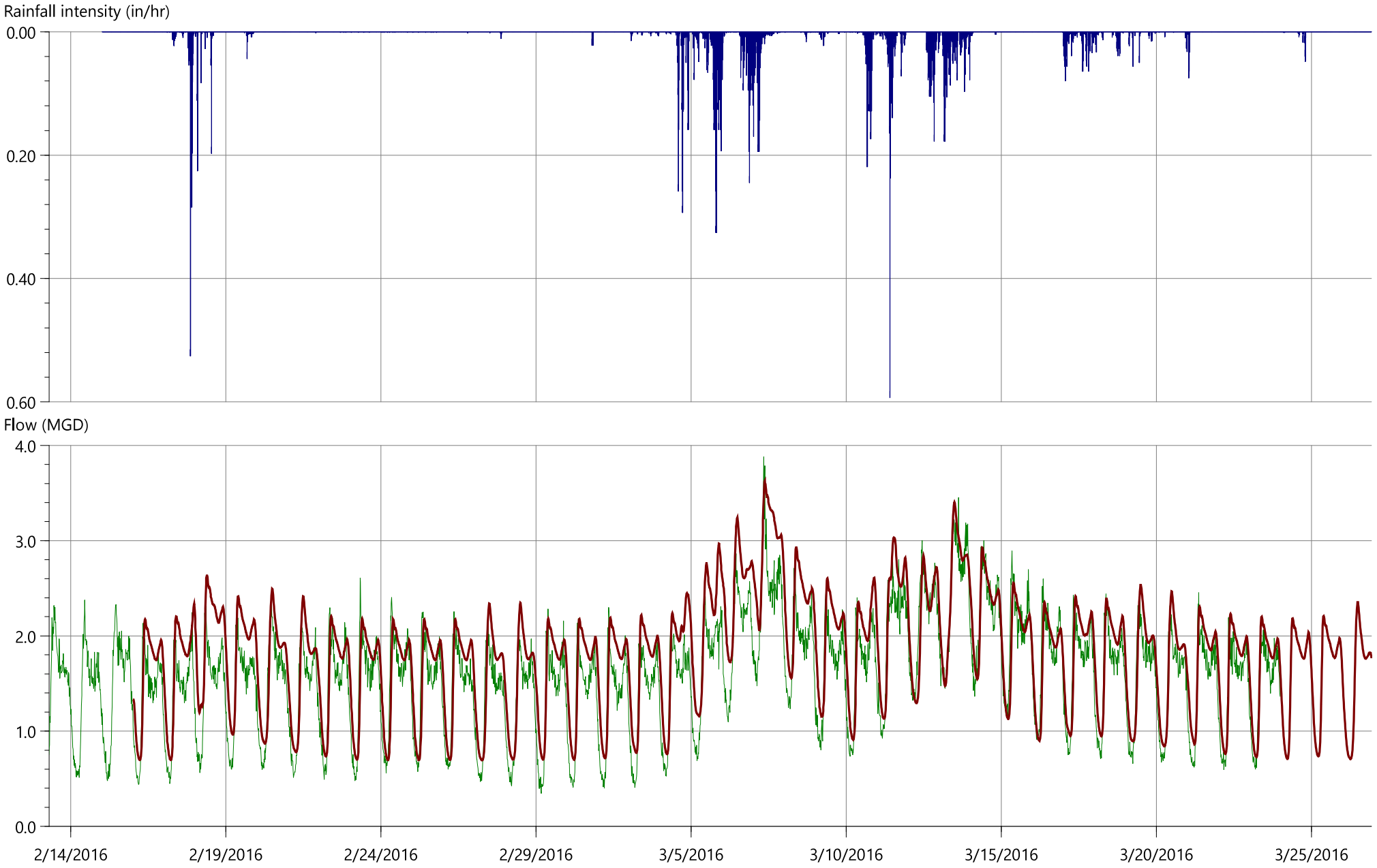
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.581	0.476	0.007			
Observed				0.074	0.623	1027152.765
...ta20160215_20160315				0.141	0.855	1734444.106

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 18, Model Location (Pred.) D/S SMH B07-233.1, Rainfall Profile: 151



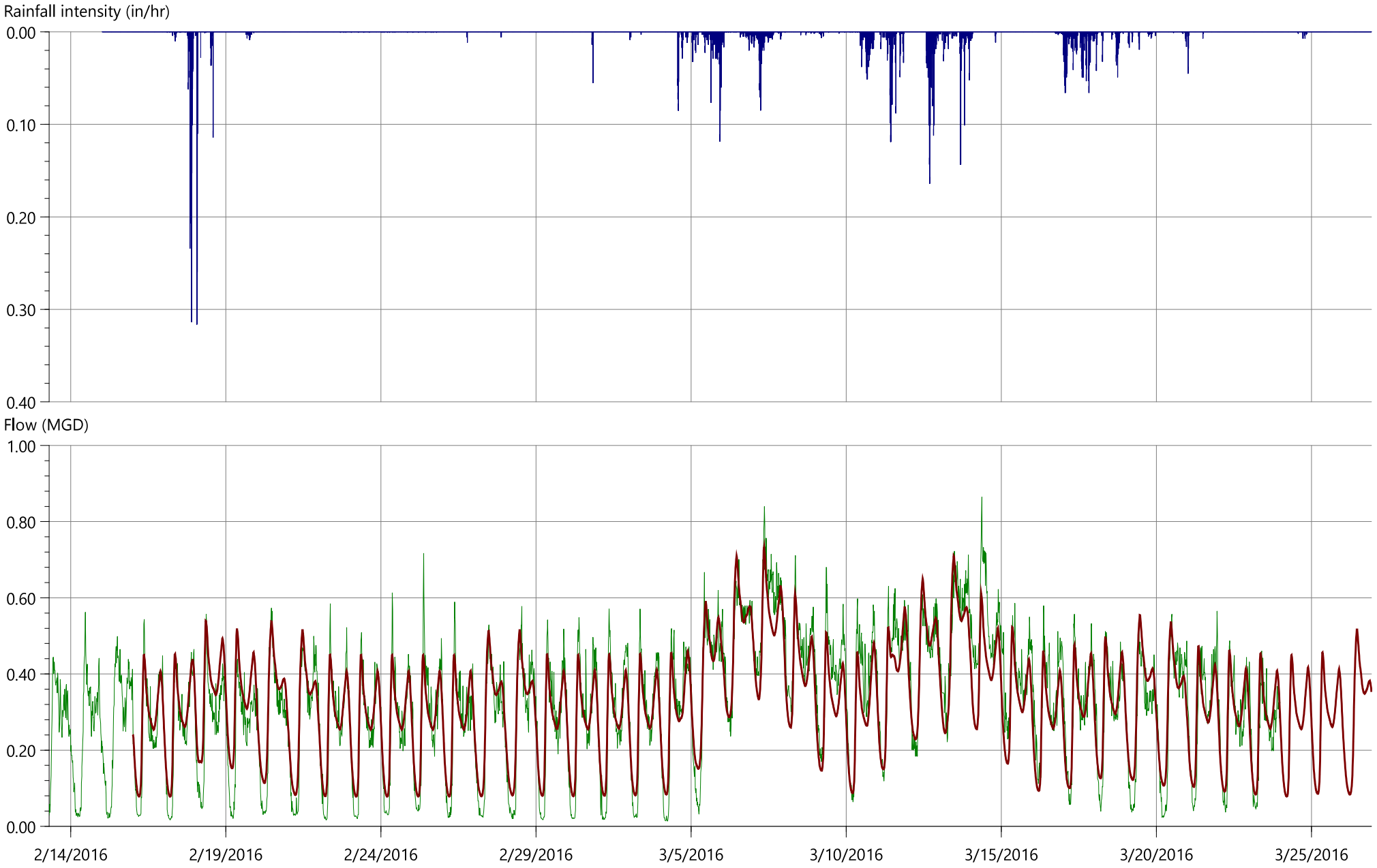
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.452	0.416	0.008			
Observed				1.241	7.372	11745270.797
...ta20160215_20160315				1.920	7.850	12994404.563

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 19, Model Location (Pred.) D/S SMH C06-025.1, Rainfall Profile: 248



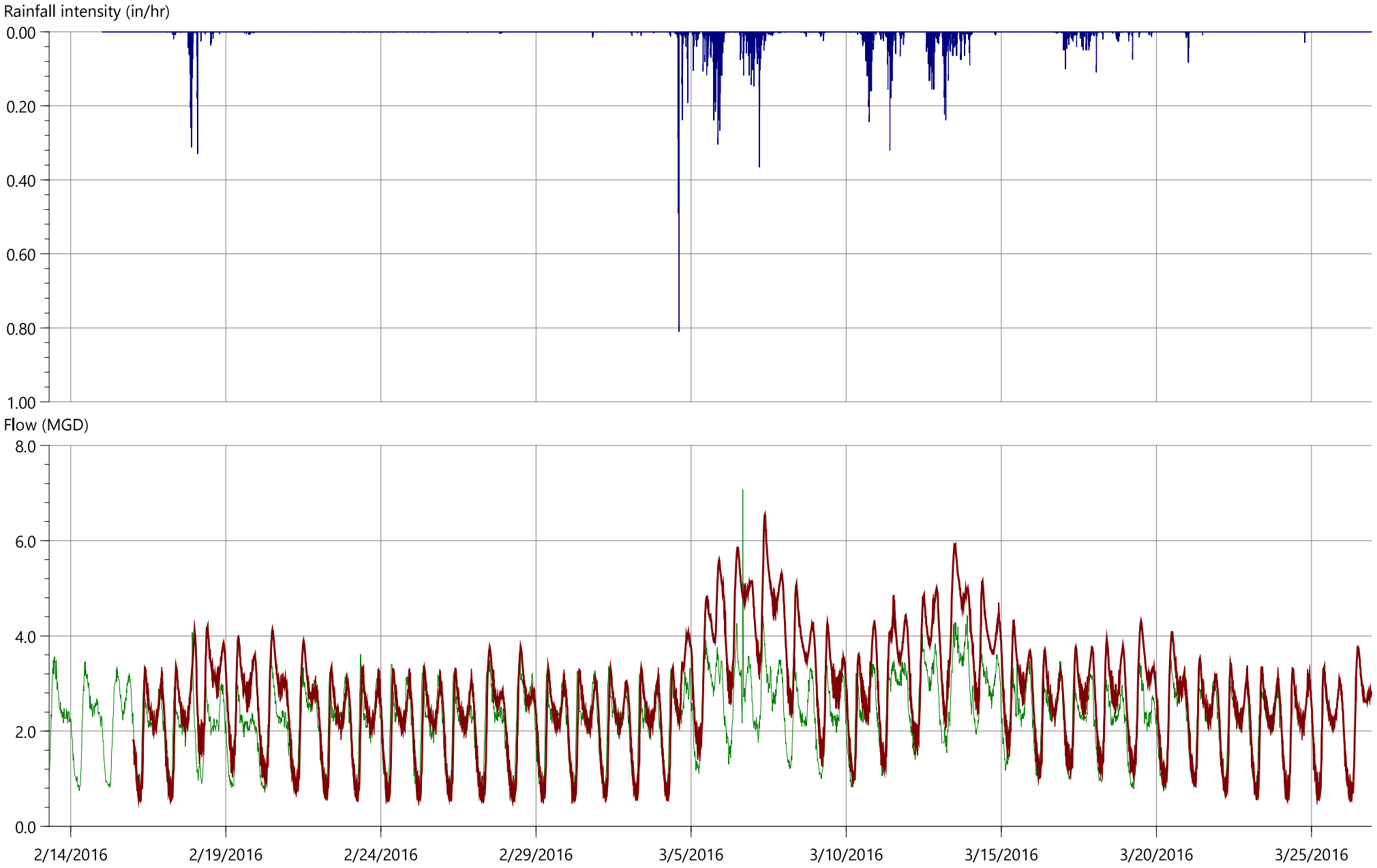
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.748	0.593	0.007			
Observed				0.347	3.882	5522255.777
...ta20160215_20160315				0.691	3.629	6310657.038

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 20, Model Location (Pred.) D/S SMH C07-004.1, Rainfall Profile: 200



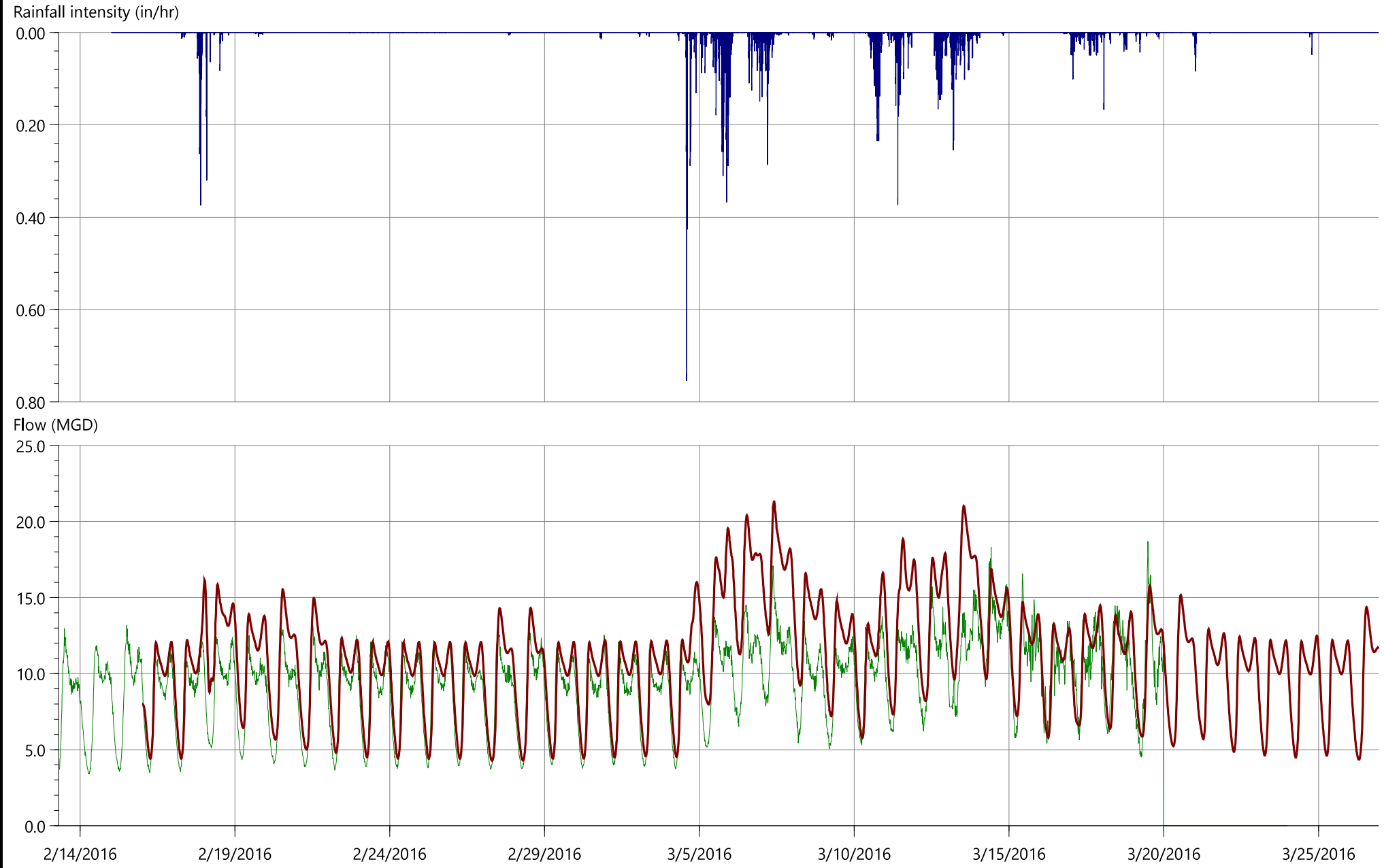
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	3.133	0.316	0.003			
Observed				0.014	0.865	1110452.108
...ta20160215_20160315				0.078	0.732	1119212.084

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 21, Model Location (Pred.) D/S SMH E01-150.1, Rainfall Profile: 305



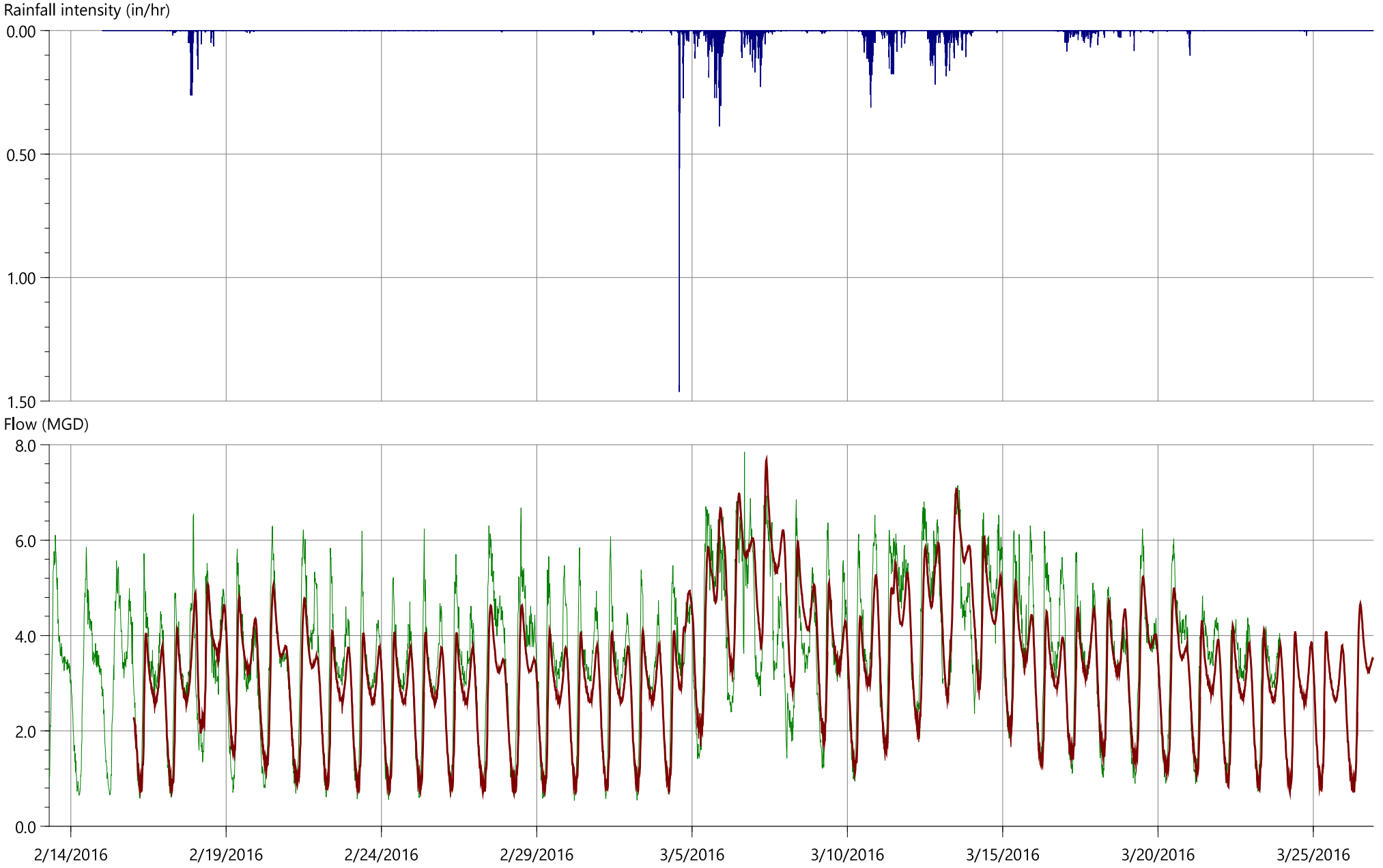
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.168	0.810	0.007			
Observed				0.681	7.071	7871327.215
...ta20160215_20160315				0.529	6.540	9303644.977

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 22, Model Location (Pred.) D/S SMH F01-135.1, Rainfall Profile: 371



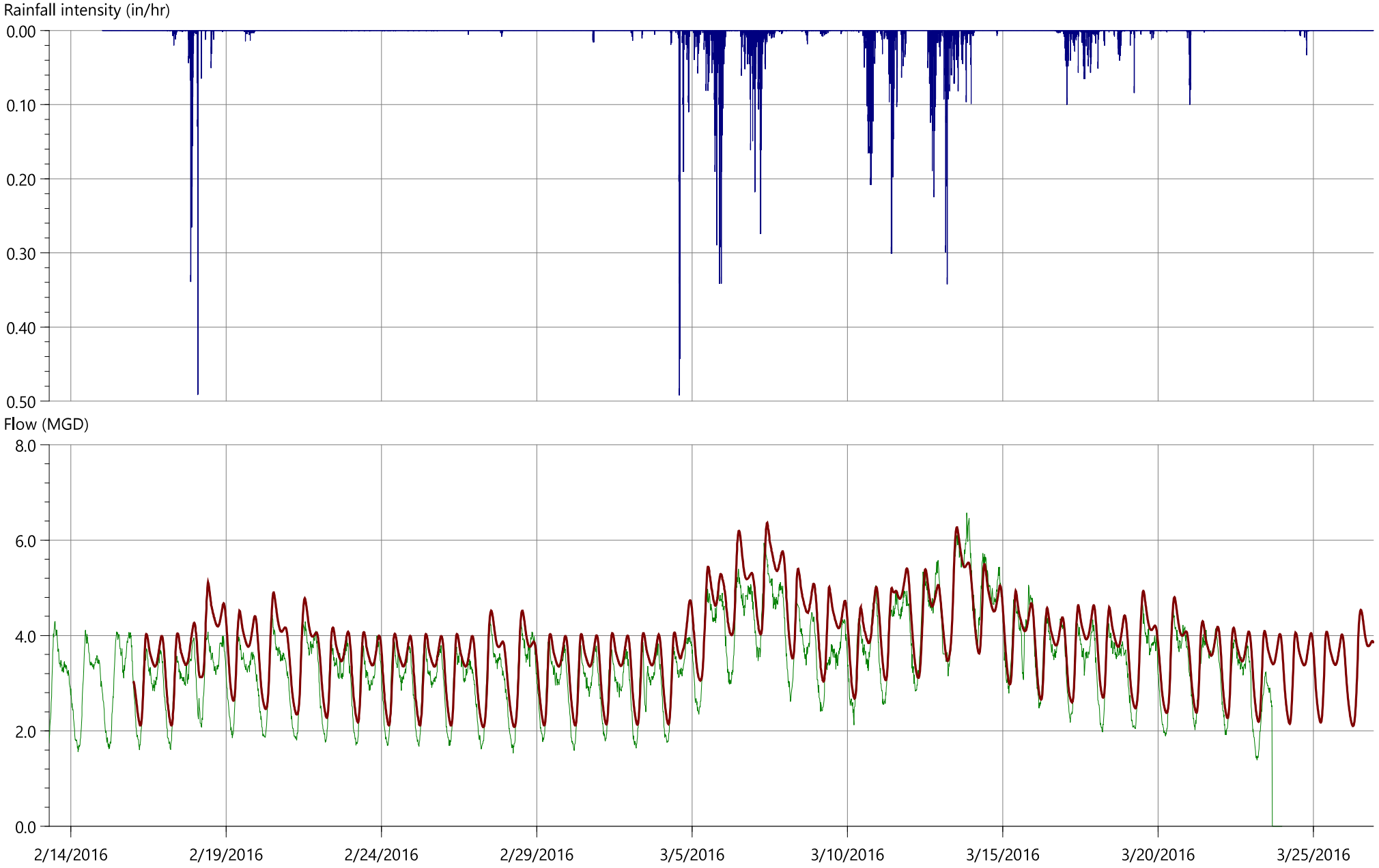
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.422	0.754	0.008			
Observed				0.000	18.708	29305470.700
...ta20160215_20160315				4.271	21.309	38289677.747

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 23, Model Location (Pred.) D/S SMH F01-147.1, Rainfall Profile: 370



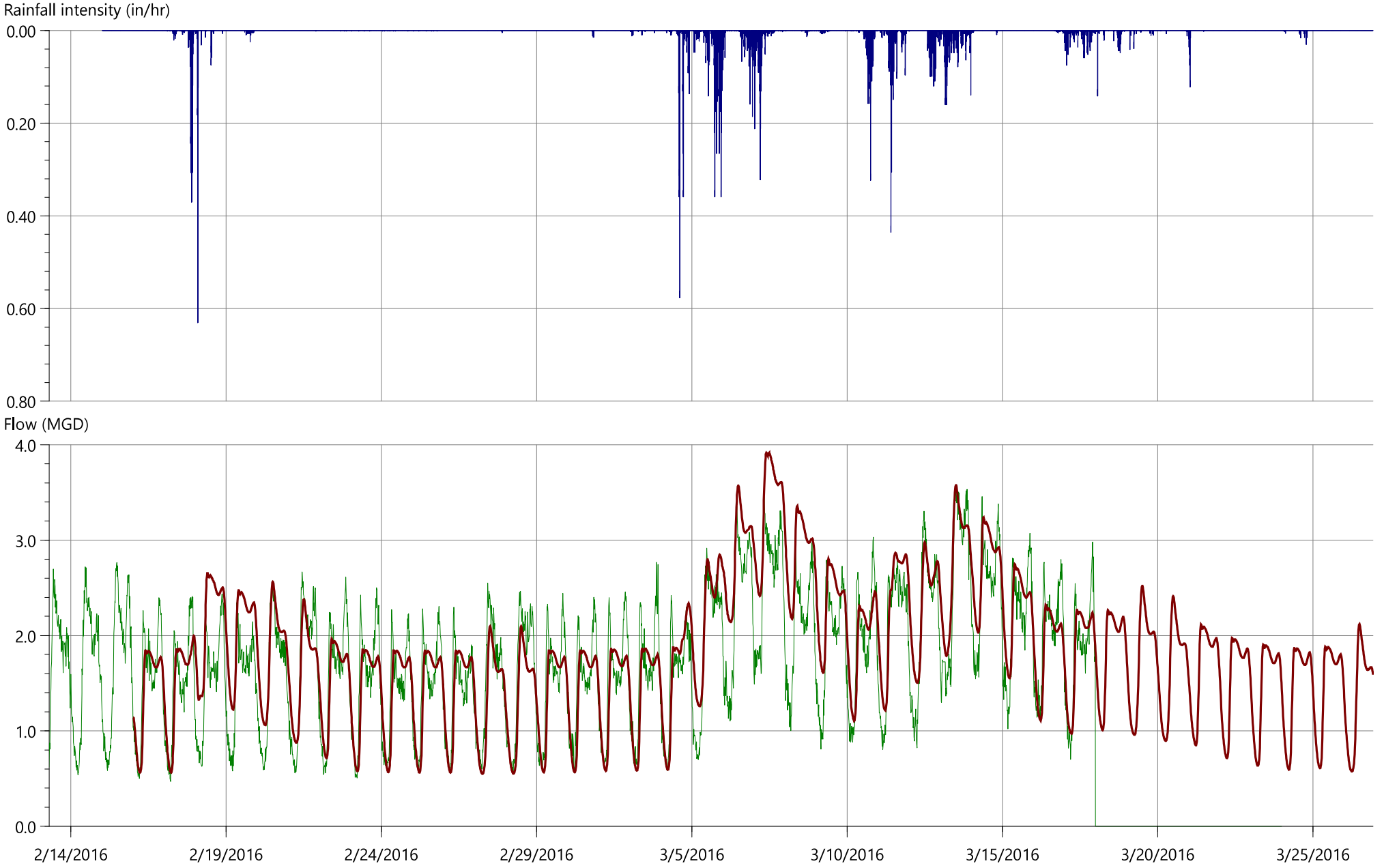
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.432	1.462	0.008			
Observed				0.542	7.848	12177525.807
...ta20160215_20160315				0.707	7.678	11302643.288

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 24, Model Location (Pred.) D/S SMH F02-073.1, Rainfall Profile: 406



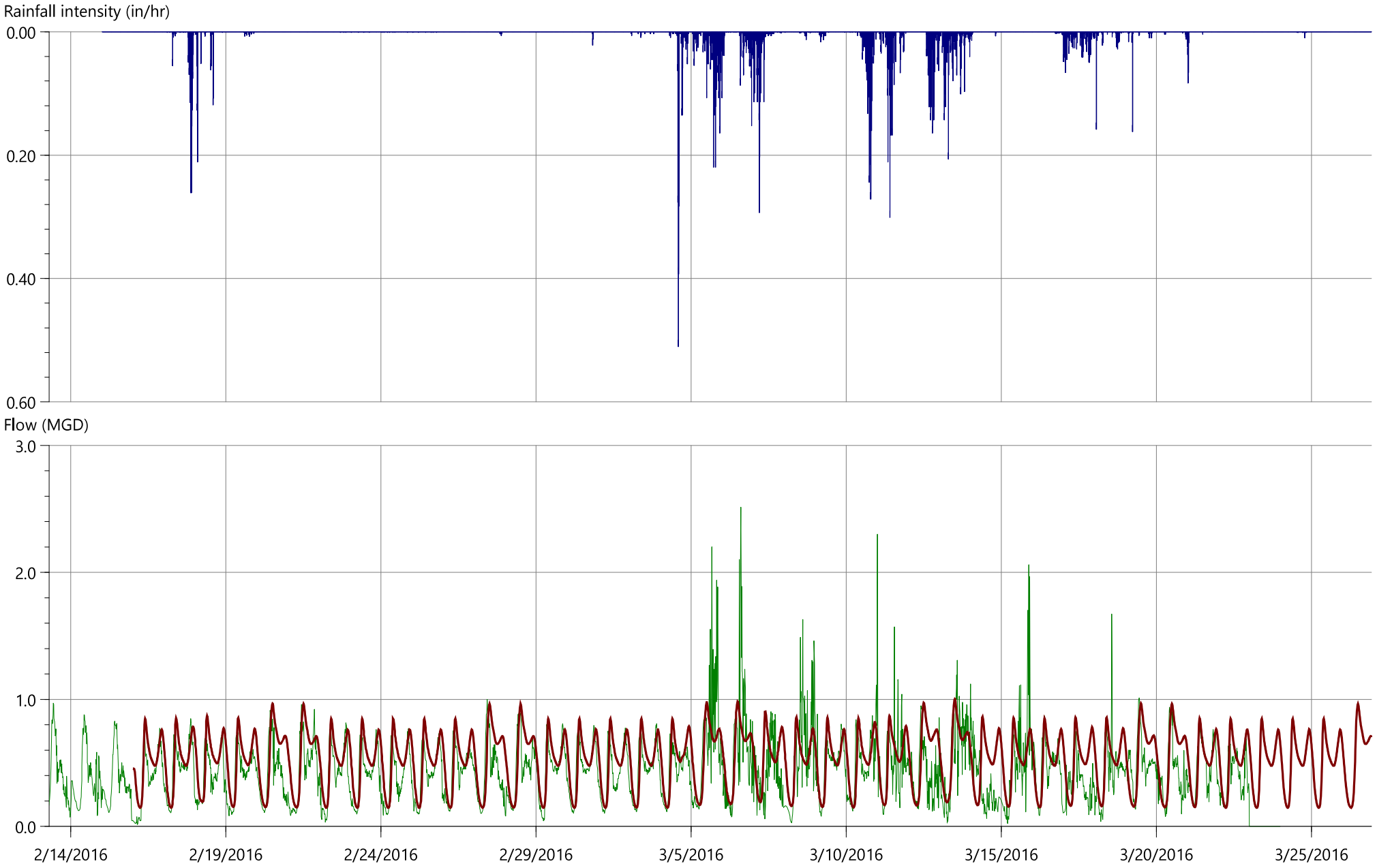
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.235	0.492	0.007			
Observed				0.000	6.569	11673591.208
...ta20160215_20160315				2.078	6.365	13083521.477

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 25, Model Location (Pred.) D/S SMH F04-003.1, Rainfall Profile: 409



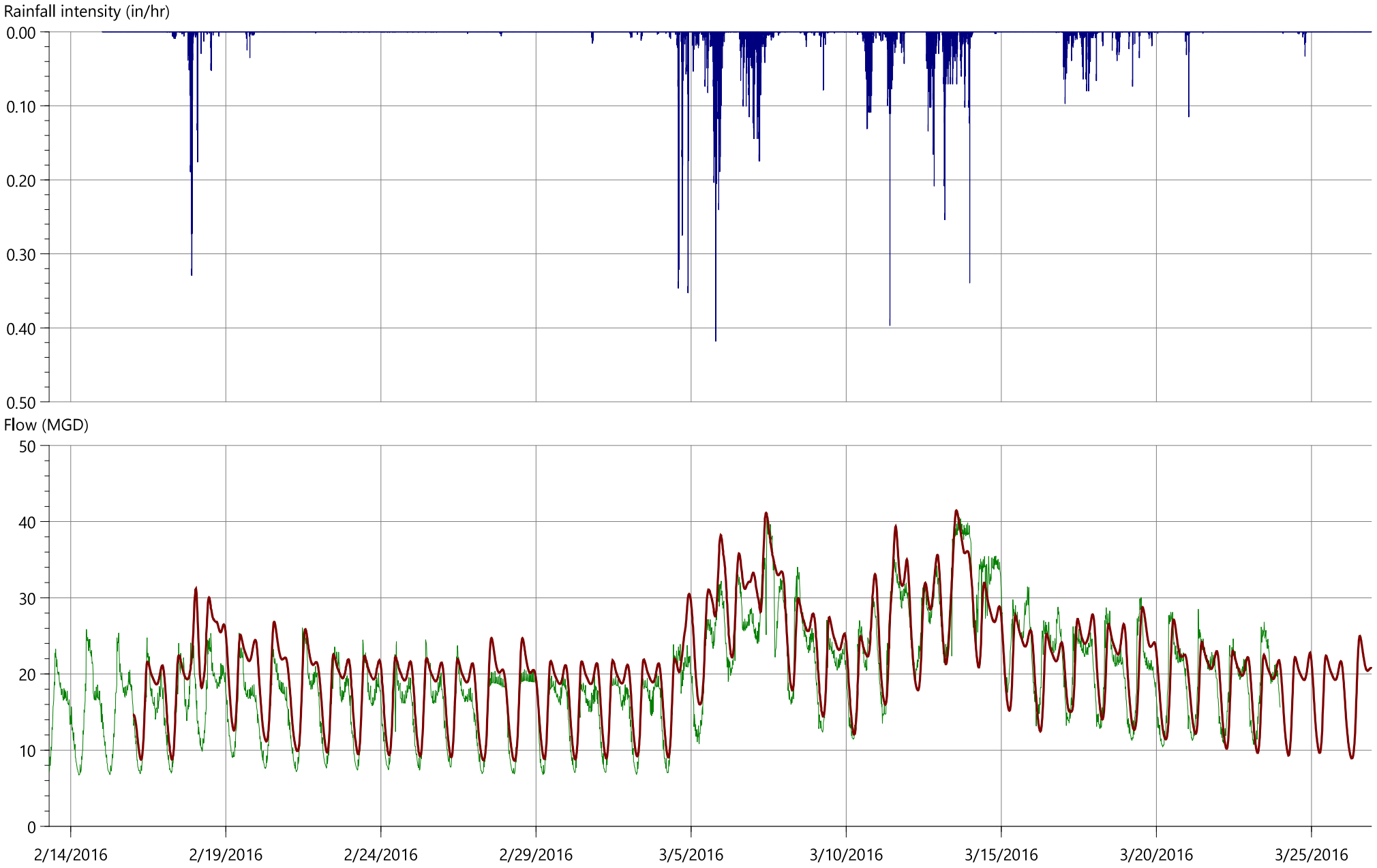
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.213	0.631	0.007			
Observed				0.000	3.566	5191133.127
...ta20160215_20160315				0.550	3.917	6371709.144

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 26, Model Location (Pred.) D/S SMH F99-034.1, Rainfall Profile: 336



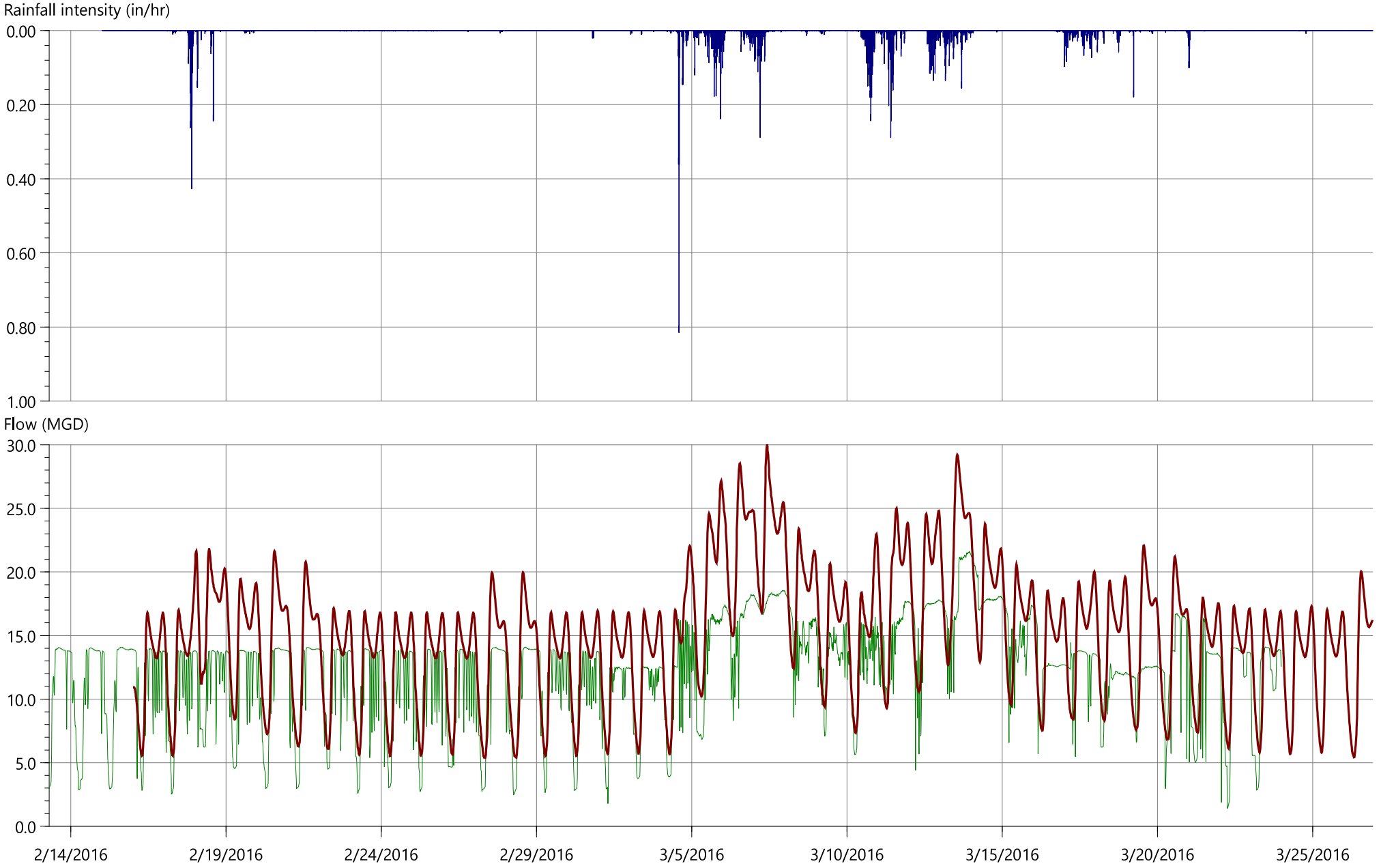
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.185	0.510	0.006			
Observed				0.000	2.513	1488940.567
...ta20160215_20160315				0.146	1.003	1837826.434

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) DC WWTP, Model Location (Pred.) D/S CAP B03-DCWWTP.1, Rainfall Profile: 177



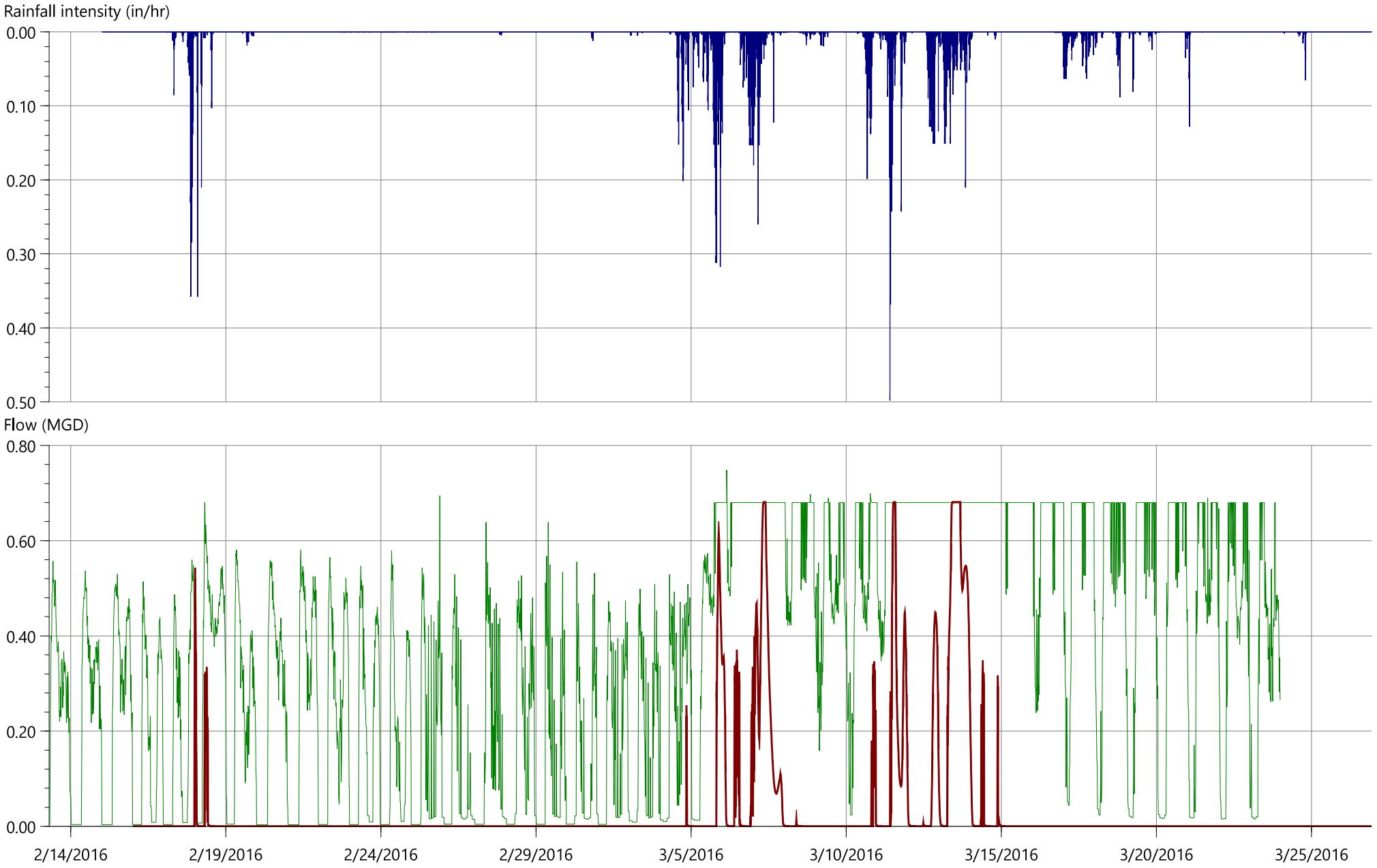
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.394	0.418	0.007			
Observed				6.736	40.725	66602465.109
...ta20160215_20160315				8.618	41.482	73053377.582

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) PG WWTP, Model Location (Pred.) D/S SMH F99-016.1, Rainfall Profile: 368



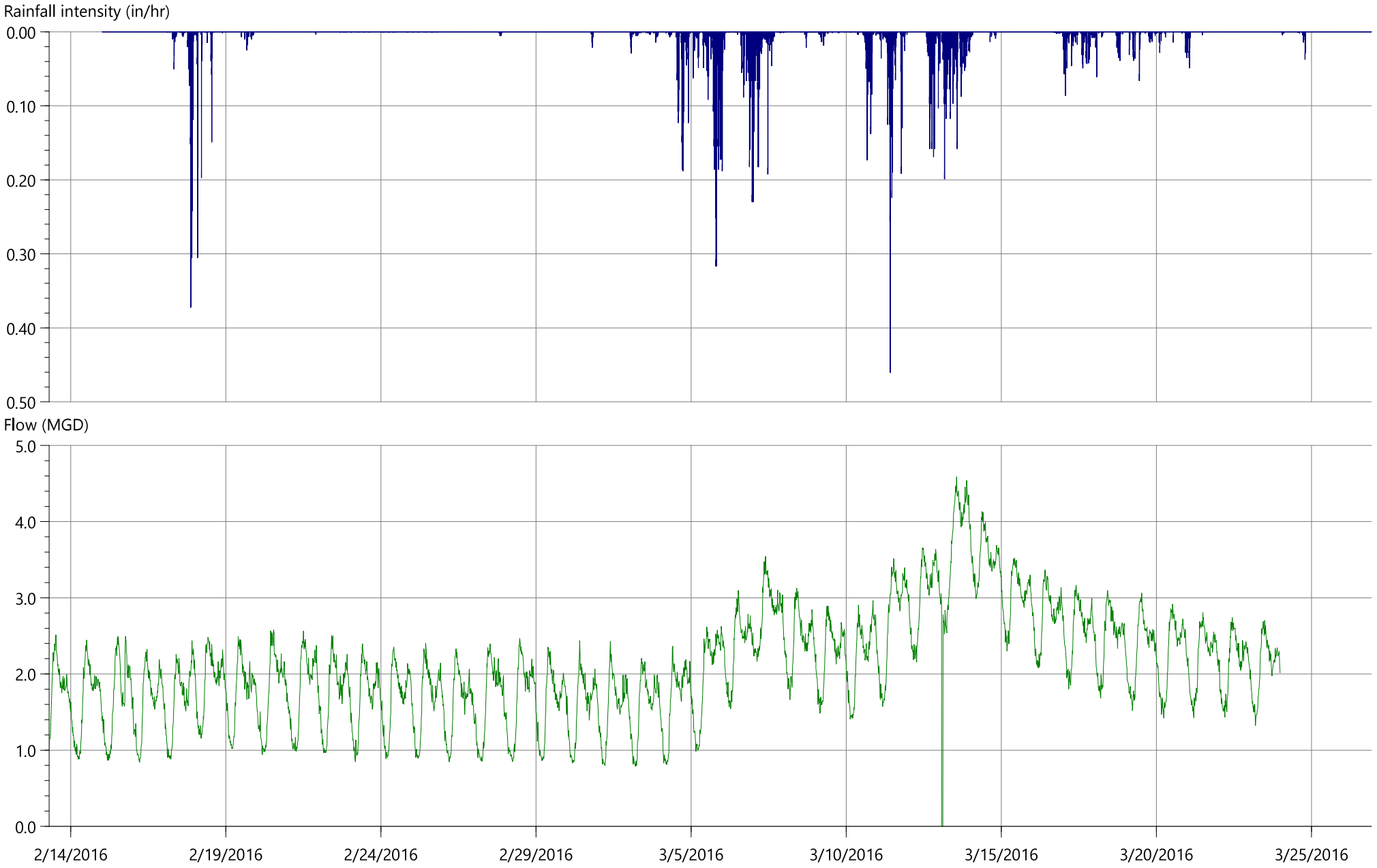
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	5.985	0.815	0.006			
Observed				1.411	21.613	42223364.633
...ta20160215_20160315				5.391	29.963	52253557.072

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) PS 26, Model Location (Pred.) D/S A08-169D1.1, Rainfall Profile: 120



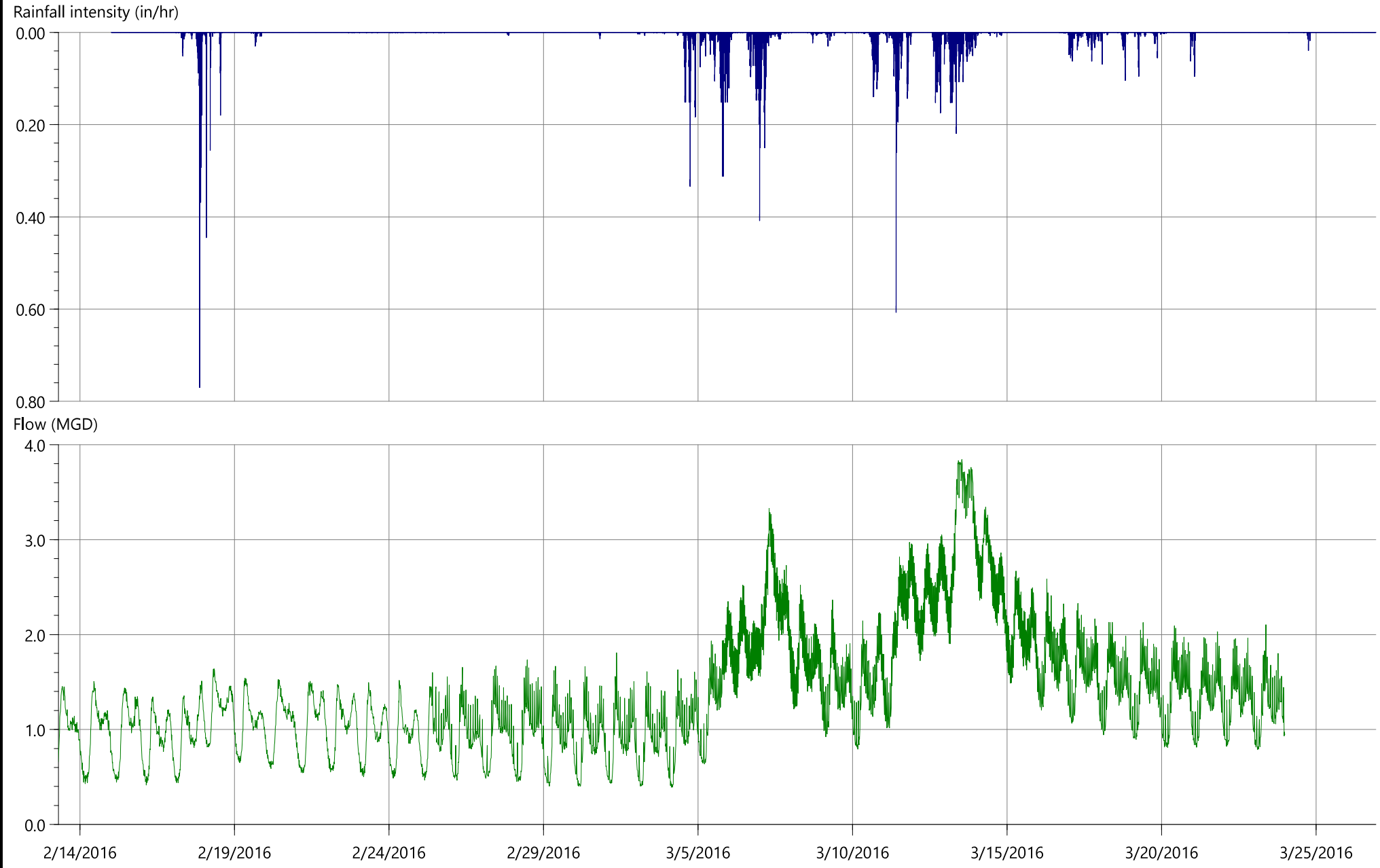
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.479	0.498	0.008			
Observed				0.003	0.748	1268714.090
...ta20160215_20160315				0.000	0.681	104826.425

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) Sierra College (Placer County), Model Location (Pred.) D/S Sierra College.1, Rainfall Profile: 289



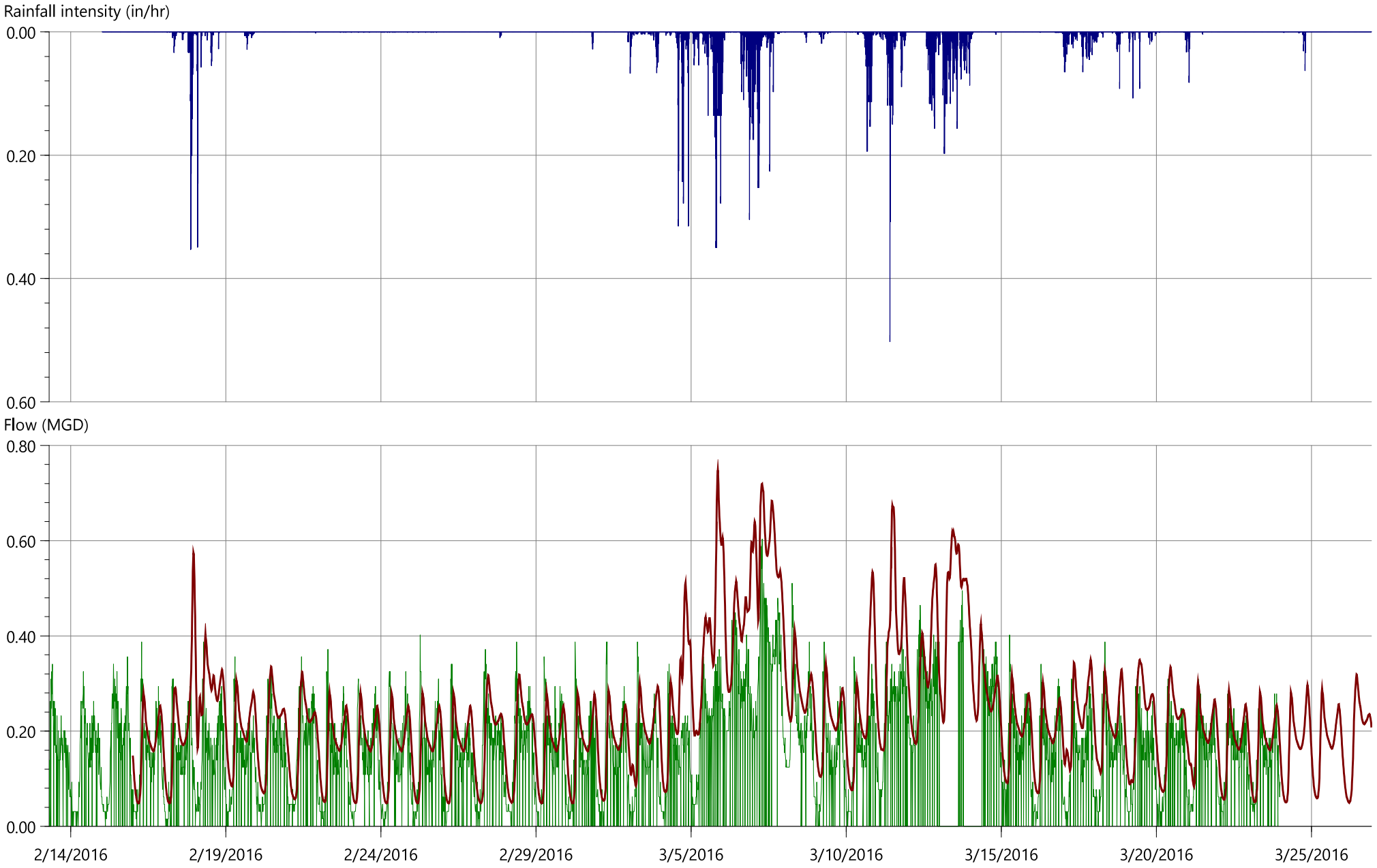
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.146	0.460	0.007			
Observed				0.000	4.589	7230337.020
...ta20160215_20160315						

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) SMD2, Model Location (Pred.) D/S SMH A08-023.1, Rainfall Profile: 157



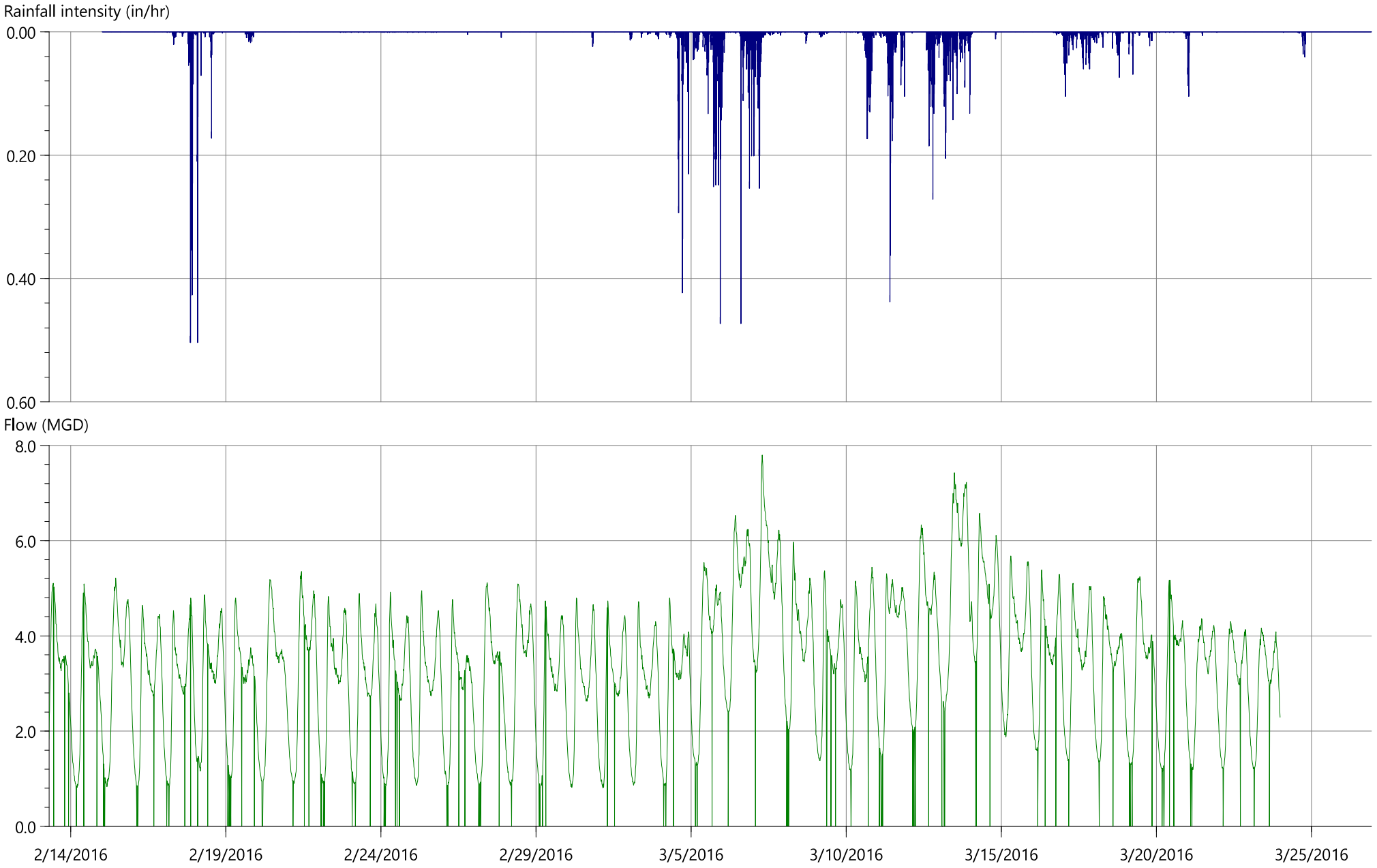
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.706	0.770	0.008			
Observed				0.391	3.843	4692173.351
...ta20160215_20160315						

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) Highlands, Model Location (Pred.) D/S SMH D08-006.1, Rainfall Profile: 318



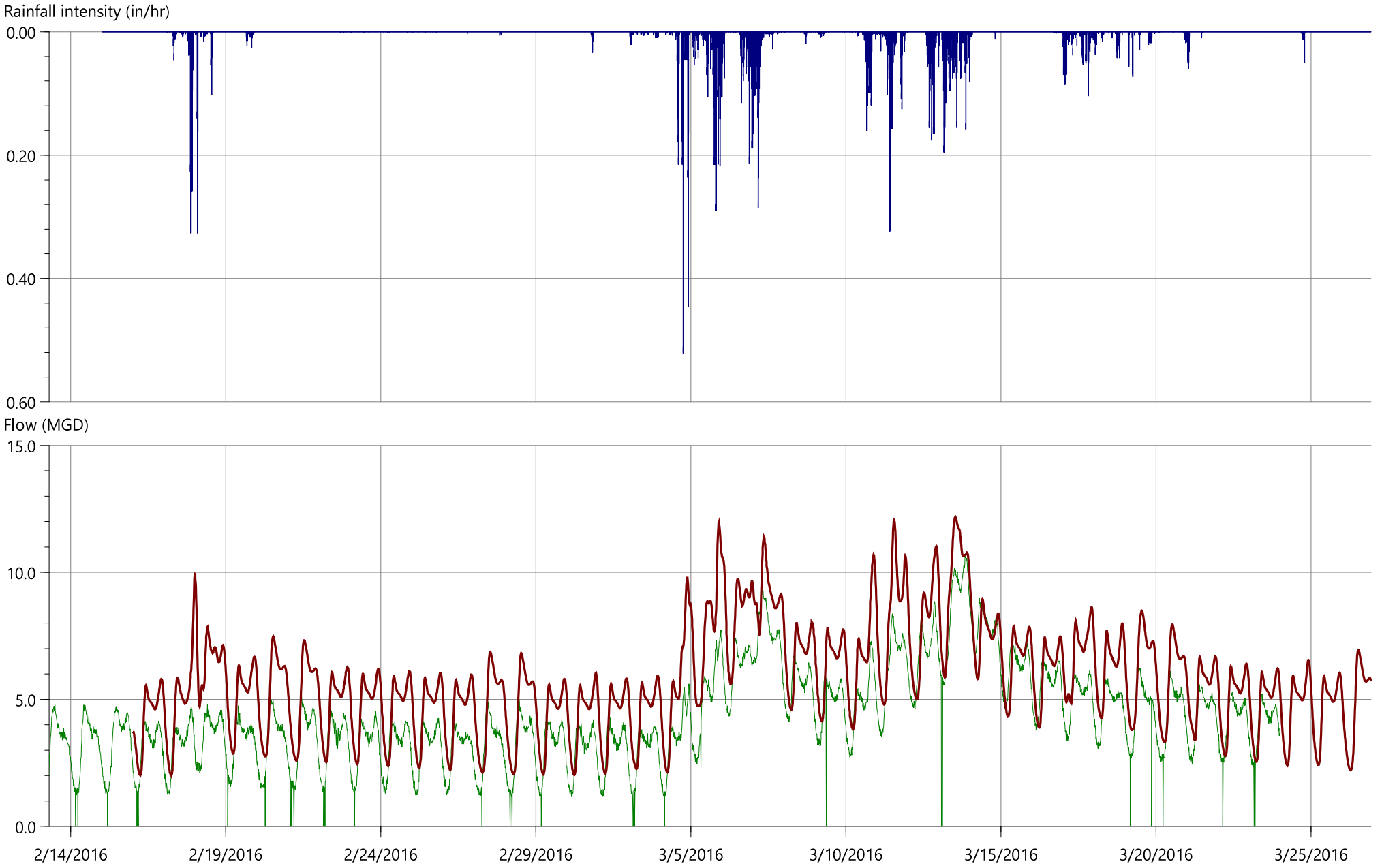
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.486	0.502	0.008			
Observed				0.000	0.603	498513.323
...ta20160215_20160315				0.048	0.748	814212.771

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) North Roseville, Model Location (Pred.) D/S NorthRoseville.1, Rainfall Profile: 479



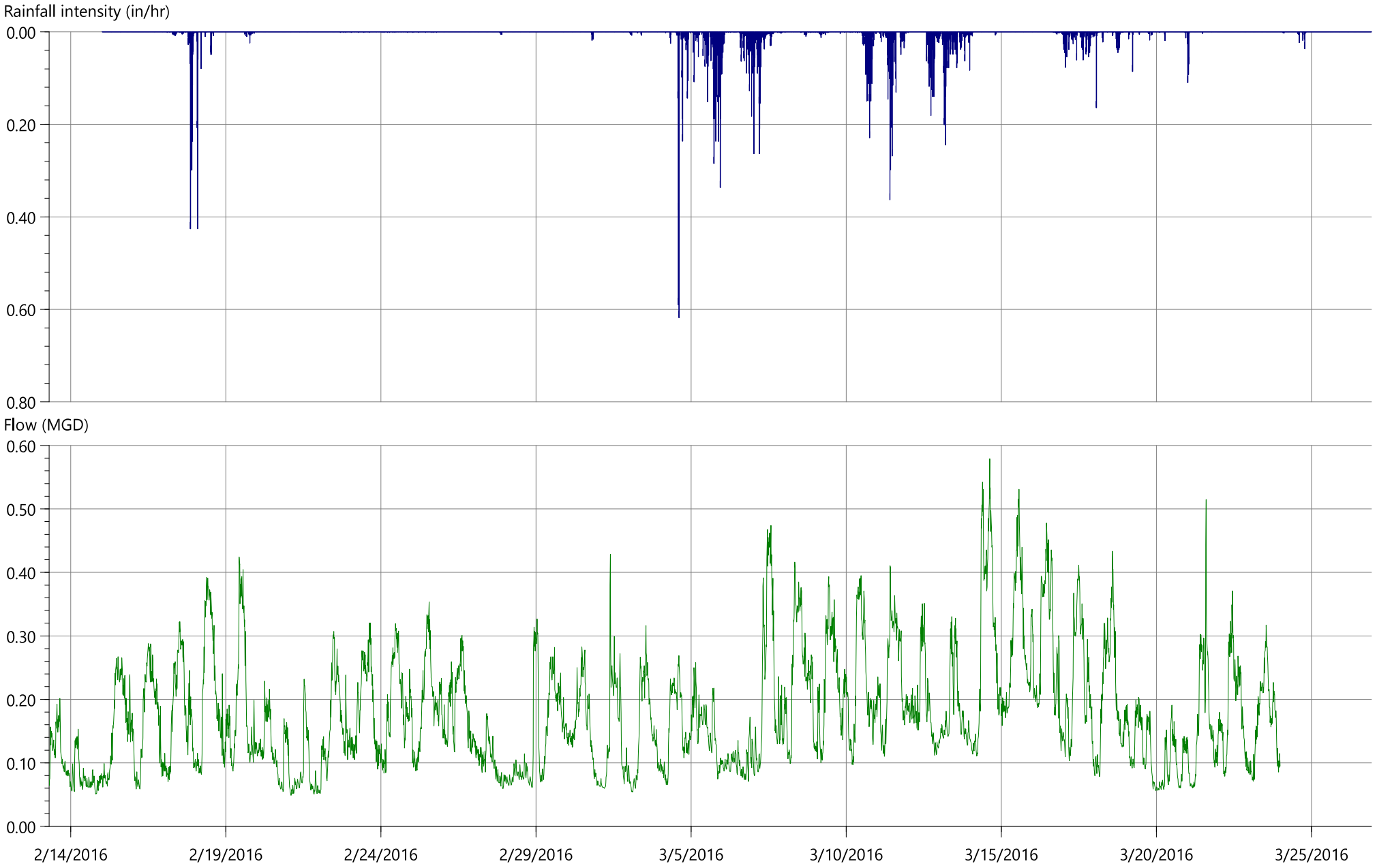
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.580	0.504	0.008			
Observed				0.000	7.798	11333261.397
...ta20160215_20160315						

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) Springview, Model Location (Pred.) D/S SMH C06-213.1, Rainfall Profile: 418



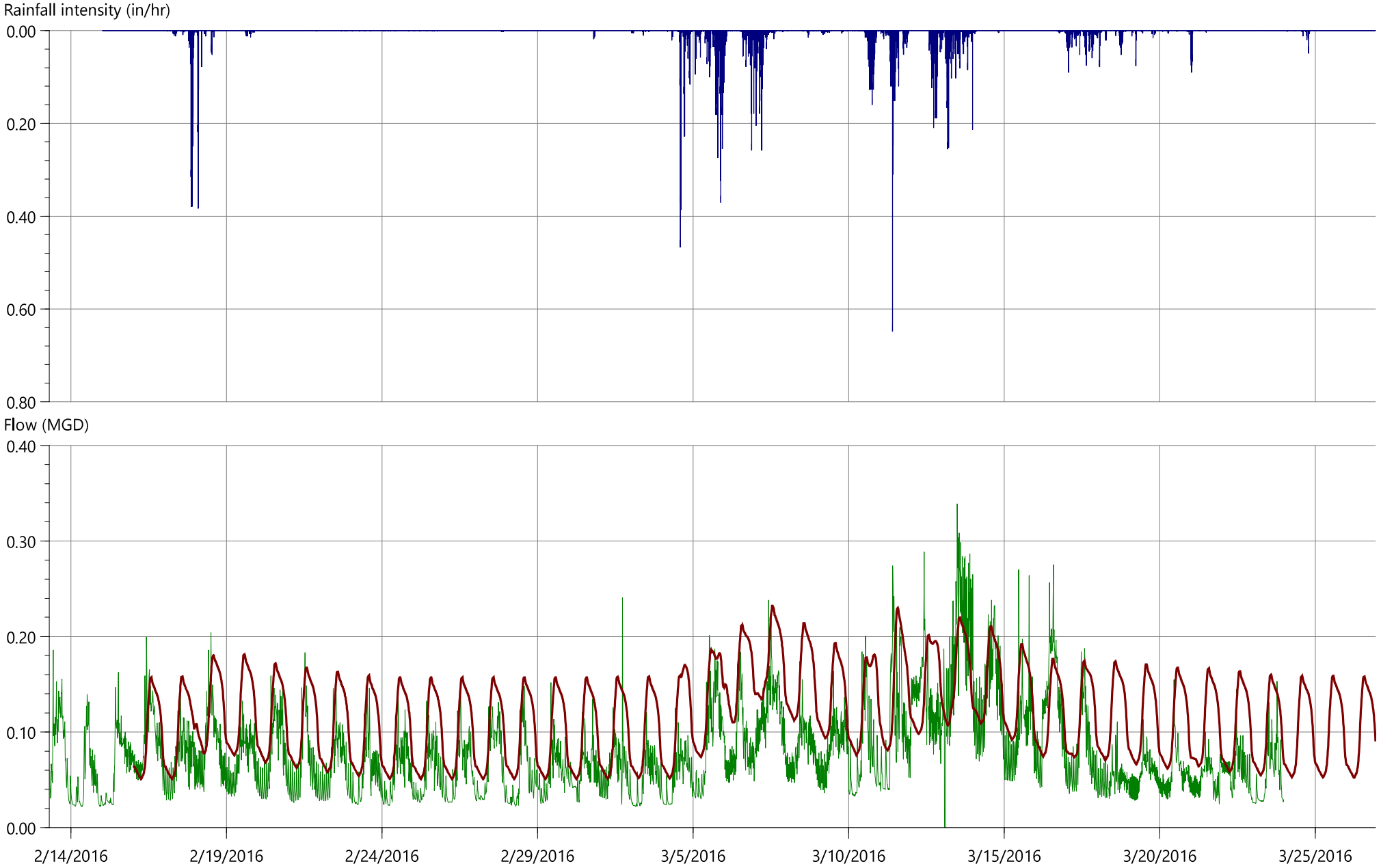
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.461	0.521	0.008			
Observed				0.000	10.738	14884868.215
...ta20160215_20160315				2.010	12.195	20206568.688

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) Cincinnati, Model Location (Pred.) D/S SMH G03-032.1, Rainfall Profile: 441



	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.365	0.618	0.007			
Observed				0.049	0.579	607274.558
...ta20160215_20160315						

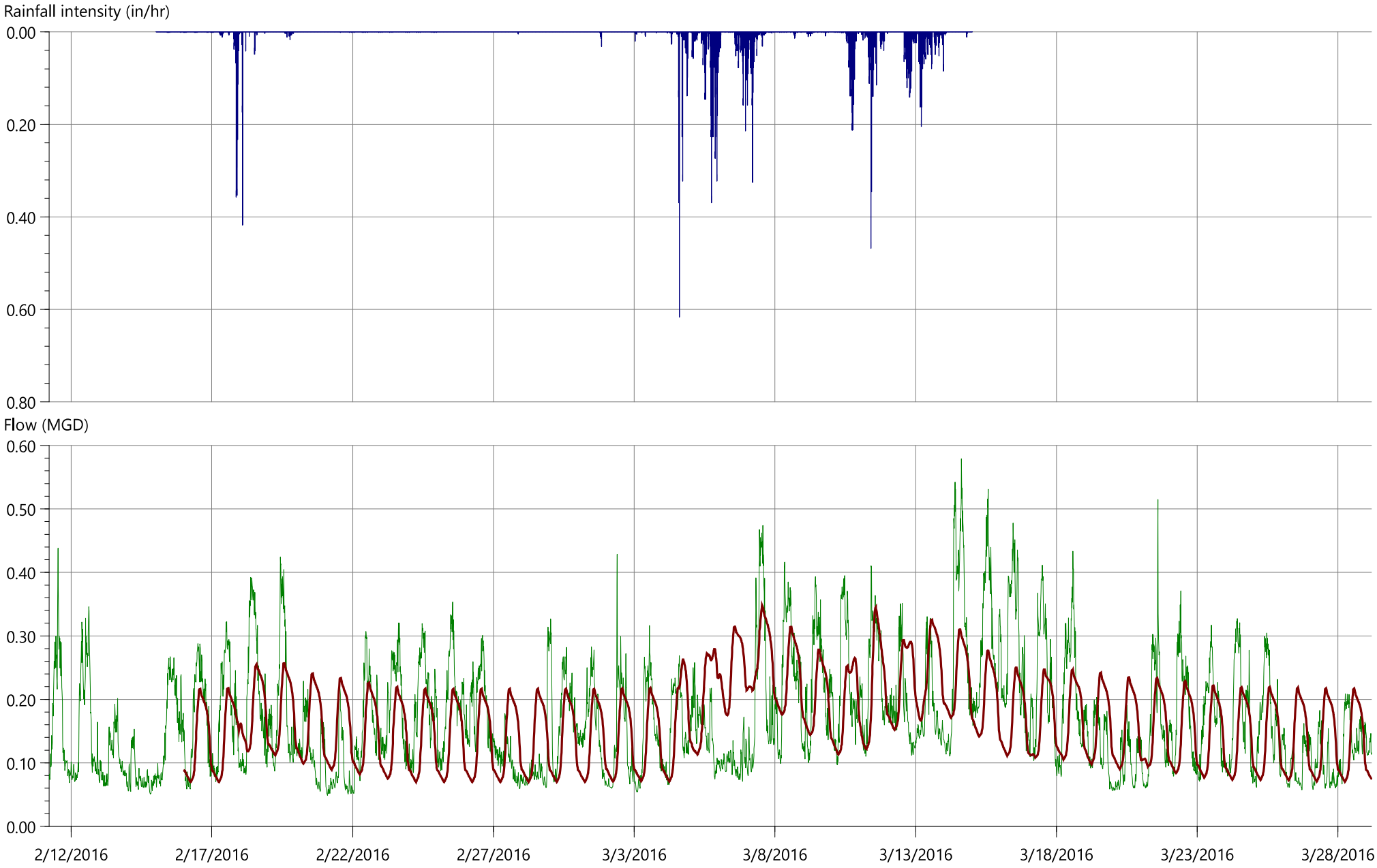
Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) Industrial, Model Location (Pred.) D/S SMH G03-062.1, Rainfall Profile: 475



	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.576	0.648	0.008			
Observed				0.000	0.339	266882.195
...ta20160215_20160315				0.051	0.232	407592.659

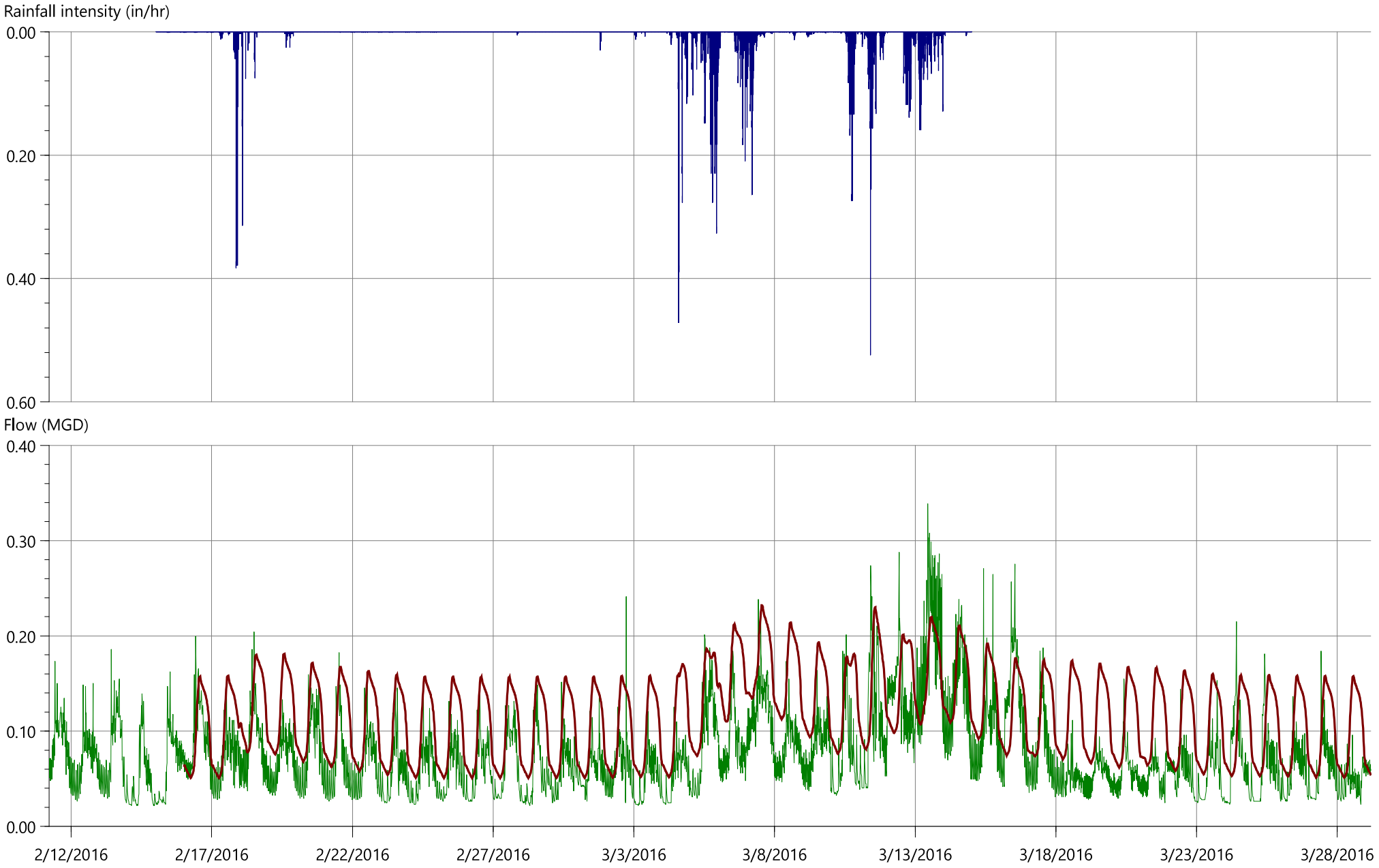
Flow survey: >Roseville>3. Data>Flow Data>Permanent Meter Data (12/1/2016 10:54:47 AM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315_RGBoundaries (11/6/2019 11:21:22 AM)

Flow Survey Location (Obs.) Cincinnati, Model Location (Pred.) D/S CA4-RSVL28.1, Rainfall Profile: 408



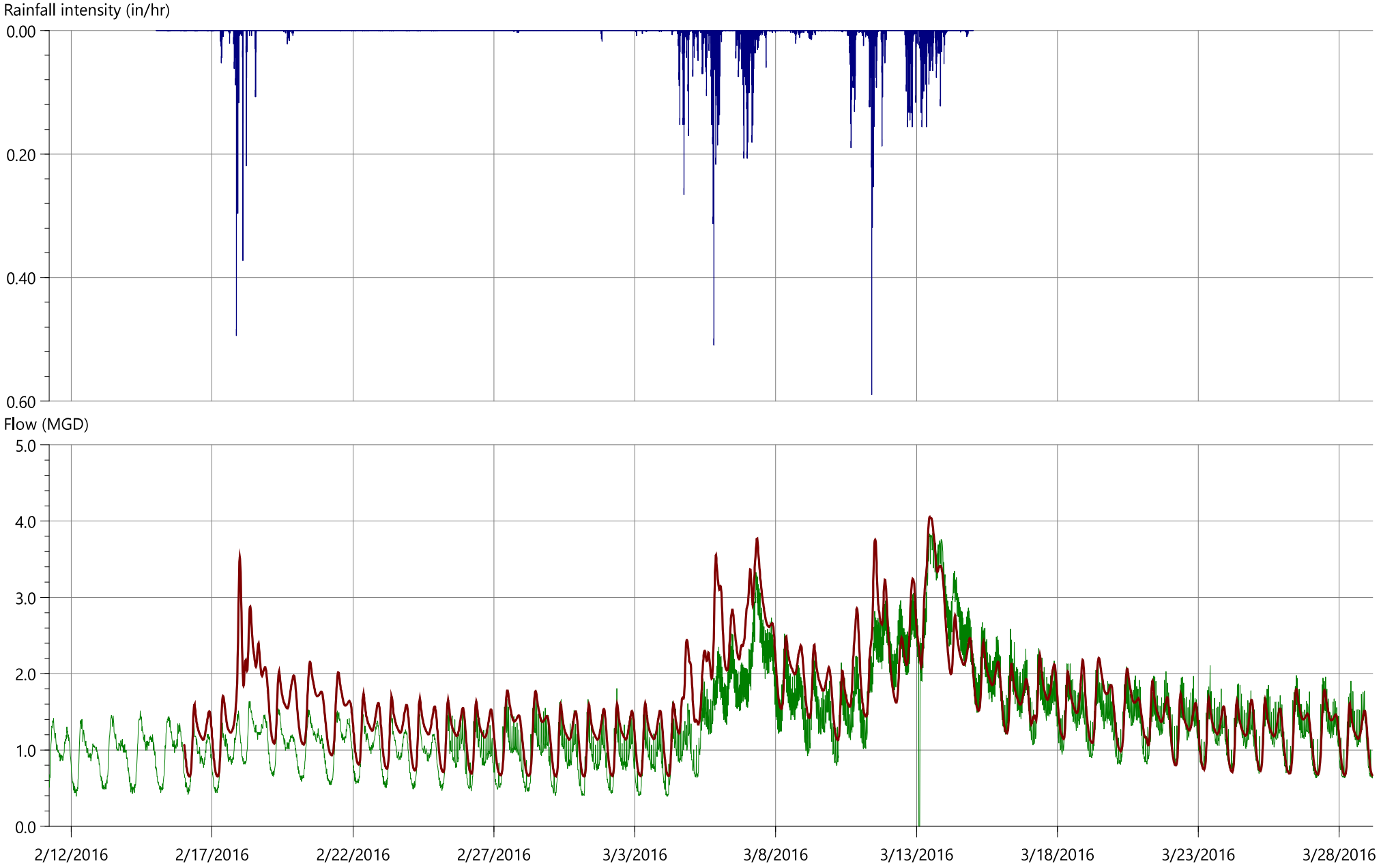
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.438	0.617	0.009			
Observed				0.049	0.579	695745.611
...160315_RGBoundaries				0.069	0.348	611280.586

Flow survey: >Roseville>3. Data>Flow Data>Permanent Meter Data (12/1/2016 10:54:47 AM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315_RGBoundaries (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) Industrial, Model Location (Pred.) D/S SMH G03-062.1, Rainfall Profile: 442



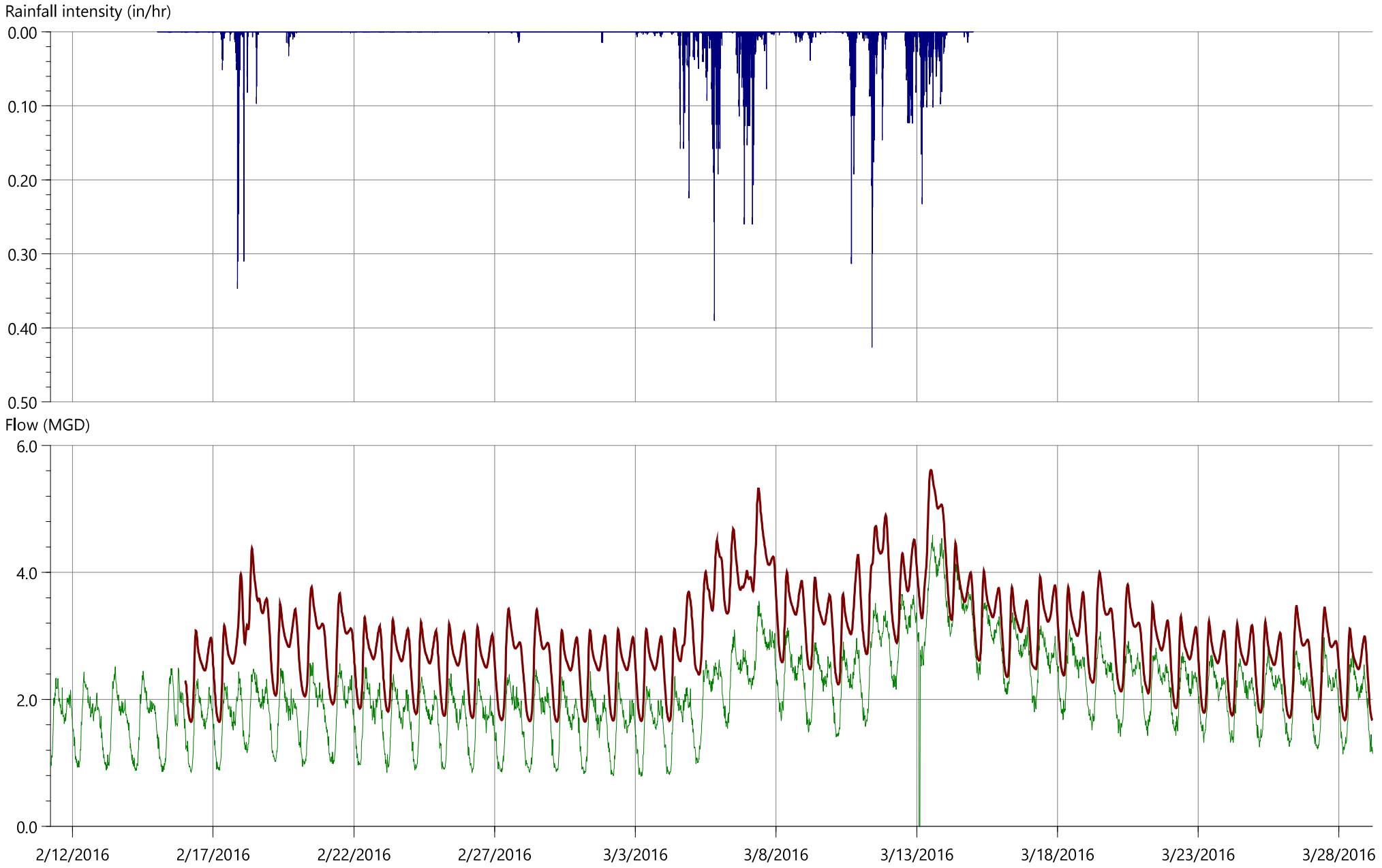
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.635	0.524	0.010			
Observed				0.022	0.339	307302.659
...160315_RGBoundaries				0.051	0.232	426162.383

Flow survey: >Roseville>3. Data>Flow Data>Permanent Meter Data (12/1/2016 10:54:47 AM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315_RGBoundaries (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) SMD2, Model Location (Pred.) D/S A10-03.1, Rainfall Profile: 121



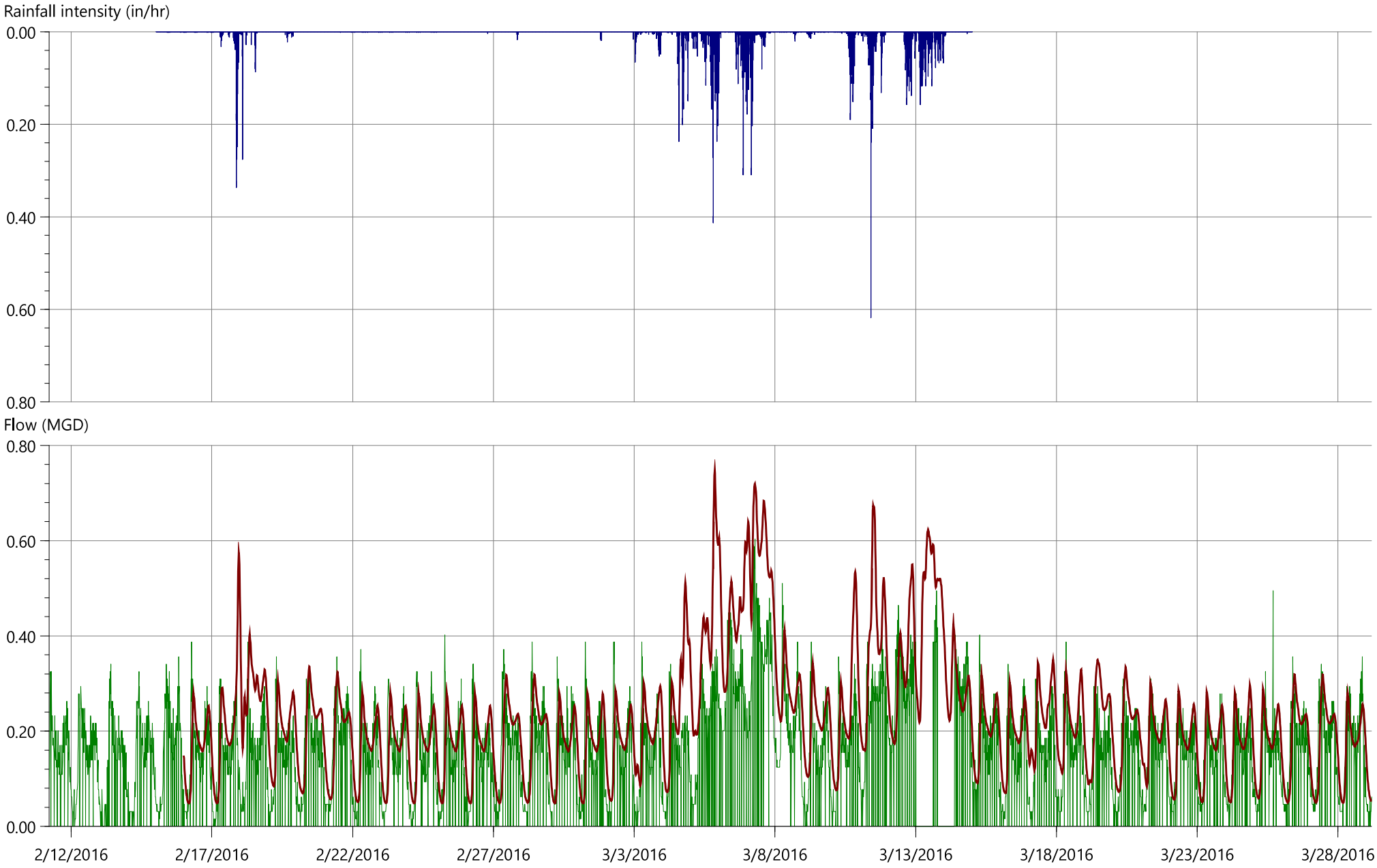
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.898	0.590	0.010			
Observed				0.000	3.843	5383819.870
...160315_RGBoundaries				0.651	4.053	5913576.081

Flow survey: >Roseville>3. Data>Flow Data>Permanent Meter Data (12/1/2016 10:54:47 AM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315_RGBoundaries (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) Sierra College/StrapRav, Model Location (Pred.) D/S SMH B08-040.1, Rainfall Profile: 186



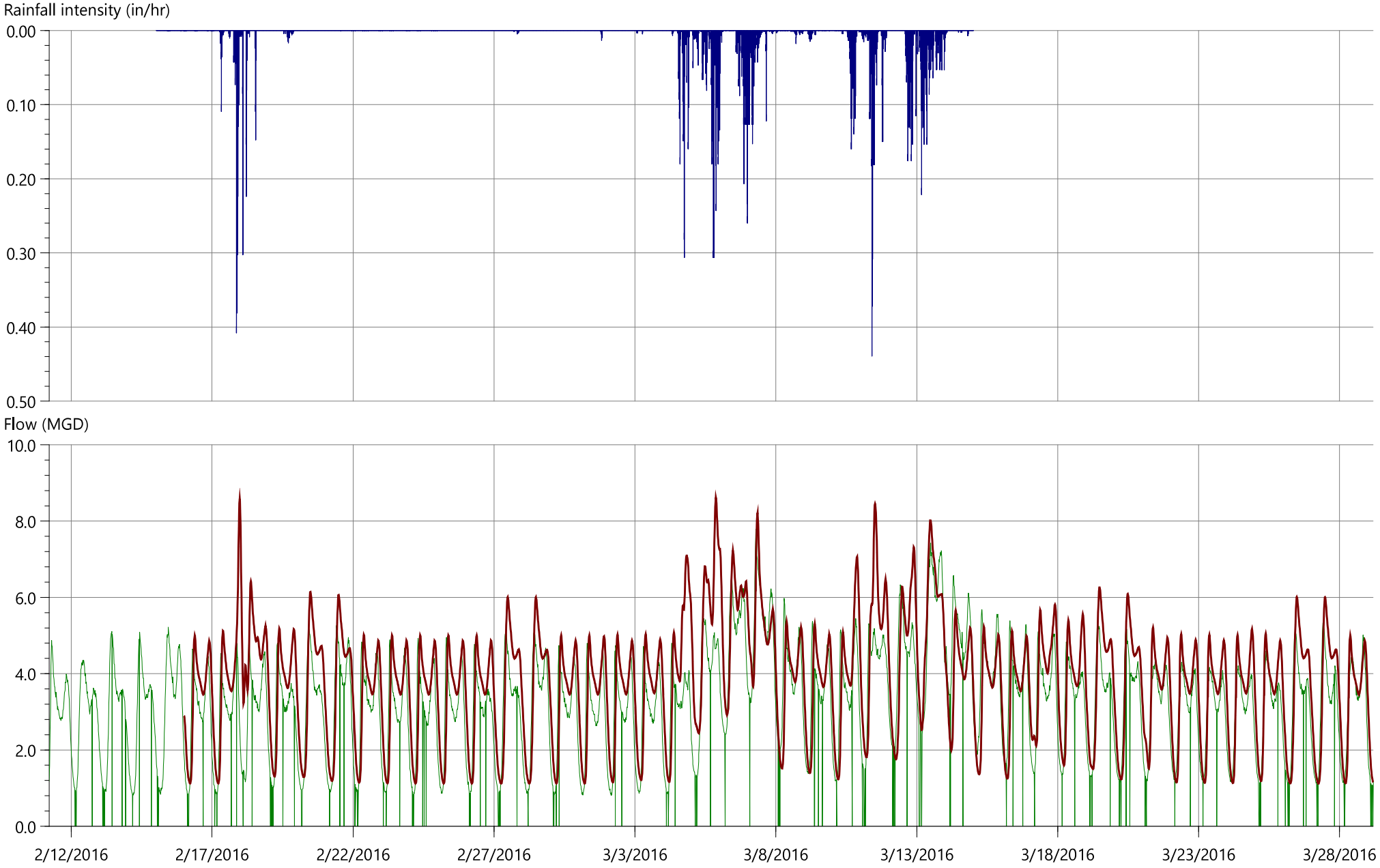
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.450	0.426	0.009			
Observed				0.000	4.589	8440619.727
...160315_RGBoundaries				1.646	5.613	10844812.901

Flow survey: >Roseville>3. Data>Flow Data>Permanent Meter Data (12/1/2016 10:54:47 AM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315_RGBoundaries (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) Highlands, Model Location (Pred.) D/S SMH D08-006.1, Rainfall Profile: 285



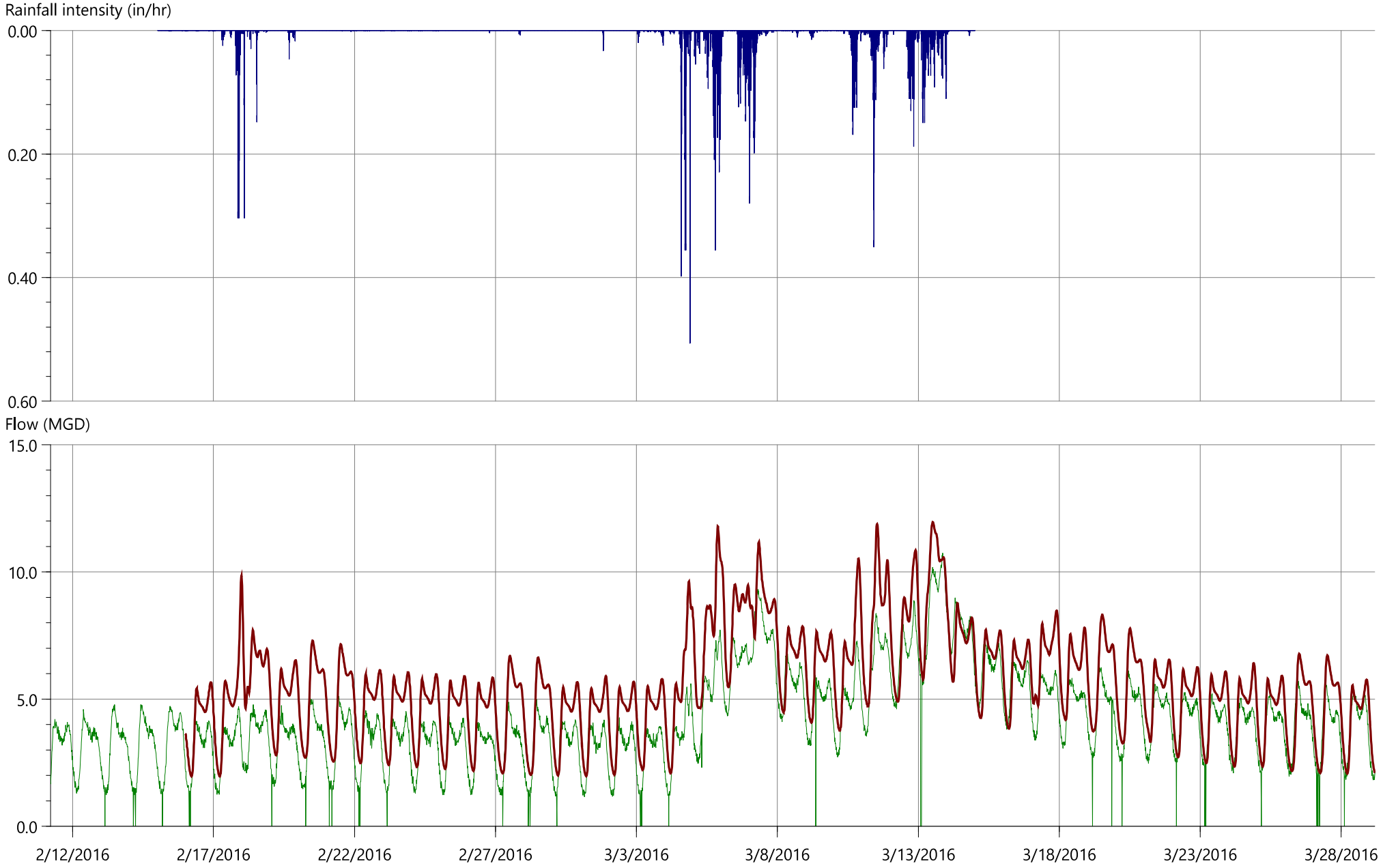
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.502	0.618	0.009			
Observed				0.000	0.603	582182.933
...160315_RGBoundaries				0.048	0.748	847296.033

Flow survey: >Roseville>3. Data>Flow Data>Permanent Meter Data (12/1/2016 10:54:47 AM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315_RGBoundaries (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) North Roseville/PG, Model Location (Pred.) D/S RSVL-001.1, Rainfall Profile: 410



	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.973	0.439	0.010			
Observed				0.000	7.798	13146868.221
...160315_RGBoundaries				1.119	8.612	14109574.857

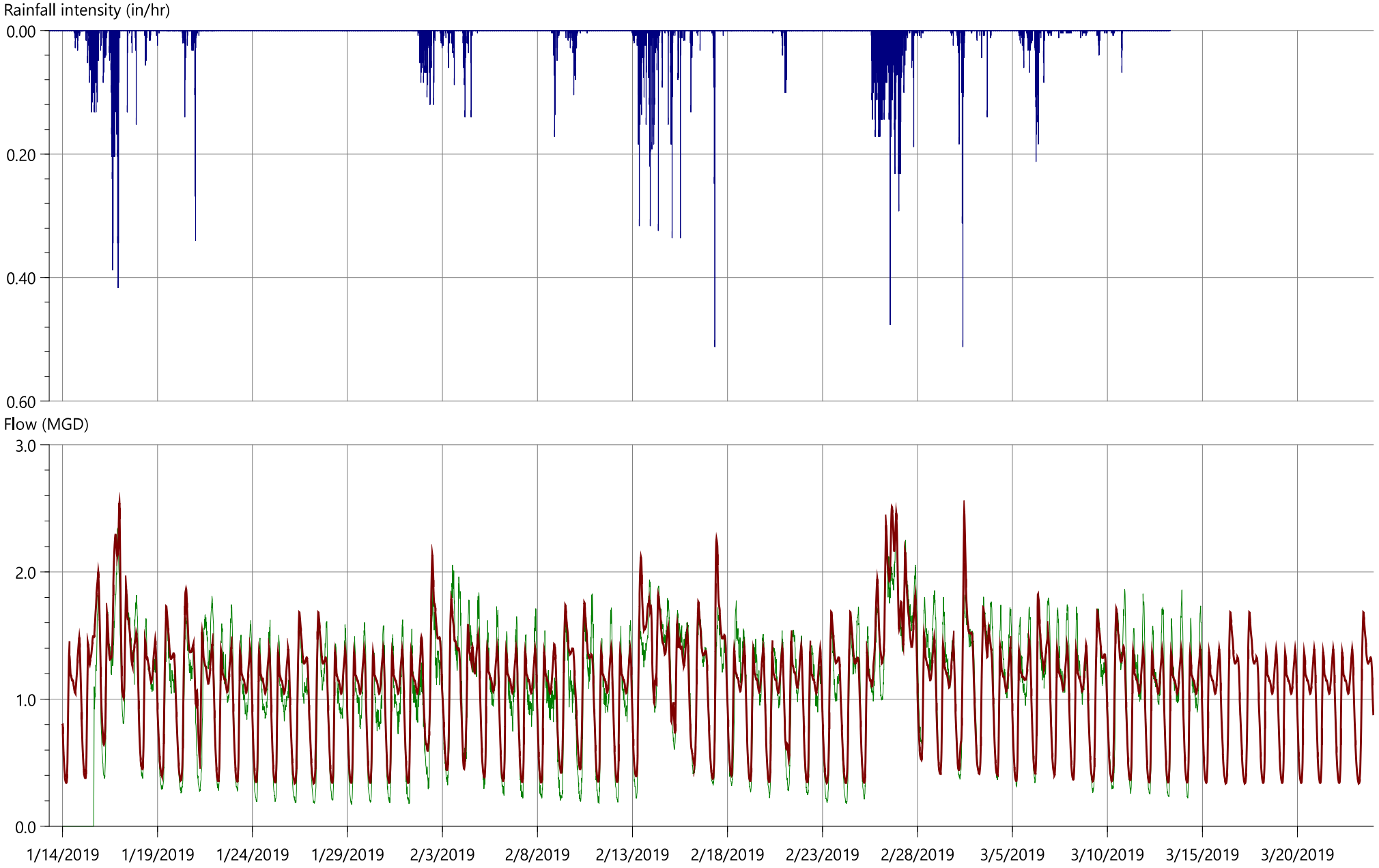
Flow survey: >Roseville>3. Data>Flow Data>Permanent Meter Data (12/1/2016 10:54:47 AM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315_RGBoundaries (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) Springview/DC, Model Location (Pred.) D/S H07-168.1, Rainfall Profile: 315



	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.280	0.506	0.009			
Observed				0.000	10.738	17143559.755
...160315_RGBoundaries				1.960	11.958	20629240.945

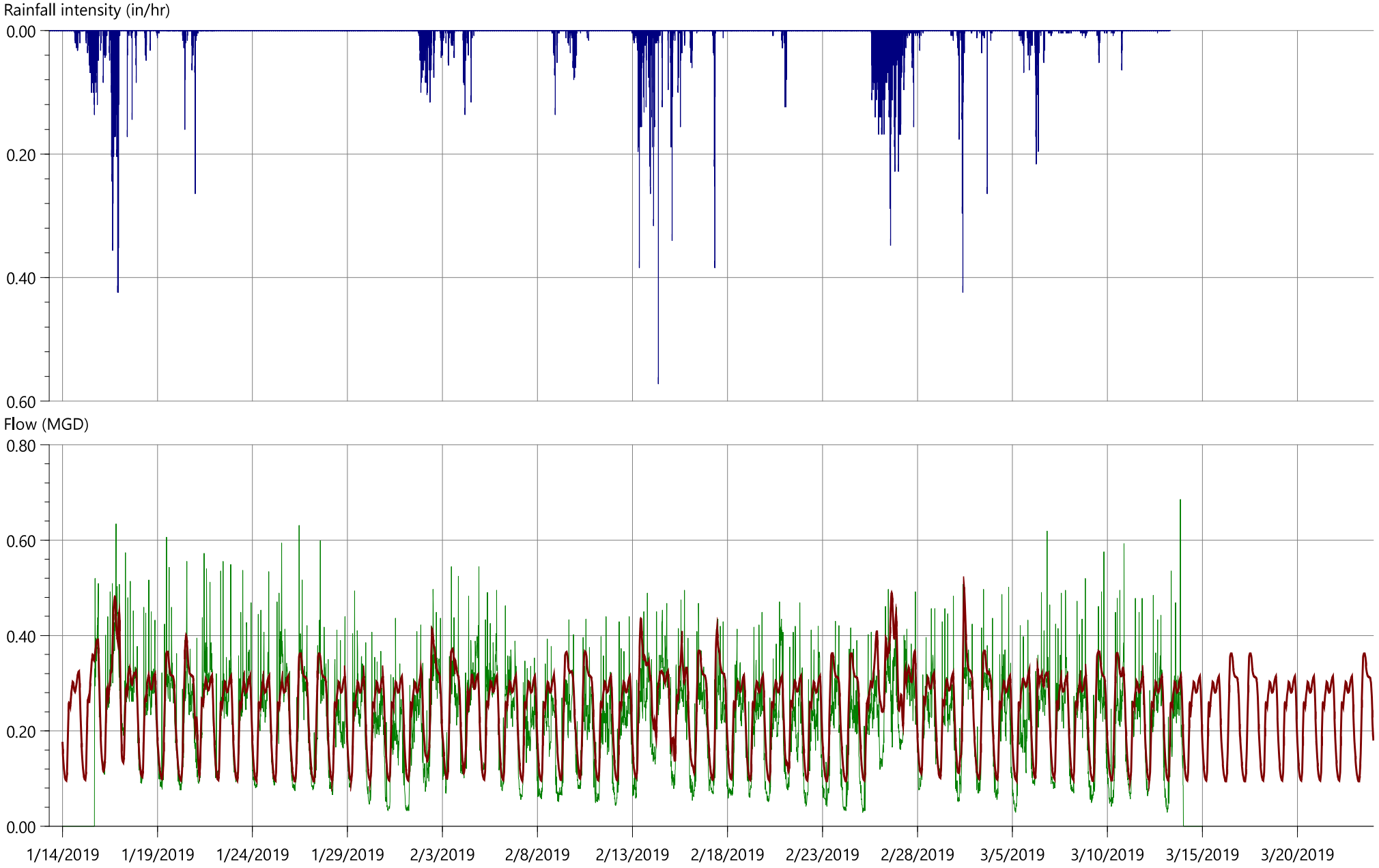
Flow survey: >SPWA>3. Data>Flow Data>Temp Flow Meter Data Jan01-Mar31 (April 16 2019) (2/11/2019 8:55:41 AM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2019 10 01)>OneRainData20190113_20190313 (11/6/2019 11:14:10 AM)

Flow Survey Location (Obs.) SIte 151, Model Location (Pred.) D/S L02-001.1, Rainfall Profile: 443



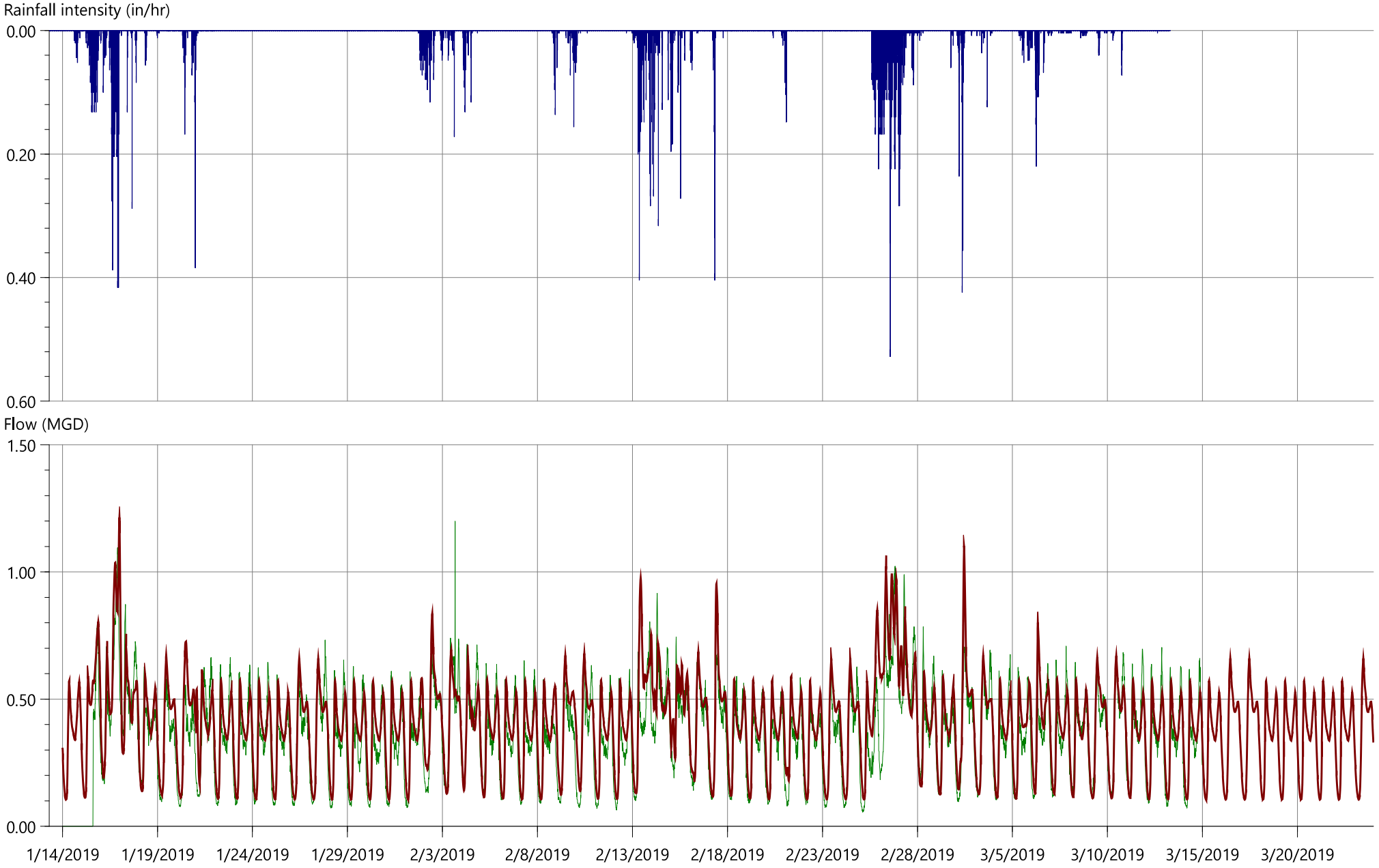
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	13.630	0.512	0.010			
Observed				0.000	2.474	5395503.465
...ta20190113_20190313				0.337	2.542	6508637.228

Flow survey: >SPWA>3. Data>Flow Data>Temp Flow Meter Data Jan01-Mar31 (April 16 2019) (2/11/2019 8:55:41 AM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2019 10 01)>OneRainData20190113_20190313 (11/6/2019 11:14:10 AM)
Flow Survey Location (Obs.) Site 152, Model Location (Pred.) D/S K02-005.1, Rainfall Profile: 410



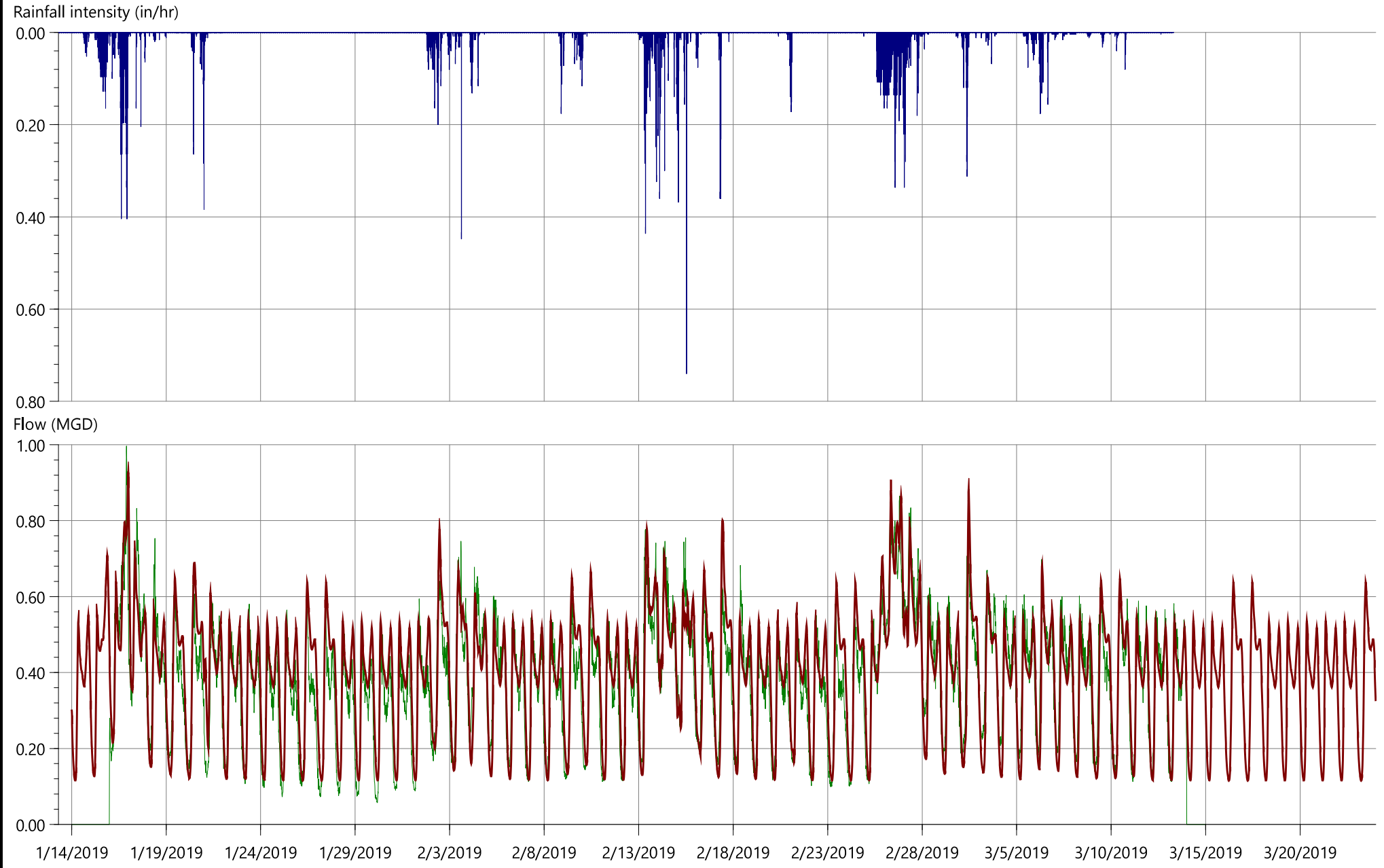
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	13.411	0.572	0.009			
Observed				0.000	0.685	1076804.266
...ta20190113_20190313				0.094	0.501	1458697.862

Flow survey: >SPWA>3. Data>Flow Data>Temp Flow Meter Data Jan01-Mar31 (April 16 2019) (2/11/2019 8:55:41 AM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2019 10 01)>OneRainData20190113_20190313 (11/6/2019 11:14:10 AM)
Flow Survey Location (Obs.) Site 153, Model Location (Pred.) D/S L03-014.1, Rainfall Profile: 411



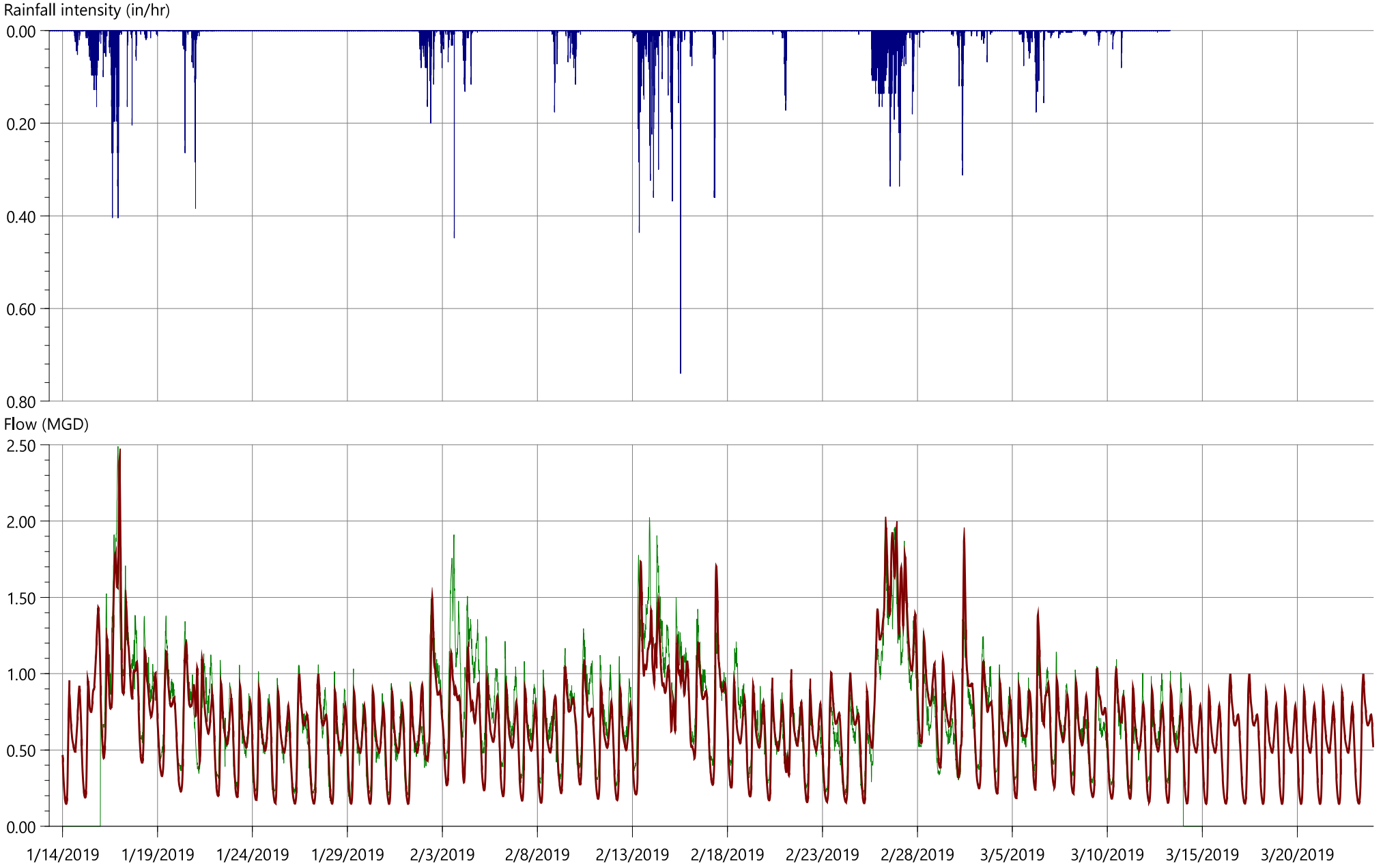
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	13.898	0.528	0.010			
Observed				0.000	1.199	1862998.190
...ta20190113_20190313				0.105	1.214	2386062.923

Flow survey: >SPWA>3. Data>Flow Data>Temp Flow Meter Data Jan01-Mar31 (April 16 2019) (2/11/2019 8:55:41 AM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2019 10 01)>OneRainData20190113_20190313 (11/6/2019 11:14:10 AM)
Flow Survey Location (Obs.) Site 154, Model Location (Pred.) D/S M06-004.1, Rainfall Profile: 446



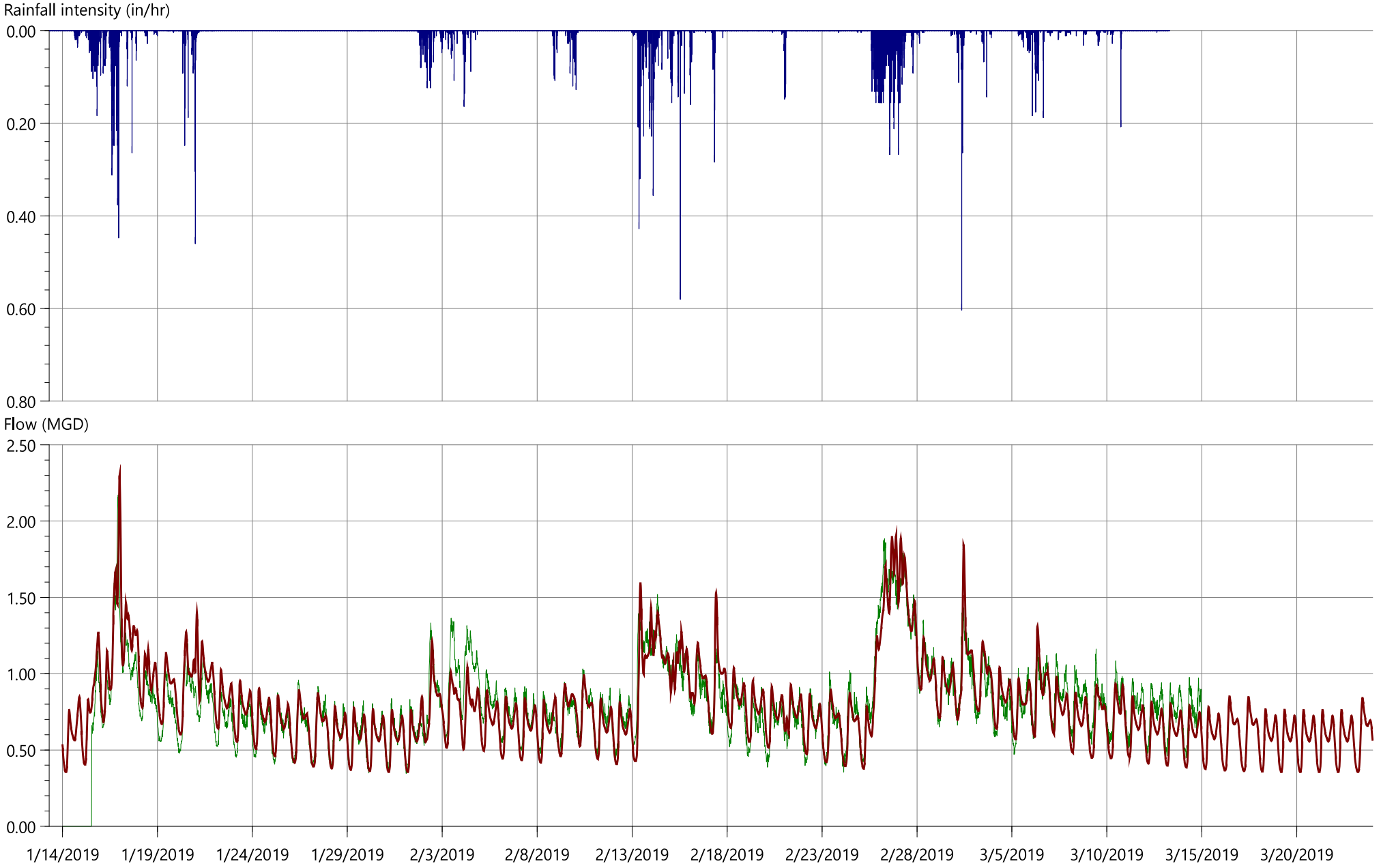
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	14.389	0.740	0.010			
Observed				0.000	0.996	1886813.424
...ta20190113_20190313				0.115	0.927	2363415.830

Flow survey: >SPWA>3. Data>Flow Data>Temp Flow Meter Data Jan01-Mar31 (April 16 2019) (2/11/2019 8:55:41 AM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2019 10 01)>OneRainData20190113_20190313 (11/6/2019 11:14:10 AM)
Flow Survey Location (Obs.) Site 155, Model Location (Pred.) D/S M06-019.1, Rainfall Profile: 446



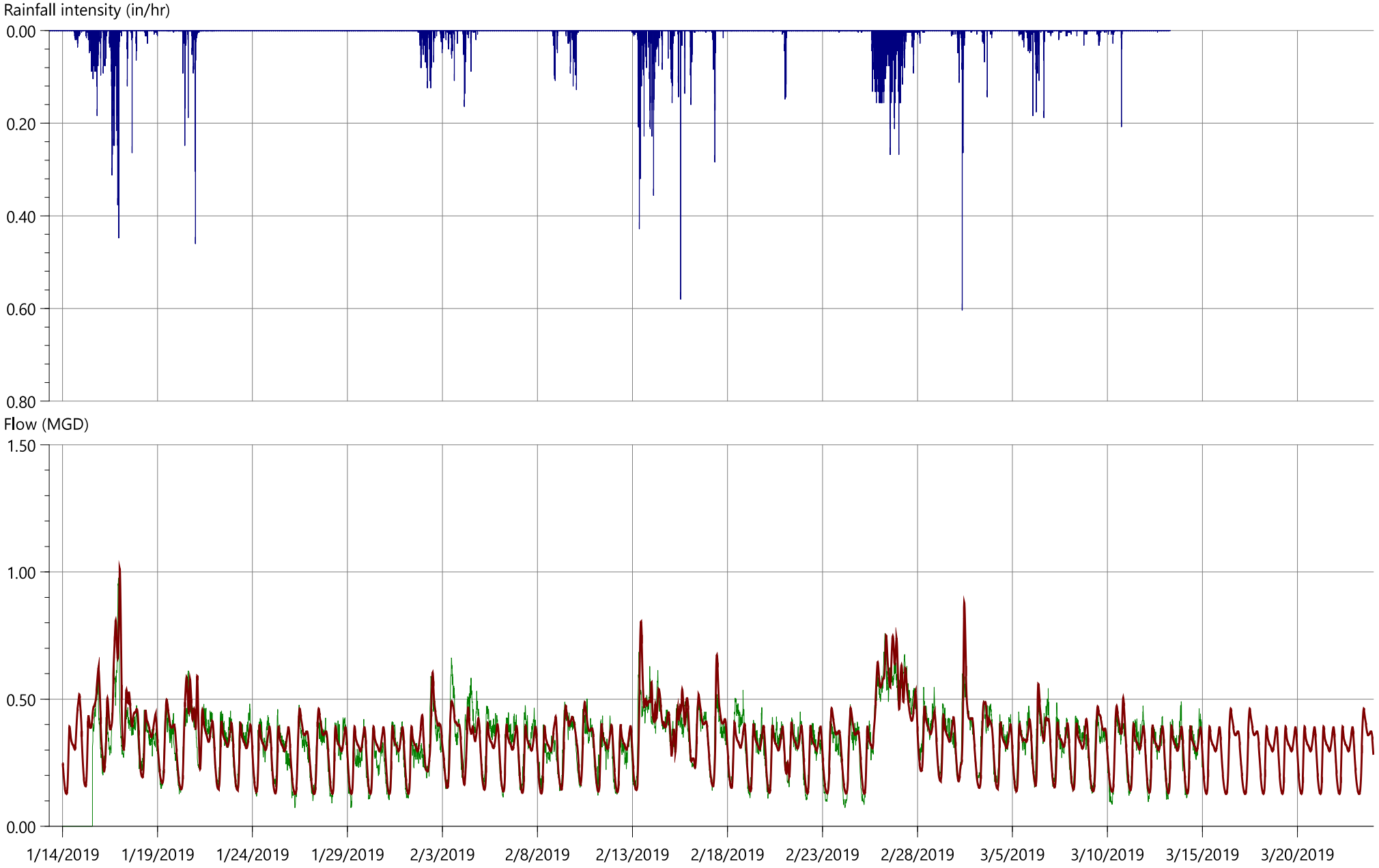
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	14.389	0.740	0.010			
Observed				0.000	2.488	3621783.843
...ta20190113_20190313				0.148	2.402	3981049.716

Flow survey: >SPWA>3. Data>Flow Data>Temp Flow Meter Data Jan01-Mar31 (April 16 2019) (2/11/2019 8:55:41 AM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2019 10 01)>OneRainData20190113_20190313 (11/6/2019 11:14:10 AM)
Flow Survey Location (Obs.) Site 156, Model Location (Pred.) D/S J07-058.1, Rainfall Profile: 382



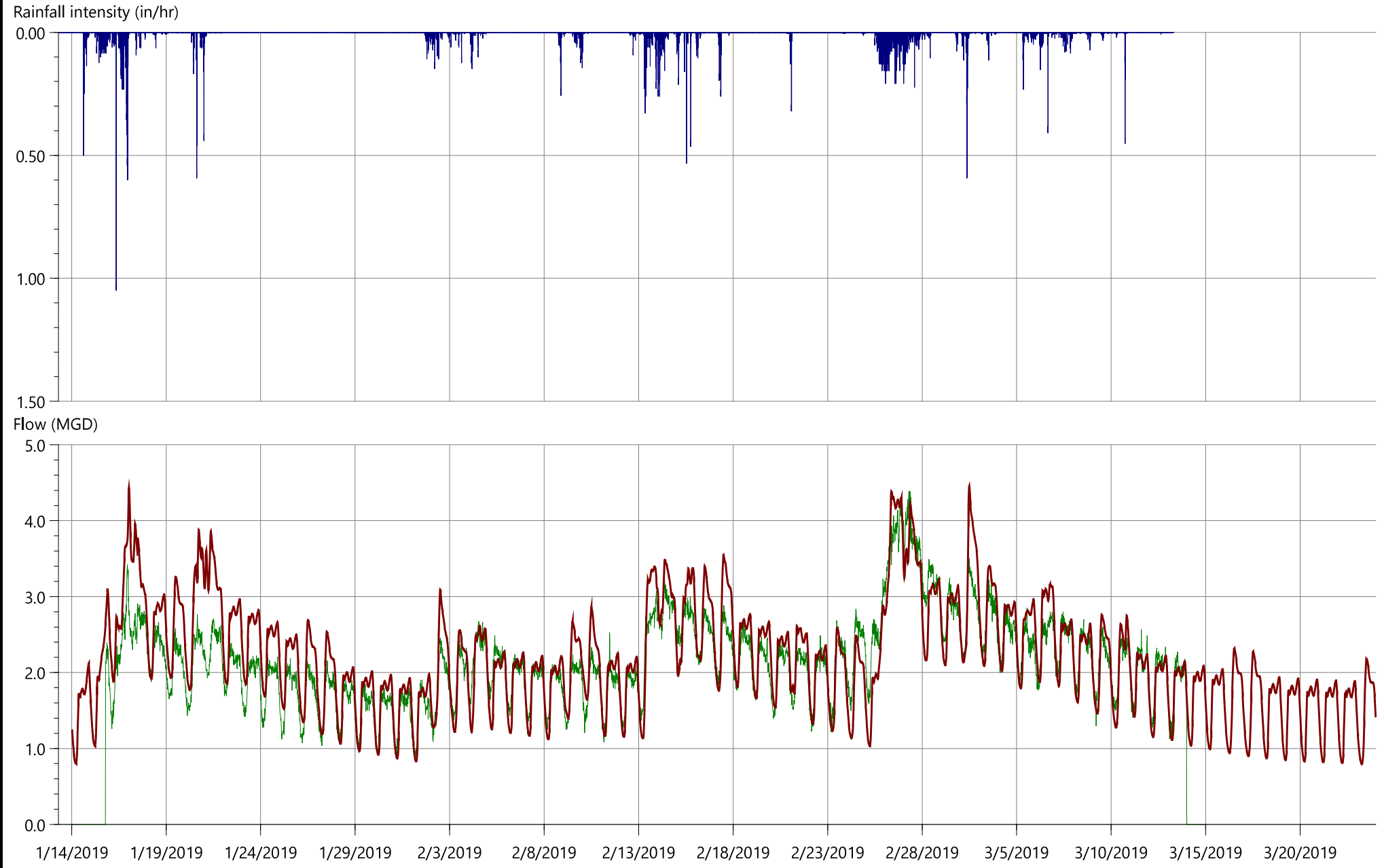
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	13.556	0.604	0.010			
Observed				0.000	2.172	4141187.489
...ta20190113_20190313				0.354	2.300	4657328.067

Flow survey: >SPWA>3. Data>Flow Data>Temp Flow Meter Data Jan01-Mar31 (April 16 2019) (2/11/2019 8:55:41 AM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2019 10 01)>OneRainData20190113_20190313 (11/6/2019 11:14:10 AM)
Flow Survey Location (Obs.) Site 157, Model Location (Pred.) D/S J07-060.1, Rainfall Profile: 382



	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	13.556	0.604	0.010			
Observed				0.000	0.976	1682585.005
...ta20190113_20190313				0.127	1.012	1976167.131

Flow survey: >SPWA>3. Data>Flow Data>Temp Flow Meter Data Jan01-Mar31 (April 16 2019) (2/11/2019 8:55:41 AM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2019 10 01)>OneRainData20190113_20190313 (11/6/2019 11:14:10 AM)
Flow Survey Location (Obs.) Site 158, Model Location (Pred.) D/S I10-037.1, Rainfall Profile: 352



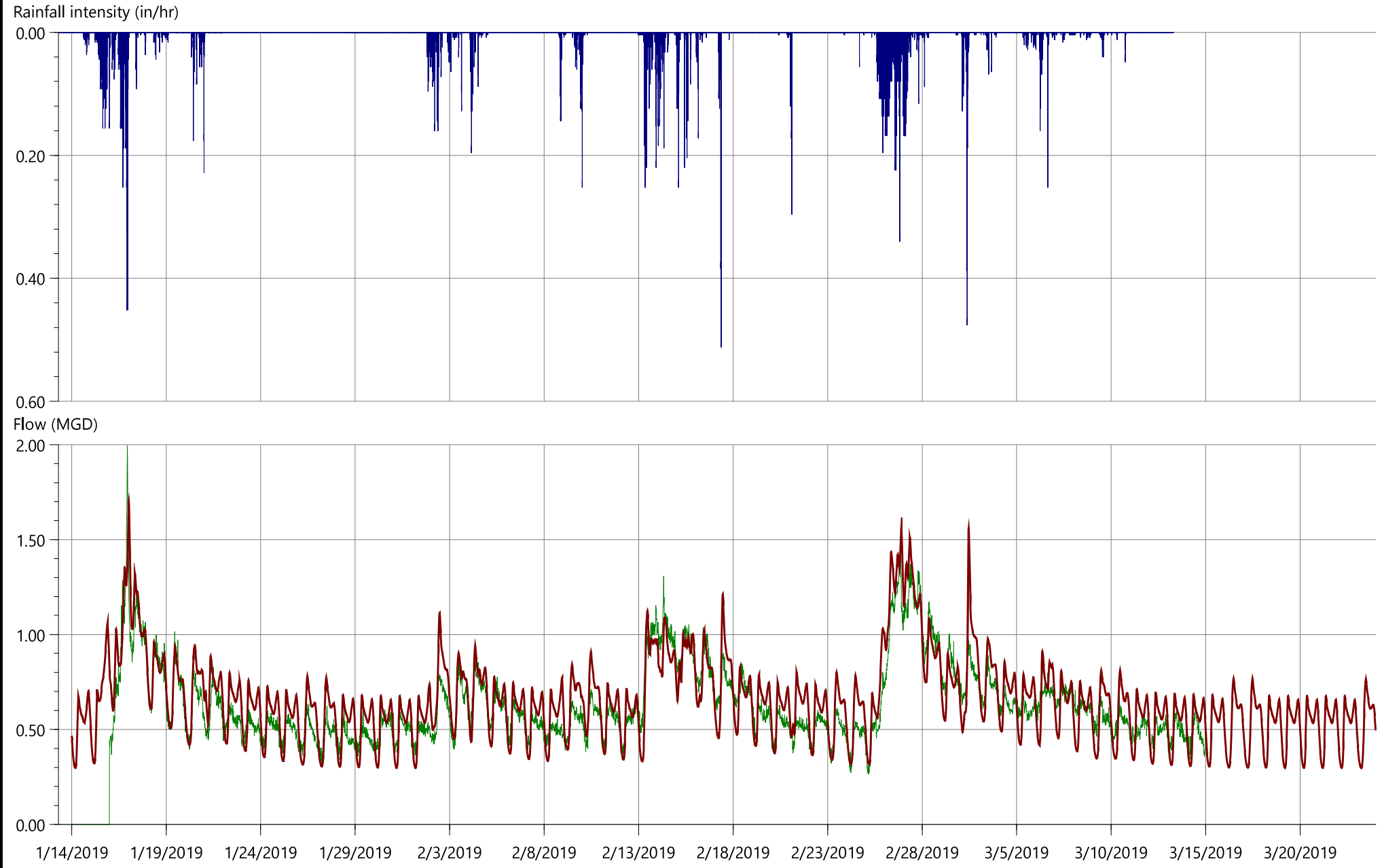
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	14.813	1.048	0.010			
Observed				0.000	4.389	10714291.384
...ta20190113_20190313				0.794	4.452	13146876.273

Flow survey: >SPWA>3. Data>Flow Data>Temp Flow Meter Data Jan01-Mar31 (April 16 2019) (2/11/2019 8:55:41 AM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2019 10 01)>OneRainData20190113_20190313 (11/6/2019 11:14:10 AM)
Flow Survey Location (Obs.) Site 159, Model Location (Pred.) D/S C9-02.1, Rainfall Profile: 186



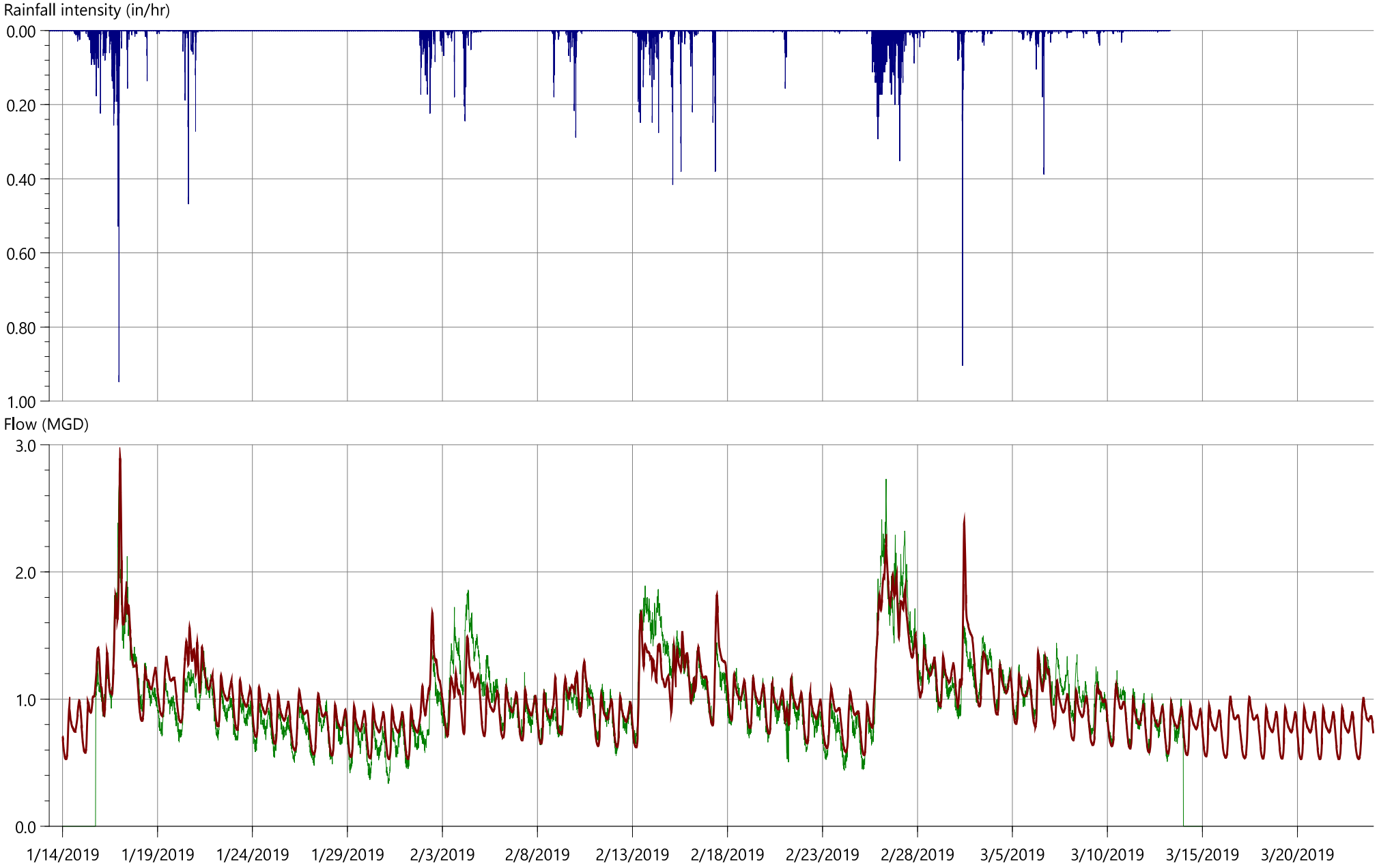
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	13.176	0.512	0.009			
Observed				0.000	4.702	11317470.919
...ta20190113_20190313				1.335	4.375	13934551.632

Flow survey: >SPWA>3. Data>Flow Data>Temp Flow Meter Data Jan01-Mar31 (April 16 2019) (2/11/2019 8:55:41 AM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2019 10 01)>OneRainData20190113_20190313 (11/6/2019 11:14:10 AM)
Flow Survey Location (Obs.) Site 160, Model Location (Pred.) D/S SMH B08-031.1, Rainfall Profile: 186



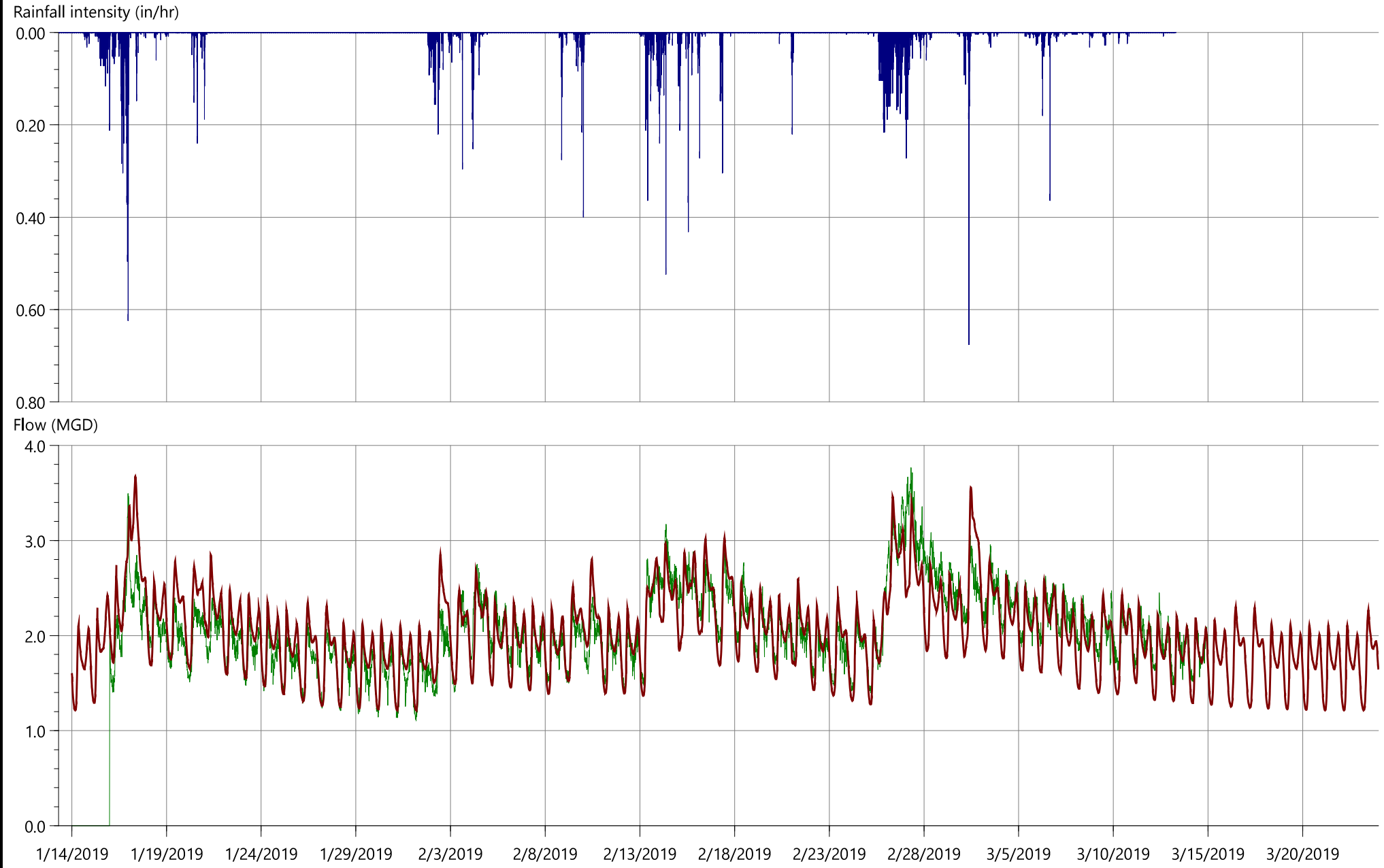
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	13.176	0.512	0.009			
Observed				0.000	1.996	3174137.958
...ta20190113_20190313				0.297	1.702	3927509.288

Flow survey: >SPWA>3. Data>Flow Data>Temp Flow Meter Data Jan01-Mar31 (April 16 2019) (2/11/2019 8:55:41 AM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2019 10 01)>OneRainData20190113_20190313 (11/6/2019 11:14:10 AM)
Flow Survey Location (Obs.) Site 161, Model Location (Pred.) D/S B12-02.1, Rainfall Profile: 156



	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	13.733	0.948	0.010			
Observed				0.000	2.731	4995129.055
...ta20190113_20190313				0.528	2.894	5828937.326

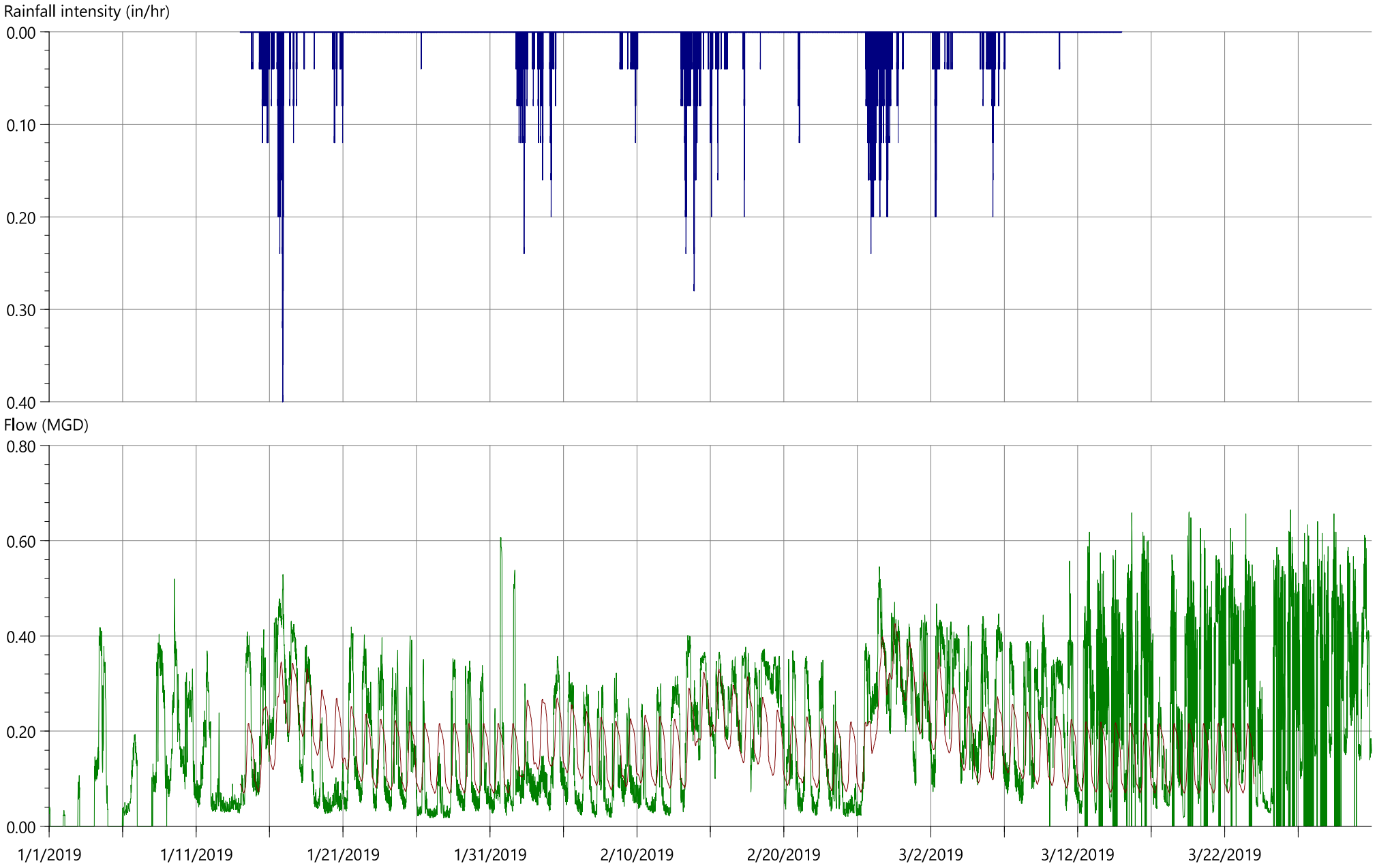
Flow survey: >SPWA>3. Data>Flow Data>Temp Flow Meter Data Jan01-Mar31 (April 16 2019) (2/11/2019 8:55:41 AM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2019 10 01)>OneRainData20190113_20190313 (11/6/2019 11:14:10 AM)
Flow Survey Location (Obs.) Site 162, Model Location (Pred.) D/S D14-03.1, Rainfall Profile: 191



	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	12.949	0.676	0.009			
Observed				0.000	3.767	10312984.650
...ta20190113_20190313				1.214	3.671	12012636.316

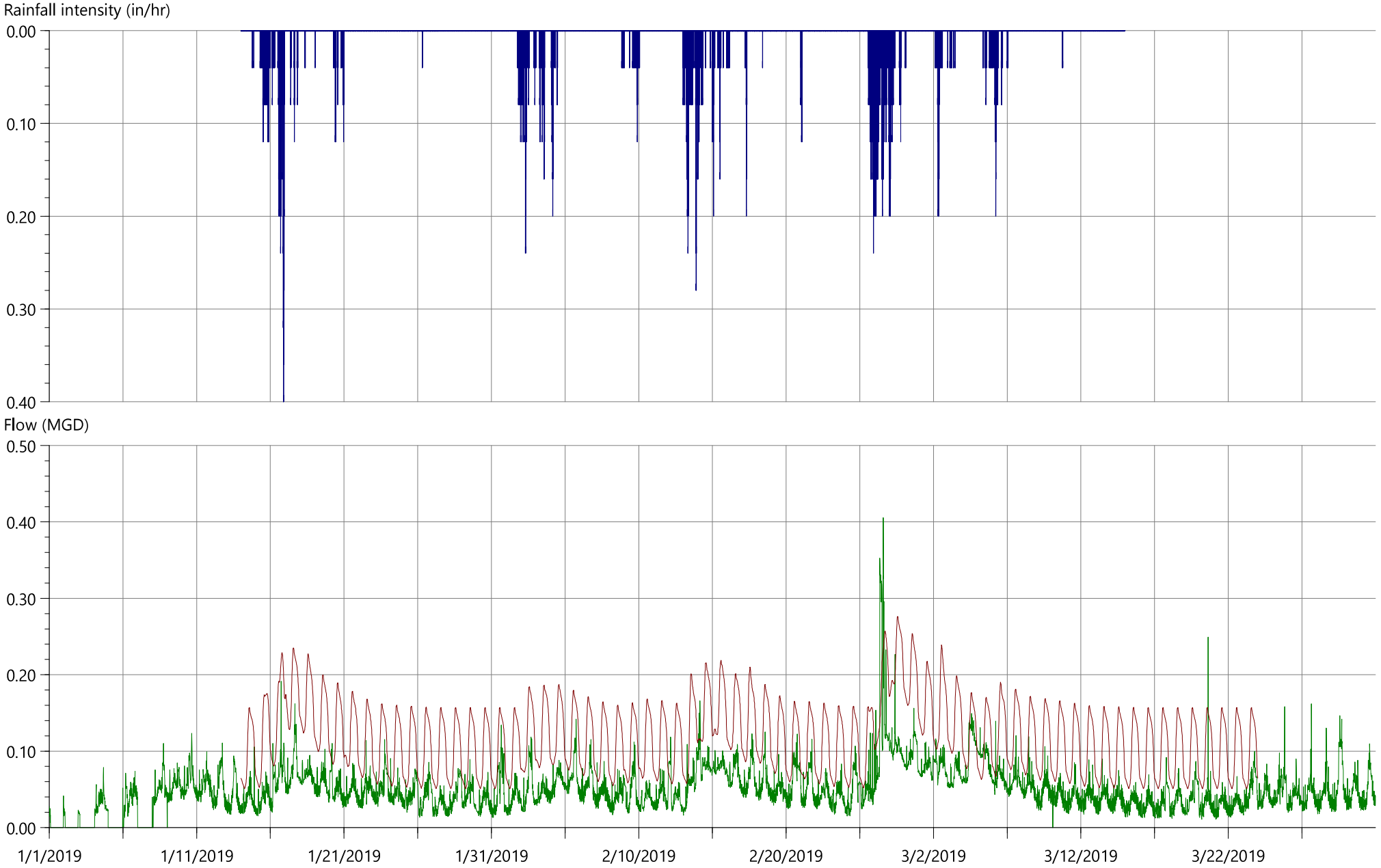
Flow survey: >SPWA>3. Data>Flow Data>Permanent Flow Meter Data Jan01-Mar31 (June 05 2019) (6/5/2019 1:51:15 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2019 10 01)_v29>OneRainData20190113_20190313_*4_RGBoundaries (11/6/2019 11:14:10 AM)

Flow Survey Location (Obs.) Cincinnati, Model Location (Pred.) D/S CA4-RSVL28.1, Rainfall Profile: 408



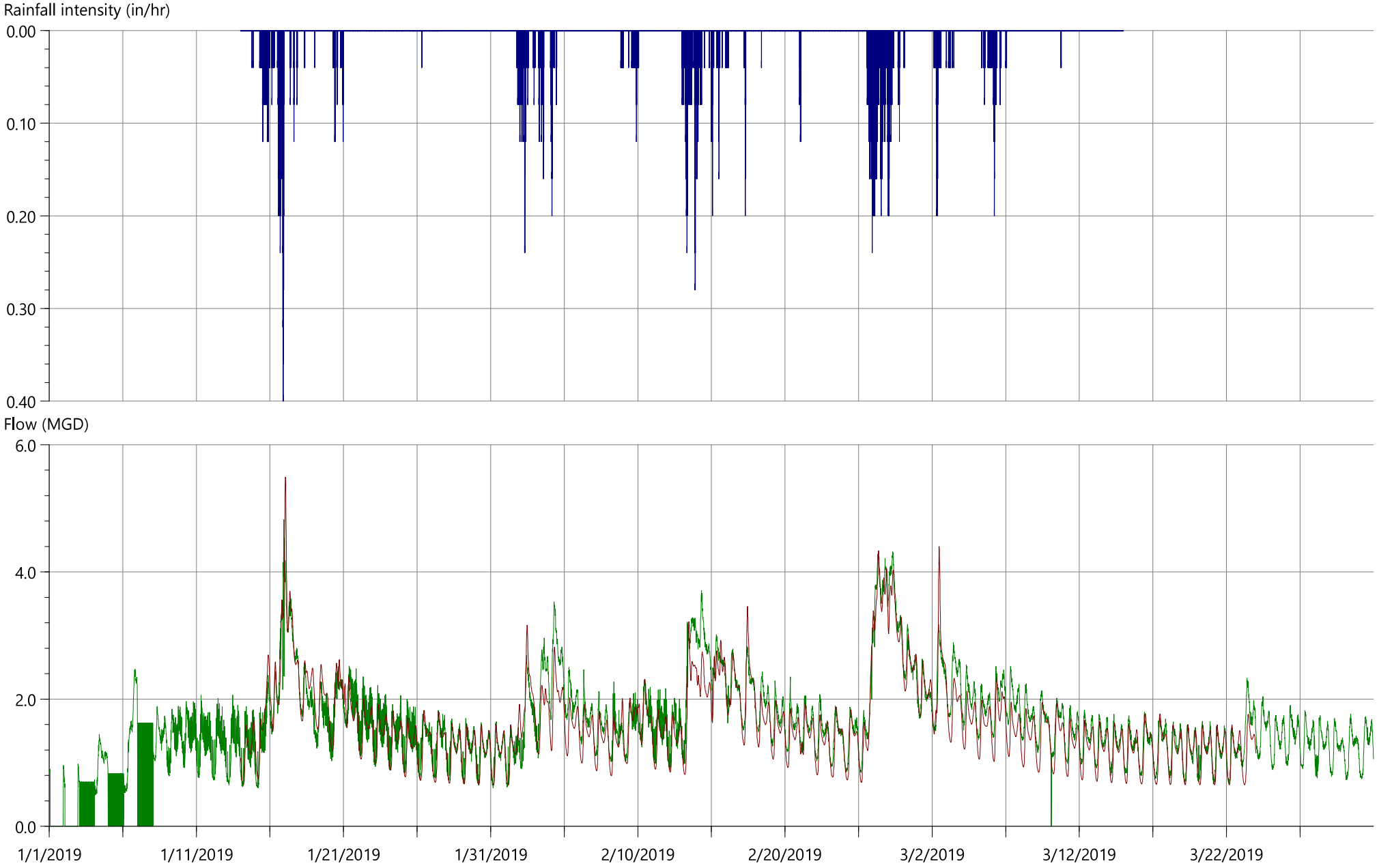
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	15.530	0.400	0.011			
Observed				0.000	0.665	1464913.927
...0313_*4_RGBoundaries				0.069	0.425	1025101.467

Flow survey: >SPWA>3. Data>Flow Data>Permanent Flow Meter Data Jan01-Mar31 (June 05 2019) (6/5/2019 1:51:15 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2019 10 01)_v29>OneRainData20190113_20190313_*4_RGBoundaries (11/6/2019 11:14:10 AM)
Flow Survey Location (Obs.) Industrial, Model Location (Pred.) D/S SMH G03-062.1, Rainfall Profile: 442



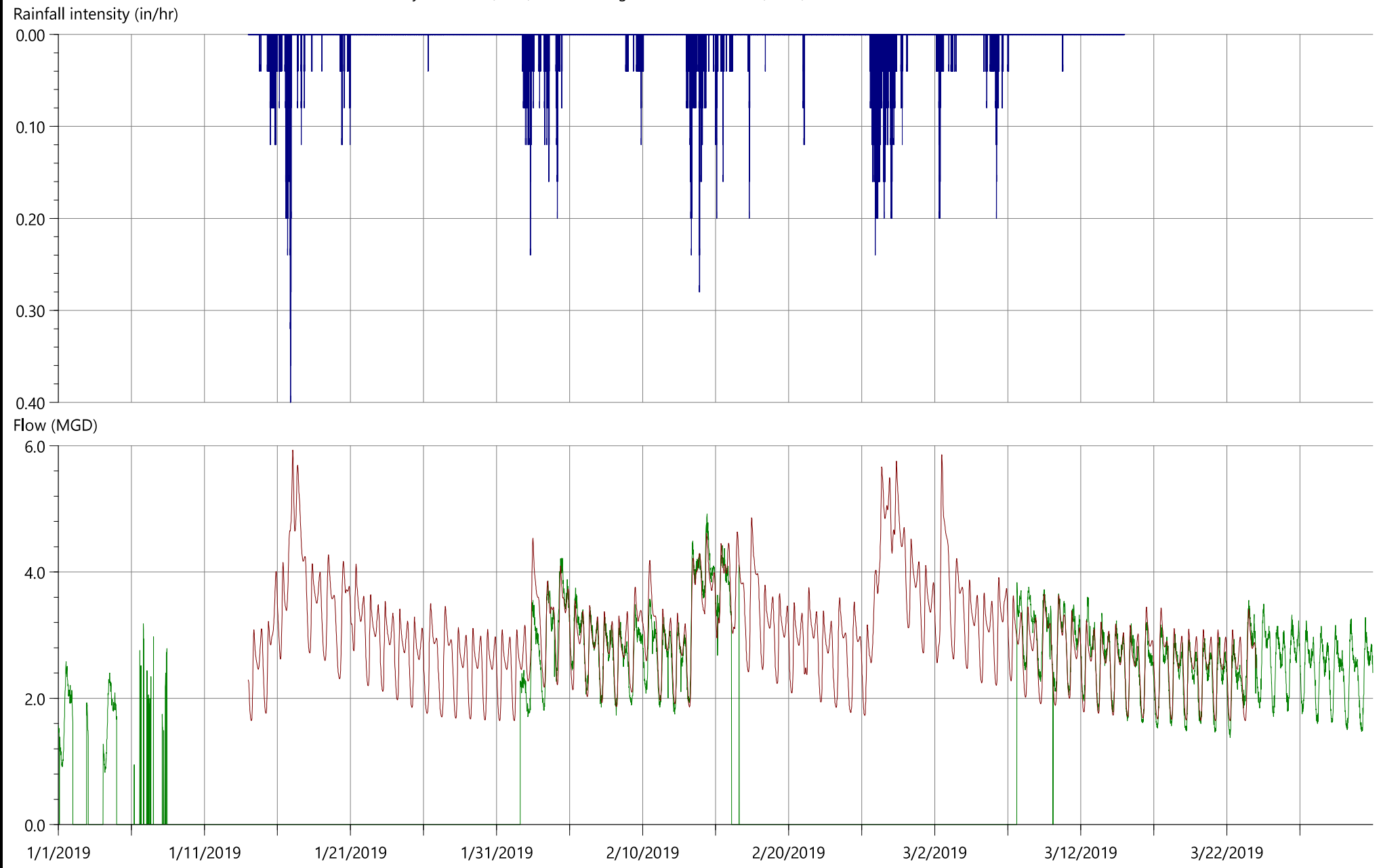
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	15.530	0.400	0.011			
Observed				0.000	0.405	388057.020
...0313_*4_RGBoundaries				0.051	0.276	712709.520

Flow survey: >SPWA>3. Data>Flow Data>Permanent Flow Meter Data Jan01-Mar31 (June 05 2019) (6/5/2019 1:51:15 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2019 10 01)_v29>OneRainData20190113_20190313_*4_RGBoundaries (11/6/2019 11:14:10 AM)
Flow Survey Location (Obs.) SMD2, Model Location (Pred.) D/S A10-03.1, Rainfall Profile: 121



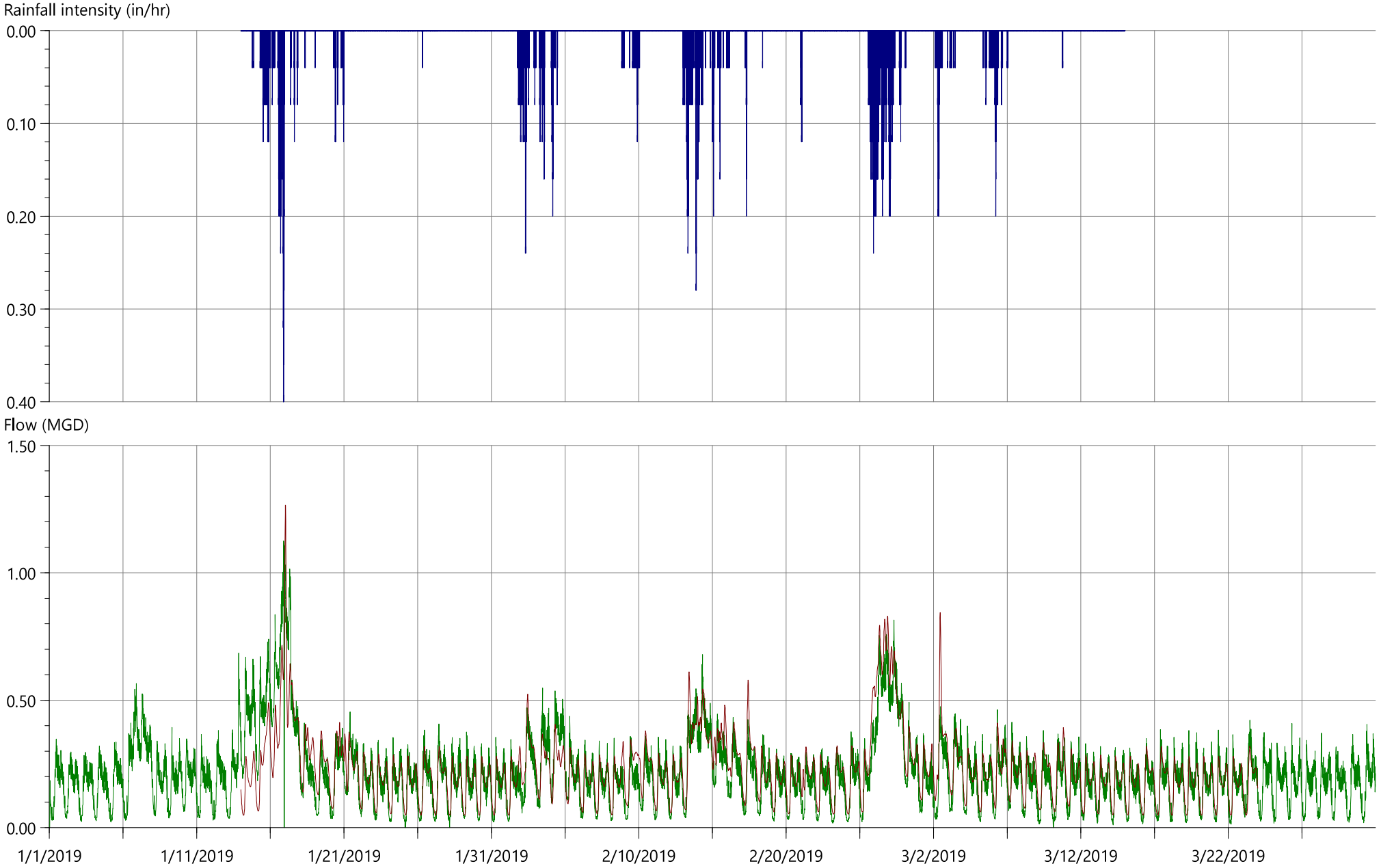
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	15.530	0.400	0.011			
Observed				0.000	4.823	12344642.590
...0313_*4_RGBoundaries				0.651	5.493	9792069.402

Flow survey: >SPWA>3. Data>Flow Data>Permanent Flow Meter Data Jan01-Mar31 (June 05 2019) (6/5/2019 1:51:15 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2019 10 01)_v29>OneRainData20190113_20190313_*4_RGBoundaries (11/6/2019 11:14:10 AM)
Flow Survey Location (Obs.) Sierra College, Model Location (Pred.) D/S SMH B08-040.1, Rainfall Profile: 186



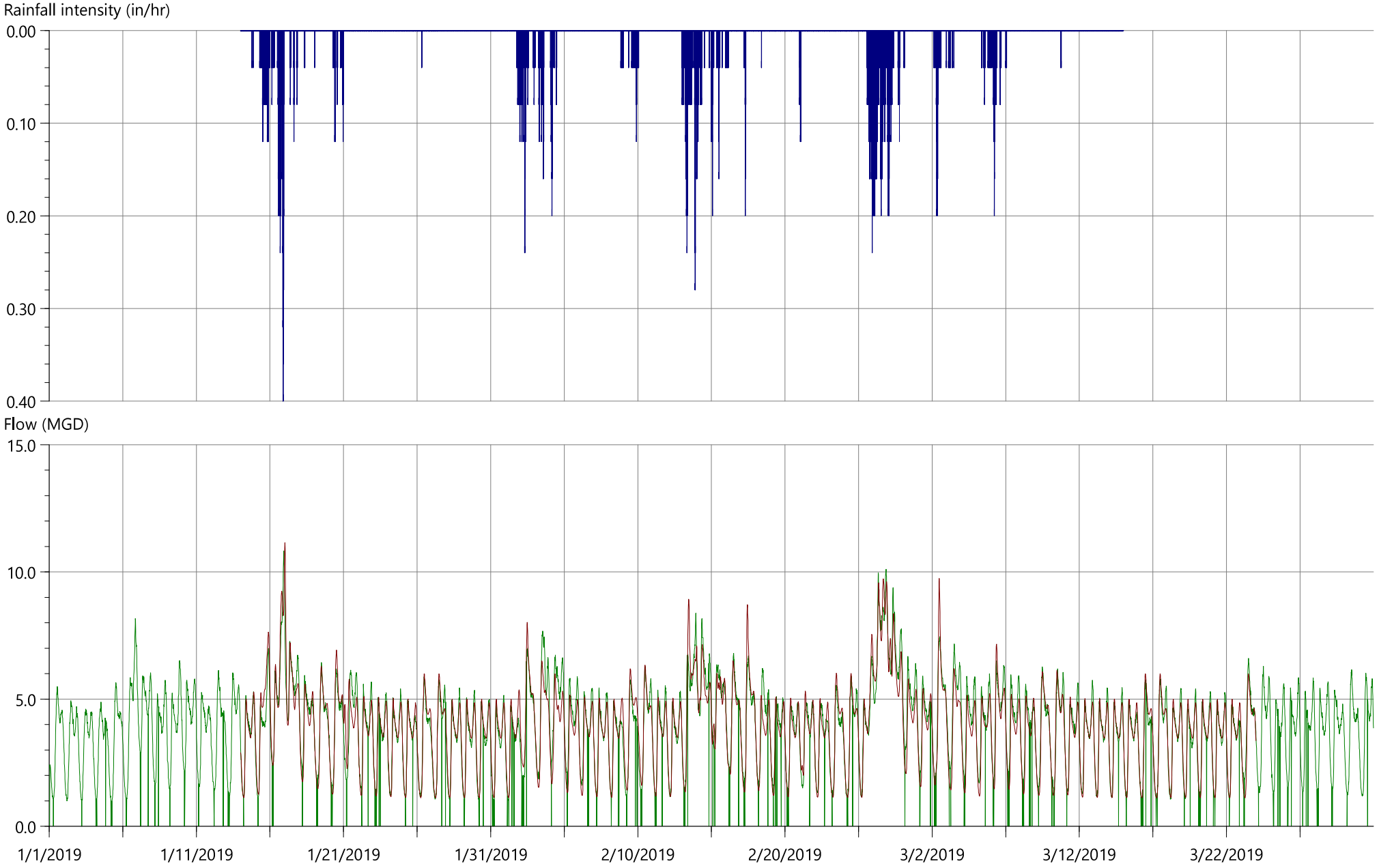
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	15.530	0.400	0.011			
Observed				0.000	4.921	9530740.132
...0313_*4_RGBoundaries				1.644	5.931	18004207.945

Flow survey: >SPWA>3. Data>Flow Data>Permanent Flow Meter Data Jan01-Mar31 (June 05 2019) (6/5/2019 1:51:15 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2019 10 01)_v29>OneRainData20190113_20190313_*4_RGBoundaries (11/6/2019 11:14:10 AM)
Flow Survey Location (Obs.) Highlands, Model Location (Pred.) D/S SMH D08-006.1, Rainfall Profile: 285



	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	15.530	0.400	0.011			
Observed				0.000	1.126	1614243.848
...0313_*4_RGBoundaries				0.048	1.266	1387804.155

Flow survey: >SPWA>3. Data>Flow Data>Permanent Flow Meter Data Jan01-Mar31 (June 05 2019) (6/5/2019 1:51:15 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2019 10 01)_v29>OneRainData20190113_20190313_*4_RGBoundaries (11/6/2019 11:14:10 AM)
Flow Survey Location (Obs.) Pleasant Grove (SPMUD), Model Location (Pred.) D/S RSVL-001.1, Rainfall Profile: 410



	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	15.530	0.400	0.011			
Observed				0.000	10.836	30336214.148
...0313_*4_RGBoundaries				1.119	11.157	23452688.731

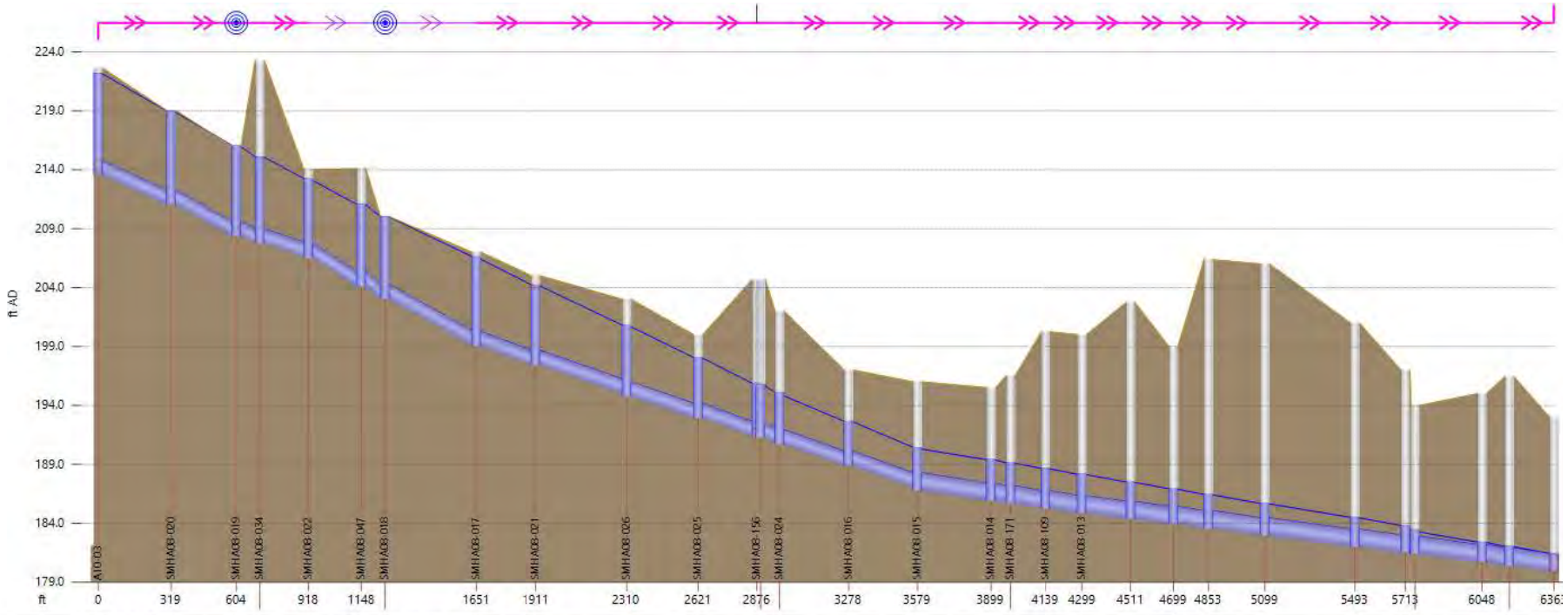
Flow survey: >SPWA>3. Data>Flow Data>Permanent Flow Meter Data Jan01-Mar31 (June 05 2019) (6/5/2019 1:51:15 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2019 10 01)_v29>OneRainData20190113_20190313_*4_RGBoundaries (11/6/2019 11:14:10 AM)
Flow Survey Location (Obs.) Dry Creek, Model Location (Pred.) D/S H07-168.1, Rainfall Profile: 315



	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	15.530	0.400	0.011			
Observed				0.000	15.348	42982669.853
...0313_*4_RGBoundaries				1.944	16.123	35431318.112

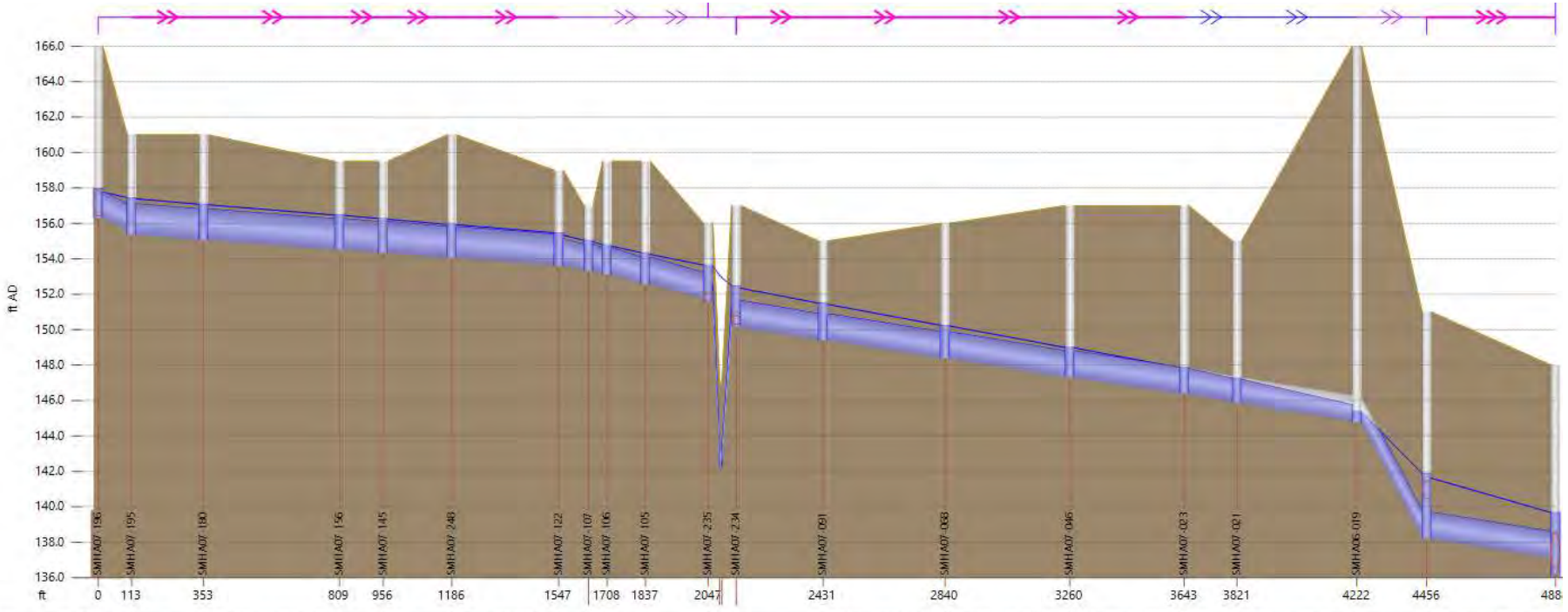
APPENDIX E – MODELED HYDRAULIC PROFILES

EXISTING LAND USE – AREA A



Link	A10-03.1	-	-	-	-	-	SMH A08-018.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
length (ft)	319.0	284.5	-	212.9	230.3	-	398.9	260.9	398.2	311.2	255.4	-	302.2	300.1	320.7	-	155.0	160.0	212.0	188.0	154.0	246.0	393.4	220.7	292.1	-	195.0
width (in)	15.0	15.0	-	15.0	15.0	-	15.0	15.0	15.0	15.0	15.0	-	15.0	15.0	18.0	-	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
us inv (ft AD)	213.530	211.020	-	207.750	206.510	-	203.000	199.010	197.410	194.750	192.920	-	190.690	188.850	186.770	-	-	-	184.840	-	-	183.550	182.960	182.000	181.380	-	-
ds inv (ft AD)	211.020	208.340	-	206.610	204.089	-	199.110	197.420	194.990	192.920	191.390	-	188.850	187.020	185.900	-	-	-	184.350	-	-	182.960	182.000	181.490	180.690	-	-
grad (%)	0.787	0.942	-	0.535	1.051	-	0.975	0.609	0.608	0.588	0.599	-	0.609	0.610	0.271	-	0.265	0.262	0.231	0.229	0.240	0.240	0.244	0.231	0.236	-	0.251
surc	2.00	2.00	-	2.00	1.00	-	1.00	2.00	2.00	2.00	2.00	-	2.00	2.00	2.00	-	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
r.pfc (MGD)	3.70	4.05	-	3.06	4.28	-	4.12	3.26	3.26	3.20	3.23	-	3.26	3.26	3.54	-	3.49	3.48	3.26	3.25	3.33	3.33	3.35	3.26	3.30	3.40	3.40
DS flow (MGD)	4.1241	4.1241	-	3.8486	3.8339	-	3.8972	3.8833	3.8673	3.8545	3.8438	-	3.5282	3.5230	3.5705	-	-	-	3.6413	3.6412	-	3.6412	3.6412	3.6412	3.6412	-	3.6411
Node	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ground (ft AD)	-	219.000	-	-	-	-	210.000	207.000	205.000	203.000	200.000	-	-	197.000	196.000	-	-	-	-	-	-	-	206.000	201.000	-	-	-	-
level (ft AD)	-	218.975	-	-	-	-	210.000	206.621	204.217	200.795	198.059	-	-	192.641	190.421	-	-	-	-	-	-	-	185.682	184.500	-	-	-	-
flood dep (ft)	-	-0.025	-	-	-0.770	-	0.000	-0.379	-0.783	-2.205	-1.941	-	-	-4.359	-5.579	-	-	-	-	-	-	-	-20.318	-16.500	-	-	-	-

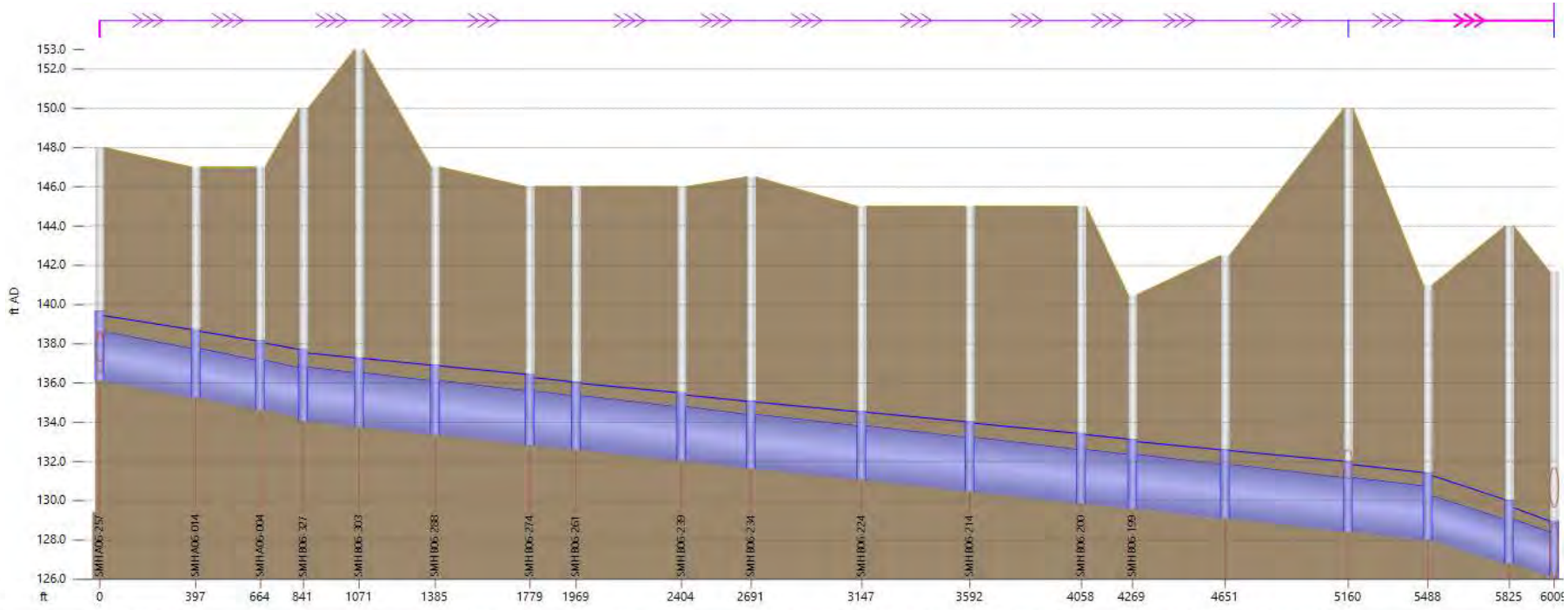
EXISTING LAND USE – AREA B



Link	-	-	SMH A07-180.1	-	-	SMH A07-248.1	-	-	-	-	-	-	SMH A07-091.1	SMH A07-068.1	SMH A07-046.1	-	SMH A07-021.1	-	SMH B06-329.1
length (ft)	112.5	240.7	456.0	146.8	230.3	360.3	99.4	-	128.8	209.5	-	290.6	408.7	419.5	383.8	177.3	401.8	233.8	431.9
width (in)	18.0	21.0	21.0	21.0	21.0	21.0	18.0	-	18.0	18.0	-	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
us inv (ft AD)	-	155.350	155.060	-	154.340	154.060	-	-	-	152.590	-	150.140	149.400	148.380	147.300	146.380	145.830	144.740	138.190
ds inv (ft AD)	-	155.060	154.510	-	154.060	153.630	-	-	-	151.720	-	149.400	148.380	147.300	146.380	145.930	144.840	138.290	137.110
grad (%)	0.622	0.120	0.121	0.116	0.122	0.119	-	-	0.411	0.415	-	0.255	0.250	0.257	0.240	0.254	0.246	2.759	0.250
surc	1.00	2.00	2.00	2.00	2.00	2.00	1.00	-	1.00	1.00	-	2.00	2.00	2.00	2.00	0.95	0.90	1.00	2.00
r.pfc (MGD)	5.36	3.56	3.56	3.49	3.57	3.54	3.79	-	4.36	4.38	-	3.43	3.39	3.45	3.32	3.42	3.37	11.28	3.40
DS flow (MGD)	-	3.6566	3.6456	3.6416	3.6391	3.6354	-	-	-	3.6347	-	3.6346	3.6346	3.6345	3.6345	3.6344	3.6344	3.6338	4.8577

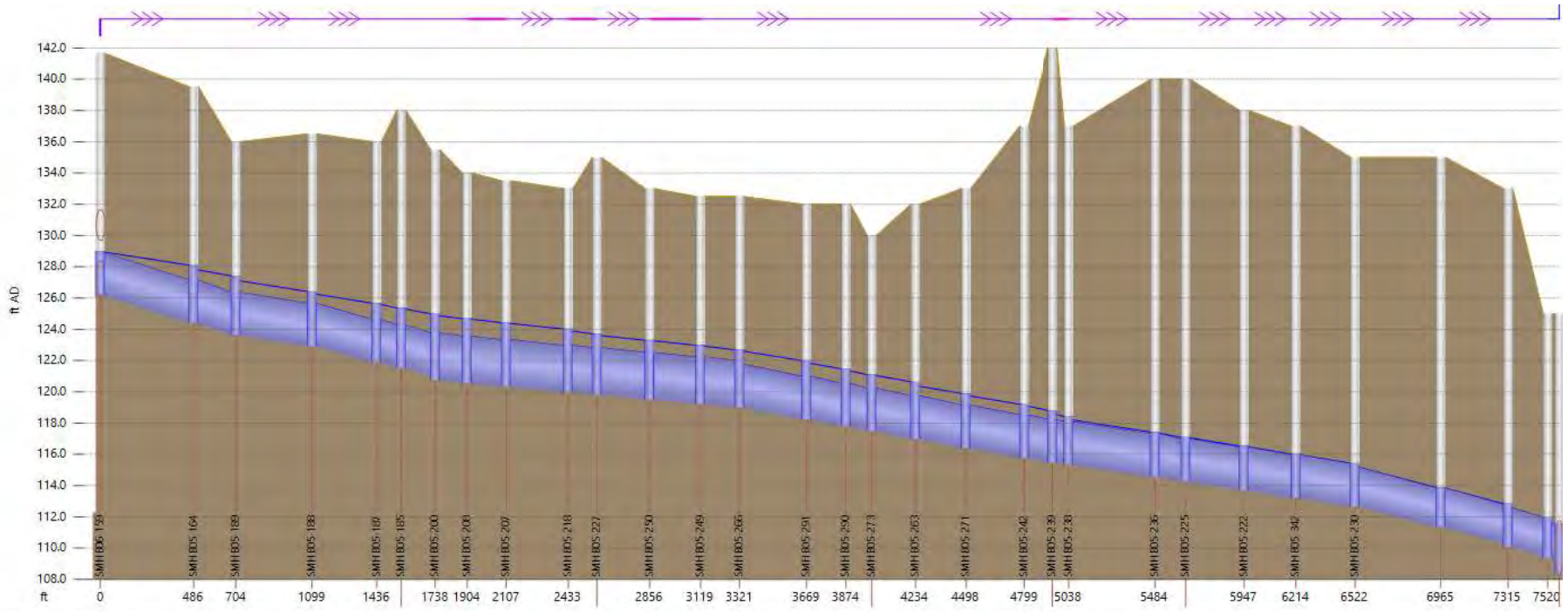
Node	-	SMH A07-180	-	-	-	-	-	-	-	-	-	-	SMH A07-091	SMH A07-068	SMH A07-046	-	-	SMH A06-019	SMH B06-329	-
ground (ft AD)	-	161.000	159.500	-	161.000	159.000	-	-	-	-	-	-	155.000	156.000	157.000	157.000	155.000	166.000	151.000	148.000
level (ft AD)	-	157.080	156.471	-	155.938	155.463	-	-	-	-	-	-	151.496	150.245	148.993	147.847	147.253	145.359	141.881	139.668
flood dep (ft)	-3.561	-3.920	-3.029	-3.231	-5.062	-3.537	-	-	-5.161	-	-4.535	-3.504	-5.755	-8.007	-9.153	-7.747	-20.641	-9.119	-8.332	

EXISTING LAND USE – AREA C



Link	SMH A06-257.1	-	-	-	-	SMH B06-288.1	-	SMH B06-261.1	-	SMH B06-234.1	SMH B06-224.1	SMH B06-214.1	-	SMH B06-199.1	SMH B06-186.1	-	-	-
length (ft)	396.7	267.4	177.3	229.3	314.6	393.4	190.1	435.0	287.1	455.6	445.4	466.4	210.4	382.2	509.2	327.5	337.3	184.4
width (in)	30.0	30.0	30.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	27.0	27.0
us inv (ft AD)	136.110	135.240	-	134.050	133.760	133.360	-	132.600	132.030	131.640	131.060	130.470	129.850	129.600	129.090	128.420	127.990	-
ds inv (ft AD)	135.240	134.660	-	133.760	133.360	132.840	-	132.030	131.640	131.060	130.470	129.850	129.600	129.090	128.420	127.990	126.792	-
grad (%)	0.219	0.217	0.220	0.126	0.127	0.132	0.126	0.131	0.136	0.127	0.132	0.133	0.119	0.133	0.132	0.131	0.355	0.358
surc	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00
r.pfc (MGD)	12.42	12.35	12.43	12.16	12.19	12.43	12.15	12.37	12.60	12.20	12.44	12.46	11.78	12.49	12.40	12.39	11.93	11.98
DS flow (MGD)	11.4670	11.4562	-	11.4373	11.5043	11.4871	-	11.4617	11.4509	11.4344	11.4189	11.4033	11.3963	11.3836	11.3678	12.1626	12.1555	-
Node	-	-	-	-	-	-	-	-	-	-	SMH B06-224	SMH B06-214	-	-	SMH B06-186	SMH B06-163	-	-	-
ground (ft AD)	-	147.000	-	-	153.000	147.000	146.000	146.000	146.000	146.500	145.000	145.000	145.000	140.500	142.500	150.000	141.000	143.984	-
level (ft AD)	-	138.722	-	-	137.284	136.911	136.434	136.062	135.504	135.073	134.537	134.024	133.439	133.133	132.597	131.997	131.432	130.022	-
flood dep (ft)	-8.332	-8.278	-8.851	-	-15.716	-10.089	-9.566	-9.938	-10.496	-11.427	-10.463	-10.976	-11.561	-7.367	-9.903	-18.003	-9.568	-13.962	-

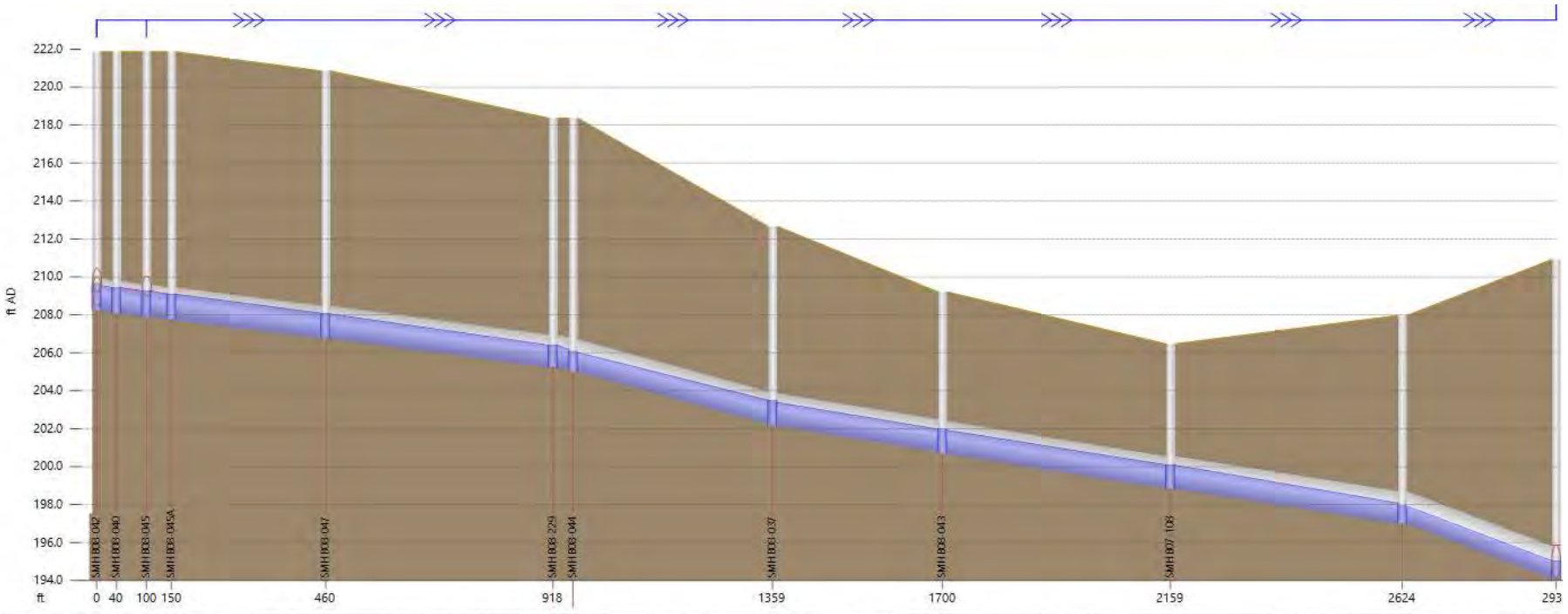
EXISTING LAND USE – AREA D



Link	SMH B06-159.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
length (ft)	485.7	218.4	394.8	337.0	-	176.0	-	202.7	326.1	-	274.6	263.3	201.7	348.2	204.6	-	227.1	263.3	301.6	-	-	446.8	-	303.8	267.3	307.6	443.8	349.1	205.1	
width (in)	33.0	33.0	33.0	33.0	-	33.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	33.0	33.0	-	33.0	33.0	33.0	33.0	-	33.0	33.0	33.0	33.0	33.0	30.0	30.0	30.0	
us inv (ft AD)	126.132	-	123.610	122.900	-	-	-	-	120.330	-	119.810	119.500	-	119.000	-	-	-	116.980	116.390	-	-	115.330	-	114.230	113.690	113.200	112.650	111.330	-	
ds inv (ft AD)	124.392	-	122.900	121.870	-	-	-	-	119.960	-	119.500	119.220	-	118.230	-	-	-	116.390	115.760	-	-	114.550	-	113.690	113.200	112.650	111.330	110.270	-	
grad (%)	0.358	0.358	0.180	0.306	-	0.284	-	0.109	0.113	-	0.113	0.106	0.109	0.221	0.225	-	0.220	0.224	0.209	-	-	0.175	-	0.178	0.183	0.179	0.297	0.304	0.302	
surc	1.00	1.00	1.00	1.00	-	1.00	1.00	2.00	1.00	2.00	1.00	2.00	1.00	1.00	1.00	-	1.00	1.00	1.00	1.00	-	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
r.pfc (MGD)	20.46	20.46	14.50	18.90	-	18.22	-	14.20	14.52	-	14.49	14.06	14.24	16.08	16.21	-	16.04	16.18	15.62	-	-	14.28	-	14.41	14.64	14.46	14.46	14.61	14.58	
DS flow (MGD)	14.6273	-	14.5897	14.5340	-	-	-	-	14.4058	-	14.3370	14.2976	-	14.2118	-	-	-	14.1618	14.1594	-	-	14.1449	-	14.1337	14.1268	14.1198	14.1189	14.1184	-	

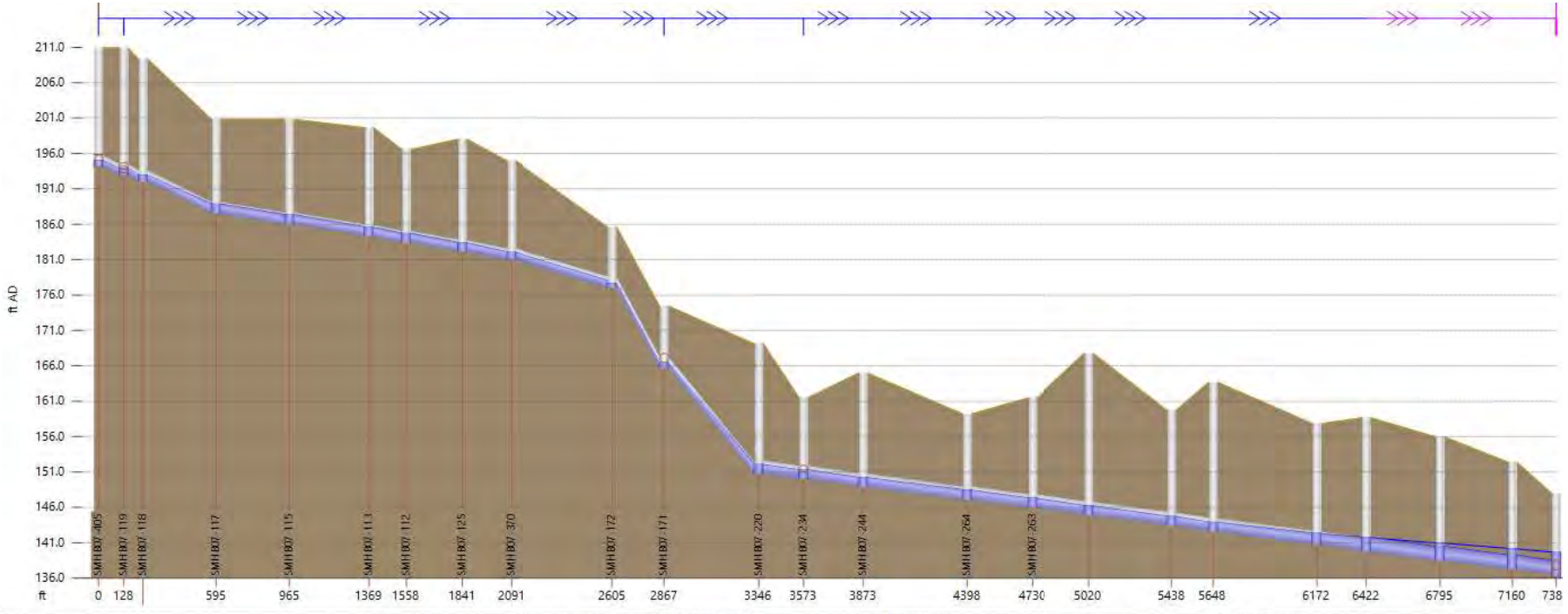
Node	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ground (ft AD)	-	139.514	136.000	136.500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	140.000	-	-	-	135.000	135.000	-	-		
level (ft AD)	-	128.077	127.390	126.402	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	117.423	-	-	-	115.415	113.877	-	-		
flood dep (ft)	-	-11.437	-8.610	-10.098	-	-	-	-	-9.080	-	-	-9.706	-	-9.810	-	-	-	-	-	-	-	-22.577	-	-21.473	-20.988	-19.585	-21.123	-	-		

EXISTING LAND USE – AREA E



Link	-	-	-	SMH B08-045A.1	SMH B08-047.1	-	SMH B08-044.1	SMH B08-037.1	SMH B08-043.1	SMH B07-108.1	SMH B07-107.1	
length (ft)	-	60.0	-	310.0	458.0	-	401.0	341.0	459.2	464.7	308.9	
width (in)	-	21.0	-	21.0	21.0	-	21.0	21.0	21.0	21.0	21.0	
us inv (ft AD)	-	-	-	207.732	206.750	-	205.000	202.150	200.680	198.840	197.000	
ds inv (ft AD)	-	-	-	206.750	205.233	-	202.250	200.780	198.840	197.000	194.107	
grad (%)	-	-	-	0.317	0.331	-	0.686	0.402	0.401	0.396	0.937	
surc	-	0.78	-	0.76	0.73	-	0.71	0.70	0.71	0.70	0.53	
r.pfc (MGD)	-	5.76	-	5.76	5.89	-	8.48	6.49	6.48	6.45	9.91	
DS flow (MGD)	-	-	-	5.2707	5.2707	-	5.3000	5.3032	5.3031	5.3031	5.3031	
Node	-	-	-	SMH B08-047	SMH B08-229	SMH B08-044	SMH B08-037	SMH B08-043	SMH B07-108	SMH B07-107	-	
ground (ft AD)	-	-	221.854	220.847	218.361	218.361	212.662	209.204	206.463	207.955	210.904	
level (ft AD)	-	-	209.080	208.068	206.386	206.059	203.479	201.956	200.078	197.921	195.031	
flood dep (ft)	-	-	-12.774	-12.779	-11.975	-12.302	-9.183	-7.248	-6.385	-10.034	-15.873	

EXISTING LAND USE – AREA F



Link	-	-	-	-	-	-	-	-	-	SMH B07-370.1	-	SMH B07-171.1	-	-	SMH B07-244.1	-	-	-	-	SMH B07-242.1	-	-	-	-
length (ft)	-	-	370.0	370.5	403.7	189.0	282.5	249.9	514.2	262.6	479.1	226.2	300.0	525.4	331.8	289.9	418.2	210.2	523.9	249.6	373.1	365.7	220.5
width (in)	-	-	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
us inv (ft AD)	-	-	192.000	187.500	186.000	-	183.416	182.070	180.950	177.000	165.650	-	149.975	148.860	147.080	145.950	144.870	-	142.540	140.670	139.730	138.470	-
ds inv (ft AD)	-	-	187.500	186.000	184.350	-	182.170	180.950	177.000	165.750	150.740	-	148.960	147.080	145.950	144.970	143.460	-	140.770	139.830	138.470	137.230	-
grad (%)	-	-	1.216	0.405	0.409	0.441	0.441	0.448	0.768	4.284	3.112	0.338	0.338	0.339	0.341	0.338	0.337	0.343	0.338	0.337	0.338	0.339	0.327
surc	-	-	0.78	0.77	0.76	0.74	0.73	0.72	0.61	0.38	0.76	0.66	0.65	0.70	0.68	0.65	0.66	0.65	0.79	0.98	1.00	1.00	1.00
r.pfc (MGD)	-	-	11.30	6.52	6.55	6.80	6.80	6.86	8.98	21.20	18.07	8.50	8.51	8.51	8.53	8.50	8.49	8.56	8.50	8.48	8.50	8.52	8.36
DS flow (MGD)	-	-	5.9914	5.9913	5.9913	-	6.0622	6.0622	6.0814	6.0814	6.3607	6.3607	6.5535	6.5534	6.5534	6.5534	6.5533	6.5533	6.5533	6.5529	6.5487	6.6404	6.6295
Node	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ground (ft AD)	-	-	200.819	200.813	199.641	-	-	194.953	185.616	174.439	169.113	-	164.971	159.204	161.463	167.769	159.712	163.680	157.842	158.647	155.955	152.380	-
level (ft AD)	-	-	188.866	187.346	185.605	-	-	182.039	177.667	166.399	152.061	-	150.223	148.465	147.308	146.245	144.741	143.910	142.341	141.774	140.975	140.198	-
flood dep (ft)	-	-	-11.953	-13.467	-14.036	-	-	-12.924	-7.949	-8.040	-17.052	-	-14.748	-10.739	-14.155	-21.524	-14.971	-19.770	-15.501	-16.873	-14.980	-12.182	-

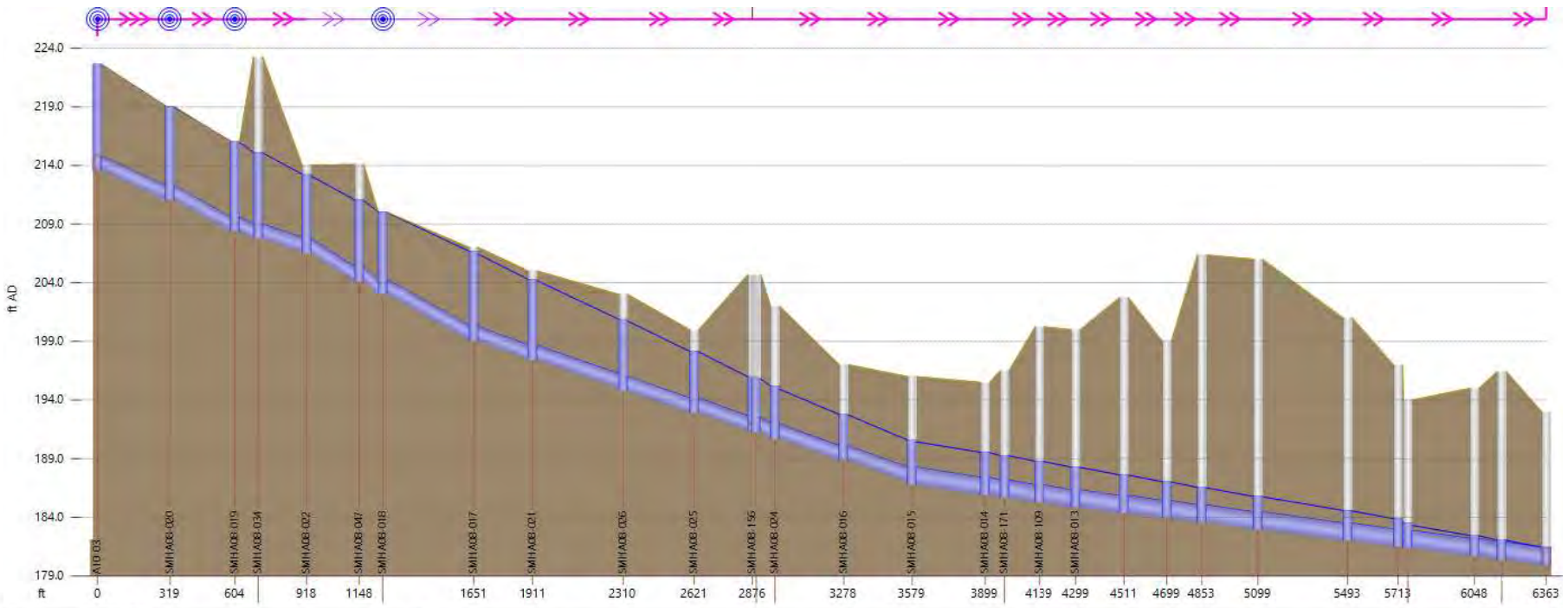
EXISTING LAND USE – AREA G



Link	SMH A08-010.1	-	SMH B08-196.1	-	SMH B08-105.1	SMH B08-083.1	SMH B08-077.1	SMH B08-066.1	-	-	-	-	-	-	-	-
length (ft)	382.5	147.9	234.6	200.3	394.4	399.4	304.0	322.1	179.5	85.6	168.0	178.0	172.0	157.2	100.0	-
width (in)	8.0	8.0	8.0	10.0	10.0	10.0	10.0	10.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	-
us inv (ft AD)	245.580	239.840	235.400	233.990	231.880	229.840	228.440	227.340	226.180	-	216.100	214.030	212.580	211.300	-	-
ds inv (ft AD)	239.840	235.400	233.990	232.080	230.040	228.640	227.530	226.380	223.990	-	214.230	212.580	211.500	210.500	-	-
grad (%)	1.501	3.002	0.601	0.954	0.467	0.300	0.299	0.298	1.220	9.100	1.113	0.815	0.628	0.509	0.929	-
surc	0.38	0.49	0.49	0.31	0.37	0.43	0.43	0.43	0.25	0.19	0.29	0.32	0.32	0.34	0.29	-
r.pfc (MGD)	0.96	1.35	0.61	1.38	0.97	0.78	0.77	0.77	2.54	6.95	2.43	2.08	1.83	1.64	2.22	-
DS flow (MGD)	0.2779	0.2779	0.2779	0.2779	0.2779	0.2900	0.2900	0.2900	0.2900	-	0.3819	0.3819	0.3819	0.3819	0.3819	-

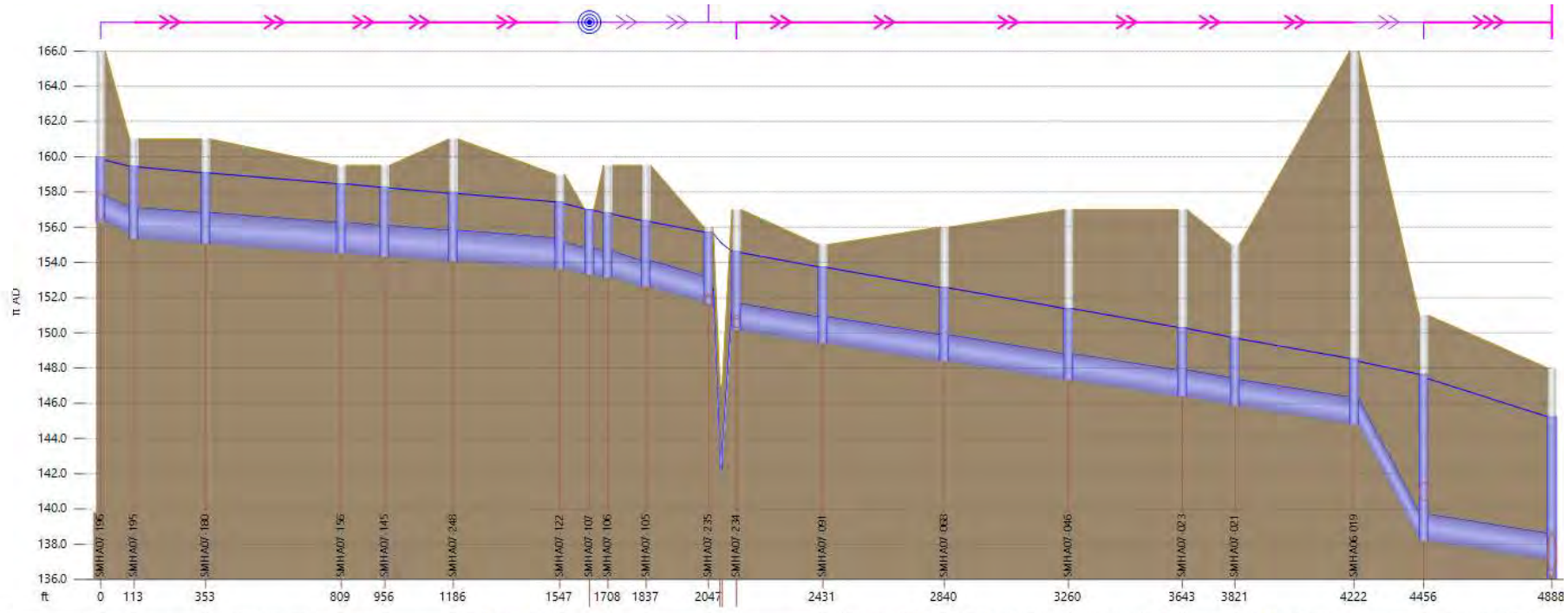
Node	-	SMH B08-143	-	SMH B08-113	SMH B08-105	SMH B08-083	SMH B08-077	SMH B08-066	SMH B08-062	-	-	-	-	-	-	-	-
ground (ft AD)	252.381	246.609	243.258	240.770	239.440	240.920	243.415	243.560	241.150	-	-	230.810	225.000	221.960	-	-
level (ft AD)	245.835	240.057	235.727	234.252	232.191	230.199	228.799	227.700	226.429	-	-	214.326	212.897	211.637	-	-
flood dep (ft)	-6.546	-6.552	-7.531	-6.518	-7.249	-10.721	-14.616	-15.860	-14.721	-12.840	-	-16.484	-12.103	-10.323	-8.412	-

BUILDOUT LAND USE – AREA A



Link	A10-03.1	-	-	-	-	-	SMH A08-018.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
length (ft)	319.0	284.5	-	212.9	230.3	-	398.9	260.9	398.2	311.2	255.4	-	302.2	300.1	320.7	-	155.0	160.0	212.0	188.0	154.0	246.0	393.4	220.7	292.1	-	195.0
width (in)	15.0	15.0	-	15.0	15.0	-	15.0	15.0	15.0	15.0	15.0	-	15.0	15.0	18.0	-	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
us inv (ft AD)	213.530	211.020	-	207.750	206.510	-	203.000	199.010	197.410	194.750	192.920	-	190.690	188.850	186.770	-	-	-	184.840	-	-	183.550	182.960	182.000	181.380	-	-
ds inv (ft AD)	211.020	208.340	-	206.610	204.089	-	199.110	197.420	194.990	192.920	191.390	-	188.850	187.020	185.900	-	-	-	184.350	-	-	182.960	182.000	181.490	180.690	-	-
grad (%)	0.787	0.942	-	0.535	1.051	-	0.975	0.609	0.608	0.588	0.599	-	0.609	0.610	0.271	-	0.265	0.262	0.231	0.229	0.240	0.240	0.244	0.231	0.236	-	0.251
surc	2.00	2.00	-	2.00	1.00	-	1.00	2.00	2.00	2.00	2.00	-	2.00	2.00	2.00	-	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
r.pfc (MGD)	3.70	4.05	-	3.06	4.28	-	4.12	3.26	3.26	3.20	3.23	-	3.26	3.26	3.54	-	3.49	3.48	3.26	3.25	3.33	3.33	3.35	3.26	3.30	3.40	3.40
DS flow (MGD)	4.3727	4.1683	-	3.9082	3.8859	-	3.9267	3.9075	3.8864	3.8696	3.8558	-	3.5250	3.5183	3.5582	-	-	-	3.6701	3.6700	-	3.6700	3.6699	3.6699	3.6699	-	3.6698
Node	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ground (ft AD)	-	219.000	-	-	-	-	210.000	207.000	205.000	203.000	200.000	-	-	197.000	196.000	-	-	-	-	-	-	206.000	201.000	-	-	-	-
level (ft AD)	-	219.000	-	-	-	-	210.000	206.648	204.261	200.863	198.146	-	-	192.766	190.563	-	-	-	-	-	-	185.784	184.585	-	-	-	-
flood dep (ft)	-	-0.000	-	-	-0.764	-	0.000	-0.352	-0.739	-2.137	-1.854	-	-	-4.234	-5.437	-	-	-	-	-	-	-20.216	-16.415	-	-	-	-

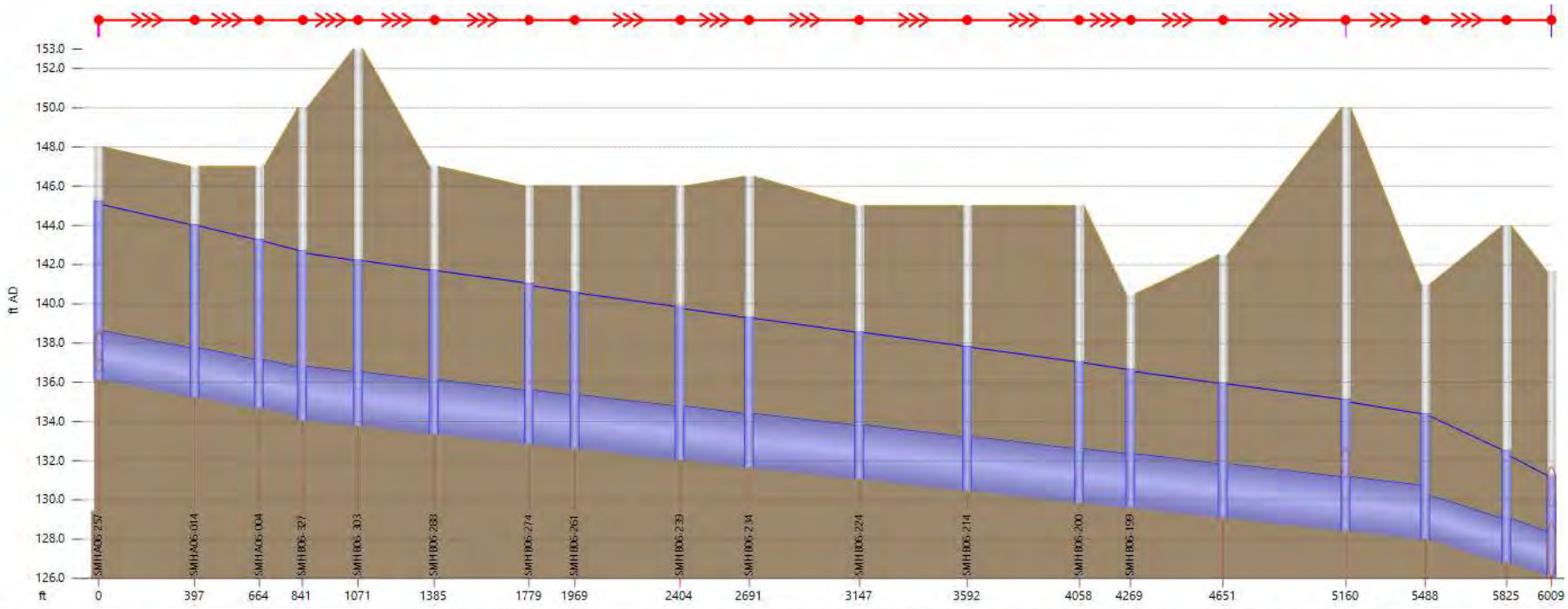
BUILDOUT LAND USE – AREA B



Link	-	-	SMH A07-180.1	-	-	SMH A07-248.1	-	-	-	-	-	-	SMH A07-091.1	SMH A07-068.1	SMH A07-046.1	-	SMH A07-021.1	-	SMH B06-329.1
length (ft)	112.5	240.7	456.0	146.8	230.3	360.3	99.4	-	128.8	209.5	-	290.6	408.7	419.5	383.8	177.3	401.8	233.8	431.9
width (in)	18.0	21.0	21.0	21.0	21.0	21.0	18.0	-	18.0	18.0	-	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
us inv (ft AD)	-	155.350	155.060	-	154.340	154.060	-	-	-	152.590	-	150.140	149.400	148.380	147.300	146.380	145.830	144.740	138.190
ds inv (ft AD)	-	155.060	154.510	-	154.060	153.630	-	-	-	151.720	-	149.400	148.380	147.300	146.380	145.930	144.840	138.290	137.110
grad (%)	0.622	0.120	0.121	0.116	0.122	0.119	-	-	0.411	0.415	-	0.255	0.250	0.257	0.240	0.254	0.246	2.759	0.250
surc	1.00	2.00	2.00	2.00	2.00	2.00	1.00	-	1.00	1.00	-	2.00	2.00	2.00	2.00	2.00	2.00	1.00	2.00
r.pfc (MGD)	5.36	3.56	3.56	3.49	3.57	3.54	3.79	-	4.36	4.38	-	3.43	3.39	3.45	3.32	3.42	3.37	11.28	3.40
DS flow (MGD)	-	3.6922	3.6921	3.6921	3.6921	3.6920	-	-	-	3.6350	-	3.6331	3.6319	3.6309	3.6307	3.6316	3.6328	3.6340	4.8525

Node	-	SMH A07-180	-	-	-	-	-	-	-	-	-	SMH A07-091	SMH A07-068	SMH A07-046	-	-	SMH A06-019	SMH B06-329	-
ground (ft AD)	-	161.000	159.500	-	161.000	159.000	-	-	-	-	-	155.000	156.000	157.000	157.000	155.000	166.000	151.000	148.000
level (ft AD)	-	159.098	158.474	-	157.925	157.432	-	-	-	-	-	153.744	152.576	151.392	150.307	149.750	148.534	147.638	145.233
flood dep (ft)	-1.543	-1.902	-1.026	-1.234	-3.075	-1.568	-	-	-3.128	-	-2.386	-1.256	-3.424	-5.608	-6.693	-5.250	-17.466	-3.362	-2.767

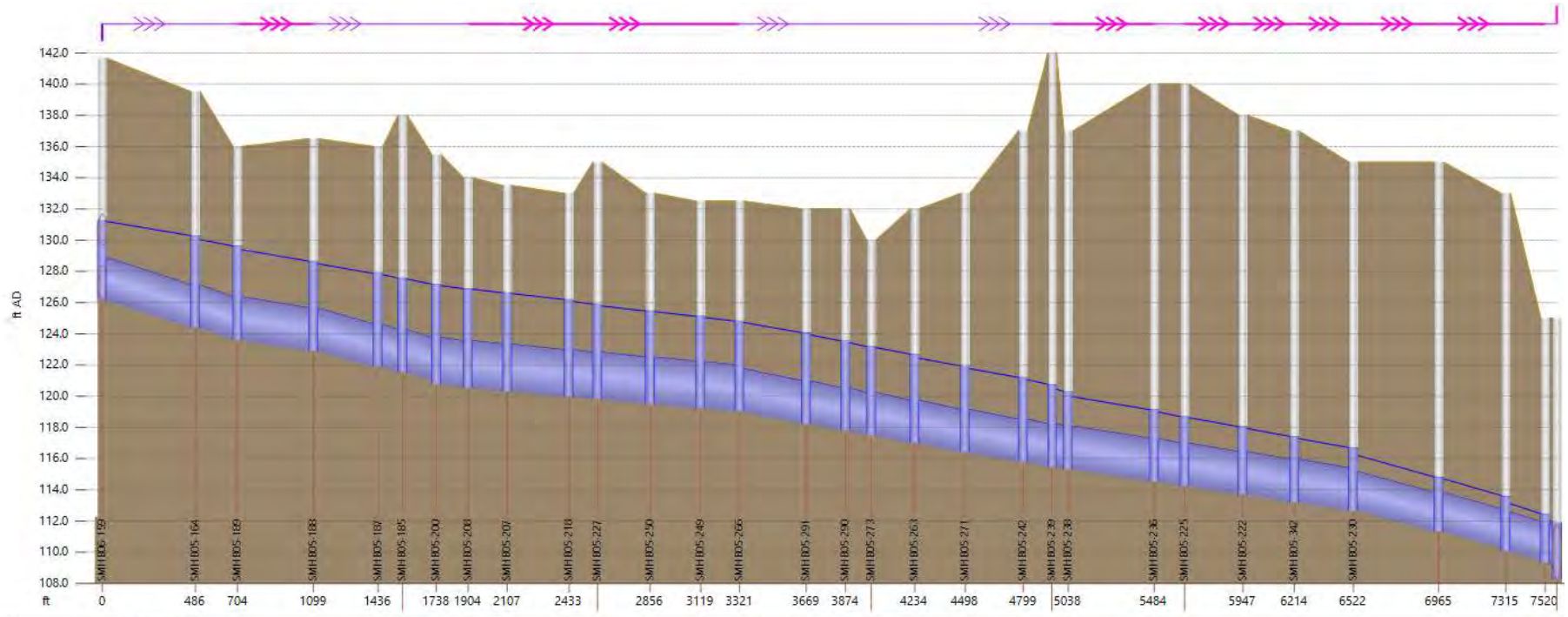
BUILDOUT LAND USE – AREA C



Link	SMH A06-257.1	-	-	-	-	SMH B06-288.1	-	SMH B06-261.1	-	SMH B06-234.1	SMH B06-224.1	SMH B06-214.1	-	SMH B06-199.1	SMH B06-186.1	-	-	-
length (ft)	396.7	267.4	177.3	229.3	314.6	393.4	190.1	435.0	287.1	455.6	445.4	466.4	210.4	382.2	509.2	327.5	337.3	184.4
width (in)	30.0	30.0	30.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	27.0	27.0
us inv (ft AD)	136.110	135.240	-	134.050	133.760	133.360	-	132.600	132.030	131.640	131.060	130.470	129.850	129.600	129.090	128.420	127.990	-
ds inv (ft AD)	135.240	134.660	-	133.760	133.360	132.840	-	132.030	131.640	131.060	130.470	129.850	129.600	129.090	128.420	127.990	126.792	-
grad (%)	0.219	0.217	0.220	0.126	0.127	0.132	0.126	0.131	0.136	0.127	0.132	0.133	0.119	0.133	0.132	0.131	0.355	0.358
surc	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
r,cfc (MGD)	12.42	12.35	12.43	12.16	12.19	12.43	12.15	12.37	12.60	12.20	12.44	12.46	11.78	12.49	12.40	12.39	11.93	11.98
DS flow (MGD)	13.2598	13.2587	-	13.2570	13.3380	13.3370	-	13.3354	13.3348	13.3340	13.3333	13.3327	13.3323	13.3318	13.3313	14.2827	14.2828	-

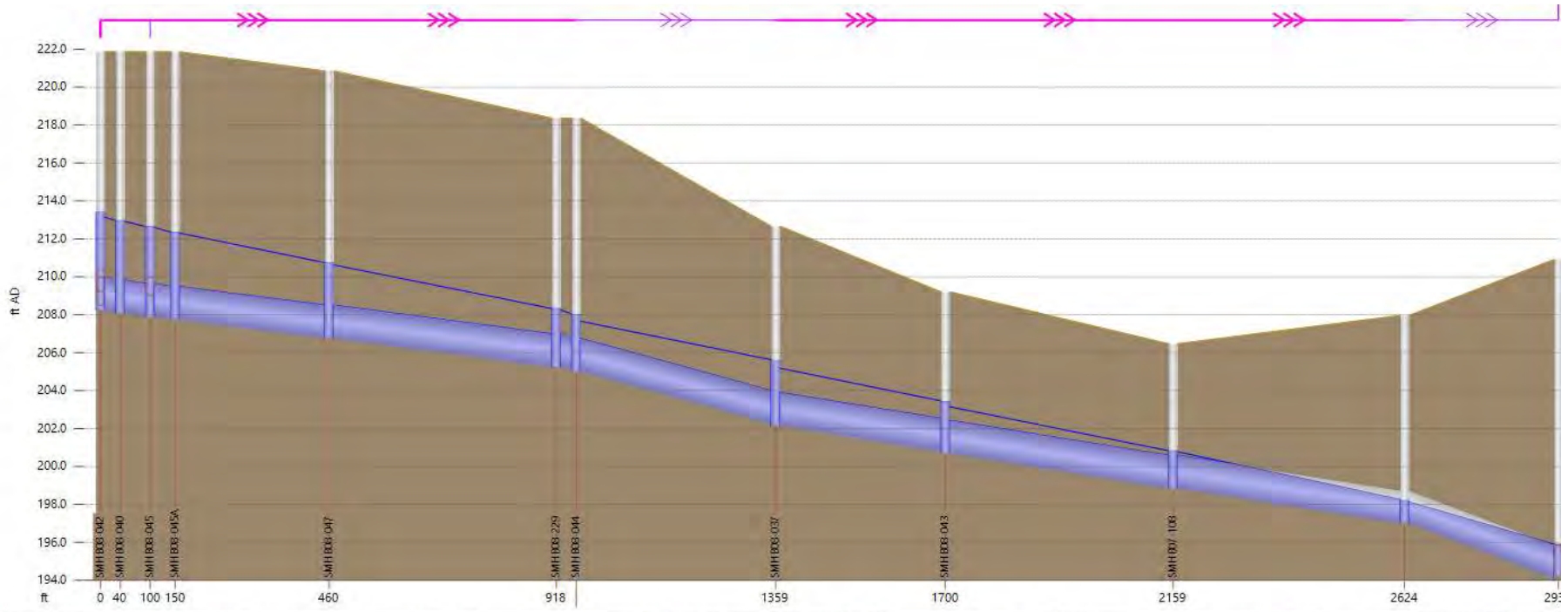
Node	-	-	-	-	-	-	-	-	-	-	-	SMH B06-224	SMH B06-214	-	-	SMH B06-186	SMH B06-163	-	-	-
ground (ft AD)	-	147.000	-	-	153.000	147.000	146.000	146.000	146.000	146.500	145.000	145.000	145.000	140.500	142.500	150.000	141.000	143.984	-	
level (ft AD)	-	144.039	-	-	142.225	141.711	141.059	140.614	139.861	139.304	138.562	137.847	137.055	136.658	135.954	135.125	134.398	132.519	-	
flood dep (ft)	-2.767	-2.961	-3.716	-7.281	-10.775	-5.289	-4.941	-5.386	-6.139	-7.196	-6.438	-7.153	-7.945	-3.842	-6.546	-14.875	-6.602	-11.465	-	

BUILDOUT LAND USE – AREA D



Link	SMH B06-159.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
length (ft)	485.7	218.4	394.8	337.0	-	176.0	-	202.7	326.1	-	274.6	263.3	201.7	348.2	204.6	-	227.1	263.3	301.6	-	-	446.8	-	303.8	267.3	307.6	443.8	349.1	205.1	
width (in)	33.0	33.0	33.0	33.0	-	33.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	33.0	33.0	-	33.0	33.0	33.0	33.0	-	33.0	33.0	33.0	33.0	33.0	30.0	30.0	30.0	
us inv (ft AD)	126.132	-	123.610	122.900	-	-	-	-	120.330	-	119.810	119.500	-	119.000	-	-	-	116.980	116.390	-	-	115.330	-	114.230	113.690	113.200	112.650	111.330	-	
ds inv (ft AD)	124.392	-	122.900	121.870	-	-	-	-	119.960	-	119.500	119.220	-	118.230	-	-	-	116.390	115.760	-	-	114.550	-	113.690	113.200	112.650	111.330	110.270	-	
grad (%)	0.358	0.358	0.180	0.306	-	0.284	-	0.109	0.113	-	0.113	0.106	0.109	0.221	0.225	-	0.220	0.224	0.209	-	-	0.175	-	0.178	0.183	0.179	0.297	0.304	0.302	
surc	1.00	1.00	2.00	1.00	-	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	-	1.00	1.00	1.00	1.00	-	2.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00	
r.pfc (MGD)	20.46	20.46	14.50	18.90	-	18.22	-	14.20	14.52	-	14.49	14.06	14.24	16.08	16.21	-	16.04	16.18	15.62	-	-	14.28	-	14.41	14.64	14.46	14.46	14.61	14.58	
DS flow (MGD)	15.0889	-	15.0329	15.0057	-	-	-	-	14.9060	-	14.8692	14.8577	-	14.8171	-	-	-	14.7435	14.7259	-	-	14.7239	-	14.7225	14.7217	14.7210	14.7201	14.7194	-	
Node	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ground (ft AD)	-	139.514	136.000	136.500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	140.000	-	-	-	135.000	135.000	-	-	
level (ft AD)	-	130.268	129.608	128.638	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	119.125	-	-	-	116.675	114.817	-	-	
flood dep (ft)	-	-9.246	-6.392	-7.862	-	-	-	-	-6.879	-	-	-7.544	-	-7.698	-7.942	-	-	-	-	-	-	-20.875	-	-19.957	-19.586	-18.325	-20.183	-	-	

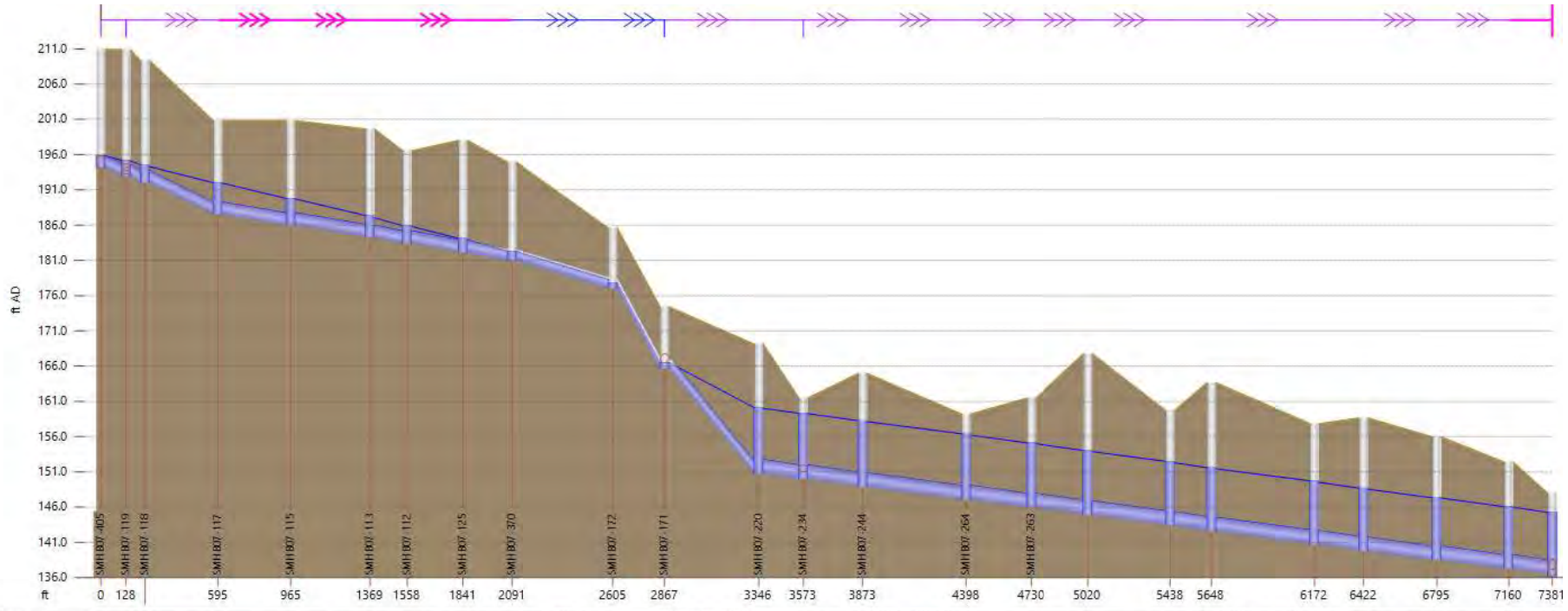
BUILDOUT LAND USE – AREA E



Link	-	-	-	SMH B08-045A.1	SMH B08-047.1	-	SMH B08-044.1	SMH B08-037.1	SMH B08-043.1	SMH B07-108.1	SMH B07-107.1
length (ft)	-	60.0	-	310.0	458.0	-	401.0	341.0	459.2	464.7	308.9
width (in)	-	21.0	-	21.0	21.0	-	21.0	21.0	21.0	21.0	21.0
us inv (ft AD)	-	-	-	207.732	206.750	-	205.000	202.150	200.680	198.840	197.000
ds inv (ft AD)	-	-	-	206.750	205.233	-	202.250	200.780	198.840	197.000	194.107
grad (%)	-	-	-	0.317	0.331	-	0.686	0.402	0.401	0.396	0.937
surc	-	2.00	-	2.00	2.00	-	1.00	2.00	2.00	2.00	1.00
r.pfc (MGD)	-	5.76	-	5.76	5.89	-	8.48	6.49	6.48	6.45	9.91
DS flow (MGD)	-	-	-	7.2196	7.2195	-	7.2509	7.2534	7.2534	7.2534	7.2522

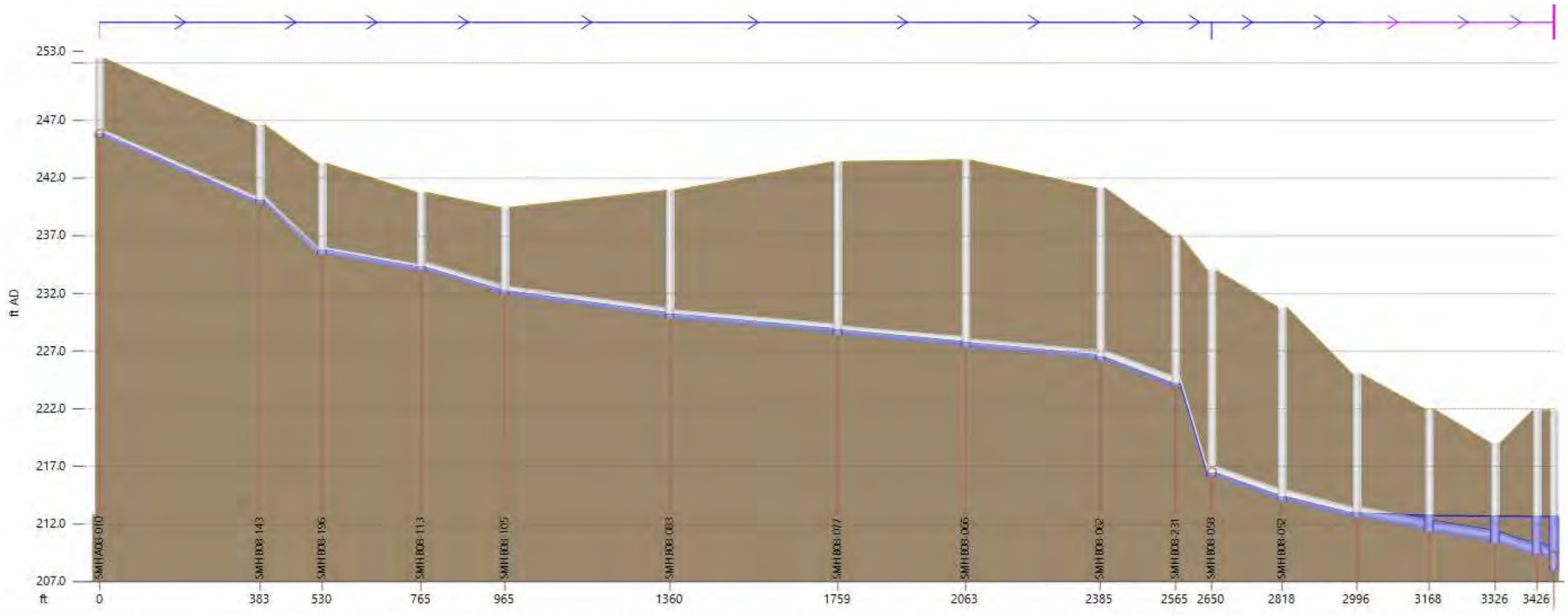
Node	-	-	-	SMH B08-047	SMH B08-229	SMH B08-044	SMH B08-037	SMH B08-043	SMH B07-108	SMH B07-107	-
ground (ft AD)	-	-	221.854	220.847	218.361	218.361	212.662	209.204	206.463	207.955	210.904
level (ft AD)	-	-	212.343	210.734	208.318	208.010	205.584	203.427	200.820	198.192	195.893
flood dep (ft)	-	-	-9.511	-10.113	-10.043	-10.351	-7.078	-5.777	-5.643	-9.763	-15.011

BUILDOUT LAND USE – AREA F



Link	-	-	-	-	-	-	-	-	SMH B07-370.1	-	SMH B07-171.1	-	-	SMH B07-244.1	-	-	-	-	SMH B07-242.1	-	-	-	-	-
length (ft)	-	-	370.0	370.5	403.7	189.0	282.5	249.9	514.2	262.6	479.1	226.2	300.0	525.4	331.8	289.9	418.2	210.2	523.9	249.6	373.1	365.7	220.5		
width (in)	-	-	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0		
us inv (ft AD)	-	-	192.000	187.500	186.000	-	183.416	182.070	180.950	177.000	165.650	-	149.975	148.860	147.080	145.950	144.870	-	142.540	140.670	139.730	138.470	-		
ds inv (ft AD)	-	-	187.500	186.000	184.350	-	182.170	180.950	177.000	165.750	150.740	-	148.960	147.080	145.950	144.970	143.460	-	140.770	139.830	138.470	137.230	-		
grad (%)	-	-	1.216	0.405	0.409	0.441	0.441	0.448	0.768	4.284	3.112	0.338	0.338	0.339	0.341	0.338	0.337	0.343	0.338	0.337	0.338	0.339	0.327		
surc	-	-	1.00	2.00	2.00	2.00	2.00	2.00	0.72	0.44	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00		
r.pfc (MGD)	-	-	11.30	6.52	6.55	6.80	6.80	6.86	8.98	21.20	18.07	8.50	8.51	8.51	8.53	8.50	8.49	8.56	8.50	8.48	8.50	8.52	8.36		
DS flow (MGD)	-	-	7.8057	7.8057	7.8057	-	7.8765	7.8765	7.8969	7.8969	8.1616	8.1590	8.3502	8.3481	8.3468	8.3458	8.3447	8.3440	8.3430	8.3424	8.3418	8.4519	8.4514		
Node	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ground (ft AD)	-	-	200.819	200.813	199.641	-	-	194.963	185.616	174.439	169.113	-	164.971	159.204	161.463	167.769	159.712	163.680	157.842	158.647	155.955	152.380	-		
level (ft AD)	-	-	192.010	189.781	187.328	-	-	182.280	177.763	166.511	160.091	-	158.261	156.391	155.117	154.027	152.482	151.592	149.709	148.676	147.314	146.045	-		
flood dep (ft)	-	-	-8.809	-11.032	-12.313	-	-	-12.683	-7.853	-7.928	-9.022	-2.197	-6.710	-2.813	-6.346	-13.742	-7.230	-12.088	-8.133	-9.971	-8.641	-6.335	-		

BUILDOUT LAND USE – AREA G



Link	SMH A08-010.1	-	SMH B08-196.1	-	SMH B08-105.1	SMH B08-083.1	SMH B08-077.1	SMH B08-066.1	-	-	-	-	-	-	-	-
length (ft)	382.5	147.9	234.6	200.3	394.4	399.4	304.0	322.1	179.5	85.6	168.0	178.0	172.0	157.2	100.0	-
width (in)	8.0	8.0	8.0	10.0	10.0	10.0	10.0	10.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	-
us inv (ft AD)	245.580	239.840	235.400	233.990	231.880	229.840	228.440	227.340	226.180	-	216.100	214.030	212.580	211.300	-	-
ds inv (ft AD)	239.840	235.400	233.990	232.080	230.040	228.640	227.530	226.380	223.990	-	214.230	212.580	211.500	210.500	-	-
grad (%)	1.501	3.002	0.601	0.954	0.467	0.300	0.299	0.298	1.220	9.100	1.113	0.815	0.628	0.509	0.929	-
surc	0.38	0.49	0.49	0.31	0.37	0.43	0.43	0.43	0.25	0.19	0.29	0.36	1.00	1.00	1.00	-
r.pfc (MGD)	0.96	1.35	0.61	1.38	0.97	0.78	0.77	0.77	2.54	6.95	2.43	2.08	1.83	1.64	2.22	-
DS flow (MGD)	0.2779	0.2779	0.2779	0.2779	0.2779	0.2900	0.2900	0.2900	0.2900	-	0.3825	0.3827	0.3871	0.3878	0.3885	-

Node	-	SMH B08-143	-	SMH B08-113	SMH B08-105	SMH B08-083	SMH B08-077	SMH B08-066	SMH B08-062	-	-	-	-	-	-	-
ground (ft AD)	252.381	246.609	243.258	240.770	239.440	240.920	243.415	243.560	241.150	-	-	230.810	225.000	221.960	-	-
level (ft AD)	245.835	240.057	235.727	234.252	232.191	230.199	228.799	227.700	226.429	-	-	214.326	212.939	212.742	-	-
flood dep (ft)	-6.546	-6.552	-7.531	-6.518	-7.249	-10.721	-14.616	-15.860	-14.721	-12.840	-	-16.484	-12.061	-9.218	-6.307	-

APPENDIX F – PROPOSED CAPACITY IMPROVEMENT PROJECT DETAILS

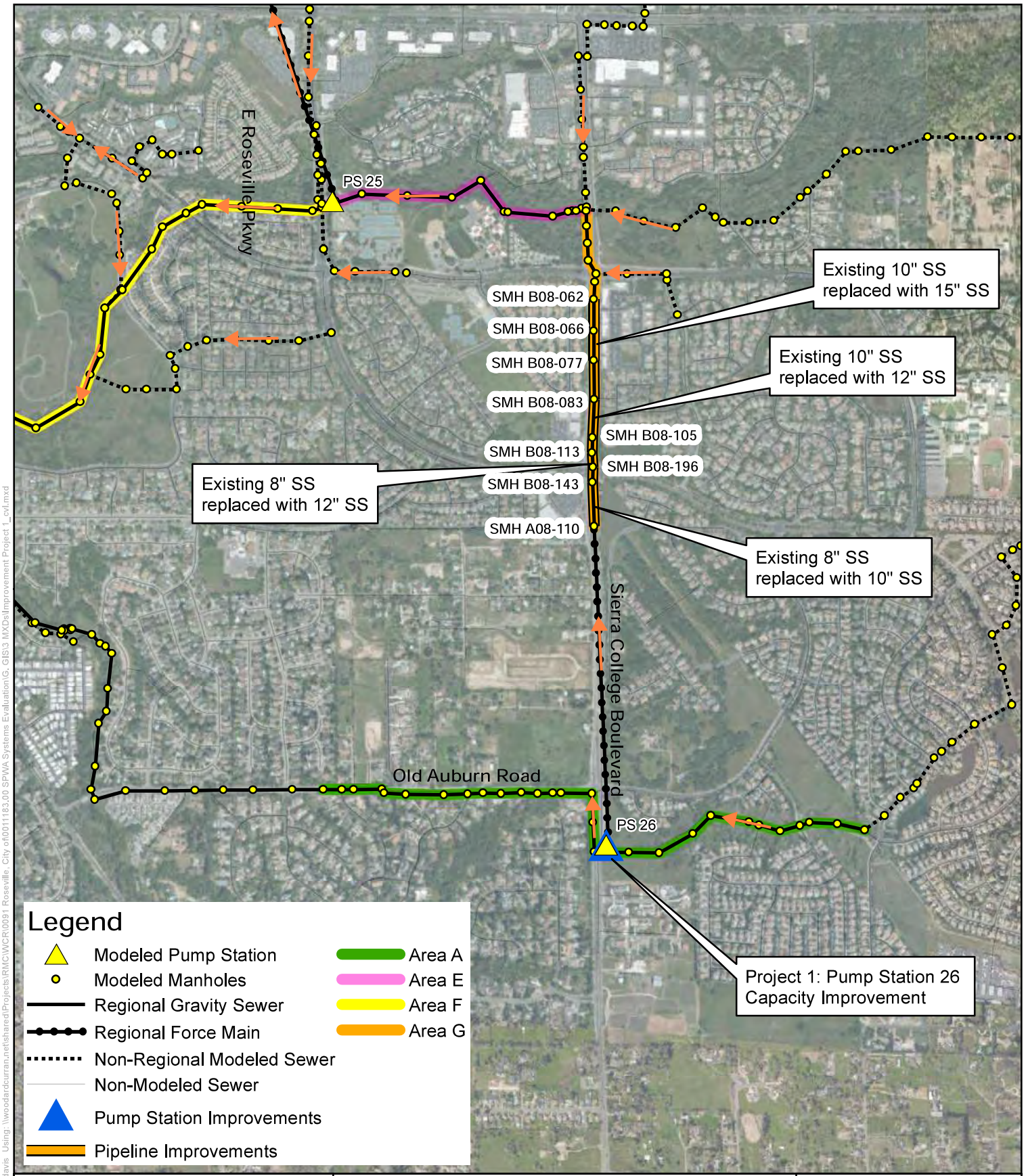
Project 1: Pump Station 26 Capacity Improvement and Sierra College Blvd. Improvement

PROJECT DESCRIPTION

Project ID	1
Project Name	Pump Station 26 Capacity Improvement and Sierra College Blvd. Improvement
Project Location	PS 26 and Sierra College Boulevard
Description	Increased Capacity of PS 26 and sewers on Sierra College Blvd (from 0.43 to 1.6 mgd)
Estimated Capital Imp. Cost	$1,606,000
Comments	(i) Pipes are listed in order from upstream to downstream
Assumptions	(i) Pipe cost estimates are based on the 20 Cities & SF Average April 2020 ENR CCI of 12115
	(ii) Cost assumes project will be implemented using open-cut construction method

PROJECT COST DETAIL

U/S MH ID	D/S MH ID	Existing Diameter (inches)	New Diameter (inches)	Length (feet)	Slope (%)	Pipe Depth (feet BGL)	Construction Method	Unit Cost ($/LF)	Total Cost ($)
SMH A08-010	SMH B08-143	8	10	383	1.50	7	Open Cut	$171	$ 65,363
SMH B08-143	SMH B08-196	8	10	148	3.00	7	Open Cut	$171	$ 25,274
SMH B08-196	SMH B08-113	8	12	235	0.60	7	Open Cut	$189	$ 44,236
SMH B08-113	SMH B08-105	10	12	200	0.95	7	Open Cut	$189	$ 37,769
SMH B08-105	SMH B08-083	10	12	394	0.47	9	Open Cut	$189	$ 74,368
SMH B08-083	SMH B08-077	10	15	399	0.30	13	Open Cut	$242	$ 96,492
SMH B08-077	SMH B08-066	10	15	304	0.30	16	Open Cut	$259	$ 78,818
SMH B08-066	SMH B08-062	10	15	322	0.30	15	Open Cut	$259	$ 83,511
							Baseline Pipeline Construction Cost:		**$ 505,831**
							Sheeting and Shoring for High Groundwater Area		$ -
							Dewatering		$ -
							Bypass Pumping (10% of pipe construction cost)		$ 50,583
							Remove & Replace Factor (5% of pipe construction cost)		$ 25,292
							Major Traffic Control (10% of pipe construction cost)		$ -
							Pipeline Construction Cost Subtotal:		**$ 581,705**
							Pumps (including 8.25% sales tax)		$ 164,540
							Allowance for new PG&E Service		$ 20,000
							Electrical improvements (new service, new MCC, new cables, soft starts)		$ 35,000
							Installation (25% of raw cost)		$ 54,885
							Piping & Structural Modifications Allowance		$ 25,000
							Contractor Overhead & Profit (20%)		$ 59,885
							Pump Station Construction Cost Subtotal:		**$ 359,310**
							Construction Subtotal:		**$ 941,015**
							Mobilization/Demobilization (5% of subtotal)		$ 47,051
							Construction Total:		**$ 988,066**
							Contingencies (30% of construction subtotal)		$ 296,420
							Total Estimated Construction Cost:		**$ 1,284,486**
							Engineering, Administration, Legal (25% of construction cost)		$ 321,121
							Estimated Capital Improvement Cost:		**$ 1,606,000**



Improvement Project 1

South Placer Wastewater Authority
2020 Systems Evaluation

0 750 1,500 3,000 Feet

N

WOODARD &CURRAN

Project #: 0011183.00
Map Created: June 2020

Figure Exported: 6/15/2020 By: apdavis Using: \\woodardcurran.net\shared\Projects\RMC\WCR\0091 Roseville, City of\0011183.00 SPWA Systems Evaluation\G, GIS\3 MXDs\Improvement Project 1_cvl.mxd

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions.
Any reliance upon the map or data contained herein shall be at the users' sole risk. Data Sources: Esri

Project 2: Eureka Road, E Rosevville Parkway Improvement

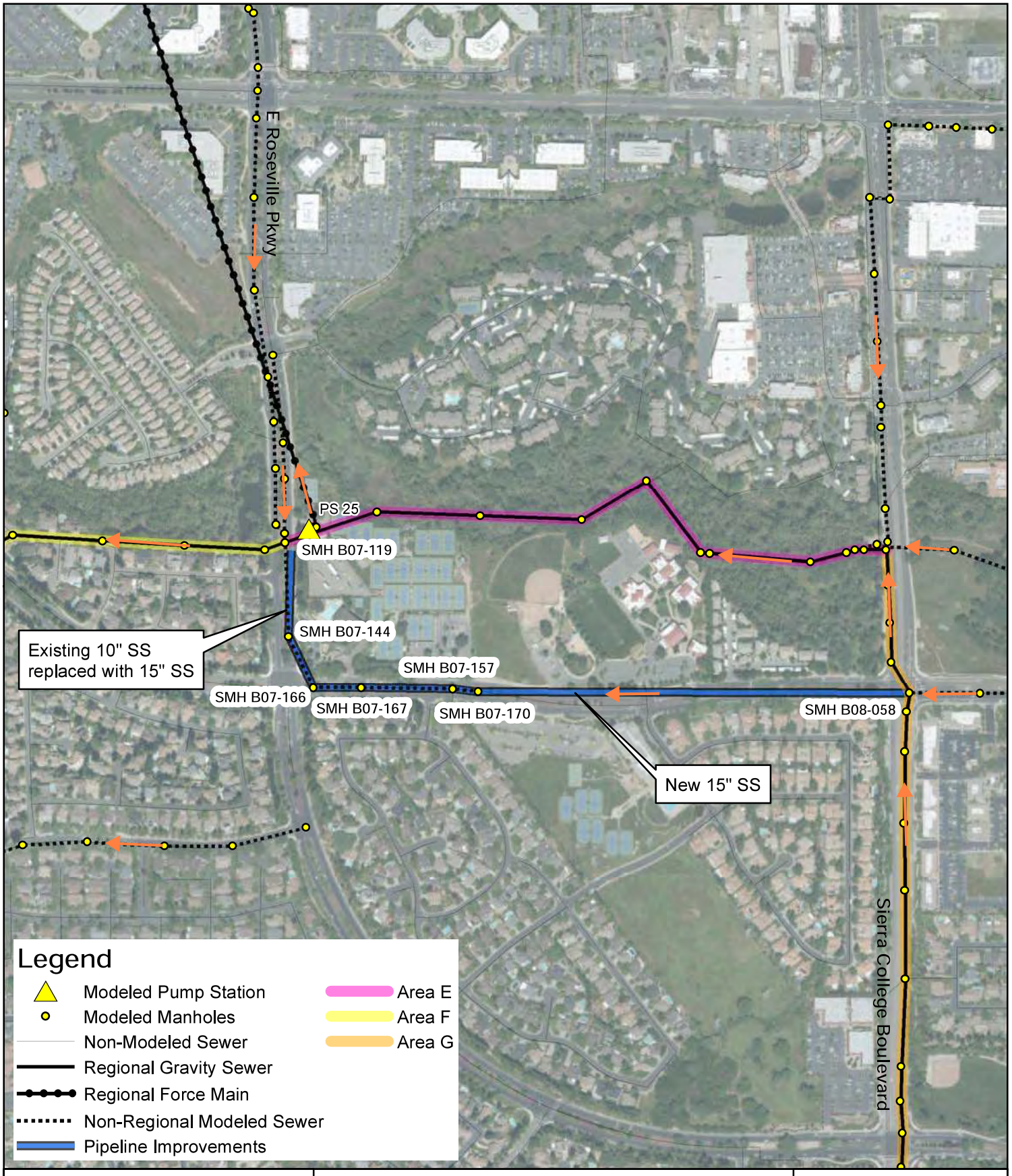
PROJECT DESCRIPTION

Project ID 2
Project Name ..... Eureka Road, E Rosevville Parkway Improvement
Project Location ..... Eureka Road and E. Roseville Parkway
Description ..... Redirect flows from PS 26 and Sierra College Blvd. down Eureka Rd via upsizing of approximately 1,310ft, installing approximately 2,740 ft of new 15in pipe and 4 new manholes.

Estimated Capital Imp. Cost $1,831,000
Comments ..... (i) Pipes are listed in order from upstream to downstream
Assumptions ..... (i) Cost estimates are based on the 20 Cities & SF Average April 2020 ENR CCI of 12115
(ii) Cost assumes project will be implemented using open-cut construction method

PROJECT COST DETAIL

U/S MH ID	D/S MH ID	Existing Diameter (inches)	New Diameter (inches)	Length (feet)	Slope (%)	Pipe Depth (feet BGL)	Construction Method	Unit Cost ($/LF)		Total Cost ($)
SMH B08-058	SMH B07-170	new pipe	15	697	0.22	15	Open Cut	$259	$	180,608
SMH B07-170	SMH B07-157	new pipe	15	1942	0.25	13	Open Cut	$242	$	469,198
SMH B07-157	SMH B07-167	10	15	413	0.97	12	Open Cut	$242	$	99,730
SMH B07-167	SMH B07-166	10	15	216	0.50	12	Open Cut	$242	$	52,112
SMH B07-166	SMH B07-144	10	15	255	0.53	11	Open Cut	$242	$	61,630
SMH B07-144	SMH B07-119	10	15	424	0.48	14	Open Cut	$242	$	102,435
								Baseline Pipeline Construction Cost:	$	965,712
								Sheeting and Shoring for High Groundwater Area	$	-
								Dewatering	$	-
								Bypass Pumping (10% of upsized pipe construction cost)	$	31,591
								Remove & Replace Factor (5% of upsized pipe construction cost)	$	15,795
								Major Traffic Control (10% of pipe construction cost)	$	-
								Pipeline Construction Cost Subtotal:	**$**	**1,013,098**
								Installation of 4 new manholes	$	60,000
								Manhole Construction Cost Subtotal:	**$**	**60,000**
								Construction Subtotal:	**$**	**1,073,098**
								Mobilization/Demobilization (5% of subtotal)	$	53,655
								Construction Total	**$**	**1,126,753**
								Contingencies (30% of construction subtotal)	$	338,026
								Total Estimated Construction Cost:	**$**	**1,464,779**
								Engineering, Administration, Legal (25% of construction cost)	$	366,195
								Estimated Capital Improvement Cost:	**$**	**1,831,000**



Improvement Project 2

South Placer Wastewater Authority
2020 Systems Evaluation

0 375 750 1,500 Feet

N

WOODARD &CURRAN

Project #: 0011183.00
Map Created: June 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions.
Any reliance upon the map or data contained herein shall be at the users' sole risk. Data Sources: Esri

Figure Exported: 6/15/2020 By: apdavis Using: \\woodardcurran.net\shared\Projects\RMC\WCR\0091 Roseville, City of\0011183.00 SPWA Systems Evaluation\G, GIS\3 MXDs\Improvement Project 2.mxd

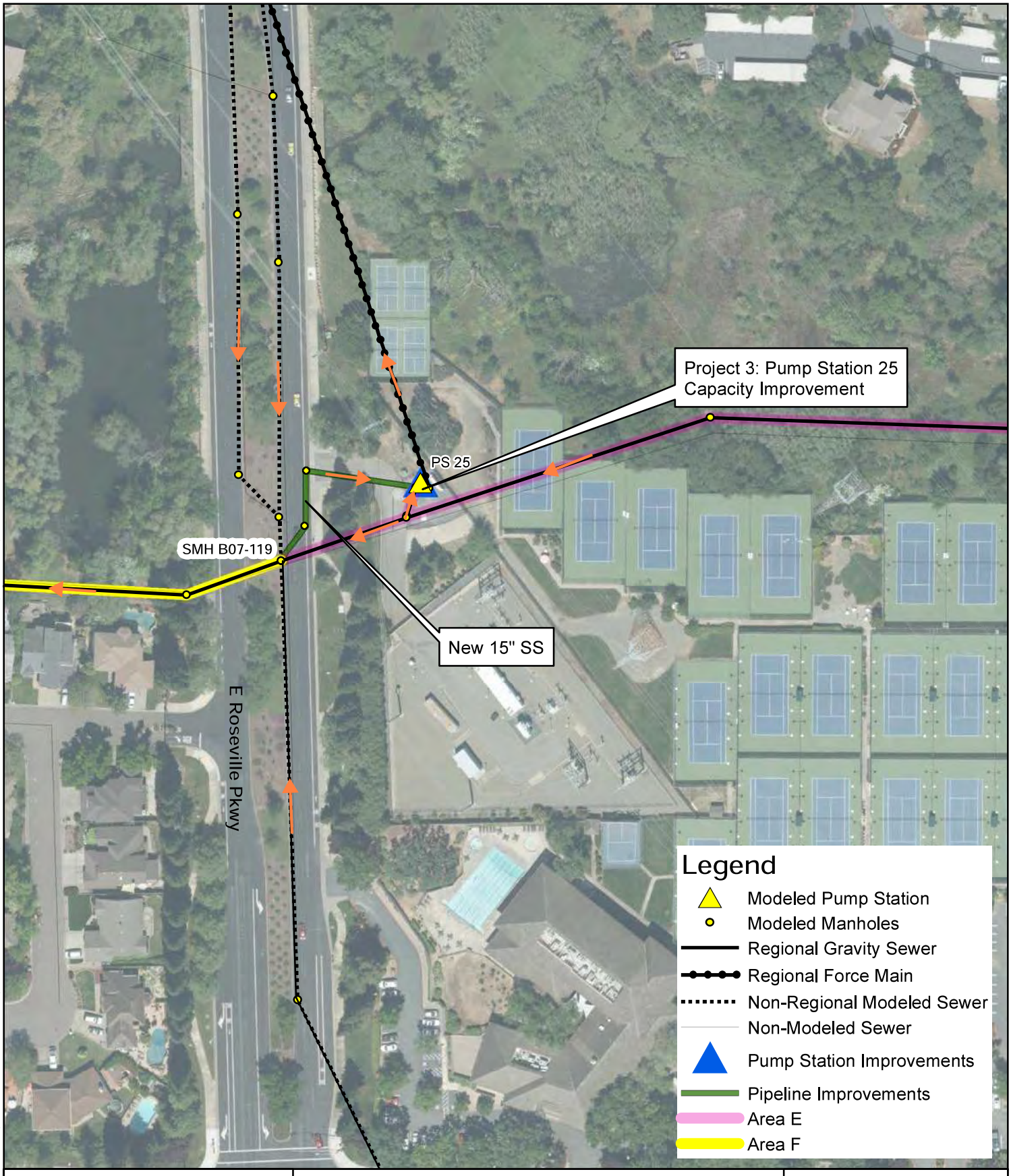
Project 3 Alternative A: Pump Station 25 Improvements

PROJECT DESCRIPTION

Project ID	3 Alternative A
Project Name	Pump Station 25 Improvements
Project Location	PS 25 (pumps)
Description	New weir structure or adjustments to existing structure at PS 25
Estimated Capital Imp. Cost	$758,000
Comments	(i) Pipes are listed in order from upstream to downstream
Assumptions	(i) Cost estimates are based on the 20 Cities & SF Average April 2020 ENR CCI of 12115 (ii) Cost assumes project will be implemented using open-cut construction method

PROJECT COST DETAIL

U/S MH ID	D/S MH ID	Existing Diameter (inches)	New Diameter (inches)	Length (feet)	Slope (%)	Pipe Depth (feet BGL)	Construction Method	Unit Cost ($/LF)		Total Cost ($)
SMH B07-119	SMH B07-119_DU2	new pipe	18	10	2%	17	Open Cut	$298	$	2,982
SMH B07-119_DU2	PS 25 Wetwell	new pipe	15	215	2%	14	Open Cut	$242	$	51,942
								Baseline Pipeline Construction Cost:	**$**	**54,924**
								Sheeting and Shoring for High Groundwater Area	$	-
								Dewatering	$	-
								Bypass Pumping (10% of pipe construction cost)	$	-
								Remove & Replace Factor (5% of pipe construction cost)	$	-
								Major Traffic Control (10% of pipe construction cost)	$	-
								Pipeline Construction Cost Subtotal:	**$**	**54,924**
								Installation of 2 new manhole	$	30,000
								Manhole Construction Cost Subtotal:	**$**	**30,000**
								Pumps (including 8.25% sales tax)	$	164,540
								Allowance for new PG&E Service	$	20,000
								Electrical improvements (new service, new MCC, new cables)	$	35,000
								Installation (25% of raw cost)	$	54,885
								Piping & Structural Modifications Allowance	$	25,000
								Contractor Overhead & Profit (20%)	$	59,885
								Pump Station Construction Cost Subtotal:	**$**	**359,310**
								Construction Subtotal:	**$**	**444,234**
								Mobilization/Demobilization (5% of subtotal)	$	22,212
								Estimated Construction Cost Subtotal:	**$**	**466,446**
								Contingencies (30% of construction subtotal)	$	139,934
								Total Estimated Construction Cost:	**$**	**606,380**
								Engineering, Administration, Legal (25% of construction cost)	$	151,595
								Estimated Capital Improvement Cost:	**$**	**758,000**



Improvement Project 3

South Placer Wastewater Authority
2020 Systems Evaluation

0 75 150 300 Feet

N

WOODARD & CURRAN

Project #: 0011183.00
Map Created: June 2020

Figure Exported: 7/17/2020 By: apdavis Using: \\woodardcurran.net\shared\Projects\RMC\WCR\0091 Roseville, City of\0011183.00 SPWA Systems Evaluation\G, GIS\3 MXDs\Improvement Project 3.mxd

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions.
Any reliance upon the map or data contained herein shall be at the users' sole risk. Data Sources: Esri

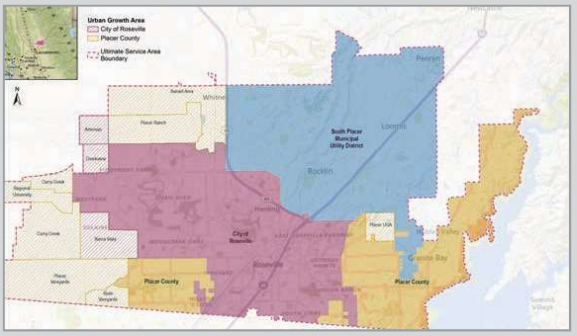


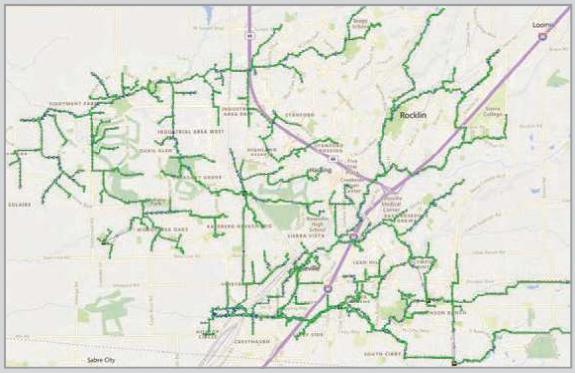
woodardcurran.com

COMMITMENT & INTEGRITY DRIVE RESULTS

801 T Street
Sacramento, CA 95811
916-999-8700
woodardcurran.com









COMMITMENT & INTEGRITY DRIVE RESULTS

Appendix J – 2015 USBR Record of Decision

RECLAMATION

Managing Water in the West

Record of Decision

Central Valley Project Municipal and Industrial Water Shortage Policy

Prepared by

United States Department of the Interior
Bureau of Reclamation
Mid Pacific Region

U.S. Department of the Interior
Bureau of Reclamation
Sacramento, California

November 2015

Mission Statements

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

Record of Decision

Central Valley Project Municipal and Industrial Water Shortage Policy

Recommended:

Richard J. Woodley
Regional Resources Manager
Mid-Pacific Region

Date Nov. 4, 2015

Concur:

Anastasia T. Leigh
Regional Environmental Officer
Mid-Pacific Region

Date 11/9/2015

Approved:

David Murillo
Regional Director
Mid-Pacific Region

Date 11/13/15

Summary of Action

The Bureau of Reclamation (Reclamation) prepared the Central Valley Project (CVP) Municipal and Industrial (M&I) Water Shortage Policy (WSP) Environmental Impact Statement (EIS) to evaluate the potential impacts of CVP M&I WSP alternatives. The M&I WSP would be used by Reclamation to: 1) define water shortage terms and conditions for applicable CVP water service contractors, as appropriate; 2) determine the quantity of water made available to CVP water service contractors from the CVP that, together with the M&I water service contractors' drought water conservation measures and other non-CVP water supplies, would assist the M&I water service contractors in their efforts to protect public health and safety (PHS) during severe or continuing droughts; and 3) provide information to CVP water service contractors for their use in water supply planning and development of drought contingency plans. The alternatives evaluated in this EIS utilize different methodologies for allocating available CVP water supplies to CVP water service contractors during a Condition of Shortage[1]. This EIS evaluates potential impacts of the M&I WSP over a 20-year period, 2010 through 2030. Reclamation's decision is the adoption of an updated M&I WSP.

Background

In January 1993, following the adoption of the Central Valley Project Improvement Act (CVPIA), many CVP M&I water service contractors expressed concerns regarding future allocations of water supplies provided by the CVP. Reclamation subsequently initiated an effort to develop an M&I WSP that would be incorporated into long-term water service contracts during the contract renewal process implemented under the CVPIA. Involved stakeholders submitted language for the M&I WSP as part of several proposed policies. In September 2001, Reclamation released a Draft M&I WSP. Reclamation initiated the preparation of an Environmental Assessment (EA) which included stakeholder input and consideration and evaluation of alternative policies developed in 1993, 1996-1997, and 2000-2001. The M&I WSP EA was released in October 2005 and a Finding of No Significant Impact was signed in December 2005. The M&I WSP currently being implemented by Reclamation is the 2001 Draft M&I WSP, as amended by Alternative 1B from the 2005 EA. Because the assumptions supporting the 2005 EA became outdated and due to significant changes in the Sacramento-San Joaquin River Delta (Delta) and CVP/State Water Project (SWP) operations, Reclamation decided in 2009 to

[1] "Condition of Shortage" is defined in Reclamation water service contracts as "...a condition respecting the Project during any Year *(March 1 through February of the following year)* such that the Contracting Officer is unable to deliver sufficient water to meet the Contract Total".

undertake the M&I WSP EIS to provide an updated M&I WSP that best recognizes the needs of various segments of the water user community and how those needs could be addressed under Conditions of Shortage.

Decision

Reclamation's decision is to implement Alternative 4, Updated M&I WSP (Preferred Alternative). This alternative comprises the updated M&I WSP developed by Reclamation with stakeholder input received during the M&I WSP stakeholder workshops held between May 2010 and January 2011, with clarifying revisions made to address comments from stakeholders received after Stakeholder Workshop 4 (November 2010) and to address public comments received on the Draft EIS (March 2015). The Updated M&I WSP will apply to the CVP water service contractors noted in Table 1. These water service contractors generally comprise those whose contracts currently reference the M&I WSP and those with a water service contract that is expected to reference the updated policy. These water users are located throughout the Sacramento River Valley, San Joaquin River Valley, Tulare Lake Region, and San Francisco Bay/Central Coast area.

Table 1. Water Service Contractors Subject to the Updated M&I WSP

General Geographical Region	CVP Division	Water Service Contractors	M&I	Ag[1]
North of Delta	Shasta and Trinity River	Bella Vista Water District	X	X
		Centerville Community Services District	X	-
		City of Redding	X	-
		City of Shasta Lake	X	-
		Clear Creek Community Services District	X	X
		Mountain Gate Community Services District	X	-
		Shasta Community Services District	X	-
		Shasta County Water Agency	X	-
		United States (U.S.) Forest Service (Shasta)	X	-
	Sacramento River	4-M Water District	X	X
		Colusa County Water District	X	X
		Corning Water District	X	X
		Cortina Water District	X	X
		County of Colusa	X	X
		County of Colusa (Stonyford)	X	-
		Davis Water District	X	X
		Dunnigan Water District	X	X
		Elk Creek Community Services District	X	-
		Glenn Valley Water District	X	X
		Glide Water District	X	X
		Holthouse Water District	X	X

General Geographical Region	CVP Division	Water Service Contractors	M&I	Ag[1]
North of Delta	Sacramento River	Kanawha Water District	X	X
		Kirkwood Water District	X	X
		La Grande Water District	X	X
		Myers-Marsh Mutual Water Company	X	X
		Orland-Artois Water District	X	X
		Proberta Water District	X	X
		Stony Creek Water District	X	X
		Thomes Creek Water District	X	X
		U.S. Forest Service (Salt Creek)	X	-
		Westside Water District	X	X
		Whitney Construction, Incorporated	X	-
	American River	City of Roseville	X	-
		East Bay Municipal Utility District	X	-
		El Dorado Irrigation District	X	-
		Placer County Water Agency	X	-
		Sacramento County Water Agency	X	-
		Sacramento Municipal Utility District	X	-
		San Juan Water District	X	-
	Delta	Banta-Carbona Irrigation District	X	X
		Byron-Bethany Irrigation District	X	X
		City of Tracy	X	X
		Coelho Family Trust	X	X
		Contra Costa Water District	X	-
		Del Puerto Water District	X	X
		Eagle Field Water District	X	X
		Fresno Slough Water District	X	X
		James Irrigation District	X	X
		Laguna Water District	X	X
		Mercy Springs Water District	X	X
		Oro Loma Water District	X	X
		Pajaro Valley Water Management Agency, Westlands Water District	X	X
		Patterson Irrigation District	X	X
		Reclamation District No. 1606	X	X
		Tranquillity Irrigation District	X	X
		Tranquillity Public Utility District	X	X
		U.S. Department of Veteran Affairs	X	-
		West Side Irrigation District	X	X
		West Stanislaus Irrigation District	X	X
		Westlands Water District Distribution Districts	X	X
South of Delta	West San Joaquin	City of Avenal	X	-
		City of Coalinga	X	-
		City of Huron	X	-
		Pacheco Water District	X	X
		Panoche Water District	X	X
		San Luis Water District	X	X
		State of California	X	-

General Geographical Region	CVP Division	Water Service Contractors	M&I	Ag[1]
South of Delta	West San Joaquin	Westlands Water District	X	X
	San Felipe	San Benito County Water District	X	X
		Santa Clara Valley Water District	X	X
	Cross Valley Canal	County of Fresno	X	X
		County of Tulare	X	X
		Hills Valley Irrigation District (includes Rag Gulch Water District)	X	X
		Kern-Tulare Water District	X	X
		Lower Tule River Irrigation District	-	X
		Pixley Irrigation District	X	X
		Tri-Valley Water District	X	X

Note:
[1] Ag = Agricultural water service contractor

Alternatives Considered

No Action Alternative

The No Action Alternative represents continued implementation of the current Draft M&I WSP. This existing draft policy is currently guiding Reclamation's allocation of CVP water to agricultural and M&I water service contractors during Conditions of Shortage and would continue if none of the action alternatives were selected.

During Conditions of Shortage when the CVP is unable to deliver sufficient water to meet the CVP water service contractors' Contract Total, M&I water service contractors allocations are maintained at 100 percent of their Contract Total as the agricultural water service contractor allocations are reduced to 75 percent of their Contract Total in incremental steps. Then, M&I water service contractor allocations are reduced to 75 percent of their historical use in incremental steps as agricultural water service contractor allocations are reduced to 50 percent of their Contract Total. The M&I water service contractor allocations are maintained at 75 percent of historical use until agricultural water service contractor allocations are reduced in incremental steps to 25 percent of Contract Total. M&I water service contractor allocations are then reduced in incremental steps to 50 percent of historical use until agricultural water service contract allocations are reduced in incremental steps from 25 percent to zero.

In years when the M&I water service contractor allocations are less than 75 percent of historical use, Reclamation would attempt to provide the amount of PHS need unmet by contractors' CVP allocation and other available non-CVP

supplies, up to 75 percent of the historical use, subject to the availability of CVP water supplies. There are some years in which allocations to agricultural water service contractors are at or near zero. In those years, CVP water deliveries for unmet PHS need to M&I water service contractors may not be fully realized. Water made available to M&I water service contractors may be reduced below 75 percent of historical use and below the unmet PHS needs when CVP water is not available.

Action Alternatives

The alternatives that moved forward for more detailed analysis in the EIS were those that responded to the National Environmental Policy Act (NEPA) purpose and need, minimized negative effects, were potentially feasible, and represented a range of reasonable alternatives. As a result of initial alternatives screening, four action alternatives were selected to move forward for analysis in the EIS (in addition to the No Action Alternative). Table 2 presents the alternatives analyzed in the EIS. Analysis of these alternatives will provide the information needed for Reclamation to make a decision.

Table 2. Alternatives Analyzed in the EIS

Alternative Number	Alternative Name	Description
Alternative 1	No Action Alternative	Represents a projection of current conditions to the most reasonable future conditions that could occur during the life of the proposed action without any action alternative being implemented. The No Action Alternative represents continued allocation of water in the same way that Reclamation currently allocates CVP water to agricultural and M&I water service contractors during Conditions of Shortage, consistent with the 2001 Draft M&I WSP, as modified by Alternative 1B of the 2005 EA.
Alternative 2	Equal Agricultural and M&I Allocation	Provides no preference for either agricultural or M&I contractors. M&I and agricultural water service contractors receive equal allocation percentages during a Condition of Shortage.
Alternative 3	Full M&I Allocation Preference	M&I water service contractors receive 100% of their Contract Total until CVP supplies are not available to meet those demands. Agricultural allocations are reduced as needed to maintain 100% allocations to M&I contractors.
Alternative 4	Updated M&I WSP (Preferred Alternative)	Similar to Alternative 1 but modified to update the definition of unconstrained years used in calculating historical use. Attempts to provide unmet PHS need, but without a guarantee. Provides implementation guidelines and procedures.
Alternative 5	M&I Contractor Suggested WSP	Similar to Alternative 4 except attempts to provide a greater quantity of unmet PHS need.

Under Alternative 2, Equal Agricultural and M&I Allocation, M&I water service contractors would receive the same allocation, as a percentage of Contract Total, as the agricultural water service contractors. This means that in years when the CVP water supplies are not adequate to provide water to all water service contractors, agricultural and M&I water service contractor allocations would be reduced by the same percentage. This allocation methodology would provide a larger volume of CVP water to agricultural water service contractors than the No Action Alternative, as there would be no reductions to agricultural contractors to provide a larger volume of CVP water to M&I water service contractors. Deliveries to both north of the Delta and south of Delta M&I contractors would be lower than under the No Action Alternative in order to provide an equal allocation to agricultural water service contractors.

Under Alternative 3, Full M&I Allocation Preference, M&I water service contractors would receive a higher allocation as compared to the No Action Alternative and other action alternatives. Under this alternative, Reclamation would attempt to provide a 100 percent allocation to M&I water service contractors during a Condition of Shortage, to the extent that adequate CVP water supplies are available. This would be achieved by reducing allocations to agricultural water service contractors as needed to maximize the frequency of 100 percent allocations to the M&I water service contractors. This allocation methodology would provide the lowest volume of CVP water to agricultural water service contractors compared to the No Action and other action alternatives. Alternative 3 would have no provisions for unmet PHS needs that would be made available by Reclamation from CVP water supplies.

Alternative 4, Updated M&I WSP, is similar to the No Action Alternative. This alternative comprises the M&I WSP developed by Reclamation with stakeholder input received during the M&I WSP stakeholder workshops held between May 2010 and January 2011, with clarifying revisions made to address comments from stakeholders received after Stakeholder Workshop 4 and to address public comments received on the Draft EIS. Reclamation used this feedback to identify elements of the 2001 Draft M&I WSP (represented in the No Action Alternative) that could be improved. The major modifications made to the 2001 Draft M&I WSP that are reflected in the Updated M&I WSP include the following:

- Reclamation deleted the reference to 1996 M&I Water Rate book.
- At the M&I water service contractors' request, Reclamation modified the method that would be used to adjust an M&I water service contractor's historical use.
- Reclamation expanded the definitions of the key terms and also defined terms not previously defined, to provide greater clarity on the intent and requirements of the M&I WSP's key terms and conditions.

- Term and Condition 1 was revised to remove the sentence stating that Reclamation intended contractors to use their non-CVP supplies first and rely on CVP water as a supplemental supply. Instead, Reclamation expects water service contractors, at their discretion, to use CVP water in conjunction with their other non-CVP supplies to meet demand during all years, including years where a Condition of Shortage exists.

- Clarified M&I allocation for contracts with both irrigation and M&I use which do not set forth individual Contract Totals for each use.

Alternative 5, M&I Contractor Suggested WSP, is similar to Alternative 4, Updated M&I WSP. This alternative was developed and recommended by several M&I water service contractors who participated in the M&I WSP workshops held between May 2010 and January 2011. Alternative 5 attempts to provide an increased quantity of CVP water allocated to M&I water service contractors to supply the unmet portion of the PHS needs during a Condition of Shortage. This would be achieved by increasing the upper limit for consideration of additional allocations to assist in meeting unmet PHS need from an initial allocation of 75 percent of historical use (under Alternative 4) to an initial allocation of 95 percent of historical use (under Alternative 5).

Environmentally Preferable Alternative

Section 1505.2(b) of NEPA requires that, in cases where an EIS has been prepared, the Record of Decision must identify all alternatives that were considered, specifying the alternative or alternatives which were considered to be environmentally preferable. The environmentally preferable alternative is the alternative that will promote the national environmental policy as expressed in NEPA's Section 101. Ordinarily, this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources (Council on Environmental Quality 40 Most Asked Questions number 6(a)). It is implicit in NEPA that the environmentally preferable alternative must be reasonable and feasible to implement.

In choosing the environmentally preferable alternative, Reclamation considered impacts to all resources. On balance, Alternative 1, No Action Alternative, and Alternative 4, Updated M&I WSP, would have the least environmental effects associated with implementing a CVP M&I WSP during a Condition of Shortage. Alternative 4 would have no environmental impacts compared to the No Action Alternative. Alternatives 2 and 3 have greater environmental effects to water quality, groundwater resources, air quality, geology and soils, and agricultural resources than Alternative 4. Alternative 5 would have small but greater effects to groundwater resources and air quality compared to Alternative 4.

Basis of Decision

Reclamation's decision to move forward is based on how the alternatives meet the project's purpose and need and the magnitude of environmental effects. While the alternatives would affect different resources in different ways, Alternative 4 provides Reclamation with the greatest degree of flexibility to address CVP water service contractors' needs during Conditions of Shortage while recognizing that CVP deliveries are subject to the amount of CVP water available and cannot be guaranteed, and provides clarity to the terms, conditions, and procedures of the CVP M&I WSP. Additionally, Alternative 4 has no environmental effects compared to the No Action Alternative; therefore, no mitigation measures are necessary.

Purpose and Need

The purpose of updating the 2001 Draft M&I WSP, as amended, is to provide detailed, clear, and objective guidelines for the allocation of available CVP water supplies to CVP water service contractors during a Condition of Shortage. The update to the M&I WSP is needed by water managers and CVP water service contractors to help them better plan for and manage available CVP water supplies, and to better integrate the use of CVP water with the use of other available non-CVP water supplies. The update to the M&I WSP is also needed to clarify certain terms and conditions with regard to the applicability and implementation process of the M&I WSP.

The updated M&I WSP would be used by Reclamation to:

- Define water shortage terms and conditions for applicable CVP water service contracts, as appropriate;
- Determine the quantity of water made available to CVP water service contractors from the CVP, that together with the M&I water service contractors' drought water conservation measures and other non-CVP water supplies, would assist the M&I water service contractors in their efforts to protect PHS during severe or continuing droughts; and
- Provide information to CVP water service contractors for their use in water supply planning and development of drought contingency plans.

All action alternatives meet the purpose and need, but the No Action Alternative does not meet the purpose and need.

Environmental Issues Evaluated

During March 2011, public scoping sessions on the development of the CVP M&I WSP EIS were held in Sacramento, Willows, Fresno, and Oakland, California. Key issues raised during the public scoping process that are applicable for inclusion in the EIS are listed below.

- The final M&I WSP should be a single document that clearly states how Reclamation interprets and implements the M&I WSP.
- Any additional water provided to M&I water service contractors is viewed as water "taken" from agricultural contractors.
- M&I water service contractors would like a guaranteed quantity of CVP water to meet PHS needs and do not want their use of non-CVP supplies to count against their deliveries of CVP water in Conditions of Shortage.
- The analysis should use an appropriate baseline given ongoing regulatory issues regarding CVP/SWP operations.
- The effects analysis should include a cumulative impact discussion in the context of other reasonably foreseeable past, present, and future actions potentially affecting the allocation of CVP water, including the Bay Delta Conservation Plan.
- The EIS should analyze the impacts to water service contractors who have limited access to alternative water supplies and to "mixed use" contractors.
- The M&I WSP EIS should specifically state the agencies that are and are not affected by the policy, and state that the M&I WSP will apply equally to all M&I contractors, including the American River Division contractors.
- Certain American River Division contractors (City of Roseville, Placer County Water Agency, Sacramento Municipal Utility District, and San Juan Water District) disagree with Reclamation's interpretation of Term 14 of State Water Resources Control Board Decision 893 and believe it should provide them with additional supply reliability beyond what the M&I WSP provides in their water service contracts.

The alternatives were evaluated to address issues raised and potential impacts to the range of environmental and socioeconomic resources relevant to NEPA. The action alternatives have the potential to result in impacts to several resources, including surface water, water quality, groundwater, geology and soils, air quality, greenhouse gases (GHGs) and climate change, agricultural

resources, socioeconomics, and power[2]. The differences between the action alternatives for these impacts include:

- *Surface Water*: Alternative 2 would increase CVP deliveries to agricultural water service contractors and decrease CVP deliveries to M&I water service contractors, compared to the No Action Alternative. Alternative 3 would decrease CVP deliveries to agricultural water service contractors and increase CVP deliveries to M&I water service contractors, compared to the No Action Alternative. Alternatives 4 and 5 would have no change in CVP deliveries compared to the No Action Alternative. PHS needs would be met for the Sacramento River Division under all alternatives. The American River, Delta, and San Felipe Divisions would have unmet PHS needs under Alternative 2. There would be unmet PHS needs for the Shasta/Trinity River and West San Joaquin Divisions under Alternatives 2, 3, and 4. The Cross Valley Canal Unit would have unmet PHS needs under all alternatives.

  There are only relatively small to no changes to Shasta and Trinity lakes storages, upper Sacramento River flows, and Lake Oroville storage as a result of action alternatives, which do not result in substantial impacts. The effects of changes to other reservoirs' storage and rivers' flows are addressed under other appropriate resource areas (e.g., water quality, recreation, flood hydrology, water quality, etc.).

- *Water Quality:* Changes in CVP deliveries could affect the salinity and bromide concentrations in the Delta Division. Alternative 5 would have only very minimal changes in reservoir or river flows compared to the No Action Alternative that would not affect salinity and bromide concentrations. Alternatives 2 and 3 would cause an increase in electrical conductivity which could affect water quality in the Delta Division.

- *Groundwater*: A reduction in CVP deliveries to agricultural water service contractors could cause these contractors to supplement their surface water supplies through increased groundwater pumping. Alternative 2 would reduce agricultural groundwater pumping in all regions due to increases in CVP deliveries to agricultural water service contractors, while Alternative 3 would increase agricultural groundwater pumping in all regions due to decreases in CVP deliveries to agricultural contractors. M&I water service contractors may need to make use of all their available groundwater supplies under Alternative 2 in order to meet PHS needs in certain years. Alternatives 4 and 5 would have little to no change in groundwater pumping by CVP water service contractors compared to the No Action Alternative.

[2] It was determined that no impacts or only minor impacts would occur to aquatic resources, terrestrial resources, environmental justice, cultural resources, Indian sacred sites, recreation, flood hydrology, and visual resources.

Increased pumping caused by change in deliveries to supplement supply shortages may cause groundwater level declines that could lead to land subsidence. Alternative 2 would cause a net increase in pumping that could potentially increase land subsidence in the San Francisco Bay/Central Coast region. Alternative 3 would cause a net increase in pumping that could potentially increase land subsidence in the Sacramento Valley, San Joaquin Valley, and Tulare Lake regions.

- *Geology and Soils:* Under Alternative 3, reduced CVP deliveries to agricultural water service contractors could indirectly lead to wind erosion if agricultural water service contractors implement crop idling to manage their water supplies.

- *Air Quality*: Increases in CVP deliveries to agricultural water service contractors under Alternative 2 would result in decreased pollutant emissions from reduced groundwater pumping. Decreases in CVP deliveries to agricultural water service contractors under Alternative 3 would result in increased pollutant emissions due to increased groundwater pumping. Under Alternative 3, the general conformity *de minimis* threshold would be exceeded in the San Joaquin Valley Air Basin. Alternatives 4 and 5 would have little to no changes compared to the No Action Alternative.

- *GHGs and Climate Change:* Changes in CVP deliveries to agricultural water service contractors would decrease GHG emissions under Alternative 2 and increase GHG emissions under Alternatives 3 and 5. Alternative 4 would have no change compared to the No Action Alternative.

- *Agricultural Resources*: Alternative 3 would reduce agricultural acreage primarily in the Tulare Lake Region, but minimally to other regions in the study area.

- *Socioeconomics*: Changes in CVP deliveries for CVP water service contractors would have differing effects for agricultural and M&I water service contractors in Alternatives 2 and 3. Generally, effects would be positive for agricultural water service contractors under Alternative 2 and negative under Alternative 3, while the opposite would be true for M&I water service contractors. Alternatives 4 and 5 would have no change compared to the No Action Alternative.

- Power: Changes in CVP deliveries may cause changes in power generation from hydroelectric power generation facilities by changing reservoir releases or by changing reservoir storage, as represented by changes in reservoir elevations. Alternative 2 and 3 would experience minimal reductions to the amount of power generated at the Folsom and Nimbus power plants and slight fluctuations in the amount of

power generated at San Luis Reservoir. Alternatives 4 and 5 would have no change compared to the No Action Alternative.

- *Indian Trust Assets*: Under Alternatives 2 and 3, the magnitudes of groundwater level fluctuations are very small compared to overall groundwater supplies and would not be substantial enough to create a noticeable change to water supply at existing wells near Indian Trust Asset sites. Therefore, Alternatives 2 and 3 would not interfere with the exercise of federally-reserved water rights and/or reduce the health of tribal members by decreasing water supplies. Alternatives 4 and 5 would have no change compared to the No Action Alternative, and would not result in impacts to Indian Trust Assets.

Section 7 of the Federal Endangered Species Act (ESA)

Reclamation coordinated with the U.S. Fish & Wildlife Service during development of the Draft EIS regarding the impact analysis on special status species and environmental commitments. Reclamation further coordinated with National Oceanic and Atmospheric Administration National Marine Fisheries Service in preparing the Final EIS. A full consultation under Section 7 of the ESA with U.S. Fish & Wildlife Service or National Oceanic and Atmospheric Administration National Marine Fisheries Service was determined not to be needed for this action because the potential impacts are within the range of impacts already observed under current operations of the CVP and are covered by the Biological Opinions on the Coordinated Long-Term Operations of the CVP and SWP.

Section 106 Compliance

Reclamation is responsible for complying with Section 106 of the National Historic Preservation Act. Alternative 4 would not result in the disturbance of land or require any construction activities; therefore, there are no impacts to cultural resources. Under Section 106 of the National Historic Preservation Act, Alternative 4 is the type of activity that does not have the potential to affect historic properties and there are no further obligations under Section 106 [36 Code of Federal Regulations Sec. 800.3(a)(1)].

Comments Received on the Final EIS

Reclamation's Notice of Availability of the Final EIS was published in the Federal Register on September 10, 2015, and the Environmental Protection Agency's Notice of Availability was published on September 18, 2015. The EIS was posted on Reclamation's website, and copies were distributed to those who requested a copy. A press release was released on September 10, 2015, and was sent to participants in public meetings and commenters on the Draft EIS.

Reclamation received comments from three entities after release of Final EIS. The commenters were: Somach Simmons & Dunn for Glenn-Colusa Irrigation District (Kelley Taber); East Bay Municipal Utility District (Michael Tognolini); and Santa Clara Valley Water District (Cindy Kao). These comments either reiterated comments previously provided during the public comment period, or supported Reclamation's choice of the Preferred Alternative. Reclamation had adequately addressed the previous comments in the Final EIS. The comments consisted of the following:

- Glenn-Colusa Irrigation District (GCID) did not agree that their comments on the Draft EIS were adequately addressed in Appendix I of the Final EIS. GCID was concerned that the M&I WSP's definition of PHS is too broad and would allow a greater amount of water than necessary for domestic use and essential public services to be included in the calculation, thereby overestimating system demands during Conditions of Shortage and influencing the allocation of water within the CVP system. Additionally, GCID was concerned that implementation of the M&I WSP could affect water supply reliability under their Settlement Contract. As described in the Final EIS, the determination of any additional CVP water supplied to M&I water service contractors during a Condition of Shortage to assist in meeting PHS needs would take into account a contractor's estimated PHS demand, as well as their non-CVP supplies available in that year, and, most importantly, the availability of CVP water in that year. Reclamation would closely review the data provided by an M&I water service contractor so that CVP water provided for PHS needs is estimated in accordance with California criteria and used appropriately during a Condition of Shortage. The Final EIS also states in Appendix B that Reclamation does not have discretion to determine water supply allocations to Sacramento River Settlement Contractors, San Joaquin River Exchange Contractors, certain named State Wildlife Areas and National Wildlife Refuges, and the privately owned/managed wetlands comprising the Grassland Resources Conservation District as identified under the CVPIA Section 3406(d). Water supply allocations for these water service contractors are determined annually based on the forecasted full natural inflow to Shasta Lake. CalSim II simulates

water supply allocations to these water service contractors based on inflow to Shasta Lake.

- East Bay Municipal Utility District (EBMUD) supports Reclamation's selection of Alternative 4 as the Preferred Alternative for the M&I WSP. However, EBMUD requested that their contractual historic use of 133,000 acre-feet (AF), per their Long Term Renewal Contract, be noted in the M&I WSP as an exception to the methodology used for calculating historical use. Reclamation, when applying the M&I WSP to EBMUD, would use EBMUD's contractual historic use of 133,000 AF as the basis for making adjustments for population growth, extraordinary water conservation measures, and use of non-CVP water supplies. But, Reclamation believes it inappropriate to specifically state or call out such an exception in the M&I WSP.

- Santa Clara Valley Water District (SCVWD) supports Reclamation's selection of Alternative 4 as the Preferred Alternative for the M&I WSP. SCVWD believes an adopted M&I WSP is critically important for water supply reliability in support of the communities and businesses in its service area.

Appendix K – Water Shortage Contingency Plan



DRAFT WATER SHORTAGE CONTINGENCY PLAN

CITY OF ROSEVILLE CALIFORNIA

City of Roseville
Draft Water Shortage Contingency Plan

May 2021

Prepared by Water Works Engineers, LLC
Colleen Boak, PE
Esmeralda Diego

Checked by:
Tim Durbin, PE
Cindy Bertsch, PE

Table of Contents

Water Shortage Contingency Plan 1
1.1 Water Supply Reliability Analysis 1
1.1.1 Constraints on Water Supply 1
1.1.2 Drought Risk Assessment 2
1.1.3 Seismic Risk Analysis 4
1.2 Legal Authorities 4
1.3 Standard Water Shortage Levels 5
1.4 Annual Water Supply and Demand Assessment Procedures 5
1.5 Supply Augmentation and Operational Changes 12
1.6 Compliance and Enforcement 12
1.7 Financial Consequences 13
1.8 Plan Adoption, Submittal, and Availability 14

Tables

WSCP Table 1 Available Surface Water Supply Under Differing Hydrologic Conditions 2
WSCP Table 2 Near-Term Five-Year Drought Risk Assessment 3
WSCP Table 3 Long-Term Single and Five-Year Drought Risk Assessment 3
WSCP Table 4 Relation Between Standard Water Shortage Levels and Existing Stages 5
WSCP Table 5 Water Supply and Demand Assessment Procedure 5
WSCP Table 6 Demand Reduction Actions to be Implemented at Each Shortage Level 8
WSCP Table 7 Supply Augmentation During Stage 3 Droughts and Higher 12

Exhibits

Exhibit A – City of Roseville 2016 Multi-Hazard Mitigation Plan
Exhibit B – City of Roseville Municipal Code 14.09
Exhibit C – Adoption Resolution

Water Shortage Contingency Plan

Following the severe drought of 2012-2016, the State of California Legislature sought to expand the water shortage contingency analysis under former law and mandated that a water shortage contingency plan (WSCP) be adopted by suppliers. The California Water Code (CWC) recognizes WSCPs as a critical tool during a drought emergency and grants that the State defer to locally adopted WSCPs, to the extent practicable.

> *California Water Code Section 10632.3*
>
> *It is the intent of the Legislature that, upon proclamation by the Governor of a state of emergency under the California Emergency Services Act (Chapter 7 (commencing with Section 8550) of Division 1 of Title 2 of the Government Code) based on drought conditions, the board defer to implementation of locally adopted water shortage contingency plans to the extent practicable.*

The WSCP is the City of Roseville Water Utility's (City's) operational plan in the event of a water shortage. Water shortage would occur when available water supplies are insufficient to meet normal customer water demands. Various causes can bring about a water shortage including population growth, climate change, drought, natural disasters, and catastrophic events.

The WSCP shall address the ten following elements:

1. Water supply reliability assessment analysis
2. Annual assessment procedures
3. Six standard shortage stages
4. Shortage response actions
5. Communication protocols
6. Compliance and enforcement
7. Legal authorities
8. Financial consequences of WSCP
9. Monitoring and reporting
10. WSCP refinement procedures

1.1 Water Supply Reliability Analysis

Pursuant to 10632(a)(1) of the CWC, a near-term (5years) and long-term (20 years) water supply reliability analysis is provided herein. The water supply reliability analysis consists of a water service reliability assessment and drought risk assessment (DRA).

1.1.1 Constraints on Water Supply

Most of the City's water is surface water received from Folsom Lake. The City's existing surface water contracts with the U.S. Bureau of Reclamation (USBR), Placer County Water Agency (PCWA), and San Juan Water District (SJWD) are received through the Folsom Dam Diversion, making this a critical facility for the reliability of Roseville's surface water supply. Under normal conditions, the capacities of the Folsom Dam Diversion, Roseville Water Treatment Plant, and distribution network are sufficient to meet the City's water demands. However, the water that the City receives is subject to reductions during dry years pursuant to the Water Forum Agreement, the USBR

Operations Criteria and Plan (OCAP), and the Central Valley Project Municipal and Industrial Water Shortage Policy (CVP M&I WSP).

Although Roseville's annual water contract entitlements total 66,000-acre feet (AF), the City along with other Sacramento-area water suppliers are signatory to the January 2000 Water Forum Agreement (updated in 2015), which includes Purveyor Specific Agreements. The City's Purveyor Specific Agreement includes limitations on City surface water diversions from the American River under different hydrologic conditions. The hydrologic conditions are characterized by three categories of year type and the corresponding limitations for the City are given in WSCP Table 1.

WSCP Table 1 Available Surface Water Supply Under Differing Hydrologic Conditions

Year Type	Unimpaired Flow into Folsom Reservoir	Roseville Available Supply
Normal/ Average or Wet Year	Greater or equal to 950,000 AF	Maximum of 58,900 AF
Drier Year	Between 400,000 and 950,000 AF	Between 43,800 and 58,900 AF
Driest/ Critically Dry Year	Less than 400,000 AF	Maximum of 43,800 AF

In addition to the impacts of the contractual agreements, the reliability of surface water is also subject to physical constraints. In the event that the water level at Folsom Lake drops close to or below the intake elevation, without additional infrastructure, the City would be unable to divert water. The severe drought of 2015, which was preceded by multiple consecutive dry years, demonstrated the vulnerability of the City's surface water as the water elevation did come close to the intake elevation.

Though the City has begun the process of expanding its groundwater program, under current operations the groundwater is not a major source of water for the City. The City has 4 existing wells with aquifer storage recovery (ASR) injection capability. The City's strategy in normal years is to not pump groundwater from the wells in excess of what was injected, thus creating a bank of water for future use. If a significant drought stage is reached the City can pump additional water to augment its water supply and make up for deficits of the surface water supply. The City continues to invest in development of groundwater infrastructure to increase supply reliability in times of drought, however in any given year type, the City must make determinations of drought stage without consideration of groundwater supplies, per the terms of the municipal code. This is further discussed in Section 1.5. For the purpose of this WSCP, only the resources available to the City in determination of a drought stage are included in calculations of the surplus or shortfall for the DRA shown in WSCP Table 2 and WSCP Table 3.

1.1.2 Drought Risk Assessment

The near-term and long-term drought risk assessment was performed by comparing the unconstrained potable water demands to the water supply availability for a single dry year and 5 consecutive dry years. The near-term DRA for a five-year drought is provided in WSCP Table 2. The long-term single and five-year DRA is provided in WSCP Table 3. Note that while typical groundwater supplies are not considered in the calculations of Total Supplies shown in WSCP Table 2 and WSCP Table 3, the volume of groundwater that the City intends to use for each year type is listed separately.

WSCP Table 2 Near-Term Five-Year Drought Risk Assessment

Category	2021	2022	2023	2024	2025
Total Supplies	62,719	57,870	57,920	49,971	42,022
Total Gross Water Use	39,172	42,276	45,380	48,484	51,589
Surplus/ Shortfall absent of WSCP Action	23,547	15,593	12,540	1,487	-9,567
Total Right/ Safe Yield Groundwater Supplies	1,560	1,560	1,560	1,560	7,920
NOTES: All values are in AF. Groundwater supplies are not included in calculation of surplus/ shortfall.					

WSCP Table 3 Long-Term Single and Five-Year Drought Risk Assessment

Drought Type/ Year	Category	2025	2030	2035	2040	2045
Single Year	Total Supplies	42,022	42,435	46,293	46,293	46,293
	Total Gross Water Use	51,589	56,990	62,547	62,547	62,547
	Surplus/ Shortfall absent of WSCP Action	-9,567	-14,555	-16,254	-16,254	-16,254
	Total Right/ Safe Yield Groundwater Supplies	7,920	12,570	14,430	14,430	14,430
Year 1	Total Supplies	62,922	63,335	67,193	67,193	67,193
	Total Gross Water Use	51,589	56,990	62,547	62,547	62,547
	Surplus/ Shortfall absent of WSCP Action	11,333	6,345	4,646	4,646	4,646
	Reasonably Available Groundwater Supplies	1,560	2,720	3,350	3,350	3,350
Year 2	Total Supplies	58,022	58,435	62,293	62,293	62,293
	Total Gross Water Use	51,589	56,990	62,547	62,547	62,547
	Surplus/ Shortfall absent of WSCP Action	6,433	1,445	-254	-254	-254
	Reasonably Available Groundwater Supplies	1,560	2,720	3,350	3,350	3,350
Year 3	Total Supplies	58,022	58,435	62,293	62,293	62,293
	Total Gross Water Use	51,589	56,990	62,547	62,547	62,547
	Surplus/ Shortfall absent of WSCP Action	6,433	1,445	-254	-254	-254
	Reasonably Available Groundwater Supplies	1,560	2,720	3,350	3,350	3,350
Year 4	Total Supplies	50,022	50,435	54,293	54,293	54,293
	Total Gross Water Use	51,589	56,990	62,547	62,547	62,547
	Surplus/ Shortfall absent of WSCP Action	-1,567	-6,555	-8,254	-8,254	-8,254
	Reasonably Available Groundwater Supplies	1,560	2,720	3,350	3,350	3,350
Year 5	Total Supplies	42,022	42,435	46,293	46,293	46,293
	Total Gross Water Use	51,589	56,990	62,547	62,547	62,547
	Surplus/ Shortfall absent of WSCP Action	-9,567	-14,555	-16,254	-16,254	-16,254
	Total Right/ Safe Yield Groundwater Supplies	7,920	12,570	14,430	14,430	14,430
NOTES: All values are in AF. Groundwater supplies are not included in calculation of surplus/ shortfall.						

1.1.3 Seismic Risk Analysis

Seismic risk in California can pose a significant threat to facilities and infrastructure. The City of Roseville 2016 Multi-Hazard Mitigation Plan addresses the seismic risk at critical facilities including those dedicated to water supply and is provided in Exhibit A.

1.2 Legal Authorities

Chapter 14.09 Water Conservation of the Roseville Municipal Code (Municipal Code) also cited as Water Conservation and Drought Mitigation Ordinance (Ordinance 5311 § 2, 2014; Ordinance 2413 § 2, 1991), grants the City the authority to declare a water shortage in the City. Chapter 14.09 of the Municipal Code is provided in Exhibit B.

The purpose and scope of the Water Conservation and Drought Mitigation Ordinance as stated in the Municipal Code is provided below:

14.09.020 General provisions

A. Purpose. The purpose of this chapter is to ensure compliance with all federal, state and local requirements relating to water conservation and drought mitigation for the protection of public health, safety and welfare by:

1. Reducing the per capita water consumption throughout the City of Roseville (the "city") during years of normal precipitation and during years of drought;

2. Protecting and conserving the city's supply of water during specified times of emergency and/or crisis;

3. Minimizing and/or eliminating the waste of water through voluntary compliance or punitive action, if necessary;

4. Promoting the use of drip irrigation and other low volume irrigation methods that reduce outdoor water use by applying water more efficiently than traditional irrigation methods;

5. No person shall use, or cause to be used any city water for landscape irrigation between the hours of 10:00 a.m. and 8:00 p.m., unless the city manager, or designee provides prior written consent to a different time limitation. A waiver may be granted for turf areas if the landscape contains too many irrigation valves to complete an irrigation event within the watering window.

6. Upon city declaration of a water shortage, the city manager, or designee, may impose revised and/or additional limitations on outdoor water use, as specified in Section 14.09.040, and no person shall use, or cause to be used, city water in violation of such limitations while the water shortage remains in effect.

B. Scope. The provisions of this chapter shall apply to all customers, users and/or recipients (hereinafter "users") of the city's potable and recycled water service within the city's territorial limits.

The City's development and adoption of the WSCP upholds 14.09.020 General Provisions of the Municipal Code by ensuring compliance with state requirements.

All components of the WSCP comply with Chapter 14.09 of the Municipal Code. Any actions to be taken under the WSCP not explicitly stated in Chapter 14.09 of the Municipal Code are a further refinement of the existing ordinance.

1.3 Standard Water Shortage Levels

The California Water Code Section 10632(a)(3) defines six standard water shortage levels. Standardization of water shortage levels provide a consistent regional and statewide approach to characterizing and conveying the severity of a water shortage. However, Chapter 14.09 of the City's Municipal Code defines water shortage stages that are different from those listed in CWC. Pursuant to 10632(a)(3)(B), the six standard water shortage levels are related to the existing shortage stages in the Municipal Code in WSCP Table 4.

WSCP Table 4 Relation Between Standard Water Shortage Levels and Existing Stages

CWC Shortage Level Description	CWC Shortage Level	Municipal Code Shortage Stage	Municipal Code Water Conservation and Drought Stage Description
Up to 10%	1	Basic Stage	City's water supply is adequate to meet all projected demands
		Stage One Drought	City's water supply is adequate to meet 90% of projected demands
Up to 20%	2	Stage Two Drought	City's water supply is adequate to meet 80% of projected demands
Up to 30%	3	Stage Three Drought	City's water supply is adequate to meet 70% of projected demands
Up to 40%	4	Stage Four Drought	City's water supply is adequate to meet 60% of projected demands
Up to 50%	5	Stage Five Drought	City's water supply is adequate to meet 50% or less of projected demands
Greater than 50%	6		

1.4 Annual Water Supply and Demand Assessment Procedures

Pursuant to CWC 10632.1, all water suppliers are required to conduct an annual water supply and demand assessment on or before July 1 of each year beginning in 2022. If the supplier receives imported water from the State Water Project or the U.S. Bureau of Reclamation (USBR) they shall submit the report within 14 days of receiving final allocations or by July 1 of each year, whichever is later. The steps for conducting the Annual Water Supply and Demands Assessment are outlined in WSCP Table 5.

WSCP Table 5 Water Supply and Demand Assessment Procedure

Step	Description	Timeframe	Participants
Step 1	Request water utility data from all departments.	Jan 1 - Jan 31	Water Conservation Administrator
Step 2	Coordinate with Planning Division for any significant planned developments and project those water demands.	Jan 15 - Jan 31	Water Conservation Administrator Planning Division
Step 3	Compile water utility data into Water Utility Reporting Master spreadsheet.	Feb 1 - Feb 14	Water Conservation Administrator
Step 4	Calculate total projected unconstrained water demands for current year.	Feb 15-Feb 28	Senior Engineer – Water Utility

Step 5	Identify any constraints on facilities or infrastructure that could impact the supply of water such as planned maintenance that would take facilities offline or known damage to facilities/ infrastructure.	Feb 15-Feb 28	Hydrogeologist Senior Engineer – Water Utility Water Distribution Superintendent Water Treatment Plant Chief Operator
Step 6	Commence preparation of Annual Water Shortage Assessment Report.	March-April	Water Conservation Administrator Senior Engineer – Water Utility
Step 7	Receive final allotments from USBR for current year.	April	EU Assistant Director-Water Utility
Step 8	Subtract current year projected water demand from final allotment volume to determine shortage percentage and volume.	2 Days after notification from USBR	Senior Engineer – Water Utility
Step 9	If a shortage is identified Environmental Utilities (EU) Department is to hold an internal meeting to inform participants that a water shortage for the current year is anticipated and the extent of that shortage. Review the WSCP and Chapter 14.09 of the Roseville Municipal Code. Identify any concerns from the group regarding the ability to carry out the actions described in the WSCP and Chapter 14.09 of the Municipal Code. Assign an individual or group, among the participants, the responsibility of resolving the concern.	Within 7 days of notification from USBR	EU Director EU Assistant Director – Water Utility Hydrogeologist Water Distribution Super Intendent Water Treatment Plant Chief Operator Senior Engineer – Water Utility Water Conservation Administrator Additional participants as needed
Step 10	Inform City Manager of water shortage emergency condition.	Within 14 days of notification from USBR	City Manager EU Director EU Assistant Director – Water Utility Additional participants as needed
Step 11	Finalize and submit Annual Water Shortage Assessment Report to DWR.	By July 1 or 14 days after receiving final allocations	EU Assistant Director – Water Utility Water Conservation Administrator Senior Engineer – Water Utility
Step 11	The City Manager shall inform City Council of the water shortage emergency condition and the "Drought stage," under which the emergency falls. City Council shall declare a water shortage emergency condition to prevail within the area served by the City of Roseville Water Utility.	Within 28 days of notification from USBR	City Manager City Council Public Information Officer
Step 12	The City of Roseville shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency.	Within 28 days of notification from USBR	City Manager City Council Public Information Officer

Step 13	The public, interested parties, and local, regional, and state governments shall be noticed of the water shortage emergency condition and of all water shortage response actions triggered by the emergency declaration. Pursuant to Municipal Code Section 14.09.020(E), the City Manager, or assigned designee, shall be responsible for determining the means by which water users shall be notified. Possible means for notification include mass media, newspaper, public notice, mailings, utility billings, or by any combination of such notice.	Beginning 2 business days after declaration of emergency condition and continuing for as long as the emergency condition persists.	Water Conservation Administrator Senior Engineer – Water Utility Public Information Officer
Step 14	The appropriate Water Shortage Response Actions for the drought stage, outlined in WSCP Table 6 and 7, will be carried out by the public and water utility. The City will enforce compliance in accordance with Roseville Municipal Code 14.09.	Duration of emergency condition	EU – Water Utility Water Users City Manager or designee
Step 15	Track customer water use at a minimum on a monthly basis. Ensure that total gross water use for that month, or more frequent tracking period, is reduced by the necessary percentage when compared to that same tracking period of the last normal supply year.	Duration of emergency condition	Water Conservation Administrator Senior Engineer – Water Utility
Step 16	If the needed water use reduction percentage is not met for any month determine which additional strategies or actions would result in the needed reduction.	Upon determination of insufficient water use reduction	EU Director EU Assistant Director – Water Utility Hydrogeologist Senior Engineer – Water Utility Water Conservation Administrator Additional participants as needed
Step 17	The EU Department management shall propose to the City Manager additional shortage response actions and whether or not those actions would require the WSCP and Chapter 14.09 of the Roseville Municipal Code to be changed.	Upon determination of insufficient water use reduction	City Manager EU Director EU Assistant Director – Water Utility Additional participants as needed
Step 18	If deemed necessary, the City Manager and City Council will revise the WSCP and Chapter 14.09 of the Roseville Municipal Code, observing all required procedures with such adoption.	Upon determination of insufficient water use reduction	City Manager City Council Additional participants as needed
NOTES: It is the intent of the WSCP that the Water Conservation Administrator and Water Utility Senior Engineer shall jointly be responsible for ensuring that the steps of this plan are carried out by noticing the necessary parties for data requests and facilitating meetings.			

WSCP Table 6 Demand Reduction Actions to be Implemented at Each Shortage Level

Standard Shortage Level	Roseville Municipal Code Stage	Demand Reduction Actions	Estimated Percent Reduction	Section of Water Conservation and Drought Mitigation Ordinance corresponding to Demand Reduction Action *Explanations provided as needed*	Penalty, Charge, or Other Enforcement?
1	Basic	Landscape - Restrict or prohibit runoff from landscape irrigation	0%	14.09.030(A)	Yes
1	Basic	Landscape - Limit landscape irrigation to specific times	0%	14.09.020(A)(1); No person shall use, or cause to be used, any city water for landscape irrigation between the hours of 10:00 a.m. and 8:00 p.m., unless the city manager, or designee provides prior written consent to a different time limitation. A waiver may be granted for turf areas if the landscape contains too many irrigation valves to complete an irrigation event within the watering window.	Yes
1	Basic	Landscape - Limit landscape irrigation to specific days	0%	14.09.060(E)(2); Irrigation of new landscaping shall be allowed on any day of the week for a period of 30 days after the new landscaping is planted, unless the city manager, or designee, provides prior written consent to extend this time period based on plant type and the season when the new landscaping is planted. After the 30 days, irrigation days and run times should be decreased to settings appropriate for an established landscape.	Yes
1	Basic	Landscape - Prohibit certain types of landscape irrigation	0%	14.09.030(E); Prohibit operation of an irrigation system that applies water to an impervious surface or that is in disrepair.	Yes
1	Basic	Landscape - Other landscape restriction or prohibition	0%	14.09.030(G); Prohibit irrigation of landscaping during rainfall or 48 hours after a measurable rain event.	Yes
1	Basic	Landscape - Other landscape restriction or prohibition	0%	14.090.060(E)(1); All landscaping installed in the City of Roseville shall comply with the water efficient landscape requirements adopted by resolution of the city council.	Yes
1	Basic	Other water feature or swimming pool restriction	0%	14.09.030(C); Prohibit maintaining ponds, waterways, decorative basins, or swimming pools without water recirculation devices.	Yes
1	Basic	Other water feature or swimming pool restriction	0%	14.09.030(D); Prohibit backwashing so as to discharge to waste swimming pools, decorative basins or ponds in excess of the frequency necessary to ensure the healthful condition of the water or in excess of that required by standards for professionally administered maintenance or to address structural considerations, as determined by the city manager, or designee.	Yes
1	Basic	Other water feature or swimming pool restriction	0%	14.09.030(H); Prohibit overfilling of any pond, pool or fountain which results in water discharging to waste.	Yes

1	Basic	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	0%	14.09.060(C)	Yes
1	Basic	Other - Require automatic shut off hoses	0%	14.09.060(B); Free-flowing hoses for all uses are prohibited. Automatic shut-off devices shall be attached on any hose or filling apparatus in use.	Yes
1	Basic	Other	0%	14.09.030(B); Prohibit water fixtures (including, but not limited to, toilets, faucets, shower heads) or heating or cooling devices to leak or run to waste.	Yes
1	Basic	Other	0%	14.09.030(A); Prohibit water use for washing in excess of that necessary to wash, wet or clean the dirty or dusty object, such as an automobile, sidewalk, or parking area, flows to waste.	Yes
1	Basic	Other	0%	14.09.060(A); Water shall be confined to the user's property and shall not be allowed to run off to adjoining properties, or to the roadside or to the gutter. Care shall be taken not to water past the point of saturation.	Yes
1	Basic	Other	0%	14.09.060(F); All site reviews shall include an evaluation of using recycled water. Recycled water shall be required if economically feasible.	Yes
1	Stage 1	Landscape - Limit landscape irrigation to specific days	1%	14.09.070(C) and 14.09.070(D); Residential and non-residential water users shall be permitted to irrigate with city water according to the schedule provided in 14.09.070(C) and 14.09.070(D), respectively.	Yes
1	Stage 1	Landscape - Other landscape restriction or prohibition	1%	14.09.070(G); City park sites shall, as an aggregate, reduce usage up to 10 percent.	Yes
1	Stage 1	CII - Restaurants may only serve water upon request	1%	14.09.070(I)	Yes
1	Stage 1	Other - Prohibit use of potable water for washing hard surfaces	1%	14.09.070(H); Washing streets, parking lots, driveways, sidewalks or buildings, except as necessary for health or sanitary purposes or pursuant to a term or condition in a permit issued by a state or federal agency, is prohibited.	Yes
1	Stage 1	Other	10%	14.09.070(B); Residential users and non-residential users shall reduce water usage up to 10 percent.	Yes
2	Stage 2	Landscape - Other landscape restriction or prohibition	1%	14.09.070(C); City park sites shall, as an aggregate, reduce usage up to 20 percent.	Yes
2	Stage 2	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	1%	14.09.080(H)	Yes
2	Stage 2	Other	10-18%	14.09.080(B); Residential users and non-residential landscapes shall reduce water usage up to 20 percent.	Yes

3	Stage 3	Landscape - Limit landscape irrigation to specific days	1%	14.09.090(D) and 14.09.090(E); Residential and non-residential water users shall be permitted to irrigate with city water according to the schedule provided in 14.09.090(D) and 14.09.090(E), respectively.	Yes
3	Stage 3	Landscape - Other landscape restriction or prohibition	1%	14.09.090(C); City park sites shall, as an aggregate, reduce usage up to 30 percent.	Yes
3	Stage 3	Landscape - Other landscape restriction or prohibition	1%	14.09.090(H); New or expanded landscaping is limited to drought-tolerant trees, shrubs, and groundcover and be irrigated using a low volume irrigation system. No new turf shall be planted, hydroseeded, or laid, unless prior written consent is received from the city manager. Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.	Yes
3	Stage 3	Water Features - Restrict water use for decorative water features, such as fountains	1%	14.09.090(I)	Yes
3	Stage 3	Pools - Allow filling of swimming pools only when an appropriate cover is in place.	1%	14.09.090(L)	Yes
3	Stage 3	Other - Prohibit use of potable water for construction and dust control	1%	14.09.090(K)	Yes
3	Stage 3	Other	1%	14.09.090(I); Except where recycled water is used, golf courses shall reduce irrigation up to 30 percent.	Yes
3	Stage 3	Other	18-27%	14.09.090(B). Residential users and non-residential landscapes are to reduce water usage up to 30 percent.	Yes
4	Stage 4	Landscape - Limit landscape irrigation to specific days	2%	14.09.100(D) and 14.09.100(E); Residential and non-residential water users shall be permitted to irrigate with city water according to the schedule provided in 14.09.100(D) and 14.09.100(E), respectively.	Yes
4	Stage 4	Landscape - Other landscape restriction or prohibition	1%	14.09.100(C); City park sites shall, as an aggregate, reduce usage up to 40 percent.	Yes
4	Stage 4	Landscape - Other landscape restriction or prohibition	1%	14.09.100(H); Installation of any new landscaping is prohibited unless irrigation is provided through connection to an active recycled water system. In the case of new construction, the city's building official will issue a temporary final upon completion of the structural development of the property. When the city has returned to a stage two drought restriction, landscaping installation can be completed, and a building final will become available upon inspection by the city.	Yes

4	Stage 4	Other water feature or swimming pool restriction	1%	14.09.100(K); Existing pools shall not be emptied and refilled using city water unless required for health or safety reasons until the city has returned to a stage two drought restriction. Pools may be re-filled only to the extent necessary to replace evaporative losses.	Yes
4	Stage 4	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	1%	14.09.100(J); Automobiles or equipment shall be washed only at commercial establishments that recycle their water or by equipment and means that separates debris and recycles wash water for continual use.	Yes
4	Stage 4	Other	1%	14.09.100(I); Except where recycled water is used, golf courses shall reduce irrigation up to 40 percent.	Yes
4	Stage 4	Other	0%	14.09.100(L); No commitments shall be made to provide water service as part of any new land use entitlement (general plan, specific plan or amendments requesting new water allocations) until the city has returned to a stage two drought restriction. Currently approved specific plans with accompanying development agreements and projects or properties that have received water allocations in advance of full entitlements may be issued building permits so long as they comply with the remainder of this chapter.	Yes
4	Stage 4	Other	27-35%	14.09.100(B); Residential users and non-residential landscapes are to reduce water usage up to 40 percent.	Yes
5 & 6	Stage 5	Landscape - Other landscape restriction or prohibition	5%	14.09.110(C); Except where recycled water is used, water users shall reduce landscape irrigation as follows: 1. Turf shall not be irrigated. 2. Trees and shrubs may be irrigated with a properly functioning low volume landscape irrigation system or by use of a handheld hose equipped with a nozzle capable of completely shutting off the flow of water except when positive action or pressure to maintain the flow of water is applied. Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.	Yes
5 & 6	Stage 5	Other water feature or swimming pool restriction	1%	14.09.110(D); Filling new or existing swimming pools and spas with city water is prohibited.	Yes
5 & 6	Stage 5	Other	33%	14.09.110(B); Residential users are to reduce water usage up to 50 percent.	Yes
NOTES: For each successive drought level all preceding restrictions shall continue in place, except to the extent they are replaced by more restrictive conditions.					

1.5 Supply Augmentation and Operational Changes

Under normal operational conditions the City's groundwater strategy is to not pump well water in excess of the potable water that is injected annually. At this time, the City's injection volume of groundwater is planned to exceed extraction volume over time, as the groundwater program is still in development. The positive difference between the injection and extraction volume is the net volume of water that the City places into long-term storage or makes available for other users. Per Section 14.09.050 of the Municipal Code, when determining drought staging, the City cannot consider the effect of well water reducing the need for conservation until a stage three drought level is reached. Specifically, the code mentions that well water cannot be considered as an alternative to declaration of a stage one or stage two drought level. The City may choose to operationalize groundwater infrastructure in any year type based on water supply conditions and/or operations and maintenance strategies for infrastructure, however this shall not be determined to reduce or alleviate the appropriate drought stage given hydrologic conditions and surface water allocations for that year. The percent reduction that could result from this supply augmentation action for the different stages is provided in WSCP Table 7. Note that there are no supply augmentation actions for drought stages 1 and 2.in accordance with the provisions of the Municipal code.

WSCP Table 7 Supply Augmentation During Stage 3 Droughts and Higher

Standard Shortage Level	Roseville Municipal Code Stage	Supply Augmentation Methods and Other Actions by Water Supplier	Percent Reduction	Additional Explanation
3	3	Stored Emergency Supply	0-10%	Groundwater Pumped
4	4	Stored Emergency Supply	0-20%	Groundwater Pumped
5 & 6	5	Stored Emergency Supply	0-30%	Groundwater Pumped

The water utility would need to adjust its operations to support a drought stage that would prompt increased reliance on well water. Tasks for operations may include more frequent maintenance of well pumps and chemical injection pumps, monitoring of ground water level, and filter backwashing.

1.6 Compliance and Enforcement

The Water Conservation and Drought Mitigation ordinance grants the City the authority to enforce compliance with the water use limitations outlined in WSCP Table 6. The sections of the Water Conservation and Drought Mitigation Ordinance, detailing compliance and enforcement authority and measures are provided below.

14.09.020 General provisions

C. Administration and Enforcement. The city manager, or designee, including, but not limited to, an enforcement officer as defined herein, shall administer, implement, and enforce the provisions of this chapter. For purposes of this chapter an "enforcement officer" means any city employee or agent of the city with the authority to enforce any provision of this chapter and the authority to make any decision on behalf of the city manager required or called for by this chapter.

D. Compliance. All provisions of this chapter are subject to the compliance procedures set forth in this chapter unless otherwise expressly stated herein.

14.09.140 Violations

It is Unlawful for any user and/or person to violate any provision or fail to comply with any of the requirements of this chapter. Causing, permitting, aiding, abetting or concealing a violation of any provision of this chapter shall constitute a violation of this chapter. A violation of the provisions of this chapter shall occur irrespective of the negligence or intent of the violator and a violation of or failure to comply with any of the requirements of this chapter may be charged as either an infraction or a misdemeanor in the discretion of the city attorney. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 3834 § 3, 2002; Ord. 2413 § 2, 1991.)

14.09.150 Enforcement authority

A. Whenever the city manager, or designee (including, but not limited to, an enforcement officer), determines that a user and/or person has violated any provision of, or failed to meet a requirement of, this chapter, an administrative citation pursuant to Chapter 2.50 or a written compliance order pursuant to Chapter 2.52 may be issued to any user and/or person responsible for the violation.

B. Any compliance order issued may require without limitation any or all of the following:

1. The allocation of a particular amount of water to a given user and/or person responsible for the violation;
2. The issuance of a fine;
3. The installation of a flow restriction device;
4. The performance of monitoring, analyses, and reporting;
5. That violations shall cease and desist; and/or
6. The discontinuance of water service

The compliance order shall set forth a deadline within which the requirements of the compliance order must be completed. Said compliance order shall further advise that, should the violator fail to comply with the compliance order within the established deadline, a hearing on the compliance order shall be set. (Ord. 5491 § 11, 2015; Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 3034 § 3, 2002; Ord. 2817 § 1, 1994; Ord. 2413 § 2, 1991.)

14.090.180 Separate offense for each day.

Any user and/or person that violates any provision of this chapter shall be guilty of a separate offense for each and every day during any portion of which any user and/or person commits, continues, permits, or causes a violation thereof, and shall be punished accordingly. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

1.7 Financial Consequences

During times of an emergency condition, the City is expected to see significant revenue reduction as a result of demand reduction actions lowering total gross water use. Additionally, enforcement of demand reduction actions, which could include investigating water waste complaints, follow ups to check for compliance, administering warnings or fines, and installation of flow restriction devices, would incur additional expenses that would not be present during non-emergency conditions.

Revenue loss percentage for each drought stage is anticipated to be approximately equal to the demand reduction percentage for each respective shortage level. Enforcement expenses will vary based on customer compliance and drought stage. For instance, at the onset of demand reduction action implementation, resources needed for enforcement may be high as customers adjust to altering their use or compliance from customers could vary seasonally with customers finding it more difficult to comply during warmer months.

The City plans to mitigate the financial consequences associated with water shortage response actions primarily through their recently adopted water rate structure, which allows for adequate reserves to accommodate reductions in revenue and increases in cost due to drought. If the water shortage rate charges are insufficient to make up for the loss in revenue, the City will use financial reserves to mitigate remaining financial consequences.

1.8 Plan Adoption, Submittal, and Availability

The Water Shortage Contingency Plan will be included as an appendix in the 2020 Urban Water Management Plan (UWMP) and will be introduced and discussed with the public and City Council in the same meetings but as separate agenda items. The WSCP is intended to be a stand-alone document and as such will be adopted by the City independently of the UWMP. The WSCP may be updated as needed between the regular 5-year updates of the UWMP and no required WSCP update shall necessitate an update of the UWMP.

The City has encouraged community and public interest involvement in the WSCP using public meetings and web-based communication. A public meeting will be held on June 16, 2021 and will provide an opportunity for the general public to ask questions and raise concerns regarding the WSCP. Prior to the public hearing the draft WSCP was made available for public inspection on the City's website: www.roseville.ca.us/WSCP/.

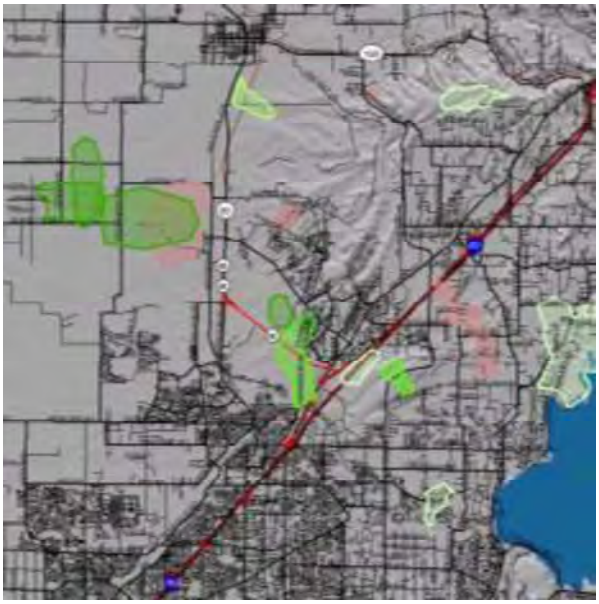
The WSCP will be presented to City Council on June 16, 2021 for adoption. Copies of the adoption resolutions will be provided as Exhibit C. A copy of this WSCP will be submitted to DWR within 30 days of adoption and by July 1, 2021. The adopted WSCP will be submitted electronically to DWR. A CD or hardcopy of the adopted WSCP will also be submitted to the California State Library. No later than 30 days after submittal to DWR, copies of the adopted WSCP will be available for public review at the City's public offices. An electronic copy of this plan will also be available for review and download on the City's website: www.roseville.ca.us/WSCP/.

Exhibit A – City of Roseville 2016 Multi-Hazard Mitigation Plan

CITY OF ROSEVILLE CALIFORNIA

2016 Multi-Hazard Mitigation Plan



TETRA TECH

September 2016

CONTENTS

Executive Summary xvi
Plan Update xvi
Plan Update Methodology xvii
Phase 1—Organize Resources xvii
Phases 2 —Update the Risk Assessment xviii
Phase 3—Engage the Public xviii
Phase 4—Assemble the Updated Plan xviii
Phase 5—Plan Adoption/Implementation xviii
Mitigation Guiding Principle, Goals, and Objectives xix
Guiding Principle xix
Goals xix
Objectives xix
Mitigation Action Plan xx
Implementation xx
1. Introduction to Hazard Mitigation Planning 1-1
1.1 Why Prepare This Plan? 1-1
1.1.1 The Big Picture 1-1
1.1.2 Roseville's Response to the DMA 1-1
1.2 Who Will Benefit From This Plan? 1-2
1.3 Contents of This Plan 1-2
2. Plan Update—What Has Changed 2-1
2.1 The Previous Plan 2-1
2.2 Mitigation Success Stories 2-1
2.3 Why Update? 2-2
2.3.1 Federal Eligibility 2-2
2.3.2 Changes in Development 2-2
2.4 The Updated Plan—What Is Different? 2-2
3. Plan Update Approach 3-1
3.1 Planning Resource Organization 3-1
3.1.1 Internal Funding 3-1
3.1.2 Formation of the Planning Team 3-1
3.1.3 The Steering Committee 3-2
3.1.4 Coordination with Other Agencies 3-2
3.1.5 Review of Existing Programs 3-3
3.2 Risk Assessment Update 3-4
3.3 Public Involvement 3-4
3.3.1 Strategy 3-4
3.3.2 Public Involvement Results 3-7
3.4 Assemble the Updated Plan 3-9
3.5 Plan Development Chronology/Milestones 3-10
4. City of Roseville Profile 4-1
4.1 Geographic Profile 4-1
4.2 Historical Overview 4-3

4.2.1 Pre-Development 4-3
4.2.2 Founding of the Community 4-3
4.2.3 Post-Incorporation Development 4-3
4.2.4 Current Conditions 4-4
4.3 Major Past Hazard Events 4-4
4.4 Physical Setting 4-4
4.4.1 Geology 4-4
4.4.2 Soils 4-4
4.4.3 Climate 4-5
4.5 Development Profile 4-5
4.5.1 Land Use Policies 4-5
4.5.2 Residential Development 4-8
4.5.3 Non-Residential Development 4-8
4.5.4 Critical Facilities and Infrastructure 4-10
4.5.5 Future Trends in Development 4-14
4.6 Open Space and Habitat 4-14
4.6.1 Grasslands 4-14
4.6.2 Oak Woodlands and Riparian Areas 4-14
4.6.3 Seasonal Wetlands 4-15
4.6.4 Sensitive Species 4-15
4.7 Demographics 4-16
4.7.1 Population Trends 4-16
4.7.2 Age Distribution 4-17
4.7.3 Race, Ethnicity and Language 4-19
4.7.4 Individuals with Disabilities and Others with Access and Functional Needs 4-20
4.8 Economy 4-20
4.8.1 Income 4-20
4.8.2 Industry, Businesses and Institutions 4-21
4.8.3 Employment Trends and Occupations 4-22
4.9 Laws and Ordinances 4-23
4.9.1 Federal 4-23
4.9.2 State 4-28
4.9.3 City Plans and Programs 4-32
4.10 Capability Assessment 4-36

5. Identified Hazards of Concern and Risk Assessment Methodology 5-1

5.1 Identified Hazards of Concern 5-1
5.2 Methodology 5-2
5.3 Risk Assessment Tools 5-2
5.3.1 Dam Failure, Earthquake and Flood—Hazus-MH 5-2
5.3.2 Landslide, Severe Weather, and Wildfire 5-3
5.3.3 Drought 5-3
5.3.4 Climate Change 5-4
5.3.5 Health Hazards and Human-Caused Hazards 5-4
5.4 Mapping 5-4
5.4.1 Building and Cost Data 5-4
5.4.2 Hazus-MH Data Inputs 5-4
5.4.3 Other Local Hazard Data 5-5
5.4.4 Data Source Summary 5-5
5.4.5 Limitations 5-5

6. Climate Change Considerations for Hazard Mitigation 6-1
6.1 California Senate Bill No. 379 6-1
6.2 What is Climate Change? 6-2
6.3 How Climate Change Affects Hazard Mitigation 6-3
6.4 Current Indications of Climate Change 6-3
6.5 Projected Future Impacts 6-4
6.5.1 Precipitation 6-4
6.5.2 Temperature 6-5
6.5.3 Snow Pack 6-5
6.5.4 Wildfire 6-5
6.6 Responses to Climate Change 6-6
6.6.1 Mitigation and Adaptation 6-6
6.6.2 Ecosystem-Based Adaptation 6-6
6.6.3 City of Roseville Sustainability Efforts 6-6
6.7 Climate Change Impacts on Hazards 6-7
6.7.1 Drought 6-7
6.7.2 Earthquake 6-8
6.7.3 Flood 6-8
6.7.4 Landslide 6-9
6.7.5 Severe Weather 6-10
6.7.6 Wildfire 6-11
7. Dam Failure 7-1
7.1 General Background 7-1
7.1.1 Causes of Dam Failure 7-1
7.1.2 Regulatory Oversight 7-2
7.2 Hazard Profile 7-3
7.2.1 Past Events 7-3
7.2.2 Location 7-4
7.2.3 Frequency 7-4
7.2.4 Severity 7-4
7.2.5 Warning Time 7-4
7.2.6 Folsom Dam Containment Dike Failure Risk Assessment 7-5
7.3 Secondary Hazards 7-6
7.4 Exposure 7-8
7.4.1 Population 7-8
7.4.2 Property 7-8
7.4.3 Critical Facilities 7-8
7.4.4 Environment 7-8
7.5 Vulnerability 7-9
7.5.1 Population 7-9
7.5.2 Property 7-9
7.5.3 Critical Facilities 7-9
7.5.4 Environment 7-10
7.6 Future Trends in Development 7-10
7.7 Review of Existing Ordinances, Programs and Plans 7-10
7.8 Scenario 7-10
7.9 Issues 7-11
8. Drought 8-1

8.1 General Background 8-1
8.1.1 Water Supply Strategy 8-1
8.1.2 Water Supply Infrastructure 8-2
8.1.3 The Water Forum 8-3
8.1.4 Local Water Contracts—Definition of Drought 8-3
8.2 Hazard Profile 8-4
8.2.1 Past Events 8-4
8.2.2 Location 8-5
8.2.3 Frequency 8-9
8.2.4 Severity 8-9
8.2.5 Warning Time 8-9
8.3 Secondary Hazards 8-10
8.4 Exposure 8-10
8.5 Vulnerability 8-10
8.5.1 Population 8-10
8.5.2 Property 8-10
8.5.3 Critical Facilities 8-10
8.5.4 Environment 8-11
8.5.5 Economic Impact 8-11
8.6 Future Trends in Development 8-11
8.7 Review of Existing Ordinances, Programs and Plans 8-12
8.8 Scenario 8-13
8.9 Issues 8-13

9. Earthquake 9-1

9.1 General Background 9-1
9.1.1 Damage from Earthquakes 9-1
9.1.2 Earthquake Classifications 9-1
9.1.3 Ground Motion 9-3
9.1.4 Effect of Soil Types 9-3
9.2 Hazard Profile 9-4
9.2.1 Past Events 9-4
9.2.2 Location 9-5
9.2.3 Frequency 9-12
9.2.4 Severity 9-12
9.2.5 Warning Time 9-12
9.3 Secondary Hazards 9-13
9.4 Exposure 9-13
9.4.1 Population 9-13
9.4.2 Property 9-13
9.4.3 Critical Facilities 9-13
9.4.4 Environment 9-14
9.5 Vulnerability 9-15
9.5.1 Population 9-15
9.5.2 Property 9-15
9.5.3 Critical Facilities 9-18
9.5.4 Environment 9-18
9.6 Future Trends in Development 9-19
9.7 Review of Existing Ordinances, Programs and Plans 9-19
9.7.1 International Building Codes 9-19

9.7.2 Improvement Standards 9-20
9.7.3 Geotechnical Studies 9-20
9.8 Scenario 9-20
9.9 Issues 9-20

10. Flooding 10-1

10.1 General Background 10-1
10.1.1 Measuring Floods and Floodplains 10-1
10.1.2 Effects of Human Activities 10-1
10.1.3 Floodplain Ecosystems 10-1
10.1.4 Federal Flood Programs 10-2
10.2 Hazard Profile 10-3
10.2.1 Flooding Types 10-3
10.2.2 Past Events 10-4
10.2.3 Location 10-7
10.2.4 Frequency 10-8
10.2.5 Severity 10-10
10.2.6 Warning Time 10-10
10.3 Secondary Hazards 10-12
10.4 Exposure 10-12
10.4.1 Population 10-12
10.4.2 Property 10-12
10.4.3 Critical Facilities and Infrastructure 10-14
10.4.4 Environment 10-15
10.5 Vulnerability 10-15
10.5.1 Population 10-15
10.5.2 Property 10-16
10.5.3 Critical Facilities and Infrastructure 10-19
10.5.4 Environment 10-19
10.6 Future Trends in Development 10-19
10.7 Review of Existing Ordinances, Programs, and Plans 10-21
10.7.1 Structural Mitigation 10-21
10.7.2 Non-Structural Mitigation 10-22
10.7.3 Regulations 10-22
10.7.4 Stormwater Management 10-26
10.7.5 Outreach and Public Education 10-28
10.8 Scenario 10-28
10.9 Issues 10-28

11. Landslide 11-1

11.1 General Background 11-1
11.1.1 Landslide Types 11-1
11.1.2 Landslide Modeling 11-3
11.2 Hazard Profile 11-3
11.2.1 Past Events 11-3
11.2.2 Location 11-3
11.2.3 Frequency 11-4
11.2.4 Severity 11-4
11.2.5 Warning Time 11-6
11.3 Secondary Hazards 11-6

11.4 Exposure 11-6
11.4.1 Population 11-6
11.4.2 Property 11-6
11.4.3 Critical Facilities and Infrastructure 11-7
11.4.4 Environment 11-7
11.5 Vulnerability 11-7
11.5.1 Population 11-7
11.5.2 Property 11-8
11.5.3 Critical Facilities and Infrastructure 11-8
11.5.4 Environment 11-8
11.6 Future Trends in Development 11-8
11.7 Review of Existing Ordinances, Programs, and Plans 11-8
11.8 Scenario 11-10
11.9 Issues 11-10

12. Severe Weather 12-1

12.1 General Background 12-1
12.1.1 Tornadoes 12-2
12.1.2 Windstorms 12-2
12.1.3 Fog 12-5
12.1.4 Heavy Rains, Thunderstorms and Lightning 12-6
12.1.5 Ice and Freezing Rain 12-7
12.2 Hazard Profile 12-7
12.2.1 Past Events 12-7
12.2.2 Location 12-7
12.2.3 Frequency 12-7
12.2.4 Severity 12-9
12.2.5 Warning Time 12-9
12.3 Secondary Hazards 12-9
12.4 Exposure 12-9
12.4.1 Population 12-9
12.4.2 Property 12-9
12.4.3 Critical Facilities and Infrastructure 12-9
12.4.4 Environment 12-10
12.5 Vulnerability 12-10
12.5.1 Population 12-10
12.5.2 Property 12-10
12.5.3 Critical Facilities and Infrastructure 12-11
12.5.4 Environment 12-11
12.6 Future Trends in Development 12-11
12.7 Review of Existing Ordinances, Programs, and Policies 12-11
12.8 Scenario 12-11
12.9 Issues 12-12

13. Wildfire 13-1

13.1 General Background 13-1
13.1.1 Contributing Factors 13-1
13.1.2 Local Conditions Related to Wildfire Hazard 13-1
13.2 Hazard Profile 13-3
13.2.1 Past Events 13-3

13.2.2 Location 13-4
13.2.3 Frequency 13-8
13.2.4 Severity 13-9
13.2.5 Warning Time 13-11
13.3 Secondary Hazards 13-11
13.4 Exposure 13-11
13.4.1 Population 13-11
13.4.2 Property 13-11
13.4.3 Critical Facilities and Infrastructure 13-11
13.4.4 Environment 13-12
13.5 Vulnerability 13-12
13.5.1 Population 13-12
13.5.2 Property 13-13
13.5.3 Critical Facilities and Infrastructure 13-13
13.6 Future Trends in Development 13-13
13.7 Review of Existing Programs, Plans and Ordinances 13-14
13.7.1 Fire Prevention Programs and Standards 13-14
13.7.2 Adopted Service Levels for Response Time 13-15
13.7.3 Annual Monitoring of Fire Department Service Levels 13-16
13.7.4 Personnel Training 13-17
13.7.5 Fire Investigation 13-17
13.7.6 Comprehensive Emergency Medical Services 13-18
13.7.7 Accreditation Recommendation 13-17
13.8 Scenario 13-18
13.9 Issues 13-19

14. Human Health Hazards 14-1

14.1 General Background 14-1
14.1.1 Influenza 14-1
14.1.2 Smallpox 14-3
14.1.3 Viral Hemorrhagic Fevers 14-3
14.1.4 Plague 14-5
14.1.5 Tick-Borne Disease 14-5
14.1.6 Mosquito-Borne Disease 14-7
14.1.7 Anthrax 14-10
14.1.8 Severe Acute Respiratory Syndrome 14-10
14.1.9 Extreme Weather 14-11
14.2 Hazard Profile 14-12
14.2.1 Past Events 14-13
14.2.2 Location 14-13
14.2.3 Frequency 14-14
14.2.4 Severity 14-14
14.3 Secondary Hazards 14-14
14.4 Exposure and Vulnerability 14-14
14.4.1 Population 14-14
14.4.2 Property 14-15
14.4.3 Critical Facilities and Infrastructure 14-15
14.4.4 Environment 14-15
14.4.5 Economy 14-15
14.5 Future Trends in Development 14-15

14.6 Review of Existing Ordinances, Programs and Plans 14-15
14.6.1 Hospital Expansions to Care for Growing Populations 14-15
14.6.2 Memorandums of Agreement 14-16
14.6.3 Integrated Emergency Response 14-17
14.7 Scenario 14-17
14.8 Issues 14-17
15. Human-Caused Hazards 15-1
15.1 General Background 15-1
15.1.1 Man-Made Hazards 15-2
15.1.2 Technological Hazards 15-7
15.1.3 Civil Disorder 15-10
15.2 Hazard Profile 15-10
15.2.1 Past Events 15-10
15.2.2 Location 15-16
15.2.3 Frequency 15-20
15.2.4 Severity 15-20
15.2.5 Warning Time 15-21
15.3 Secondary Hazards 15-21
15.4 Exposure 15-21
15.4.1 Population 15-22
15.4.2 Property 15-23
15.4.3 Critical Facilities and Infrastructure 15-23
15.4.4 Environment 15-24
15.5 Vulnerability 15-25
15.5.1 Population 15-25
15.5.2 Property 15-25
15.5.3 Critical Facilities and Infrastructure 15-25
15.5.4 Environment 15-25
15.5.5 Economic impacts 15-25
15.6 Future Trends in Development 15-26
15.7 Review of Existing Ordinances, Programs, and Plans 15-26
15.7.1 City of Roseville Emergency Response Plan 15-26
15.7.2 City of Roseville Terrorism Contingency Plan 15-26
15.7.3 City of Roseville Hazardous Materials Contingency Plan 15-27
15.7.4 State of California Certified Unified Program Agency 15-27
15.7.5 Roseville Police Department 15-28
15.7.6 Roseville Public Safety Communications 15-28
15.7.7 Roseville Fire Department 15-28
15.8 Scenario 15-31
15.9 Issues 15-31
16. Planning Area Risk Ranking 16-1
16.1 Probability of Occurrence 16-1
16.2 Impact 16-1
16.3 Risk Rating and Ranking 16-3
17. Guiding Principle, Goals and Objectives 17-1
17.1 Guiding Principle 17-1
17.2 Goals 17-1

17.3 Objectives 17-2
18. Mitigation Alternatives 18-1
19. Action Plan and Implementation 19-1
19.1 Hazard Mitigation Action Plan 19-1
19.1.1 Benefit-Cost Review 19-7
19.1.2 Action Plan Prioritization 19-8
19.1.3 Analysis of Mitigation Actions 19-8
19.2 Adoption 19-8
19.3 Plan Maintenance Strategy 19-13
19.3.1 Plan Implementation 19-14
19.3.2 Steering Committee 19-14
19.3.3 Annual Progress Report 19-15
19.3.4 Plan Update 19-15
19.3.5 Continuing Public Involvement 19-16
19.3.6 Incorporation into Other Planning Mechanisms 19-16
References
Glossary

Appendices

Appendix A. Public Outreach Materials
Appendix B. 2015 Progress Report
Appendix C. Steering Committee Participation Documentation

Tables

Table 2-1. Plan Changes Crosswalk 2-3
Table 3-1. Steering Committee Members 3-2
Table 3-2. Summary of Public Meetings 3-7
Table 3-3. Plan Development Chronology/Milestones 3-11
Table 4-1. Presidential Major Disaster, Emergency, and Fire Management Assistance Declarations 4-5
Table 4-2. Roseville Climate 4-6
Table 4-3. Non-Residential Land Uses 4-9
Table 4-4. Non-Residential Development Profile as of July 2016 4-10
Table 4-5. Planning Area Critical Facilities 4-10
Table 4-6. Planning Area Critical Infrastructure 4-10
Table 4-7. General Plan Projections of Residential Units and Population by Specific Plan Area 4-18
Table 4-8. Status of Non-Institutionalized Population with Disabilities 4-20
Table 4-9. Population Under the Poverty Level 4-21
Table 4-10. Legal and Regulatory Capability 4-37
Table 4-11. Administrative and Technical Capability 4-39
Table 4-12. Fiscal Capability 4-39
Table 4-13. National Flood Insurance Program Compliance 4-40

Table 4-14. Education and Outreach 4-40
Table 4-15. Community Classifications 4-41
Table 5-1. Hazus-MH Model Data Documentation 5-6
Table 7-1. Dams in Placer and Sacramento Counties With Potential to impact Roseville 7-4
Table 7-2. Hazard Potential Classification 7-5
Table 7-3. Value of Property Exposed to Dam Failure 7-8
Table 7-4. Critical Facilities in Dam Failure Inundation Areas in Roseville 7-8
Table 7-5. Loss Estimates for Dam Failure 7-9
Table 8-1. City of Roseville Water Supply Contracts and Resources 8-2
Table 8-2. Dry Year Flows into Folsom Lake 8-3
Table 8-3. Water Supply Reliability by 2040 8-11
Table 8-4. City of Roseville Past, Current, and Projected Water Use 8-12
Table 9-1. Richter Magnitude Scale 9-2
Table 9-2. Moment Magnitude Scale 9-2
Table 9-3. Mercalli Scale and Peak Ground Acceleration Comparison 9-3
Table 9-4. NEHRP Soil Classification System 9-4
Table 9-5. Recent Earthquakes Magnitude 5.0 or Larger Within 100-mile radius 9-4
Table 9-6. Critical Facilities Exposed to the Earthquake Hazard 9-13
Table 9-7. Critical Infrastructure Exposed to the Earthquake Hazard 9-13
Table 9-8. Age of Structures in the City of Roseville 9-16
Table 9-9. Building Type 9-16
Table 9-10. Damage Probability (Vulnerability) of Critical Facilities from a 100-Year Earthquake Event 9-18
Table 9-11. Damage Probability (Vulnerability) of Critical Facilities from the Great Valley 3 Scenario 9-18
Table 9-12. Functionality of Critical Facilities, 100-Year Earthquake 9-19
Table 9-13. Functionality of Critical Facilities, Great Valley 3 Scenario 9-19
Table 10-1. Reported Damage from Major Flooding in Roseville (1973 to 2009) 10-4
Table 10-2. Observed Characteristics of Flooding 10-10
Table 10-3. Structures Within the SFHA and the Roseville Regulatory Floodplain 10-12
Table 10-4. Value of Exposed Buildings Within the FEMA SFHA 10-13
Table 10-5. Value of Exposed Buildings Within the Roseville Regulatory Floodplain 10-13
Table 10-6. Critical Facilities in Flood Area 10-14
Table 10-7. Critical Infrastructure in Flood Areas 10-14
Table 10-8. Flood Insurance Statistics for the City of Roseville 10-16
Table 10-9. Estimated Flood Loss for the 10-Year Flood Event (Preliminary FIRM) 10-17
Table 10-10. Estimated Flood Loss for the 100-Year and 500-Year Flood Events (Preliminary FIRM) 10-18
Table 10-11. Estimated Flood Loss for the Regulatory Floodplain 10-18
Table 11-1. Loss Estimates for Buildings Vulnerable to High Landslide Hazard 11-8
Table 11-2. Loss Estimates for Buildings Vulnerable to Moderate Landslide Risk Hazard 11-8
Table 12-1. Monthly Wind Records for Sacramento, California 12-5
Table 12-2. Monthly Dense Fog Occurrence 12-6
Table 12-3. Frequency of Thunderstorms in Sacramento, California, 1948 – 2008 12-6
Table 12-4. Severe Weather Events in Placer County since 1958 (NOAA 2015) 12-8
Table 12-5. Loss Potential for Roseville Buildings Vulnerable to Severe Weather Hazard 12-10
Table 13-1. Wildfire Incident Counts—2011 to 2015 13-8
Table 13-2. Critical Facilities and Infrastructure Adjacent to Potential Wildfire Areas 13-12
Table 13-3. Potential Loss Estimates for the Wildfire Hazard 13-13
Table 15-1. Event Profiles for Terrorism 15-3
Table 15-2. Common Mechanisms for Cyber Attacks 15-6
Table 15-3. Accidents Responded to by McClellan Fire Department, 1950-1980s 15-11

Table 15-4. Traffic Accident Counts—2009 to 2014 15-16
Table 15-7. Criticality Factors 15-21
Table 15-8. Vulnerability Criteria 15-22
Table 15-9. Residential Dwelling Units in the City of Roseville as of 2012 15-23
Table 16-1. Probability of Hazards 16-1
Table 16-2. Impact on People from Hazards 16-2
Table 16-3. Impact on Property from Hazards 16-3
Table 16-4. Impact on Economy from Hazards 16-3
Table 16-5. Hazard Risk Rating 16-3
Table 16-6. Hazard Risk Ranking 16-4
Table 17-1. Objectives for 2011 Multi-Hazard Mitigation Plan 17-2
Table 18-1. Alternatives to Mitigate the Dam Failure Hazard 18-2
Table 18-2. Alternatives to Mitigate the Drought Hazard 18-3
Table 18-3. Alternatives to Mitigate the Earthquake Hazard 18-4
Table 18-4. Alternatives to Mitigate the Flooding Hazard 18-5
Table 18-5. Alternatives to Mitigate the Landslide Hazard 18-6
Table 18-6. Alternatives to Mitigate the Severe Weather Hazard 18-7
Table 18-7. Alternatives to Mitigate the Wildfire Hazard 18-8
Table 18-8. Alternatives to Mitigate Health Hazards 18-9
Table 18-9. Alternatives to Mitigate Human-Cause Hazards 18-9
Table 19-1. Action Plan 19-2
Table 19-2. Prioritization of Mitigation Actions 19-9
Table 19-3. Analysis of Mitigation Actions 19-11

Figures

Figure 3-1. Hazard Mitigation Booth 3-6
Figure 3-2. City of Roseville Earth Day Festival 3-6
Figure 3-3. Hazus-MH Work Station 3-6
Figure 3-4. Sample Printout from Work Station 3-6
Figure 3-5. Twitter Survey Announcement 3-8
Figure 3-6. Facebook Survey Announcement 3-8
Figure 3-7. Nextdoor Survey Announcement 3-8
Figure 3-8. Sample Page from Hazard Mitigation Plan Website 3-9

Figure 4-1. Roseville Planning Area 4-2
Figure 4-2. Total Land Use Allocation in Roseville 4-7
Figure 4-3. Critical Facilities in the Planning Area 4-11
Figure 4-4. Critical Infrastructure in the Planning Area—Transportation 4-12
Figure 4-5. Critical Infrastructure in the Planning Area—Utilities 4-13
Figure 4-6. Placer County and Roseville Population Growth 4-17
Figure 4-7. Planning Area Age Distribution 4-18
Figure 4-8. Planning Area Race Distribution 4-19
Figure 4-9. Industry in the Planning Area 4-21
Figure 4-10. California and Roseville Unemployment Rate (U.S. Census, 2009 – 2014) 4-22
Figure 4-11. Occupations in the Planning Area 4-23

Figure 6-1. Global Carbon Dioxide Concentrations Over Time 6-2

Figure 6-2. Observed and Projected Average Temperatures in the Roseville Area 6-5
Figure 6-3. Projected Future Fire Risk in Placer County Relative to 2010 Levels 6-5

Figure 7-1. Folsom Dam and Folsom Lake on the American River, Looking Northeast 7-6
Figure 7-2. Folsom Dam Containment Dike Failure Flow Direction and Evacuation Routes 7-7

Figure 8-1. Palmer Crop Moisture Index for Week Ending January 30, 2016 8-6
Figure 8-2. Palmer Z Index Short-Term Drought Conditions (December 2015) 8-6
Figure 8-3. Palmer Drought Severity Index (December 2015) 8-7
Figure 8-4. Palmer Hydrological Drought Index Long-Term Hydrologic Conditions (December 2015) 8-8
Figure 8-5. 24-Month Standardized Precipitation Index (January 2013 – December 2015) 8-8

Figure 9-1. Location of Recent Earthquakes in Roseville Vicinity 9-5
Figure 9-2. 100-Year Probabilistic PGA 9-8
Figure 9-3. Concord-Green Valley Fault Scenario PGA 9-9
Figure 9-4. Great Valley 3 Fault Scenario PGA 9-10
Figure 9-5. National Earthquake Hazard Reduction Program Soil Classification 9-11
Figure 9-6. Age of Construction of Structures in Roseville 9-17

Figure 10-1. CRS Communities by Class as of May 1, 2016 10-3
Figure 10-2. Dry Creek Flooding, January 1995 10-6
Figure 10-3. Business Flooding, February 1998 10-7
Figure 10-4. Floodplains 10-9
Figure 10-5. Example of Stream Gauge Graphic Display 10-11
Figure 10-6. Repetitive Loss Area 10-20
Figure 10-7. Floodplain Designation Cross-Sections for Infill Areas 10-23
Figure 10-8. Floodplain Designation Cross-Sections for Areas Other Than Infill Areas 10-23
Figure 10-9. Updated Floodplain Mapping 10-26

Figure 11-1. Deep Seated Slide 11-2
Figure 11-2. Shallow Colluvial Slide 11-2
Figure 11-3. Bench Slide 11-2
Figure 11-4. Large Slide 11-2
Figure 11-5. Typical Debris Avalanche Scar and Track 11-2
Figure 11-6. Roseville Area Landslide Hazard Map 11-5

Figure 12-1. Roseville Regional Surface Elevation 12-1
Figure 12-2. Potential Impact and Damage from a Tornado 12-3
Figure 12-3. Tornado Risk Areas in the Coterminous United States 12-4

Figure 13-1. CAL FIRE FRAP Map for Placer County 13-5
Figure 13-2. View of Ravine, Tree Canopy and Stoneridge Development 13-6
Figure 13-3. Stoneridge Specific Plan Wildfire Threat Areas 13-8
Figure 13-4. Fire Hazard Severity Zones in the Planning Area 13-10
Figure 13-5. City of Roseville Fire Training Center 13-17

Figure 14-1. Areas with Confirmed H5N1 2003-2013 14-2
Figure 14-2. 2014 Distribution of Ebola Virus Outbreaks in Humans and Animals 14-4
Figure 14-3. California 2014 *Yersinia Pestis* Results in Tested Mammals by County 14-6

Figure 15-1. Pop-Up Message Indicating Ransomware Infection 15-6
Figure 15-2. February 12, 2006 Aircraft Crash into Residence 15-12
Figure 15-3. October 21, 2010 Arson Fire at Galleria Mall 15-13
Figure 15-4. 1973 Roseville Rail Yard Disaster 15-14

Figure 15-5. 1997 Bomb Discovery 15-15
Figure 15-6. The J.R. Davis Yard in Roseville, the Largest Train Yard West of the Mississippi..... 15-17
Figure 15-7. Roseville Truck Routes with High Potential for Hazardous Materials Incidents 15-18
Figure 15-8. Kinder Morgan National Pipeline Map 15-19
Figure 15-9. Roseville Civic Center..... 15-24

Figure 19-1. Resolution Adopting the Roseville Hazard Mitigation Plan..... 19-12

ACKNOWLEDGMENTS

City of Roseville

Rob Jensen, City Manager
Wayne Wiley, Associate Planner
Jason Rizzi, Roseville Fire Department
Carl Walker, Senior Civil Engineer
Helen Dyda, Marketing & Communications Analyst

Consultants

Rob Flaner, CFM, Lead Project Planner, Tetra Tech, Inc.
Carol Baumann, Hazus/GIS lead, Tetra Tech, Inc.
Jessica Cerutti, CFM, Planner, Tetra Tech, Inc.
Stephen Veith, GIS Analyst, Tetra Tech, Inc.

Stakeholders

Erik Angle, Sutter Roseville Medical Center
Michael Algots, Union Pacific Railroad
Rick Stalker, Placer County Association of Realtors

Special Acknowledgments

The development of this Plan would not have been possible without the dedication and commitment to this process by the Roseville Hazard Mitigation Plan Steering Committee. The dedication of this volunteer committee to allocate their time to this process is greatly appreciated. Also, the citizens of Roseville are commended for their participation in the outreach strategy identified by the Steering Committee. This outreach success will set the course to the successful implementation of this Plan during its next performance period.

- Grace Keller
- Wayne Wiley
- Rob Jensen
- Jason Rizzi
- Carl Walker
- Helen Dyda
- Erik Angle
- Brenette Macintosh
- Mark Lacher
- Jaime Garrett
- Joseph Van Zant
- Rod Rodriguez
- Rick Stalker
- Michael Algots
- Jim Williams

EXECUTIVE SUMMARY

The Disaster Mitigation Act (DMA; Public Law 106-390) is the latest federal legislation enacted to encourage and promote proactive, pre-disaster planning as a condition of receiving financial assistance under the Robert T. Stafford Act. The DMA emphasizes planning for disasters before they occur. Under the DMA, a pre-disaster hazard mitigation program and new requirements for the national post-disaster hazard mitigation grant program were established.

The DMA encourages state and local authorities to work together on pre-disaster planning and it promotes sustainability as a strategy for disaster resistance. The intent is three-fold:

- To gather hazard, vulnerability, and mitigation information at the local level for use in state-level planning
- To ensure that state and local hazard mitigation planning is coordinated to the greatest extent practical
- To ensure that local jurisdictions are made aware of the hazards and vulnerabilities within their jurisdiction and to develop strategies to reduce those vulnerabilities.

This process ensures that mitigation actions are based on sound planning processes that account for the risks and capabilities of California communities. "Sustainable hazard mitigation" includes the sound management of natural resources, local economic and social resiliency, and the recognition that hazards and mitigation must be understood in the largest possible social and economic context. The enhanced planning network called for by the DMA helps local governments articulate accurate needs for mitigation, resulting in faster allocation of funding and more cost-effective risk reduction projects.

Using this initiative as a foundation for proactive planning, the City of Roseville has developed and maintained a hazard mitigation plan in an effort to reduce future loss of life and property resulting from disasters. It is impossible to predict exactly when and where disasters will occur or the extent to which they will impact the City. However, with careful planning and collaboration among public agencies, stakeholders, and citizens, it is possible to minimize losses that can occur from disasters.

Hazard mitigation is a way to reduce or alleviate the loss of life, personal injury, and property damage that can result from a disaster through long- and short-term strategies. It involves strategies such as planning, policy changes, programs, projects, and other activities that can mitigate the impacts of hazards on the City of Roseville. The responsibility for hazard mitigation lies with many, including private property owners; business and industry; and local, state, and federal government.

PLAN UPDATE

Federal regulations stipulate that hazard mitigation plans must describe the method and schedule for monitoring, evaluating, and updating the Plan. Prescribing an update schedule establishes an opportunity to reevaluate recommendations, monitor the impacts of actions that have been accomplished, and determine if there is a need to change the focus of mitigation strategies. DMA compliance is contingent on meeting the plan update requirement. A jurisdiction covered by a plan that has expired is not able to pursue elements of federal funding afforded under the Robert T. Stafford Act for which a current hazard mitigation plan is a prerequisite. The California Office of

Emergency Services (Cal OES) reviews all local hazard mitigation plans in accordance with DMA 2000 regulations and coordinates with local jurisdictions to ensure compliance with state requirements and the Code of Federal Regulations (Title 44 Section 201.6). Once Cal OES planning staff find the local hazard mitigation plan to be approvable, the Plan is forwarded to mitigation planning staff at Region IX of the Federal Emergency Management Agency (FEMA). FEMA performs final review and designates compliant plans as "approved pending adoption."

The City of Roseville used the plan update process to comprehensively revise its initial hazard mitigation plan, which was adopted in 2005. Due to the success of the initial plan, no major changes were made to the plan's approach and function. The subsequent 2011 Plan was enhanced using recent best available data and technology, especially in the risk assessment. For this 2016 planning effort, the enhanced format of the 2011 Plan has been retained in order to ensure the consistency of discussion points on each hazard of concern and address required elements for plan updates. The Plan update followed the same basic planning process as was followed under the initial effort and subsequent update. A Steering Committee was once again the critical component in the process. The Steering Committee consisted of 14 members of the community representing the public, private industry, and government. The Steering Committee met six times between November 2015 and August 2016 to provide recommendations and support throughout the planning process.

PLAN UPDATE METHODOLOGY

Development of the hazard mitigation plan included five phases:

- Phase 1—Organize resources
- Phase 2—Update the risk assessment
- Phase 3—Engage the public
- Phase 4—Assemble the updated Plan
- Phase 5—Plan adoption

Phase 1—Organize Resources

The City hired Tetra Tech, Inc. as a consultant to assist with development and implementation of the 2016 Plan. The Tetra Tech project manager assumed the role of the lead project planner and reported directly to a City project manager. Once the technical assistance was secured, a planning team was formed to lead the planning effort. The Steering Committee that oversaw the development of the initial plan remained intact during the initial performance period of the Plan and then provided oversight for the 2016 Plan. For the update process, some new members were added and some previous members left the committee. The planning team facilitated each Steering Committee meeting, which addressed a set of objectives based on the work plan established for the update. The Steering Committee met six times from November 2015 through August 2016. Coordination with other local, state and federal agencies involved in hazard mitigation in the region helped to ensure consistency with other ongoing efforts.

One of the Steering Committee's first action items was to review the State of California Hazard Mitigation Plan, the Roseville 2011 Hazard Mitigation Plan and all of the progress reports completed since the 2011 Plan. The Steering Committee identified hazards listed in the state plan to which Roseville is susceptible, in order to determine if there was a need to expand the scope of the risk assessment. Each annual progress report for the initial plan contains a section that recommends changes or enhancements to the Plan or plan development process. These reports effectively completed a key step of the plan update process before the update process began—identifying needs for changes or enhancements.

Phase 2 —Update the Risk Assessment

Federal planning guidance specifies comprehensive updates to the risk assessment portion of local hazard mitigation plans if there have been new technical data pertaining to a hazard developed by a creditable source since the Plan's previous development. Updated risk assessment efforts for the 2016 Plan included the following:

- The latest version of the Federal Emergency Management Agency's Hazus-MH risk assessment software was used to enhance the risk assessments for flood, dam failure and earthquake.
- All hazards of concern were updated with new relevant data.
- The Hazus default general building stock was updated using current address point, building footprint, parcel and tax assessor data.

Phase 3—Engage the Public

The Steering Committee drafted a comprehensive public involvement strategy for this update using multiple media sources. This strategy was built upon the Steering Committee's previous public engagement strategy and enhanced with social media and non-traditional outreach initiatives not regularly employed during the previous planning processes. The planning team identified stakeholders to target through the multi-disciplinary public involvement strategy.

Phase 4—Assemble the Updated Plan

The base format of the 2011 Plan was maintained in the 2016 Plan. However, enhancements were made to include the following components:

- The update describes the process used to review and analyze each section of the Plan.
- The update provides a discussion on how the public was kept apprised of the Plan's actions during the initial performance period.
- The update describes the need for changes to the risk assessment and what changes were made from the previous update.
- The update describes changes to risk exposure due to either of the following:
  - Successful mitigation projects
  - Changes in land use due to annexation or new development.
- The update describes changes to the action plan and the reasons for them.
- The update identifies completed, deleted, or deferred actions or activities from the previously approved plan as a benchmark for progress in the form of the 2015 Progress Report located in Appendix B. It also includes in its evaluation and prioritization new mitigation actions identified since the previous plan

Phase 5—Plan Adoption/Implementation

This Plan details a formal process for implementing and maintaining the Plan so that it remains an active and relevant document. The plan maintenance process includes a schedule for monitoring and evaluating the Plan's progress annually and producing a plan revision every five years. This process seeks to keep a steering body that meets the criteria of the original steering committee intact to perform this annual review. This phase includes strategies for continued public involvement and incorporation of the recommendations of this Plan into other planning mechanisms of the City, such as the comprehensive plan, capital improvement plan, building code, and development design guidelines.

MITIGATION GUIDING PRINCIPLE, GOALS, AND OBJECTIVES

Guiding Principle

The following guiding principle was identified for this hazard mitigation plan:

> Through community partnerships, establish a plan to reduce vulnerability to hazards in order to protect the health, safety, welfare, and economy of the City.

Goals

The Steering Committee established the following goals for the Plan update:

- G-1: Protect lives and reduce injury.
- G-2: Promote hazard mitigation as an integrated policy.
- G-3: Protect the continuity of local government to ensure no significant disruption of services during or due to a disaster.
- G-4: Improve community emergency management preparedness, collaboration and outreach.
- G-5: Minimize or reduce damage to property, including critical facilities.
- G-6: Develop and implement mitigation strategies that optimize public funds in an efficient and cost-effective way.
- G-7: Monitor and support the natural environment's capacity to deal with the impacts of natural hazards, taking into account the potential impacts of global climate change.

Objectives

Plan objectives were developed via a facilitated exercise that focused on finding objectives that meet multiple goals. During this exercise, Steering Committee members were requested to review the 2011 objectives in addition to newly proposed objectives. The selected objectives are listed in Table ES-1.

Table ES-1. Objectives for 2016 Multi-Hazard Mitigation Plan

Objective Number	Objective Statement	Goals for which it can be applied
O-1	Consider the impacts of hazards on future land uses in the City of Roseville by coordinating with other planning mechanisms such as the General Plan and land-use code development.	1, 2, 5, 7
O-2	Protect and sustain reliable local emergency operations and communication facilities during and after disasters.	1, 3, 4
O-3	Develop new or enhance existing early warning response systems and plans.	1, 3, 4, 5
O-4	Seek to enhance emergency response capabilities through improvements to infrastructure and City programs.	1, 4, 5
O-5	Enhance the understanding of all present and future hazards that impact the City of Roseville and the risk they pose.	1, 3, 4, 5, 7
O-6	Seek mitigation projects that provide the highest degree of hazard protection at the least cost.	1, 5, 6
O-7	Seek to update information on natural, environmental, and human-caused hazards, vulnerabilities, and mitigation measures by coordinating planning efforts and creating partnerships with appropriate local, private, county, state, and federal agencies.	1, 2, 3, 4, 5, 7
O-8	Seek to implement codes, standards, and policies that will protect life and property, including natural habitat, from the impacts of hazards within the City of Roseville.	1, 2, 3, 5, 6
O-9	Educate the public on preparedness for and mitigation of potential impacts of hazards on the City of Roseville.	1, 2, 4
O-10	Support efforts to retrofit, purchase, or relocate structures in high hazard areas, including those known to be repetitively damaged.	3, 5, 6

MITIGATION ACTION PLAN

The hazard mitigation action plan is a key element of this Plan. It is through the implementation of this action plan that the City of Roseville can strive to become disaster-resilient through sustainable hazard mitigation. This action plan includes an assessment of the capabilities of the City to implement hazard mitigation actions, a review of alternatives, a prioritization schedule, and a mitigation strategy matrix that identifies the following:

- Description of recommended actions
- Hazards addressed
- Objectives addressed
- Lead implementation agency (or agencies)
- Estimated benefits
- Estimated costs
- Timeframe for implementation
- Funding sources

For the purposes of this document, mitigation actions are defined as activities designed to reduce or eliminate losses resulting from the impacts of natural hazards of concern. Table ES-2 summarizes the hazard mitigation actions identified by this Plan update.

IMPLEMENTATION

Full implementation of the recommendations of this Plan will require time and resources. This Plan reflects an adaptive management approach in that specific recommendations and plan review protocols are provided to evaluate changes in vulnerability and action plan prioritization after the Plan is adopted. Funding resources are always evolving, as are requirements under state or federal mandates, and the true measure of the Plan's success will be its ability to adapt to the ever-changing climate of hazard mitigation.

Roseville has a long-standing tradition of progressive, proactive response to issues that may impact its citizens. This tradition is reflected in the development of this Plan. The Roseville City Council will assume responsibility for adopting the recommendations of this Plan and committing City resources toward its implementation. The City's track record in the mitigation of hazards impacting its citizens is exemplary. The framework established by this Plan will help maintain this tradition in that it identifies a strategy to maximize the potential for implementation based on available and potential resources. It commits the City to pursue actions when the benefits of a project exceed its costs. Most important, the City developed this Plan with extensive public input, which sets the stage for acceptance of the actions recommended for implementation in this Plan.

Table ES-2. Hazard Mitigation Action Plan Matrix

Action Number and Description	Timeframe
DAM FAILURE	
DF-1—Create a dam failure element for the City's emergency response plan that includes a phased warning protocol in response to the findings of the Folsom Dam Containment Dike Risk Assessment.	Short-term
DROUGHT	
D-1—Perform a groundwater recharge feasibility study to determine the most cost-effective way to replenish groundwater resources within Roseville.	Ongoing
D-2—Implement aquifer storage and recovery program that uses direct injection technique in areas identified as appropriate.	Ongoing
D-3—Continue to implement the Environmental Utility Department's recycled water program and seek all opportunities to expand its coverage, focusing first on the Sunset Industrial area. The City pumps recycled water through a system of purple pipes completely separate from potable (drinking water) pipes. The City pumps the recycled water to customers such as streetscapes, golf courses and parks, where it irrigates turf and shrubs. Using recycled water for uses such as landscape irrigation reduces demand on the potable water system, creating a more reliable water supply for the entire City. Recycled water is not subject to the effects of drought.	Ongoing
D-4—Promote active water conservation techniques and strategies to private property owners through Roseville-sponsored outreach projects such as printed media and the City's website.	Ongoing
EARTHQUAKE	
EQ-1—Perform building-specific, structural seismic vulnerability assessment of City-owned critical facilities constructed prior to 1980 (including infrastructure). Included in this assessment will be recommended mitigation alternatives that meet goals and objectives of this Plan.	Short-term; Ongoing
EQ-2—Incorporate earthquake mitigation measures for private property into existing City-sponsored outreach programs such as printed media and the City's website.	Short-term
EQ-3—Reassess the overall vulnerability to the earthquake hazard using the best available science and technology as it becomes available. State-sponsored programs, Seismic Hazards Mapping Act, and future FEMA-sponsored initiatives are anticipated to create a wealth of knowledge regarding this hazard that did not exist during the preparation of this Plan update	Short-term; Ongoing
FLOOD	
F-1—The City shall designate all areas identified as the 100-year floodplain. The boundaries of the 100-year floodplain shall be as specified in the floodplain designations section of this component of the City's general plan. Floodplain areas shall be preserved as specified in the open space and conservation element. Such preservation may include required dedication to the City. If needed, modify the City's ordinances to include floodplain use regulations consistent with the goals, policies, and implementation measures of the safety, land use, open space and conservation, and parks and recreation elements of the City's general plan.	Ongoing
F-2—Refer any development proposal that has a direct or indirect impact on flood protection to Public Works for comment. In addition, forward such proposals to other agencies as applicable, including the U.S. Army Corps of Engineers, California Reclamation Board, FEMA, California Department of Fish and Wildlife, Placer County Resource Conservation District, and Placer County Flood Control District. Consider the comments of the agencies during the development review process.	Ongoing
F 3—Continue City participation in the National Flood Insurance Program and the Community Rating System (CRS). Maintain the City's current CRS status as the nation's only Class 1 CRS community.	Ongoing
F 4—Maintain Roseville's compliance and good standing under the National Flood Insurance program	Ongoing
F 5—Continue the City's outreach program to flood-prone property owners and the citizens of Roseville to program is to help make them aware of the flood threat and how best to deal with them.	Ongoing
F 6—Continue to pursue a regional approach to flood issues by remaining actively involved in the Placer Co Flood Control District. This involvement includes cooperation in the development of a comprehensive regional database. Continue to participate in regional flooding studies, including the Auburn Creek/Coon Creek/Pleasant Grove Creek flood mitigation plan and the Dry Creek watershed flood control plan.	Ongoing

Action Number and Description	Timeframe
F 7—Continue City coordination with other agencies on issues of flood control. Coordination between the City and adjacent jurisdictions occurs through several mechanisms, including distribution of development proposals for review and comment. Continue City cooperation with federal, state, and local agencies, including the U.S. Army Corps of Engineers, California Reclamation Board, FEMA, California Department of Fish and Wildlife, Placer County Resource Conservation District, and Placer County Flood Control District.	Ongoing
F 8—Continue to develop, implement, and expand the Flood Alert and Early Warning Program systems and integrate the systems with other local jurisdictions to form a regional warning program.	Ongoing
F 9—Ensure that future specific plans and specific plan amendments are consistent with the goals and policies of the general plan. The specific plans shall include the designation and preservation of floodplain areas and adjacent habitat. Provisions shall be incorporated to ensure that public infrastructure, utilities, and emergency services remain functional during flood conditions. Such infrastructure and facilities include water, sewer and gas mains, telephone and electric lines, streets and bridges, hospitals, and fire and police stations. Financing mechanisms shall be explored to fund necessary flood protection improvements and maintenance. Development agreements may be used to secure implementation and funding provisions. (Specific plans have 100% cost recovery by developers).	Short -term
F 10—Monitor and regularly update City flood studies, modeling, and associated land use, zoning, and other development regulations at a minimum of every 5 years or whenever information becomes available that would significantly modify previous data. New information could include new studies, change in City policy, consideration of a major development project or specific plan, or implementation of a flood control project.	Short-term; Ongoing
F 11-Require a master drainage plan as part of the approval process for all specific plans and large development projects as determined by the Public Works director. The master drainage plan should consider cumulative regional drainage and flooding mitigation. The plan's intent is to ensure that the overall rate of runoff from a project does not exceed predevelopment levels. If necessary, this objective shall be achieved by incorporating run-off control measures to minimize peak flows and/or assistance in financing or otherwise implementing comprehensive drainage plans.	Short-term
F-12—Continue the Department of Parks, Recreation and Libraries' regular creek maintenance program within the City's creeks and floodplain areas. This program clears and removes debris that could contribute to blockage and flooding and may include the removal of silt. This is only done in areas of high risk to flood damage or where property or facilities are threatened by flooding.	Ongoing
F 13—Continue annual inspection and maintenance program of City storm drain systems. Review after every major storm system function and performance. This program removes debris that could contribute to blockage of the storm drain system.	Ongoing
F 14—Complete the final two phases of the Cirby/Linda/Dry Creek flood control project (Phase 1 and 2). Five of the seven phases of this project have been completed at a cost of about $18,000,000. The basis for determining viability of this project will be a benefit /cost analysis to determine if project meets federal grant eligibility requirements.	Long-term
F 15—Analyze alternative improvements to the Cirby/Linda/Dry Creek flood control project that may be cost effective in the flood-prone areas of Roseville: • Dry Creek from Darling Way to Riverside Avenue • Area on Dry Creek upstream of Folsom Road in the Columbia Avenue/Marilyn Avenue/Bonita Street area • Linda Creek near Samoa Way/Hurst Way area • Cirby Creek in the Trimble Way/Zien Court area	Long –term; depends on funding
F 16—Replace the Huntington Drive/Cirby Creek culvert with a bridge to protect Queens Court/Huntington Drive area. This project is overseen by Public Works department.	Long-term; depends on funding
F 17—Divert the main drainage storm drain system down Crestmont Avenue to Cirby Way and then into Dry Creek so that the existing system will not exceed capacity. If system capacity is exceeded, the intersection on Cirby Way and Crestmont Avenue and nearby homes will flood during major flood events.	Short-term
F 18—Continue to promote and sponsor programs to buy out, relocate, and flood-proof existing flood-prone structures within Roseville.	Long-term; depends on funding
F-19—Implement recommendation of Downtown Roseville Specific Plan to relocate the Public safety Building.	Long-term
F-20—Retrofit the City's Downtown library by sealing the exterior and installing a flood door to protect against flood damage should Dry Creek overspill the existing floodwall.	Short-term; Ongoing

Action Number and Description	Timeframe
F-21—Continue the Tree Mitigation Fund program administered by the Open Space Division in conjunction with non-profit organizations. The planting of oak trees in the open spaces adjacent to riparian zones increases infiltration and slows storm water surges.	Ongoing
F-22—Manage beaver dam sites for flood control protection and habitat restoration after dam removal. One primary issue is impacts to floodwater capacity of creeks. Part of the desired comprehensive approach to beaver management includes establishment of quantitative and qualitative "carrying capacity," including acre-feet of flood capacity lost. Implement a standard monitoring and reporting process to track beaver dam locations, population, and impacts. Gain regulatory approval for beaver management techniques such as biological control and habitat manipulation using the most benign options first.	Ongoing
F-23 – Develop the City's multi-use, multi-benefit stormwater retention project within the Pleasant Grove Creek Watershed, the Reason Farms Stormwater Retention Project.	Long-term
LANDSLIDE	
LS-1—Once California Geological Survey completes soils mapping for the Roseville vicinity under the Seismic Hazards Mapping Act, reassess landslide hazard using best available data to gauge the true vulnerability to this hazard.	Long-term
LS-2—Continue to implement policies adopted by the general plan that promote open space land uses within identified steep slope areas of Roseville. The City of Roseville Northeast Roseville Specific Plan and Stoneridge Specific Plans include the identified steep slope areas within Roseville. Both Plan Areas have continuing development. When individual projects are submitted,	Ongoing
SEVERE WEATHER	
SW-1—Continue the Shade Tree Program, an energy conservation rebate program provided by Roseville Electric	Ongoing
SW-2—Continue ongoing line clearing and weed abatement of electrical utilities to reduce exposure to severe weather hazards.	Ongoing
SW-3—Continue education/outreach programs to improve winter preparedness and minimize loss of life or injury.	Short-term, ongoing
SW-4—Enhance and implement strategies for debris management and removal during severe weather events.	Ongoing
SW 5-Continue to operate the Roseville Energy Park to support the City's electrical requirements and maintain service continuity during severe weather events.	Ongoing
SW 6-Take over ownership and operation of the Roseville Combustion Turbines from Northern CA Power Agency to support the City's electrical requirements and maintain service continuity during severe weather events.	Ongoing
WILDFIRE	
WF-1—Continue "Goat Grazing" program for removal of grassland in areas of Roseville potentially vulnerable to wildfire. Implement goat grazing in City open space and preserve areas for fire and invasive plant species management and native plant restoration.	Ongoing
WF-2—Enhance existing City public outreach programs to include information on fire safety, defensible spaces, and areas of concern.	Short-term; Ongoing
MULTIPLE HAZARDS	
MH-1—Continue to maintain Cal OES certification of all City inspectors for post-disaster damage assessment.	Ongoing
MH-2—Continue to maintain the hazard mitigation page on City website that provides following types of information: • The Hazard Management Plan and its progress reports • Hazard-specific information • Mitigation information by hazard, with specific emphasis on private property • Emergency response and warning information • Links to county, state, and federal related agencies	Ongoing

Action Number and Description	Timeframe
MH-3—Establish/maintain a post-disaster action plan to be part of the City Emergency operations plan that will include following elements: • Procedures for public information • Post-disaster damage assessment • Grant writing • Code enforcement • Redundant operations	Ongoing
MH-4—Implement an "Adopt an Open Space" program in coordination with the open space management program. Develop "adoption contracts" with neighborhoods, organizations, businesses, etc., describing the level of stewardship and the terms of the "adoption." Publicize these activities through online resource directory and other media to encourage participation.	Long--term
MH-5—Develop and disseminate best practices information to private property owners whose land is adjacent to open space areas describing stewardship opportunities and owners' role in preserving beneficial uses of open space areas (including vernal pool grassland and creek or riparian uses). Offer classes to provide in-depth information, such as demonstration projects, techniques for ecologically friendly weed abatement and vegetation control, and creating a backyard habitat compatible with open space areas.	Short-term; Ongoing
MH-6—Work with the Roseville City School District, local high school districts, and non-profit organizations to promote ecology-oriented curricula and stewardship activities. Identify resource and administrative barriers that may be limiting schools' abilities to more actively participate in stewardship, and work collaboratively to identify solutions.	Short-term; Ongoing
MH 7—Strive to maintain high availability of essential communication services	Ongoing
MH 8-Secure the City's physical locations that contain technology infrastructure	Ongoing
HUMAN-CAUSED	
HC 1-Commit support to initiatives within the Sacramento-Roseville-Arden-Arcade Metropolitan Statistical Area; continue to seek funding from other federal sources to fund its initiatives	Short-term
HC-2—Enhance emergency response capability of City by contingency planning for specific events based on identified vulnerabilities.	Short-term, ongoing
HC-3— Seek to establish appropriate staffing levels of public safety personnel to address vulnerabilities identified through an incremental targeted study that provides immediate needs as well as anticipated needs in 1 year, 5 years, and 10 years.	Short Term; depends on funding
HC-4—Prepare a site-specific vulnerability assessment of City-owned critical facilities that use the best available science and technology with regards human-caused hazards.	Long-term
HC-5—Address vulnerabilities identified in vulnerability assessment of water facilities performed by Environmental Utilities Department in response to EPA initiative.	Long-term
HC 6-Maintain compliance with California Energy Commission license conditions for the operations of the Roseville Energy Park with respect to Hazardous Material Management	Ongoing
HC 7-Establish and maintain compliance with state and local laws and regulations for the operation of the Roseville Combustion Turbines upon transfer of ownership from Northern CA Power Agency to City.	Ongoing
HC-8-Maintain compliance with North American Electric Reliability Corporation mandatory reliability standards related to plant operation, sabotage reporting and critical infrastructure protection (cyber security.	Ongoing
HC 9—Protect the City's data, technology infrastructure and staff against Cyber terrorism such as but not limited to: • Identity Theft • Virus/Malware/Ransomware/Spyware/Spam/Phishing • Network and system attacks • Web site hacking	Short Term; depends on funding
HC-10: Improve evacuation transportation routes within the City of Roseville by removing traffic constrictions.	Long-term
HUMAN HEALTH	
HH-1—Continue to collaborate with the Placer County Health Department to ensure the health and welfare of the community	Ongoing

Action Number and Description	Timeframe
HH-2—Support the public education efforts of the Placer County Health Department and the Placer Mosquito Abatement District	Ongoing
HH-3—Collaborate with the Placer County Mosquito Abatement District to review resource protection policies that conflict with human health protection in the City of Roseville and work to resolve these policy issues	Short-term; Ongoing

Part 1. Planning Process and Community Profile

1. INTRODUCTION TO HAZARD MITIGATION PLANNING

1.1 WHY PREPARE THIS PLAN?

1.1.1 The Big Picture

Hazard mitigation is defined as any action taken to reduce or alleviate the loss of life, personal injury, and property damage that can result from a disaster. It involves long- and short-term actions implemented before, during and after disasters. Hazard mitigation activities include planning efforts, policy changes, programs, studies, improvement projects, and other steps to reduce the impacts of hazards.

For many years, federal disaster funding focused on relief and recovery after disasters occurred, with limited funding for hazard mitigation planning in advance. The Disaster Mitigation Act (DMA; Public Law 106-390), passed in 2000, shifted the federal emphasis toward planning for disasters before they occur. The DMA requires state and local governments to develop hazard mitigation plans as a condition for federal disaster grant assistance. Regulations developed to fulfill the DMA's requirements are included in Title 44 of the Code of Federal Regulations (44 CFR).

The responsibility for hazard mitigation lies with many, including private property owners, commercial interests, and local, state and federal governments. The DMA encourages cooperation among state and local authorities in pre-disaster planning. The enhanced planning network called for by the DMA helps local governments articulate accurate needs for mitigation, resulting in faster allocation of funding and more cost-effective risk-reduction projects.

The DMA also promotes sustainability in hazard mitigation. To be sustainable, hazard mitigation needs to incorporate sound management of natural resources and address hazards and mitigation in the largest possible social and economic context.

1.1.2 Roseville's Response to the DMA

Roseville has a long-standing reputation as a national leader in risk reduction through proactive mitigation. This reputation has been built through innovative planning and a commitment to protecting its citizens from the impacts of natural disasters. Embracing the goals of the DMA, Roseville created an initial hazard mitigation plan that became a model nationally and has been touted by the Federal Emergency Management Agency (FEMA) as a "mitigation success story." The *City of Roseville Hazard Mitigation Plan* was adopted by the Roseville City Council on July 20, 2005, and was formally approved by FEMA Region IX on August 10, 2005. The initial plan was developed with the following objectives:

- Meet or exceed program requirements specified under the DMA, thereby enabling the City of Roseville to continue using federal grant funding to reduce risk through mitigation.
- Meet not only state and federal requirements but also the needs of the City (this Plan addresses human-caused hazards, which are not required to be addressed under the DMA).
- Develop the Plan according to FEMA's Community Rating System (CRS) guidelines so that Roseville can meet requirements to become the nation's first CRS Class 1 community.

- Create a risk assessment that focuses on the City of Roseville hazards of concern.
- Coordinate existing plans and programs so that high-priority actions and projects to mitigate possible disaster impacts are funded and implemented.

The initial plan was developed according to the requirements of 44 CFR, qualifying the City to pursue funding under the Robert T. Stafford Act. The City has achieved numerous objectives identified in the Plan. Local hazard mitigation plans must be regularly updated to comply with the DMA. The City responded to this requirement with a plan update process that resulted in the 2011 Multi-Hazard Mitigation Plan, and now this 2016 Multi-Hazard Mitigation Plan.

This hazard mitigation plan update identifies resources, information, and strategies for reducing risk from natural hazards. Elements and strategies in the Plan were selected because they meet a program requirement and because they best meet the needs City residents. The Plan will help guide and coordinate mitigation activities throughout the planning area. It also will meet the planning requirements of the CRS, allowing the City of Roseville to maintain its CRS Class 1 rating.

1.2 WHO WILL BENEFIT FROM THIS PLAN?

All residents and businesses of the City of Roseville are the ultimate beneficiaries of this hazard mitigation plan update. The Plan reduces risk for those who live in, work in, and visit the City. It provides a viable planning framework for all foreseeable natural hazards. Participation in development of the Plan by key stakeholders helped ensure that outcomes will be mutually beneficial. The Plan's goals and recommendations can lay groundwork for the development and implementation of local mitigation activities and partnerships.

1.3 CONTENTS OF THIS PLAN

This hazard mitigation plan is organized into three primary parts:

- Part 1—Planning Process and Community Profile
- Part 2—Risk Assessment
- Part 3—Mitigation Strategy.

Each part includes elements required under federal guidelines. DMA compliance requirements are cited at the beginning of subsections as appropriate to illustrate compliance.

The following appendices provided at the end of the Plan include information or explanations to support the main content of the Plan:

- Appendix A—Public outreach information used in preparation of this update
- Appendix B—The 2015 Progress Report.

2. PLAN UPDATE—WHAT HAS CHANGED

2.1 THE PREVIOUS PLAN

Several factors initiated the first hazard mitigation planning effort for the City of Roseville:

- The Roseville area has significant exposure to numerous natural hazards that have caused millions of dollars in past damage.
- Limited local resources make it difficult to be pre-emptive in risk reduction actions. Being able to leverage federal financial assistance is paramount to successful hazard mitigation in the area.
- The City wanted to be proactive in its preparedness for natural hazards.

With these factors in mind, the City of Roseville committed to the preparation of its initial plan by attaining grant funding for the effort and then securing technical assistance to complete a planning process that complied with all requirements. Five years later, the City followed a similar process to update the Plan.

Due to the success of the 2005 effort, no major changes were made to the Plan's approach and function during the 2011 planning process. The 2011 update enhanced the 2005 effort but remained consistent on discussion points for each hazard of concern. The 2011 Plan format changed to address required elements for plan updates. A major addition to the 2011 Plan, per recommendations from FEMA Region IX, was the inclusion of dam failure as a hazard of concern.

The 2011 Plan update followed a phased approach to planning per FEMA's July 2008 *Local Hazard Mitigation Planning Guidance*.

2.2 MITIGATION SUCCESS STORIES

One of the principal objectives of the initial plan was to create a plan that would help the City achieve the highest possible rating under FEMA's Community Rating System (CRS) program. The CRS program has stringent requirements for Classes 4 or better, and especially for Class 1. Several of these requirements are related to planning, and the initial plan was developed to meet these requirements. The Insurance Services Office (ISO), which performs classification reviews for the CRS, determined that the initial plan met the Class 1 requirements. In December 2005, the City was verified with sufficient credit to become the nation's first and only CRS Class 1 community. This classification went into effect on October 1, 2006, and was confirmed again during the re-verification process in 2008, and most recently in 2014. As of the writing of this Plan, the City of Roseville maintains its status as the nation's only CRS Class 1 community.

Detailed accounts of other successful mitigation actions completed by the City during each reporting period are included in the progress reports on the previous hazard mitigation plan, including the 2015 Progress Report contained in Appendix B of this Plan.

2.3 WHY UPDATE?

2.3.1 Federal Eligibility

Under 44 CFR, hazard mitigation plans must present a schedule for monitoring, evaluating, and updating the Plan. This provides an opportunity to reevaluate recommendations, monitor the impacts of actions that have been accomplished, and determine if there is a need to change the focus of mitigation strategies. A jurisdiction covered by a plan that has expired is not able to pursue elements of federal funding under the Robert T. Stafford Act for which a current hazard mitigation plan is a prerequisite.

2.3.2 Changes in Development

Hazard mitigation plan updates must be revised to reflect changes in development within the planning area during the previous performance period of the Plan (44 CFR Section 201.6(d)(3)). The Plan must describe changes in development in hazard-prone areas that increased or decreased vulnerability since the last plan was approved. If no changes in development impacted the jurisdiction's overall vulnerability, then plan updates may validate the information in the previously approved plan. The intent of this requirement is to ensure that the mitigation strategy continues to address the risk and vulnerability of existing and potential development and takes into consideration possible future conditions that could impact vulnerability.

The Roseville planning area experienced a 31-percent increase in population between 2003 and 2013, an average annual growth rate of 3.1 percent per year (Placer County Office of Economic Development, 2014). The City has adopted a comprehensive plan that governs land-use decisions and policy-making, as well as a building code and specialty ordinances based on state and federal mandates. This Plan update assumes that some new development triggered by the increase in population occurred in hazard areas. Because all such new development would have been regulated pursuant to local programs and codes, it is assumed that vulnerability did not increase even if exposure did.

2.4 THE UPDATED PLAN—WHAT IS DIFFERENT?

The updated Plan differs from the initial plan in a variety of ways:

- **Climate Change Impacts—**The most recent version of the California hazard mitigation plan noted specific hazards that are created or augmented by the environmental impacts of climate change. Additionally, the recent passage of Senate Bill 379 brings the effects of climate change into focus as it relates to mitigation and general planning. As a result, instead of briefly reviewing the impact of climate change in each individual hazard profile, this 2016 Plan update dedicates a comprehensive chapter to the issue of climate change and its effects on the state-identified climate-related hazards.
- **Drought Chapter Enhancements—**Enhancements to the drought Chapter were made to reflect current, historic drought conditions of the stat, region, and city. This information was supplemented with new information provided by the City's 2015 Urban Water Management Plan (UWMP) update.
- **Public Engagement Enhancements through Social Media —**Social media platforms not available during the previous planning initiative were used to enhance public outreach capabilities.
- **Planning Area Changes—**The City adopted 3 new Specific Plans since the previous plan update. As such, all development and demographic information will include data pertaining to these new Specific Plan Areas of Sierra Vista, Creekview, and Amaruso Ranch.
- **Separation of Natural from Non-natural Hazards—**In an effort to draw distinction from the natural hazards from the non-natural hazards, the non-natural hazards (Human Caused and Human Health Hazards) are placed after the natural hazards instead of listed alphabetically with the natural hazards.

- **Human-Caused Hazards—**The human-caused hazards noted in the 2011 effort were updated for the 2016 Plan. These human-caused hazards were moved within the document to after the natural hazards due to the difference in assessing risk. Cyber threat was included as a new human-caused hazard, due to the increase in connectivity, technological advances, and emergence of "hacktivist" groups.
- **Human Health Hazards—**The human health hazards noted in the 2011 effort were updated for the 2016 Plan. These human health hazards were moved within the document to after the natural hazards due to the difference in assessing risk. Ebola was included as a new human health hazard due to the 2014 West Africa Ebola outbreak that threatened the United States, though that threat never fully materialized. Zika virus is included in the discussion, as well.
- **Additional Demographic Information—**Additional demographic data are included—beyond age and disability/access and function need—addressing Roseville's industry, business and institutional footprint. Employment trends and occupations are included to develop a fuller understanding of the population of Roseville.
- **Disabilities, Access and Functional Need Language Revision—**The entire Plan was updated to reflect appropriate references when discussing individuals with disabilities and others with access and functional needs. This includes person-first language and references to individuals instead of the more general term of populations.
- **Guiding Principle—**A guiding principle for the hazard mitigation plan was developed. The goals and objectives of the Plan support the guiding principle.

Table 2-1 indicates the major changes between the 2011 and 2016 plans as they relate to 44 CFR planning requirements.

Table 2-1. Plan Changes Crosswalk

44 CFR Requirement	Previous Plan (2011)	Updated Plan (2016)
§201.6(b): In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include: • **An opportunity for the public to comment on the Plan during the drafting stage and prior to Plan approval;** • **An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and** • **Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.**	The plan development process deployed under this update was similar to the 2005 Plan. Chapters 1, 2, and 3 describe the planning process for the 2011 updated Plan.	The plan development process deployed under this update was similar to the 2011 Plan; however, additional public outreach initiatives were conducted through new social media platforms. Chapters 1, 2, and 3 describe the planning process for the 2016 updated Plan.

44 CFR Requirement	Previous Plan (2011)	Updated Plan (2016)
§201.6(c)(2): The Plan shall include a risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.	Chapters 6 through 15 presents a risk assessment of eight hazards of concern: Climate change, dam failure, drought, earthquake, flood, landslide, severe weather, and wildfire. These hazards are profiled as they impact Roseville. Additionally, human-caused and health hazards were qualitatively assessed to develop a more complete picture of the hazards facing the county.	The 2016 Plan presents a risk assessment of the same hazards as the 2011 Plan—in Chapters 6 through 16. Each hazard was updated with new occurrence information from 2011 through 2015 where applicable, and a new comprehensive risk assessment was conducted using updated building stock, demographics, and land use information.
§201.6(c)(2)(i): [The risk assessment shall include a] description of the … location and extent of all natural hazards that can affect the jurisdiction. The Plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.	Chapters 6 through 15 presents a risk assessment of each hazard of concern. Each chapter includes the following components: • Hazard profile-including maps of extent and location, historical occurrences, frequency, severity and warning time. • Secondary hazards • Climate change impacts • Exposure of people, property, critical facilities and environment. • Vulnerability of people, property, critical facilities and environment. • Future trends in development • Scenarios • Issues	The 2016 Plan presents a risk assessment of the same hazards as the 2011 Plan—from Chapters 6 through 16. Each hazard was updated with new occurrence information from 2011 through 2015 where applicable, and a new comprehensive risk assessment was conducted using updated building stock, demographics, and land use information. Climate change impacts were omitted from the individual hazards of concern, as the new climate change chapter provides a more detailed and comprehensive overview of climate change impacts for identified hazards.
§201.6(c)(2)(ii): [The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i). This description shall include an overall summary of each hazard and its impact on the community	Vulnerability was assessed for all hazards of concern. The Hazus-MH computer model was used for the dam failure, earthquake and flood hazards. These were Level 2 user-defined analyses using City data. Site-specific data on City-identified critical facilities was entered into the Hazus model. Hazus outputs were generated for other hazards by applying an estimated damage function to an asset inventory was extracted from Hazus-MH.	Vulnerability was again assessed for all hazards of concern using the Hazus-MH computer model for dam failure, earthquake, and flood hazards. Level 2 analysis was again conducted for these hazards. Site-specific data on City-identified critical facilities was entered into the Hazus model. Hazus outputs were generated for other hazards by applying an estimated damage function to an asset inventory extracted from Hazus-MH. All assets were updated using current available data.
§201.6(c)(2)(ii): [The risk assessment] must also address National Flood Insurance Program insured structures that have been repetitively damaged floods	The Plan includes a comprehensive analysis of repetitive loss areas that includes an inventory of the number and types of structures in the repetitive loss area. Repetitive loss areas are delineated, causes of repetitive flooding are cited, and these areas are reflected on maps	The Plan includes a comprehensive analysis of repetitive loss areas that includes an inventory of the number and types of structures in the repetitive loss area. Repetitive loss areas are delineated, causes of repetitive flooding are cited, and these areas are reflected on maps.

44 CFR Requirement	Previous Plan (2011)	Updated Plan (2016)
§201.6(c)(2)(ii)(A): The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard area.	A complete inventory of the numbers and types of buildings exposed was generated for each hazard of concern. The Steering Committee defined "critical facilities" for the planning area, and these were inventoried by exposure. Each hazard chapter provides a discussion on future development trends.	Building inventory was updated and the Steering Committee revised the critical facilities definition to reflect 2016 priorities. Each hazard chapter again provides a discussion on future development trends.
§201.6(c)(2)(ii)(B): [The plan should describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) and a description of the methodology used to prepare the estimate.	Loss estimations in terms of dollar loss were generated for all hazards of concern. These were generated by Hazus-MH for the dam failure, earthquake and flood hazards. For the other hazards, loss estimates were generated by applying a regionally relevant damage function to the exposed inventory. In all cases, a damage function was applied to an asset inventory. The asset inventory was the same for all hazards and was generated in Hazus.	Loss estimates were recalculated using new data and the new asset inventory.
§201.6(c)(2)(ii)(C): [The plan should describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.	There is a discussion on future development trends as they pertain to each hazard of concern. This discussion looks predominantly at the existing land use and the current regulatory environment that dictates this land use.	The Plan contains a discussion on development trends from the previous planning period, through future trends anticipated in the next five years as they pertain to each hazard.
§201.6(c)(3): The plan shall include a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.	The Plan contains a guiding principal, goals, objectives and actions. The actions strive to meet multiple objectives. The objectives are broad and overarching; each meets multiple goals and stands alone as a component of the Plan. The City of Roseville completed a capability assessment that looks at its regulatory, technical and financial capabilities.	The Steering Committee reviewed the 2011 guiding principle, goals, objectives, and actions and made minor adjustments to reflect 2016 priorities. The City of Roseville updated its capability assessment to reflect regulatory revisions and new initiatives.
§201.6(c)(3)(i): [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.	The Steering Committee identified a guiding principal, goals and objectives.	The Steering Committee reviewed the 2011 guiding principle, goals, objectives, and actions and made minor adjustments to reflect 2016 priorities.
§201.6(c)(3)(ii): [The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.	Chapter 18 includes a hazard mitigation catalog that was developed through a facilitated process. This catalog identifies actions that manipulate the hazard, reduce exposure to the hazard, reduce vulnerability, or increase mitigation capability. The catalog further segregates actions by scale of implementation. A table in the action plan section analyzes each action by mitigation type to illustrate the range of actions selected.	The hazard mitigation catalog developed in 2011 was enhanced with results of the 2016 planning effort focusing on updated program capabilities and the dam failure and cyber threat hazards.
§201.6(c)(3)(ii): [The mitigation strategy] must also address the jurisdiction's participation in the National Flood Insurance Program, and continued compliance with the program's requirements, as appropriate.	The City of Roseville has identified an action stating its commitment to maintain compliance and good standing under the National Flood Insurance Program. Additionally, the City identified multiple actions to maintain its Class 1 standing under the CRS program.	The City of Roseville has identified an action stating its commitment to maintain compliance and good standing under the National Flood Insurance Program. Additionally, the City identified multiple actions to maintain its Class 1 standing under the CRS program.

44 CFR Requirement	Previous Plan (2011)	Updated Plan (2016)
§201.6(c)(3)(iii): [The mitigation strategy shall describe] how the actions identified in Section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.	Each recommended initiative is prioritized using a qualitative methodology that looked at the objectives the project will meet, the timeline for completion, how the project will be funded, the impact of the project, the benefits of the project and the costs of the project. This prioritization scheme is detailed in Chapter 19.	The updated Plan uses the same qualitative approach to prioritization as used for the 2011 Plan.
§201.6(c)(4)(i): [The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.	Chapter 7 details a plan maintenance strategy	Chapter 19 retains the plan maintenance strategy developed in 2011.
§201.6(c)(4)(ii): [The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.	Chapter 7 details recommendations for incorporating the Plan into other planning mechanisms such as: • General plan • Emergency response plan • Capital improvement programs • Municipal code • Stormwater Master Plan This chapter additionally discusses current and future integration opportunities.	Recommendations are provided for incorporating the Plan into other planning mechanisms. This update additionally discusses current and future integration opportunities.
§201.6(c)(4)(iii): [The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.	Chapter 7 details a comprehensive strategy for continuing public involvement.	A comprehensive strategy is provided for continuing public involvement with additional information regarding social media.
§201.6(c)(5): [The local hazard mitigation plan shall include] documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, County Commission, Tribal Council).	Chapter 6 contains the resolution for adoption of this Plan.	The implementation chapter for this update contains the resolution of adoption.

3. PLAN UPDATE APPROACH

Local governments are required to review and revise their hazard mitigation plans and resubmit them for approval within five years in order to remain eligible for mitigation project grant funding (44 CFR §201.6(d)(3)). FEMA's July 2008 *Local Hazard Mitigation Planning Guidance* outlines five phases for updates:

- Phase 1—Organize resources
- Phase 2—Update the risk assessment
- Phase 3—Engage the public
- Phase 4—Assemble the updated Plan
- Phase 5—Plan adoption/implementation.

Phases 1 through 4 are discussed in the following sections. The elements of Phase 5 are described in Chapter 19.

3.1 PLANNING RESOURCE ORGANIZATION

The first phase of planning was to organize needed resources. This phase had the following primary objectives:

- Secure grant funding
- Form a planning team
- Confirm political support for the process
- Establish a steering committee
- Coordinate with other agencies
- Review existing programs.

3.1.1 Internal Funding

The planning effort was made possible through local funds for the City of Roseville.

3.1.2 Formation of the Planning Team

The City hired Tetra Tech, Inc. as a consultant to assist with the 2016 Plan update. The Tetra Tech project manager acted as lead project planner, reporting directly to a City project manager. Once the technical assistance was secured, a planning team made up of the following members was formed to lead the planning effort:

- Rob Jensen (Roseville City Manager's Office)—City Manager, project oversight
- Carl Walker (City of Roseville Department of Public Works)—Floodplain management
- Jason Rizzi (City of Roseville Fire Department)—Emergency preparedness
- Wayne Wiley (City of Roseville Development Services Department)-City planning lead
- Rob Flaner (Tetra Tech)—Lead project planner
- Carol Baumann (Tetra Tech)—Hazus-MH/GIS lead
- Jessica Cerutti (Tetra Tech)—Hazard Identification and profiling
- Dan Portman (Tetra Tech)—Lead editor.

3.1.3 The Steering Committee

Hazard mitigation planning is one of the best ways to enhance collaboration and gain support among the parties whose interests might be affected by hazard losses. By working together, a broad range of stakeholders can identify and create partnerships that pool resources to achieve a common vision for the community. The Steering Committee that oversaw development of the initial plan remained intact during the performance period of that plan and subsequently provided oversight for the 2011 Plan. For this 2016 update process, some new members were added and some previous members left the committee. Table 3-1 lists the 2016 Steering Committee members.

Table 3-1. Steering Committee Members

Name	Title	Jurisdiction/Agency
Grace Keller[a]	Citizen	Community Emergency Response Team
Wayne Wiley[b]	Associate Planner	The City of Roseville Development Services
Rob Jensen	City Manager	The City of Roseville City Manager's Office
Jason Rizzi	Emergency Preparedness Manager	City of Roseville Fire Department
Carl Walker	Senior Civil Engineer	The City of Roseville Public Works
Helen Dyda	Public Information Specialist	City of Roseville Communications
Jaime Garrett	Fire Department Public Information Officer	City of Roseville Fire Department
Erik Angle	Emergency Preparedness Manager	Sutter Roseville Medical Center
Brenette Macintosh	Safety Officer	Consolidated Communications
Mark Lacher	Risk Manager	Consolidated Communications
Jim Williams	Citizen	Meadow Oaks Neighborhood Association
Joseph Van Zant	Citizen/Hazardous Materials Consultant	Roseville Coalition of Neighborhood Associations
Rod Rodriguez	Senior Emergency Services Specialist	Placer County Office of Emergency Services
Rick Stalker	Stalker & Burnett RE Group	Placer County Association of Realtors
Michael Algots	Manager, Hazardous Materials	Union Pacific Railroad

a. Steering Committee Chairperson
b. Steering Committee Vice Chairperson

Leadership roles and ground rules were reconfirmed during the Steering Committee's initial meeting for the plan update on November 3, 2015. The Steering Committee agreed to meet on the first Tuesday of every month as needed throughout the course of the 2016 Plan's development. The planning team facilitated each Steering Committee meeting, which addressed a set of objectives based on the work plan established for the update. The Steering Committee met six times from November 2015 through June 2016. Meeting agendas, minutes and attendance logs are available for review. All Steering Committee meetings were open to the public, and agendas and meeting minutes were posted to the internet.

3.1.4 Coordination with Other Agencies

Coordination with other local, state and federal agencies involved in hazard mitigation in the region helped to ensure consistency with other ongoing efforts. 44 CFR requires that opportunities for involvement in the planning process be provided to neighboring communities, local and regional agencies involved in hazard mitigation, agencies with authority to regulate development, businesses, academia, and other interests (Section 201.6.b.2). Agency coordination was accomplished as follows:

- **Steering Committee Involvement—**Agency representatives were invited to participate on the Steering Committee.

- **Coordination with Placer County—**Placer County had recently finished updating its multi-jurisdictional hazard mitigation plan and was invited to join the Steering Committee. County staff were able to provide insight into lessons learned through the County's update process. The County's involvement also allowed for integration between the two plan updates.
- **Agency Notification—**The following agencies were invited to participate in the process and were kept apprised of plan development milestones:

  - FEMA Region IX
  - California Governor's Office of Emergency Services (Cal OES)
  - California Department of Water Resources
  - Placer County Office of Emergency Services
  - Placer County Flood Control District
  - Placer County Office of Education
  - Sacramento County Department of Water Resources
  - City of Rocklin
  - City of Citrus Heights
  - Roseville City School District
  - Eureka School District
  - Dry Creek School District
  - Center School Districts
  - Roseville Joint Union High School District
  - U.S. Bureau of Reclamation

  All of these agencies received meeting announcements, meeting agendas, and meeting minutes by e-mail throughout the plan development process. This approach proved to be beneficial when these agencies supported the effort by attending meetings or providing feedback on issues. All of these agencies were also informed about the plan update web page for up-to-date information.

- **Pre-Adoption Review—**All the agencies listed above were provided means to review and comment on the mitigation action plan for the 2016 Plan. The predominant means for this review was through the project web page. Each agency was sent an e-mail informing them that draft portions of the update were available for review. In addition, the complete draft plan was sent for a pre-adoption review to FEMA Region IX, the ISO, and the Placer County Office of Emergency Services. No immediate comments were received from these agencies during the pre-adoption public review period.

3.1.5 Review of Existing Programs

Hazard mitigation planning must include review and incorporation, if appropriate, of existing plans, studies, reports and technical information (44 CFR Section 201.6.b(3)). Chapter 4 of this Plan provides a review of laws and ordinances in effect within the planning area that can affect hazard mitigation actions, as well as an assessment of the City's regulatory, technical and financial capabilities to implement hazard mitigation actions.

Of particular interest for the plan update effort are the City of Roseville General Plan, the City of Roseville Emergency Response Plan (an emergency support function-based plan that directs emergency response actions in the planning area), and the State of California 2013 Enhanced Hazard Mitigation Plan.

One of the Steering Committee's first action items was to review the State of California Enhanced Hazard Mitigation Plan and all of the progress reports completed during the performance period for the initial plan. The Steering Committee identified hazards listed in the state plan to which the Roseville area is susceptible, in order to determine if there was a need to expand the scope of the risk assessment. The committee also reviewed the goals, objectives and strategies of the state plan in order to select goals, objectives, and actions for the City's Plan that are consistent with those of the state.

Each annual progress report for the initial plan contains a section that recommends changes or enhancements to the Plan or plan development process. These reports effectively completed a key step of the plan update process before the update process began—identifying needs for changes or enhancements.

3.2 RISK ASSESSMENT UPDATE

Local hazard mitigation plans must provide sufficient hazard and risk information to identify and prioritize appropriate actions to reduce hazard-related losses. This includes detailed descriptions of all the hazards that could affect the jurisdiction, along with an analysis of the jurisdiction's vulnerability to those hazards. The update of the risk assessment is typically the most involved part of the plan update process.

FEMA planning guidance specifies comprehensive updates to the risk assessment portion of local hazard mitigation plans if there have been new technical data pertaining to a hazard developed by a creditable source since the plan's initial development or previously completed update. Updated risk assessment efforts for the 2016 Plan included the following:

- The latest version (2.2) of FEMA's Hazus-MH risk assessment software was used to enhance the risk assessments for the flood, dam and earthquake hazards.
- All hazards of concern were updated with new relevant data.
- The Hazus default general building stock was updated using current address point, building footprint, parcel and tax assessor data.

A detailed description of the methodology deployed in the update of the risk assessment is provided in Chapter 5.

3.3 PUBLIC INVOLVEMENT

Broad public participation in the planning process helps ensure that diverse points of view about the planning area's needs are considered and addressed. The public must have opportunities to comment on disaster mitigation plans during the drafting stages and prior to plan approval (44 CFR, Section 201.6(b)(1)). The Community Rating System expands on these requirements by making CRS credits available for optional public involvement activities.

3.3.1 Strategy

The Steering Committee drafted a comprehensive public involvement strategy for this update using multiple media sources. This strategy was built upon the Steering Committee's perception of what was effective during development of the update, in addition to the use of social media as a major message distribution vehicle. The planning team identified stakeholders to target through the multi-disciplinary public involvement strategy. The strategy for involving the public in the development of the Plan emphasized the following elements:

- Include members of the public on the Steering Committee.
- As was done for the previous update, use a survey to reassess the public's perception of risk and support of hazard mitigation and to get direction on alternatives.
- Hold public meetings to describe the plan update process and progress and to collect input from a wide range of the public.
- Develop a unified message for distribution on social media platforms.
- Attempt to reach as many citizens in the planning area as possible through the use of multiple media, including websites and brochures.

Steering Committee

Eleven of the fourteen members of the Steering Committee live or work in the City of Roseville. This body has provided a mechanism for continuing public involvement in the maintenance of the Plan by meeting annually to monitor the progress of the plan implementation and creating annual progress reports. The ongoing participation of some members from the time that the initial plan was developed provided a valuable historical perspective for

the committee during the update process. All Steering Committee meetings were open to the public and advertised on the City's hazard mitigation plan website. The Steering Committee met six times during the course of the plan update process. One of the meetings was attended by two members of the public. Steering Committee documentation can be found in Appendix C.

Survey

The Steering Committee elected to use a survey for the update process to collect new information from the public about household preparedness for hazards, the level of knowledge about tools and techniques for reducing loss from hazards, and areas of public concern about hazards.

The Steering Committee reviewed the previous survey and requested a simplification of the process to keep residents engaged while ensuring the collection of useful information. The survey asked 26 quantifiable questions and provided opportunities for written comment. The final survey used some of the same questions asked on the initial survey, which helped to show whether citizens' perception of risk and vulnerability has changed over the last five years. The survey also revised some questions to support the plan update process and fulfill the Steering Committee's request for simplification.

The web-based survey tool "Survey Monkey" was used to set up and deploy the survey. The survey was made available to all citizens of Roseville via a web-link posted on the City's website, advertised via press releases, sent via e-mail to community residents, and linked through various forms of social media, including Nextdoor, a geographically based social media website. Over 670 surveys were completed during the course of the plan update process. These results were distributed to the Steering Committee during the strengths, weaknesses, obstacles and opportunities session to inform the Steering Committee of public concerns and opportunities for new public engagement strategies. Multiple survey respondents indicated concern about radon, which the Steering Committee will consider adding as a hazard of concern during the next plan update. The survey and a summary of its findings are provided in Appendix A.

Public Meetings

Participation in a well-attended community event was used as the vehicle to introduce the plan update process, to share the results of the revised risk assessment, and to gauge the public's perception of risk. A final public hearing was held at the end of the process to provide the public an opportunity to comment on the draft Plan.

Community Event Participation—Public Meeting

A public meeting was held as part of the City of Roseville's Earth Day celebration on Saturday, April 16, 2016 from 10 a.m. to 3 p.m. at the Utility Exploration Center, 1501 Pleasant Grove Boulevard (see Figure 3-1 through Figure 3-4). The public meeting was an open-house-format meeting, allowing citizens to come and go as they pleased during the meeting time frame.

The principal objective of the meeting was to share the results of the revised risk assessment with the public, then gage their perception of risk by having them complete a survey. Multiple members of the Steering Committee and planning team were present to speak with residents and answer questions about the process and their risk. Hazus-MH work stations were set up, allowing citizens to see information on their property, including exposure and damage estimates for earthquake and flood events. The 20 property owners who elected to receive a risk assessment were provided printouts of this information for their properties. This tool was highly effective in illustrating risk to the public. This Earth Day event was well attended, with thousands in attendance. During this event, the planning team recorded direct contact and discussion regarding the Plan with 50 event attendees. One resident, a local veterinarian, requested additional information to share with her clients which was later provided to her in electronic form by the City.



Figure 3-1. Hazard Mitigation Booth



Figure 3-2. City of Roseville Earth Day Festival

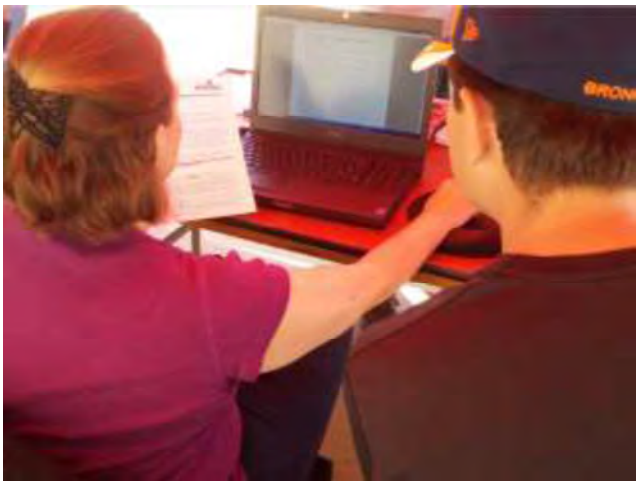


Figure 3-3. Hazus-MH Work Station

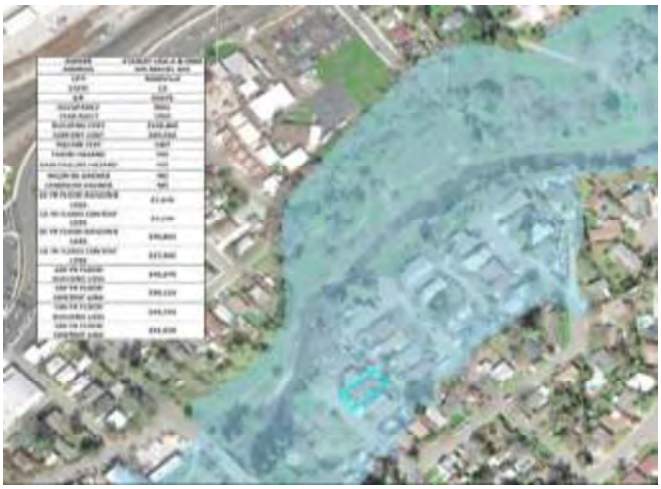


Figure 3-4. Sample Printout from Work Station

Public Comment Period

Once the draft updated Plan was assembled, a comment period for public input was open from August 2, 2016 through August 19, 2016. The public comment period was advertised via the City website, a press-release, and through the use of social media. A public comment link was established on the City's Hazard Mitigation Plan website. During this public comment period, the City received one comment from the public on the Draft Plan regarding the dam failure chapter. This comment requested additional information regarding exposure and vulnerability to the hazard. The City of Roseville decided to address the comment directly with the individual with no change to the plan for dam facility operational security and safety. A copy of the exchange is available upon request.

Use of Media

Press Releases

Press releases were distributed over the course of the 2016 Plan's development as key milestones were achieved and prior to each public meeting.

Social Media

Social media was identified by the Steering Committee as an appropriate method for spreading public messages. The Steering Committee decided to use multiple platforms to reach a variety of audiences:

- Twitter is a messaging platform that allows users to send brief messages to followers (Figure 3-5).
- Facebook is a social network that connects friends, businesses, and governments. The City of Roseville shared messages on its Public Safety Facebook page, allowing other government pages to share (Figure 3-6).
- Nextdoor is a neighborhood social network launched in 2013. On this platform, users must be confirmed members of a community. Once verified, neighbors can receive community updates from local government, share or sell unused goods, or coordinate community events. The City's public information specialists regularly used Nextdoor to engage Roseville's neighborhoods (Figure 3-7).

Internet

The City used its web-based capabilities to keep the public apprised of the plan update process. Upon completion of the initial Plan, a permanent hazard mitigation plan website was established on the Roseville website (see Figure 3-8):

www.roseville.ca.us/HazardPlan

This page can be accessed from the City's home page using the site's search engine. This page housed all pertinent information on the hazard mitigation plan, its progress, and its implementation status. This site has proven to be a highly effective measure for ongoing public access to the Plan. The update scope of work was posted on the website during the update process, along with announcements of all key milestones of the plan update development. Steering Committee meeting announcements, agendas and meeting minutes were also made available on the site. This website also was the principal means of disseminating the survey for the 2016 Plan.

3.3.2 Public Involvement Results

The public involvement strategy used for the plan update introduced the concept of mitigation to the public and provided the Steering Committee with feedback to use in developing the Plan. All citizens of Roseville were provided ample opportunities to provide comment during all phases of this plan update process. Details of attendance and comments received from the public meeting are provided in Appendix A and summarized in Table 3-2. Detailed analysis of the survey findings from the 671 electronically submitted surveys is presented in Appendix A.

Table 3-2. Summary of Public Meetings

Date	Location	Number of Citizens in Attendance	Number of Contacts Made
April 16, 2016	City of Roseville Earth Day	5,000	Over 50
August 2, 2016	Steering Committee Meeting – Public Draft	1	1



Figure 3-5. Twitter Survey Announcement



Figure 3-6. Facebook Survey Announcement

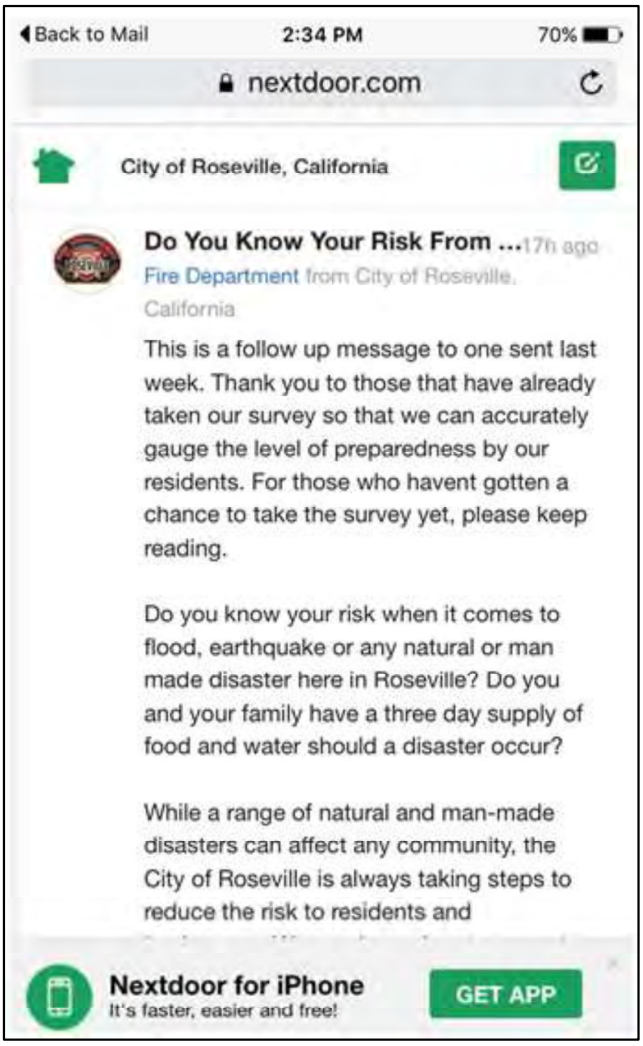


Figure 3-7. Nextdoor Survey Announcement

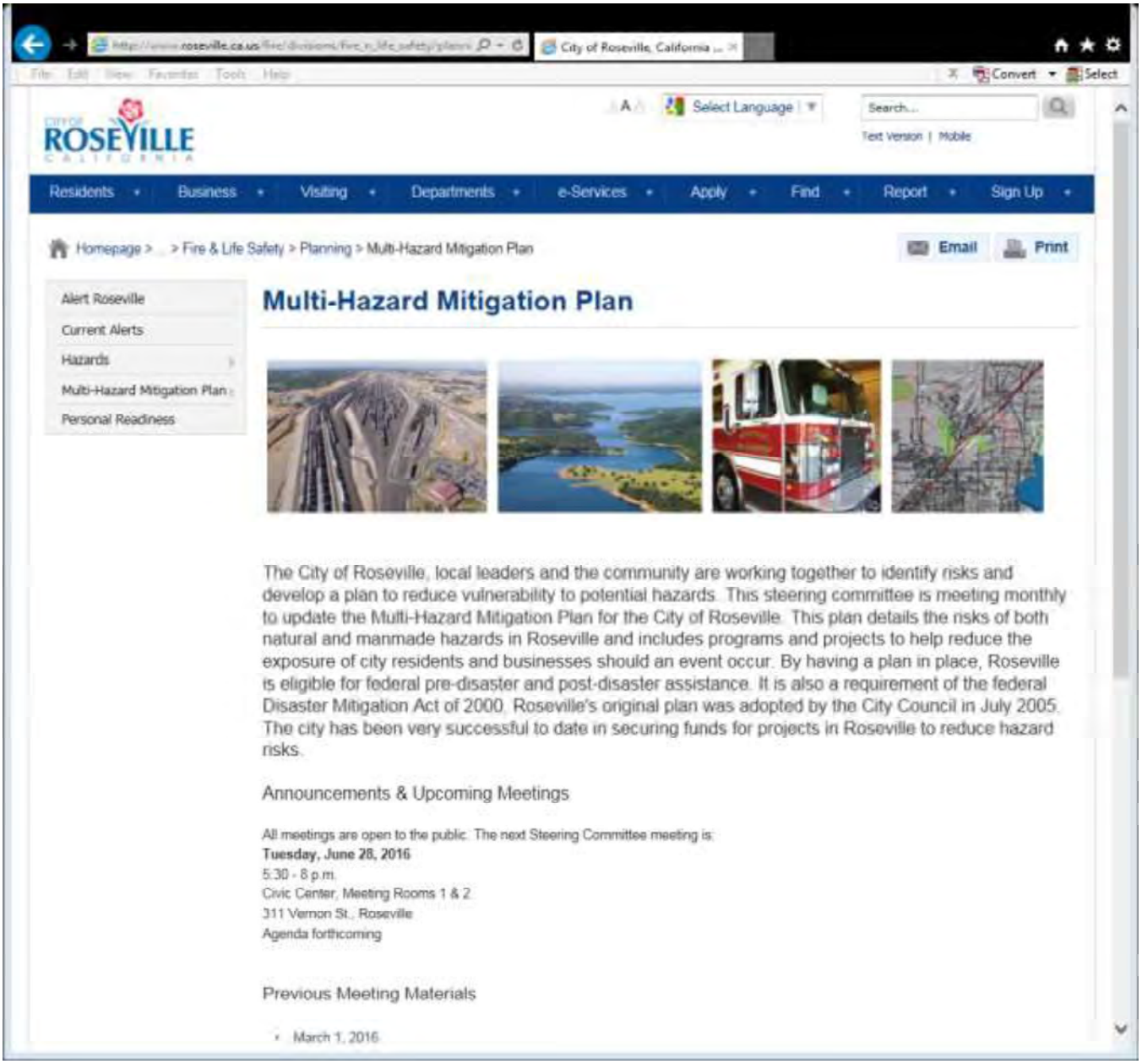


Figure 3-8. Sample Page from Hazard Mitigation Plan Website

3.4 ASSEMBLE THE UPDATED PLAN

The base format of the 2011 Plan was retained for the 2016 Plan. Enhancements were made to include the following components:

- The 2016 update provides a discussion on new mediums used to keep the public apprised of the Plan's actions during the project performance period.
- The 2016 update describes the need for changes to the risk assessment and what changes were made in comparison to the previous plan update.
- The update describes changes to risk exposure due to either of the following:

  - Successful mitigation projects
  - Changes in land use due to annexation or new development.

- The 2016 update describes changes to the action plan and the reasons for them.
- The 2016 update identifies completed, deleted, or deferred actions or activities from the previously approved plan as a benchmark for progress.
- The 2016 Plan includes in its evaluation and prioritization new mitigation actions identified since the previous plan update.
- To be compliant with California Senate Bill 379, the 2016 hazard mitigation plan includes linkage with the City's General Plan. The bill requires the update to include a set of goals, policies, and objectives based on a vulnerability assessment, identification of the risks that climate change poses to the local jurisdiction and the geographic areas at risk from climate change impacts, and specified information from federal, state, regional, and local agencies.

3.5 PLAN DEVELOPMENT CHRONOLOGY/MILESTONES

Table 3-3 summarizes important milestones in the plan update process.

Table 3-3. Plan Development Chronology/Milestones

Date	Event	Description	Attendance
2014			
9/23	CRS re-verification visit	City undergoes its re-verification visit as the nation's only CRS Class 1 community. The Class 1 is re-verified by this process.	N/A
2015			
10/18	Selection of Tetra Tech as plan facilitation consultant through sole source contract	Technical assistance secured	N/A
11/3	1st Steering Committee meeting	Reconfirm Steering Committee organization/ground rules Review the plan update work plan Risk assessment update Review progress reports and state plan	13
11/30	2nd Steering Committee meeting	Progress Report Recommendations Hazards of Concern Confirmation Guiding Principle/Vision/Mission Statement Confirm Goals and Objectives Public Involvement Strategy	14
2016			
1/5	3rd Steering Committee Meeting	Risk Assessment Update Public Involvement Strategy Critical Facilities Definition General Plan Update Emergency Operations Plan Review Debris Management Plan	17
2/2	4th Steering Committee Meeting	Risk Assessment Update Public Involvement Strategy, Survey Finalization Public Involvement, PPI Alternatives Analysis	15
2/8	Survey Deployment	The public survey was deployed via multiple platforms including City websites, Facebook, Nextdoor, Twitter, and public announcement.	N/A
3/1	5th Steering Committee meeting	Risk assessment update Public Involvement Strategy Update, Public Meeting (Strengths, weaknesses, obstacles and opportunities)	16
4/16	Public information open house—Roseville Earth Day	Public open house held at the Roseville Earth Day Festival at Mahany Park outside of the Roseville Utility Exploration Center, 1501 Pleasant Grove Boulevard, Roseville from 10:00 AM to 4:00 PM. Risk assessment data shared with the public as well as distribution of hazard specific information.	50
8/2	6th Steering Committee meeting/Public Review Meeting	Review the public draft and launch the public comment period for the 2016 Plan	13
8/19	Public Comment Period Ends	Draft Plan posted on Hazard Mitigation Plan website. Press release advertising public comment period	N/A
9/01	Plan review	Plan sent to Cal OES and ISO for review and approval pending adoption (APA)	N/A
TBD	Final public meeting and Plan adoption	APA Plan presented to City Council for adoption. The public was provided opportunity to provide comment prior to formal adoption.	##
TBD	CRS approval	Plan was approved by ISO for CRS credit at ___ points	N/A
TBD	Final approval	FEMA granted final approval of the adopted plan	N/A

4. CITY OF ROSEVILLE PROFILE

4.1 GEOGRAPHIC PROFILE

The City of Roseville lies to the west of the foothills of the Sierra Nevada Range, about 16 miles northeast of downtown Sacramento. It is the largest city in Placer County and has experienced considerable residential and commercial growth in the past two decades.

The focus of this Hazard Mitigation Plan is the primary planning area defined in the *City of Roseville General Plan 2035*. The planning area includes 43.39 square miles of incorporated lands and an additional 796 acres making up the City's sphere of influence, as shown in Figure 4-1. It is divided into smaller areas called "Specific Plan Areas" for which more detailed individual plans have been developed to implement the General Plan. The City of Roseville is unusual in that 14 specific plans have been adopted. These Plan Areas contain detailed design guidelines and development agreements to guide development and ensure that development is funded and built as planned.

Roseville is largely urbanized. The greatest area of undeveloped property is in the western portion of the City, which includes the remainder of the developing West Roseville Specific Plan, as well as planned specific Plan Areas including Sierra Vista, Creekview and Amoruso Ranch. The incorporated area and sphere of influence are the primary focus of General Plan policies, but "secondary planning areas" also bear relationship to Roseville planning efforts, depending on the planning issue. For example:

- For the issue of air quality, the secondary planning area includes the City and all areas outside the City that are within the associated Sacramento Valley air basin.
- For flood protection, the secondary planning area encompasses the complete drainage basins of surface waters that flow through Roseville.
- Other secondary planning areas encompass varying boundaries beyond the primary planning area for issues such as solid waste, recycling, transportation and wastewater treatment.

The City's area is characterized by gently sloping terrain with areas of steep ravines in the northeast, and relatively flat valley on the western portion of the City. It is segmented by topographical and physical features, including streams, natural parkways, open space, Interstate 80 and Highway 65, the Union Pacific railroad, and industrial facilities. Traffic is directed around several of these topographical features by bridges and an underpass. These limitations may create traffic congestion and delay emergency response. Heavy traffic congestion at peak commute times on the City's major roadways acts as a barrier to timely response for emergency services. In the event of an accident or other emergency at one of the key intersections between a road and a stream, freeway, or railway, sections of the City could be isolated or have response time slowed.

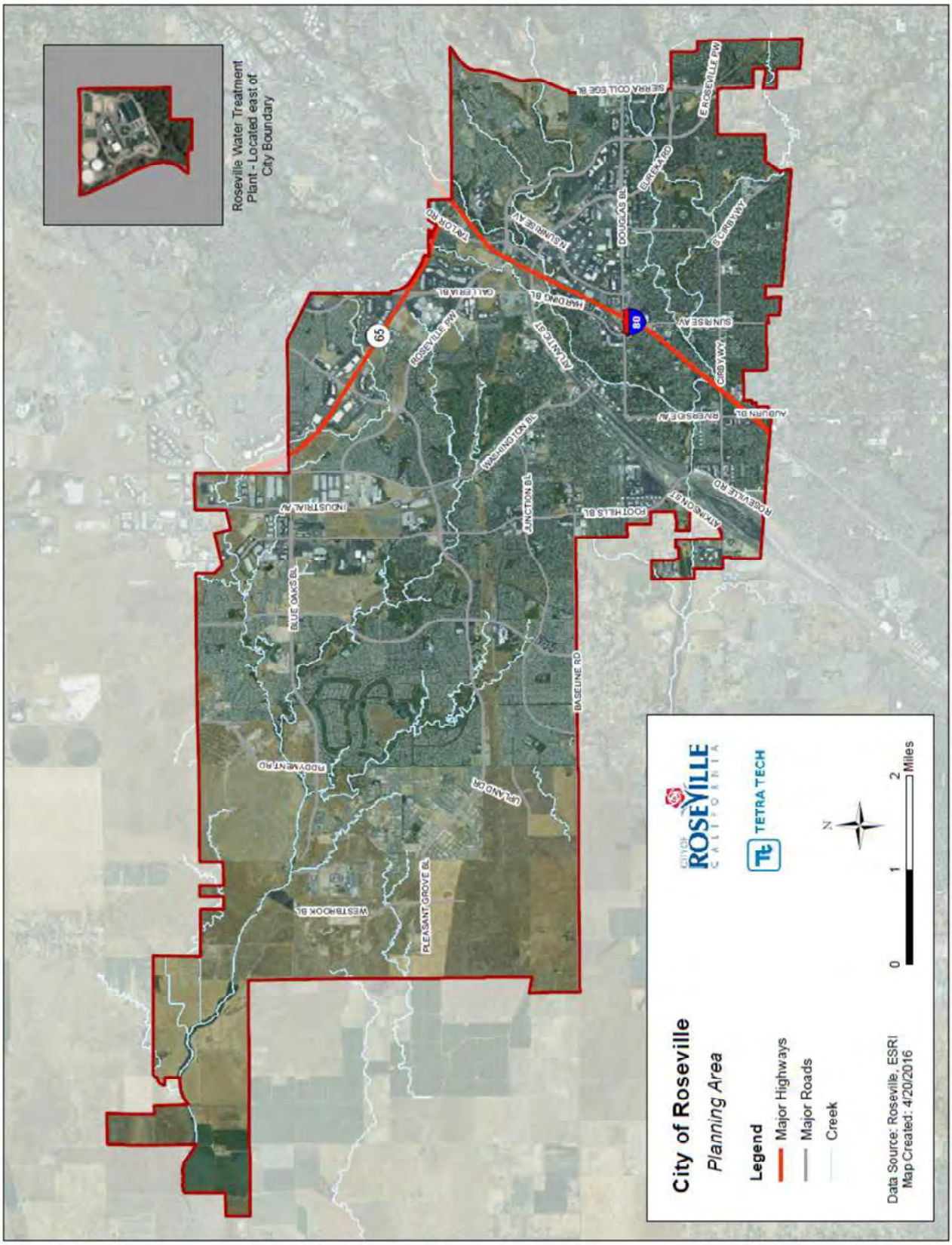


Figure 4-1. Roseville Planning Area

4.2 HISTORICAL OVERVIEW

4.2.1 Pre-Development

The Placer County region was first inhabited by the Maidu Indians, whose territory extended from the Sacramento River Valley to the Sierra Nevada Range. The Southern Maidu occupied the American River basin, along with the Bear and Yuba River basins in the area now recognized as the City of Roseville. An abundance of plants and animals supported the Maidu tribes' large population. Evidence of the Maidu communities still exists along the banks of Strap Ravine and Dry Creek.

4.2.2 Founding of the Community

Fur trapping expeditions came to the area in the early 1800s, and James Marshall discovered gold in the region in 1848. Some of the miners who came in search of gold became the area's first pioneers, taking up farming along the fertile creeks. Eventually, disease, gold miners and early settlers killed or forcibly removed the Maidu from their traditional lands. By 1864, track-laying crews from the Central Pacific Railroad had pushed eastward from Sacramento building the western half of the nation's first transcontinental railroad line. At the site of today's Roseville, the rails of the Central Pacific intersected with those of the California Central, a small line which then linked the towns of Folsom and Lincoln. The place where the two lines joined was labeled on railroad maps as "The Junction." The small freight and passenger center called Roseville developed around the junction.

For many years, Roseville remained a small railroad shipping point of about 250 inhabitants, centered on the train depot and a few small businesses and houses lining the two principal streets, Atlantic and Pacific. This changed between 1906 and 1908, when railroad roundhouse and repair facilities were moved to Roseville from nearby Rocklin. By 1908, the population increased to 2,000. New subdivisions were laid out to accommodate newcomers, many of whom moved from Rocklin. The business district expanded along Lincoln, Main, Church, and Vernon Streets. A chamber of commerce was organized to provide municipal services such as water, electricity, police and fire protection. In April 1909, the town incorporated and began to grow until it became Placer County's largest city.

4.2.3 Post-Incorporation Development

Railroad expansion continued, and local businesses grew as well. In the 1920s, the Pacific Fruit Express ice plant was the world's largest artificial ice plant. Also by the 1920s, the Southern Pacific Railroad boasted the largest freight marshaling yards west of the Mississippi River at Roseville. By the start of the Great Depression in 1929, Roseville's population had risen to 6,425.

During World War II, thousands of troop and munitions trains made their way through Roseville. The City continued to boom as a railroad center into the post-war years, but by the 1950s it faced competition from airlines and interstate trucking. The introduction of jet aircraft and the construction of Interstate 80 through Roseville caused the once-booming passenger train service to decline abruptly. The local depot was closed in 1972 and razed the following year. The Pacific Fruit Express ice plant closed in 1974, rendered obsolete by the introduction of self-refrigerating shipping options.

Completion of Roseville Community Hospital in 1952, the Folsom Dam in 1955, and the Roseville Freeway (Interstate 80) in 1956 gradually shifted the population away from downtown Roseville to what would become known as East Roseville. Roseville Square, the town's first shopping complex, was completed in 1961. Today, Roseville has more than 28 million square feet of commercial, office, and industrial floor space, and is ranked 10th statewide in total taxable retail sales.

In 1964, Roseville was selected as one of Look magazine's All America Cities. Roseville experienced a population surge in the 1980s as developers built up its broad expanses of cheap open land with easy transportation access. As the population expanded, so did the need for water, electrical, sewage, police, fire protection, recreational and educational services.

4.2.4 Current Conditions

The City has continued to grow outward. An expansive industrial zone lies north of Roseville adjacent to Highway 65, along with numerous corporate headquarters along Douglas Boulevard and the Johnson Ranch Road area. Although Roseville is no longer just a railroad town, the railroad remains a major factor in the local economy, and Roseville is still one of the principal railroad centers of the West. Passenger service was reintroduced in 1987 and a new intermodal depot facility was completed.

Today Roseville is an emerging urban center with a mix of residential and employment uses. The center of the City is typified by the downtown and small lot, single-family residences, while newer commercial and office development and larger suburban-type residences characterize the edges of town. As of January 2016, the California Department of Finance estimated the City's population to be 134,073—a 61-percent increase since 2000. It is anticipated that Roseville, along with the remainder of the South Placer/Sacramento Region, will continue to be the focus of significant development. Currently, the focus of new development is along the eastern, western, and northern portions of the community.

4.3 MAJOR PAST HAZARD EVENTS

Presidential disaster declarations are typically issued for hazard events that cause more damage than state and local governments can handle without assistance from the federal government, although no specific dollar loss threshold has been established for these declarations. A presidential disaster declaration puts federal recovery programs into motion to help disaster victims, businesses and public entities. Some of the programs are matched by state programs. Table 4-1 lists the presidential major disasters and other federal declarations since 1950 that have affected Placer County, according to Placer County's Multi-Hazard Mitigation Plan, Cal OES, and FEMA.

Review of these events helps identify targets for risk reduction and ways to increase a community's capability to avoid large-scale events in the future. Many natural hazard events do not trigger federal disaster declaration protocol but have significant impacts on their communities. These events are also important to consider in establishing recurrence intervals for hazards of concern.

4.4 PHYSICAL SETTING

4.4.1 Geology

Roseville is within the Great Valley and Sierra Nevada geomorphic provinces of California. Located on the east side of the Sacramento Valley, Roseville's geology consists of water deposited (alluvial) sediments from the erosion of the Sierra Nevada mountain range.

4.4.2 Soils

Soils in Roseville include some Quaternary (less than 1.8 million years old) sands, sandstones and mudstones, some Upper Tertiary (1.8 to 24 million years old) sandstones, mudstones and limestone, some Lower Tertiary (24 to 64 million years old) mudstones and sandstones, and Franciscan melange and serpentinite. These soils tends to be very dense or in some areas, soft rock. Some Quaternary muds, sands, gravels, silts and mud are located along 100-year floodplains. Soils in Roseville also include mehrten lava flow, which restricts permeability.

Table 4-1. Presidential Major Disaster, Emergency, and Fire Management Assistance Declarations

Type of Event	FEMA Disaster #	Date
Flooding	DR-47	12/23/1955
Flooding	DR-82	4/4/1958
Flooding	DR-138	10/24/1962
Late Winter Storms/Flooding	DR-145	2/7/1963
Late Winter Storms/Flooding	DR-183	12/28/1964
1969 Storms	DR-253	1/26/1969
Winter storms	DR-682	2/9/1983
Spring Storms/Flooding	DR-758	2/18/1986
Severe Winter Storms	DR-1044	1/10/1995
Late Winter Storms	DR-1046	1/13/1995
Winter Storms/Flooding	DR-1155	1/4/1997
Sierra Fire	FM-2463	9/19/2002
Stevens Fire	FM-2541	8/8/2004
Hurricane Katrina Evacuations: Economic	EM-3248	9/13/2005
Severe Rainstorms, Flooding, Landslides, and Mudslides	DR-1628	2/3/2006
Severe Storms, Flooding, Landslides, and Mudslides	DR-1646	6/5/2006
Wildfire	FM-2786	9/1/2008
Wildfire	FM-2832	8/31/2009

Source: FEMA, Placer County Multi-Hazard Mitigation Plan, 2016

4.4.3 Climate

Roseville and the northern Central Valley have a Mediterranean climate with warm, dry days and cool nights during the summer, when the average temperature is 93ºF during the day and 57ºF at night. In 2001, the California Energy Commission developed climate zones based on energy use, temperature, and other factors and created representative temperature data for each zone. Roseville is located in Zone 11: Red Bluff. As a whole, Zone 11 experiences sharply defined seasons with summers consisting of almost constant sunshine and dry air and winters with piercing winds and thick ground fog.

Table 4-2 presents a summary of annual climate conditions. Precipitation from May through October is rare, with most of the rainfall in the Greater Sacramento area, including Roseville, occurring between November and April. Prevailing winds in the summer can be light to gusty from the south. In the late summer and early fall, several wind events typically occur, with northerly winds that cause critical fire weather conditions in the City and surrounding areas.

4.5 DEVELOPMENT PROFILE

4.5.1 Land Use Policies

In addition to a considerable jump in residential growth, Roseville has experienced considerable growth in commercial and industrial development. Based on growth projections and current land use allocations in the General Plan, the City has sufficient development potential through 2035 for both residential and commercial uses. Typically residential land uses will be built out well before complete buildout of nonresidential land could occur, anticipated after 2050.

Table 4-2. Roseville Climate

	Average High Temperature (°F)	Average Low Temperature (°F)	Record High Temperature (°F)	Record Low Temperature (°F)	Total Inches of Precipitation
January	54	39	73	17	4.5
February	61	42	78	19	4.5
March	65	45	86	26	4.3
April	72	47	106	60	1.8
May	80	52	112	35	0.5
June	89	57	115	43	0.3
July	95	61	115	50	0.1
August	94	60	114	45	0.1
September	89	58	108	46	0.5
October	79	53	102	32	1.3
November	64	45	86	26	3.5
December	55	39	74	16	3.4
Annual Average or Total	**77**	**51**	**100**	**36**	**24.8**

Source: The Weather Channel

Numerous factors will influence growth throughout the South Placer County/Sacramento region:

- General economic conditions of the state
- Federal and state budget issues and cutbacks
- Competition from other growth areas
- Perceptions about the quality of life
- Housing costs and availability
- Employment opportunities
- Infrastructure and resource availability.

Management of the City's growth is guided by the Land Use Element of Roseville's General Plan, which consists of a land use map and land use policies. The overall goal of the Land Use Element is to promote a balanced and innovative land use pattern that retains and enhances the distinct character and identity of Roseville. It is organized into the following six components:

- **Existing Conditions and Projections—**Provides a description of the planning area, an existing land use inventory, and future projections.
- **Land Use Designations, Definitions and Standards—**Identifies and defines the City's land use categories, incorporating general use, development, intensity, siting, and compatibility standards.
- **Community Form—**Provides goals and policies to define and direct the future form and pattern of the City. Issues addressed include community character; relationship to transit and pedestrian uses; air quality; downtown and neighborhoods; jobs and housing; economic development; community involvement; and inter-jurisdictional coordination.
- **Community Design—**Includes goals and policies that address aesthetics and function; the integration of the built and natural environment; and community character. Emphasis is on the development of a design framework that reflects the City's goal of high quality, community-wide design.
- **Growth Management—**Focuses on the proactive management of growth in the community. Included is the identification of performance standards to regulate potential future growth areas. Policies addressing annexations and expansion of the City's sphere of influence are also included.

- **Relationship to Specific Plans—**Discusses the interrelationship between the General Plan and the City's Specific Plans.

The land use map included in the Land Use Element generally shows the City's existing and planned land use mix and pattern. The total land use allocation at buildout is shown in Figure 4-2. The land use map reflects only those policies that can be graphically shown. Land use decision-making is guided not only by the land use map but also by the goals, policies and implementation measures in the Land Use Element.

Source: City of Roseville, General Plan, 2015

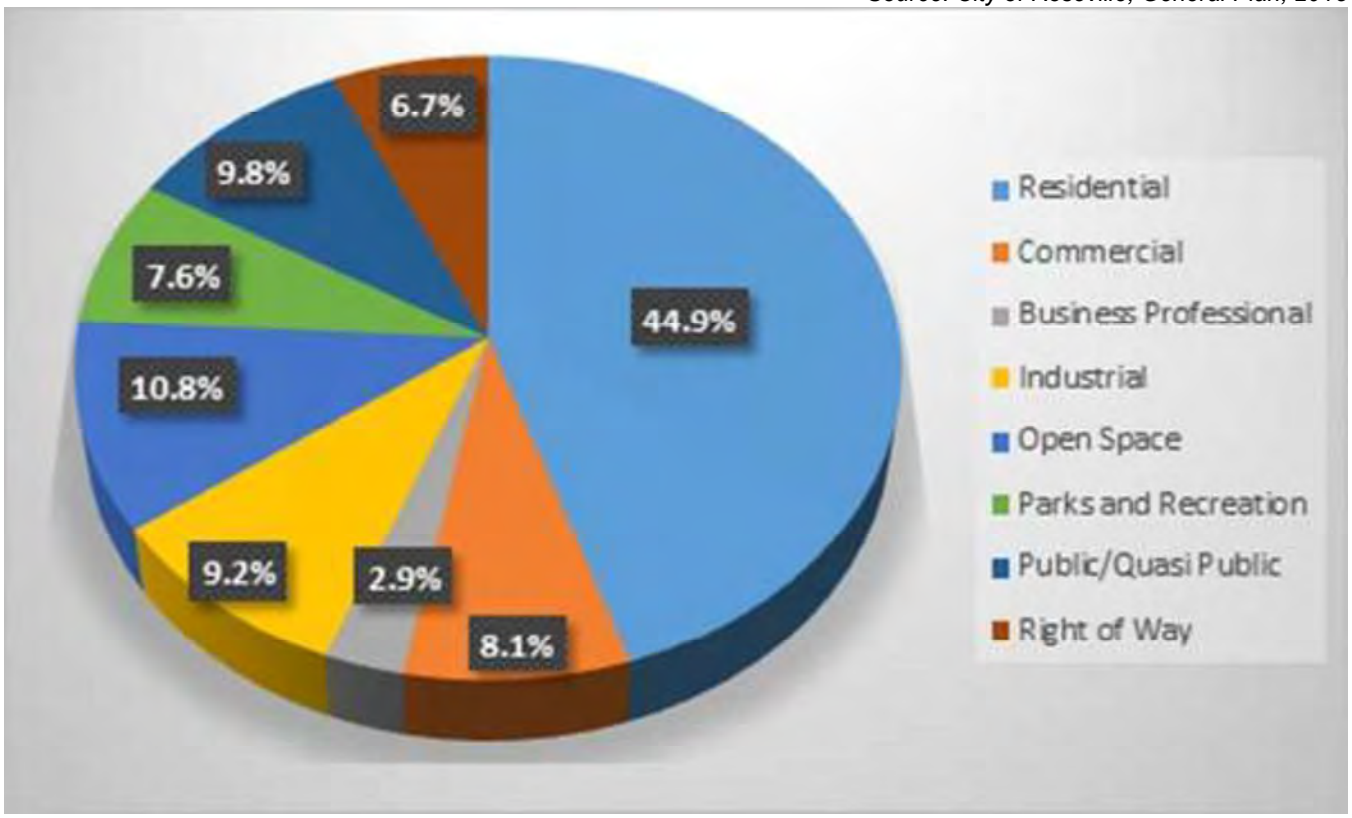


Figure 4-2. Total Land Use Allocation in Roseville

The City's land use policies are built upon underlying principles that were established based on input the City received from its residents and the Growth Management Committee established in 2005. These principles have impacted the overall policy direction and land use pattern in the City of Roseville. They include the following:

- Promote and enhance Roseville's unique character and identity.
- Distinguish Roseville from adjacent communities through the quality of development and design, and the level of public services and facilities provided.
- Protect and enhance Old Town/ Downtown and the City's established neighborhoods.
- Promote new development as an integrated and connected part of the City's land use pattern.
- Provide a variety of housing types and opportunities, including those for all income groups.
- Create a balanced land use pattern with an appropriate mix of uses to accommodate resident employment, service, and social needs within the community.
- Promote a land use pattern that provides a high level of open space and recreational amenities and is sensitive to the natural environment.

- Create a land use mix and pattern that accommodates and promotes alternative transportation modes for ease of access and improved air quality.
- Proactively manage and plan for growth.
- Ensure that new development is fiscally neutral, and does not impact existing residents.

State, regional and local growth projections indicate that Roseville and the South Placer County/Sacramento region will continue to draw residential and employment growth. Much of this attraction can be attributed to desirable location and access, availability of an educated and skilled workforce, land costs and overall quality of life. Local and regional economic conditions will drive the local growth potential, and existing land use allocations may require modification in the near future.

4.5.2 Residential Development

The Land Use Element of the General Plan identifies three primary residential land uses:

- **Low-Density Residential—**The low-density residential land use category is for development of the single-family dwelling units that make up the majority of Roseville's housing supply. The lower densities are assigned to lands that require flexibility to accommodate development constraints (e.g., slopes, trees, etc.). Typically, low-density residential lands should require minimal grading or disturbance of natural features.
- **Medium-Density Residential—**The medium-density residential land use category is for small-lot single-family detached dwelling units and attached patio homes, half-plexes, townhouses, condominiums, and mobile home parks. This residential land use accommodates a variety of housing types and designs, and is often used as a transition or buffer between higher intensity land uses and low-density residential land use. It may also be applied as a transition between higher volume roadways and lower density residential uses.
- **High-Density Residential—**The high-density residential land use category is normally developed with multiple-story apartment or condominium structures containing multiple attached dwelling units. The broad range of densities in this category yields a variety of design options. In some areas, this land use category may be combined with commercial uses to form a mixed-use development where higher densities are desirable and beneficial.

According to the State Department of Finance, there are 51,590 housing units in the City. Single-family detached homes made up over 75 percent of the housing stock as of January 2016. Multi-family homes made up 24 percent, and mobile homes accounted for less than 1 percent. Residential construction valuation reached $208,581,000 in 2015. The Building Division reported that $19,111,000 in new construction was completed during the 2015 – 2016 fiscal year. The Placer County Association of Realtors provided statistics indicating that the median purchase price of single-family houses and condominiums in Roseville rose approximately 9 percent between May 2015 and May 2016, from $391,500 to $425,000 and $168,500 to $178,300, respectively. As indicated by the increase in housing prices, the demand for single-family homes continues and available land for single-family homes is ample.

4.5.3 Non-Residential Development

Roseville's non-residential land use designations include areas designated for commercial, office, industrial uses, special areas, and combining districts. Special designations include Central Business District, Public and Quasi-Public uses, Parks and Recreation, Open Space, and Urban Reserve. Like the residential designations, each non-residential designation includes a purpose statement, primary and secondary uses, and development standards, including a floor area ratio. Unlike the specific secondary uses listed for residential designations, which are intended to be subordinate and may be permitted only to support neighborhood convenience, the non-residential land use designations permit secondary land uses that are supportive and complementary of the primary uses, not

necessarily subordinate. Typically, the size of secondary uses is limited and therefore does not warrant a separate land use designation. Table 4-3 summarizes the non-residential land uses. A summary of non-residential development in Roseville is given in Table 4-4.

Table 4-3. Non-Residential Land Uses

Land Use	Purpose
Neighborhood Commercial	The neighborhood commercial land use designation is intended to provide basic commercial services for the convenience of surrounding neighborhoods within walking distance of major residential areas.
Community Commercial	The community commercial land use designation is distinguished from the neighborhood commercial designation by providing a broader range of goods and services to an expanded service area.
Regional Commercial	The regional commercial land use designation is intended to accommodate larger shopping centers and commercial activities where uses provide goods and services to a citywide and regional service area.
Business Professional	The business professional land use designation provides areas for small and large office uses, including uses supportive of offices.
Light Industrial	The light industrial land use designation is applied to lands reserved for office, industrial, and research and development uses that generate very limited noise, vibration, odor, dust, smoke, light, or other pollutants, and are either integrated or compatible with surrounding uses.
General Industrial	The general industrial land use designation is intended to provide areas for industrial uses that tend to generate noise, vibration, odor, dust, smoke, light, and an aesthetic appearance not compatible with residential and other sensitive receptors. The intent of this category is to provide a place for industrial uses within the City that is properly buffered from other uses.
Central Business District	The Central Business District is a distinct land use category that acknowledges land use patterns of significantly greater intensities and traditional mixed uses of retail, office, and apartment. The district is limited in its application to Central Roseville, the West Roseville Village Center, and areas of greater urban intensity.
Open Space	The open space land use designation is used to preserve and protect public and private lands that are significant due to wildlife habitat, natural features, or flood hazard. Within new development areas, the 100-year floodplain boundaries will be designated as Open Space. In addition, sensitive or unique natural features, including, but not limited to, wetlands, vernal pools, and oak woodlands, are to be designated as open space as part of specific plans and other major development review processes.
Public/Quasi-Public	The public/quasi-public land use designation is used to establish areas for education, religious assembly, governmental offices, municipal corporation yards, and water treatment plants.
Urban Reserve	The urban reserve land use designation is applied to lands that are anticipated to receive urban land entitlements, but at the present time are constrained by growth management policies, availability of services or other limitations.
Park/ Recreation	The park and recreation designation is used to identify public parks in Roseville
Floodplain	The floodplain designation identifies lands that are within the 100-year floodplain boundaries as defined in the Safety Element of the General Plan. Development of lands with a floodplain land use designation is strictly regulated by the City of Roseville. In areas with existing development, the floodplain designation is an overlay or combining land use. As part of a specific plan, the land use designation may be combined with an open space or parks designation, if found consistent with the policies of the Safety Element.
Study Area	The study area land use designation is used as a combining land use to identify future General Plan or neighborhood study areas. This combining designation may be applied to any area where the City believes that additional land use analysis and amendment of the General Plan may be desirable to resolve specific neighborhood or land use issues.
Village Center	The Village Center land use designation is intended allow for a mix and density of land uses common to a traditional downtown, urban setting. It allows for flexibility and deviation from the standards and permitted uses contained in the primary land use designation for which it is combined.
Transfer Station	The transfer station land use designation is intended to preserve and protect industrial areas suitable for a solid waste transfer station.

Table 4-4. Non-Residential Development Profile as of July 2016

Activity/Use	Total Developed Building Area (square feet)	Total Area Zoned for Use (acres)
Commercial	11,249,499	2,249
Office	8,080,479	802.69
Industrial	8,997,392	2,369
Public/Quasi Public	2,037,310	2,702

4.5.4 Critical Facilities and Infrastructure

Critical and essential facilities and infrastructure are those that are critical to the health and welfare of the population. These become especially important after a hazard event. The Steering Committee created the following definition specific to Roseville, regarding which facilities are considered critical:

> *A structure or other improvement, public or private, that, because of its function, size, service area, or uniqueness, has the potential to cause serious bodily harm, extensive property damage, or disruption of vital socioeconomic activities if it is destroyed or damaged or if its functionality is impaired. Critical facilities may include, but are not limited to, health and safety facilities, utilities, government facilities, hazardous materials facilities, and transportation infrastructure.*

The location of critical facilities and infrastructure in the planning area is shown on Figure 4-3 through Figure 4-5. Due to the sensitivity of this information, a detailed list of facilities is not provided. The list is on file with the City of Roseville. Table 4-5 and Table 4-6 provide summaries of the general types of critical facilities and infrastructure, respectively.

Table 4-5. Planning Area Critical Facilities

Facility Type	Number in Planning Area
Medical and Health	2
Government Functions	27
Protective Functions	10
Schools	49
Hazmat	6
Other Critical Functions	78
Total	**172**

Table 4-6. Planning Area Critical Infrastructure

Facility Type	Number in Planning Area
Bridges	68
Water Supply	11
Wastewater	23
Power	18
Communications	98
Other	6
Total	**224**

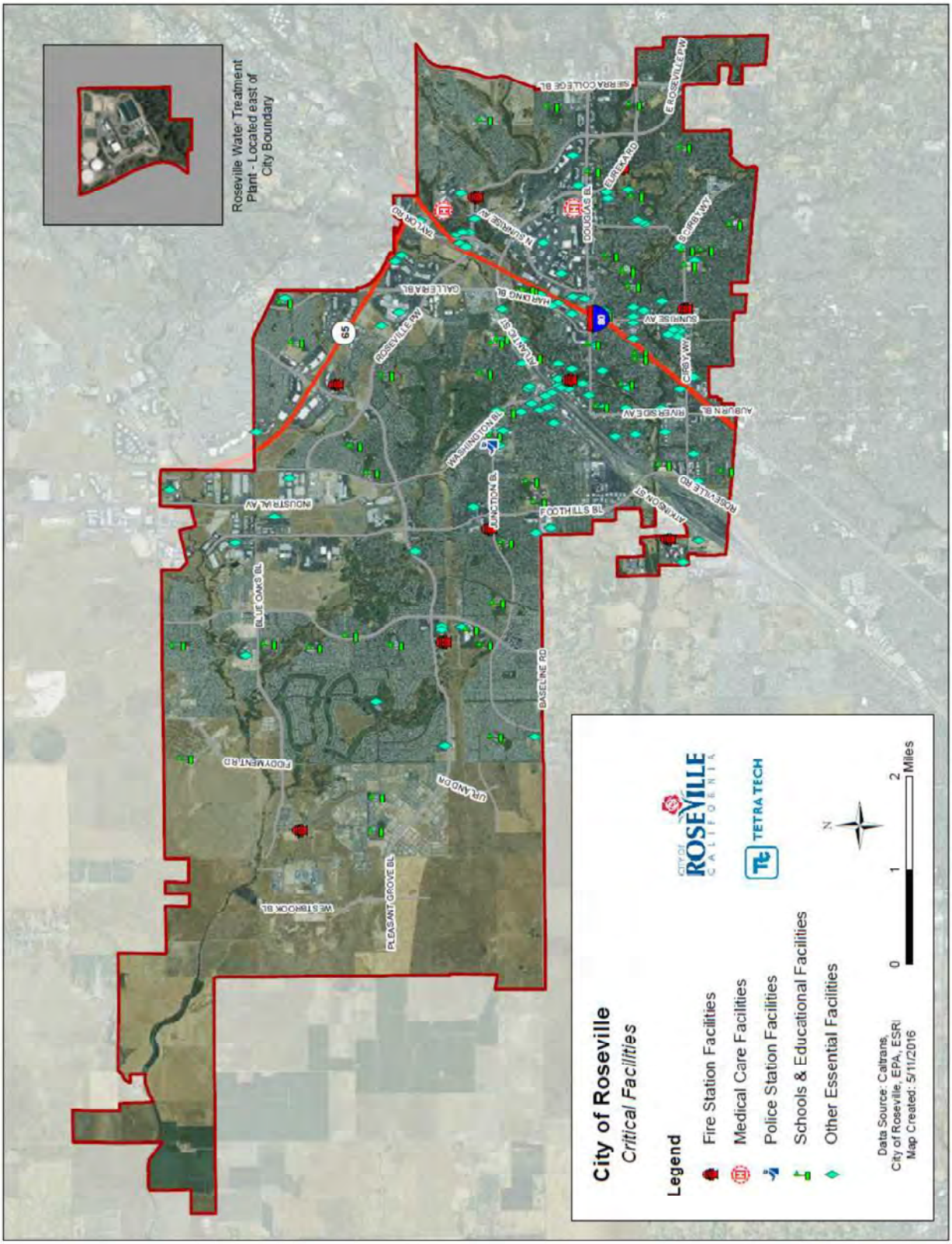


Figure 4-3. Critical Facilities in the Planning Area

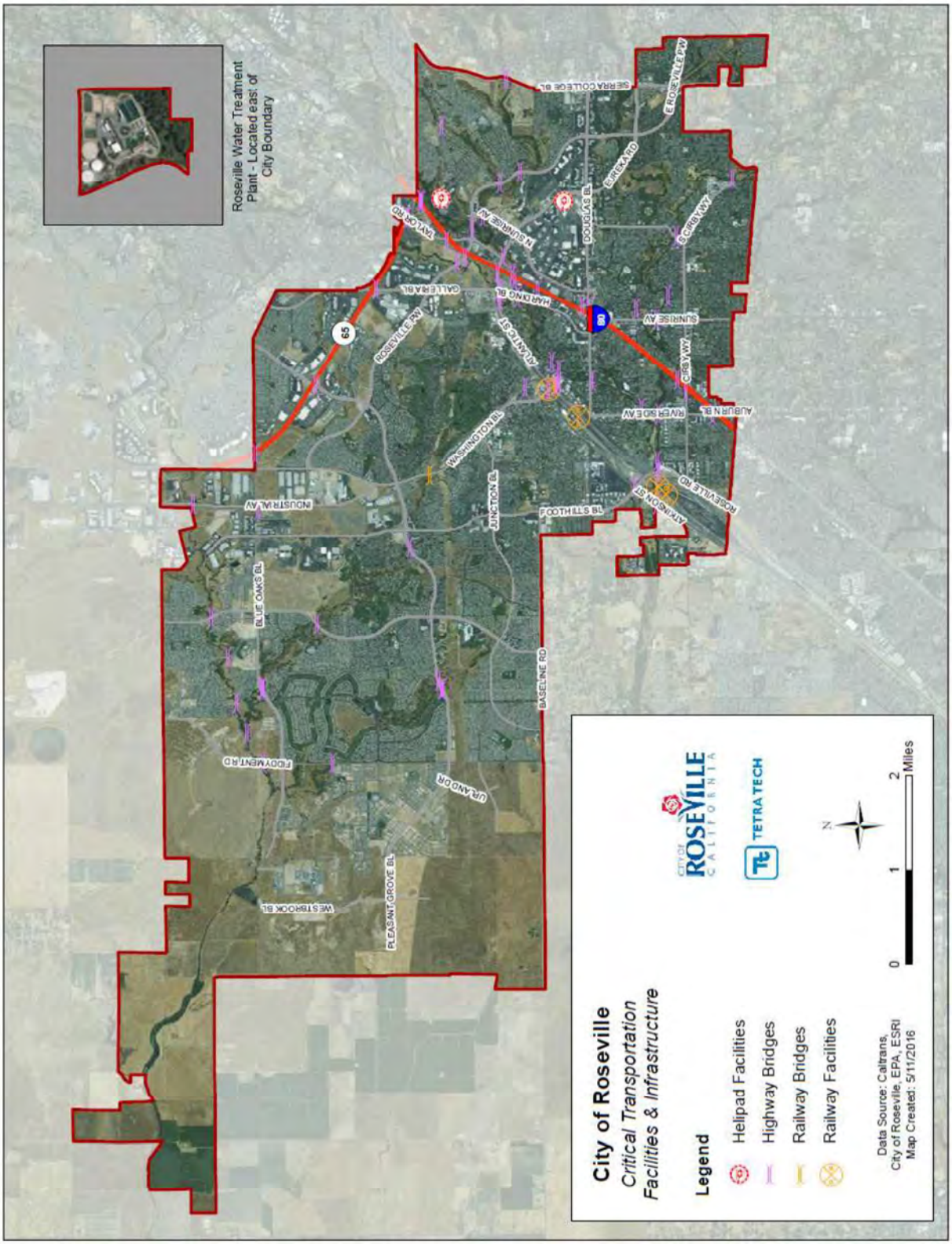


Figure 4-4. Critical Infrastructure in the Planning Area—Transportation

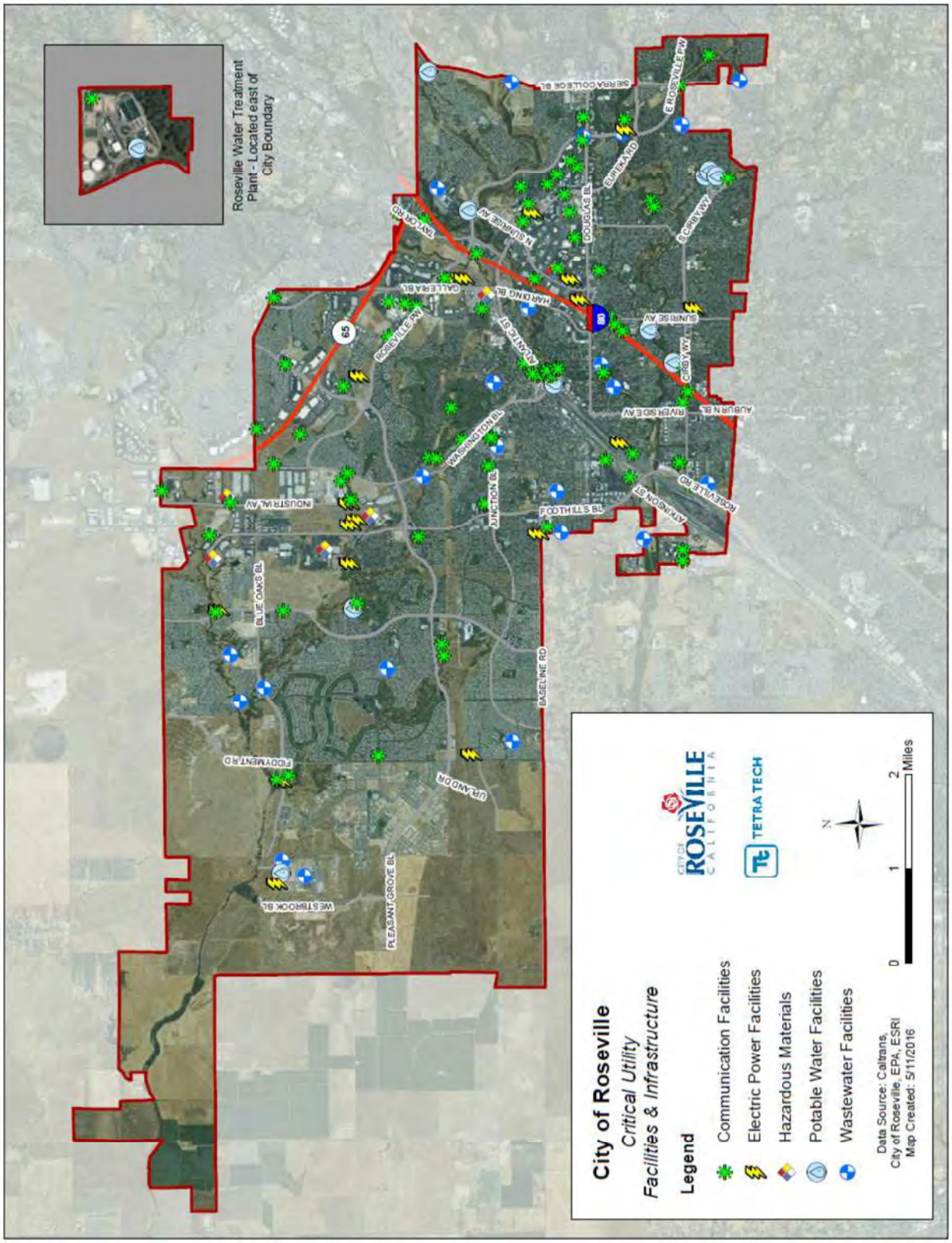


Figure 4-5. Critical Infrastructure in the Planning Area—Utilities

4.5.5 Future Trends in Development

The Roseville General Plan and associated specific area plans govern land use decision and policy-making. Decisions on land use will be governed by these programs. This Plan will work together with these programs to support wise land use in the future by providing vital information on the risk associated with natural hazards in the planning area. The City of Roseville will incorporate by reference the updated Hazard Mitigation Plan in the Safety Element of its General Plan. In addition to proactively planning for the implementation of Senate Bill (SB) 379 upon the next plan update process (see Section 4.9 for a discussion of this state law), this incorporation will ensure that all future trends in development can be established with the benefits of the information on risk and vulnerability to natural hazards identified in this Plan.

4.6 OPEN SPACE AND HABITAT

The City recognizes that open space land is limited and that valuable resources must be conserved wherever possible. For many, the City's open space setting is a highly valued natural resource. Given the strong interrelationship between open space and conservation issues, the City of Roseville has chosen to address these issues in a single element of its General Plan: the Open Space and Conservation Element. Vegetation and wildlife resources and corridors are an important component of the overall open space system and have been the historical focus of preservation efforts in Roseville. If future generations are to enjoy and benefit from the resources available to the present generation, these finite and fragile resources must be preserved and managed.

The vegetation and wildlife resources of Roseville can be broadly classified by habitat type—grasslands, oak woodlands, riparian areas, and seasonal wetlands—as discussed below. Whenever possible, the focus of preservation efforts is multipurpose. It is therefore preferred, for example, to preserve woodlands, grasslands, and wetlands in combined rather than separate and unconnected settings.

4.6.1 Grasslands

Relatively small amounts of self-sustaining grasslands remain in the northern and western undeveloped edges of Roseville. Less extensive areas of grassland are present in smaller undeveloped areas scattered throughout the City. Before Spanish and later settlers arrived in the Central Valley, the grasslands contained native species. The effects of grazing and clearing of large tracts for agriculture resulted in the decline of native species. Today, most of the grasslands in the region contain non-native species. These areas do, however, provide important habitat for birds and other wildlife.

4.6.2 Oak Woodlands and Riparian Areas

Oak woodlands are generally present near the City's major stream channels. The microclimates and alluvial soils in the woodlands provide ideal conditions for deep-rooting shrubs and trees. Most woodland areas are relatively open, with little shrub growth.

Riparian areas support a much wider biological diversity. Situated along and within the City's creeks and watercourses, riparian corridors are a source of food and water and provide cover, nesting sites, and migration and dispersal corridors for wildlife. Riparian areas are also important in flood protection and improve air and water quality through natural filtering.

Oak woodland and riparian areas are City resources not only because of the diversity of species they support but also because they provide natural open space and aesthetic value. The City's creek systems are described in detail in the groundwater recharge and water quality component of the Open Space and Conservation Element. The City regulates the protection of native oak trees through the Tree Preservation Ordinance, which includes standards that limit disturbance within protected zones of oaks and emphasizes avoidance of tree removal. Where avoidance

is not feasible and tree removal is authorized by the City, mitigation is required on an inch-for-inch basis. The Tree Preservation Ordinance is a valuable tool in protecting Roseville's oak trees and habitats. A creek and riparian management and restoration plan is being developed that will provide standards for riparian area management and enhancement. Additionally, the City maintains an overarching management plan for upholding the City's requirements in maintaining open space.

4.6.3 Seasonal Wetlands

Many of the wetland areas in Roseville are seasonal and therefore receive, retain, and transport water only during the wet season. Wetlands are subject to the regulations of the U.S. Army Corps of Engineers under the provisions of Section 404 of the Clean Water Act. Two primary types of seasonal wetlands are present in the City: intermittent drainage and vernal pool wetlands.

Intermittent drainage wetlands typically consist of channels 1 to 10 feet wide that flow over a variety of substrata. Most are wet only during winter and transport runoff. They are typically dry during summer, with scattered ponds, but they may contain water from adjacent urban runoff.

Vernal pools represent a significant seasonal wetland resource in Roseville. Although relatively abundant in Roseville and the Sacramento/Placer County region, they are considered rare statewide for their limited natural occurrence and distribution and for the unique native plant and animal species they support. Found in valley grassland areas, vernal pools are typically small, shallow, hardpan-floored depressions that fill with water during the winter wet season, gradually drying by late spring or early summer. Several plant species occur only in association with these special habitats, which has triggered concern about their inventory and preservation. Two types of vernal pools are present in the Roseville area:

- Northern volcanic mud flow vernal pools occur in shallow depressions on Mehrten mud flow formations where the slope is generally less than 2 percent.
- Northern hardpan pools generally occur on the Inks or Cometa soil series at the lower basin portions of creek floodplains. During the wet season, the pools provide special habitat for unique plant and animal species whose germination, growth, and reproductive cycles coincide with the availability of collected water. Individual pools vary significantly in the length of time they remain wet and in the diversity of plant species present.

4.6.4 Sensitive Species

The California Department of Fish and Wildlife maintains the California Natural Diversity Data Base, which includes known locations of state and federally listed endangered, rare, and threatened plant and animal species, including species considered by the scientific community to be deserving of such listing.

The sensitive plant species that may be present in Roseville are primarily associated with vernal pool environments and include the following: Bogg's Lakehedge Hyssop (*Gratiola heterosepala*), Dwarf Downingia *(Downingia humilis*), and Vernal Pool Brodiaca (*Dichelostemma lacunavernalis*). Bogg's Lake Hyssop is listed as endangered by the state and California Native Plant Society. Dwarf Downingia and Vernal Pool Brodiaca are both included on the California Native Plant Society "watch list" and have sufficiently limited distribution to warrant continued monitoring. Vernal pools in the City may also contain federally listed, endangered vernal pool tadpole shrimp (*Lepidurus packardi*) and federally listed threatened vernal pool fairy shrimp (*Branchinecta lynchi*).

Anadromous chinook salmon (*Oncorhynchus tshawytscha*) and Central Valley steelhead (*Oncorhynchus mykiss*) are known to be present seasonally in Dry Creek and its upper tributaries. Steelhead is listed by the U.S. Fish and Wildlife Service as a threatened species under the Endangered Species Act. Chinook salmon within the Central Valley Fall/Late Fall Run are listed as a candidate species. In addition to the federal and state classified rare or

endangered wildlife species known to inhabit Roseville, favorable habitats for other listed species are present in the area. Other special status species potentially present in Roseville include Cooper's Hawk, Swainson's Hawk, Valley Elderberry, Longhorn Beetle, Sanford's Arrowhead, and the Northwestern Pond Turtle. Bald eagles have been sighted near Folsom Lake, and the American peregrine falcon is present in the Sacramento Valley. All of these species thrive in the riparian habitats of floodplain environments.

Preservation of habitat for sensitive species benefits from the City of Roseville's Open Space Preserve Overarching Management Plan, as described in Section 4.9.3.

4.7 DEMOGRAPHICS

Some populations are at greater risk from hazard events because of decreased resources or physical abilities. Elderly people, for example, may be more likely to require additional assistance. Research has shown that people living near or below the poverty line, the elderly (especially older single men), individuals with disabilities, individuals with access and functional needs, women, children, ethnic minorities and renters all experience, to some degree, more severe effects from disasters than the general population. These vulnerable populations may vary from the general population in risk perception, living conditions, access to information before, during and after a hazard event, capabilities during an event, and access to resources for post-disaster recovery. Indicators of vulnerability often overlap spatially and often in the geographically most vulnerable locations. Detailed spatial analysis to locate areas where there are higher concentrations of vulnerable community members would help to extend focused public outreach and education to these most vulnerable citizens.

4.7.1 Population Trends

According to the California Department of Finance, Roseville's estimated population for 2015 was 134,073 and the estimated daytime population, which includes those coming into Roseville to work, shop, and do business, was 145,000. Roseville is the 45th largest of California's 482 cities. The City has been striving to accommodate growth while retaining and enhancing its distinct character.

The full-time population increased by 38,223 from 2000 to 2010, a 31.9-percent increase (see Figure 4-6). The 2010 population was more than four times that of 1982, when the City had 26,127 residents. The 2.6-percent growth rate from 2009 to 2010 was comparable to average annual growth rates of the past decade. This rate exceeded annual growth rates for Placer County (1.7 percent) and California (1.0 percent) for the same time period.

Between 2010 and the end of 2015, Roseville experienced an estimated 10.9 percent increase in population—averaging 2.2 percent per year. This trend indicates that the population of Roseville will continue to grow through the end of the decade, albeit more slowly than the population boom experienced between 2000 and 2010.

The average household size in Roseville is 2.61 persons, according to U.S. Census Bureau American Community Survey estimates for 2010-2014. This household average may vary by land use and location in the City. For example, the 3,814 age-restricted low-density residential units in the Del Webb and West Roseville planning areas have an estimated average household size of 1.8.

The General Plan's estimates of when Roseville will achieve buildout (the maximum development allowed by zoning) vary based on the methodology used. Under all scenarios, however, Roseville and the Placer County/Sacramento Metropolitan region are expected to remain attractive to both residential and commercial development. As growth rates continue to climb in the region, the City of Roseville has captured an increasing share of that growth. Considerable recent growth in Roseville is attributed to the annexation of the Sierra Vista Specific Plan Area of 2,064 acres and the Creekview Specific Plan of 500 acres in 2012.

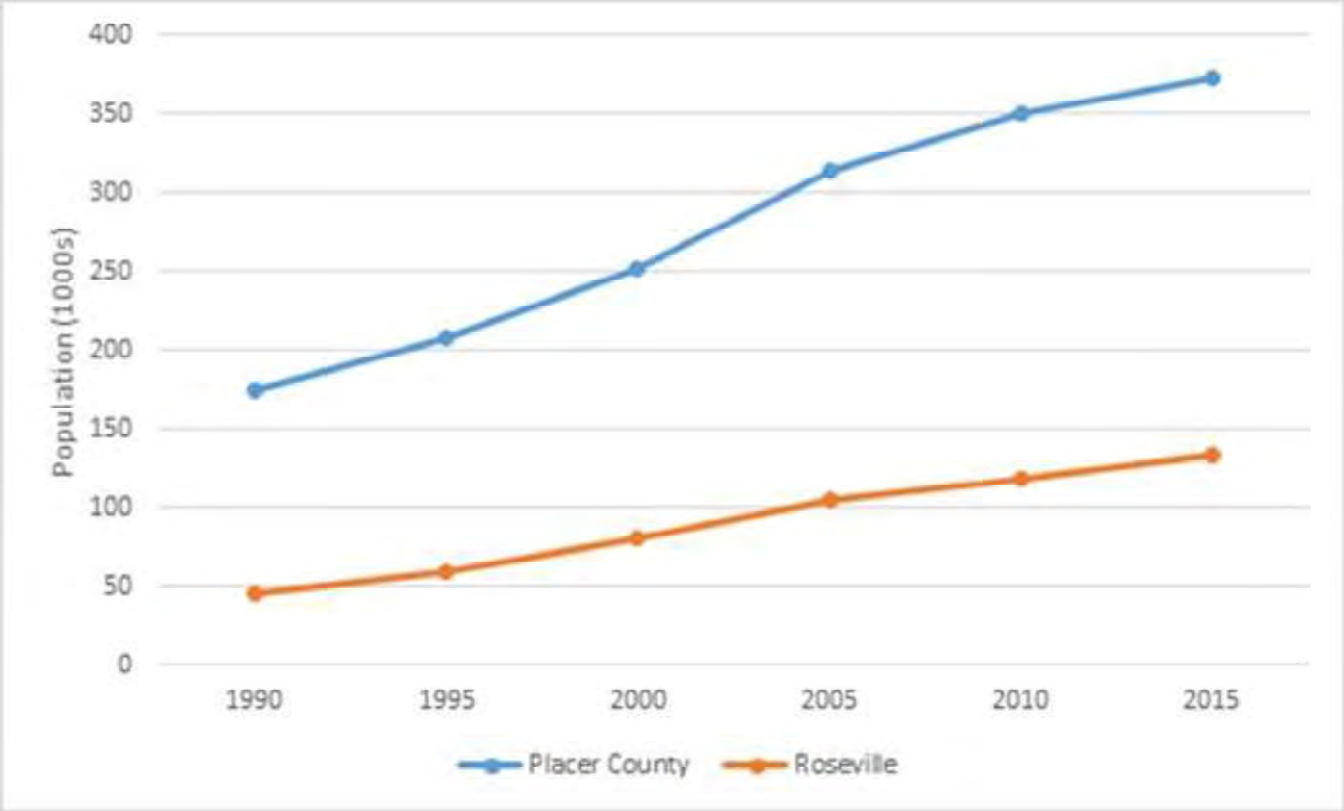


Figure 4-6. Placer County and Roseville Population Growth

Additionally, the City is in the process of annexing the 694-acre Amoruso Ranch Specific Plan, located on the northwest boundary of the City. Through buildout, these western specific Plan Areas are projected to experience the highest increase in population. The overall population, when all residential property is developed, is projected to be over 185,000. Table 4-7 shows the General Plan's population forecasts by Specific Plan Area.

4.7.2 Age Distribution

The vulnerability of elderly citizens can vary significantly based on health, age, and economic security. However, as a group, the elderly are more apt to lack the physical and economic resources necessary for response to hazard events and are more likely to suffer health-related consequences making recovery slower. They are more likely to be vision, hearing, and/or mobility impaired, and more likely to experience mental impairment.

Additionally, the elderly are more likely to live in assisted-living facilities where emergency preparedness occurs at the discretion of facility operators. These facilities are typically identified as "critical facilities" by emergency managers because they require extra notice to implement evacuation. Elderly residents living in their own homes may have more difficulty evacuating their homes and could be stranded in dangerous situations. This population group is more likely to need special medical attention, which may not be readily available during natural disasters due to isolation caused by the event. Specific planning attention for the elderly is an important consideration given the current aging of the American population.

Children under 14 are particularly vulnerable to disaster events because of their young age and dependence on others for basic necessities. Very young children may additionally be vulnerable to injury or sickness; this vulnerability can be worsened during a natural disaster because they may not understand the measures that need to be taken to protect themselves from hazards.

Table 4-7. General Plan Projections of Residential Units and Population by Specific Plan Area

	Dwelling Units			Population		
Specific Plan Area	2016	2035	Buildout	2016	2035	Buildout
Infill	15,409	16,349	16,349	40,217	42,671	42,671
Southeast Roseville	3,047	3,163	3,163	7,953	8,255	8,255
Northeast Roseville	933	1,514	1,514	2,435	3,952	3,952
Northwest Roseville	8,941	9,068	9,068	23,336	23,667	23,667
North Central Roseville	4,247	4,487	4,711	11,085	11,711	12,296
North Industrial	1,043	1,043	1,043	2,722	2,722	2,722
Del Webb	3,210	3,210	3,210	5,895	5,859	5,895
Highland Reserve North	1,669	1,669	1,669	4,356	4,356	4,356
North Roseville	4,887	6,072	6,072	12,755	15,848	15,848
Stoneridge	2,446	2,861	2,861	6,384	7,467	7,467
West Roseville	2,899	10,478	10,478	6,996	26,651	26,651
Riverside Gateway	204	456	456	532	1,190	1,190
Downtown	255	638	2,272	666	1,665	5,930
Sierra Vista	0	5,905	8,679	0	15,412	22,652
Creekview	0	2,011	2,011	0	5,249	5,249
Amoruso Ranch	0	2,827	2,827	0	7,379	7,379
Total	**49,190**	**71,751**	**76,383**	**125,332**	**184,054**	**196,180**

According to the 2010-2014 U.S. Census American Community Survey estimates, 14.3 percent of Roseville's population is 65 or older, 21.1 percent of the population is under the age of 14 and the median age is 37.5. Figure 4-7 shows the age distribution for Roseville.

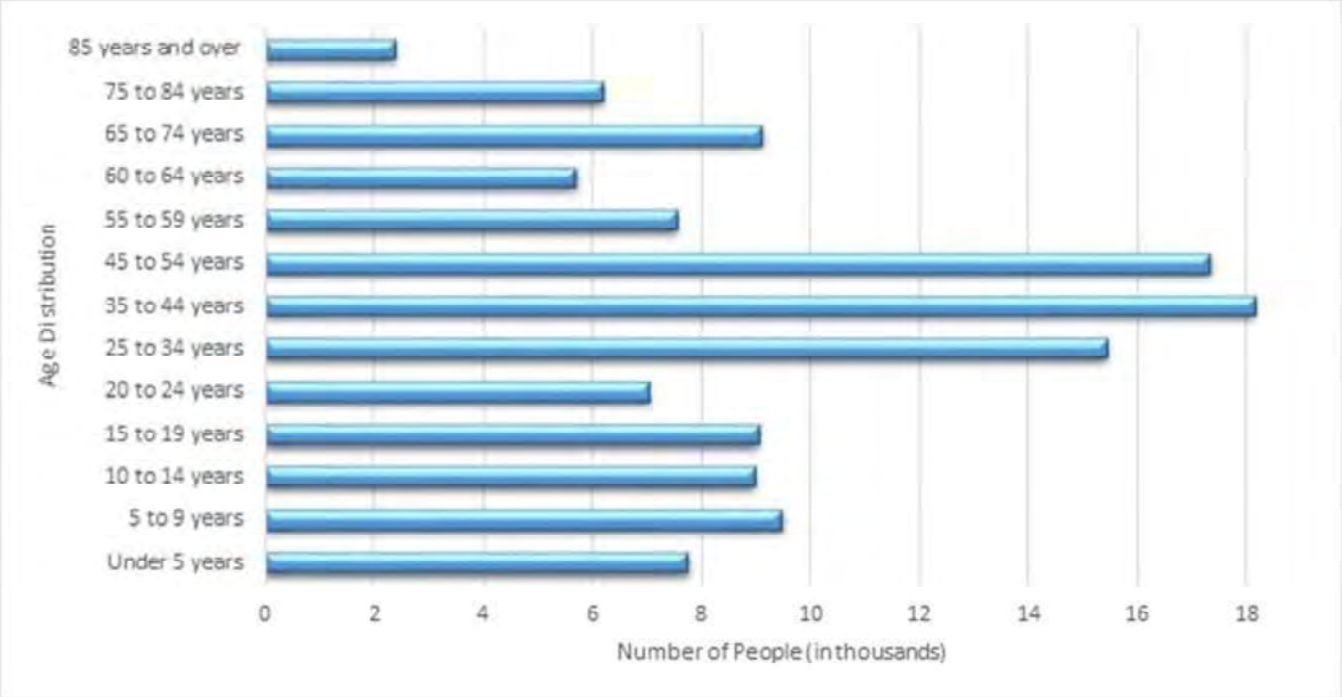


Figure 4-7. Planning Area Age Distribution

4.7.3 Race, Ethnicity and Language

Many disaster researchers have focused on the increased vulnerability that ethnic minorities experience in the United States. Research shows that minorities are less likely to be involved in pre-disaster planning and experience higher mortality rates during a disaster event. Post-disaster recovery can be ineffective and is often characterized by cultural insensitivity. Since higher proportions of ethnic minorities live below the poverty line than the majority white population, poverty can compound vulnerability.

According to the U.S. Census, Roseville's racial composition is predominately white, at about 80 percent of the City population. The largest minority population in Roseville is Hispanic, followed by Asian. Figure 4-8 shows the racial distribution of Roseville.

About 12 percent of Roseville's population is foreign-born, with the majority born in Latin America, according to 2014 U.S. Census estimates. Other than English, the most commonly spoken language in the City is Spanish. In the U.S. Census estimates, 5.6 percent of the City's residents reported speaking English "less than very well." Of the foreign born population, 38.5 percent speak English "less than very well." This has important implications for emergency managers, who must get crucial information out to all members of the population before, during and after emergency events.

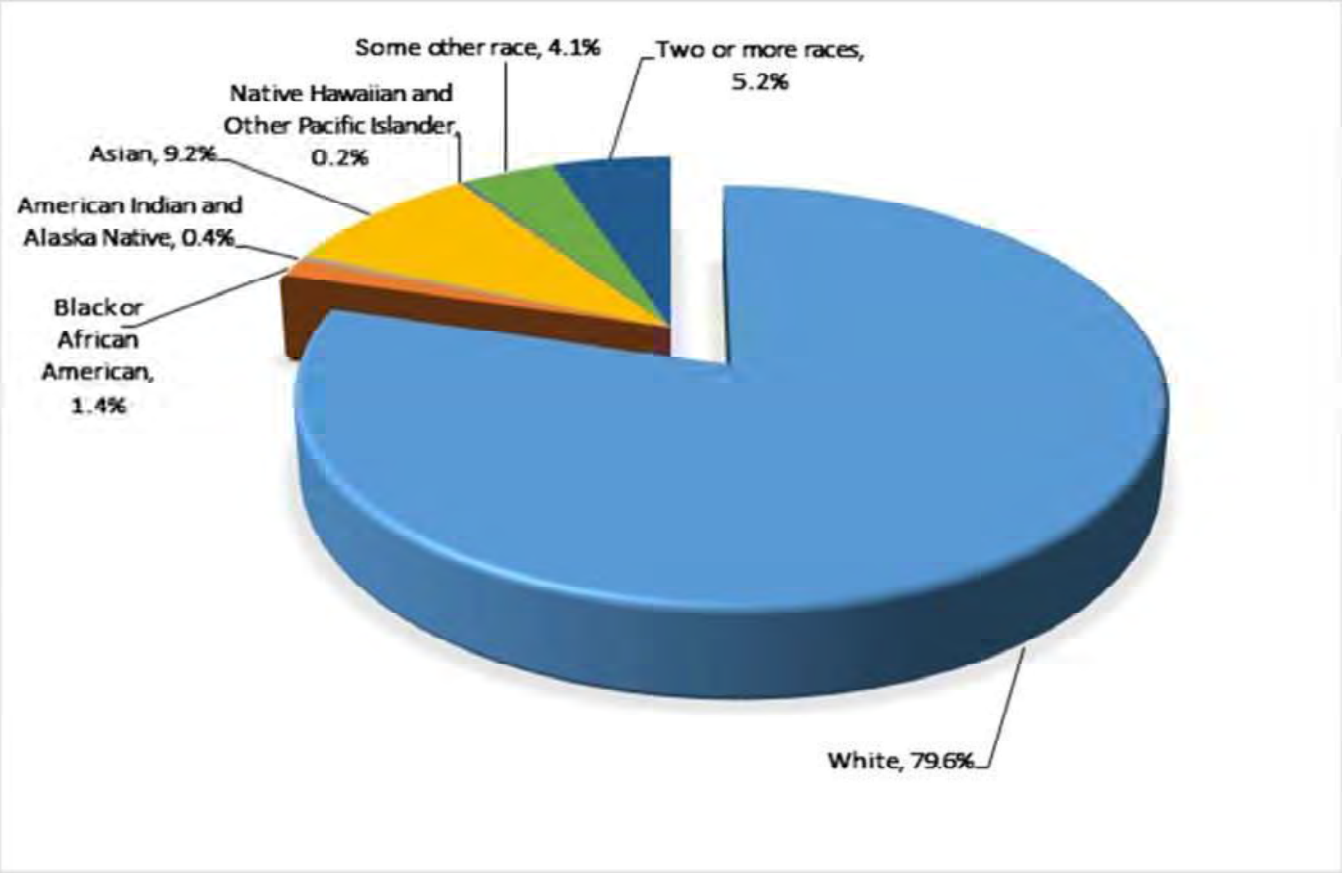


Figure 4-8. Planning Area Race Distribution

4.7.4 Individuals with Disabilities and Others with Access and Functional Needs

Individuals with disabilities and others with access and functional needs have a special stake in emergency planning because they are more likely to have difficulty responding to a hazard event than the general population. According to the 2010 U.S. Census, 12.3 percent of the U.S. noninstitutionalized population lives with a disability. As individuals with disabilities and others with access and functional needs are increasingly integrated into society, relatively large segments of the population may require assistance during the first 72 hours post-disaster, the period generally reserved for self-help.

Disabilities and access/functional needs can vary greatly in severity and permanence, making these individuals difficult to define and track. There is no "typical" disability or need, which can complicate disaster-planning processes that attempt to incorporate them. Furthermore, disabilities and access/functional needs are likely to be compounded with other vulnerabilities, such as age, economic disadvantage and ethnicity, all of which mean that housing is more likely to be substandard.

While the City of Roseville's percentage of individuals with disabilities and others with access and functional needs does not differ much from that of the state as a whole, the overall numbers are significant and warrant attention from planners and emergency managers (see Table 4-8). According to 2014 U.S. Census data, 10.3 percent of the City's population over the age of 5 has a disability.

Table 4-8. Status of Non-Institutionalized Population with Disabilities

Age	Individuals with Disabilities and Others with Access and Functional Needs	% of Age Group Population
5-17 years	1,065	4.7
18-64 years	5,038	7.2
65+ years	5,979	34.9

4.8 ECONOMY

4.8.1 Income

In the United States, individual households are expected to use some private resources to prepare for, respond to and recover from disasters. This means that households living in poverty are automatically disadvantaged when confronting hazards. Additionally, the poor typically occupy more poorly built and inadequately maintained housing. Mobile or modular homes, for example, are more susceptible to damage in earthquakes and floods than other types of housing. In urban areas, the poor often live in older houses and apartment complexes, which are more likely to be made of un-reinforced masonry, a building type that is particularly susceptible to damage during earthquakes. Furthermore, residents below the poverty level are less likely to have insurance to compensate for losses incurred from natural disasters. This means that residents below the poverty level have a great deal to lose during an event and are the least prepared to deal with potential losses. The events following Hurricane Katrina in 2005 illustrated that personal household economics significantly impact people's decisions on evacuation. Individuals who cannot afford gas for their cars will likely decide not to evacuate.

Based on U.S. Census American Community Survey estimates for 2014, per capita income in Roseville was $34,6514, and the median household income was $76,712. Table 4-9 compares the income and poverty estimates at the city, county, and state level. About 8.6 percent of Roseville residents are below the poverty level (meaning they spend more than a third of income on an economy food budget); this includes 10.2 percent of those under the age of 18 and 7.4 percent of those 65 or older.

Table 4-9. Population Under the Poverty Level

	Median Household Income	Percent of Total Population Below Poverty Level	Percent of Children (18 and Under) Below Poverty Level	Percent of Elderly (65 and Older) Below Poverty Level
City of Roseville	$76,712	8.6	10.2	7.4
Placer County	$73,747	8.9	11.2	6.8
California	$61,489	16.4	22.7	10.2

4.8.2 Industry, Businesses and Institutions

The planning area's economy is strongly based in the educational/healthcare/social service industry (22 percent), followed by the retail trade and professional/scientific industries. Information, wholesale trade, and agriculture make up the smallest sources of the local economy, with less than 1 percent of local economy driven by agriculture. Figure 4-9 shows the breakdown of industry types in the planning area.

The planning area benefits from a variety of business activity. Major businesses include Kaiser Permanente, Union Pacific Railroad, Adventist Health and Sutter Roseville Medical Center.

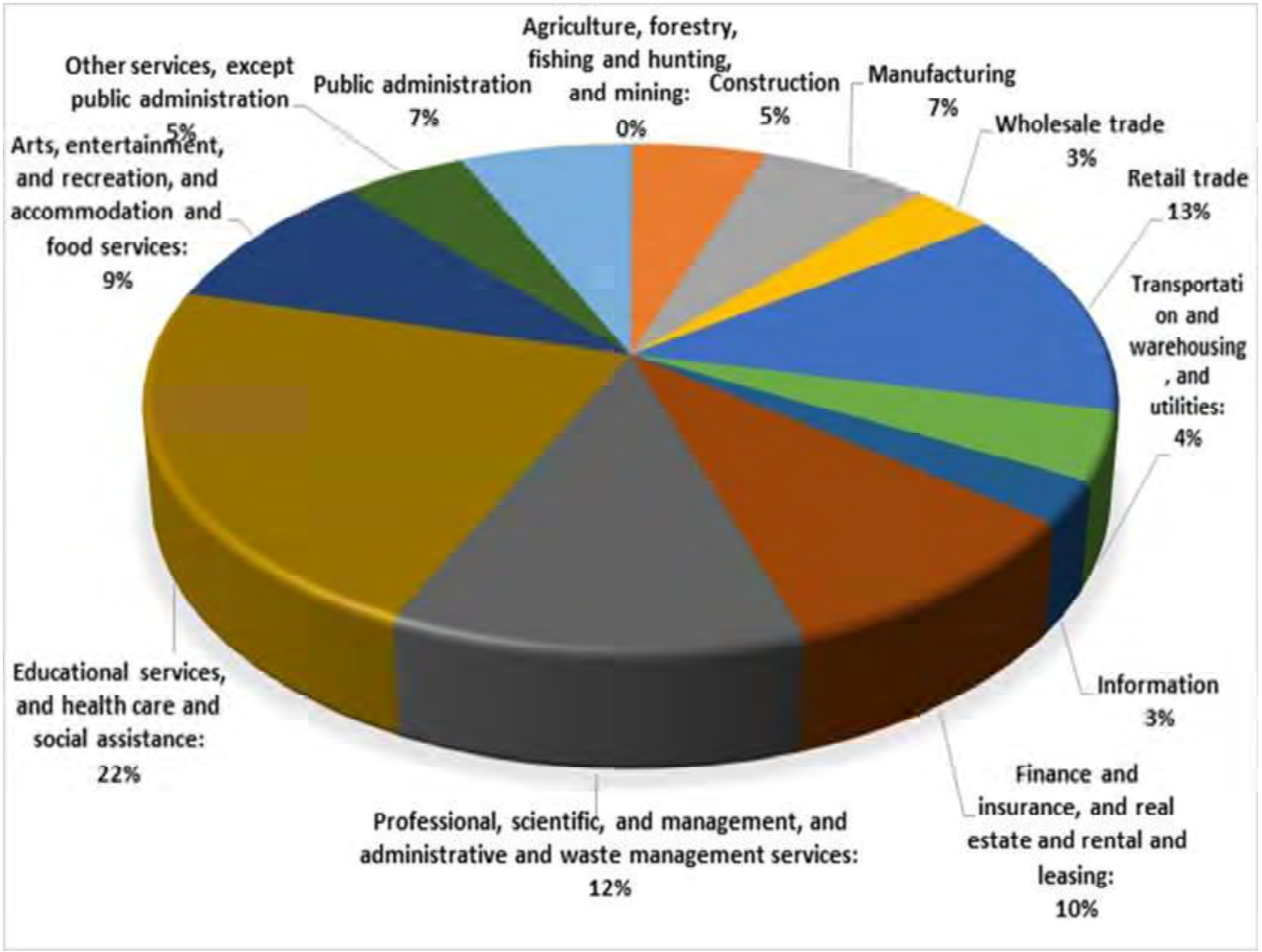


Figure 4-9. Industry in the Planning Area

4.8.3 Employment Trends and Occupations

According to the American Community Survey, about 48.4 percent of the planning area's population is in the labor force. Of the working-age population group (ages 20 – 64), 88.5 percent of men and 75.6 percent of women are in the labor force. Figure 4-10 compares California's and Roseville's unemployment trends from 2009 through 2014. Roseville's unemployment rate was lowest in 2009, at 5.9 percent. Unemployment rates significantly dropped from 9.5 percent to 8.3 percent between 2013 and 2014.

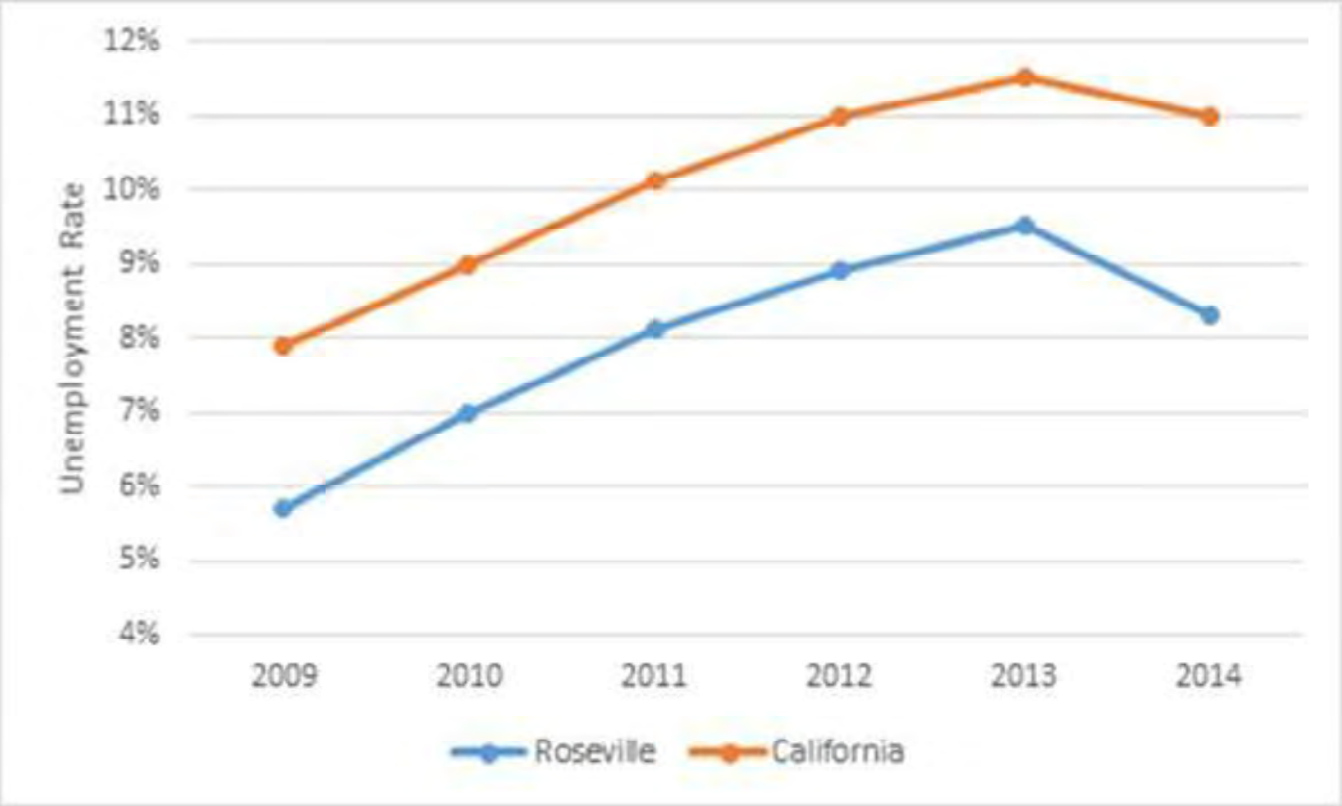


Figure 4-10. California and Roseville Unemployment Rate (U.S. Census, 2009 – 2014)

Management, business, science and arts occupations and sales and office occupations make up 72 percent of the jobs in the planning area (see Figure 4-11). Service occupations make up 16 percent of the local working population.

As of October 2014, the largest employer is Kaiser Permanente, with 3,231 employees, followed by Hewlett-Packard, which employs 2,132. Other major employers include the following:

- Sutter-Roseville Medical Group
- Roseville Joint Union High School District
- Union Pacific Railroad Company
- Adventist Health System West
- Roseville City School District
- City of Roseville
- Wal-Mart Superstore (PG Blvd)
- LB Construction, Inc.

The U.S. Census estimates that over 79.6 percent of workers in the planning area commute alone (by car, truck or van) to work, and mean travel time to work is 26.1 minutes (the state average is 27.6 minutes).

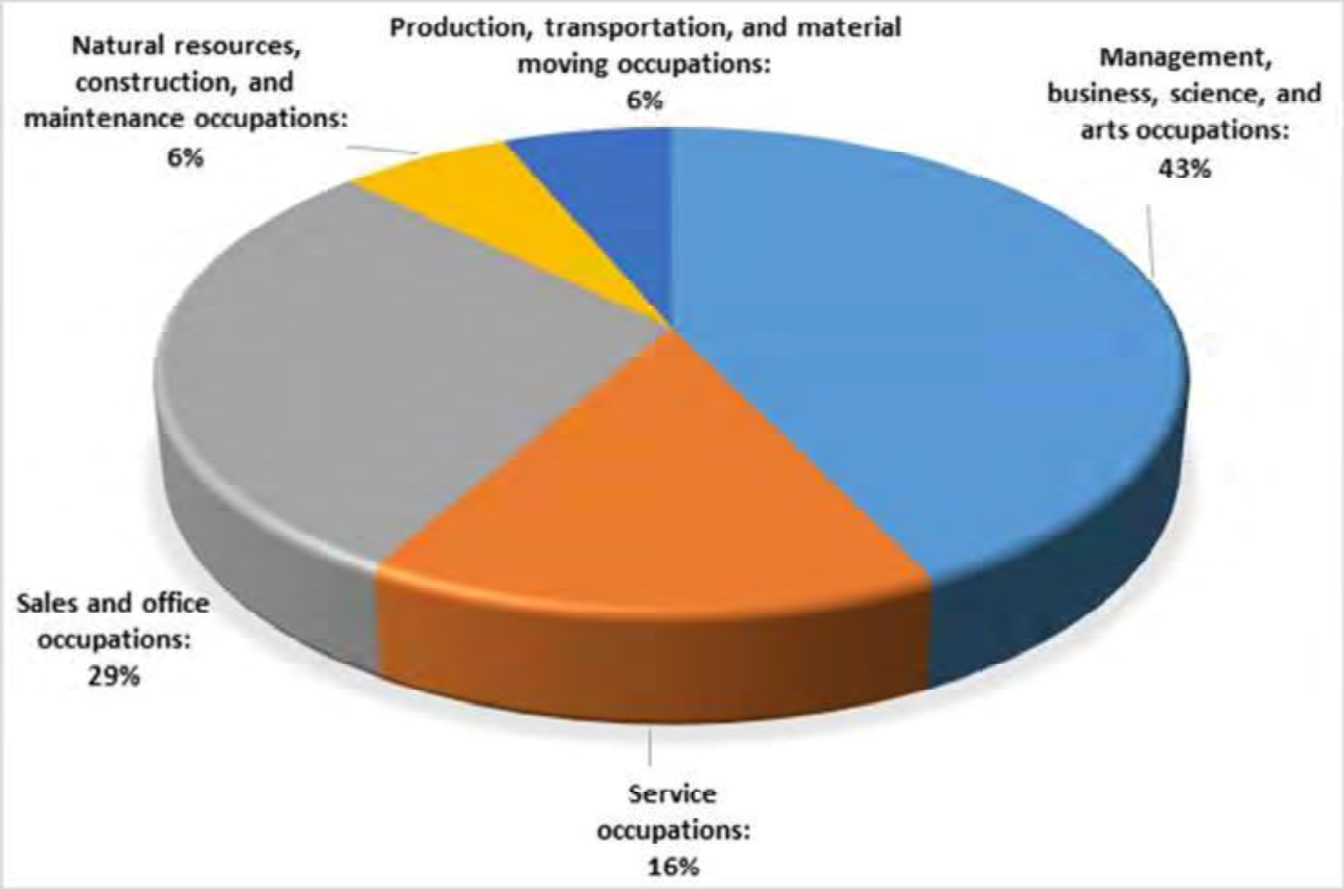


Figure 4-11. Occupations in the Planning Area

4.9 LAWS AND ORDINANCES

Existing laws, ordinances and plans at the federal, state and local level can support or impact hazard mitigation actions identified in this Plan. Hazard mitigation plans are required by 44 CFR to include a review and incorporation, if appropriate, of existing plans, studies, reports, and technical information as part of the planning process (Section 201.6.b(3)). The following federal, state, and local laws described below were reviewed to inform this plan update process. Not all laws and ordinances reviewed during this process are relevant to the immediate process of plan development. In such instances, the City will assure compliance, where relevant, upon implementation of programs that overlap with the requirements of the following programs at project implementation.

4.9.1 Federal

Disaster Mitigation Act of 2000

The DMA is the latest federal legislation addressing hazard mitigation planning. It reinforces the importance of mitigation planning and emphasizes planning for disasters before they occur. It specifically addresses planning at the local level, requiring plans to be in place before Hazard Mitigation Grant Program funds are available to communities. The 2016 Plan is designed to meet the requirements of the DMA.

Endangered Species Act

The Endangered Species Act (ESA) was enacted in 1973 to conserve species that are facing depletion or extinction and the ecosystems that support them. The act sets forth a process for determining which species are threatened and endangered and requires the conservation of the critical habitat in which those species live. The ESA provides broad protection for species of fish, wildlife and plants that are listed as threatened or endangered. Provisions are made for listing species, as well as for recovery plans and the designation of critical habitat for listed species. The ESA outlines procedures for federal agencies to follow when taking actions that may jeopardize listed species and contains exceptions and exemptions. It is the enabling legislation for the Convention on International Trade in Endangered Species of Wild Fauna and Flora. Criminal and civil penalties are provided for violations of the ESA and the Convention.

The purposes of the ESA are to provide a means of conserving the ecosystems upon which endangered and threatened species depend; to provide a program for conserving those species; and to take steps necessary to achieve the purposes of international treaties and conventions. The policy of Congress is that federal agencies must seek to conserve endangered and threatened species and use their authorities in furtherance of the ESA's purposes. The ESA defines three fundamental terms:

- **Endangered** means that a species of fish, animal or plant is "in danger of extinction throughout all or a significant portion of its range." (For salmon and other vertebrate species, this may include subspecies and distinct population segments.)
- **Threatened** means that a species "is likely to become endangered within the foreseeable future." Regulations for a threatened species may be less restrictive than if it were endangered.
- **Critical habitat** means "specific geographical areas that are…essential for the conservation and management of a listed species, whether occupied by the species or not."

Five sections of the ESA are of critical importance to understanding it:

- **Section 4: Listing of a Species—**The National Oceanic and Atmospheric Administration Fisheries Service (NOAA Fisheries) is responsible for listing marine species; the U.S. Fish and Wildlife Service is responsible for listing terrestrial and freshwater aquatic species. The agencies may initiate reviews for listings, or citizens may petition for them. A listing must be made "solely on the basis of the best scientific and commercial data available." After a listing has been proposed, agencies receive comment and conduct further scientific reviews for 12 to 18 months, after which they must decide if the listing is warranted. Economic impacts cannot be considered in this decision, but it may include an evaluation of the adequacy of local and state protections. Critical habitat for the species may be designated at the time of listing.
- **Section 7: Consultation—**Even when a listing has only been proposed, all federal agencies must ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed species or adversely modify its critical habitat. This includes private and public actions that require a federal permit. Once a final listing is made, non-federal actions are subject to the same review, termed a "consultation." If the listing agency finds that an action will "take" a species, it must propose mitigations or "reasonable and prudent" alternatives to the action; if the proponent rejects these, the action cannot proceed.
- **Section 9: Prohibition of Take—**It is unlawful to "take" an endangered species, including killing or injuring it or modifying its habitat in a way that interferes with essential behavioral patterns, including breeding, feeding or sheltering.
- **Section 10: Permitted Take—**Through voluntary agreements with the federal government that provide protections to an endangered species, a non-federal applicant may commit a take that would otherwise be prohibited as long as it is incidental to an otherwise lawful activity (such as developing land or building a road). These agreements often take the form of a "Habitat Conservation Plan."

- **Section 11: Citizen Lawsuits—**Civil actions initiated by any citizen can require the listing agency to enforce the ESA's prohibition of taking or to meet the requirements of the consultation process

The Clean Water Act

The Clean Water Act (CWA) is the cornerstone of surface water quality protection in the United States. (The Act does not deal directly with groundwater or with water quantity issues.) The statute employs a variety of regulatory and non-regulatory tools to sharply reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff. These tools are employed to achieve the broader goal of restoring and maintaining the chemical, physical, and biological integrity of the nation's waters so that they can support "the protection and propagation of fish, shellfish and wildlife and recreation in and on the water."

Evolution of CWA programs over the last decade has included a shift from a program-by-program, source-by-source, pollutant-by-pollutant approach to more holistic watershed-based strategies. Under the watershed approach, equal emphasis is placed on protecting healthy waters and restoring impaired ones. A full array of issues are addressed, not just those subject to CWA regulatory authority. Involvement of stakeholder groups in the development and implementation of strategies for achieving and maintaining state water quality and other environmental goals is another hallmark of this approach.

National Flood Insurance Program

The National Flood Insurance Program (NFIP) provides federally backed flood insurance in exchange for communities enacting and enforcing floodplain regulations. Since its inception in 1968, the NFIP has been successful in requiring new buildings to be protected from probable damage by 100-year flood events. Requirements for participation in this program are stipulated in Parts 59 through 79 of 44 CFR. At the time of the preparation of this Plan, the City is in good standing with the requirements of the NFIP. Participation and good-standing under NFIP are prerequisites for funding eligibility under the Robert T. Stafford Act.

National Incident Management System

The National Incident Management System (NIMS) is a systematic approach for government, nongovernmental organizations, and the private sector to work together to manage incidents involving hazards. The NIMS provides a flexible but standardized set of incident management practices. Incidents typically begin and end locally, and they are managed at the lowest possible geographical, organizational, and jurisdictional level. In some cases, success depends on the involvement of multiple jurisdictions, levels of government, functional agencies, and emergency responder disciplines. These cases necessitate coordination across a spectrum of organizations. Communities using NIMS follow a comprehensive national approach that improves the effectiveness of emergency management and response personnel across the full spectrum of potential hazards (including natural hazards, terrorist activities, and other human-caused disasters) regardless of size or complexity.

Americans with Disabilities Act and Amendments

The Americans with Disabilities Act (ADA) seeks to prevent discrimination against people with disabilities in employment, transportation, public accommodation, communications, and government activities. Title II of the ADA deals with compliance with the Act in emergency management and disaster-related programs, services, and activities. It applies to state and local governments as well as third parties, including religious entities and private nonprofit organizations.

The ADA has implications for sheltering requirements and public notifications. During an emergency alert, officials must use a combination of warning methods to ensure that all residents have all necessary information. Those with hearing impairments may not hear radio, television, sirens, or other audible alerts, while those with visual impairments may not see flashing lights or visual alerts. Two technical documents issued for shelter

operators address physical accessibility needs of people with disabilities as well as medical needs and service animals.

The ADA intersects with disaster preparedness programs in regards to transportation, social services, temporary housing, and rebuilding. Persons with disabilities may require additional assistance in evacuation and transit (e.g., vehicles with wheelchair lifts or paratransit buses). Evacuation and other response plans should address the unique needs of residents. Local governments may be interested in implementing a special-needs registry to identify the home addresses, contact information, and needs for residents who may require more assistance.

Civil Rights Act of 1964

The Civil Rights Act of 1964 prohibits discrimination based on race, color, religion, sex or nation origin and requires equal access to public places and employment. The Act is relevant to emergency management and hazard mitigation in that it prohibits local governments from favoring the needs of one population group over another. Local government and emergency response must ensure the continued safety and well-being of all residents equally, to the extent possible.

Rural Development Program

The mission of the U.S. Department of Agriculture (USDA) Rural Development Program is to help improve the economy and quality of life in rural America. The program provides project financing and technical assistance to help rural communities provide the infrastructure needed by rural businesses, community facilities, and households. The program addresses rural America's need for basic services, such as clean running water, sewage and waste disposal, electricity, and modern telecommunications and broadband. Loans and competitive grants are offered for various community and economic development projects and programs, such as the development of essential community facilities including fire stations (USDA, 2015b).

Community Development Block Grant Disaster Resilience Program

In response to disasters, Congress may appropriate additional funding for the U.S. Department of Housing and Urban Development Community Development Block Grant programs to be distributed as Disaster Recovery grants (CDBG-DR). These grants can be used to rebuild affected areas and provide seed money to start the recovery process. CDBG-DR assistance may fund a broad range of recovery activities, helping communities and neighborhoods that otherwise might not recover due to limited resources. CDBG-DR grants often supplement disaster programs of the Federal Emergency Management Agency, the Small Business Administration, and the U.S. Army Corps of Engineers. Housing and Urban Development generally awards noncompetitive, nonrecurring CDBG-DR grants by a formula that considers disaster recovery needs unmet by other federal disaster assistance programs. To be eligible for CDBG-DR funds, projects must meet the following criteria:

- Address a disaster-related impact (direct or indirect) in a presidentially declared county for the covered disaster
- Be a CDBG-eligible activity (according to regulations and waivers)
- Meet a national objective.

Incorporating preparedness and mitigation into these actions is encouraged, as the goal is to rebuild in ways that are safer and stronger.

Emergency Watershed Program

The USDA Natural Resources Conservation Service (NRCS) administers the Emergency Watershed Protection (EWP) Program, which responds to emergencies created by natural disasters. Eligibility for assistance is not dependent on a national emergency declaration. The program is designed to help people and conserve natural

resources by relieving imminent hazards to life and property caused by floods, fires, wind-storms, and other natural occurrences. EWP is an emergency recovery program. Financial and technical assistance are available for the following activities (Natural Resources Conservation Service, 2016):

- Remove debris from stream channels, road culverts, and bridges
- Reshape and protect eroded banks
- Correct damaged drainage facilities
- Establish cover on critically eroding lands
- Repair levees and structures
- Repair conservation practices.

Presidential Executive Orders 11988 and 13690

Executive Order 11988 requires federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of flood plains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. In accomplishing this objective, "each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by flood plains in carrying out its responsibilities" for the following actions:

- Acquiring, managing, and disposing of federal lands and facilities
- Providing federally-undertaken, financed, or assisted construction and improvements
- Conducting federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulation, and licensing activities (FEMA, 1982).

Executive Order 13690 amends and expands Executive Order 11988, acknowledging that the impacts of flooding are anticipated to increase over time due to the effects of climate change and other threats. It mandates a Federal Flood Risk Management Standard, which is a flexible framework to increase resilience against flooding and help preserve the natural values of floodplains. This standard expands management of flood issues from the current base flood level to a higher vertical elevation and corresponding horizontal floodplain to address current and future flood risk and ensure that projects funded with taxpayer dollars last as long as intended (Office of the Press Secretary, 2015).

Presidential Executive Orders 11990

Executive Order 11990 requires federal agencies to provide leadership and take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands. The requirements apply to the following activities (National Archives, 2016):

- Acquiring, managing, and disposing of federal lands and facilities
- Providing federally undertaken, financed, or assisted construction and improvements
- Conducting federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulation, and licensing.

Emergency Relief for Federally Owned Roads Program

The U.S. Forest Service's Emergency Relief for Federally Owned Roads Program was established to assist federal agencies with repair or reconstruction of tribal transportation facilities, federal lands transportation facilities, and other federally owned roads that are open to public travel and have suffered serious damage by a natural disaster over a wide area or by a catastrophic failure. The program funds both emergency and permanent repairs (Office of Federal Lands Highway, 2016).

4.9.2 State

California General Planning Law

California state law requires that every county and city prepare and adopt a comprehensive long-range plan to serve as a guide for community development. The general plan expresses the community's goals, visions, and policies relative to future land uses, both public and private. The general plan is mandated and prescribed by state law (Cal. Gov. Code §65300 et seq.), and forms the basis for most local government land use decision-making.

The plan must consist of an integrated and internally consistent set of goals, policies, and implementation measures. In addition, the plan must focus on issues of the greatest concern to the community and be written in a clear and concise manner. City actions, such as those relating to land use allocations, annexations, zoning, subdivision and design review, redevelopment, and capital improvements, must be consistent with the plan.

California Environmental Quality Act

The California Environmental Quality Act (CEQA) was passed in 1970, shortly after the federal government passed the National Environmental Policy Act, to institute a statewide policy of environmental protection. CEQA requires state and local agencies in California to follow a protocol of analysis and public disclosure of the potential environmental impacts of development projects. CEQA makes environmental protection a mandatory part of every California state and local agency's decision making process.

CEQA establishes a statewide environmental policy and mandates actions all state and local agencies must take to advance the policy. For any project under CEQA's jurisdiction with potentially significant environmental impacts, agencies must identify mitigation measures and alternatives by preparing an environmental impact report and may approve only projects with no feasible mitigation measures or environmentally superior alternatives.

The Roseville City Council certified a mitigated negative declaration (MND) for the initial City of Roseville hazard plan on July 20, 2005. The MND evaluated potential environmental effects associated with adoption and implementation of the initial hazard plan. It was circulated for a 20-day public review and comment period (per CEQA Guidelines Section 15073(a)), and no comments were received.

Under CEQA guidelines (Section 15164), an addendum to an adopted MND shall be prepared if only minor technical changes or additions are necessary and none of the conditions have occurred calling for the preparation of a new negative declaration or Environmental Impact Report (as described in CEQA Section 15162). The addendum need not be circulated for public review; however, an addendum is to be considered by the decision-making body prior to making a decision on the project.

The City has determined that the 2016 Plan required a new Initial Study/Mitigated Negative Declaration (IS/MND).The public comment period for the IS/MND ran concurrently with the public comment period for the plan update. During this time, no comments were received on the IS/MND. The results of this study were presented to the Council for consideration prior to their consideration of the revised Plan.

AB 52: Addition of Tribal Cultural Resources CEQA

This bill adds "tribal cultural resources" to the categories of cultural resources in CEQA, which had formerly been limited to historic, archeological, and paleontological resources. Recognizing that tribes may have expertise with regard to their tribal history and practices, AB 52 requires lead agencies to provide notice to tribes that are traditionally and culturally affiliated with the geographic area of a proposed project if they have requested notice of projects proposed within that area. If the tribe requests consultation within 30 days upon receipt of the notice, the lead agency must consult with the tribe.

In accordance with AB 52, in July 2016 the City of Roseville provided certified mail notification of the proposed hazard mitigation plan update to tribes that requested such notification. The City's notice included a summary project description, a location map and request for written response should the tribe desire formal AB 52 consultation on tribal cultural resources. Many of the hazard mitigation alternatives and selected actions contained in Chapter 19 are ongoing City activities and programs, some of which were previously subject to CEQA and do not require further CEQA compliance for continued implementation. However future action plan items that still require Council approval would also require future project-level CEQA compliance and therefore an additional opportunity for AB 52 consultation prior to implementation.

AB 162: Flood Planning, Chapter 369, Statutes of 2007

This California State Assembly bill passed in 2007 requires cities and counties to address flood-related matters in the land use, conservation, and safety and housing elements of their general plans. The land use element must identify and annually review the areas covered by the general plan that are subject to flooding as identified in floodplain mapping by either FEMA or the state Department of Water Resources (DWR). Upon the next revision of the housing element on or after January 1, 2009, the conservation element of the general plan must identify rivers, creeks, streams, flood corridors, riparian habitat, and land that may accommodate floodwater for the purposes of groundwater recharge and stormwater management. The safety element must identify information regarding flood hazards including:

- Flood hazard zones
- Maps published by FEMA, DWR, the U.S. Army Corps of Engineers, the Central Valley Flood Protection Board, Cal OES, etc.
- Historical data on flooding
- Existing and planned development in flood hazard zones.

The general plan must establish goals, policies and objectives to protect from unreasonable flooding risks including:

- Avoiding or minimizing the risks of flooding new development
- Evaluating whether new development should be located in flood hazard zones
- Identifying construction methods to minimize damage.

AB 162 establishes goals, policies and objectives to protect from unreasonable flooding risks. It establishes procedures for the determination of available land suitable for urban development, which may exclude lands where FEMA or DWR has determined that the flood management infrastructure is not adequate to avoid the risk of flooding.

AB 2140: General Plans: Safety Element, Chapter 739, Statutes of 2006

This bill provides that the state may allow for more than 75 percent of public assistance funding under the California Disaster Assistance Act only if the local agency is in a jurisdiction that has adopted a local hazard mitigation plan as part of the safety element of its general plan. The local hazard mitigation plan needs to include elements specified in this legislation. In addition this bill requires Cal OES to give federal mitigation funding preference to cities and counties that have adopted local hazard mitigation plan. The intent of the bill is to encourage cities and counties to create and adopt hazard mitigation plans. The City of Roseville linked the Roseville Hazard Mitigation Plan to the Safety Element of the General Plan by City Council resolution on May 10, 2010. The 2016 Roseville Hazard Mitigation Plan will continue to link to the Roseville General Plan.

AB 70: Flood Liability, Chapter 367, Statutes of 2007

This bill provides that a city or county may be required to contribute a fair and reasonable share to compensate for property damage caused by a flood to the extent that it has increased the state's exposure to liability for property damage by unreasonably approving new development in a previously undeveloped area that is protected by a state flood control project, unless the city or county meets specified requirements.

AB 32: The California Global Warming Solutions Act

This bill addresses greenhouse gas emissions. It identifies the following potential adverse impacts of global warming:

> "… the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems."

AB 32 establishes a state goal of reducing greenhouse gas emissions to 1990 levels by 2020 (a reduction of approximately 25 percent from forecast emission levels) with further reductions to follow. The law requires the state Air Resources Board to do the following:

- Establish a program to track and report greenhouse gas emissions.
- Approve a scoping plan for achieving the maximum technologically feasible and cost-effective reductions from sources of greenhouse gas emissions.
- Adopt early reduction measures to begin moving forward.
- Adopt, implement and enforce regulations—including market mechanisms such as "cap and-trade" programs—to ensure that the required reductions occur.

The Air Resources Board recently adopted a statewide greenhouse gas emissions limit and an emissions inventory, along with requirements to measure, track, and report greenhouse gas emissions by the industries it determined to be significant sources of greenhouse gas emissions.

Senate Bill 97

Senate Bill 97, enacted in 2007, amended the California Environmental Quality Act (CEQA) to clearly establish that greenhouse gas emissions and the effects of greenhouse gas emissions are appropriate subjects for CEQA analysis. It directed the Governor's Office of Planning and Research to develop draft CEQA guidelines for the mitigation of greenhouse gas emissions or their effects by July 1, 2009 and directed the California Natural Resources Agency to certify and adopt the CEQA Guidelines by January 1, 2010.

Senate Bill 5: Central Valley Flood Protection Act of 2008

The fundamental change imposed through this legislation was the directive for local agencies to revise their general plans no later than July 2, 2015 to address flood risk for affected land use decisions based on an Urban Level of Flood Protection. The legislation also requires local agencies to revise their zoning codes to reflect this new standard within one year following the adoption of their revised general plans. In areas not subject to the Urban Level of Flood Protection standards, the 100-year floodplain standards will continue to apply.

Senate Bill 1241: General Plans: Safety Element—Fire Hazard Impacts

In 2012, Senate Bill 1241 passed requiring that all future general plans address fire risk in state responsibility areas and very high fire hazard severity zones in their safety element. In addition, the bill requires cities and

counties to make certain findings regarding available fire protection and suppression services before approving a tentative map or parcel map.

Senate Bill 379: General Plans: Safety Element—Climate Adaptation

Senate Bill 379 builds upon the flood planning inclusions into the safety and housing elements and the hazard mitigation planning safety element inclusions in general plans outlined in AB 162 and AB 2140, respectively. SB 379 focuses on a new requirement that cities and counties include climate adaptation and resiliency strategies in the safety element of their general plans beginning January 1, 2017. In addition, this bill requires general plans to include a set of goals, policies and objectives, and specified implementation measures based on the conclusions drawn from climate adaptation research and recommendations. In anticipation of the implementation of this bill in 2017, the 2016 Hazard Mitigation Plan includes relevant information regarding climate adaptation and resiliency strategies for incorporation into the Roseville General Plan through existing linkage resulting from AB 2140.

California State Building Code

California Code of Regulations Title 24 (CCR Title 24), also known as the California Building Standards Code, is a compilation of building standards from three sources:

- Building standards that have been adopted by state agencies without change from building standards contained in national model codes
- Building standards that have been adopted and adapted from the national model code standards to meet California conditions
- Building standards authorized by the California legislature that constitute extensive additions not covered by the model codes adopted to address particular California concerns.

The state Building Standards Commission is authorized by California Building Standards Law (Health and Safety Code Sections 18901 through 18949.6) to administer the processes related to the adoption, approval, publication, and implementation of California's building codes. These building codes serve as the basis for the design and construction of buildings in California. The national model code standards adopted into Title 24 apply to all occupancies in California except for modifications adopted by state agencies and local governing bodies. Since 1989, the Building Standards Commission has published new editions of Title 24 every three years.

On January 1, 2014, California Building Code Accessibility Standards found in Chapter 11B incorporated the 2010 Americans with Disabilities Act (ADA) Standards as the model accessibility code for California. The purpose for this incorporation was to ensure consistency with federal guidelines. As a result of this incorporation, the California standards will fully implement and include 2010 ADA Standards within the California Building Code while maintaining enhanced levels of accessibility already provided by existing California accessibility regulations.

Standardized Emergency Management System

CCR Title 19 establishes the Standardized Emergency Management System (SEMS) to standardize the response to emergencies involving multiple jurisdictions. SEMS is intended to be flexible and adaptable to the needs of all emergency responders in California. It requires emergency response agencies to use basic principles and components of emergency management. Local governments must use SEMS by December 1, 1996 in order to be eligible for state funding of response-related personnel costs under CCR Title 19 (Sections 2920, 2925 and 2930). Individual agencies' roles and responsibilities contained in existing laws or the state emergency plan are not superseded by these regulations.

California State Hazard Mitigation Plan

Under the DMA, California must adopt a federally approved state multi-hazard mitigation plan in order to be eligible for certain disaster assistance and mitigation funding. The intent of the California State Hazard Mitigation Plan is to reduce or prevent injury and damage from hazards in the state through the following:

- Documenting statewide hazard mitigation planning in California
- Describing strategies and priorities for future mitigation activities
- Facilitating the integration of local and tribal hazard mitigation planning activities into statewide efforts
- Meeting state and federal statutory and regulatory requirements.

The plan is an annex to the State Emergency Plan. It identifies past and present mitigation activities, current policies and programs, and mitigation strategies for the future. It also establishes hazard mitigation goals and objectives. The plan will be reviewed and updated annually to reflect changing conditions and new information, especially information on local planning activities.

Governor's Executive Order S-13-08

Governor's Executive Order S-13-08 enhances the state's management of climate impacts from sea level rise, increased temperatures, shifting precipitation and extreme weather events. It required the following key actions:

- Initiate California's first statewide climate change adaptation strategy to assess expected climate change impacts, identify where California is most vulnerable, and recommend adaptation policies by early 2009. This effort will improve coordination within state government so that better planning can more effectively address climate impacts on human health, the environment, the state's water supply and the economy.
- Request that the National Academy of Science establish an expert panel to report on sea level rise impacts in California, to inform state planning and development efforts.
- Issue interim guidance to state agencies for how to plan for sea level rise in designated coastal and floodplain areas for new projects.
- Initiate a report on critical infrastructure projects vulnerable to sea level rise.

4.9.3 City Plans and Programs

General Plan

The City of Roseville General Plan 2035 was developed concurrently with the mitigation planning effort. Roseville proactively addresses problems through the General Plan, which includes a Safety Element designed to address hazards. The 2016 General Plan and the 2016 Hazard Mitigation Plan will work together to achieve the goal of hazard risk reduction. Many of the action items identified in this 2016 Plan are recommendations of the General Plan. Updating the General Plan will serve as a trigger for future updates of the hazard mitigation plan.

Purpose

The General Plan is a long-term policy guide for the City's physical, economic, and environmental growth. City actions, such as those relating to land use allocations, annexations, zoning, subdivision, design review, redevelopment and capital improvements, must be consistent with the General Plan. The General Plan emphasizes performance policies or standards that define levels of service and other less tangible factors that the City is seeking to achieve. It also designates land use categories for the entire City. Land use category definitions in the General Plan include information on general uses, development, intensity, siting and compatibility standards. The General Plan serves these purposes:

- It enables the Roseville City Council and Planning Commission to establish long-range development policies.
- It provides a basis for judging whether private development proposals and public projects are in harmony with the policies.
- It guides public agencies and private developers in designing projects consistent with City policies.

The General Plan is designed to be:

- **Long-range—**Most development decisions have effects lasting more than 20 years. In order to create a useful context for development decisions, the General Plan looks toward 2035 and beyond.
- **Comprehensive—**The General Plan provides direction to coordinate all major components of the community's physical development.
- **General—**The General Plan's purpose is to serve as a framework for detailed public and private development proposals. It establishes requirements for additional planning studies that must be completed before modifying land-use allocations.

Contents

Two primary components constitute the City of Roseville General Plan:

- The General Plan document, which presents goals, policies, and implementation measures
- The land use map, which graphically represents the City's existing and planned land use mix and pattern.

The General Plan document is organized into nine elements. The state-mandated elements are land use, circulation, open space and conservation, safety, housing, and noise. The optional elements are air quality, parks and recreation, and public facilities. Each element includes a brief setting and outlook section describing existing conditions and critical issues for the topic area, followed by goals, policies and implementation measures. The goals state the overall desired conditions that the City would like to achieve. The policies indicate an action or direction that the City must take as a step toward achieving the goals. The implementation measures include precise actions to achieve the stated policies. The general content of each element is as follows:

- **Land Use Element** discusses existing and projected land-use conditions, land-use designations and standards, community form, community design, and growth management. The goals and policies are intended to promote a balanced land-use pattern that supports innovative land-use approaches and retains and enhances the distinct character and identity of Roseville.
- **Circulation Element** identifies the general locations and extent of existing and proposed roadways, highways, railroads, and transit routes. The element identifies policies and programs to reduce traffic congestion, promote alternative forms of transportation, and provide safe travel throughout the City.
- **Air Quality and Climate Change Element** integrates related land-use, transportation and circulation, transit, and energy issues. The policies and implementation measures are intended to improve air quality and encourage cooperation among the jurisdictions involved in regional air quality efforts.
- **Open Space and Conservation Element** provides for the conservation, development, and use of natural resources; details plans and measures for the preservation of open space; and provides for outdoor recreation, public health and safety. It is the overall goal of the element to preserve a comprehensive interconnected system of open space encompassing preservation and enhancement of natural habitat areas for the use and enjoyment of the community.
- **Parks and Recreation Element** provides goals and policies for both traditional "active" park lands and non-traditional "open space recreational" park lands. It specifies standards and conditions as guidelines for planning parks and recreation facilities, including size, type, and location.
- **Public Facilities Element** identifies facility and service needs of the community and performance standards to ensure that desired service levels are maintained. Discussed under this element are civic

facilities, libraries, schools, electric and privately owned utilities, water and wastewater systems, solid waste and recycling, water and energy conservation, and the extension of City services. Emphasis is placed on the fair-share contribution of new development toward the provision of services and facilities.

- **Safety Element** establishes standards and plans for the protection of the community from a variety of hazards, including earthquakes, flooding, crime, fire, hazardous materials, and electromagnetic fields.
- **Noise Element** establishes standards for transportation and fixed noise sources to protect the health and welfare of the community.
- **Housing Element** identifies the existing and projected housing needs and establishes goals, policies, and implementation measures for the preservation, improvement and development of housing to meet the needs of all economic sectors of the community.

Specific Plans

Roseville's specific plans are comprehensive planning documents that guide the development of defined geographic areas. Specific plans typically include more detailed information than the General Plan about land use, traffic circulation, affordable housing programs, resource management strategies, development standards and a comprehensive infrastructure plan. Specific plans currently exist for the Amoruso Ranch, Creekview, Del Webb, Downtown, Highland Reserve North, North Central Roseville, Northeast Roseville, North Industrial, North Roseville, Northwest Roseville, Riverside Gateway, Sierra Vista, Southeast Roseville, Stoneridge, West Roseville, and the Infill Area. All of these specific plans were adopted by the City Council after extensive review by City staff, commissions and the public. Specific plans contain detailed regulations, conditions, programs and design criteria unique to specific areas of the City and serve to implement the General Plan. Each specific plan includes a menu of strategies.

Development Agreements

California planning law authorizes cities and developers to enter into contracts to lock in regulations and policies governing a property. Development agreements benefit the City and its residents by detailing the developer's responsibilities for public improvements and infrastructure, such as street lights and roads. Development agreements also give developers the certainty they need to develop their property. With the obligations of both the City and the developer detailed and in writing, the project is able to move ahead smoothly with few obstacles.

Community Design Guidelines

Community design guidelines identify the City's expectations for planning, designing and reviewing development proposals in Roseville. They establish standards for high quality development and design. The community design guidelines provide design professionals, property owners, commissioners, staff, and residents with a clear and common understanding of the City's expectations for the planning, design, and review of development proposals in Roseville. They also increase the community's awareness and appreciation of design considerations.

Open Space Preserve Overarching Management Plan

In August 2011, the City of Roseville adopted an Open Space Preserve Overarching Management Plan (OSPOMP), which provides a City-wide approach to open space management, maintenance, and monitoring of the City's open space preserves. The OSPOMP also provides the same approach for the management and maintenance of open space areas outside of a preserve areas. Prior to adoption of the OSPOMP, the City managed, monitored, and provided reports to the U.S. Army Corps of Engineers for over 30 individual preserve management plans regulated by natural resource agencies, with various requirements for management and monitoring that had evolved in comprehensiveness and complexity since the 1990s. Adoption of the OSPOMP eliminates the need for additional management plans when new open space is dedicated through the development process or habitat conservation efforts.

Urban Water Management Plan

The City of Roseville Urban Water Management Plan assumes an important role in water supply planning and management. Current drought conditions have resulted in unprecedented State mandates for water conservation, and the 2015 UWMP serves as the primary compliance document for interim water use targets required by the Water Conservation Act of 2009. The primary objective of the UWMP is to provide a framework for long term water supply planning and document how urban water suppliers carry out long term resource planning responsibilities.

The 2015 UWMP describes City water system, historical and projected use, water supply sources, and a comparison of projected water supply to water demands during normal, single-dry, and multiple dry years in 5 year increments from 2020 to 2040.

Emergency Operations Plan

The City of Roseville Emergency Operations Plan (EOP) establishes an emergency management organization and assigns functions and tasks consistent with California's Standardized Emergency Management System. It provides for the integration and coordination of planning efforts of multiple jurisdictions. This plan was reviewed and approved by representatives from each City of Roseville department, local special districts with emergency services responsibilities in the City, and the Placer County Office of Emergency Services. The content is based on guidance approved and provided by the State of California and FEMA. The EOP provides direction on how to respond to an emergency from the initial onset, through an extended response, and into the recovery process.

A key element of the update process for this hazard mitigation plan was the simultaneous review of the EOP. The Steering Committee remained informed of major review findings of the EOP with an eye toward integration with key components of the hazard mitigation plan. Updates to the EOP will continue to coincide with the future updates of the multi-hazard mitigation plan.

4.9.4 Incorporation of Information into the 2016 Planning Process

Pursuant to 44 CFR §201.6(b)(3), the City of Roseville specifically reviewed certain plans and programs for inclusion into this update for the purpose of planning consistency among documents. The full capability assessment includes these reviewed plans, as well as additional regulatory, administrative, fiscal, and NFIP compliance information. Relevant information from reviewed plans, studies, reports, and technical information incorporated into the mitigation plan includes:

- **State Hazard Mitigation Plan –** The State Hazard Mitigation Plan was reviewed for recent updates on state-wide hazard events and hazard information.

- **Placer County Hazard Mitigation Plan –** The Placer County Hazard Mitigation Plan was reviewed for planning consistency and augmented hazard event history for hazards that extend beyond Roseville city limits, such as drought and severe weather.
- **General Plan and Specific Plans –** General Plan demographics and land use was cross referenced for inclusion into this Plan as part of the overall community profile. Additionally, area vulnerabilities identified in Specific Plan Areas were included as part of the vulnerability and risk assessment for wildfire, landslide, and flood. The General Plan and Specific Plans were also included as part of the capability inventory for the City's capability assessment.
- **Urban Water Management Plan –** the information provided in the City's UWMP provided the main resource for illustrating the historical and current conditions for the drought chapter. The UWMP was also included as part of the capability inventory for the City's capability assessment.
- **Open Space Preserve Overarching Management Plan –** This plan was reviewed in reference to the open space policies regarding the City's floodplain management program and the flood chapter of this Plan.
- **Emergency Operations Plan –** The EOP was reviewed to augment hazard information as it relates to response to the assessed natural hazards. Additionally, the EOP underwent a gap analysis review in coordination with the Plan development so as to identify further consistency opportunities among documents. The EOP was also included as part of the capability inventory for the City's capability assessment.
- **Additional Resources and Technical Information –** A complete listing of technical reports, research materials, and articles used during development of this Plan is found in the References section.

4.10 CAPABILITY ASSESSMENT

The planning team performed an inventory and analysis of existing authorities and capabilities called a "capability assessment." A capability assessment creates an inventory of an agency's mission, programs and policies, and evaluates its capacity to carry them out. An assessment of legal and regulatory capabilities is presented in Table 4-10. An assessment of administrative and technical capabilities is presented in Table 4-11. An assessment of fiscal capabilities is presented in Table 4-12. Information on National Flood Insurance Program compliance is presented in Table 4-13. An assessment of education and outreach capabilities is presented in Table 4-14. Classifications under various community mitigation programs are presented in Table 4-15.

Table 4-10. Legal and Regulatory Capability

	Local Authority	State or Federal Prohibitions	Other Jurisdiction Authority	State Mandated
Codes, Ordinances & Requirements				
Building Code	Y	NA	N	Y
Comments: *The 2013 California Building Standards Code was adopted by the City of Roseville and incorporated by reference into the City of Roseville Municipal Code.*				
Zoning Code	Y	NA	N	N
Comments: *RMC, Title 19*				
Subdivisions	Y	NA	N	Y
Comments: *RMC, Title 18*				
Stormwater Management	Y	NA	N	Y
Comments: *RMC, Chapter 14.20*				
Post-Disaster Recovery	N	NA	N	N
Comments: *None at this time.*				
Real Estate Disclosure	N	NA	Y	N
Comments: *California Civil Code 1102 governs real estate and various disclosure laws. It does not mandate disclosure at the local government level but does require local governments to make known information on natural hazards available to the real estate community.*				
Growth Management	Y	NA	N	Y
Comments: *Growth management strategies are incorporated into the Land Use Element of the General Plan.*				
Site Plan Review	Y	NA	N	N
Comments: *The Zoning Ordinance (RMC 19.74.010.(C)) requires a design review permit for all new construction except single-family and two-family residences. Site design, building architecture, landscape design, and lighting are reviewed through the design review permit. Design review permits are reviewed and approved by the City's Design Committee or Planning Commission.*				
Flood Damage Prevention	Y	N/A	Y	Y
Comments: *The Roseville Zoning Ordinance incorporates combining or overlay of districts to regulate floodplain development, open space preservation, and other sensitive habitat. The Flood Damage Prevention Ordinance (RMC 9.80) regulates development in special flood hazard areas. Outside agencies with jurisdiction over sensitive habitats include the U.S. Army Corps of Engineers and California Department of Fish and Wildlife.*				
Public Health and Safety	Y	NA	N	N
Comments: *RMC, Title 9 includes multiple public health and safety regulations.*				
Environmental Protection	N	NA	N	N
Comments: *None at this time.*				
Planning Documents				
General or Comprehensive Plan	Y	NA	N	Y
Is the plan equipped to provide linkage to this mitigation plan? *Yes*				
Comments: *The City's General Plan was most recently updated in 2016 and is implemented through 14 specific plans (Amoruso Ranch, Sierra Vista, Creekview, Downtown, Riverside Gateway, Southeast Roseville, Northeast Roseville, Northwest Roseville, North Central Roseville, North Roseville, Highland Reserve North, Stoneridge, Del Webb, and West Roseville) and one other planning area (North Industrial).*				
Capital Improvement Plan	Y	NA	N	N
What types of capital facilities does the plan address? Roads, water, and sewer				
How often is the plan updated? Every 2-3 Years.				
Comments: *6-year CIP*				

	Local Authority	State or Federal Prohibitions	Other Jurisdiction Authority	State Mandated
Floodplain or Basin Plan	Y	NA	N	N
Comments: *RMC 9.80 and Safety Element of the General Plan*				
Stormwater Plan	Y	NA	Y	Y
Comments: *City of Roseville 2004 Stormwater Management Plan. The plan is required by the State of California as part of the federal National Pollution Discharge Elimination System program. Outside jurisdictional authority is through the State Water Resources Control Board and Regional Water Quality Control Board (Central Valley Region).*				
Habitat Conservation Plan	N	NA	N	N
Comments: *There are no Habitat Conservation Plans within the City. However, preserve areas have been established as a condition of Section 404 permits and biological opinions of the U.S. Fish and Wildlife Service and are regulated through the City's Overarching Open Space Preserve Management Plan approved by the U.S. Fish and Wildlife Service and U.S. Army Corps of Engineers. The Open Space and Conservation Element of the City's General Plan also contains policies relative to habitat conservation.*				
Economic Development Plan	Y	NA	N	N
Comments: *Current economic development strategy was adopted by the City Council on May 23, 2012. This document will guide the City for efforts related to business attraction, retention, expansion and creation.*				
Shoreline Management Plan	Y	NA	N	Y
Comments: *This is not applicable to Roseville. Shoreline management plans are applicable to coastal communities and are incorporated into local coastal plans reviewed and approved by the California Coastal Commission.*				
Community Wildfire Protection Plan	N	NA	Y	Y
Comments:				
Response/Recovery Planning				
Comprehensive Emergency Management Plan	Y	NA	N	Y
Comments: *The City of Roseville emergency operations plan was adopted by the City Council on July 21, 2004 (Resolution #04-301) and previously updated in conjunction with the 2011 hazard mitigation plan update. The EOP was subsequently reviewed parallel to the 2016 hazard mitigation plan update. The plan is mandated by the California Office of Emergency Services.*				
Threat & Hazard Identification & Risk Assessment	N	NA	N	N
Comments:				
Terrorism Plan	Y	NA	N	N
Comments: *Terrorism Contingency Plan, 2004*				
Hazard Mitigation Plan	Y	N	N	N
Comments: *The Roseville Multi-Hazard Mitigation Plan was adopted on January 19, 2011. The City received formal approval by FEMA on March 28, 2011.*				
Post-Disaster Recovery Plan	N	NA	N	N
Comments:				
Continuity of Operations Plan	Y (partial)	NA	N	N
Comments: *The EOP contains a general overview of continuity of government and continuity of operations guidelines. The City does not have a stand-alone plan for continuity of government or continuity of operations.*				
Public Health Plan	N	NA	N	N
Comments:				

Table 4-11. Administrative and Technical Capability

Staff/ Personnel Resources	Available (Y or N)	Department or Agency (Positions)
1. Planners or engineers with knowledge of land development and land management practices	Y	Departments of Development Services, Public Works, Environmental Utilities, Electric, and Parks, Recreation & Libraries (Planners, Engineers, Landscape Architect)
2. Engineers or professionals trained in construction practices related to buildings and/or infrastructure	Y	Public Works, Development Services Department- Engineering Division (Engineering Inspectors); Building Inspection Division (Building Inspectors); Environmental Utilities Department (Engineers and Inspectors for Water/Sewer/Storm water), Parks, Recreation & Libraries (Park Development)
3. Planners or engineers with an understanding of natural hazards	Y	Development Services Department (Planners, Engineering); Public Works (Engineers); Environmental Utilities (Engineers)
4. Floodplain manager	Y	Public Works, Floodplain Management Division (Engineer)
5. Surveyors	N	No licensed surveyors on City staff. City can and has contracted for survey work on as-needed basis.
6. Personnel skilled or trained in GIS Applications	Y	Development Services Department (Business Services Technicians); Public Works (Engineering Assistants); Fire Department (GIS Analysts); Environmental Utilities Department (Mapping Manager); Information Technology Division (GIS Manager)
7. Scientist familiar with local natural hazards	N	
8. Emergency manager	Y	Fire Department (Emergency Preparedness Manager)
9. Grant writers	Y	City Manager's Office (Government Relations Manager)
10. Staff with expertise or training in benefit/cost analysis	Y	Finance Department (administration and budget); City Manager's Office (Economic Development Team); Public Works; Environmental Utilities Department; Electric Department

Table 4-12. Fiscal Capability

Financial Resources	Accessible or Eligible to Use (Y or N)
1. Community Development Block Grants	Y
2. Capital Improvements Project Funding	Y
3. Authority to Levy Taxes for Specific Purposes	Y
4. User Fees For Water, Sewer, Gas or Electric Service	Y
5. Impact Fees for Buyers or Developers of New Development/Homes	Y
6. Incur Debt through General Obligation Bonds	Y
7. Incur Debt through Special Tax Bonds	Y
8. Incur Debt through Private Activity Bonds	N
9. Could Withhold Public Expenditures in Hazard-Prone Areas	N
10. State-Sponsored Grant Programs	Y
11. Other	NA

Table 4-13. National Flood Insurance Program Compliance

Compliance Issue	Local Response
What local department is responsible for floodplain management?	City of Roseville Public Works
Who is your floodplain administrator? (department/position)	Public Works/Senior Civil Engineer
Are any certified floodplain managers on staff in your jurisdiction?	Yes
What is the date of adoption of your flood damage prevention ordinance?	2006
When was the most recent Community Assistance Visit or Community Assistance Contact?	September 10, 2014.
Does your jurisdiction have any outstanding National Flood Insurance Program compliance violations that need to be addressed?	No
Do your flood hazard maps adequately address the flood risk within your jurisdiction?	Yes
Does your floodplain management staff need any assistance or training to support its floodplain management program?	The City's floodplain management is staff is always seeking ways to expand its nationally recognized subject matter expertise in the field of floodplain management.
• **If so, what type of assistance/training is needed? .....**	For this planning performance period, the training will focus on fundamental changes to the NFIP and CRS driven by flood insurance reform.
Does your jurisdiction participate in the Community Rating System?	Yes

Table 4-14. Education and Outreach

Criteria	Response
Do you have a Public Information Officer or Communications Office?	Yes – multiple communications specialists in multiple departments. The Public Works and Fire communications specialists are heavily involved in developing and distributing mitigation-specific information.
Do you have personnel skilled or trained in website development?	Yes
Do you have hazard mitigation information available on your website?	Yes
• **If yes, please briefly describe.**	Fire Department City website contains the maintained mitigation webpage. This page includes information on the Plan, meetings, and progress reports
Do you utilize social media for hazard mitigation education and outreach?	Yes
• **If yes, please briefly describe.**	Facebook, Twitter, Nextdoor
Do you have any citizen boards or commissions that address issues related to hazard mitigation?	Yes – the Roseville Coalition of Neighborhood Associations is an active neighborhood association that participated in the 2016 Plan Steering Committee.
Do you have any other programs already in place that could be used to communicate hazard-related information?	Yes
• **If yes, please briefly describe.**	Email distribution lists, annual events (e.g. Earth Day), Neighborhood Fire Station Tours
Do you have any established warning systems for hazard events?	Yes – Alert Roseville

Table 4-15. Community Classifications

	Participating?	Classification	Date Classified
Community Rating System	Yes	1	10/01/06
Building Code Effectiveness Grading Schedule	Yes	2/2	11/28/2011
Public Protection	Yes	2	May 2015
Storm Ready	Yes	Blue	N/A
Firewise	No	N/A	N/A

Part 2. Risk Assessment

5. IDENTIFIED HAZARDS OF CONCERN AND RISK ASSESSMENT METHODOLOGY

Risk assessment is the process of measuring the potential loss of life, personal injury, economic injury, and property damage resulting from natural hazards. It allows emergency management personnel to establish early response priorities by identifying potential hazards and vulnerable assets. The process focuses on the following elements:

- **Hazard identification**—Use all available information to determine what types of disasters may affect a jurisdiction, how often they can occur, and their potential severity.
- **Vulnerability identification**—Determine the impact of natural hazard events on the people, property, environment, economy and lands of the region.
- **Cost evaluation**—Estimate the cost of potential damage or cost that can be avoided by mitigation.

The risk assessment for this hazard mitigation plan update evaluates the risk of natural hazards prevalent in the planning area and meets requirements of the DMA (44 CFR, Section 201.6(c)(2)).

5.1 IDENTIFIED HAZARDS OF CONCERN

The Steering Committee considered the full range of natural and human-caused hazards that could impact the area, and then identified and ranked the hazards that present the greatest concern. The selection of hazards of concern was based on the following criteria:

- The California State Hazard Mitigation Plan identified Placer County as being susceptible to the hazard.
- Historical occurrence of the hazard within the City of Roseville has caused fatalities, injury, or property damage.
- There is local knowledge and perception that the hazard could significantly impact the planning area, regardless of past occurrence.

Based on review of all available resources, the following hazards of concern were identified for the 2016 Plan:

- Climate change
- Dam failure
- Drought
- Earthquake
- Flooding
- Landslide
- Severe weather
- Wildfire
- Health hazards
- Human-caused hazards.

The Steering Committee did not omit any hazard commonly recognized to affect the City of Roseville.

5.2 METHODOLOGY

The risk assessments in Chapters 6 through 15 describe the risks associated with each identified hazard of concern. Each chapter describes the hazard, the planning area's vulnerabilities, and probable event scenarios. The following steps were used to define the risk of each hazard:

- **Identify and profile each hazard—**The following information is given for each hazard:
  - Geographic areas most affected by the hazard
  - Event frequency estimates
  - Severity estimates
  - Warning time likely to be available for response.
- **Determine exposure to each hazard—**Exposure was determined by overlaying hazard maps with an inventory of structures, facilities, and systems to determine which of them are within the area affected by the hazard.
- **Assess the vulnerability of exposed facilities—**Vulnerability of exposed structures and infrastructure was determined by interpreting the probability of occurrence of each event and assessing structures, facilities, and systems that are exposed to each hazard. Tools such as geographic information systems (GIS) and FEMA's hazard-modeling program called Hazus-MH were used to perform this assessment for the flood, dam failure and earthquake hazards. Outputs similar to those from Hazus-MH were generated for other hazards, using maps generated by the Hazus program.

5.3 RISK ASSESSMENT TOOLS

5.3.1 Dam Failure, Earthquake and Flood—Hazus-MH

Overview

In 1997, FEMA developed the standardized Hazards U.S., or Hazus, model to estimate losses caused by earthquakes and identify areas that face the highest risk and potential for loss. Hazus was later expanded into a multi-hazard methodology, Hazus-MH, with new models for estimating potential losses from hurricanes and floods.

Hazus-MH is a GIS-based software program used to support risk assessments, mitigation planning, and emergency planning and response. It provides a wide range of inventory data, such as demographics, building stock, critical facility, transportation and utility lifeline, and multiple models to estimate potential losses from natural disasters. The program maps and displays hazard data and the results of damage and economic loss estimates for buildings and infrastructure. Its advantages include the following:

- Provides a consistent methodology for assessing risk across geographic and political entities.
- Provides a way to save data so that it can readily be updated as population, inventory, and other factors change and as mitigation planning efforts evolve.
- Facilitates the review of mitigation plans because it helps to ensure that FEMA methodologies are incorporated.
- Supports grant applications by calculating benefits using FEMA definitions and terminology.
- Produces hazard data and loss estimates that can be used in communication with local stakeholders.
- Is administered by the local government and can be used to manage and update a hazard mitigation plan throughout its implementation.

Levels of Detail for Evaluation

Hazus-MH provides default data for inventory, vulnerability and hazards; this default data can be supplemented with local data to provide a more refined analysis. The model can carry out three levels of analysis, depending on the format and level of detail of information about the planning area:

- **Level 1—**All of the information needed to produce an estimate of losses is included in the software's default data. This data is derived from national databases and describes in general terms the characteristic parameters of the planning area.
- **Level 2—**More accurate estimates of losses require more detailed information about the planning area. To produce Level 2 estimates of losses, detailed information is required about local geology, hydrology, hydraulics and building inventory, as well as data about utilities and critical facilities. This information is needed in a GIS format.
- **Level 3—**This level of analysis generates the most accurate estimate of losses. It requires detailed engineering and geotechnical information to customize it for the planning area.

Application for This Plan

The following hazards were evaluated using Hazus-MH:

- **Flood—**A Level 2, user-defined analysis was performed for general building stock in flood zones and for critical facilities and infrastructure. Preliminary planning area flood mapping was used to delineate flood hazard areas and estimate potential losses from the 10-, 100- and 500-year flood events. To estimate damage that would result from a flood, Hazus uses pre-defined relationships between flood depth at a structure and resulting damage, with damage given as a percent of total replacement value. Curves defining these relationships have been developed for damage to structures and for damage to typical contents within a structure. By inputting flood depth data and known property replacement cost values, dollar-value estimates of damage were generated.
- **Dam Failure—**A Level 2 analysis was run for Folsom Dam using the flood methodology described above.
- **Earthquake—**A Level 2 analysis was performed to assess earthquake exposure and vulnerability for two scenario events and one probabilistic event:
  - A Magnitude-6.8 event on the Concord-Green Valley Fault with an epicenter 56 miles southwest of Roseville
  - A Magnitude-7.1 event on the Great Valley Fault with an epicenter 58 miles west northwest of Roseville
  - The standard Hazus-MH 100-year probabilistic event.

5.3.2 Landslide, Severe Weather, and Wildfire

For most of the hazards of concern, historical data was not adequate to model future losses. However, areas and inventory susceptible to some of the hazards of concern were mapped, and exposure was evaluated. For other hazards, a qualitative analysis was conducted using the best available data and professional judgment.

5.3.3 Drought

The risk assessment methodologies used for the 2016 Plan focus on damage to structures. Because drought does not impact structures, the risk assessment for drought was more limited and qualitative than the assessment for the other hazards of concern.

5.3.4 Climate Change

Climate change was addressed to different standards than the above natural hazards for the following reasons:

- Specific data needed to assess risk, such as maps of extent and location and applied damage functions, are not readily available for climate change.
- Standardized climate change models based on greenhouse gas emissions do not currently exist, resulting in a high variation of scenarios that result in differing projections. Until a standardized model is identified, climate change assessment will remain subjective.

5.3.5 Health Hazards and Human-Caused Hazards

The non-natural hazards of concern were assessed to different standards than the natural hazards for the following reasons:

- The assessment of non-natural hazards is optional under federal hazard mitigation planning requirements (44 CFR Section 201.6).
- The data needed to assess risk, such as maps of extent and location and applied damage functions, are not readily available for these types of hazards.
- A key element of risk is the probability of occurrence. Probabilities are usually assigned based on past historical occurrences. While human-caused and human health hazards have had significant impacts on our nation as a whole, they have not impacted regions of the country uniformly as do natural hazard events. The lack of record of past occurrences within a planning area makes it difficult to assign probability of occurrence.

5.4 MAPPING

A review of national, state and county databases was performed to locate available spatially based data relevant to this planning effort. Maps were produced using GIS software to show the spatial extent and location of identified hazards when such data was available. These maps are included in the hazard profile chapters of this document. Information regarding the data sources and methodologies employed in these mapping efforts is provided in the sections below.

5.4.1 Building and Cost Data

Replacement cost values and detailed structure information derived from parcel and tax assessor data provided by the City of Roseville were loaded into Hazus-MH. When available, an updated inventory was used in place of the Hazus-MH defaults for critical facilities and infrastructure.

Replacement cost is the cost to replace the entire structure with one of equal quality and utility. Replacement cost is based on industry-standard cost-estimation models published in *RS Means Square Foot Costs* (RS Means, 2015). It is calculated using the RS Means square foot cost for a structure, which is based on the Hazus-MH occupancy class (e.g., multi-family residential, commercial retail trade), multiplied by the square footage of the structure from the tax assessor data. For single-family residential, the construction class and number of stories also factor into determining the square foot costs.

5.4.2 Hazus-MH Data Inputs

The following hazard data were used for the Hazus-MH Level 2 analysis conducted for the risk assessment:

- **Flood—**The preliminary Digital Flood Insurance Rate Map (DFIRM) for the planning area – dated December 28, 2015 – was used to delineate flood hazard areas and estimate potential losses from the

100-year, 500-year and 10-year flood events. Using the DFIRM floodplain boundaries and base flood elevation information, and the Central Valley Flood Delineation Project 3-foot digital elevation model data, flood depth grids were generated and integrated into the Hazus-MH model.

- **Dam Failure—**Inundation area data from the Folsom Dam Containment Dike Failure Risk Assessment Project, provided by the City of Roseville, and the 3-foot digital elevation model were used to develop depth grids that were integrated into the Hazus-MH model.
- **Earthquake—**Earthquake shake maps and probabilistic data prepared by the U.S. Geological Survey (USGS) were used for the analysis of this hazard. A National Earthquake Hazard Reduction Program (NEHRP) soils map from the California Department of Conservation was also integrated into the Hazus-MH model.

5.4.3 Other Local Hazard Data

Locally relevant information on hazards was gathered from a variety of sources. Frequency and severity indicators include past events and the expert opinions of geologists, emergency management specialists and others. Data sources for specific hazards were as follows:

- **Landslide—**A dataset for landslide probability was created by intersecting slope data with NEHRP soils data. Three landslide probability classifications were created: high (greater than 30 percent slope, D soils), moderate (15 to 30 percent slope, D type soils), and low (0 to 15 percent slope, D type soils). The slope data were generated from the 3-foot digital elevation model. The NEHRP soils data were provided by the California Department of Conservation.
- **Severe Storm—**No GIS format severe storm area data were identified for the City of Roseville.
- **Wildfire—**California Department of Forestry and Fire Protection (CAL FIRE) fire severity data was downloaded from the CAL FIRE website.

5.4.4 Data Source Summary

Table 5-1 summarizes the data sources used for the risk assessment for this project.

5.4.5 Limitations

Loss estimates, exposure assessments and hazard-specific vulnerability evaluations rely on the best available data and methodologies. Uncertainties are inherent in any loss estimation methodology and arise in part from incomplete scientific knowledge concerning hazards and their effects on the built environment. Uncertainties also result from the following:

- Approximations and simplifications necessary to conduct a study
- Incomplete or outdated inventory, demographic, or economic parameter data
- The unique nature, geographic extent and severity of each hazard
- Mitigation measures already employed
- The amount of advance notice residents have to prepare for a specific hazard event.

These factors can result in a range of uncertainty in loss estimates, possibly by a factor of two or more. Therefore, exposure and loss estimates are approximate. These results do not predict precise results and should be used only to understand relative risk. Over the long term, the City of Roseville will collect additional data to assist in estimating potential losses associated with other hazards.

Table 5-1. Hazus-MH Model Data Documentation

Data	Source	Date	Format
Property parcel data	City of Roseville	2016	Digital (GIS) format
Address points	City of Roseville	2016	Digital (GIS) format
Building footprints	City of Roseville	2016	Digital (GIS) format
Building information[a]	City of Roseville	2016	Digital (GIS) format
Building replacement cost	RS Means	2015	Printed. Updated RS Means values
Population data	Hazus-MH v2.2	2010	Digital (GIS and tabular) format
Flood hazard data	FEMA	2015	Digital (GIS) format
First floor elevation data	City of Roseville	2011	Digital (tabular) format
Earthquake shake maps	USGS Earthquake Hazards Program website	2012	Digital (GIS) format
NEHRP Soils	California Department of Conservation	2008	Digital (GIS) format
Dam inundation area	City of Roseville	2010	Digital (GIS) format
Landslide	Tetra Tech Inc.	2016	Digital (GIS) format
Wildfire	CAL FIRE	2008	Digital (GIS) format
Digital Elevation Model	City of Roseville	2015	Digital (GIS) format
CRITICAL FACILITIES AND ASSETS			
Landmarks[b]	City of Roseville	2015	Digital (GIS) format
State and local bridges	Caltrans	2015	Digital (GIS) forma
Rail facilities	Caltrans	2015	Digital (GIS) format
Telecommunications facilities	City or Roseville	2015	Digital (GIS) format
Consolidated communications facilities	Consolidated Communications (from 2011 Hazard Mitigation Plan)	2011	Digital (GIS) format
Hazardous material facilities	U.S. EPA Toxic Release Inventory	2016	Digital (GIS) format
Potable water facilities	City of Roseville	2015	Digital (GIS) format
Sewer facilities	City of Roseville	2015	Digital (GIS) format

a. Building information includes area, occupancy, date of construction, and stories
b. Landmarks include fire stations, police stations, schools, medical care facilities, helipads, rail facilities, electric power facilities, potable water facilities, sewer facilities, and various government facilities

6. CLIMATE CHANGE CONSIDERATIONS FOR HAZARD MITIGATION

6.1 CALIFORNIA SENATE BILL NO. 379

California Senate Bill 379, adopted October 8, 2015, requires that local hazard mitigation plans adopted on or after January 1, 2017 include all of the following:

- A vulnerability assessment that identifies the risks that climate change poses to the local jurisdiction and the geographic areas at risk from climate change impacts, including but not limited to flood and fire hazards. Information available from federal, state, regional and local agencies should be used in the development of this assessment, including the following:
  - Information from the Internet-based Cal-Adapt tool
  - Information from the most recent version of the California Adaptation Planning Guide
  - Information from local agencies on the types of assets, resources, and populations that will be sensitive to various climate change exposures
  - Information from local agencies on their current ability to deal with the impacts of climate change
  - Historical data on natural events and hazards, including locally prepared maps of areas subject to previous risk, areas that are vulnerable, and sites that have been repeatedly damaged
  - Existing and planned development in identified at-risk areas, including structures, roads, utilities, and essential public facilities
  - Federal, state, regional, and local agencies with responsibility for the protection of public health and safety and the environment, including special districts and local offices of emergency services
- A set of adaptation and resilience goals, policies, and objectives based on the available information
- A set of feasible implementation measures designed to carry out the goals, policies, and objectives including, but not limited to, all of the following:
  - Feasible ways to avoid or minimize climate change impacts associated with new uses of land
  - Siting new essential public facilities outside of at-risk areas when feasible (including, but not limited to, hospitals and health care facilities, emergency shelters, emergency command centers, and emergency communications facilities) or, if these facilities are located in at-risk areas, using construction or other methods to minimize damage
  - The designation of adequate and feasible infrastructure in an at-risk area
  - Guidelines for working cooperatively with relevant local, regional, state, and federal agencies.
  - The identification of natural infrastructure that may be used in adaptation projects, where feasible. Where feasible, the plan shall use existing natural features and ecosystem processes or restore natural features and ecosystem processes, when developing alternatives for consideration.

At the time of the development of this hazard mitigation plan, guidelines and resources are still being developed to assist local governments in meeting the intent of Senate Bill No. 379. Information in this chapter addresses the issues presented and the intent of the requirements using the best currently available information. It focuses on the

vulnerability assessment of climate change as it relates to the natural hazards of concern selected by the steering committee. Goals, policies, objectives and implementation measures for climate change are incorporated into this Plan's overall mitigation goals, objectives, and actions presented in Part 3.

6.2 WHAT IS CLIMATE CHANGE?

Climate, consisting of patterns of temperature, precipitation, humidity, wind and seasons, plays a fundamental role in shaping natural ecosystems and the human economies and cultures that depend on them. "Climate change" refers to changes over a long period of time. Worldwide, average temperatures have increased 1.4ºF since 1880 (NASA, 2015). Although this change may seem small, it can lead to large changes in climate and weather.

The warming trend and its related impacts are caused by increasing concentrations of carbon dioxide and other greenhouse gases in the earth's atmosphere. Greenhouse gases are gases that trap heat in the atmosphere, resulting in a warming effect. Carbon dioxide is the most commonly known greenhouse gas; however, methane, nitrous oxide and fluorinated gases also contribute to warming. Emissions of these gases come from a variety of sources, such as the combustion of fossil fuels, agricultural production, changes in land use and volcanic eruptions. According to the U.S. Environmental Protection Agency (EPA), carbon dioxide concentrations measured about 280 parts per million (ppm) before the industrial era began in the late 1700s and have risen 43 percent since then, reaching 399 ppm in 2014 (see Figure 6-1). Scientists are able to place this rise in carbon dioxide in a longer historical context through the measurement of carbon dioxide in ice cores. According to these records, carbon dioxide concentrations in the atmosphere are the highest that they have been in 800,000 years (NASA, 2016).

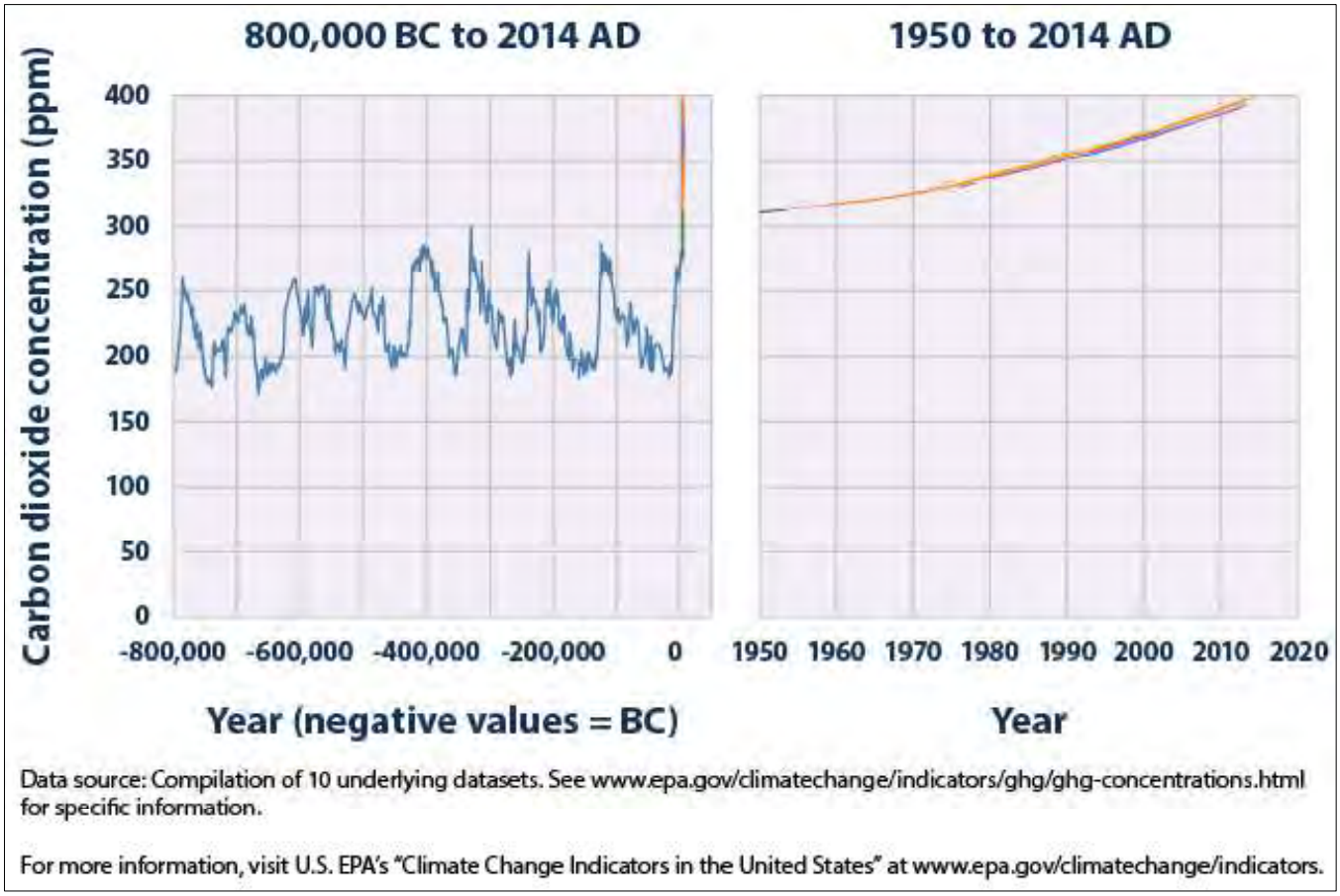


Figure 6-1. Global Carbon Dioxide Concentrations Over Time

According to NASA, most of this trend is very likely human-induced, and the rate of change has not been matched in the past 1,300 years (NASA, 2016). There is broad scientific consensus (97 percent of scientists) that climate-warming trends are very likely due to human activities (NASA, 2016). Unless emissions of greenhouse gases are substantially reduced, this warming trend and its associated impacts are expected to continue.

Climate change will affect the people, property, economy and ecosystems of the City of Roseville in a variety of ways. Climate change impacts are most frequently associated with negative consequences, such as increased flood vulnerability or increased heat-related illnesses and other public health concerns; however, other changes may present opportunities. The most important effect for the development of this Plan is that climate change will have a measurable impact on the occurrence and severity of natural hazards.

6.3 HOW CLIMATE CHANGE AFFECTS HAZARD MITIGATION

An essential aspect of hazard mitigation is predicting the likelihood of hazard events in a planning area. Typically, predictions are based on statistical projections from records of past events. This approach assumes that the likelihood of hazard events remains essentially unchanged over time. Thus, averages based on the past frequencies of, for example, floods are used to estimate future frequencies: if a river has flooded an average of once every 5 years for the past 100 years, then it can be expected to continue to flood an average of once every 5 years.

For hazards that are affected by climate conditions, the assumption that future behavior will be equivalent to past behavior is not valid if climate conditions are changing. As flooding is generally associated with precipitation frequency and quantity, for example, the frequency of flooding will not remain constant if broad precipitation patterns change over time. The risks of, landslide, severe storms, extreme heat and wildfire are all affected by climate patterns as well. For this reason, an understanding of climate change is pertinent to efforts to mitigate natural hazards. Information about how climate patterns are changing provides insight on the reliability of future hazard projections used in mitigation analysis. This chapter summarizes current understandings about climate change in order to provide a context for the recommendation and implementation of hazard mitigation measures.

6.4 CURRENT INDICATIONS OF CLIMATE CHANGE

The major scientific agencies of the United States and the world—including the National Aeronautics and Space Administration (NASA), the National Oceanic and Atmospheric Administration (NOAA) and the Intergovernmental Panel of Climate Change (IPCC)—agree that climate change is occurring. Multiple temperature records from all over the world have shown a warming trend, and the IPCC has stated that the warming of the climate system is unequivocal (IPCC, 2014). Of the 10 warmest years in the 134-year record, all but one (1998) occurred since 2000, and 2015 was the warmest year on record (NASA, 2016).

Rising global temperatures have been accompanied by other changes in weather and climate. Many places have experienced changes in rainfall resulting in more intense rain, as well as more frequent and severe heat waves (IPCC, 2014). The planet's oceans and glaciers have also experienced changes: oceans are warming and becoming more acidic, ice caps are melting, and sea levels are rising (NASA, 2016). Global sea level has risen 6.7 inches, on average, in the last 100 years (NASA, 2016). This has already put some coastal homes, beaches, roads, bridges, and wildlife at risk (USGCRP, 2009).

NASA currently maintains information on the vital signs of the planet and has identified the following trends as of the time of the development of this Plan (NASA, 2016):

- Carbon Dioxide—Increasing trend, currently at 403.28 parts per million
- Global Temperature—Increasing trend, increase of 1.4ºF since 1880
- Arctic Ice Minimum—Decreasing trend, 13.4 percent per decade

- Land Ice—Decreasing trend, 287.0 billion metric tons per year
- Sea Level—Increasing trend, 3.4 mm per year.

6.5 PROJECTED FUTURE IMPACTS

Climate change projections contain inherent uncertainty because they are dependent on future greenhouse gas emission scenarios. Different climate change models may assume different scenarios, resulting in differing projections. Generally, the uncertainty is addressed by developing projections for a range of scenarios: in low-emissions scenarios, greenhouse gas emissions are assumed to be reduced substantially from current levels; in high-emissions scenarios, they are assumed to increase or continue at current levels. Despite these uncertainties, climate change projections present valuable information to help guide decision-making for the future.

The Third National Climate Assessment Report for the United States indicates that impacts resulting from climate change will continue through the 21st century and beyond. Although not all changes are understood at this time and the impacts of those changes will depend on global emissions of greenhouse gases and sensitivity in human and natural systems, the following impacts are expected in the United States (NASA, 2016):

- Temperatures will continue to rise
- Growing seasons will lengthen
- Precipitation patterns will change
- Droughts and heat waves will increase
- Hurricanes will become stronger and more intense
- Sea level will rise 1 to 4 feet by 2100
- The Arctic may become ice free.

The California Climate Adaptation Planning Guide outlines the following climate change impact concerns for the North Sierra Region communities (Cal EMA et al., 2012):

- Increased temperature
- Decreased precipitation
- Reduced snowpack
- Reduced tourism
- Ecosystem change
- Sensitive species stress
- Increased wildfire.

Cal-Adapt, a publicly available resource, offers information on how climate change might impact local communities. It presents visualization tools that present the most current data available whenever possible. The following sections summarize projections by Cal-Adapt for the Roseville area's local climate.

6.5.1 Precipitation

According to Cal-Adapt, precipitation projections for California remain uncertain. Models show differing impacts from slightly wetter winters to slightly drier winters, with potential for a 10- to 20-percent decrease in total annual precipitation (Cal-Adapt, 2016). Changes in precipitation patterns, coupled with warmer temperatures, may lead to significant changes in hydrology. In high-emissions scenarios, more precipitation may fall as rain rather than snow, and snow may melt earlier in the season, impacting the timing of stream flow changes and floods (Cal-Adapt, 2016).

6.5.2 Temperature

The historical average (1961-1990) temperature in the Roseville area is 61.7ºF. By 2090, the average temperature in the City is expected to increase above this baseline in the low- and high-emissions scenarios by 3.8ºF and 6.5ºF, respectively, as shown in Figure 6-2.

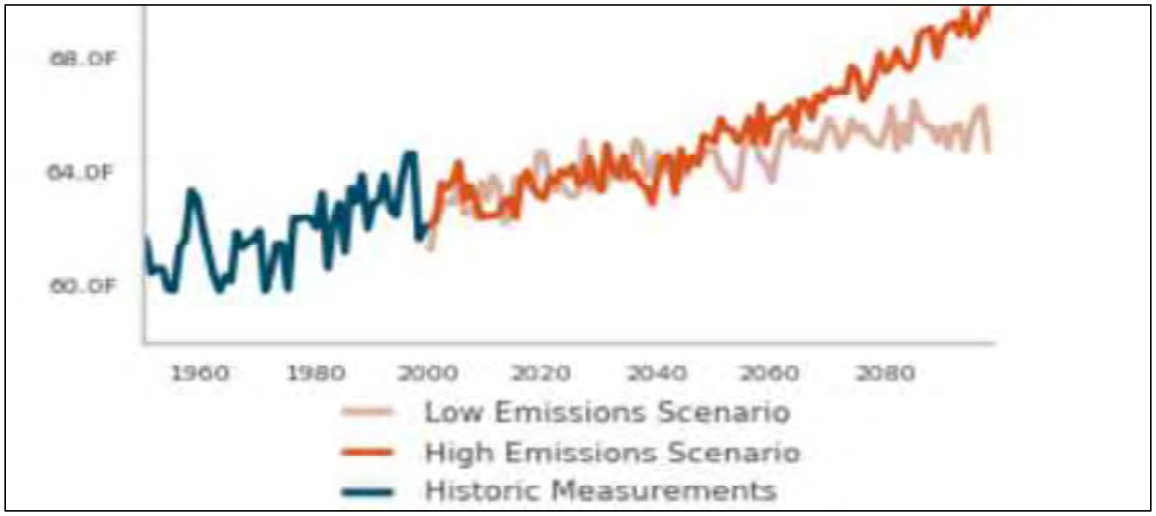


Figure 6-2. Observed and Projected Average Temperatures in the Roseville Area

6.5.3 Snow Pack

While there are no snow-water equivalency measurements for the Roseville area, Cal-Adapt indicates that some parts of California should expect snow pack levels to be reduced by up to 25 inches from the baseline (1961-1990) by 2090.

6.5.4 Wildfire

Wildfire risk is expected to change in the coming decades. Under the high-emissions scenario, the fire risk in Placer County may increase by 1.86 times the current risk by 2085, while the risk may be 1.31 times the current risk for the low-emissions scenario (see Figure 6-3).

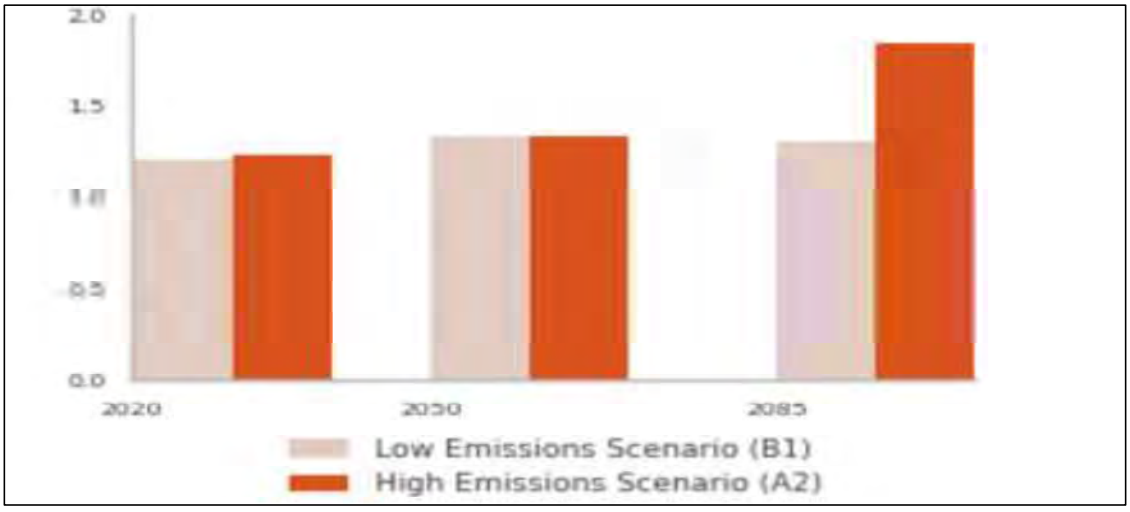


Figure 6-3. Projected Future Fire Risk in Placer County Relative to 2010 Levels

6.6 RESPONSES TO CLIMATE CHANGE

Communities and governments worldwide are working to address, evaluate and prepare for climate changes that are likely to impact communities in coming decades. Societies across the world are facing the need to adapt to changing conditions associated with natural disasters and climate change. Farmers are altering crops and agricultural methods to deal with changing rainfall and rising temperature; architects and engineers are redesigning buildings; planners are looking at managing water supplies to deal with droughts or flooding.

6.6.1 Mitigation and Adaptation

Generally, climate change discussions encompass two separate but inter-related considerations: mitigation and adaptation. The term "mitigation" can be confusing, because it's meaning changes across disciplines:

- Mitigation in climate change discussions is defined as "a human intervention to reduce the impact on the climate system." It includes strategies to reduce greenhouse gas sources and emissions and enhance greenhouse gas sinks (EPA, 2013).
- Mitigation in emergency management is typically defined as the effort to reduce loss of life and property by lessening the impact of disasters (FEMA, 2016a).
- Mitigation in restoration ecology and related fields generally refers to policies, programs or actions that are intended to reduce or to offset the negative impacts of human activities on natural systems. Generally, mitigation can be understood as avoiding, minimizing, rectifying, reducing or eliminating, or compensating for known impacts (U.S. DOT, n.d.).

In this chapter, mitigation is used as defined by the climate change community. In the other chapters of this Plan, mitigation is primarily used in an emergency management context.

Adaptation is defined by the IPCC as adjusting to actual or expected climate and its effects. It includes efforts to moderate or avoid harm to human systems or take advantage of beneficial opportunities. It also includes human intervention to help natural systems adjust to expected climate change (IPCC, 2014).

Mitigation and adaptation are related, as the world's ability to mitigate greenhouse gas emissions will affect the degree of adaptation that will be necessary. Some initiatives and actions can both reduce greenhouse gas emissions and support adaptation to likely future conditions.

6.6.2 Ecosystem-Based Adaptation

Ecosystem-based adaptation is the use of biodiversity and ecosystem services as part of an overall strategy to help people adapt to the adverse effects of climate change. This includes the sustainable management, conservation and restoration of specific ecosystems that provide key services. Most ecosystems show a remarkable ability to adapt to change and to buffer surrounding areas from the impacts of change. Forests can bind soils and hold large volumes of water during times of plenty, releasing it through the year; floodplains can absorb vast volumes of water during peak flows; coastal ecosystems can hold out against storms, attenuating waves and reducing erosion. Other ecosystem services—such as food provision, timber, materials, medicines and recreation—can provide a buffer to societies in the face of changing conditions.

6.6.3 City of Roseville Sustainability Efforts

The City of Roseville has taken steps to reduce the impacts of climate change through greenhouse gas mitigation and community sustainability efforts:

- The City of Roseville's general plan highlights existing policies and programs that either reduce greenhouse gas emissions or assist in protecting residents from the potential adverse impacts of climate change (City of Roseville, 2016).
- In 2009, the City Council adopted the City-operations Climate Action Plan, which set a greenhouse gas emission reduction goal of 22.8 percent (City of Roseville, n.d.).
- In 2010 the Community-wide Sustainability Action Plan was developed, recommending 11 steps to reach the greenhouse gas emission targets. (City of Roseville, 2010a).

6.7 CLIMATE CHANGE IMPACTS ON HAZARDS

The following sections provide information on how each identified hazard of concern for this planning process may be impacted by climate change. They describe how these impacts may alter current exposure and vulnerability to these hazards of the people, property, critical facilities and environment in the City of Roseville. Detailed hazard profiles and risk assessment information on each hazard of concern are presented in Chapters 7 through 15.

6.7.1 Drought

Impacts on Hazard

The long-term effects of climate change on regional water resources are unknown, but global water resources are already experiencing the following stresses without climate change:

- Growing populations
- Increased competition for available water
- Poor water quality
- Environmental claims
- Uncertain reserved water rights
- Groundwater overdraft
- Aging urban water infrastructure.

With a warmer climate, droughts could become more frequent, more severe, and longer-lasting. According to the National Climate Assessment Report, higher surface temperatures caused by global warming increase the potential for drought. Evaporation and the higher rate at which plants lose moisture through their leaves both increase with temperature. Unless higher evapotranspiration rates are matched by increases in precipitation, areas become more dry, promoting drought conditions (Globalchange.gov, 2014).

Because expected changes in precipitation patterns are still uncertain, the potential impacts and likelihood of drought are uncertain. California DWR has already noted the impact of climate change on statewide water resources by charting changes in snowpack, sea level, and river flow. As temperatures rise and more precipitation comes in the form of rain instead of snow, these changes will likely continue or grow even more significant. DWR estimates that the Sierra Nevada snowpack, which supplies water for the City of Roseville and other parts of the state, will experience a 48- to 65-percent loss by the end of the century, based on historical April 1 averages (CA DWR 2016). Increasing temperatures may also increase net evaporation from reservoirs by 15 to 37 percent (CA DWR 2013).

Population

Population exposure and vulnerability to drought are unlikely to increase as a result of climate change. While greater numbers of people may need to engage in behavior change, such as water saving efforts, significant life or health impacts are unlikely.

Property

Property exposure and vulnerability may increase as a result of increased drought resulting from climate change, although this would most likely occur in non-structural property such as landscaping. It is unlikely that structure exposure or vulnerability would increase as a direct result of drought, although secondary impacts of drought, such as wildfire, may increase and threaten structures.

Critical Facilities

Critical facility exposure and vulnerability are unlikely to increase as a result of increased drought resulting from climate change; however, critical facility operators may need to alter standard management practices and actively manage resources, particularly in water-related service sectors.

Environment

The vulnerability of the environment may increase as a result of increased drought resulting from climate change. Ecosystems and biodiversity in the Roseville area are already under stress from development and water diversion. Prolonged or more frequent drought resulting from climate change may further stress the ecosystems in the region, which include many special status species (Cal EMA et al., 2012).

6.7.2 Earthquake

Impacts on Hazard

The impacts of global climate change on earthquake probability are unknown. Some scientists say that melting glaciers could induce tectonic activity. As ice melts and water runs off, tremendous amounts of weight are shifted on the earth's crust. As newly freed crust returns to its original, pre-glacier shape, it could cause seismic plates to slip and stimulate volcanic activity, according to research into prehistoric earthquakes and volcanic activity. NASA and USGS scientists found that retreating glaciers in southern Alaska may be opening the way for future earthquakes (NASA, 2004).

Secondary impacts of earthquakes could be magnified by climate change. Soils saturated by repetitive storms or heavy precipitation could experience liquefaction or an increased propensity for slides during seismic activity due to the increased saturation. Dams storing increased volumes of water due to changes in the hydrograph could fail during seismic events.

Population, Property, Critical Facilities and the Environment

Because impacts of climate change on the earthquake hazard are not well understood, increases in exposure and vulnerability of the local resources are not able to be determined.

6.7.3 Flood

Impacts on Hazard

Use of historical hydrologic data has long been the standard of practice for designing and operating water supply and flood protection projects. For example, historical data are used for flood forecasting models and to forecast snowmelt runoff for water supply. This method of forecasting assumes that the climate of the future will be similar to that of the period of historical record. However, the hydrologic record cannot be used to predict changes in frequency and severity of extreme climate events such as floods. Going forward, model calibration or statistical relation development must happen more frequently, new forecast-based tools must be developed, and a standard of practice that explicitly considers climate change must be adopted. Climate change is already impacting water resources, and resource managers have observed the following:

- Historical hydrologic patterns can no longer be solely relied upon to forecast the water future.
- Precipitation and runoff patterns are changing, increasing the uncertainty for water supply and quality, flood management and ecosystem functions.
- Extreme climatic events will become more frequent, necessitating improvement in flood protection, drought preparedness and emergency response.

The amount of snow is critical for water supply and environmental needs, but so is the timing of snowmelt runoff into rivers and streams. Rising snowlines caused by climate change will allow more mountain areas, such as the Sierra Nevada watersheds, to contribute to peak storm runoff. High frequency flood events (e.g. 10-year floods) in particular will likely increase with a changing climate. Along with reductions in the amount of the snowpack and accelerated snowmelt, scientists project greater storm intensity, resulting in more direct runoff and flooding. Changes in watershed vegetation and soil moisture conditions will likewise change runoff and recharge patterns. As stream flows and velocities change, erosion patterns will also change, altering channel shapes and depths, possibly increasing sedimentation behind dams, and affecting habitat and water quality. With potential increases in the frequency and intensity of wildfires due to climate change, there is potential for more floods following fire, which increase sediment loads and water quality impacts.

As hydrology changes, what is currently considered a 1-percent-annual-chance (100-year) flood may strike more often, leaving many communities at greater risk. Planners will need to factor a new level of safety into the design, operation, and regulation of flood protection facilities such as dams, bypass channels and levees, as well as the design of local sewers and storm drains.

Population and Property

Population and property exposure and vulnerability may increase as a result of climate change impacts on the flood hazard. Runoff patterns may change, resulting in flooding in areas where it has not previously occurred.

Critical Facilities

Critical facility exposure and vulnerability may increase as a result of climate change impacts on the flood hazard. Runoff patterns may change, resulting in risk to facilities that have not historically been at risk from flooding. Additionally, changes in the management and design of flood protection critical facilities may be needed as additional stress is placed on these systems.

Environment

The exposure and vulnerability of the environment may increase as a result of climate change impacts on the flood hazard. Changes in the timing and frequency of flood events may have broader ecosystem impacts that alter the ability of already stressed species to survive.

6.7.4 Landslide

Impacts on Hazard

Climate change may impact storm patterns, increasing the probability of more frequent, intense storms with varying duration. Increase in global temperature is likely to affect the snowpack and its ability to hold and store water. Warming temperatures also could increase the occurrence and duration of droughts, which would increase the probability of wildfire, reducing the vegetation that helps to support steep slopes. All of these factors would increase the probability for landslide occurrences.

Population and Property

Population and property exposure and vulnerability would be unlikely to increase as a result of climate change impacts on the landslide hazard. Landslide events may occur more frequently, but the extent and location should be contained within mapped hazard areas.

Critical Facilities

Critical facility exposure and vulnerability would be unlikely to increase as a result of climate change impacts on the landslide hazard; however, critical facility owners and operators may experience more frequent disruption to service provision as a result of landslide hazards. For example, transportation systems may experience more frequent delays if slides blocking these systems occur more frequently.

Environment

Exposure and vulnerability of the environment would be unlikely to increase as a result of climate change, but more frequent slides in riverine systems may impact water quality and have negative impacts on already stressed species.

6.7.5 Severe Weather

Impacts on Hazard

Climate change presents a challenge for risk management associated with severe weather. The frequency of severe weather events has increased steadily over the last century. The number of weather-related disasters during the 1990s was four times that of the 1950s, and cost 14 times as much in economic losses. Historical data shows that the probability of severe weather events increases in a warmer climate.

An increase in average surface temperatures can also lead to more intense heat waves that can be exacerbated in urbanized areas by what is known as urban heat island effect. Evidence suggests that heat waves are already increasing, especially in western states. According to information on Cal-Adapt, extreme heat days in Roseville (103ºF is the extreme heat day threshold) are likely to increase from a historical average for four days annually. This increase would be coupled with an increase in heat waves and warm nights (67ºF threshold).

Population and Property

For the most part, population and property exposure and vulnerability would be unlikely to substantially increase as a direct result of climate change impacts on the severe weather hazard. Severe weather events may occur more frequently. Disproportionately impacted populations such as the elderly or disadvantaged communities that have substandard living arrangements (homeless populations, etc.) would have a potential for increased exposure and vulnerability from severe weather. Secondary impacts, such as the extent of localized flooding, may increase, thus impacting greater numbers of people and structures.

Critical Facilities

Critical facility exposure and vulnerability would be unlikely to increase as a result of climate change impacts on the severe weather hazard; however, critical facility owners and operators may experience more frequent disruption to service provision. For example, more frequent and intense storms may cause more frequent disruptions in power service.

Environment

Exposure and vulnerability of the environment would be unlikely to increase as a result of climate change impacts on the severe weather hazard; however, more frequent storms and heat events and more intense rainfall may place additional stressors on already stressed systems.

6.7.6 Wildfire

Impacts on Hazard

Wildfire is determined by climate variability, local topography, and human intervention. Climate change has the potential to affect multiple elements of the wildfire system: fire behavior, ignitions, fire management, and vegetation fuels. Hot dry spells create the highest fire risk. Increased temperatures may intensify wildfire danger by warming and drying out vegetation. Additionally, changes in climate patterns may impact the distribution and perseverance of insect outbreaks that create dead trees (increase fuel). When climate alters fuel loads and fuel moisture, forest susceptibility to wildfires changes. Climate change also may increase winds that spread fires. Faster fires are harder to contain, and thus are more likely to expand into residential neighborhoods.

Population, Property and Critical Facilities

According to the Cal-Adapt projections, wildfire risk in the areas surrounding the City of Roseville is expected to increase by 2085. Larger, more frequent fires may impact people, property and critical facilities by increasing the risk of ignition from nearby fire sources. Additionally, secondary impacts such as air quality issues may increase.

Environment

It is possible that the exposure and vulnerability of the environment will be impacted by impacts on wildfire risk from climate change. Natural fire regimes may change, resulting in more frequent or higher intensity burns. These impacts may alter the composition of the ecosystems in areas in and around Roseville.

7. DAM FAILURE

7.1 GENERAL BACKGROUND

7.1.1 Causes of Dam Failure

Dam failures can be catastrophic to human life and property downstream. Dam failures in the United States typically occur in one of four primary ways:

- Overtopping of the primary dam structure, which accounts for 34 percent of all dam failures, can occur due to inadequate spillway design, settlement of the dam crest, blockage of spillways, and other factors.
- Foundation defects due to differential settlement, slides, slope instability, uplift pressures, and foundation seepage can also cause dam failure. These account for 30 percent of all dam failures.
- Failure due to piping and seepage accounts for 20 percent of all failures. These are caused by internal erosion due to piping and seepage, erosion along hydraulic structures such as spillways, erosion due to animal burrows, and cracks in the dam structure.
- Failure due to problems with conduits and valves, typically caused by the piping of embankment material into conduits through joints or cracks, constitutes 10 percent of all failures.

The remaining 6 percent are due to other miscellaneous causes. Many of the historical dam failures in the United States have been secondary results of other disasters. The prominent causes are earthquakes, landslides, extreme storms, massive snowmelt, equipment malfunction, structural damage and foundation failures.

The most likely disaster-related causes of dam failure in Placer County and the Roseville vicinity are earthquakes, excessive rainfall, and landslides. Poor construction, lack of maintenance and repair, and deficient operational procedures are preventable or correctable by a program of regular inspections. Terrorism and vandalism are serious concerns that all operators of public facilities must plan for; these threats are under continuous review by public safety agencies.

DEFINITIONS

Dam—Any artificial barrier, together with appurtenant works, that does or may impound or divert water, and that either (a) is 25 feet or more in height from the natural bed of the stream or watercourse at the downstream toe of the barrier (or from the lowest elevation of the outside limit of the barrier if it is not across a stream channel or watercourse) to the maximum possible water storage elevation; or (b) has an impounding capacity of 50 acre-feet or more. (CA Water Code, Division 3.)

Dam Failure—An uncontrolled release of impounded water due to structural deficiencies in dam.

Emergency Action Plan—A formal document that identifies potential emergency conditions at a dam and specifies actions to be followed to minimize property damage and loss of life. The plan specifies actions the dam owner should take to alleviate problems at a dam. It contains procedures and information to assist the dam owner in issuing early warning and notification messages to responsible downstream emergency management authorities of the emergency situation. It also contains inundation maps to show emergency management authorities the critical areas for action in case of an emergency. (FEMA 2013)

High Hazard Dam—Dams where failure or improper operation will probably cause loss of human life. (FEMA 2004)

Significant Hazard Dam—Dams where failure or improper operation will result in no probable loss of human life but can cause economic loss, environmental damage or disruption of lifeline facilities, or can impact other concerns. Significant hazard dams are often located in rural or agricultural areas but could be located in areas with population and significant infrastructure. (FEMA 2004)

7.1.2 Regulatory Oversight

The potential for catastrophic flooding due to dam failures led to passage of the National Dam Safety Act (Public Law 92-367). The National Dam Safety Program requires a periodic engineering analysis of every major dam in the country. The goal of this FEMA-monitored effort is to identify and mitigate the risk of dam failure so as to protect the lives and property of the public.

National Dam Safety Act

The potential for catastrophic flooding due to dam failures led to passage of the National Dam Safety Act (Public Law 92-367). The National Dam Safety Program requires a periodic engineering analysis of every major dam in the country. The goal of this FEMA-monitored effort is to identify and mitigate the risk of dam failure so as to protect the lives and property of the public. The National Dam Safety Program is a partnership between the states, federal agencies, and other stakeholders that encourages individual and community responsibility for dam safety. Under FEMA's leadership, state assistance funds have allowed all participating states to improve their programs through increased inspections, emergency action planning, and the purchase of needed equipment. FEMA has also expanded existing training programs and initiated new ones. Grant assistance from FEMA provides support for improvement of dam safety programs that regulate most of the dams in the United States (FEMA 2015).

California Division of Safety of Dams

California's Division of Safety of Dams (a division of the Department of Water Resources) monitors dam safety at the state level. When a new dam is proposed, Division engineers and geologists inspect the site and the subsurface. Upon submittal of an application, the Division reviews the plans and specifications prepared by the owner to ensure that the dam is designed to meet minimum requirements and that the design is appropriate for the known geologic conditions. After approval of the application, the Division inspects all aspects of the construction to ensure that the work is done in accordance with the approved plans and specifications. After construction, the Division inspects each dam on an annual basis to ensure that it is performing as intended and is not developing problems. Roughly a third of these inspections include in-depth instrumentation reviews. The Division periodically reviews the stability of dams and their major appurtenances in light of improved design approaches and requirements, as well as new findings regarding earthquake hazards and hydrologic estimates in California (CA DWR, 2016a).

U.S. Army Corps of Engineers Dam Safety Program

The U.S. Army Corps of Engineers is responsible for safety inspections of some federal and non-federal dams in the United States that meet the size and storage limitations specified in the National Dam Safety Act. The Corps has inventoried dams; surveyed each state and federal agency's capabilities, practices and regulations regarding design, construction, operation and maintenance of the dams; and developed guidelines for inspection and evaluation of dam safety (U.S. Army Corps of Engineers, 2011).

Federal Energy Regulatory Commission Dam Safety Program

The Federal Energy Regulatory Commission (FERC) has the largest dam safety program in the United States. The FERC cooperates with a large number of federal and state agencies to ensure and promote dam safety and, more recently, homeland security. Approximately 3,000 dams that are part of regulated hydroelectric projects are in the FERC program. Two-thirds of these dams are more than 50 years old. As dams age, concern about their safety and integrity grows, and oversight and a regular inspection program are extremely important. FERC staff inspects hydroelectric projects on an unscheduled basis to investigate the following:

- Potential dam safety problems
- Complaints about constructing and operating a project

- Safety concerns related to natural disasters
- Issues concerning compliance with the terms and conditions of a license.

Every five years, an independent consulting engineer, approved by the FERC, must inspect and evaluate projects with dams higher than 32.8 feet, or with a total storage capacity of more than 2,000 acre-feet.

FERC staff monitors and evaluates seismic research in geographic areas such as California where there are concerns about possible seismic activity. This information is applied in investigating and performing structural analyses of hydroelectric projects in these areas. FERC staff also evaluates the effects of potential and actual large floods on the safety of dams. During and following floods, FERC staff visits dams and licensed projects, determines the extent of damage, if any, and directs any necessary studies or remedial measures the licensee must undertake. The FERC publication *Engineering Guidelines for the Evaluation of Hydropower Projects* guides the FERC engineering staff and licensees in evaluating dam safety. The publication is frequently revised to reflect current information and methodologies.

The FERC requires licensees to prepare emergency action plans and conducts training sessions on how to develop and test these plans. The plans outline an early warning system if there is an actual or potential sudden release of water from a dam due to failure or accident. The plans include operational procedures that may be used, such as reducing reservoir levels and reducing downstream flows, as well as procedures for notifying affected residents and agencies responsible for emergency management. These plans are frequently updated and tested to ensure that everyone knows what to do in emergency situations.

7.2 HAZARD PROFILE

7.2.1 Past Events

According to the Placer County Multi-Hazard Mitigation Plan, there have been five dam failures in Placer County (none are known to have impacted the Roseville planning area):

- **Hell Hole Dam Failure—**In 1964, construction of the Hell Hole Dam was underway and the contractor had stopped operations for the winter. A major storm event in December caused the Hell Hole Reservoir to fill, and since the dam was not completed, it failed, sending a considerable amount of water toward Auburn. The water washed out a bridge on Highway 49 over the American River at the confluence of the North and Middle Forks and flooded a quarry. Due to the way the construction contract was worded, the contractor had to rebuild the dam at his own expense. As a result, Placer County incurred no costs related to this event. No claims for damage were filed against the Placer County Water Agency (PCWA) by either the quarry owner or the state.
- **1986 Auburn Coffer Dam Failure—**As a result of area flooding, the Coffer Dam at Auburn breached and partially washed away. The U.S. Bureau of Reclamation had designed the Coffer Dam for a controlled failure by building a soft earthen plug into the dam for this purpose. It appears the dam failed as designed.
- **August 2004 Ralston Dam Release Gate Break—**A broken release gate on Ralston Dam in the Middle Fork of the American River prompted the National Weather Service to issue a flash flood warning in Placer County. According to the PCWA, the gate near the Ralston Powerhouse malfunctioned, and the sudden release of water from Ralston Reservoir south of Auburn sent a wall of water 3 to 4 feet high down the river. The volume of water released was 800 to 1,000 acre-feet. Sheriff's deputies and California Highway Patrol officers alerted campers in the Auburn State Recreation Area to move to higher ground. The CHP monitored the muddy water as it approached Highway 49. There were no reports of injuries or damage along the river, which is popular with rafters, kayakers and residents during summer.

- **August 2009 Cottonwood Dam—**A privately owned and constructed dam on Miners Ravine in the Hidden Valley Estates subdivision (the Auburn Folsom Road and Twin Rocks Road area of Granite Bay), failed and leached flows and sediment into Miners Ravine. NOAA Fisheries quickly became involved because of the impacts on critical fish species. A temporary fix—a notch in the concrete portion of the dam—was approved and made while the homeowners association and interested agencies determined next steps. A dam removal project with creek restoration is now being proposed.
- **January 2016 Folsom Dam—**Seepage occurred at the Folsom cofferdam during final construction of the new Folsom Dam Auxiliary Spillway on January 20, 2016. The seepage was in the spillway basin. At no time was there a threat of a dam failure.

7.2.2 Location

According to the California Division of Safety of Dams, as of 2014 there are 45 dams in Placer County. Of these, the western levees along Folsom Lake, which is a reservoir lined by a series of containment dikes, have the potential to significantly impact the City of Roseville in the event of a failure. Another dam, the Miners Ravine Detention Facility located near Roseville's eastern boundary, has the potential to adversely impact Roseville should it fail. Table 7-1 provides summary information about these two facilities.

Table 7-1. Dams in Placer and Sacramento Counties With Potential to impact Roseville

Name	Hazard Class[a]	Water Course	Owner	Year Built	Dam Type	Crest Length (feet)	Height (feet)	Storage Capacity (acre-feet)	Drainage area (sq. mi.)
Folsom	1A	American River	US Bureau of Reclamation	1956	Gravity	102,000	275	975,000	1,885
Miners Ravine Detention Facility	1B	Dry Creek	Placer County Flood & Water Conservation District	2007	Earthen	2000	22.5	120	14

a. Downstream Hazard Class 1A: > 300 lives at risk, 1B: 31 to 300 lives at risk, 1C: 7 to 30 lives at risk

7.2.3 Frequency

Dam failure events are infrequent and usually coincide with the events that cause them, such as earthquakes, landslides and excessive rainfall and snowmelt. There is a "residual risk" associated with dams; residual risk is the risk that remains after safeguards have been implemented. For dams, the residual risk is associated with events beyond those that the facility was designed to withstand. However, the probability of occurrence of any type of dam failure event is considered to be low in today's regulatory and dam safety oversight environment.

7.2.4 Severity

Dam failure can be catastrophic to all life and property downstream. The U.S. Army Corps of Engineers developed the classification system shown in Table 7-2 for the hazard potential of dam failures.

7.2.5 Warning Time

Warning time for dam failure varies depending on the cause of the failure. In events of extreme precipitation or massive snowmelt, evacuations can be planned with sufficient time. In the event of a structural failure due to earthquake, it is possible that there would be no warning time.

Table 7-2. Hazard Potential Classification

Hazard Category[a]	Direct Loss of Life[b]	Lifeline Losses[c]	Property Losses[d]	Environmental Losses[e]
Low	None (rural location, no permanent structures for human habitation)	No disruption of services (cosmetic or rapidly repairable damage)	Private agricultural lands, equipment, and isolated buildings	Minimal incremental damage
Significant	Rural location, only transient or day-use facilities	Disruption of essential facilities and access	Major public and private facilities	Major mitigation required
High	Certain (one or more) extensive residential, commercial, or industrial development	Disruption of essential facilities and access	Extensive public and private facilities	Extensive mitigation cost or impossible to mitigate

a. Categories are assigned to overall projects, not individual structures at a project.
b. Loss of life potential based on inundation mapping of area downstream of the project. Analyses of loss of life potential should take into account the population at risk, time of flood wave travel, and warning time.
c. Indirect threats to life caused by the interruption of lifeline services due to project failure or operational disruption; for example, loss of critical medical facilities or access to them.
d. Damage to project facilities and downstream property and indirect impact due to loss of project services, such as impact due to loss of a dam and navigation pool, or impact due to loss of water or power supply.
e. Environmental impact downstream caused by the incremental flood wave produced by the project failure, beyond what would normally be expected for the magnitude flood event under which the failure occurs.

Source: U.S. Army Corps of Engineers, 1995

A dam's structural type also affects warning time. Earthen dams do not tend to fail completely or instantaneously. Once a breach is initiated, discharging water erodes the breach until either the reservoir water is depleted or the breach resists further erosion. Concrete gravity dams also tend to have a partial breach as one or more monolith sections formed during dam construction are forced apart by the escaping water. The time for breach formation ranges from a few minutes to a few hours (U.S. Army Corps of Engineers, 2011).

The City has established protocols for flood warning and response to imminent dam failure in the flood warning portion of its adopted emergency operations plan.

7.2.6 Folsom Dam Containment Dike Failure Risk Assessment

During the 2005 review of the initial Roseville Hazard Mitigation Plan, FEMA Region IX plan reviewers indicated that there was sufficient risk of dam failure of the western dikes on Folsom Lake (see Figure 7-1) to warrant treating dam failure as a stand-alone hazard in the City's next hazard mitigation plan update. Six dikes, increasing in size and numeric designation (from 1 to 6) from north to south, fill gaps along the western edge of Folsom Lake.

Because there was insufficient data to assess risk to the standards established for the other hazards in the hazard mitigation plan, the City developed a comprehensive, scenario-based risk assessment of the western dikes on the Folsom Dam complex during the 2011 Plan update. Detailed inundation modeling and mapping performed as part of this assessment are available to inform the City's preparedness and response to a dam breach of the Folsom Lake containment dike system. The maps are not presented in this Plan for security purposes. Figure 7-2 shows mapping that has been created by the City to inform citizens of the direction of flow and possible routes for evacuation during a dam failure event.

Source: United States Army Corps of Engineers, Michael Nevins [Public domain], via Wikimedia Commons

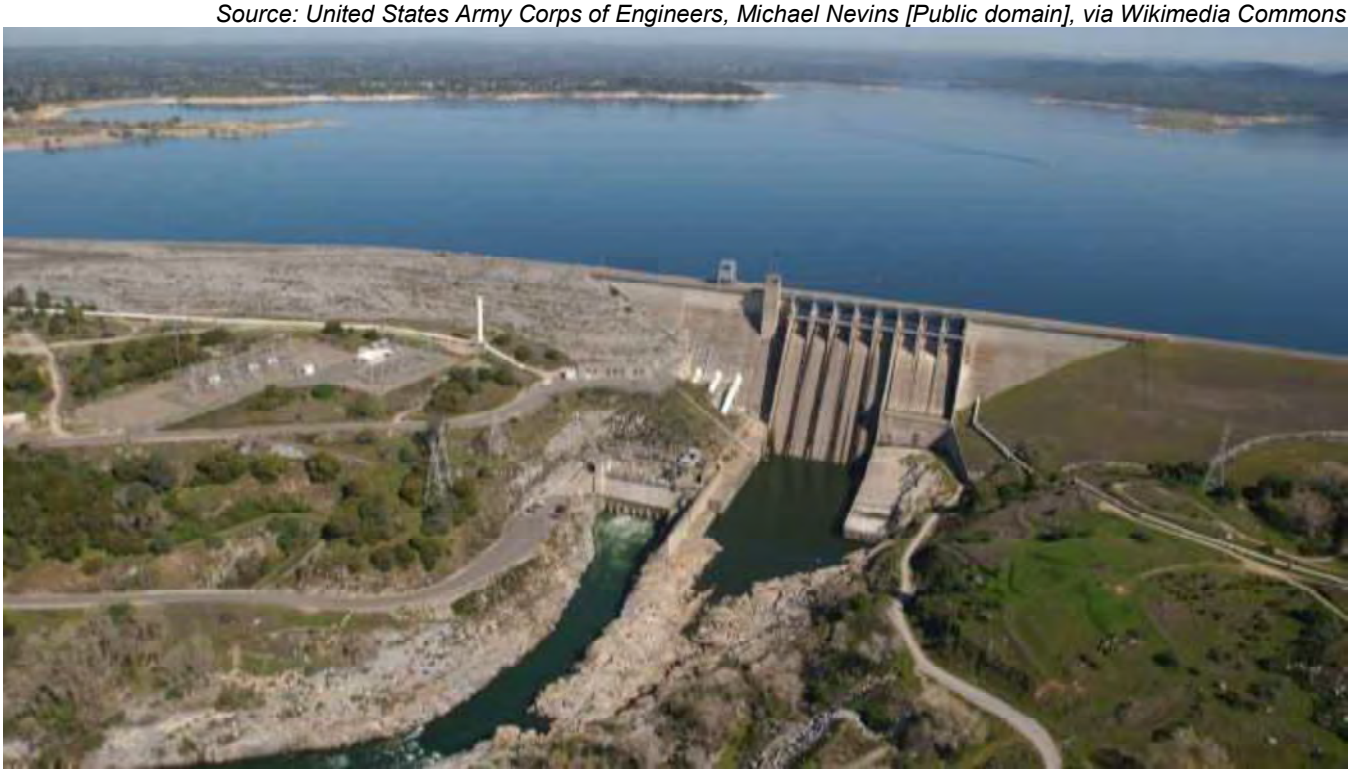


Figure 7-1. Folsom Dam and Folsom Lake on the American River, Looking Northeast

The study provided inundation mapping to determine the probable impact of flooding in Roseville if any of the western dikes were to fail. It addressed the relative risk of failure of each dike based on the frequency with which the dikes impound water, the potential for overtopping, the recent and in-progress work to upgrade the dikes to reduce the risk of failure due to piping, and a new reservoir spillway that is under construction. Models were prepared to simulate dike failures and resulting inundation. These simulations provide the basis for inundation area mapping and other emergency management tools such as maps that illustrate the time from failure to flooding.

The northernmost dikes are relatively low height embankments above the normal operating range of the lake. Though the occurrence of inundation due to dam failure is based on extremely remote conditions, failure of these facilities has the potential to cause significant property damage and loss of life in the City. The degree of impact would be affected by the water level of the lake at the time of failure, which could be just above the top of the dikes in the case of failure by overtopping. The study mapped the maximum depth of flooding and the timing of the flood wave from the time of failure for various scenarios. The study found that flood depths could reach as much as 58 feet in parts of the City.

7.3 SECONDARY HAZARDS

Dam failure can cause severe downstream flooding depending on the magnitude of the failure. Other potential secondary hazards of dam failure include landslides around the reservoir perimeter, bank erosion on the rivers, and destruction of downstream habitat.

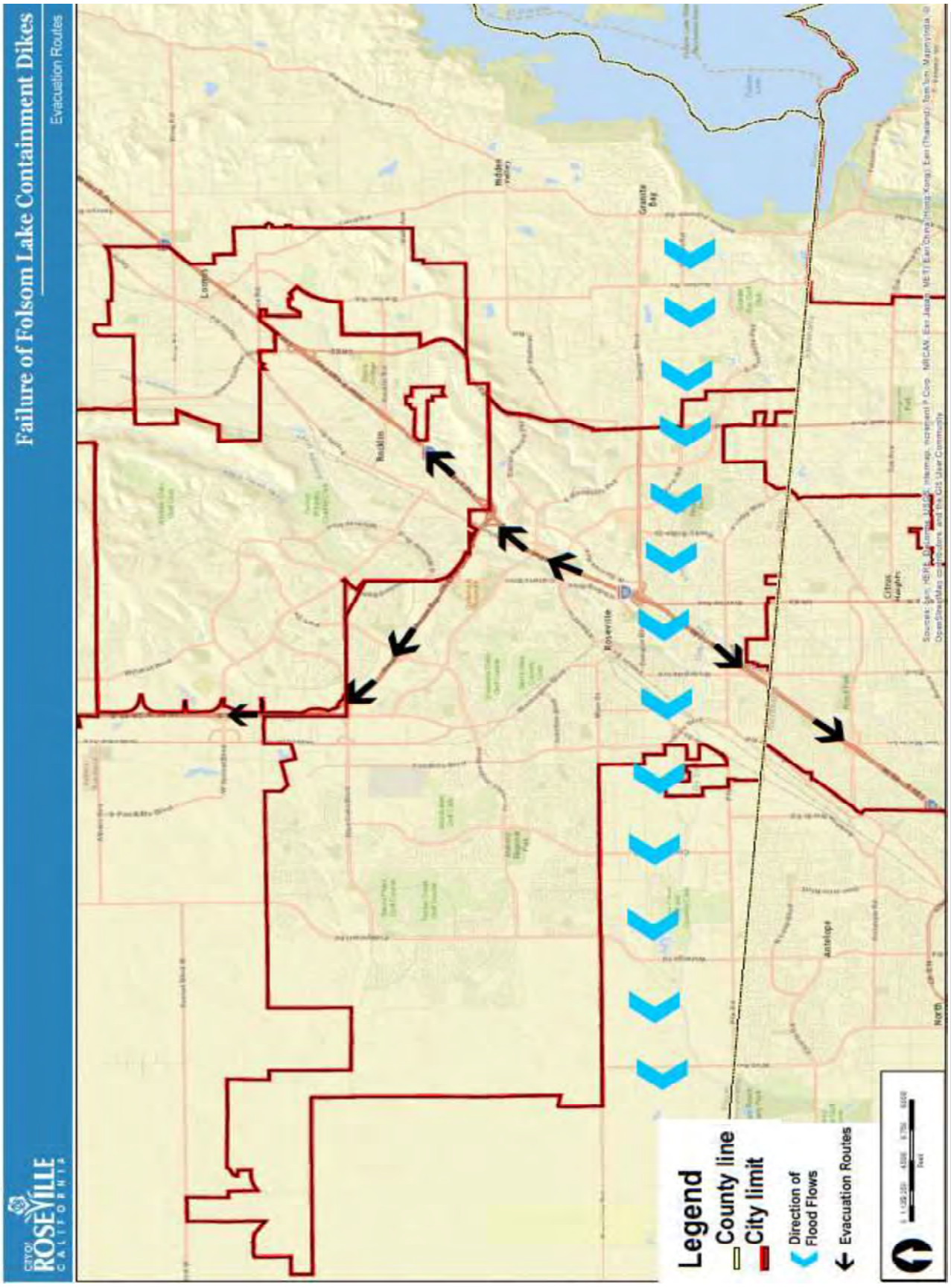


Figure 7-2. Folsom Dam Containment Dike Failure Flow Direction and Evacuation Routes

7.4 EXPOSURE

The flood module of HAZUS-MH was used for a Level 2 assessment of dam failure risk exposure and vulnerability for facilities in Roseville with sufficient data to support modeling. HAZUS-MH uses census data at the block level and FEMA floodplain data, which has a level of accuracy acceptable for planning purposes. Where possible, the HAZUS-MH data for this risk assessment was enhanced using GIS data from county, state and federal sources. The exposure and vulnerability analyses focused on inundation data from the Folsom Dam Containment Dike Failure Risk Assessment.

7.4.1 Population

All populations located in a dam failure inundation zone would be exposed to the risk of a dam failure. The estimated population living in the Folsom Dam failure inundation area is 55,858, or 43.4 percent of the City's population.

7.4.2 Property

The HAZUS-MH model estimated that there are 20,303 structures within the Folsom Dam failure inundation areas. It is estimated that 18,746 or 92 percent, of these structures are residential. The value of exposed buildings in the planning area was generated using HAZUS-MH and is summarized in Table 7-3. This methodology estimated $11 billion worth of building-and-contents exposure to Folsom Dam failure inundation, representing 37.1 percent of the total assessed value of the planning area.

Table 7-3. Value of Property Exposed to Dam Failure

Type	Number of Buildings Exposed	Value Exposed			% of Total Assessed Value
		Building	Contents	Total	
Residential	18,746	$4,877,113,351	$2,438,892,264	$7,316,005,614	39.13%
Commercial	1,017	$1,197,859,838	$1,253,661,717	$2,451,521,555	29.63%
Industrial	260	$210,792,151	$239,393,311	$450,185,463	38.79%
Religion	53	$86,626,396	$86,626,396	$173,252,792	69.13%
Government	18	$19,135,549	$19,135,549	$38,271,098	22.66%
Education	209	$284,707,447	$284,707,447	$569,414,895	52.17%
Total	**20,303**	**$6,676,234,732**	**$4,322,416,685**	**$10,998,651,417**	**37.11%**

7.4.3 Critical Facilities

GIS analysis was used to determine the number of critical facilities in the mapped dam failure inundation areas. As Table 7-4 shows, 96 of the planning area's critical facilities (55.8 percent) are in the inundation areas.

Table 7-4. Critical Facilities in Dam Failure Inundation Areas in Roseville

Medical & Health Services	Government Function	Protective Function	Schools	Hazmat	Other Critical Function	**Total**
0	17	8	25	0	46	**96**

7.4.4 Environment

Reservoirs held behind dams affect many ecological aspects of a river. River topography and dynamics depend on a wide range of flows, but rivers below dams often experience long periods of very stable flow conditions or saw-

tooth flow patterns caused by releases followed by no releases. Water releases from a reservoir, including those exiting a turbine, usually contain very little suspended sediment; this can lead to scouring of river beds and loss of riverbanks.

The environment would be exposed to a number of risks in the event of dam failure. The inundation could introduce many foreign elements into local waterways. This could result in destruction of downstream habitat and could have detrimental effects on many species of animals, especially endangered species such as salmon.

7.5 VULNERABILITY

7.5.1 Population

Vulnerable populations are all populations downstream from dam failures that are incapable of escaping the area within the allowable time frame. This population includes the elderly and young who may be unable to get themselves out of the inundation area. The vulnerable population also includes those who would not have adequate warning from a television or radio emergency warning system. The potential for loss of life is affected by the capacity and number of evacuation routes available to populations living in areas of potential inundation.

7.5.2 Property

Vulnerable properties are those closest to the dam failure inundation area. These properties would experience the largest, most destructive surge of water. Low-lying areas are also vulnerable since they are where the dam waters would collect. Transportation routes are vulnerable to dam failure inundation and have the potential to be wiped out, creating isolation issues. This includes all roads, railroads and bridges in the path of the dam failure inundation. Those that are most vulnerable are those that are already in poor condition and would not be able to withstand a large water surge. Utilities such as overhead power lines, cable and phone lines could also be vulnerable. Loss of these utilities could create additional isolation issues for the inundation areas.

It is estimated that there could be up to $4.46 billion of loss from a dam failure affecting the planning area. This represents 40.5 percent of the total exposure within the inundation area, or 15.0 percent of the total assessed value of the planning area. Table 7-5 summarizes the loss estimates for dam failure.

Table 7-5. Loss Estimates for Dam Failure

	Value Exposed			% of
	Building Loss	Contents Loss	**Total Loss**	Total Assessed Value
Residential	$1,550,424,727	$933,258,844	$2,483,683,571	13.28%
Commercial	$456,285,740	$844,987,114	$1,301,272,854	15.73%
Industrial	$84,633,925	$203,408,629	$288,042,554	24.82%
Religion	$34,364,944	$72,524,654	$106,889,598	42.65%
Government	$11,072,696	$16,609,362	$27,682,057	16.39%
Education	$82,091,723	$166,677,363	$248,769,086	22.79%
Total	**$2,218,873,754**	**$2,237,465,967**	**$4,456,339,721**	**15.03%**

7.5.3 Critical Facilities

HAZUS estimated that critical facilities would receive an average of 40 percent damage to the structure and an average 70 percent damage to the contents during a dam failure event. The estimated functional down-time to restore these facilities to 100 percent of their functionality is 700 days.

7.5.4 Environment

The environment would be vulnerable to a number of risks in the event of dam failure. The inundation could introduce foreign elements into local waterways, resulting in destruction of downstream habitat and detrimental effects on many species of animals, especially endangered species such as coho salmon. The extent of the vulnerability of the environment is the same as the exposure of the environment.

7.6 FUTURE TRENDS IN DEVELOPMENT

All land use decision-making is guided by the goals, policies and implementation measures contained in the Land Use Element of Roseville's General Plan. The Safety Element of the General Plan establishes standards and plans for the protection of the community from hazards. Dam failure is currently not addressed as a stand-alone hazard in the Safety Element, but flooding is. The City has established comprehensive policies regarding sound land use in identified flood hazard areas. Most of the areas vulnerable to the more severe impacts from the bank-full Folsom Dam failure scenario intersect the City's flood hazard areas. Flood-related policies in the General Plan will help to reduce the risk associated with the dam failure hazard for all future development within the City.

The dam failure risk exposure with in the planning area increased by 22% at an increase in value of over $2 billion dollars. This increase in risk exposure can be attributed to the vast extent and location of the dam failure hazard, and a population growth rate of 14.5% over the performance period of the prior plan. The planning area also saw in increase in assessed valuation of real property of over 34%. This increase in value can be attributed to the continued economic recovery from the 2008 economic down turn that had a significant impact on the State of California as well as the City of Roseville. Any increase in asset value will increase risk quotient when risk is being measured by looking at assets exposed as is with this plan.

While the exposure went up within the dam failure inundation area, the loss estimation from Hazus decreased by over 28%. This decrease in vulnerability could be attributed to 2 factors. The first factor is that the new construction that has occurred during the performance period for the plan was built to high code standards that reduce the risk. While the City of Roseville does not have specific standards adopted specifically for the dam failure inundation area, their adopted improvements standards applied city-wide do include several higher standards that would reduce flood risk within a dam failure inundation area. The second factor could be due to the increased accuracy of the Hazus model. For this update, the digital elevation model used in Hazus was developed using LiDAR data available to the City. The accuracy of the Digital Elevation Model (DEM) for this update should be cons9dered more accurate than the DEM from the last update. It is logical to assume that both of these factors plan a role in the reduced vulnerability for the planning area.

7.7 REVIEW OF EXISTING ORDINANCES, PROGRAMS AND PLANS

Since most of the dam failure inundation areas overlay the regulated floodplain within the planning area, ordinances and programs in Chapter 4 are applicable to this hazard. The extent of dam failure inundation as well as the estimated flood depths significantly exceed those projected for flooding. Future revisions to the flood programs may want to consider the potential impacts of dam failure in their scope, even though the statistical probability of such an event is low.

7.8 SCENARIO

According to the 2011Folsom Dam Containment Dike Failure Risk Assessment Project, the worst-case scenario would be a bank-full failure of Dikes 4, 5 and 6 due to overtopping. Overtopping flows may quickly erode the top and downstream portions of the dikes, causing failure. Therefore, there is a possibility of simultaneous failure due to overtopping. However, the likelihood of reservoir inflows that could cause overtopping is extremely low. The

completion of the new Folsom Dam spillway in early 2016 decreased the likelihood even further. Failure from piping could occur at any water surface elevation within the reservoir.

An earthquake within the region could lead to liquefaction of soils around the dams. This could occur without warning during any time of the day. A human-caused failure such as a terrorist attack also could trigger a catastrophic failure of a dam that impacts the planning area.

7.9 ISSUES

The most significant issue associated with dam failure involves the properties and populations in the inundation zones. Flooding as a result of a dam failure would significantly impact these areas. There is often limited warning time for dam failure. These events are frequently associated with other natural hazard events such as earthquakes, landslides or severe weather, which limits their predictability and compounds the hazard. Another significant issue is the loss of the City's primary potable water supply source if the dam were to fail (not overtop). The City would have to rely on significant water demand reductions, interties with other water agencies not dependent on Folsom and groundwater wells to provide some level of water supply to the community. Other important issues associated with dam failure include the following:

- Federally regulated dams have an adequate level of oversight and sophistication in the development of emergency action plans for public notification in the unlikely event of failure. However, the protocol for notification of downstream citizens of imminent failure needs to be tied to local emergency response planning.
- Mapping for federally regulated dams is already required and available; however, mapping that estimates inundation depths is needed for dams that are not federally regulated, in order to better assess the risk associated with failure of these facilities.
- Most dam failure mapping required at federal levels requires determination of the probable maximum flood. While the probable maximum flood represents a worst-case scenario, it is generally the event with the lowest probability of occurrence. For dams that are not federally regulated, mapping of failure scenarios that are less extreme than the probable maximum flood but have a higher probability of occurrence can be valuable to downstream community officials and emergency managers. This type of mapping can illustrate areas potentially impacted by more frequent events to support emergency response and preparedness actions.
- The concept of residual risk associated with structural flood control projects should be considered in the design of capital projects and the application of land use regulations.
- Addressing security concerns and the need to inform the public of the risk associated with dam failure is a challenge for public officials.

8. DROUGHT

8.1 GENERAL BACKGROUND

Most of California's precipitation comes from storms moving across the Pacific Ocean. The path followed by the storms is determined by the position of an atmospheric high pressure belt that normally shifts southward during the winter, allowing low-pressure systems to move into the state. On average, 75 percent of California's annual precipitation occurs between November and March, with 50 percent occurring between December and February. If a persistent Pacific high-pressure zone takes hold over California mid-winter, there is a tendency for the water year to be dry.

DEFINITIONS

Drought—The cumulative impacts of several dry years on water users. It can include deficiencies in surface and subsurface water supplies and generally impacts health, well being, and quality of life.

Hydrological Drought—Deficiencies in surface and subsurface water supplies.

A typical water year produces about 100 inches of rainfall over the North Coast, 50 inches of precipitation (combination of rain and snow) over the Northern Sierra, 18 inches in the Sacramento area, and 15 inches in the Los Angeles area. In extremely dry years, these annual totals can fall to as little as half, or even one-third of these amounts.

Rain and snowfall in the American River watershed eventually flow into Folsom Lake, a reservoir within the U.S. Central Valley Project. These flows directly affect water availability for Roseville water users. The City of Roseville owns the Roseville water system and water treatment plant and has negotiated contracts with the U.S. Bureau of Reclamation, the Placer County Water Agency (PCWA), and the San Juan Water District (SJWD) to ensure that water needs are met for existing and future growth.

Roseville is largely urbanized with little agricultural interests remaining. Lack of sufficient water supply would affect residents and businesses that rely on water for their daily household, employee, and industrial needs.

8.1.1 Water Supply Strategy

The water supply strategy for the City of Roseville uses a comprehensive approach to ensure water reliability for customers. The City has a diverse set of water supply options—including surface water contracts, recycled water, and groundwater wells—to ensure that even following a period of dry years, a combination of available water supplies and water conservation measures will meet the community's water needs. The City has contracts for surface water with three agencies (see Table 8-1):

- The primary water contract is with the U.S. Bureau of Reclamation (USBR) for 32,000 acre-feet per year of surface water from Folsom Lake.
- The City also has a contract with PCWA for 30,000 acre-feet of water from PCWA's American River Middle Fork Project. The City has a long-term agreement with the USBR to wheel PCWA water supplies through Folsom Reservoir for delivery to the City's water treatment plant.

Table 8-1. City of Roseville Water Supply Contracts and Resources

Source	Contract Amount (acre-feet per year) [a]	Supply Projections [b]				
		2020	2025	2030	2035	2040
U.S. Bureau of Reclamation	32,000	32,000	32,000	32,000	32,000	32,000
San Juan Water District	4,000	4,000	4,000	4,000	4,000	4,000
Placer County Water Agency		20,000	30,000	30,000	30,000	30,000
Treated Water (Additional Future Purchase)	N/A	0	0	1,500	1,500	1,500
Exercised	10,000					
Two additional options	20,000					
Placer County Water Agency Total	***30,000***					
Recycled Water	N/A	*4,421*	*4,791*	*5,259*	*5,643*	*5,958*
Total	**66,000**	**60,421**	**70,791**	**72,759**	**73,143**	**73,458**

a. N/A = Not Applicable based on future contract or existing recycled resources
b. Based on reasonable available volume.

- The third source of surface water for the City of Roseville is an additional 4,000 acre-feet of PCWA water transferred through SJWD. SJWD is a water district in Sacramento and Placer Counties that draws water from Folsom Lake. SJWD also wholesales water to Citrus Heights Water District, Fair Oaks Water District and Orangevale Water Company in Sacramento County. The City of Roseville has entered into a reallocation agreement with SJWD for this 4,000 acre-feet per year, which is a normal-year water supply only—it is not available for use during drought conditions.
- With the approval of the Amoruso Ranch Specific Plan, the City is pursuing an additional contract through PCWA, through its planned Ophir Water Treatment Plant facility. This new source and supply of water will not be dependent on Folsom Lake deliveries and will increase water reliability citywide. It is not subject to cutbacks during dry or driest years, and is estimated to provide 1,500 acre-feet of additional supply once the plant is on line.
- The City maintains six groundwater wells for emergency and dry-year supply, with plans to install 10 more in coming years as new development progresses. All wells are equipped for aquifer storage and recovery.

8.1.2 Water Supply Infrastructure

The City of Roseville Water Treatment Plant is on Barton Road east of Roseville. Constructed in 1971, the plant treats water from Folsom Lake to Environmental Protection Agency (EPA) domestic drinking water standards. The City owns a water system network consisting of water mains ranging from 4 to 66 inches in diameter. The system is designed to deliver an adequate supply of water throughout the community at an acceptable pressure level for domestic and fire flow purposes. A booster pump station near East Roseville Parkway and North Sunrise Boulevard is designed to provide sufficient water pressure to the higher elevations of the City and to fill and manage reservoirs in the system. Some areas within the Roseville city limits are served by PCWA, SJWD, or the City of Citrus Heights where topography and facility locations make it beneficial to do so.

The City maintains the capability to supplement its water supply in drought conditions with groundwater wells. These wells are planned to be used primarily to offset surface water cutbacks in times of drought or other emergencies. The City's groundwater wells are equipped to implement aquifer storage and recovery, in which potable water can be injected into the underground aquifers in wet years and recovered in dry years for public use. In addition, the City operates a recycled water system to lessen the use of potable water for irrigating landscaped areas.

8.1.3 The Water Forum

The Water Forum is a group of business and agricultural leaders, citizens groups, environmentalists, water managers, and local governments originally formed in Sacramento County. Water managers in Placer and El Dorado Counties joined the group in 1995. The City of Roseville is a member of the Water Forum and a signatory to the January 2000 Water Forum Agreement. The agreement provides a framework for how future surface water and groundwater supplies will be used in the region through 2040.

Although Roseville's water contract entitlements total 66,000 acre-feet per year, the City's diversions from the American River are limited by the Water Forum Agreement. In normal/wet years, the City has agreed to limit diversions from the American River to 58,900 acre-feet per year. In driest years (also called critically dry years), the maximum diversion from the American River is 39,800 acre-feet. In drier years, the City may divert between 39,800 and 54,900 acre-feet, depending on the unimpaired flow into Folsom Lake.

During the drier and driest years, the City agreed to have PCWA release an additional 20,000 acre-feet per year of water down the American River on the City's behalf through re-operation of PCWA's American River Middle Fork Project. This is not part of the City's contracted supply of 66,000 acre-feet per year. The intent of Middle Fork Project re-operational releases during drier and driest years is to mitigate environmental impacts resulting from increased diversions above 1995 baseline levels.

Roseville's water supply contracts, in combination with future planned supply sources, base level conservation measures, and groundwater resources, ensure that the City is well positioned to meet projected water needs.

8.1.4 Local Water Contracts—Definition of Drought

Roseville's drought levels are defined by the 2000 Water Forum agreement. The definition is based on the type of hydrologic year for inflow to Folsom Lake, as defined by 70 years of hydrologic data into the lake. The hydrological year types are as follows:

- **Baseline**—Baseline means the maximum amount of water that suppliers diverted from the American River in any one year through 1995 or, in certain instances, other amounts specified in a Purveyor Specific Agreement. For the City of Roseville, the baseline amount is 19,800 acre-feet per year.
- **Normal/Wet Years**—When the projected unimpaired flow into Folsom Reservoir is greater than or equal to 950,000 acre-feet
- **Drier Years**—When the projected unimpaired flow into Folsom Reservoir is between 400,00 acre-feet and 950,000 acre-feet
- **Driest Years**—When the projected unimpaired flow into Folsom Reservoir is less than 400,000 acre-feet.

Dry years over the 85-year hydrologic record are listed in Table 8-2, excluding the driest years. The driest years for American River flows in the Folsom Lake vicinity were 1924, with 379,000 acre-feet of unimpaired inflow to Folsom Lake, 1977, with 332,000 acre-feet, and 2015, with 321,000 acre-feet.

Table 8-2. Dry Year Flows into Folsom Lake

Year	Unimpaired Inflow to Folsom Lake (acre-feet)	Year	Unimpaired Inflow to Folsom Lake (acre-feet)
1931	571,000	1987	705,000
1934	690,000	1988	545,000
1939	873,000	1990	873,000
1959	872,000	1992	631,000
1961	854,000	1994	649,000
1976	518,000	2013	778,000
1981	881,000	2014	682,000

8.2 HAZARD PROFILE

Droughts originate from a deficiency of precipitation resulting from an unusual weather pattern. If the weather pattern lasts a short time (a few weeks or a couple months), the drought is considered short-term. If the weather pattern becomes entrenched and the precipitation deficits last for several months or years, the drought is considered long-term. It is possible for a region to experience a long-term pattern that produces drought, and to have short-term changes that result in wet spells within the long-term pattern. Likewise, it is possible for a long-term wet pattern to be interrupted by weather spells that result in short-term drought. Droughts typically occur after two or three years of below-average rainfall for the period from November to March.

8.2.1 Past Events

State of California

The California Department of Water Resources has state hydrologic data back to the early 1900s (http://watersupplyconditions.water.ca.gov). The hydrologic data show multi-year droughts from 1912 to 1913, 1918 to 1920 and 1922 to 1924. Since then, three prolonged periods of drought occurred in California:

- **1929 to 1934 Drought—**The 1929 to 1934 drought established the criteria for designing the supply and yield of many large Northern California reservoirs. The Sacramento Valley runoff was 55 percent of average for the time period from 1901 to 1996, with only 9.8 million acre-feet received.
- **1975 to 1977 Drought—**California had one of its most severe droughts due to lack of rainfall during the winters of 1976 and 1977. 1977 was the driest period on record in California, with the previous winter recorded as the fourth driest in California's hydrological history. The cumulative impact led to widespread water shortages and severe water conservation measures throughout the state. Only 37 percent of the average Sacramento Valley runoff was received, with just 6.6 million acre-feet recorded. Over $2.6 billion in crop damage was recorded in 31 counties. A federal disaster declaration was declared in Placer County and surrounding counties.
- **1987 to 1992 Drought—**California received precipitation well below average levels for four consecutive years. While the Central Coast was most affected by the lack of rainfall and low runoff, the Sierra Nevada range in Northern California and Central Valley counties including Placer County were also affected. During this drought, only 56 percent of average runoff for the Sacramento Valley was received, totaling just 10 million acre-feet. By February 1991, all 58 counties in California were suffering from drought conditions. Urban areas as well as rural and agricultural areas were impacted.
- **2012 to 2016 (Ongoing) Drought—**California's current drought has set several records for the state:
  - The period from 2012 to 2014 ranked as the driest three consecutive years for statewide precipitation.
  - 2014 set new climate records for statewide average temperatures and for record-low water allocations in the State Water Project and federal Central Valley Project.
  - 2013 set minimum annual precipitation records for many communities.

  On January 17, 2014 the governor declared a state of emergency for drought throughout California. This declaration followed release of a report that stated that California had had the least amount of rainfall in its 163-year history. Californians were asked to voluntarily reduce their water consumption by 20 percent. Drought conditions worsened into 2015. On April 1, 2015, following the lowest snowpack ever recorded, the governor announced actions to save water, increase enforcement to prevent wasteful water use, streamline the state's drought response, and invest in new technologies to make California more drought-resilient. The governor directed the State Water Resources Control Board to implement mandatory water reductions in cities and towns across California to reduce water usage by 25 percent on average. The City of Roseville was assigned a 28-percent water conservation target by the State Water Resources Control

Board. The City exceed its water conservation goal. Total impacts of the drought cannot be determined until after its conclusion.

Placer County

The following additional drought impacts have affected Placer County:

- **1977—**A federal disaster declaration was made as a result of a drought affecting Placer and surrounding counties. The PCWA declared a water shortage and restricted water use for both irrigation and treated water users. The restrictions included a 50-percent reduction in water usage by customers and rate increases. This shortage lasted until January 1978 when the PCWA terminated its restrictions.
- **1988—**Again the PCWA declared a water emergency. All customers had their water use reduced by 25 percent, and rates were again increased for excessive usage. The countywide emergency prohibited washing of sidewalks, driveways, parking lots and other hard surfaces, restricted the washing of vehicles, airplanes, and trailers to 3 gallons of water, prohibited fire hydrant flushing and drills, prohibited filling of pools, and prohibited new agricultural land irrigation.
- **1991—**Raw water customers had their water usage reduced by 50 percent annually and by 25 percent seasonally. Treated water users were given most of the same restrictions and prohibitions as in 1988. Due to a very late storm season, the emergency was lifted by April 1991.
- **2008—**The Governor of California declared a drought on June 4, 2008. In July 2009, PCWA reported the implementation of normal ongoing conservation measures.
- **2014—**On February 6, 2014, PCWA adopted a resolution declaring a water shortage emergency. This is the most recent declaration from PCWA. It was rescinded in February 2016.

Roseville Drought History

Roseville's drought history parallels the water shortages for the State of California and Placer County. The Roseville City Council has declared official drought alerts three times:

- From April 1991 to March 1993 when Stage 2 drought water restrictions were in effect and enforced through full-time water patrols
- In May 2008 when the City of Roseville's Environmental Utilities Department activated a Stage 1 drought alert
- In 2014, when the City enacted a Stage 3 drought alert asking residents to reduce water demand by 28 percent compared to 2013 water use.

In response to the 2014 drought, the City of Roseville took a proactive approach to water conservation. The City enacted water waste patrols, limited watering for residential and non-residential customers to specific days of the week depending on the time of year, and enacted funding for utility support. With a 2015 reduction target of 278 gallons per capital per day, Roseville's conservation efforts resulted in an actual accomplishment of 165 gallons per capital per day, far exceeding goals and expectations (Roseville, 2015a).

8.2.2 Location

The National Oceanic and Atmospheric Administration (NOAA) has developed several indices to measure drought impacts and severity and to map their extent and locations:

- The ***Palmer Crop Moisture Index*** measures short-term drought on a weekly scale and is used to quantify drought's impacts on agriculture during the growing season. Figure 8-1 shows this index for the week ending January 30, 2016.
- The ***Palmer Z Index*** measures short-term drought on a monthly scale. Figure 8-2 shows this index for December 2015.

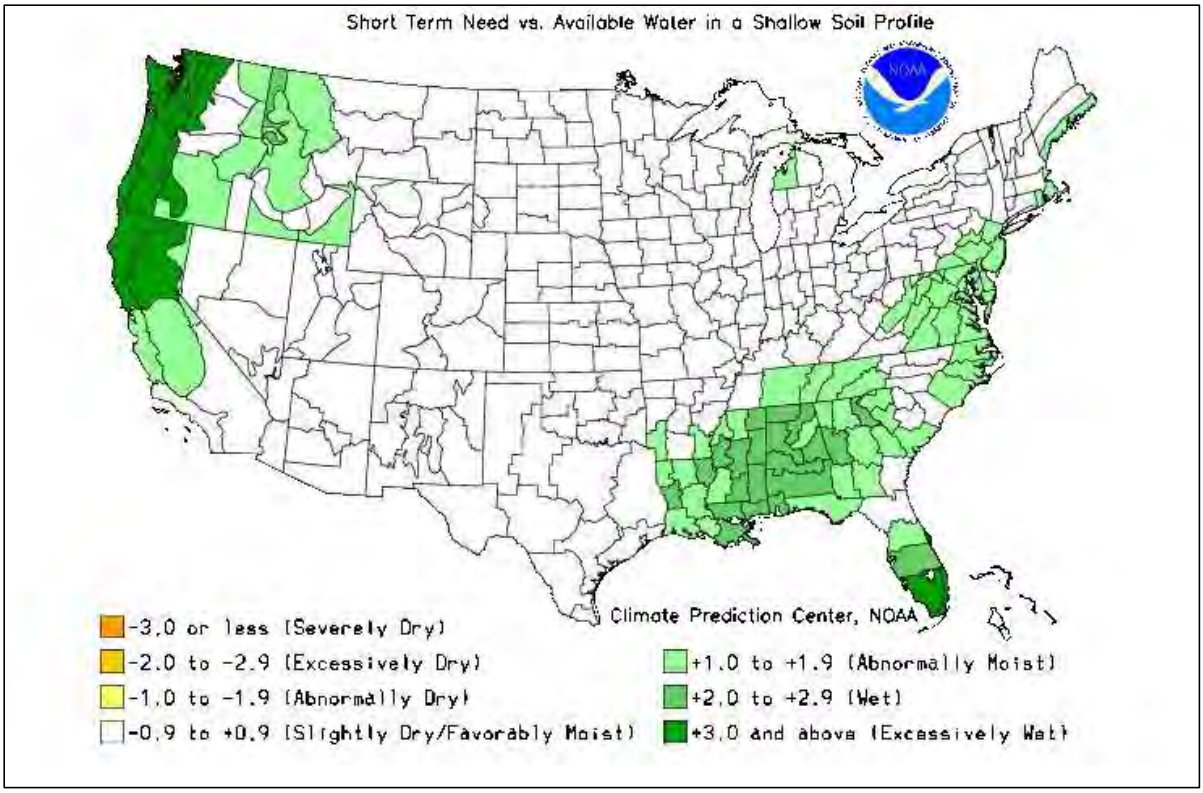


Figure 8-1. Palmer Crop Moisture Index for Week Ending January 30, 2016

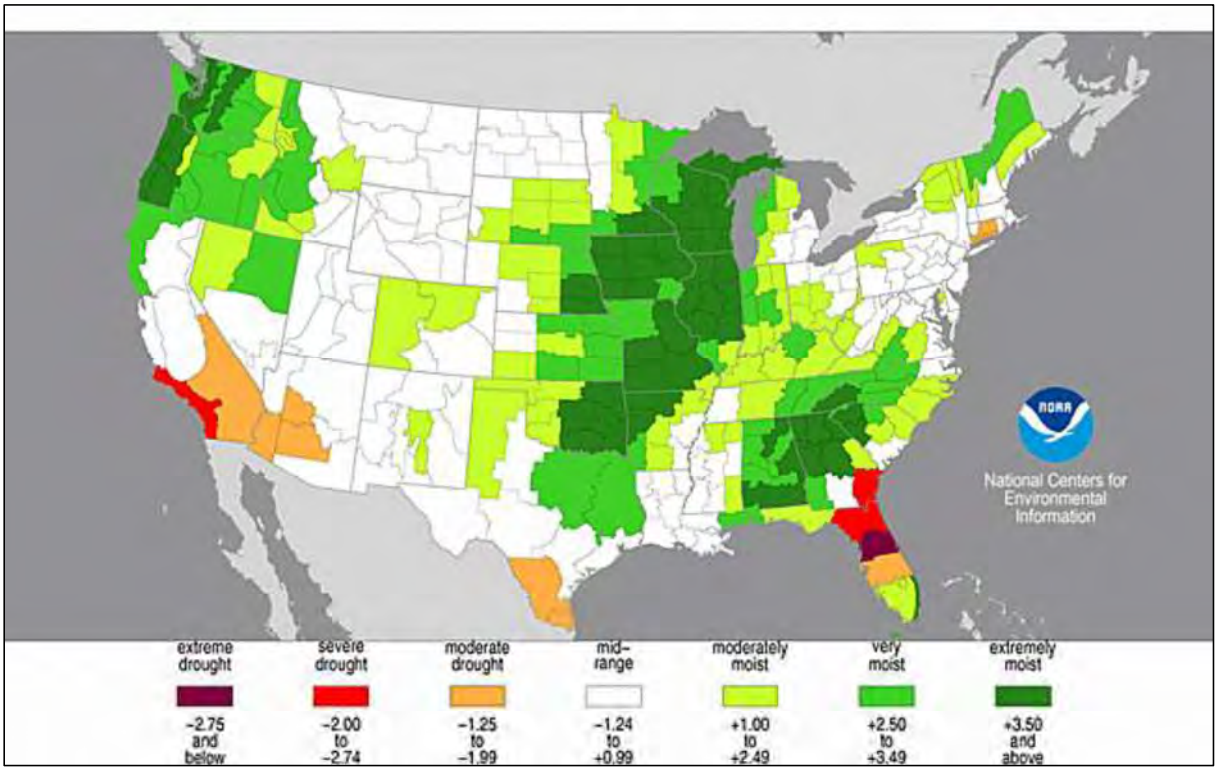


Figure 8-2. Palmer Z Index Short-Term Drought Conditions (December 2015)

- The ***Palmer Drought Index*** measures the duration and intensity of long-term drought-inducing circulation patterns. Long-term drought is cumulative, so the intensity of drought during a given month is dependent on the current weather patterns plus the cumulative patterns of previous months. Weather patterns can change quickly from a long-term drought pattern to a long-term wet pattern, and the Palmer Drought Index can respond fairly rapidly. Figure 8-3 shows this index for January 2016.
- The hydrological impacts of drought (e.g., reservoir levels, groundwater levels, etc.) take longer to develop and it takes longer to recover from them. The ***Palmer Hydrological Drought Index***, another long-term index, was developed to quantify hydrological effects. The Palmer Hydrological Drought Index responds more slowly to changing conditions than the Palmer Drought Index. Figure 8-4 shows this index for January 2013.
- While the Palmer indices consider precipitation, evapotranspiration and runoff, the ***Standardized Precipitation Index*** considers only precipitation. In the Standardized Precipitation Index, an index of zero indicates the median precipitation amount; the index is negative for drought and positive for wet conditions. The Standardized Precipitation Index is computed for time scales ranging from one month to 24 months. Figure 8-5 shows the 24-month Standardized Precipitation Index map for February 2011 through January 2013.

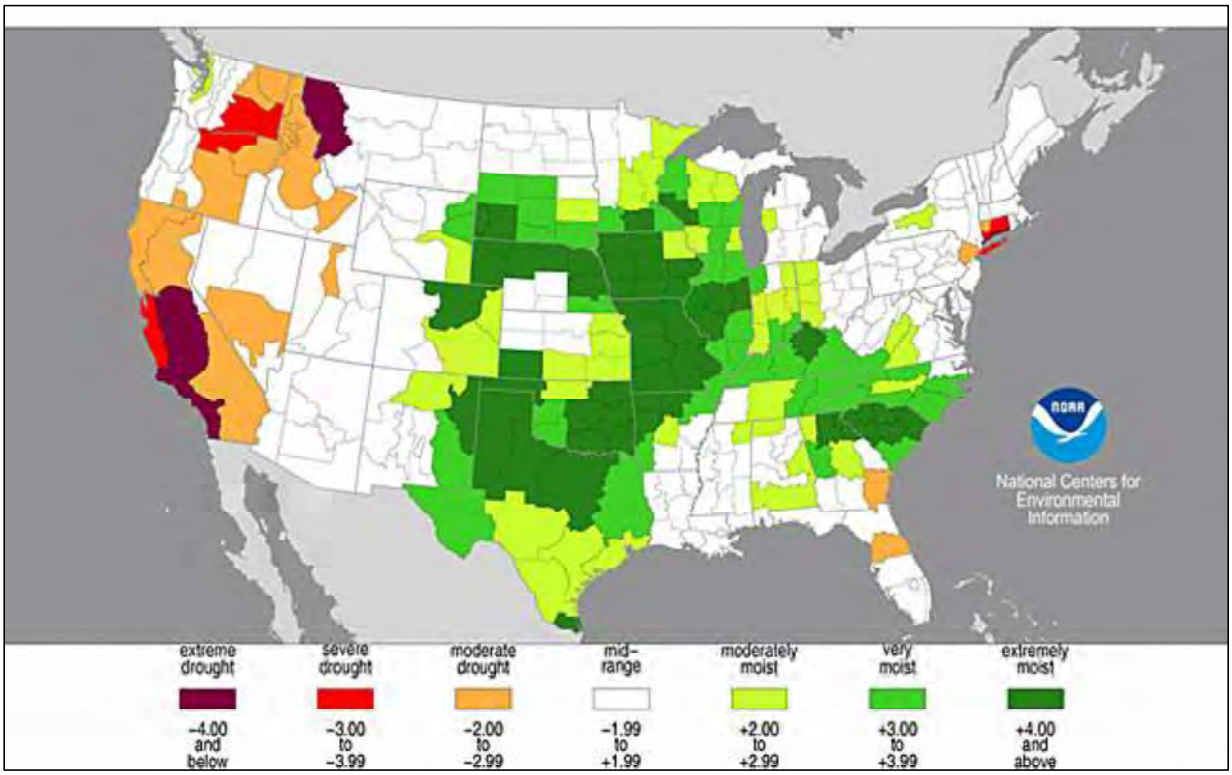


Figure 8-3. Palmer Drought Severity Index (December 2015)

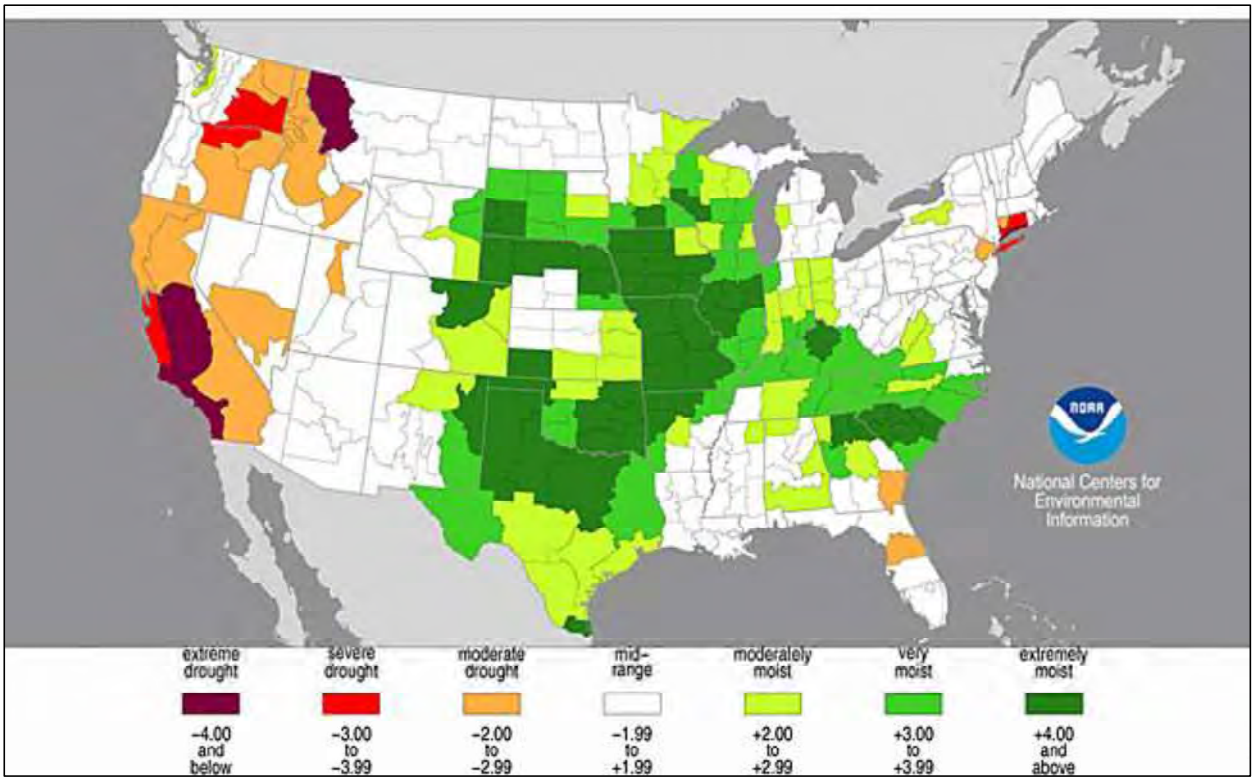


Figure 8-4. Palmer Hydrological Drought Index Long-Term Hydrologic Conditions (December 2015)

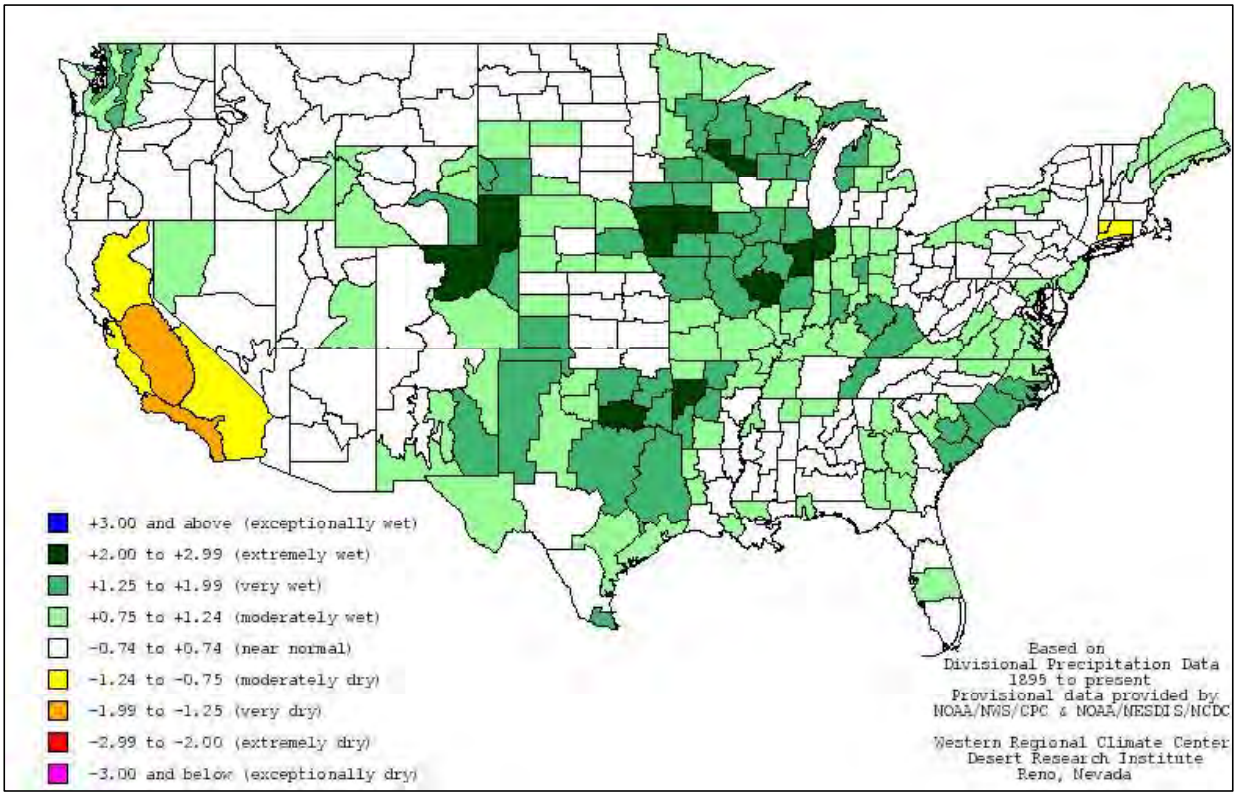


Figure 8-5. 24-Month Standardized Precipitation Index (January 2013 – December 2015)

8.2.3 Frequency

Historical drought data for the Placer County region indicate that, in the 88 years from 1929 through 2016, four multi-year droughts have spanned a total of 20 years. This averages to a five-year drought every 22 years, or a 22 percent chance of a drought in any given year.

8.2.4 Severity

Drought can have a widespread impact on the environment and the economy, although it typically does not result in loss of life or damage to property, as do other natural disasters. Nationwide, the impacts of drought occur primarily in the agriculture, transportation, recreation and tourism, forestry, and energy sectors. Social and environmental impacts are also significant, although it is difficult to put a precise cost on these impacts. The National Drought Mitigation Center uses three categories to describe likely drought impacts:

- Water supply—Drought threatens supplies of water for irrigated crops and for communities.
- Fire hazard—Drought increases the threat of wildfires from dry conditions in forest and rangelands.

The severity of a drought depends on the degree of moisture deficiency, the duration, and the size and location of the affected area. The longer the duration of the drought and the larger the area impacted, the more severe the potential impacts. When measuring the severity of droughts, analysts typically look at economic impacts. All people could pay more for water if utilities increase their rates due to shortages. Other water- or electricity-dependent industries are commonly forced to shut down all or a portion of their facilities, resulting in further layoffs. A drought can harm recreational companies that use water (e.g., swimming pools, water parks, and river rafting companies) as well as landscape and nursery businesses.

Drought generally does not affect groundwater sources as quickly as surface water supplies, but groundwater supplies generally take longer to recover. Reduced precipitation during a drought means that groundwater supplies are not replenished at a normal rate. This can lead to a reduction in groundwater levels and problems such as reduced pumping capacity or wells going dry. Shallow wells are more susceptible than deep wells. Reduced replenishment of groundwater affects streams. Much of the flow in streams comes from groundwater, especially during the summer when there is less precipitation and after snowmelt ends. Reduced groundwater levels mean that even less water will enter streams when steam flows are lowest.

8.2.5 Warning Time

Droughts are climatic patterns that occur over long periods of time. Only generalized warning can take place due to the numerous variables that scientists have not pieced together well enough to make accurate and precise predictions.

Empirical studies conducted over the past century have shown that meteorological drought is never the result of a single cause. It is the result of many causes, often synergistic in nature; these include global weather patterns that produce persistent, upper-level high-pressure systems along the West Coast with warm, dry air resulting in less precipitation.

Scientists at this time do not know how to predict drought more than a month in advance for most locations. Predicting drought depends on the ability to forecast precipitation and temperature. Anomalies of precipitation and temperature may last from several months to several decades. How long they last depends on interactions between the atmosphere and the oceans, soil moisture and land surface processes, topography, internal dynamics, and the accumulated influence of weather systems on the global scale.

8.3 SECONDARY HAZARDS

The secondary hazard most commonly associated with drought is wildfire. A prolonged lack of precipitation dries out vegetation, which becomes increasingly susceptible to ignition as the duration of the drought extends. Millions of board feet of timber have been lost, and in many cases erosion occurred, which caused serious damage to aquatic life, irrigation, and power production by heavy silting of streams, reservoirs, and rivers.

Drought also is often accompanied by extreme heat, exposing people to the risk of sunstroke, heat cramps and heat exhaustion. Pets and livestock are also vulnerable to heat-related injuries.

8.4 EXPOSURE

All people, property and environments within the City of Roseville would be exposed to some degree to the impacts of moderate to extreme drought conditions.

8.5 VULNERABILITY

Based on hydrologic data for the American River, there is a probability that rainfall will be insufficient once every 17 years to supply Folsom Lake and guarantee the City of Roseville its existing contract amounts. In these years, the City by agreement is required to find alternate sources of supply.

Having the flexibility to use both the USBR and PCWA contractual supplies during a drier year or driest year enables the City to provide a reliable surface water supply for municipal and industrial uses. Any shortages can easily be compensated for by water use reductions through conservation (implementation of drought stages as outlined in the Roseville Municipal Code). By incorporating emergency groundwater reserves into the water supply strategy, the City's reliability is increased further still.

The City's 2015 Urban Water Management Plan outlines the potable water supply reliability for normal and dry years, as well as for a three-year drought. Water would be supplied by the American River through Folsom Lake, with conservation measures and groundwater reserves implemented as needed. Roseville's recycled water utility is expected to provide an offset to demand for irrigation supply, thereby reducing the demand for potable water. A summary of the water supply reliability until 2040 for multiple dry water years is provided in Table 8-3.

8.5.1 Population

The City of Roseville, regional water purveyors, members of the Water Forum, and the USBR have spent considerable time and effort to protect life, safety and health should several consecutive dry years occur. Provisions and measures have been taken to analyze and account for anticipated water shortages. The City has the ability to minimize any impacts on residents and water consumers in Roseville. No significant life or health impacts are anticipated as a result of drought in Roseville.

8.5.2 Property

No structures will be directly affected by drought conditions in Roseville, though some structures may become vulnerable to wildfires, which are more likely following years of drought.

8.5.3 Critical Facilities

Critical facilities as defined for this Plan will continue to be operational during a drought. Critical facility elements such as landscaping may not be maintained due to limited resources, but the risk to the City's critical facilities inventory will be largely aesthetic. These aesthetic impacts are not considered significant.

Table 8-3. Water Supply Reliability by 2040

	Normal Water Year	Single Dry Water Year	Multiple Dry Water Years		
			Year 1	Year 2	Year 3
Surface Water (acre-feet)	60,400[a]	39,500[b]	52,894[b]	55,500	46,926[c]
Groundwater (acre-feet)	0	6569	0	0	0
Recycled Water (acre-feet)	4,838	4,838	4,838	4,838	4,838
Projected Demand (acre-feet)	50,907[d]	50,907[d]	50,907 [d]	50,907 [d]	50,907 [d]
Surplus or (Deficit) (acre-feet)[e]	4,655	0	6,826	8,931	857

a. Although additional water is under contract, surface water supplies are available based on Water Forum agreement diversion commitments. This projection includes anticipated PCWA supply from the future Ophir Water Treatment Plant project.
b. Although contracts are in place for normal water year supplies of 67,500 acre-feet, the supply shown is consistent with Water Forum agreement diversion limits and the limitation that 4,000 acre-feet of SJWD supplies are only available for use in normal years.
c. Surface supply reduction is consistent with Water Forum supply agreement anticipating worst case shortage (driest years).
d. No conservation measures are assumed for any year type.
e. Assume full use of available recycled water to offset potable demand for landscape irrigation.

Source: Roseville, 2015a

8.5.4 Environment

Environmental losses are the result of damage to plants, animals, habitat, and air and water quality; wildfires; degradation of landscape; loss of biodiversity; and soil erosion. Some of the effects are short-term and conditions quickly return to normal following the end of the drought. Other environmental effects linger for some time or may even become permanent. Wildlife habitat, for example, may be degraded through the loss of wetlands, lakes, and vegetation. However, many species will eventually recover from this temporary aberration. The degradation of landscape quality, including increased soil erosion, may lead to a more permanent loss of biological productivity. Although environmental losses are difficult to quantify, growing public awareness and concern for environmental quality has forced public officials to focus greater attention and resources on these effects.

8.5.5 Economic Impact

Economic impact will be largely associated with industries that use water or depend on water for their business. For example, landscaping businesses were affected in the droughts of the past as the demand for service significantly declined because landscaping was not watered. The City's Environmental Utilities Department, through the water conservation programs, works to ensure that businesses that rely on water receive allotments to continue operating.

There is always the possibility of some financial exposure for the City as a result of drought conditions. The Environmental Utilities Department plans proactively for this possibility in order to mitigate these impacts to the greatest extent possible.

8.6 FUTURE TRENDS IN DEVELOPMENT

Table 8-4 lists past, current, and projected water use from 2010 to 2040. Water use projections for 2020 through 2040 are based on land use-based water demand projections documented in the City's General Plan.

The general building stock within the planning area increased by 17.7% with an increase in valuation from $21.967 billion to $29.641 billion (34.9%). This increase in valuation of the planning area was impacted by the areas recovery from the economic downturn of 2008. Since the entire planning area would be considered susceptible to drought, it would be perceived that there was an increase in drought exposure over the performance

period of the 2011 plan. However, since droughts typically do not kill or injure people or damage structures, there would be no increase in vulnerability to drought from this increased exposure.

Table 8-4. City of Roseville Past, Current, and Projected Water Use

	Water Use (acre-feet/year)						
	2010	2015	2020	2025	2030	2035	2040
Single family residential	15,836	11,680	21,262	22,425	23,862	25,254	26,365
Multi-Family residential	2,196	1,464	2,399	2,530	2,692	2,849	2,974
Commercial	2,042	1,930	3,402	3,588	3,818	4,041	4,219
Industrial	891	934	1,699	1,792	1,907	2,018	2,107
Institutional and Governmental	667	561	1,001	1,056	1,123	1,189	1,241
Landscape	5,534	4,152	7,559	7,973	8,483	8,978	9,373
Losses[a]	1,195	2,160	3,732	3,936	4,189	4,433	4,628
Total	**28,361**	**22,881**	**41,054**	**43,300**	**46,074**	**48,762**	**50,907**

a. Losses include unbilled/unmetered losses for 2010 and 2015
Source: Roseville, 2015a

8.7 REVIEW OF EXISTING ORDINANCES, PROGRAMS AND PLANS

Since California's 1975 to 1977 drought, Roseville has had a policy of no water waste supported by City ordinances. The City adopted a "No Waste" ordinance in 1989 and updated the Water Conservation Ordinance (Roseville Municipal Code Chapter 14.09—Water Conservation) to include drought mitigation measures in April 1991. The ordinance provides conservation measures for shortages in water supply due to drought. Drought mitigation is achieved through a tiered approach that is based on the surface water available to Roseville. As water supplies decrease, additional restrictions are imposed. Conservation measures (water use restrictions) have been established to address conditions from adequate water supplies to conditions in which surface water supplies are capable of meeting only 50 percent of Roseville's water needs.

A significant portion of Roseville's water is used for landscape irrigation. Landscape irrigation also accounts for a large portion of water wasted in Roseville. Conservation patrols are used to enforce City ordinances restricting water waste. These patrols generally consist of existing service workers that identify and document water waste during daily travels or when responding to complaints. Evening calls are made in response to resident complaints.

In times of reduced water availability, higher drought stages are implemented. In summer 1991, Roseville hired temporary employees to serve as the first dedicated water patrol. This patrol supplemented existing service crew coverage and provided 24-hour-per-day capability. These patrols led to the issuance of over 500 water waste citations that greatly decreased water wasted through malfunctioning irrigation systems and/or excessive watering. In response to the current drought, Roseville instituted these water patrols once more.

Roseville has a number of programs and policies that are implemented as early as possible to reduce water use in the event of a prolonged water shortage. As a USBR contractor, Roseville is required to develop and maintain a water conservation plan consistent with the requirements of the Central Valley Project Improvement Act of 1992. In addition, Roseville is a member and signatory to the American River Water Forum, which also includes requirements for water conservation programs.

To proactively promote water conservation and to be prepared in the event of a water shortage, the City implements demand management (conservation) measures, is developing supplemental water supplies, and has a water shortage contingency plan. These are summarized in the City of Roseville 2010 Urban Water Management Plan Update and detailed in the work programs for the Environmental Utilities Department Water Division.

Given recent legislation and state oversight of the City's water conservation efforts, the Roseville City Council adopted a revised Water Efficient Landscape Ordinance on March 16, 2016. The revised ordinance, effective on April 16, 2016, responds to state legislation mandating stricter requirements for reducing landscape irrigation, water consumption and waste. The revised ordinance addresses the objectives of the Department of Water Resources model ordinance by incorporating the new water efficient landscape requirements into Chapter 14.18 of the Roseville Municipal Code.

8.8 SCENARIO

An extreme multi-year drought can impact the region with little warning. Combinations of low precipitation and unusually high temperatures could occur over several consecutive years. Intensified by such conditions, extreme wildfires could break out throughout Placer County, increasing the need for water. Surrounding communities, also in drought conditions, could increase their demand for water supplies relied upon in the City of Roseville, causing social and political conflicts. If such conditions persisted for several years, the economy of Placer County and Roseville could experience setbacks, especially in water dependent industries.

8.9 ISSUES

The planning team has identified the following drought-related issues:

- Identification and development of alternative water supplies
- Utilization of groundwater recharge techniques to stabilize the groundwater supply
- The probability of increased drought frequencies and durations due to climate change
- The promotion of active water conservation even during non-drought periods.

9. EARTHQUAKE

9.1 GENERAL BACKGROUND

California is seismically active because of movement of the North American Plate, on which everything east of the San Andreas Fault sits, and the Pacific Plate, which includes coast communities west of the fault. The Pacific Plate is constantly moving northwest past the North American Plate, at a relative rate of movement of about 2 inches per year (SHMP 2013). The movement of the tectonic plates creates stress released as energy that moves through the earth as waves called earthquakes.

DEFINITIONS

Earthquake—The shaking of the ground caused by an abrupt shift of rock along a fracture in the earth or a contact zone between tectonic plates. Earthquakes are typically measured in both magnitude and intensity.

Liquefaction—A condition in which water-saturated sands, silts or gravelly soils are shaken so violently that the individual grains lose contact with one another and "float" freely in the water, turning the ground into a pudding-like liquid.

9.1.1 Damage from Earthquakes

Earthquakes can last from a few seconds to over 5 minutes; they may also occur as a series of tremors over a period of several days. The actual movement of the ground in an earthquake is seldom the direct cause of injury or death. Casualties generally result from falling objects and debris, because the shocks shake, damage or demolish buildings and other structures. Disruption of communications, electrical power supplies and gas, sewer and water lines should be expected. Earthquakes may trigger fires, dam failures, landslides or releases of hazardous material, compounding their disastrous effects.

9.1.2 Earthquake Classifications

Earthquakes are typically classified in one of two ways: By the amount of energy released, measured as magnitude; or by the impact on people and structures, measured as intensity.

- Magnitude represents the amount of seismic energy released at the hypocenter of the earthquake. It is based on the amplitude of the earthquake waves recorded on instruments. Magnitude is thus represented by a single, instrumentally determined value.
- Intensity represents the observed effects of ground shaking at any specified location. The intensity of earthquake shaking lessens with distance from the earthquake epicenter. Tabulated peak ground accelerations for a listed "maximum credible earthquake" are a measure of how a site will be affected by seismic events on distant faults.

Magnitude

An earthquake's magnitude is a measure of the energy released at the source of the earthquake. It is commonly expressed by ratings on either of two scales (Michigan Tech University 2016):

- The Richter scale measures magnitude of earthquakes based on the amplitude of the largest energy wave released by the earthquake. Richter scale readings are suitable for smaller earthquakes; however, because

it is a logarithmic scale, the scale does not distinguish clearly the magnitude of large earthquakes above a certain level. Table 9-1 presents the Richter scale magnitudes and corresponding earthquake effects.

- A more commonly used magnitude scale today is the moment magnitude (M_w) scale, with classifications as shown in Table 9-2. The moment magnitude scale is based on the total moment release of the earthquake (the product of the distance a fault moved and the force required to move it). Moment magnitude roughly matches the Richter scale but provides more accuracy for larger magnitude earthquakes.

Table 9-1. Richter Magnitude Scale

Richter Magnitude	Earthquake Effects
2.5 or less	Usually not felt, but can be recorded by seismograph
2.5 to 5.4	Often felt, but causes only minor damage
5.5 to 6.0	Slight damage to buildings and other structures
6.1 to 6.9	May cause a lot of damage in very populated areas
7.0 to 7.9	Major earthquake; serious damage
8.0 or greater	Great earthquake; can totally destroy communities near the epicenter

Source: Michigan Tech University n.d.

Table 9-2. Moment Magnitude Scale

Magnitude Class	Magnitude Range
Great	$M_w \geq 8$
Major	M_w =7.0 - 7.9
Strong	M_w =6.0 - 6.9
Moderate	M_w =5.0 - 5.9
Light	M_w =4.0 - 4.9
Minor	M_w =3.0 - 3.9
Micro	M_w =< 3

Intensity

Currently the most commonly used intensity scale is the modified Mercalli intensity scale, with ratings defined as follows (USGS, 1989):

I. Not felt except by a very few under especially favorable conditions
II. Felt only by a few persons at rest, especially on upper floors of buildings.
III. Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it is an earthquake. Standing cars may rock slightly. Vibrations similar to the passing of a truck.
IV. Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like a heavy truck striking building. Standing cars rocked noticeably.
V. Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI. Felt by all; many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII. Damage negligible in buildings of good design and construction; slight in well-built ordinary structures; considerable in poorly built or badly designed structures. Some chimneys broken.

VIII. Damage slight in specially designed structures; considerable damage in ordinary buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.

IX. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.

X. Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

XI. Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.

XII. Damage total. Lines of sight and level are distorted. Objects thrown into the air.

9.1.3 Ground Motion

Earthquake hazard assessment is also based on expected ground motion. This involves determining the annual probability that certain ground motion accelerations will be exceeded, then summing the annual probabilities over the time period of interest. The most commonly mapped ground motion parameters are the horizontal and vertical peak ground accelerations (PGA) for a given soil or rock type. Instruments called accelerographs record levels of ground motion due to earthquakes at stations throughout a region. These readings are recorded by state and federal agencies that monitor and predict seismic activity.

Maps of PGA values form the basis of seismic zone maps that are included in building codes such as the International Building Code. Building codes that include seismic provisions specify the horizontal force due to lateral acceleration that a building should be able to withstand during an earthquake. PGA values are directly related to these lateral forces that could damage "short period structures" (e.g. single-family dwellings). Longer period response components determine the lateral forces that damage larger structures with longer natural periods (apartment buildings, factories, high-rises, bridges). Table 9-3 lists damage potential and perceived shaking by PGA factors, compared to the Mercalli scale.

Table 9-3. Mercalli Scale and Peak Ground Acceleration Comparison

Modified Mercalli Scale	Perceived Shaking	Potential Structure Damage		Estimated PGA[a] (%g)
		Resistant Buildings	Vulnerable Buildings	
I	Not Felt	None	None	<0.17%
II-III	Weak	None	None	0.17% - 1.4%
IV	Light	None	None	1.4% - 3.9%
V	Moderate	Very Light	Light	3.9% - 9.2%
VI	Strong	Light	Moderate	9.2% - 18%
VII	Very Strong	Moderate	Moderate/Heavy	18% - 34%
VIII	Severe	Moderate/Heavy	Heavy	34% - 65%
IX	Violent	Heavy	Very Heavy	65% - 124%
X - XII	Extreme	Very Heavy	Very Heavy	>124%

a. PGA measured in percent of g, where g is the acceleration of gravity

Sources: USGS, 2008; USGS, 2010

9.1.4 Effect of Soil Types

The impact of an earthquake on structures and infrastructure is largely a function of ground shaking, distance from the source of the quake, and liquefaction, a secondary effect of an earthquake in which soils lose their shear strength and flow or behave as liquid, thereby damaging structures that derive their support from the soil. Liquefaction generally occurs in soft, unconsolidated sedimentary soils. A program called the National Earthquake Hazard Reduction Program (NEHRP) creates maps based on soil characteristics to help identify

locations subject to liquefaction. Table 9-4 summarizes NEHRP soil classifications. NEHRP Soils B and C typically can sustain ground shaking without much effect, dependent on the earthquake magnitude. The areas that are commonly most affected by ground shaking have NEHRP Soils D, E and F. In general, these areas are also most susceptible to liquefaction.

Table 9-4. NEHRP Soil Classification System

NEHRP Soil Type	Description	Mean Shear Velocity to 30 m (m/s)
A	Hard Rock	1,500
B	Firm to Hard Rock	760-1,500
C	Dense Soil/Soft Rock	360-760
D	Stiff Soil	180-360
E	Soft Clays	< 180
F	Special Study Soils (liquefiable soils, sensitive clays, organic soils, soft clays >36 m thick)	

9.2 HAZARD PROFILE

9.2.1 Past Events

The last seismic event recorded in the Roseville vicinity measuring at least 4.0 on the Richter scale occurred between Placerville and Roseville in 1908 on a north-south fault line between Folsom and Auburn. No significant seismic events in the Roseville vicinity have been recorded since then. Significant recent earthquakes in California include the 1906 earthquake in San Francisco, the 1971 San Fernando Earthquake, the 1989 Loma Prieta Earthquake, and the 1994 Northridge earthquake. Table 9-5 lists recent earthquakes with a magnitude of 5.0 or greater within a 100-mile radius of Roseville. Figure 9-1 shows the location of the most recent four events in relation to Roseville.

Table 9-5. Recent Earthquakes Magnitude 5.0 or Larger Within 100-mile radius

Date	Magnitude	Epicenter Location
8/24/2014	6.0	6 miles southwest of Napa, CA
5/24/2013	5.7	12 miles southeast of Chester, CA
4/26/2008	5.1	6 miles west of Reno, NV
10/31/2007	5.6	10 miles northeast of San Jose, CA
8/10/2001	5.5	9 miles west of Portola, CA
9/3/2000	5.17	8 miles northwest of Napa, CA
10/30/1998	5.35	4 miles south-southeast of Truckee, CA
12/28/1995	5.33	7 miles east-northeast of Markleeville, CA
12/23/1995	5.08	8 miles east of Markleeville, CA
9/12/1994	5.95	7 miles north-northeast of Markleeville, CA
9/12/1994	5.12	7 miles north-northeast of Markleeville, CA
3/31/1986	5.70	12 miles east-northeast of Milpitas, CA

Source: Earthquake Catalogs, Northern California Earthquake Data Center, USGS

Source: NCEDC, 2014; Google Earth

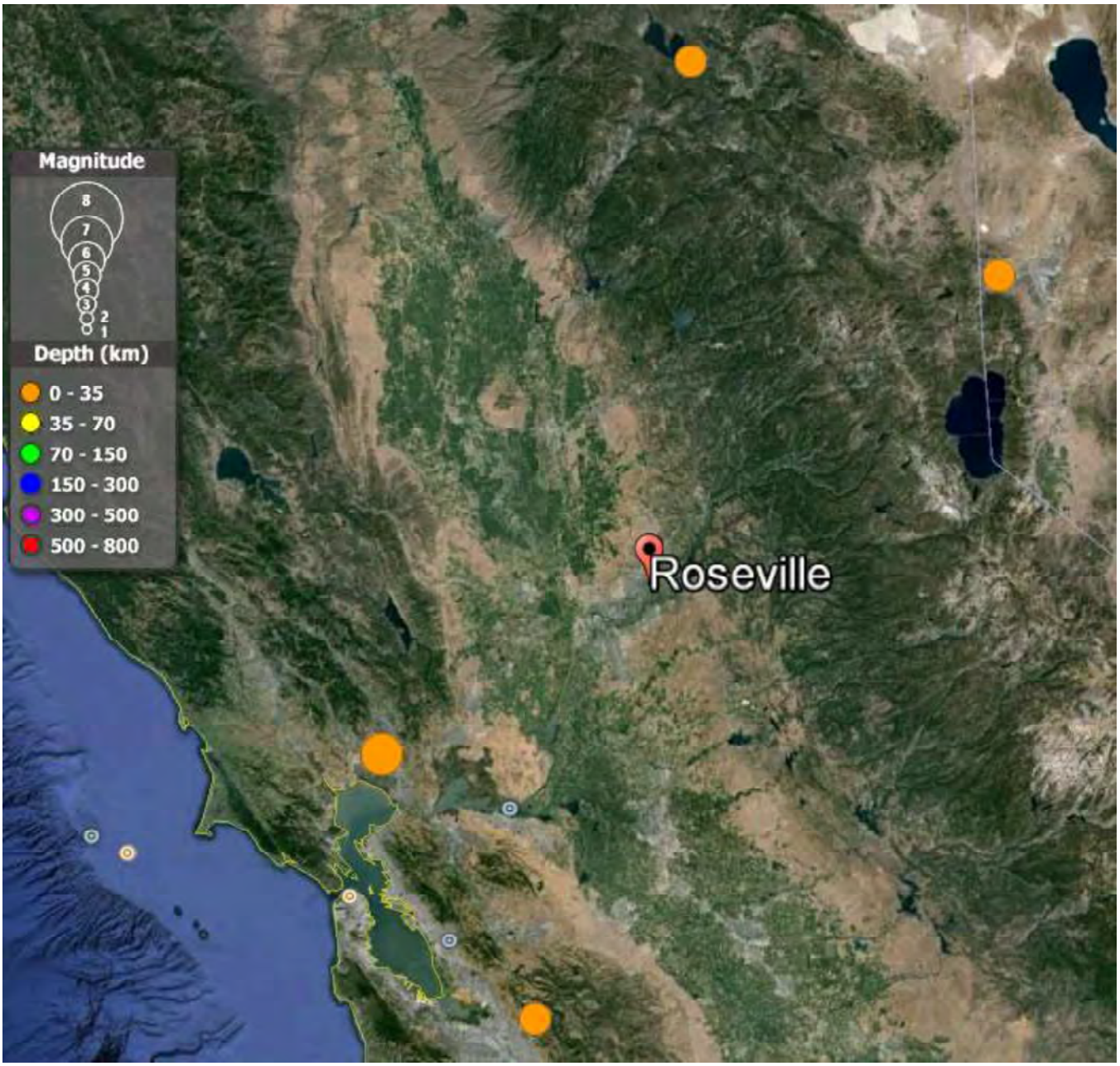


Figure 9-1. Location of Recent Earthquakes in Roseville Vicinity

9.2.2 Location

A direct relationship exists between a fault's length and location and its ability to generate damaging ground motion at a given site. Small, local faults produce lower magnitude quakes, but ground shaking can be strong and damage can be significant in areas close to the fault. Large regional faults can generate earthquakes of great magnitudes but, because of their distance and depth, they may result in only moderate shaking in an area. The City of Roseville is in a region of moderate seismicity between the seismically active Coast Ranges and the historically seismic Foothills Fault Zone in the Sierra Nevada. The primary seismic hazard for the City is potential ground shaking from distant large faults.

East of Roseville

The Great Valley Fault Zone is the geomorphic boundary of the Coast Ranges and the Central Valley. It is underlain by a 300-mile long seismically active fold-and-thrust belt that has been the source of recent earthquakes, such as the 1983 Magnitude-6.5 Coalinga and the 1985 Magnitude-6.1 Kettleman Hills earthquakes. Nearly the entire thrust system is concealed (Krazan & Associates, 2011). The Great Valley fault system consists of 14 segments, named numerically based on location along the fault system from north (1) to south (14).

The Foothill Fault Zone, a complex series of northwest trending-faults that are related to the Sierra Nevada uplift, runs from about Oroville in the north to east of Fresno in the south. This was the source of Oroville's 1975 earthquake and an event in the 1940s. Subsequent research of these events led to the identification and naming of the zone. Earthquakes on fault segments in the zone could be a source of ground shaking in Placer County.

The closest potentially active faults in the near vicinity of Roseville are the Bear Mountain and Melones Faults. The closest recently active fault in the western Sierra Nevada foothills is the Cleveland Hills Fault, about 36 miles northwest of Auburn.

Eastern Placer County borders the Basin and Range geological province, which includes most of Nevada and western Utah. This area is riddled with active faults that form the boundary between each basin or valley and the neighboring mountain range.

The Lake Tahoe Basin is seismically active with earthquakes greater than 7.0 that have occurred beneath Lake Tahoe. According to the Placer County Multi-Hazard Mitigation Plan, a series of small earthquakes also occurred in late 2003 and early 2004 due to volcanic magma (molten rock) moving 20 miles below the Sierra Nevada Mountains. The earthquakes reflect the movement of the Sierra Nevada range to the northwest at a rate of about half an inch per year.

West of Roseville

Tectonic stresses associated with the North American-Pacific Plate boundary can generate damaging earthquakes along faults 30 to 100 miles west of Placer County. Both the San Andreas fault (source of the estimated 8.0-Richter magnitude San Francisco earthquake that caused damage in Sacramento in 1906) and the closer Hayward fault have the potential for experiencing major to great events. Another potential earthquake source is the Midland Fault Zone on the western side of the Sacramento Valley. This was the source of the 1892 Vacaville-Winters earthquake.

The Petrolia (coastal Humboldt County) earthquake increased concern about how amplified long-period motions from much closer major events, such as on the San Andreas Fault or the Hayward Fault, might reach damaging levels and affect Sacramento.

Other potential earthquake sources are the faults associated with the western edge of the Central Valley, recently defined as the Coast Range Central Valley Boundary Thrust Fault System. Various documents define portions of this little known system as the Midland Fault Zone or the Dunnigan Hills fault, where the 1892 Vacaville-Winters earthquake occurred. A southern part of the system may have been the source of the 1983 Coalinga earthquake.

Inactive Faults

Active faults are those that have experienced displacement in historical time. However, inactive faults, for which no such displacements have been recorded, also have the potential to reactivate or experience displacement along a branch sometime in the future. An example of a fault zone that has been reactivated is the Foothills Fault Zone. The zone was considered inactive until evidence of an earthquake (approximately 1.6 million years ago) was found near Spenceville, California. Then, in 1975, an earthquake occurred on another branch of the zone near Oroville, California (now known as the Cleveland Hills Fault). The State Division of Mines and Geology

indicates that increased earthquake activity throughout California may cause tectonic movement along currently inactive fault systems.

No active faults are known to exist in Placer County. The following inactive faults have been identified within the city limits:

- The Volcano Hill fault extends northwest from Volcano Hill for a distance of 1 mile, terminating near Eureka Road. No activity has been recorded along this fault; therefore, it is considered inactive.
- Identified in 1973, the Linda Creek fault is located along Linda Creek in Roseville and Sacramento County. No activity has been recorded along this fault.
- The Willows Fault and Stockton Fault are in the Roseville vicinity and are considered inactive as displacement occurred greater than 1.8 million years ago.
- An unnamed fault extends east to west between Folsom Lake and the City of Rocklin. Segments of the fault are concealed and therefore unmapped. However, the east/west alignment suggests that the fault could connect to the Bear Mountain Fault, branches of which are located beneath Folsom Lake. The Bear Mountain Fault is a fault that could be undergoing reactivation as a result of continental tectonic activity. However, no evidence has been identified along the unnamed fault alignment of such reactivation.

Maps of Earthquake Impact in Roseville

A probabilistic seismic hazard map shows the hazard from earthquakes that seismologists agree could occur. It is probabilistic in the sense that the analysis takes into consideration the uncertainties in the size and location of earthquakes and the resulting ground motions that can affect a particular site. The maps are expressed in terms of probability of exceeding a certain ground motion, such as the 10-percent probability of exceedance in 50 years. This level of ground shaking has been used for designing buildings in high seismic areas. Figure 9-2 shows the estimated ground motion for a 100-year probabilistic earthquake.

Earthquake scenarios describe the expected ground motions and effects of specific hypothetical large earthquakes for a region. Maps of these scenarios can be used to support all phases of emergency management. Two such scenarios were evaluated for this Plan:

- A Magnitude-6.8 event on the Concord-Green Valley Fault with an epicenter 56 miles southwest of Roseville near Vallejo, California (see Figure 9-3)
- A Magnitude-7.1 event on the Great Valley Fault with an epicenter 58 miles west northwest of Roseville (see Figure 9-4)

NEHRP Soil Maps

NEHRP soil types define locations that will be significantly impacted by an earthquake. NEHRP Soils B and C typically can sustain low-magnitude ground shaking without much effect. Areas with NEHRP Soils D, E and F are most commonly affected by ground shaking. Figure 9-5 shows NEHRP soil classifications in the county.

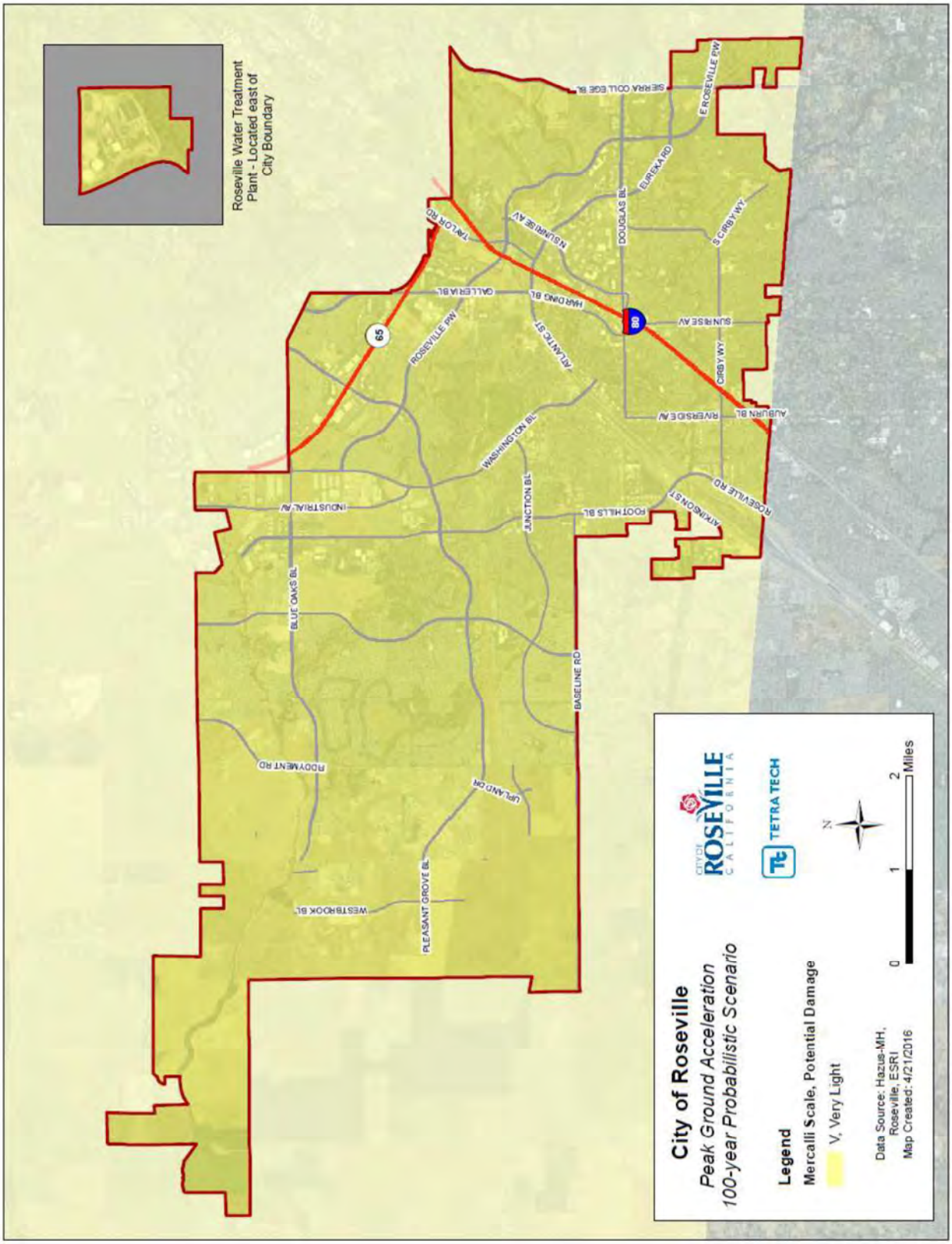


Figure 9-2. 100-Year Probabilistic PGA

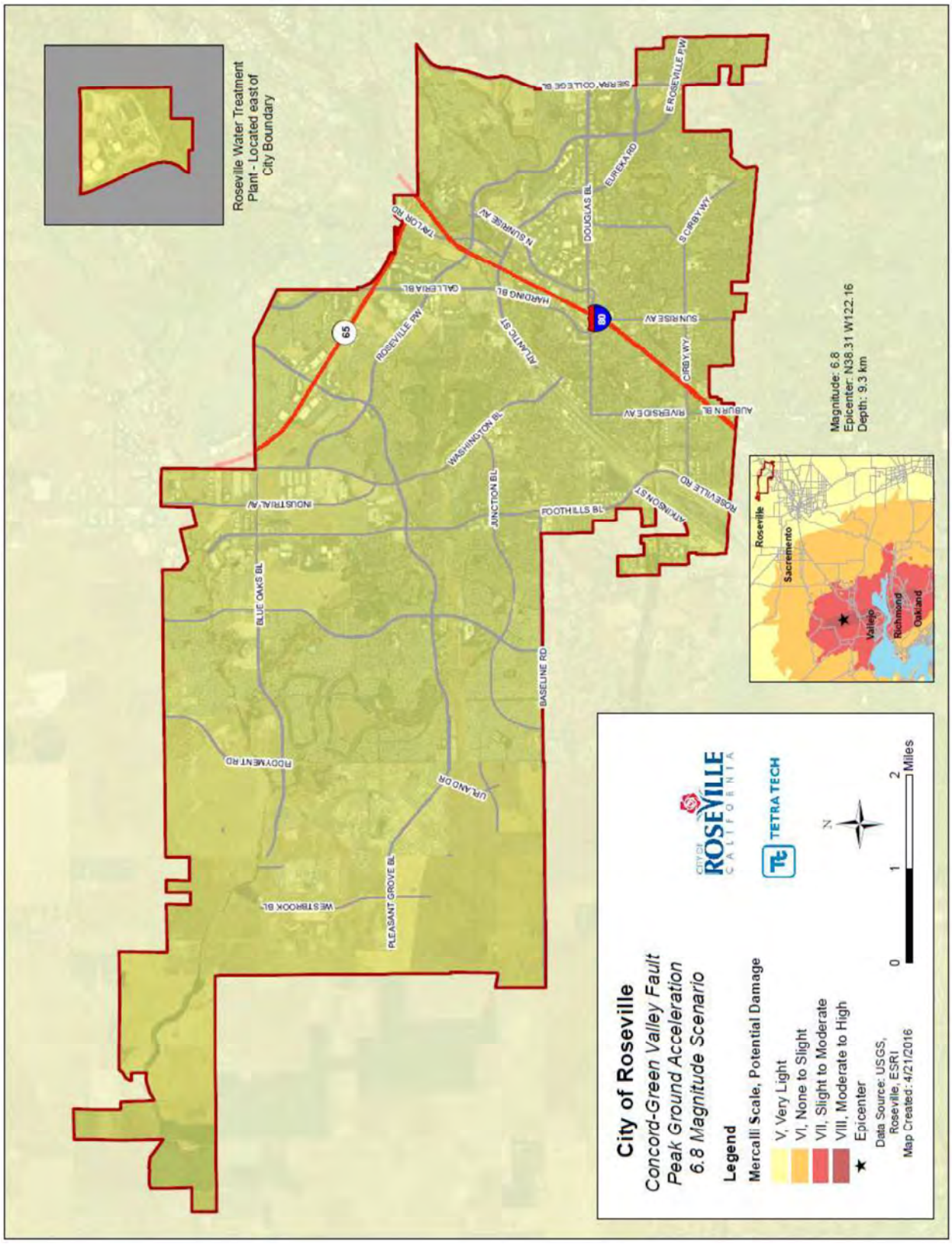


Figure 9-3. Concord-Green Valley Fault Scenario PGA

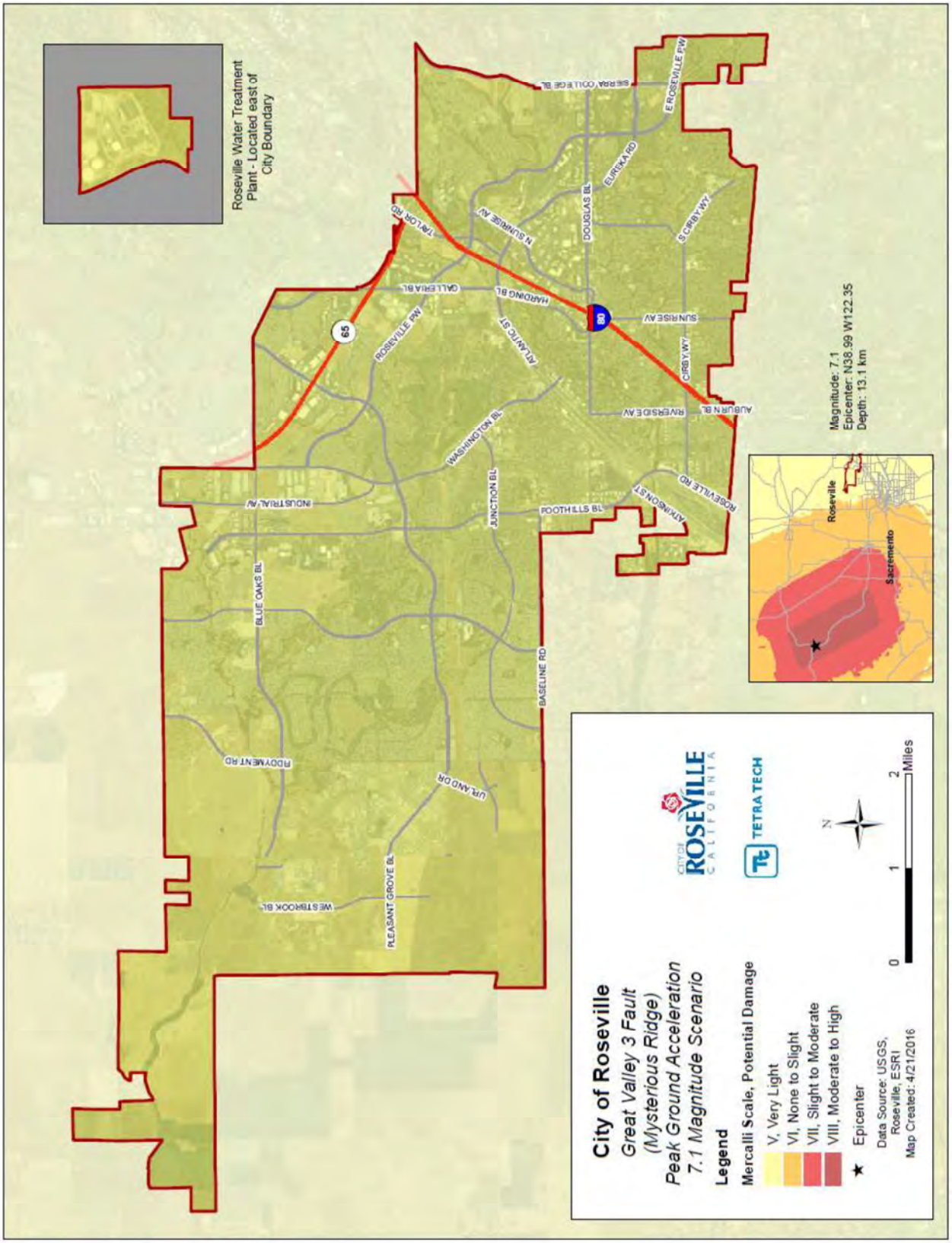


Figure 9-4. Great Valley 3 Fault Scenario PGA

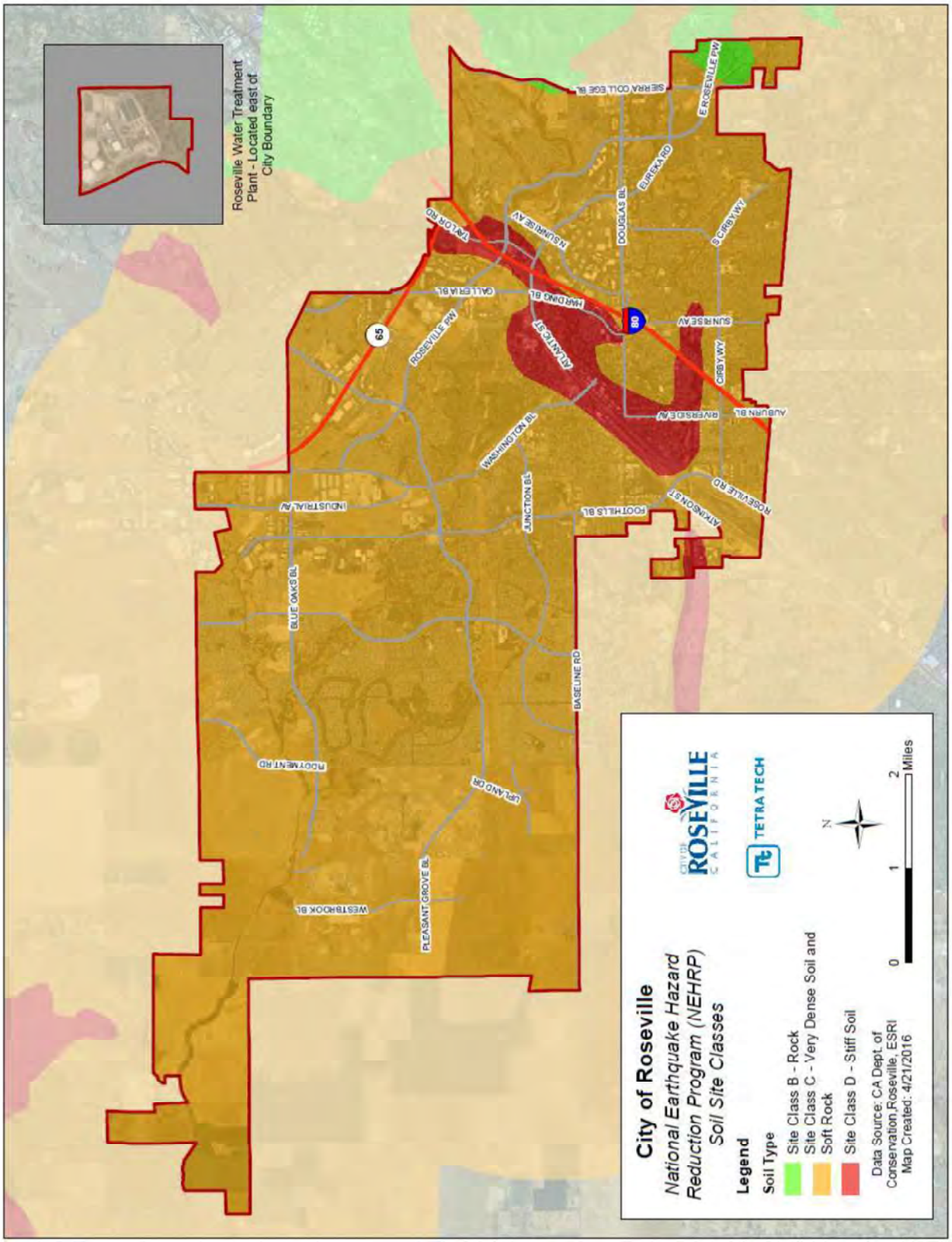


Figure 9-5. National Earthquake Hazard Reduction Program Soil Classification

9.2.3 Frequency

California experiences hundreds of earthquakes each year, most with minimal damage and magnitudes below 3.0 on the Richter Scale. Earthquakes that cause moderate damage to structures occur several times a year. According to the USGS, a strong earthquake measuring greater than 5.0 on the Richter Scale occurs every two to three years and major earthquakes of more than 7.0 on the Richter Scale occur once a decade. Both the San Andreas Fault and the closer Hayward Fault have the potential for experiencing major to great events. The State Hazard Mitigation Plan indicates that in the next 30 years in California there is over a 99-percent probability of a magnitude 6.7 earthquake and a 94-percent probability of a magnitude 7.0 earthquake.

9.2.4 Severity

Placer County and Roseville are identified as a low-severity zone. While there are several faults with the potential for large-magnitude earthquakes in the vicinity, the distance between those faults and the City of Roseville would result in very low, peak-ground accelerations in the City. The biggest contributor to potential intensity of shaking in Roseville is the Foothills Fault Zone.

Liquefaction

Liquefaction of loose sandy soil with a high water content during an earthquake undermines the ground's ability to solidly support building structures. Foundations supported on liquefiable soils can lose their ability to support load, and can experience settlement on the order of several inches or more. Differential settlement can cause significant damage to buildings, lifelines, and transportation structures, with partial or total collapse.

The City of Roseville is not specifically addressed in currently available State Division of Mines and Geology liquefaction risk data. No determination has been made as to whether liquefaction potential exists in Roseville. Based on project-specific analysis that has been done for many of Roseville's development projects, liquefaction has not been identified as a significant problem in Roseville.

The prevailing water table in the vicinity of Roseville is approximately 80 feet below grade. Without water to saturate the soil, liquefaction is not possible. The liquefaction potential in Roseville is, therefore, considered to be very low. The most likely location for liquefaction would be along the City's creek beds. The City's policy of protecting floodplain areas has avoided development in many of the most susceptible areas.

Ground Failure

Roseville's geographic location, soil conditions, and surface terrain combine to minimize risk of major damage from landslides, subsidence (gradual shrinking of the earth's surface due to underground resource extraction), or other geologic hazards resulting from seismic activity and related natural forces.

Slopes

Roseville is located on relatively level terrain, with slopes that gradually increases to the north and east. Recent development in the Stoneridge Specific Plan and Northeast Roseville Specific Plan is adjacent to ravine areas and developed property would be more susceptible in the event of seismic activity due to steep slopes in some areas.

9.2.5 Warning Time

There is no current reliable way to predict the day or month that an earthquake will occur at any given location. Research is being done with warning systems that use the low energy waves that precede major earthquakes. These potential warning systems would give approximately 40 seconds notice that a major earthquake is about to occur. The warning time is very short but it could allow for someone to get under a desk, step away from a hazardous material they are working with or shut down a computer system.

9.3 SECONDARY HAZARDS

Earthquakes can cause large and sometimes disastrous landslides and mudslides. River valleys are vulnerable to slope failure, often as a result of loss of cohesion in clay-rich soils. When soil liquefaction occurs, building and road foundations can lose load-bearing strength and may sink quicksand-like into what was previously solid ground. Unless properly secured, hazardous materials can be released during earthquakes, causing significant damage to the environment and people. Earthen dams and levees are highly susceptible to seismic events and the impacts of their eventual failures can be considered secondary earthquake hazards.

The City of Roseville faces potential social impacts in the wake of mass evacuations should a large seismic event occur in the San Francisco Bay area. As the first major metropolitan city along Interstate 80 east of Sacramento, the City's services and infrastructure could be strained as evacuating populations seek shelter close to home. Evacuees could need shelter for long periods, depending on the magnitude of the event. This could significantly tax hospitals, schools and services in the City, causing significant economic impacts.

9.4 EXPOSURE

9.4.1 Population

All of the population of Roseville, both residents and visitors, would be directly or indirectly exposed to the potential impacts of an earthquake.

9.4.2 Property

All structures within Roseville are exposed to the potential impacts of an earthquake.

9.4.3 Critical Facilities

Since the entire planning area has exposure to the earthquake hazard, all critical facilities and infrastructure components are exposed to the earthquake hazard, as summarized in Table 9-6 and Table 9-7.

Table 9-6. Critical Facilities Exposed to the Earthquake Hazard

Facility Type	Number in Planning Area
Medical and Health	2
Government Functions	27
Protective Functions	10
Schools	49
Hazmat	6
Other Critical Functions	78
Total	**172**

Table 9-7. Critical Infrastructure Exposed to the Earthquake Hazard

Facility Type	Number in Planning Area
Bridges	68
Water Supply	11
Wastewater	23
Power	18
Communications	98
Other	6
Total	**224**

The City's Water Treatment Plant on Barton Road is the only critical facility located near an identified local inactive fault. All other City facilities are within Roseville and are not located near an inactive local fault. However, all are considered to be exposed to the same earthquake risk as the general building stock.

Most of the City's critical facilities have been built since the Uniform Building Code (UBC) was amended to include provisions for seismic safety. For example, the two major hospitals—Sutter Roseville Medical Center and Kaiser Permanente—were both constructed in the 1990s, as were the Roseville Police Department and Roseville Civic Center. The movement of the California Building Code to the International Building Code standard in 2013 has upheld seismic standards previously established by the UBC.

Critical industrial facilities are of concern because of potential hazardous materials spills or the potential for critical employment centers to continue operating. Many forms of hazardous materials are present in Roseville at private businesses, in permanent storage locations, along the Union Pacific Railroad, and on Interstate 80 and Highway 65.

Hazardous Materials

Hazardous material releases from fixed facilities and transportation-related releases can occur during an earthquake event. Roseville's location at the junction of two major rail lines with two freeways increases the potential for a hazardous materials event should a major earthquake occur. Facilities holding hazardous materials are of particular concern because of possible isolation of surrounding populations.

Roads

Roads have the potential to be significantly damaged during an earthquake. Access to major roads is crucial to life and safety after a disaster event as well as to response and recovery operations.

Bridges

Earthquake events can significantly impact bridges, which often provide the only access to some neighborhoods. Since soft soil regions generally follow floodplain boundaries, bridges that cross water courses are considered vulnerable. Since most of the City's bridges provide access across water courses, most are at least somewhat vulnerable to earthquakes. Key factors in the degree of vulnerability are the facility's age and type of construction, which indicate the standards to which the facility was built.

Water and Sewer Infrastructure

Water and sewer infrastructure would likely suffer considerable damage in the event of an earthquake. This is hard to analyze due to the amount of infrastructure and the fact that water and sewer infrastructure are usually linear easements. Without further analysis of individual system components, it should be assumed that these systems are exposed to breakage and failure.

9.4.4 Environment

Environmental problems as a result of an earthquake can be numerous. Secondary hazards will likely have some of the most damaging effects on the environment. Earthquake-induced landslides in landslide prone areas can significantly impact surrounding habitat. It is also possible for streams to be rerouted after an earthquake. This can change the water quality, possibly damaging habitat and feeding areas. There is a possibility of streams fed by groundwater wells drying up because of changes in underlying geology.

9.5 VULNERABILITY

The data in this section was generated using the HAZUS-MH program for earthquakes. Once the location and size of a hypothetical earthquake are identified, HAZUS-MH estimates the intensity of the ground shaking, the number of buildings damaged, the number of casualties, the amount of damage to transportation systems and utilities, the number of people displaced from their homes, and the estimated cost of repair and clean up.

Although Roseville is in California and has three faults documented in the City's General Plan, the seismic hazard is not considered to be a serious risk to life or property. Studies have not identified the Sierra Foothills, including Placer County, as a likely location for a significant seismic event. Roseville is fortunate in that more than three-quarters of the development in the City has occurred in the past two decades and all applicable seismic building codes have been enforced through the planning and development process.

9.5.1 Population

The measurable impact of earthquake on loss of life is minimal in Roseville and has not been estimated for this Plan. The life-safety exposure to earthquake in Roseville is low and would most likely occur in buildings as a result of damage to structures. To prevent damage to structures that could lead to loss of life, the City has a strict code enforcement policy to prevent improper alterations to original buildings. The City has funded façade grants to renovate older commercial structures, and has established an infill development team to work with property owners to upgrade and add value to older properties.

The City encourages residents to be prepared through public education and training via the Roseville Fire Department and local non-profits. Local employers such as Union Pacific, Sutter Roseville Medical Center, Kaiser Hospital, HP and NEC maintain emergency response plans that include earthquake preparedness and response training to protect life and property. Earthquake preparedness and response training prepares employees to continue service to the community in the event of a seismic event.

The vulnerable populations are those living in economically disadvantaged households, those over 65 and those under 16.

9.5.2 Property

Loss Potential

An earthquake would cause property damage in a small percentage of the City's buildings built prior to 1933 and structures such as manufactured homes and older homes that have not been well maintained. Loss estimates for the planning area were generated for the 100-year earthquake event as well as the Concord-Green Valley Fault scenario event and the Great Valley 3 Fault scenario event, through a Level 2 analysis using HAZUS-MH. A summary of results is as follows:

- For a 100-year earthquake, the estimated damage potential is $43.37 million, or 0.15 percent of the total assessed value for the planning area.
- For a 6.8-magnitude event on the Concord-Green Valley Fault, the estimated damage potential is $1.7 million, or 0.01 percent of the total assessed value for the planning area.
- For a 7.1-magnitude event on the Great Valley 3 Fault, the estimated damage potential is $21.3 million, or 0.07 percent of the total assessed value for the planning area.

Age of Structures

The City of Roseville is a relatively new community, with most of its development occurring since 1976. The California Multi-Hazard Mitigation Plan identifies significant milestones in building and seismic code

requirements that affect the structural integrity of development in California. Table 9-8 lists the City's structures by the time period in which they were built, based on age-of-structure data from the City's land inventory database. The number of structures is approximate and is based on best available data currently entered into Roseville and Placer County databases. The number of structures does not reflect the number of total housing units, as many multi-family units and attached housing units are reported as one structure.

Table 9-8. Age of Structures in the City of Roseville

Time Period	Number of Structures in Roseville	Significance of Time Period
Pre-1933	540	Before 1933, there were no explicit requirements for earthquakes in building codes. State law did not require local governments to have building officials or issue building permits.
1933-1940	608	In 1940, the first strong motion recording was made in El Centro.
1941-1960	2,526	In 1960, the Structural Engineers Association of California reached the first statewide consensus on recommended earthquake provisions and published the guidelines.
1961-1975	3,029	In 1975, significant improvements were made to lateral force requirements that were then enforced throughout the state.
1976-1994	12,932	In 1994, the Uniform Building Code was amended to include provisions for seismic safety.
1994 to present	26,423	Seismic code is currently enforced.
Total	**46,058**	

Just over 57 percent of the City's structures were constructed since the UBC was amended in 1994 to include seismic safety provisions. Approximately 1 percent of the City's structures were built before 1933 when there were no building permits, inspections, or seismic standards. Figure 9-6 shows the distribution of structures across the City by age.

Construction Materials

The type of construction is a factor in a building's ability to withstand shaking and liquefaction should an earthquake occur. Developers in Roseville have built primarily wood frame structures. The tallest building in Roseville is currently three stories. HAZUS-MH generated the percentages of each building type in Roseville as shown in Table 9-9.

Table 9-9. Building Type

Building Type	Percent of Total
Wood	96.67%
Reinforced Masonry	<1%
Manufactured Homes	<1%
Concrete	1.2%
Un-reinforced Masonry	<1%
Steel	<1%
Total	**100%**

Sources: HAZUS – MH (Occupancy Class Data)

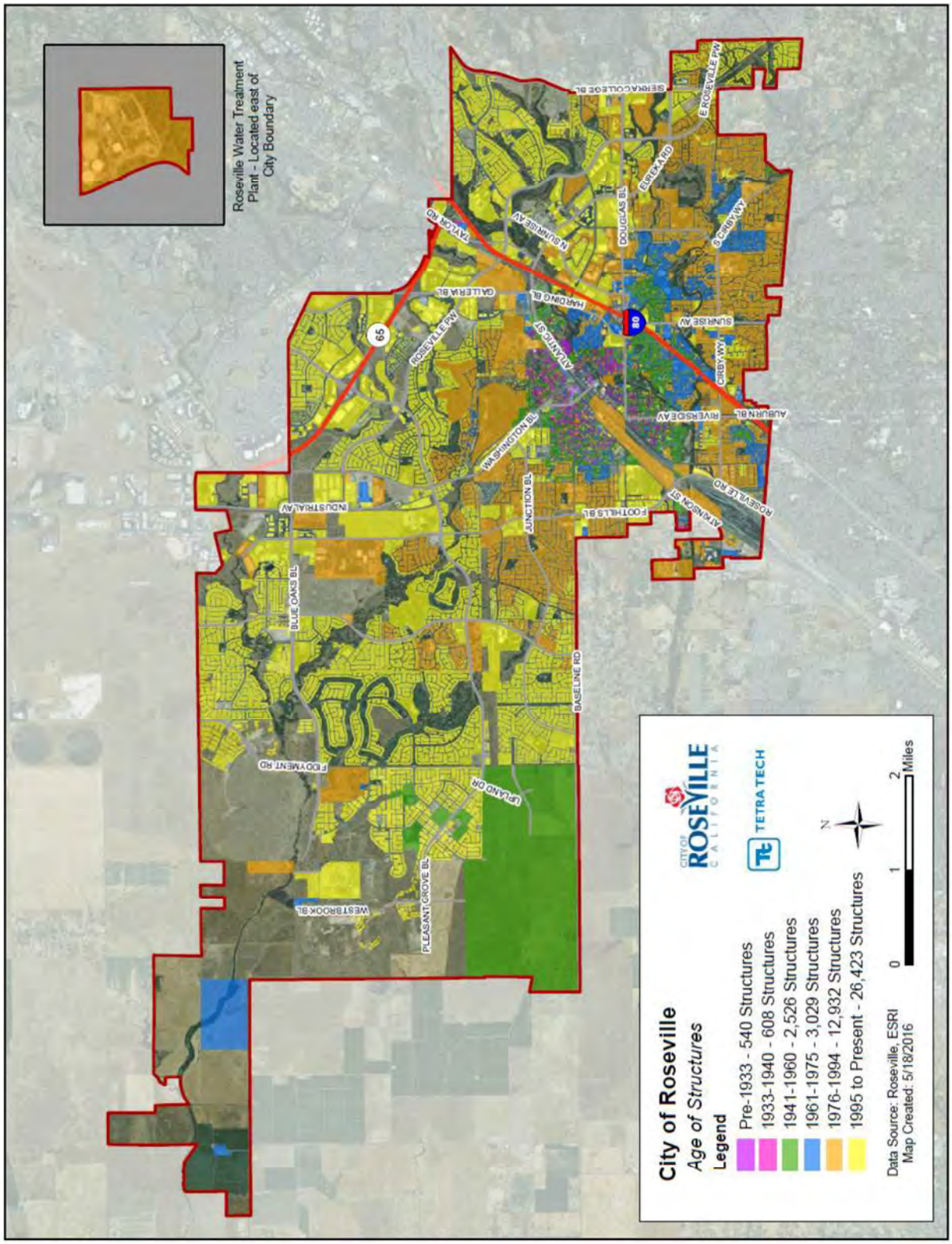


Figure 9-6. Age of Construction of Structures in Roseville

9.5.3 Critical Facilities

Roseville's utilities all have funded rehabilitation programs that identify and replace worn infrastructure to ensure continuous service. The latest technologies, including computerized alarms, video inspections, and mapping of all of the City's water, wastewater, recycled water and electric systems, would identify damaged sections in the event of a seismic event. Private utilities in Roseville also use modern technology to monitor their infrastructure in Roseville and respond quickly to service interruptions.

Level of Damage

The inventory of critical facilities was entered into HAZUS-MH to determine the vulnerability of these facilities to earthquake damage. Critical facilities were categorized into the following levels of damage probability: no damage, slight damage, moderate damage, extensive damage, or complete damage. HAZUS-MH calculated the probability of damage under each of these categories for the 100-year event and the Great Valley 3 Fault Scenario. The results are summarized in Table 9-10 and Table 9-11. The impact on critical facilities for the Concord-Green Valley Fault scenario was not run due to the limited impacts of this event identified by the general building stock analysis.

Table 9-10. Damage Probability (Vulnerability) of Critical Facilities from a 100-Year Earthquake Event

Category	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage
Medical and Health	99.8	0.2	0	0	0
Government Functions	93.4	5.0	1.5	0.1	0
Protective Functions	97.4	2.4	0.2	0	0
Schools	97.3	2.5	0.2	0	0
Other Critical Functions	95.4	4.0	0.6	0	0
Average	**96.7**	**2.8**	**0.5**	**0**	**0**

Table 9-11. Damage Probability (Vulnerability) of Critical Facilities from the Great Valley 3 Scenario

Category	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage
Medical and Health	100	0	0	0	0
Government Functions	99.3	0.7	0	0	0
Protective Functions	99.7	0.3	0	0	0
Schools	99.8	0.2	0	0	0
Other Critical Functions	99.6	0.4	0	0	0
Average	**99.7**	**0.3**	**0**	**0**	**0**

Time to Return to Functionality

HAZUS-MH estimates the expected time required to restore critical facilities to full functional use, in the form of percent probability of being functional at specified time increments post-event: 1, 3, 7, 14, 30 and 90 days after the event occurs. For example, HAZUS-MH may estimate that a facility has 5-percent chance of being fully functional at Day 3, and a 95-percent chance of being fully functional at Day 90. The functionality analysis was performed for all critical facilities and infrastructure components in the planning area for both the 100-year event and the Great Valley 3 Scenario. Results are summarized in Table 9-12 and Table 9-13.

9.5.4 Environment

The environment vulnerable to earthquake hazard is the same as the environment exposed to the hazard.

Table 9-12. Functionality of Critical Facilities, 100-Year Earthquake

Planning Unit	# of Critical Facilities	Probability of Being Fully Functional (%)					
		at Day 1	at Day 3	at Day 7	at Day 14	at Day 30	at Day 90
Medical and Health	2	99.7	99.7	99.9	99.9	99.9	99.9
Government Functions	27	93.4	93.6	98.3	98.3	99.8	99.9
Protective Functions	10	97.3	97.3	99.7	99.8	99.9	99.9
Schools	49	97.2	97.2	99.7	99.8	99.9	99.9
Other Critical functions	78	95.3	95.5	99.3	99.3	99.9	99.9
Total/Average	**166**	**96.6**	**96.7**	**99.4**	**99.4**	**99.9**	**99.9**

Table 9-13. Functionality of Critical Facilities, Great Valley 3 Scenario

Planning Unit	# of Critical Facilities	Probability of Being Fully Functional (%)					
		at Day 1	at Day 3	at Day 7	at Day 14	at Day 30	at Day 90
Medical and Health	2	100	100	100	100	100	100
Government Functions	27	99.2	99.2	99.9	99.9	99.9	99.9
Protective Functions	10	99.7	99.7	99.9	99.9	99.9	99.9
Schools	49	99.8	99.8	99.9	99.9	99.9	99.9
Other Critical functions	78	99.5	99.5	99.9	99.9	99.9	99.9
Total/Average	**166**	**99.6**	**99.6**	**99.9**	**99.9**	**99.9**	**99.9**

9.6 FUTURE TRENDS IN DEVELOPMENT

The general building stock within the planning area increased by 17.7% with an increase in valuation from $21.967 billion to $29.641 billion (34.9%). This increase in valuation of the planning area was impacted by the areas recovery from the economic downturn of 2008. Since the entire planning area would be considered susceptible to earthquake, there was an increase in earthquake exposure over the performance period of the 2011 plan. However, the vulnerability of this new exposure should be considered to be low due to the application of strong seismic building code standards that are contained within the International Building Code.

Roseville is expected to grow considerably in the next 10 years. The moderate potential for earthquake in Roseville is not likely to lessen or prohibit development in the City.

The City's development departments will strictly enforce all seismic building codes and design standards to prevent loss of life and property due to earthquake. Public education, cooperation with the development community, and individual preparedness are essential as Roseville welcomes thousands of new residents and hundreds of new businesses to the City each year.

9.7 REVIEW OF EXISTING ORDINANCES, PROGRAMS AND PLANS

9.7.1 International Building Codes

The State of California provides minimum standards for structural design and site development through the California Building Standards Code (California Code of Regulations (CCR), Title 24). The California Building Code (CBC) is based on the International Building Code (IBC), which is widely used throughout the United States and has been modified for California conditions with numerous more detailed and stringent regulations.

Chapter 18 of the IBC/CBC regulates the excavation of foundations and retaining walls and regulates grading activities, including drainage and erosion control, and construction on expansive soils (soils that expand when

water is added, and shrink when they dry out). Specific minimum seismic safety and structural design requirements are set forth in Chapter 16 of the IBC/CBC. The IBC/CBC requires a site-specific geotechnical study to address seismic issues and identifies seismic factors that must be considered in structural design.

The following uniform codes have been adopted in Chapter 16 of the Roseville Zoning Ordinance to ensure that buildings are designed and sited properly to protect against seismic and unstable soil conditions: CBC (2013), California Plumbing Code (2013), California Green Building Standards (2013), and the California Mechanical Code (2013).

To reduce the risk of seismic-related safety hazards and structural damage to pipelines, roads, and residential homes to an acceptable level, the City of Roseville conditions of approval for development projects require that at the time of tentative map approval, construction be in accordance with the IBC and local building standards, as administered by the Roseville Building Division. Regular monitoring and enforcement through the building permit and plan check process ensures that new development and construction meet all seismic and geologic safety standards, reducing the risk of building damage.

9.7.2 Improvement Standards

The City of Roseville Improvement Standards require the development of a grading plan, an erosion and sedimentation control plan, and mitigation monitoring requirements to reduce the exposure of people and structures to seismic hazards.

9.7.3 Geotechnical Studies

The City of Roseville requires the preparation of site-specific geotechnical studies as part of the building permit process. The technical information that must be compiled for these studies, which address both seismic hazards and soil conditions, is specified in Chapters 16 and 18 of the CBC. The studies provide recommendations to address slope and foundation instability, stream bank protection, and slope evaluation, as well an evaluation of expansive soils and differential settlement. Implementation of recommendations minimizes impacts associated with the exposure of people and structures to seismic hazards, the development of structures on expansive soils, grading that increases slope instability, increased erosion along stream channels, and soil erosion from grading.

9.8 SCENARIO

Inactive faults in the region could significantly impact the City of Roseville should they reactivate, but modeling such impact is difficult due to the lack of data. The direct earthquake risk in Roseville is considered to be low to moderate, but indirect impacts from a significant event in the region could be significant. The City would most likely experience impacts from a large seismic event in the Bay Area. As a large metropolitan center with easy access to transportation corridors, the City would likely become a major evacuation center in response to such an event. This could significantly tax City resources.

9.9 ISSUES

Important issues associated with an earthquake in Roseville include but are not limited to the following:

- Planning is required for mass evacuations into the City of Roseville.
- There is enough older building stock in the City featuring un-reinforced masonry construction to warrant structural and non-structural mitigation.
- There is a need for better comprehensive soils data to better identify the probable earthquake risks in the City.

- A large seismic event in the Sacramento Region could trigger a dam failure on Folsom Lake, causing significant impacts.
- The perceived lack of risk can lead to complacency. Earthquakes provide a significant risk to all populations in California, whether the impacts are direct or indirect.
- There is still much to learn about the impacts of climate change on seismic activity.

10. FLOODING

10.1 GENERAL BACKGROUND

A floodplain is the area adjacent to a river, creek or lake that becomes inundated during a flood. Floodplains may be broad, as when a river crosses an extensive flat landscape, or narrow, as when a river is confined in a canyon.

10.1.1 Measuring Floods and Floodplains

The frequency and severity of flooding are measured using a discharge probability, which represents the probability that a certain discharge level will be equaled or exceeded in a given year. Discharge is the volume of water flowing in a stream or river and over its banks during a given time. Flood studies use historical records to determine the probability of occurrence for different discharge levels. The flood frequency equals 100 divided by the discharge probability. For example, the 100-year discharge has a 1 percent chance of being equaled or exceeded in any given year. The "annual flood" is the greatest flood event expected to occur in a typical year.

The extent of flooding associated with a 1-percent annual probability of occurrence (the base flood or 100-year flood) is commonly used as the regulatory boundary. This boundary is also referred to as the special flood hazard area (SFHA). Many communities have maps that show the extent and likely depth of flooding for the base flood. The base flood elevation is computed using discharge probabilities. The corresponding water-surface elevations describe the exact elevation of water that will result from a given discharge level, which is one of the most important factors used in estimating the potential flood damage in a given area.

10.1.2 Effects of Human Activities

Throughout history, humans have developed settlements in floodplains to take advantage of the benefits of being near the water bodies, but such settlements have always been susceptible to damage from flooding. Human activities concentrate in floodplains for a number of reasons: water is readily available; land is fertile; transportation by water is easily accessible; and land is flatter and easier to develop. But human activity in floodplains frequently interferes with natural processes. It can affect the distribution and timing of drainage, thereby increasing flood problems. Human development creates local flooding problems by altering or confining drainage channels. This increases flood potential in two ways: it reduces the stream's capacity to contain flows, and it increases flow rates or velocities downstream during all stages of a flood event.

10.1.3 Floodplain Ecosystems

Floodplains can support ecosystems that are rich in biological quantity and diversity. Wetting of the floodplain soil releases a surge of nutrients: those left over from the last flood, and those that result from the rapid decomposition of organic matter that has accumulated since then. Microscopic organisms thrive and larger species enter a rapid breeding cycle. Opportunistic feeders—particularly birds—move in to take advantage. The production of nutrients peaks and falls away quickly, but the surge of new growth endures for some time. This makes floodplains particularly valuable for agriculture. Riparian zone species have significant differences from those outside of floodplains. For instance, riparian trees tend to be very tolerant of root disturbance and tend to be very quick-growing compared to non-riparian trees.

10.1.4 Federal Flood Programs

National Flood Insurance Program

The NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in participating communities. For most communities participating in the NFIP, FEMA has prepared a detailed Flood Insurance Study. The study presents water surface elevations for floods of various magnitudes, including the 1-percent annual chance flood and the 0.2-percent annual chance flood (the 500-year flood). Base flood elevations and the boundaries of the 100- and 500-year floodplains are shown on Flood Insurance Rate Maps (FIRMs).

Roseville entered the NFIP on December 15, 1983. The date of the City's current effective FIRM is November 21, 2001. As a participant in the NFIP, the City must, at a minimum, regulate development in its floodplain areas in accordance with NFIP criteria. Before a permit to build in a floodplain area is issued, the City must ensure that two basic criteria are met:

- All new buildings and developments undergoing substantial improvements must, at a minimum, be elevated to protect against damage by the 100-year flood.
- New floodplain development must not worsen existing flood problems or increase damage to other properties.

Properties constructed after a FIRM has been adopted are eligible for reduced flood insurance rates. Such structures are less vulnerable to flooding since they were constructed after regulations and codes were adopted to decrease vulnerability. Properties built before the FIRM was adopted may be more vulnerable to flooding and related damage because they do not meet code or are located in hazardous areas. The first FIRMs for Roseville were available at the end of 1983. According to Placer County Assessor records, 131 of the 154 structures located in the City's regulated floodplain were constructed prior to January 1984 and are therefore considered pre-FIRM under the NFIP. The number of post-FIRM structures in the regulatory floodplain is extremely low because of the City's proactive floodplain management policy of not allowing new development in the floodplain.

The Community Rating System

The Community Rating System (CRS) is a voluntary incentive program within the NFIP. The CRS encourages floodplain management activities that exceed the minimum NFIP requirements (FEMA 2002). Flood insurance premium rates are discounted to reflect the reduced flood risk resulting from community actions meeting the following three goals of the CRS:

- Reduce flood losses.
- Facilitate accurate insurance rating.
- Promote awareness of flood insurance.

For participating communities, flood insurance premium rates are discounted in increments of 5 percent. For example, a Class 1 community would receive a 45 percent premium discount, and a Class 9 community would receive a 5 percent discount. (Class 10 communities are those that do not participate in the CRS; they receive no discount.) The CRS classes for local communities are based on 18 creditable activities in the following categories:

- Public Information
- Mapping and Regulations
- Flood Damage Reduction
- Flood Preparedness

Figure 10-1 shows the nationwide number of CRS communities by class as of May 1, 2016, when there were 1,391 communities receiving flood insurance premium discounts under the CRS program. Although insurance

premium discounts are one benefit of participation in the CRS, more important benefits result from activities that save lives and reduce property damage. Communities participating in the CRS represent a significant portion of the nation's flood risk as evidenced by the fact that over 68 percent of the NFIP's policy base is located in these communities. Communities receiving premium discounts through the CRS range from small to large and represent a broad mixture of flood risks, including both coastal and riverine flood risks.

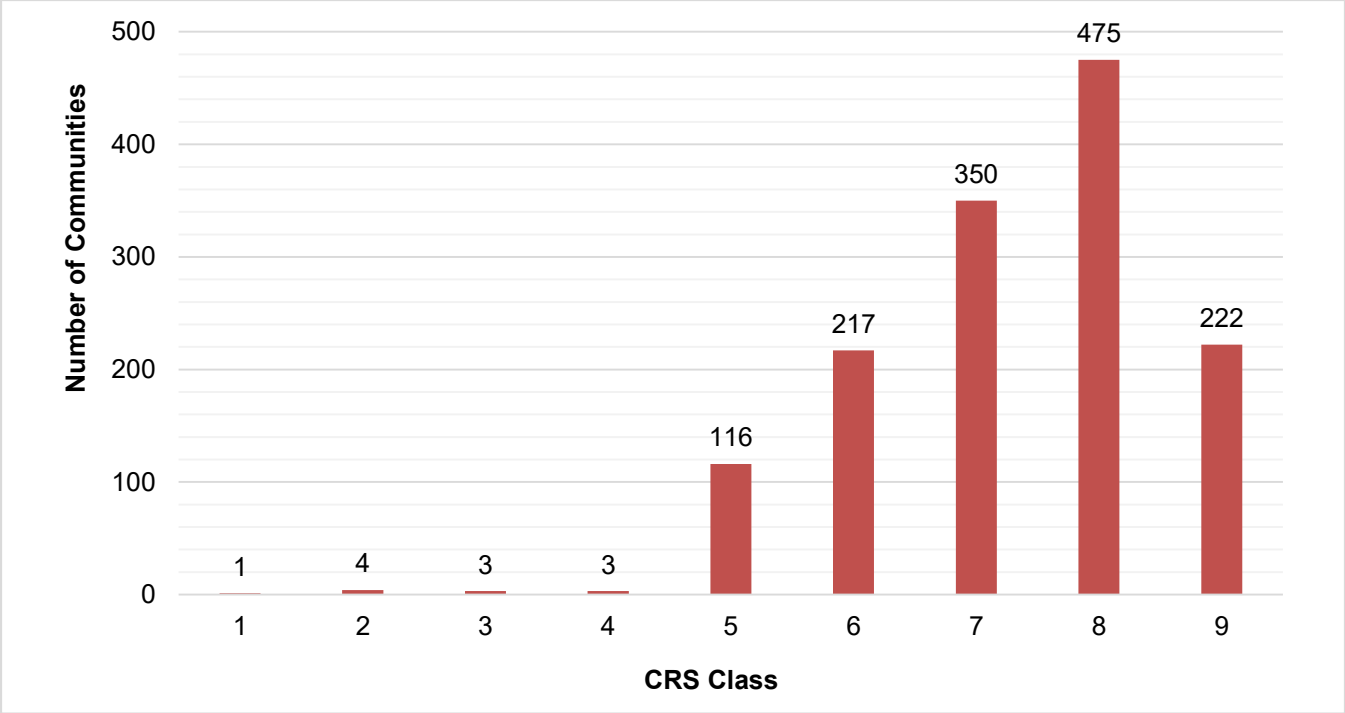


Figure 10-1. CRS Communities by Class as of May 1, 2016

The City of Roseville participated as a pilot-test community during CRS development in the late 1980s. The City began its official participation in the CRS program in 1991 and became the nation's first and only Class 1 community on October 1, 2006. This classification provides flood insurance policy holders in Roseville up to a 45-percent reduction in flood insurance premiums and represents an annual savings of $101,858 in flood insurance premiums; an average of $172 per year for each policy in force.

10.2 HAZARD PROFILE

10.2.1 Flooding Types

Flooding in Roseville is typically caused by high-intensity storms of relatively short duration (1 to 3 hours) concentrated on a stream reach with already saturated soil. In Roseville, two types of flooding typically occur:

- Flash floods that occur suddenly after a brief but intense and concentrated downpour. They move rapidly, end suddenly, and can occur in areas not generally associated with flooding (such as subdivisions not adjacent to a water body and areas serviced by underground drainage systems). Although the duration of these events is usually brief, the damage they cause can be severe. Flash floods cannot be predicted accurately and happen whenever there are heavy storms.

- Riverine floods, which are described in terms of their extent (including the horizontal area affected and the vertical depth of floodwater) and the related probability of occurrence (expressed as the percentage chance that a flood of a specific extent will occur in any given year).

Some localized flooding not associated with creek or stream overflow occurs in Roseville when rainfall runoff volumes exceed the design capacity of drainage facilities or when there are no drainage facilities to control flows. The City has attempted to address this type of flooding with regulations that require an "overland release" of stormwater generated at a site to a recognized stormwater facility. The City also requires mitigation of any increase in runoff generated from new development. However, some developments and facilities in the City were put in place before these policies were adopted.

10.2.2 Past Events

Correspondence from the 1930s between the U.S. Army Corps of Engineers and the City of Roseville indicated a need for establishing flood control measures along Dry, Cirby, and Linda Creeks. The flood of February 1986 was the largest flood on record at its time. This flood caused substantial property damage and was considered to be a 70- to 100-year event, depending on location. In January 1995, the City was subject to flooding that exceeded the 1986 flood event in most streams in Roseville, and that flood is now considered to be the flood of record.

Based on data from the National Climactic Data Center and the University of South Carolina's Spatial Hazard Events and Losses Database for the United States, 16 major flood events were reported in Placer County between January 1950 and December 2009, with an estimated $49,115,460 in property damage. Table 10-1 shows the estimated damage from flooding in Placer County that impacted Roseville from 1973 to 2009.

Table 10-1. Reported Damage from Major Flooding in Roseville (1973 to 2009)

Date	Reported Damage (not adjusted for inflation)
January 1973	$86,207
March 1983	Not Available
February 1986	$5,000,000 (Roseville only)
January 1995	$8,000,000 Total ($4.4 million structural)
January 26,1997	$43,600 (structural)
February 1998	$20,000 (structural)
December 17, 2005	$2,000,000 (county-wide)

Significant flood events impacting the City of Roseville are discussed below with respect to damage, frequency, injuries and fatalities. Unreported injury or illness may be associated with each event. In addition to the events discussed below, flooding occurred during other storms in 1950, 1952 and 1963. However, little information is available to define the extent and impacts of these flooding events.

December 1955

Flooding occurred primarily along Dry Creek. Homes in the Douglas Boulevard area were surrounded by floodwater, and one family was evacuated. Douglas Boulevard was impassable, and pavement was damaged. Royer Park was inundated, and floodwater extended across Park Drive. No injuries or fatalities were reported.

April 1958

This flood, which continued for at least 12 hours, was the second largest event on record at the time. Flooding was most severe on Sunrise Avenue in the southeast portion of the City, on Douglas Boulevard, in the Royer Park area, and on Riverside Avenue at Dry Creek. Agricultural damage occurred along Dry Creek immediately west of

the City. Many homes and businesses were surrounded by floodwater. Several families were evacuated by boat from homes in the Columbia Street and Douglas Boulevard areas. At Royer Park, floodwater covered the ball field and extended across Park Drive. Part of the sewage treatment plant was flooded, but the plant remained operational. No injuries or fatalities were reported.

October 1962

This flood was considered the flood of record at the time. Over 9 inches of rain fell. Creeks overflowed their banks throughout the City, but the areas most affected were along Linda Creek in the Sierra Gardens Subdivision and along Dry Creek. A number of families were evacuated from their homes on Lee Way and Douglas Boulevard. Royer Park was completely inundated for a time, and one deer in the zoo was drowned before animals could be evacuated. Other flood losses in the park included bank erosion, destruction of fencing, damage to a footbridge, and damage to a recreation building and the park office. Restoration of the park required two weeks. Water mains were damaged in the Cresthaven and Atlantic Street areas. The Dry Creek Bridge on Riverside Avenue and the Antelope Creek Bridge on Atlantic Street were damaged. No injuries or fatalities were reported.

December 1964

During this flood event, the fire and police departments evacuated four families when floodwater from Linda Creek surrounded their homes on Champion Oaks Drive and Lee Way. Dry Creek overflowed its banks in several locations, and flood-borne debris was removed in an effort to keep the stream flowing at Booth Road and the Southern Pacific railroad tracks. Floodwater at this location was deep enough to submerge a car stalled in the underpass. Stream-bank erosion occurred along the east bank of Dry Creek behind the Campfire Girls lodge on Sutter Avenue. No injuries or fatalities were reported.

January 1969

A series of downpours beginning on January 16, 1969 caused flooding along Dry Creek, affecting Royer Park, the Champion Oaks area, and the intersection of Cirby Way and Old Auburn Road. Rising water from Linda Creek crested at the doorsteps of five homes along Champion Oaks Drive. City crews prepared to load belongings into vehicles if floodwater entered the homes. A second storm during the week of January 25, caused rising water in Linda Creek that led to the evacuation of five homes on Champion Oaks Drive. Dry Creek Bridge on Douglas Boulevard at Royer Park was closed when Dry Creek washed out fill placed by City crews in response to an earlier washout. No injuries or fatalities were reported.

January 1970

Heavy rains and severe winds caused flooding in Roseville and throughout northern California. High water levels were reported on Champion Oaks Way, Subway Road, and Royer Park. No injuries or fatalities were reported.

January 1973

Heavy rain and high winds impacted northern California border during the week of January 16, 1973. City crews kept watch on Linda Creek at Champion Oaks Drive and closed Subway Road because of flooding. Royer Park flooded after Dry Creek overflowed its banks. No injuries or fatalities were reported.

March 1983

This flood damaged approximately 25 residences along Linda and Cirby Creeks. Portions of Royer Park and areas in the Sierra Lakes Mobile Home Park were inundated. Dry Creek overflowed the Darling Way and Riverside Avenue bridges and flooded six businesses along Riverside Avenue. No injuries or fatalities were reported.

February 1986

This flood caused widespread damage in most of the Dry Creek basin. Nearly all bridges and culverts were overtopped, with 30 sustaining embankment damage. The crossing at Rocky Ridge Drive washed out. Two bridges over Dry Creek were damaged, and street cave-ins occurred at a number of locations. Approximately 209 homes along Dry, Linda, and Cirby Creeks reported flood damage, with water levels up to 5 feet above finished floor levels. The Roseville City Library was closed due to flooding. Floodwaters reached the foundation of the Public Safety Building but did not cause any damage. One fatality associated with this flood event was reported.

January 1995

The January 1995 flood event (Figure 10-2) exceeded the flood event of 1986 on Cirby and Linda Creeks. This event is now considered the flood of record for Dry Creek based on flood heights. The flood was calculated to be a 100-year event. This flood resulted in 358 structures in the Dry Creek Basin being inundated by floodwaters. No injuries or fatalities were reported.



Figure 10-2. Dry Creek Flooding, January 1995

January 1997

Flood events in 1997 were some of the most severe on record for the region. An isolated storm event typical for the Roseville area occurred on soils saturated from repetitive storm events, causing a flash flood. This flooding resulted in 21 structures being inundated with floodwater. The impact of this event was significantly reduced by the partially completed Cirby, Linda, and Dry Creek flood control project. No injuries or fatalities were reported.

February 1998

A small flood occurred on February 3, 1998, resulting in eight structures being inundated by floodwater in the Dry Creek Basin (Figure 10-3). This event was caused by an isolated storm event centered over the basin. No injuries or fatalities were reported.



Figure 10-3. Business Flooding, February 1998

10.2.3 Location

Primary Flood Sources

Upstream flows generated in Placer County enter the City of Roseville's creeks and tributaries from the east and north. Picking up additional stormwater runoff, the creek systems flow west-southwest through Roseville. These flows continue to move west-southwest, passing through Placer, Sacramento, and Sutter Counties to their ultimate destination, the Sacramento and American Rivers.

Roseville is located in portions of two major drainage basins: the Pleasant Grove Creek Basin and the Dry Creek Basin. Pleasant Grove Creek and its tributaries drain most of the western and central areas of the City, and the Dry Creek Basin and its tributaries drain the rest of the City.

The Dry Creek system has year-round flow in its major water courses, and the Pleasant Grove system is intermittent, with only seasonal flow. Since 1950, there have been no reports of structural flood damage along Pleasant Grove Creek. Due to the City's floodplain management policies, no structures in the Pleasant Grove Creek Basin are presently subject to flooding. The focus of flood hazard management is the Dry Creek Basin.

Seven creeks and streams that drain the 80-square-mile Upper Dry Creek Basin pass through and join within the city limits of Roseville. Three of these creeks have primary flooding impacts on the City: Cirby, Dry, and Linda Creeks.

Regulatory Floodplain

The science available at the time that most of the City of Roseville was developed did not accurately project flood heights that could occur from typical rainfall events in the region. Development therefore occurred in areas needed for stormwater conveyance, with insufficient levels of flood protection. Development now exists in low-lying areas adjacent to creek or stream systems needed to convey the over-bank flooding that can occur during storm events.

The City eventually modeled flooding using the best available hydrologic and hydraulic science to better reflect actual rainfall events that can impact the City. This modeling generated a projection of flood heights and areas of inundation that is well supported by conditions observed during the 1986 flood. The City has since used this information to create and enhance its floodplain management program to minimize flood risk to all new developments. Based on the detailed modeling, the City identified a regulatory floodplain that exceeds the SFHA mapped by FEMA. Figure 10-4 shows FEMA's mapped floodplain and the City's regulatory floodplain, as authorized by the Roseville City Code. The City has mapped and regulates 2,372 acres as floodplain, which includes the 1,529 acres of floodplain identified by FEMA on the current effective FIRM for the City. The regulatory floodplain is the area susceptible to risk from flooding based on City-approved studies. These areas are based on detailed hydrologic and hydraulic floodplain modeling that meets or exceeds FEMA criteria for mapping and modeling floodplains. The flood event used to delineate these boundaries is referred to as "the regulatory flood" to differentiate it from the "base flood" used by FEMA.

In many portions of the City, the Nolte Future Floodplain has been used to designate floodplain boundaries. The Nolte Future Floodplain defines floodway and floodway fringe boundaries within the floodplain. The floodway fringe is an area along the boundary of the floodplain that, if totally obstructed, would not result in more than a 1-foot rise in the water surface elevation. The floodway constitutes the remainder of the floodplain area and is typically where floodwaters have the most velocity.

10.2.4 Frequency

Flood magnitude measurements reflect statistical averages only; it is possible for two or more rare floods (with a 100-year or higher recurrence interval) to occur within a short time period. Assigning recurrence intervals to historical floods on different streams can help indicate the intensity of a storm over a large area. For example, the 1995 flood event was determined to be a 100-year flood on Dry Creek and a 50-year flood on Linda Creek.

Recent history has shown that Roseville can expect an average of one episode of minor river flooding each winter. Recent flooding resulting in property damage has occurred about every 3 to 5 years since 1950, except for the period from 1973 to 1981, when no significant flooding occurred. The frequency of flood events that cause significant damage has decreased significantly over the past 10 years due to City efforts to mitigate flood risk. Exposure to events that could cause significant flooding can be expected every 5 to 10 years. Additionally, the City can expect what is often referred to as "nuisance" flooding annually in the historic core due to urban drainage issues.

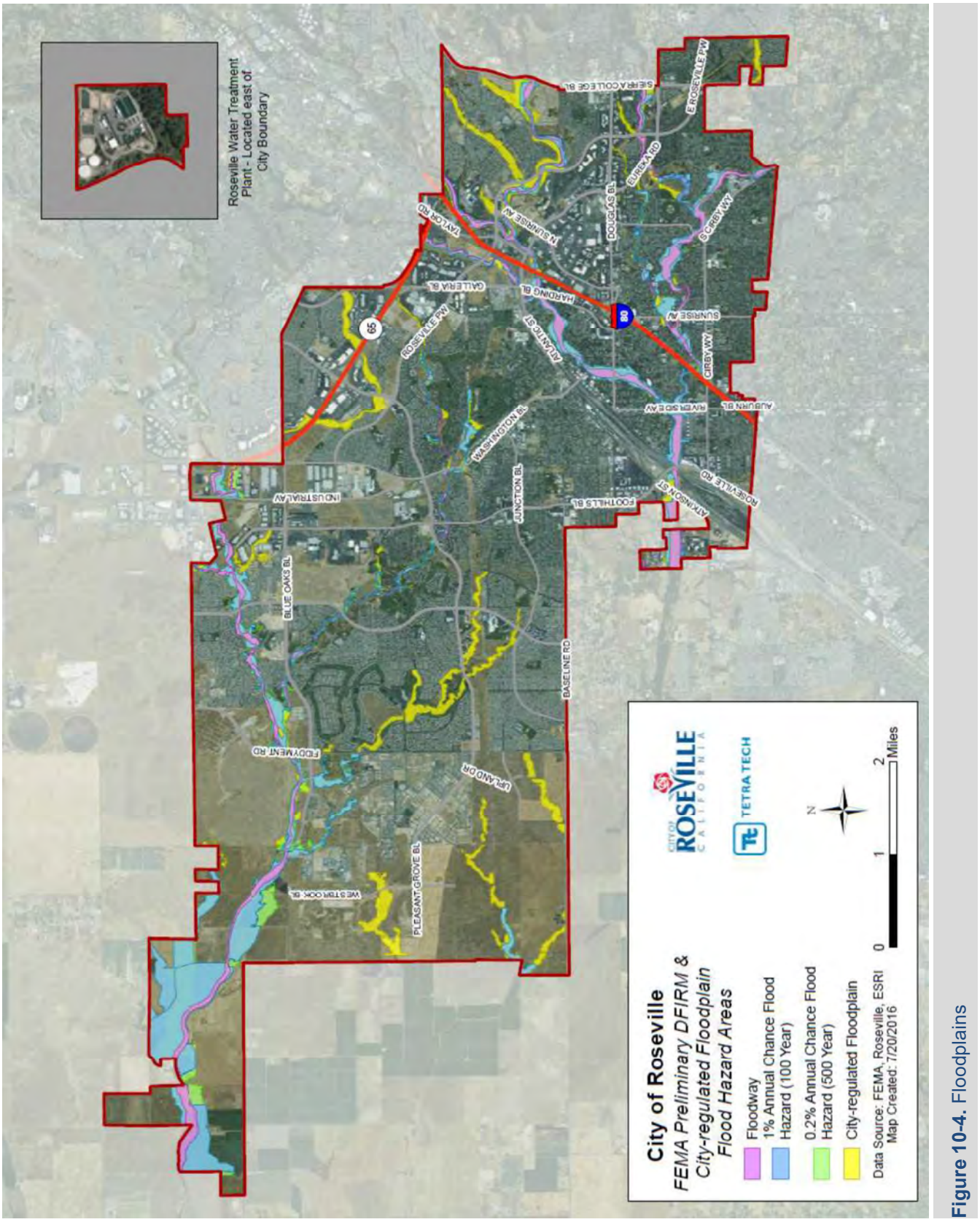


Figure 10-4. Floodplains

10.2.5 Severity

Table 10-2 shows observed flooding characteristics for the Pleasant Grove and Dry Creek basins, based on measurements made during past flood events.

Table 10-2. Observed Characteristics of Flooding

	Pleasant Grove Creek Basin	Dry Creek Basin
Approximate Base Flood Velocity (feet/second)[a]	0.5 to 8.0	2.0 to 14.0
Flow Rate (cubic feet per second)[b]	1,100 to 5,000	900 to 15,000
Base Flood Elevation (feet, National Geodetic Vertical Datum)		
Downstream limit	89.7	79.7
Upstream limit	150.0	210.0
Approximate Depth of Overbank Flooding (feet above existing grade)	0 to 2	0 to 3
Approximate Warning Time (hours)	3	3

a. Higher velocities were observed in the channel; lower velocities were observed in the overbank area
b. 1 cubic foot is about 7.5 gallons

The City recently completed five phases of the seven-phase "Cirby-Linda-Dry Creek Flood Control Project." The purpose of this project is to reduce stormwater backup at constrictions and increase the overall capacity of the floodplain during storm conditions. Project structures were designed to provide 1 foot of freeboard above the projected 500-year flood elevation. This project significantly reduced the flood risk exposure for this area, but did not eliminate it.

10.2.6 Warning Time

Due to the extended precipitation needed to cause serious flooding, it is unusual for a flood to occur without warning. Flash flooding can be less predictable, but hazard areas can be warned in advanced of potential flash flooding. Typical warning times for Roseville range from 1 to 3 hours. The City's flood warning system has four ways to warn the public of potential flooding:

- A comprehensive graphical display of stream levels, broadcast on Channel 14 or 73, with the status of the warning
- The "Stream Level" link on the City of Roseville home web page (www.roseville.ca.us)
- An automatic telephone dialing system to problem areas
- Flooding status broadcasted on radio station 530 AM.

Numerous stream flow and rain gauges form the City's stream monitoring system for the Upper Dry Creek Drainage Basin. These stations are placed at strategic locations throughout the drainage basin. For example, one is mounted on the floodwall just upstream from the pedestrian bridge that crosses between Tina Way and Marlin Drive and another is on Dry Creek at the Vernon Street Bridge. Each station transmits information via radio antenna to a central computer. Stream level information from five of the most critical stream level gauges is broadcasted on cable Channel 14/73 and on the City's web page during significant storm events. City staff uses this information in deciding whether to advise residents to evacuate. The goal is to provide up to 3 hours of advance warning. The continuously changing variables of precipitation, stream levels, and forecasts have a major effect on meeting this goal. The display shown on Channel 14/73 consists of a set of basic graphics shown in 15-second intervals:

- The first, which is shown only once for every complete cycle, is a City of Roseville map that includes major roadways (Vernon Street, Douglas Boulevard, Cirby Way, etc.), the three major streams (Dry Creek, Linda Creek, and Cirby Creek) and the five stream level gauge locations. Residents living in a

designated floodplain can determine which of the five stream gauges best represents their neighborhood. Once this is established, it is important to focus on how the streams are reacting to the weather conditions.

- Following this display, a more specific map identifies a single stream gauge's location in relation to nearby roadways and streams.
- Transmitted information from the gauges is presented in visual formats that include the current stream depth and the stream depth over the past six hours.

The stream level graph is divided into four colored categories of flood depth stages (see Figure 10-5):

- Blue (Normal Stage)—Stream level conditions are normal and safe.
- Green (Advisory Stage)—City staff is continuously monitoring creek levels and weather conditions. Residents should be closely watching for further information about flooding in their area.
- Yellow (Warning Stage)—There is a possibility of flooding in this area. Necessary precautions need to be taken to secure personal property and safety.
- Red (Critical Stage)—Flooding appears imminent in this area. Residents should evacuate their homes.

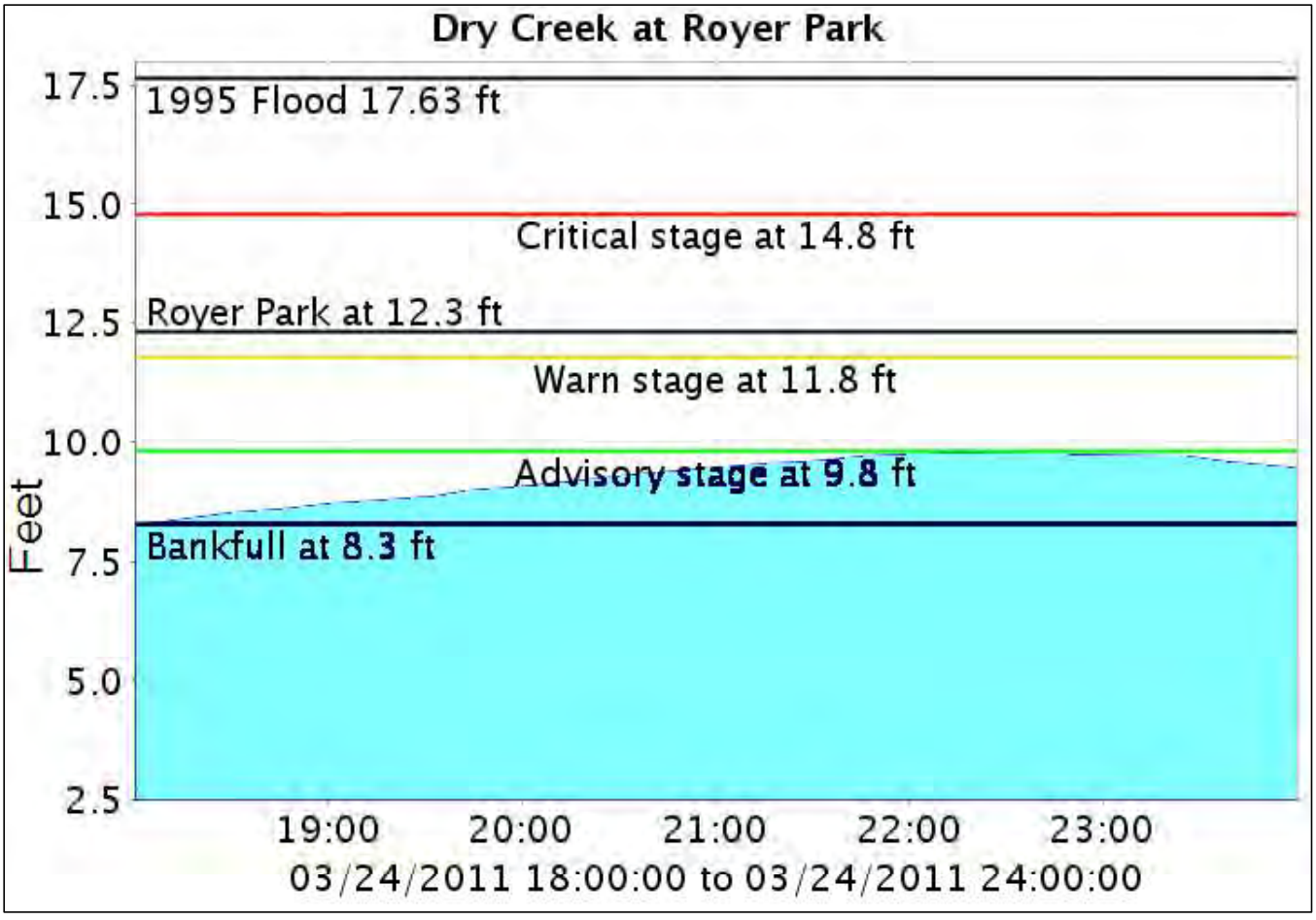


Figure 10-5. Example of Stream Gauge Graphic Display

The numeric values of the stream depths associated with the flood depth stages are shown on the vertical bar graph for all five of the stream level gauges, and reference stream levels are identified for each gauge. For example, the stream level during the 1995 flood is marked for each location. Also identified are other reference

points such as roadway surface, bridge and/or top of berm levels. This enables viewers to identify and understand the present stage of the stream in relation to known benchmarks.

The City of Roseville also has an automated telephone dialing system. During significant storm events, this system is used to phone residents and businesses in the floodplain and provide recorded messages containing important information. The message to be played will depend on the flood threat in the area at that time.

10.3 SECONDARY HAZARDS

The most significant secondary hazard for flooding in Roseville is bank erosion. The dangers of bank erosion often are greater than those of flooding. Flooding is responsible for landslides when high flows over-saturate soils on steep slopes, causing them to fail. Hazardous materials spills are also a secondary hazard of flooding if storage tanks rupture and spill into streams, rivers or drainage sewers.

10.4 EXPOSURE

The Level 2 HAZUS-MH protocol was used to assess the risk and vulnerability to flooding in the planning area. HAZUS-MH uses census data at the block level, FEMA floodplain data, and GIS data for the City's regulatory floodplain. Where possible, the HAZUS-MH data for this risk assessment was enhanced using GIS data from the City and from county, state and federal sources. The following sections describe risk exposure and vulnerability of the general building stock, critical facilities and infrastructure, land use, and environment within the City's mapped regulatory floodplain.

10.4.1 Population

Estimates of the population living in the floodplain in the planning area were generated by analyzing census blocks that intersect with the City's regulatory floodplain. Census blocks do not follow the same boundaries as the floodplain. Therefore, the methodology used to generate these estimates counted census block groups whose centers are in the floodplain or where the majority of the population most likely lives in or near the floodplain. HAZUS-MH estimated the number of buildings within the floodplain in each block, and then estimated the total population by multiplying the number of residential structures by the City average of 2.54 persons per household. Using this approach, the exposed population within the regulatory floodplain was estimated to be 330 (0.25 percent of the total City population). This is only slightly greater than the estimated 322 people exposed in the SFHA.

10.4.2 Property

Structures in the Floodplain

Table 10-3 summarizes the number and type of structures in the floodplain, as calculated from the Level 2 HAZUS-MH analysis. There are 210 structures in the City of Roseville regulatory floodplain. This represents less than 1 percent of the total structures in the City. It includes the 200 buildings identified within FEMA's SFHA.

Table 10-3. Structures Within the SFHA and the Roseville Regulatory Floodplain

	# of Structures in Mapped Floodplain						
	Residential	Commercial	Industrial	Religion	Government	Education	Total
FEMA-Preliminary Mapped SFHA	157	34	7	1	0	1	**200**
Roseville Regulatory Floodplain	156	38	11	2	2	1	210

Exposed Value

The value of exposed buildings within the City's regulated floodplain area and the SFHA was generated using HAZUS-MH and is summarized in Table 10-4 and Table 10-5. This methodology estimated $289 million worth of building-and-contents exposure, representing 0.97 percent of the total building-and-contents value in the City.

Table 10-4. Value of Exposed Buildings Within the FEMA SFHA

	Value of Exposed Property in the Mapped Floodplain			% of Total Value in the City
	Buildings	Contents	**Total**	
Residential	$24,700,000	$12,400,000	$37,000,000	0.2%
Commercial	$75,600,000	$77,000,000	$152,600,000	1.8%
Industrial	$2,400,000	$2,600,000	$5,000,000	0.4%
Religion	$0	$0	$0	0.00%
Government	$0	$0	$0	0.00%
Education	$1,200,000	$1,200,000	$2,500,000	0.2%
Total	**$103,900,000**	**$93,200,000**	**$197,100,000**	**0.7%**

Table 10-5. Value of Exposed Buildings Within the Roseville Regulatory Floodplain

	Value of Exposed Property in the Mapped Floodplain			% of Total Value in the City
	Buildings	Contents	**Total**	
Residential	$39,719,211	$19,859,606	$59,578,817	0.32%
Commercial	$84,278,680	$87,860,805	$172,139,485	2.08%
Industrial	$24,855,494	$25,109,167	$49,964,662	4.30%
Religion	$1,337,875	$1,337,875	$2,675,749	1.07%
Government	$1,032,368	$1,032,368	$2,064,736	1.22%
Education	$1,231,683	$1,231,683	$2,463,365	0.23%
Total	$152,455,311	$136,431,504	$288,886,814	0.97%

Land Use in the Floodplain

To preserve the natural and beneficial functions of open space resource areas adjacent to the floodplain areas of Roseville, the City has adopted policies under the Open Space and Conservation Element of its General Plan that include the following:

- Preserve and rehabilitate continuous riparian corridors and adjacent habitat along the City's creeks and waterways.
- Require dedication of the 100-year floodplain or comparable mechanism to protect habitat and wildlife values in perpetuity.
- Restrict development within the 200-year floodplain subject to the State of California Urban Level of Flood Protection Criteria.
- Require preservation of contiguous areas outside the 100-year floodplain as merited by special resources or circumstances, which may include, but are not limited to, sensitive wildlife or vegetation, wetland habitat, oak woodland areas, grassland connections in association with other habitat areas, slope or topographical considerations, recreation opportunities, and maintenance access requirements.
- Limit recreation activities within the 100-year floodplain and require additional setback areas for trails and other recreation uses so that natural resource areas are not adversely impacted.
- Provide protection and enhancement of fishery resources, including continued coordination with the California Department of Fish and Wildlife to release water to Linda Creek.

Because of these policies, a large portion of the floodplains within Roseville is held for open space use, much of it in a natural or beneficial state. Currently, 1,491.4 acres (97 percent) of the regulatory floodplain within Roseville is designated for open space use, as defined in the Open Space and Conservation Element of the General Plan.

10.4.3 Critical Facilities and Infrastructure

Flooding poses numerous risks to critical facilities and infrastructure:

- Roads or railroads that are blocked or damaged can prevent access throughout the area and can isolate residents and emergency service providers needing to get to vulnerable populations or to make repairs.
- Bridges washed out or blocked by floods or debris from floods also can cause isolation.
- Creek or river floodwaters can back up drainage systems, causing localized flooding.
- Culverts can be blocked by debris from flood events, also causing localized urban flooding.
- Floodwaters can get into drinking water supplies, causing contamination.
- Sewer systems can be backed up, causing waste to spill into homes, neighborhoods, rivers and streams.
- Underground utilities can also be damaged.

The inventory of critical facilities in Roseville's SFHA and regulatory floodplain is shown in Table 10-6 and Table 10-7.

Table 10-6. Critical Facilities in Flood Area

	Critical Facilities within the SFHA	Critical Facilities within the City of Roseville Regulated Floodplain
Medical & Health Services	0	0
Government Function	0	0
Protective Function	0	0
Schools	0	0
Societal Function	2	2
Hazmat	0	0
Other Critical Function	17	1
Total	**19**	**3**

Table 10-7. Critical Infrastructure in Flood Areas

	Critical Infrastructure within the SFHA	Critical Infrastructure within the City of Roseville Regulated Floodplain
Water Supply	0	4
Wastewater	5	4
Power	0	0
Fuel Storage	0	0
Communications	1	2
Bridges	11	27
Total	**17**	**18**

The City of Roseville has determined that the following major roadways and stream crossings (bridges or culverts) would be impassable during a 100-year flood event:

- Dry Creek Road Crossings
- Cirby Creek Road Crossings

  - Vernon Street
  - Riverside Avenue
  - Darling Way
  - Douglas Boulevard
  - Folsom Road
- Linda Creek Road Crossings
  - Rocky Ridge Drive
  - Champion Oaks Drive
  - Sierra College Boulevard
  - Sunrise Avenue
  - Coloma Way
  - Oakridge Road
  - Sierra Gardens Drive
  - Huntington Drive
- Miners Ravine
  - Sierra College Boulevard

10.4.4 Environment

Flooding is a natural event, and floodplains provide many natural and beneficial functions. Nonetheless, with human development factored in, flooding can impact the environment in negative ways:

- Migrating fish can wash into roads or over dikes into flooded fields, with no possibility of escape.
- Pollution from roads, such as oil, and hazardous materials can wash into rivers and streams.
- Pollutants carried by floodwaters can settle onto normally dry soils, polluting them for agricultural uses.
- Human development, such as bridge abutments and levees, and logjams from timber harvesting can increase streambank erosion, causing rivers and streams to migrate into non-natural courses.

With much of Roseville's regulatory floodplain zoned for open space use, the City has taken significant steps to preserve the natural and beneficial functions of the floodplain, while at the same time reducing the risk exposure to the built environment. Still, all vegetation and wildlife resources and corridors in the floodplain open space system—grasslands, oak woodlands, riparian areas, and seasonal wetlands—are exposed to the flood risk.

10.5 VULNERABILITY

10.5.1 Population

Flooding can be a deadly hazard. Roads running through low-lying areas prone to sudden and frequent flooding are a serious threat. Motorists often attempt to drive through barricaded or flooded roadways. Because as little as 18 to 24 inches of water moving across a roadway can carry away most vehicles, floods can present significant potential safety risks. The second largest potential for injuries from flooding results from people walking or playing in or near flooded areas. Generally, floods kill people in one of two situations: when people ignore basic safety precautions (such as evacuations and warnings), and when a flash flood hits an area with no warning.

Although it is possible to analyze life and safety impacts resulting from the flood hazard, injuries and casualties were not estimated for this hazard. One flood-related fatality in Roseville has been recorded, but the flood hazard is not generally considered to pose a serious risk to life in this area, for the following reasons:

- Flooding in Roseville tends to be rapid in terms of the rise and fall of floodwaters. Because of the City's geographical location in the watershed, floods tend to come and go quickly as they move toward their drainage endpoints, thereby decreasing the threat that people become trapped by floodwaters.
- The City has made it a priority to warn and educate its citizens on the dangers and impacts of flooding. The City implements public outreach programs that provide information on flood warnings, property protection, flood safety, and flood insurance. The City also has developed a comprehensive flood warning program that can deliver real-time data to citizens and emergency management personnel through cable

television and the Internet. The program can provide a warning up to 3 hours before a flood event occurs in the 100-year floodplain. The City's approach has resulted in an educated and well-informed constituency.

The June 2004 City of Roseville Emergency Operations Plan, most recently updated in 2010, directs the City of Roseville Emergency Management Organization, coordinates the actions of emergency operations center staff, establishes operational priorities, ensures development and implementation of strategies to meet the needs of the emergency, works with local elected officials on issues related to emergency response and recovery, identifies procedures for evacuation, communicates with the media, coordinates response with outside agencies, and ensures the safety of responders. The Emergency Operations Plan follows California's Standardized Emergency Management System (SEMS) format (see Section 4.9.2).

Regarding health concerns, one of Roseville's sewage treatment facilities is located on the downstream end of Dry Creek. This facility is located above the 100-year floodplain but has overflow ponds within the floodplain. When plant influent loads exceed the plant capacity, untreated sewage is discharged to the overflow ponds. If this scenario occurred simultaneously with a 100-year flood, floodwaters could be contaminated. This situation has not occurred during past flood events, and its probability of occurrence is low. Therefore, its potential impacts on health were not estimated as part of this assessment.

10.5.2 Property

Flood Insurance

Flood insurance statistics help identify vulnerability by showing where there is claim activity, where there is a high rate of flood insurance in force, and where flooding may be occurring in areas not identified as flood-prone. Table 10-8 lists flood insurance statistics for the City of Roseville. The total of $9.9 million paid on 292 claims through July 31, 2010 represents an average of $33,923 per claim.

Table 10-8. Flood Insurance Statistics for the City of Roseville

Date of Entry Initial FIRM Effective Date	December 15, 1983
Current FIRM Effective Date	November 21, 2001
Number of flood insurance policies in force as of 3/31/2016	591
Total annual premium	$311,643
Average policy cost	$527 (national average = $412)
Total insurance coverage	$176,339,200
Total claims filed (1978 to 11/30/2009)	292
Value of claims paid	$9,905,478
Average claim paid	$33,923
Number of flood insurance policies in force within the SFHA	111
X Standard/AR/A99 policies	18
Preferred Risk Policies	462

Flood insurance statistics relevant to reducing flood hazard are as follows:

- Approximately 76 percent of the insurable structures in the SFHA are currently covered by a flood insurance policy. This is well above the national average. According to a study conducted for the NFIP, about 49 percent of single-family homes in special flood hazard areas nationwide are covered by flood insurance.
- 81.2 percent of the current policies in force are for properties outside the SFHA.

- The high percentage of policies outside the SFHA is probably due to the impact of the Cirby-Linda-Dry Creek Flood Control Project and resulting remapping.

Flood Loss Potential of Structures

The HAZUS-MH program calculates losses to structures from flooding by looking at depth of flooding and type of structure. Using historical flood insurance claim data, HAZUS-MH estimates the percentage of damage to structures and their contents by applying established damage functions to an inventory. This inventory comes pre-loaded within the HAZUS-MH model and is based on data from the U.S. Census, state databases, the U.S. Highway Administration, and other sources. Default values can be overridden with locally generated data if available. For this analysis, local data on facilities was used to assess flood risk in the City of Roseville. The City has created a flood inventory database of site-specific information for each property in the regulatory floodplain. This database includes information for the following basic categories:

- Buildings in the regulatory floodplain
- Building use
- Building area
- Building value
- Permit history
- Flood loss history
- Regulatory flood elevation
- Base flood elevation
- Pre- and post-FIRM structures
- Elevation of lowest adjacent grade
- Finished floor elevation

The HAZUS-MH analysis is summarized in Table 10-9 through Table 10-11. It is estimated that there would be up to $2.16 million of flood loss from a 10-year flood event. This represents less than 0.01 percent of the total assessed value of the City. It is estimated that there would be up to $7.04 million of flood loss from a 100-year flood event. This represents 3.6 percent of the total value exposed to the flood hazard in the regulatory floodplain and 0.02 percent of the total assessed value of the City. It is estimated that there would be $7.14 million of flood loss from a 500-year flood event, representing 3.4 percent of the total value exposed to the flood hazard in the regulatory floodplain and 0.02 percent of the total assessed value for the City.

Table 10-9. Estimated Flood Loss for the 10-Year Flood Event (Preliminary FIRM)

	Estimated Flood Loss			% of Total
	Buildings	Contents	**Total**	Assessed Value
Residential	$1,275,990	$609,637	$1,885,627	<0.01%
Commercial	$70,143	$172,585	$242,727	<0.01%
Industrial	$16,759	$21,065	$37,825	<0.01%
Agricultural	$0	$0	$0	0.00%
Religion	$0	$0	$0	0.00%
Government	$0	$0	$0	0.00%
Education	$0	$0	$0	0.00%
Total	**$1,362,892**	**$803,287**	**$2,166,179**	**<0.01%**

Table 10-10. Estimated Flood Loss for the 100-Year and 500-Year Flood Events (Preliminary FIRM)

	Estimated Flood Loss						% of Total Assessed Value	
	Buildings		Contents		**Total**			
	100-year	500-year	100-year	500-year	**100-year**	**500-year**	100-year	500-year
Residential	$2,253,989	$2,253,989	$1,257,030	$1,257,030	$3,511,019	$3,511,019	0.02%	0.02%
Commercial	$686,896	$704,051	$2,366,376	$2,452,152	$3,053,271	$3,156,203	0.04%	0.04%
Industrial	$107,228	$107,228	$375,139	$375,139	$482,368	$482,368	0.04%	0.04%
Agricultural	$0	$0	$0	$0	$0	$0	0.00%	0.00%
Religion	$0	$0	$0	$0	$0	$0	0.00%	0.00%
Government	$0	$0	$0	$0	$0	$0	0.00%	0.00%
Education	$0	$0	$0	$0	$0	$0	0.00%	0.00%
Total	**$3,048,113**	**$3,065,269**	**$3,998,545**	**$4,084,321**	**$7,046,658**	**$7,149,590**	**0.02%**	**0.02%**

Table 10-11. Estimated Flood Loss for the Regulatory Floodplain

	Estimated Flood Loss			% of Total Assessed Value
	Buildings	Contents	**Total**	
Residential	$2,096,568	$944,975	$3,041,544	0.02%
Commercial	$1,322,410	$3,044,262	$4,366,672	0.05%
Industrial	$87,710	$254,384	$342,094	0.03%
Agricultural	$33,023	$240,436	$273,459	0.11%
Religion	$1,603	$9,617	$11,220	0.01%
Government	$0	$0	$0	0.00%
Education	$3,541,314	$4,493,675	$8,034,988	0.03%
Total	**$2,096,568**	**$944,975**	**$3,041,544**	**0.02%**

Repetitive Loss

Several federal government programs encourage communities to identify and mitigate "repetitive loss" properties. Nationwide, repetitive loss properties make up only 1 to 2 percent of the flood insurance policies currently in force, yet they account for 40 percent of the flood insurance claim payments. A report on repetitive loss structures by the National Wildlife Federation found that 20 percent of these structures are listed as outside the 100-year floodplain. In 1998, FEMA reported that the NFIP's 75,000 repetitive loss structures had already cost $2.8 billion in flood insurance payments.

FEMA identifies repetitive loss structures based on flood insurance payments. A repetitive loss area is the portion of the floodplain where numerous buildings have been subject to repetitive flooding. The purpose of identifying repetitive loss areas is to identify structures that are subject to the same risk but are not on FEMA's list because a flood insurance policy was not in force at the time of loss.

The list of repetitive loss properties maintained by FEMA identifies one commerical repetitive loss property within the City's regulatory floodplain. When Roseville first began its participation in the CRS program in 1991, the list of repetitive loss properties totaled 27 locations. Since then, flood protection and mitigation projects (including purchase and relocation of structures) have occurred at 23 repetitive loss locations and all 23 locations are no longer subject to repetitive flood losses. This represents an 85 percent reduction in exposure of insured properties to repetitive flood losses. This reduction is a prime example of how the City of Roseville's proactive flood mitigation practices have decreased the exposure of its citizens to the flood hazard, reduced the number of repetitive loss properties, and minimized reliance on post-disaster assistance provided by the federal government and the nation's taxpayers.

Figure 10-6 shows the location of Roseville's single remaining repetitive loss area. The City is required to address its repetitive loss area as a condition of its participation in the CRS program. This hazard mitigation plan meets this CRS requirement.

10.5.3 Critical Facilities and Infrastructure

HAZUS-MH was used to estimate the flood loss potential of critical facilities exposed to the flood risk. The model uses depth/damage function curves to estimate the percent of damage to a building and its contents and correlates that with an estimate of functional downtime (the time it will take to restore a facility to 100 percent of its functionality). The findings were as follows:

- On average, critical facilities would receive 5 percent damage to the structure and 19 percent damage to the contents during a 100-year flood event, and the estimated time to restore these facilities to full functionality would be 90 days.
- On average, critical facilities would receive 8 percent damage to the structure and 31 percent damage to the contents during a 500-year flood event, and the estimated time to restore these facilities to full functionality would be 160 days.

Six critical facilities are exposed and vulnerable to flooding in Roseville. A detailed vulnerability analysis of all critical facilities is on file with appropriate City staff and will not be published for public review. Of these six critical facilities, two have sufficient vulnerability to flooding to warrant mitigation strategies. Flood protection has been provided to the two churches identified, although it is not 100-year flood protection. The estimated depth of flooding for these two facilities is minimal and there have been no reports of flood damage. The County courthouse has been elevated to above the 100-year flood level. Mitigation strategies outlined in this Plan will mitigate the impact of flooding on the remaining facilities, including retrofitting the floodwall that protects the library and public safety building.

Of Roseville's two wastewater treatment plants, only the Dry Creek Plant is partially located in the floodplain. The storm sewer system is separate from the sanitary sewer system, so the sanitary sewers are not significantly affected by storm events.

10.5.4 Environment

The environment vulnerable to the flood hazard is the same as the environment exposed to the hazard. While flood events have historically caused significant damage to the environment, estimating damage can be difficult. Loss estimation platforms such as HAZUS-MH are not currently equipped to measure environmental impacts of flood hazards. The best gauge of vulnerability of the environment would be a review of damage from past flood events. Loss data that segregates damage to the environment were not available at the time of this Plan. Capturing this data from future events could be beneficial in measuring the vulnerability of the environment for future updates to this Plan.

10.6 FUTURE TRENDS IN DEVELOPMENT

Increased urbanization of western Placer County within the Pleasant Grove and Dry Creek Basins has resulted in the potential for increased flooding problems in Roseville. Land development typically results in increased hard surfaces and decreased vegetation, conditions that limit infiltration opportunities and, without adequate mitigation, can increase stormwater runoff rates and volumes and decrease the time required to reach peak discharge.

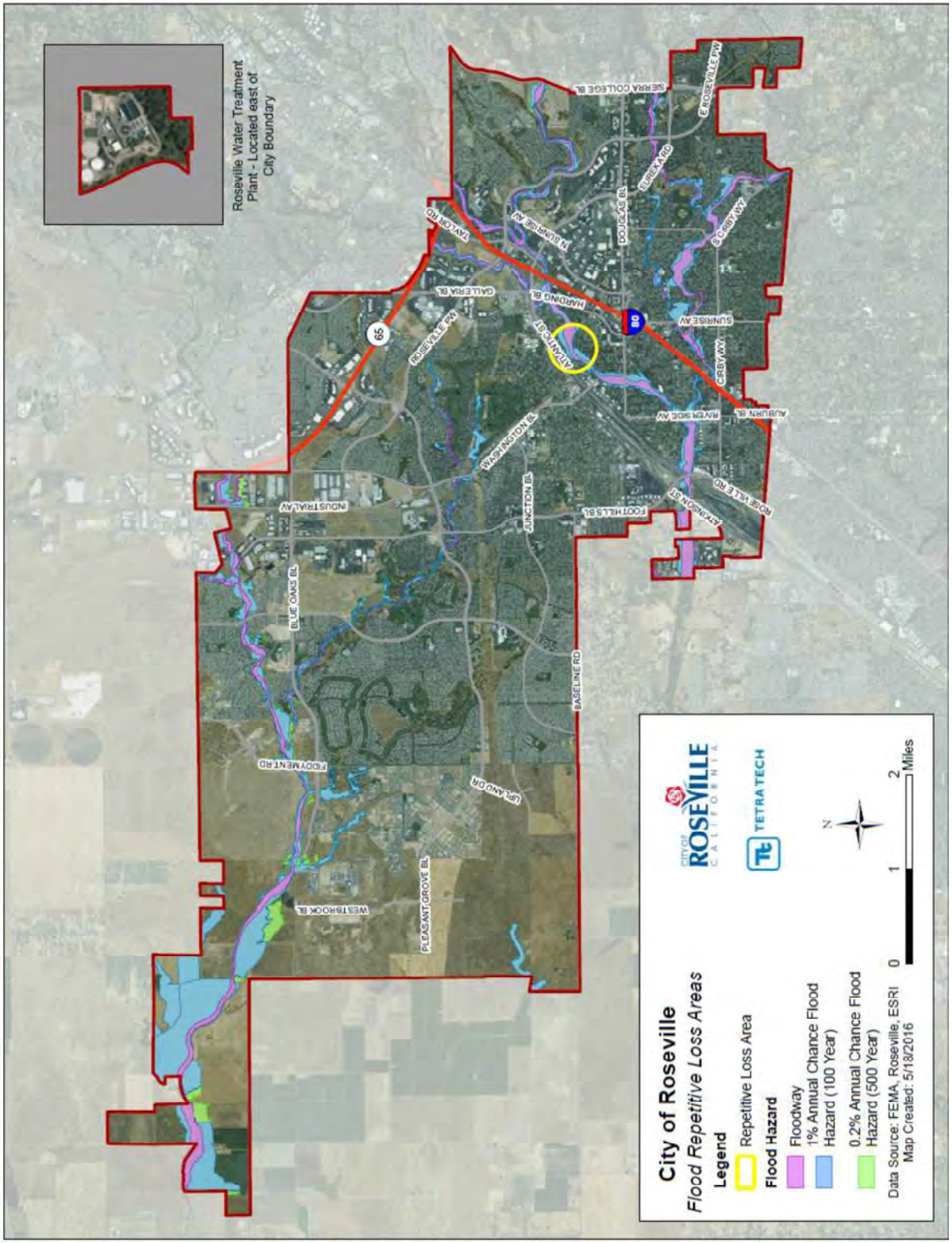


Figure 10-6. Repetitive Loss Area

Recognizing that typical growth patterns in California would impact and exacerbate the flood hazard problem, the City of Roseville took an aggressive, proactive approach to managing its floodplains through the development of its General Plan in 1992. Land-use categories are defined in the General Plan, with information on general uses, development, intensity, siting, and compatibility standards in relation to the flood hazard. City actions, such as land-use allocation, annexations, zoning, subdivision and design review, redevelopment and capital improvements, must be consistent with the General Plan.

Only three parcels in Roseville's regulatory floodplain are in the current buildable lands inventory. These parcels were all created before the City's flood-protection policies were enacted. Any new development on these parcels would be subject to strict regulations.

Because of policies, activities and mitigation measures in place in Roseville, it can be concluded that future land development trends will not impact or be impacted by flooding in Roseville as long as existing policies remain in force.

10.7 REVIEW OF EXISTING ORDINANCES, PROGRAMS, AND PLANS

The City of Roseville has a long-standing policy to proactively manage its floodplains. Under the guidance of the General Plan and its Safety Element, Roseville has been able to decrease the exposure of its citizens to flooding with a comprehensive approach that includes the following measures:

- Structural mitigation (flood control)
- Non-structural mitigation (elevation or acquisition)
- Regulations
- Stormwater management
- Flood warning
- Outreach and public education.

This section discusses each element except flood warning, which is discussed in Section 10.2.6).

10.7.1 Structural Mitigation

The following major flood control improvements have been accomplished by the City of Roseville since the January 1995 flood event:

- **Tina Way/Elisa Way Area—**Completed in 1996 at the cost of $3 million (100 percent City-funded), this project included channel excavation and construction of berms and floodwalls. The project removed 40 structures from the floodplain. Based on the pre-project location and construction of these structures, the entire area would have flooded during the 1997 flood if the improvements had not been implemented.
- **Riverside Avenue/Vernon Street Area—**Completed in 1996 at the cost of $2 million (90 percent funded by the Union Pacific Railroad and 10 percent funded by the City), the construction project included replacing culverts with a new bridge over Dry Creek. The net effect of this project lowered flood elevations for the reach by 5 to 7 feet and removed 150 structures from the floodplain.
- **Sunrise Avenue/Oakridge Drive and Champion Oaks Areas—**Completed in 2001 at the cost of $16.1 million ($8.7 million from FEMA and $7.4 million from the City), this project replaced culverts with a new bridge over Linda Creek at Sunrise Avenue. Twin 9-foot-diameter bypass pipes were installed in the Oakridge Drive area. The project included channel excavation and berm and floodwall construction. The project removed 233 structures from the floodplain; 44 structures remained in the floodplain, but these structures were less likely to be flooded. Features included maintaining a channel in

as natural a state as possible; planting over 500 oak trees; assigning biologists, ornithologists, and arborists to minimize environmental impacts; and monitoring fish passage and plantings for 5 years.

The City has spent more than $22 million on flood mitigation since the January 1995 flood event and has eliminated 445 flood-prone structures from the floodplain.

10.7.2 Non-Structural Mitigation

Structural mitigation projects reduced the flood exposure of property by 91 percent. Roseville offered mitigation through acquisition or home elevation to the remaining 9 percent of properties exposed to flooding. Completed in 2001 at the cost of $1 million (50 percent funded by FEMA, 40 percent funded by the property owners, and 10 percent funded by the City), the project included elevating 27 homes and acquiring (buying out) 4 homes. This effort resulted in 22 flood-prone homes with post-project floor levels higher than the floodplain level.

10.7.3 Regulations

The City of Roseville regulates its floodplain areas through land use, zoning, and other development restrictions, including a policy that prohibits most development within the 100-year floodplain area. Development in floodplain areas in Roseville is restricted by the following:

- 2035 General Plan, Safety Element, Flood Protection Component
- Improvement Standards
- Flood Damage Prevention Ordinance (Roseville Municipal Code [RMC] Chapter 9.80)
- Zoning Ordinance (RMC Chapter 19.18)
- State of California Urban Level of Flood Protection Legislation.

2035 General Plan, Safety Element, Flood Protection Component

The Safety Element of Roseville's General Plan sets forth goals and policies to address community safety concerns. The flood protection component identifies nine policies and 12 measures to achieve the following goals:

- Minimize the potential for loss of life and property due to flooding.
- Pursue flood control solutions that are cost-effective and minimize environmental impacts.

The policies and implementation measures are incorporated into the City's area-specific plans and are legally enforceable. Key to the City's flood-protection effort is the clear definition and application of floodplain boundaries. The flood protection component of the Safety Element establishes policies prohibiting new development in an identified floodplain or requiring an appropriate level of flood protection in design and construction for any development that does occur in the floodplain:

- **Infill Areas—**No development is permitted in the future floodway. Development may be permitted within the future floodway fringe. In accordance with the Nolte Future Floodplain definition, such development is limited to areas within the assumed cumulative 1-foot rise in water surface elevation, if it can be demonstrated that the development will not impact flood levels (see Figure 10-7).
- **Remainder of the City (specific plans and north industrial area)—**No development is permitted within the future floodplain (floodway and floodway fringe). Exceptions may be considered by the City on a case-by-case basis if encroachment is limited to only the future floodway fringe and would not result in any off-site increase in the water surface elevation (see Figure 10-8).

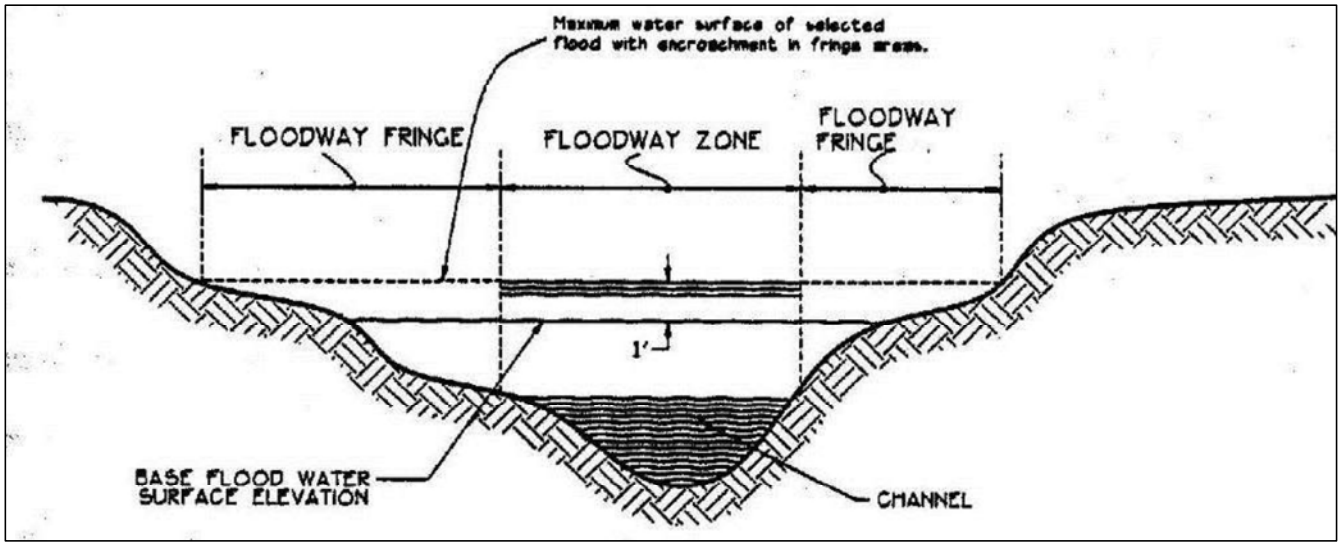


Figure 10-7. Floodplain Designation Cross-Sections for Infill Areas

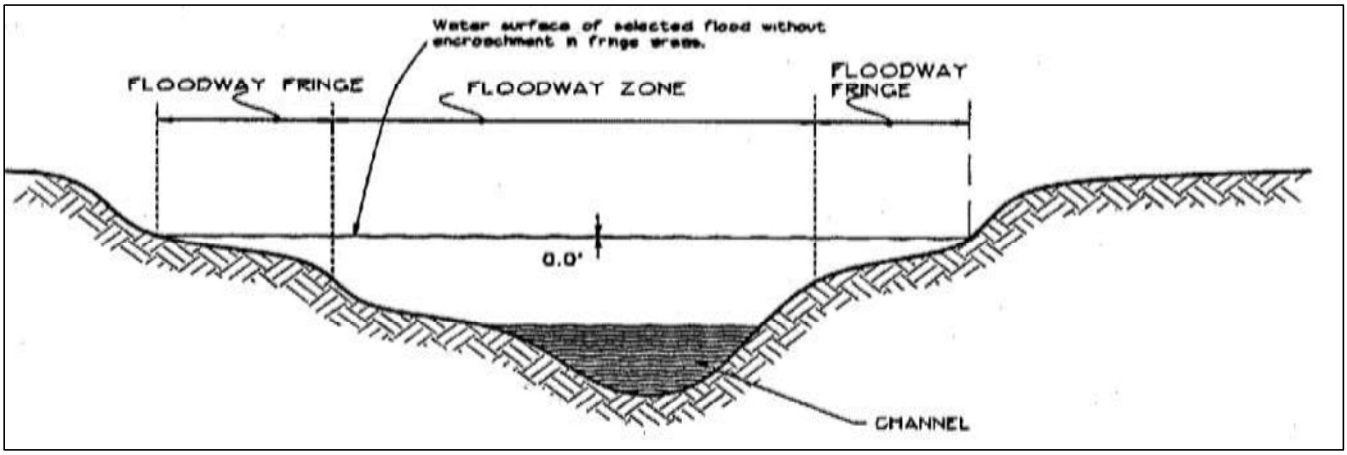


Figure 10-8. Floodplain Designation Cross-Sections for Areas Other Than Infill Areas

The City is committed to exploring environmentally sensitive flood control solutions, so this component is intended to be used in combination with the goals, policies, and implementation measures contained in the Open Space and Conservation Element of the General Plan. Emphasis is placed on protecting floodplain areas and on pursuing regional cooperation on flooding issues.

Improvement Standards

Roseville's improvement standards provide minimum standards for the following:

- Improvements dedicated to the public and accepted by the City for maintenance or operation
- Certain private works
- Improvements to be installed within existing rights-of-way and easements.

Improvement standards provide coordinated development of required facilities used by and for the protection of the public. They apply to, regulate, and guide preparation of traffic impact studies and the design and preparation of plans for construction of streets, highways, alleys, drainage systems, sewage systems, traffic signals, site access structures, water supply facilities and related public improvements. The standards also set guidelines for private

works that involve drainage, grading, tree removal, and related improvements. Section 10 of the improvement standards deals with drainage as follows:

- Requires residential lots developed in and adjacent to a designated floodplain to have a pad elevation a minimum of 2 feet above the regulatory flood elevation.
- Establishes stormwater management provisions that require mitigation of the increase in runoff generated by new development.
- Establishes provisions that require the building pads of structures built outside the regulatory floodplain to be a minimum of 1 foot above the 100-year water surface elevation for the site, assuming total blockage of drainage facilities.

Flood Damage Prevention Ordinance (RMC Chapter 9.80)

The flood damage prevention ordinance provides regulatory provisions for the floodplains of Roseville and is a requirement for participation in the NFIP. Chapter 9.80 of the RMC meets the NFIP requirements (44 CFR, Section 60.3) and includes the following standards that exceed those requirements:

- Adoption of a regulatory floodplain that includes areas not mapped by FEMA for application
- Requirement for elevation to 2 feet above the regulatory flood elevation for all structures within the flood hazard area
- Provisions to track substantial improvements to structures over a period of 10 years.

Zoning Ordinance (RMC Chapter 19.18)

Updated in September 2010, the zoning ordinance implements the City's general and specific plans and establishes regulations governing the use, placement, spacing and size of land and buildings. The zoning ordinance describes permits available through the Planning Division, when permits are needed, and the process for obtaining permits. This ordinance includes policy that prohibits most development within the 100-year floodplain. Exceptions to this policy exist primarily within the infill area and for the maintenance of essential services. Where encroachments may be permitted, improvements are required to minimize cumulative upstream and downstream effects.

The zoning ordinance identifies floodway and floodway fringe zoning districts. The floodway zoning district is not synonymous with FEMA's defined floodway. Development is generally prohibited in the floodway zone, with some level of development allowed in the floodway fringe zones with restrictions. The floodway fringe and floodway zone boundaries are based on previous hydraulic modeling conducted by the U.S. Army Corps of Engineers. The floodplain boundaries have changed over time since this modeling, but the zone district boundaries have not changed. The zone boundaries are updated on a parcel-by-parcel basis at a landowner's request using best available data.

State of California Urban Level of Flood Protection Legislation

The Central Valley Flood Protection Act of 2008 (SB 5) and its subsequent amendments (SB 1278, AB 1965 and AB 1259) include requirements and standards for flood protection that relate to land use planning. The legislation defines the Urban Level of Flood Protection (ULOP) as the level of protection necessary to withstand flooding that has a 1-in-200 (0.5-percent) chance of occurring in any given year (also referred to as the 200-year flood). This legislation directed local agencies to revise their general plans no later than July 2, 2015 to address flood risk for affected land use decisions based on an ULOP. It also required local agencies to revise their zoning codes to reflect the new standard within one year after the adoption of their revised general plans. In areas not subject to the ULOP standards, the 100-year floodplain standards will continue to apply.

The legislation defines five locational criteria that determine whether the ULOP applies. All areas of the City of Roseville meet two of the criteria (the City is an urban area of more than 10,000 people and the City is within the Sacramento-San Joaquin Valley), but only certain areas of the City meet the remaining three criteria:

- Areas mapped as either a special hazard area or an area of moderate hazard on FEMA's official (i.e., effective) Flood Insurance Rate Map
- Areas with a potential flood depth above 3 feet from sources other than localized conditions
- Areas within a watershed with a contributing area of more than 10 square miles.

As required by SB 5 as amended, the City of Roseville will implement the following:

- Updating the General Plan to define the City's regulatory floodplain as the combination of the City's mapped 100-year floodplain, the ULOP floodplain, and the FEMA floodplain.
- Amendment of the Land Use Element to include a reference to the Safety Element map identifying existing and planned development areas within the regulated floodplain as defined above.
- Amendment of the Open Space and Conservation Element setting and background to reflect the current regulatory environment.
- Amendment of the Safety Element to identify and revise flood hazard information and policies which protect communities from flooding risks as follows:

    - Revise the setting, outlook, and floodplain designations portions of the flood protection section to reflect the updated regulatory environment and to identify sources of floodplain mapping and hazard data.
    - Revise the floodplain designation policy and the implementation measures sections to include definitions and floodplain development regulations and implementation for the ULOP floodplain.
    - Provide new floodplain maps showing the extent of the FEMA 100-year, City's regulatory 100-year, and ULOP floodplains.

As required by adopted State law, the various City regulations requiring preservation of the floodplain and elevation of structures above the floodplain will include the ULOP floodplain, which is shown on Figure 10-9. After the modeling analysis was completed by the City, staff examined the data to determine the effect on land uses. Both the ULOP and the 100-year floodplains along Pleasant Grove Creek are almost entirely contained within existing or planned open space and recreation areas. This is generally because these areas of Roseville were planned or developed relatively recently in the City's history, and in compliance with the City's current General Plan goals and objectives restricting development in the floodplain.

The areas where the ULOP floodplain extends into residential or commercial areas are older areas of the City along Dry Creek, where development was planned and implemented prior to Roseville's initial participation in the NFIP in 1983 and prior to adoption of the City's current General Plan. These infill areas are already affected by the FEMA 100-year floodplain, and a few areas will now also be affected by the ULOP.

According to the City's GIS database, 4 of 11 vacant parcels affected by the ULOP are privately owned. The remaining 7 parcels are City-owned. In the future, any new habitable structure along streams affected by the ULOP floodplain will need to be elevated slightly higher (less than 1 foot) than would have been required prior to the legislation. For existing structures, additional elevation would only be required if the owner undertook a "substantial improvement" to the structure (defined within the City's Flood Damage Prevention Ordinance as any work in a 10-year period that is worth 50 percent or more of the value of the structure).

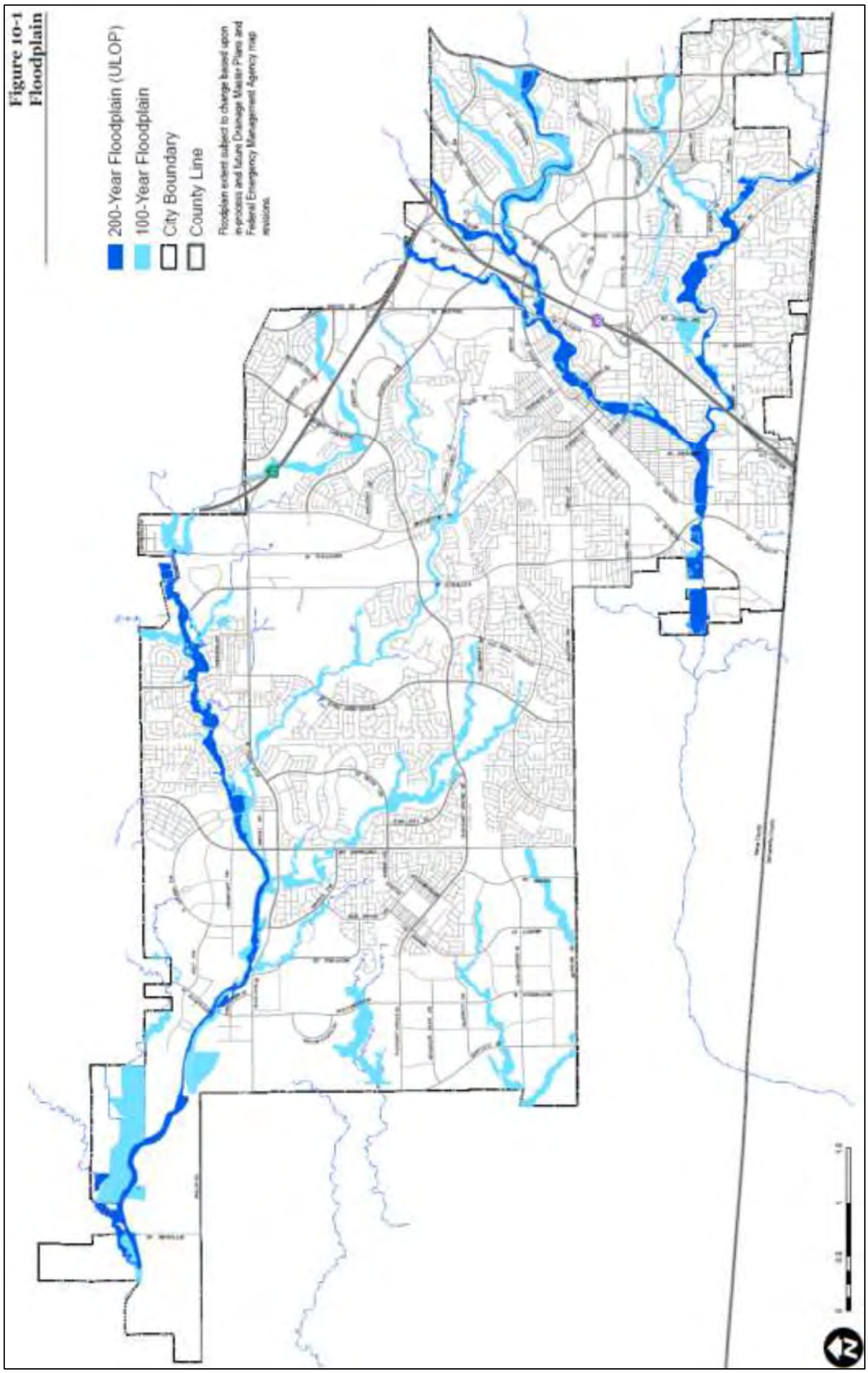


Figure 10-9. Updated Floodplain Mapping

10.7.4 Stormwater Management

Stormwater management in the City of Roseville is accomplished through a multi-tiered approach. The City uses a combination of regional development impact studies, sub-regional impact studies, the City of Roseville improvement standards, the City of Roseville grading ordinance, and the Placer County stormwater management manual. All of these tools manage the City's stormwater system at different levels. The Roseville General Plan is the principal planning document that lays out goals for managing the flooding hazard. Each update to the General Plan reviews these goals to determine their effectiveness in managing watershed characteristics. Regional master planning, sub-regional master planning, and project drainage design are discussed below.

Regional Master Planning

City ordinances establish developer fees to pay for mitigation projects that will reduce development impacts on flooding on major streams in the Dry Creek and Pleasant Grove Creek basins. Regional master planning for each basin has been conducted through the Placer County Flood Control District (PCFCD). Seven communities, including the City of Roseville, are members of this district.

The Dry Creek and Pleasant Grove Creek basins each have a detailed hydrology report that calculates the 5-, 10-, 50-, and 100-year storm frequencies based on total buildout of the basin:

- **Dry Creek Basin Report—**The *Final Report for the Dry Creek Flood Control Plan,* adopted by the Roseville City Council in April 1992, was co-sponsored, supported, and approved by the PCFCD and the Sacramento County flood control agency that oversees floodplains downstream of Placer County.
- **Pleasant Grove Creek Basin Report—**Pleasant Grove Creek Basin hydrology is included in the *Cross Canal Study*. Pleasant Grove Creek is one of several major streams that flow to a reclamation district canal; overflow is stored behind levees during Sacramento River flooding. Except for the PCFCD, this report was supported, sponsored, and approved by all agencies within the basin, in particular Sutter County and State Reclamation Board Districts 1001 and 1000.

Each report defines development impacts on the basin and specifies mitigation procedures and improvements to developers' mitigation. Both reports indicate a strategy for mitigation of floods resulting from new development on a regional scale. The reports indicate that most of Roseville is in the part of the watershed where detention is not recommended. These studies have been submitted to FEMA for approval, and FEMA is currently using the hydrology and hydraulics information provided in the reports to update FIRMs for the region.

Sub-Regional Master Planning

The City requires each sub-region to develop a master plan and mitigation strategy in a specific plan. Specific plans currently exist for Amoruso Ranch, Creekview, Del Webb, Downtown, Highland Reserve North, North Central Roseville, Northeast Roseville, North Industrial, North Roseville, Northwest Roseville, Riverside Gateway, Sierra Vista, Southeast Roseville, Stoneridge, West Roseville, and the Infill Area. Before zoning and development rights are issued for these newly developing areas, a detailed hydrology and hydraulic study dealing with that sub-region's concerns is required, in order to examine local drainage problems, define flood levels based on total buildout of the watershed, and set aside floodplain areas as open space. Floodplains are defined on swales with drainage areas greater than 300 acres. The City of Roseville and PCFCD review and approve each specific plan.

Major drainage infrastructure in the specific plans is designed as part of the infrastructure of the sub-regions and is constructed prior to development in the area; this eliminates the need for on-site detention requirements because regional detention, if required, is built into the infrastructure for the entire specific plan and not on a project-by-project basis. This approach allows for more control of the design and easier maintenance of the facility. In

addition, in newly developing areas, hydraulic requirements used to define floodplains assume well-vegetated swales and creeks, which reduces the need to provide constant cleaning of these streams by maintenance crews.

Project Drainage Design

As each project in the specific plan is developed, the City requires the project to meet drainage improvement standards. The standards require storm drain systems that support more than one parcel to be dedicated to the City for maintenance or that project owners maintain the system. In both cases, the storm drain system is reviewed by the City's Public Works Department to meet the same hydraulic standards. Project owners must demonstrate that in the case of total system failure, surface water would be able to exit the project area without causing damage. For example, if drain inlets are not maintained on a commercial site and water ponds, surface water should be able to discharge into the public drainage system without entering any on- or off-site buildings. This requirement eliminates the need for the City to monitor private storm drain systems to verify that they are adequately maintained.

10.7.5 Outreach and Public Education

The City of Roseville makes a concerted effort to educate and inform its citizens on the impacts of flooding and how to prepare for flooding impacts. The ongoing outreach and public education program uses multiple media:

- Floodplain information is published in "Roseville Reflections," a City-sponsored newsletter sent to all citizens.
- Flood information is published on the City's website and includes real-time flood warning and flood threat recognition information. The website is www.roseville.ca.us/flood/alert/floodalert.html.
- On-line surveying is used to identify public perception of flood risk and support of mitigation.
- An informational brochure, "Weathering the Storm," is available to the public.
- Literature on flood warning, property protection, and flood safety is mailed annually to Roseville residents.

10.8 SCENARIO

The City of Roseville has made great strides to reduce the risk from flooding. Events like those that caused past flooding will continue to occur, but impacts will be significantly less than in the past. Intense isolated rainstorms over the region will cause creeks and streams to overflow their banks, causing road closures and power outages. However, structure damage to personal property will be limited to the few properties that have exposure to significant depths of flooding. Flash flooding caused by rainfall runoff exceeding the capacity of stormwater systems will also continue to occur. However, potential personal property damage will be limited to structures constructed prior to building and stormwater standards adopted by the City to remediate these impacts.

10.9 ISSUES

Important issues associated with flood hazard in Roseville include but are not limited to the following:

- The boundaries of the 100-year floodplain could be as specified in the floodplain designations section of the flood-protection component of the City's General Plan. Floodplain areas shall be preserved as specified in the Open Space and Conservation Element. Preservation may include required dedication to the City. If needed, the City's ordinances can be modified to include floodplain use regulations consistent with the goals, policies, and implementation measures of the Safety Element, Land Use Element, Open Space and Conservation Element, and Parks and Recreation Element of the City's General Plan. This effort would be overseen by the Planning Division and would require no special funding.

- The development, implementation, and expansion of the Flood Alert and Early Warning Program systems should be continued, and the systems should be integrated with other local jurisdictions to form a regional warning program. This effort is overseen by the Public Works Department. Annual funding is provided through the City's general fund and is about $100,000 per year.
- By remaining actively involved in the PCFCD, the City of Roseville should continue to pursue a regional approach to flood issues. Involvement includes cooperation in the development of a comprehensive regional database. Regional drainage planning and design for all individual developments in the Placer County Flood Control District should be encouraged to address cumulative flooding impacts. The City should also continue to participate in regional flooding studies, including the Auburn Creek/Coon Creek/Pleasant Grove Creek flood mitigation plan and the Dry Creek Basin flood control plan. Efforts would be overseen by the Public Works Department. Annual funding for membership to the PCFCD is currently provided by the City's General Fund and is about $90,000 per year.
- The City should continue coordination with other agencies on issues of flood control. Coordination between the City and adjacent jurisdictions occurs through several mechanisms, including the distribution of development proposals for review and comment. The City should also continue its cooperation with federal, state, and local agencies, including the U.S. Army Corps of Engineers, California Reclamation Board, FEMA, California Department of Fish and Wildlife, Placer County Resource Conservation District, and PCFCD. This effort would be overseen by the Community Development Department, Planning Division, and Public Works Department as appropriate and should not require special funding.
- The final two phases of the Cirby-Linda-Dry Creek Flood Control Project should be completed. Five of the seven phases of this project have been completed at a cost of about $18,000,000. This project is overseen by the Public Works Department. The cost for the last two phases would be about $3,000,000. Funding could be from City, state, federal, or private developer sources.
- Alternative improvements to the Cirby-Linda-Dry Creek Flood Control Project could be analyzed. These improvements may be cost-effective in the following flood-prone areas of Roseville:

  - Dry Creek from Darling Way to Riverside Avenue
  - The area on Dry Creek upstream of Folsom Road in the Columbia Avenue, Marilyn Avenue, Bonita Street area
  - The Linda Creek area near Champion Oaks Drive, Samoa Way, and Hurst Way
  - Cirby Creek in the Trimble Way and Zien Court area.

- The existing wood flood wall along Dry Creek that is protecting the City's Main Library and Public Safety Building could be replaced. The wood wall allows floodwater to leak through, and constant pumping is required. This effort would be overseen by the Public Works Department and cost about $300,000. Funding could be from City, state, federal, private developer, property owner sources.
- How will the potential impacts of climate change impact flood conditions in the City of Roseville?

11. LANDSLIDE

11.1 GENERAL BACKGROUND

According to the U.S. Geological Survey (USGS), the term landslide includes a wide range of ground movement, such as rock falls, deep failure of slopes, and shallow debris flows. Although gravity acting on an over-steepened slope is the primary reason for a landslide, there are other contributing factors (USGS, n.d.).

Landslides and mudslides can be initiated by storms, earthquakes, fires, volcanic eruptions or human modification of the land. They can move rapidly down slopes or through channels, and can strike with little or no warning at avalanche speeds.

Landslides can pose a serious hazard to properties on or below hillsides. When landslides occur—in response to such changes as increased water content, earthquake shaking, addition of load, or removal of downslope support—they deform and tilt the ground surface. The result can be destruction of foundations, offset of roads, breaking of underground pipes, or overriding of downslope property and structures.

DEFINITIONS

Landslide—The movement of masses of loosened rock and soil down a hillside or slope. Slope failures occur when the strength of the soils forming the slope is exceeded by the pressure, such as weight or saturation, acting upon them.

Mass Movement—A collective term for landslides and mudslides.

Mudslide (or Debris Flow)—A river of rock, earth, organic matter and other materials saturated with water. Mudslides develop in the soil overlying bedrock on sloping surfaces when water rapidly accumulates in the ground, such as during heavy rainfall or rapid snowmelt. Water pressure in the pore spaces of the material increases to the point that the internal strength of the soil is drastically weakened. The soil's reduced resistance can then easily be overcome by gravity, changing the earth into a flowing river of mud or "slurry."

11.1.1 Landslide Types

Landslides are commonly categorized by the type of initial ground failure. Common types of slides are shown on Figure 11-1 through Figure 11-4 (Ecology 2014). The most common is the shallow colluvial slide, occurring particularly in response to intense, short-duration storms. The largest and most destructive are deep-seated slides, although they are less common than other types.

Mudslides (or debris flows) are rivers of rock, earth, organic matter and other soil materials saturated with water. They develop in the soil overlying bedrock on sloping surfaces when water rapidly accumulates in the ground, such as during heavy rainfall or rapid snowmelt. Water pressure in the pore spaces of the material increases to the point that the internal strength of the soil is drastically weakened. The soil's reduced resistance can then easily be overcome by gravity, changing the earth into a flowing river of mud.

A debris avalanche (Figure 11-5) is a fast-moving debris flow that travels faster than about 10 miles per hour (mph). Speeds in excess of 20 mph are not uncommon, and speeds in excess of 100 mph, although rare, can occur. The slurry can travel miles from its source, growing as it descends, picking up trees, boulders, cars, and anything else in its path. Although these slides behave as fluids, they pack many times the hydraulic force of water due to the mass of material included in them. They can be among the most destructive events in nature.

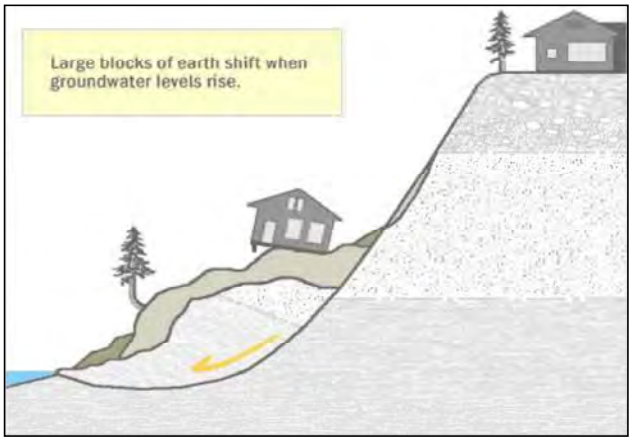


Figure 11-1. Deep Seated Slide

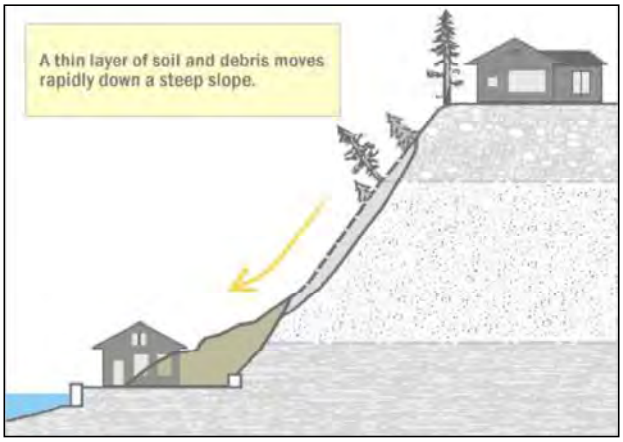


Figure 11-2. Shallow Colluvial Slide

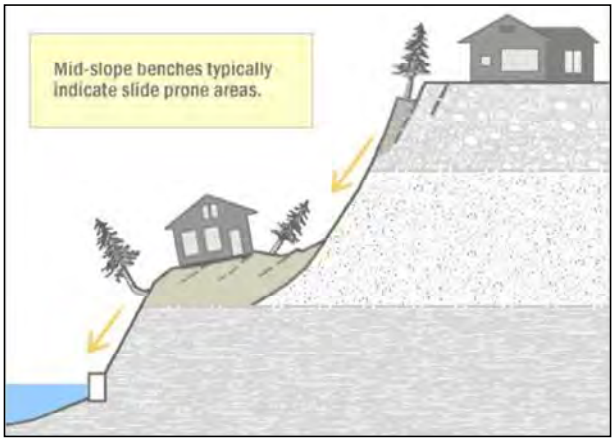


Figure 11-3. Bench Slide

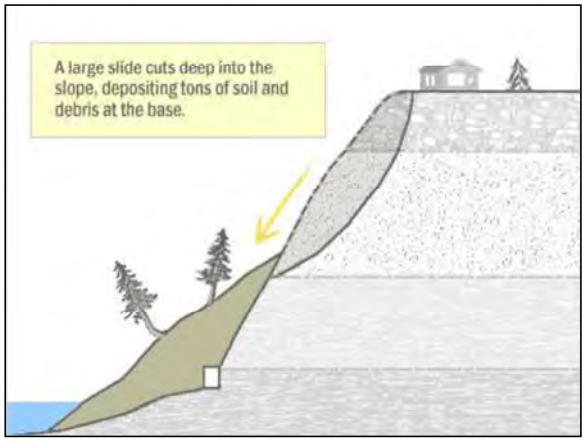


Figure 11-4. Large Slide

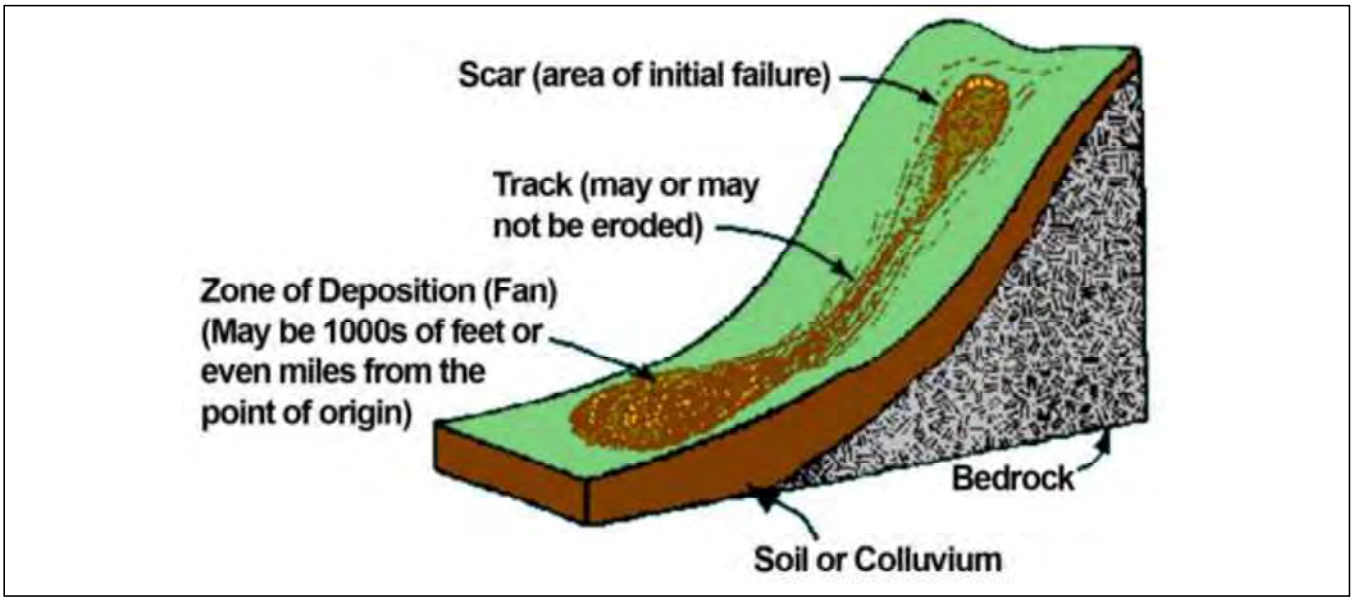


Figure 11-5. Typical Debris Avalanche Scar and Track

Landslides also include the following:

- Rock Falls—blocks of rock that fall away from a bedrock unit without a rotational component
- Rock Topples—blocks of rock that fall away from a bedrock unit with a rotational component
- Rotational Slumps—blocks of fine-grained sediment that rotate and move down slope
- Transitional Slides—sediments that move along a flat surface without a rotational component
- Earth Flows—fine-grained sediments that flow downhill and typically form a fan structure
- Creep—a slow-moving landslide often only noticed through crooked trees and disturbed structures
- Block Slides—blocks of rock that slide along a slip plane as a unit down a slope

11.1.2 Landslide Modeling

Two characteristics are essential to conducting an accurate risk assessment of the landslide hazard:

- The type of initial ground failure that occurs, as described above
- The post-failure movement of the loosened material ("run-out"), including travel distance and velocity.

All current landslide models—those in practical applications and those more recently developed—use simplified hypothetical descriptions of mass movement to simulate the complex behavior of actual flow. The models attempt to reproduce the general features of the moving mass of material through measurable factors, such as base shear, that define a system and determine its behavior. Due to the lack of experimental data and the limited current knowledge about the behavior of the moving flows, landslide models use simplified parameters to account for complex aspects that may not be defined. These simplified parameters are not related to specific physical processes that can be directly measured, and there is a great deal of uncertainty in their definition. Some, but not all, models provide estimates of the level of uncertainty associated with the modeling approach.

Run-out modeling is complicated because the movement of materials may change over the course of a landslide event, depending on the initial composition, the extent of saturation by water, the ground shape of the path traveled and whether there is additional material incorporated during the event (Savage and Hutter 1991; Rickenmann & Weber 2000; Iverson 2004).

11.2 HAZARD PROFILE

11.2.1 Past Events

There is little or no record of landslides occurring in Roseville that caused damage to property. Three notable landslide events have been recorded in Placer County, according to the Placer County Hazard Mitigation Plan. These events occurred in the eastern portion of the county, which is significantly different from Roseville in geologic terms. Therefore, no parallel can be drawn from these events for Roseville.

11.2.2 Location

Landslide hazard areas are areas where characteristics such as the following indicate a landslide risk:

- A slope greater than 15 percent
- A history of landslide activity during the last 10,000 years
- Stream or wave activity that has caused erosion or cut into a bank to cause the surrounding land to be unstable
- The presence of an alluvial fan, which indicates vulnerability to the flow of debris or sediments
- The presence of impermeable soils, such as silt or clay, mixed with granular soils such as sand and gravel.

The California Landslide Hazard Identification Act directs the State Geologist to identify and map hazardous landslide areas for use by municipalities in planning and decision-making on grading and building permits. Three factors that characterize landslide hazard areas include significant slope, weak rocks, and heavy rains. This program focuses on urban areas and growth areas that exhibit these characteristics.

Roseville and the surrounding Sacramento region are not identified as areas prone to landslide hazards. The City's geographic location, soil conditions, and surface terrain combine to minimize risk of major damage from landslides, subsidence (gradual shrinking of the earth's surface due to underground resource extraction), or other geologic hazards resulting from seismic activity and related natural forces. Therefore, the region has not been included as a part of the state's study program. The USGS, in its identification of geologic hazard areas and their susceptibility and rate of incidence, has classified Placer County and the Roseville vicinity as a low rate of incidence, with less than 1.5 percent of the area susceptible to landslides.

Little scientific analysis is available about landslide hazards in Roseville. Assessment of the risk from this hazard is based on past occurrences, observed conditions, and guidance from state and federal agencies. However, with slopes steeper than 15 percent and the frequent occurrence of multiple intense storms that can saturate the soil, there is an exposure to landslides. Future risk assessment of landslides could be enhanced with better data specific to the hazard.

While Roseville is located on relatively level terrain, the slope gradually increases to the east and north. The most significant slopes are along creeks and ravines. The soil in ravine areas is a Mehrten soil typically associated with post-volcanic activity. It is very dense and not considered to be erosion prone.

Areas with slopes greater than 15 percent in the Stoneridge Specific Plan Area exhibit characteristics of potential landslide hazard areas. Landsliding in these areas has likely occurred numerous times in the past, as evidenced by past deposits exposed in erosion gullies. The timeframe for these past occurrences is probably over the last several hundred years, if not thousands.

Due to the lack of available data on this hazard, the extent and location of the hazard has been estimated with an emphasis on steepness of slopes. Figure 11-6 shows the estimated landslide hazard areas in Roseville, based on slopes of 15 to 30 percent (moderate risk) and 30 percent and higher (high risk). The map represents a general assessment of citywide exposure; it does not apply on a site-specific basis and should be used with caution.

11.2.3 Frequency

Landslides are often triggered by other natural hazards such as earthquakes, heavy rain, floods or wildfires, so the frequency of landslides is related to the frequency of these other hazards. In the Roseville vicinity, landslides are most likely to occur during and after major storms. Due to the soil types in the steep slope areas of Roseville and the lack of historical occurrence of significant landslide events, the frequency of occurrence of landslide events in Roseville is considered to be low.

11.2.4 Severity

Landslides destroy property and infrastructure and can take the lives of people. Slope failures in the United States result in an average of 25 lives lost per year and an annual cost of about $1.5 billion. Due to the lack of exposure to this hazard in Roseville, the severity of the impacts of landslides on the people, property and economy of Roseville is considered to be low.

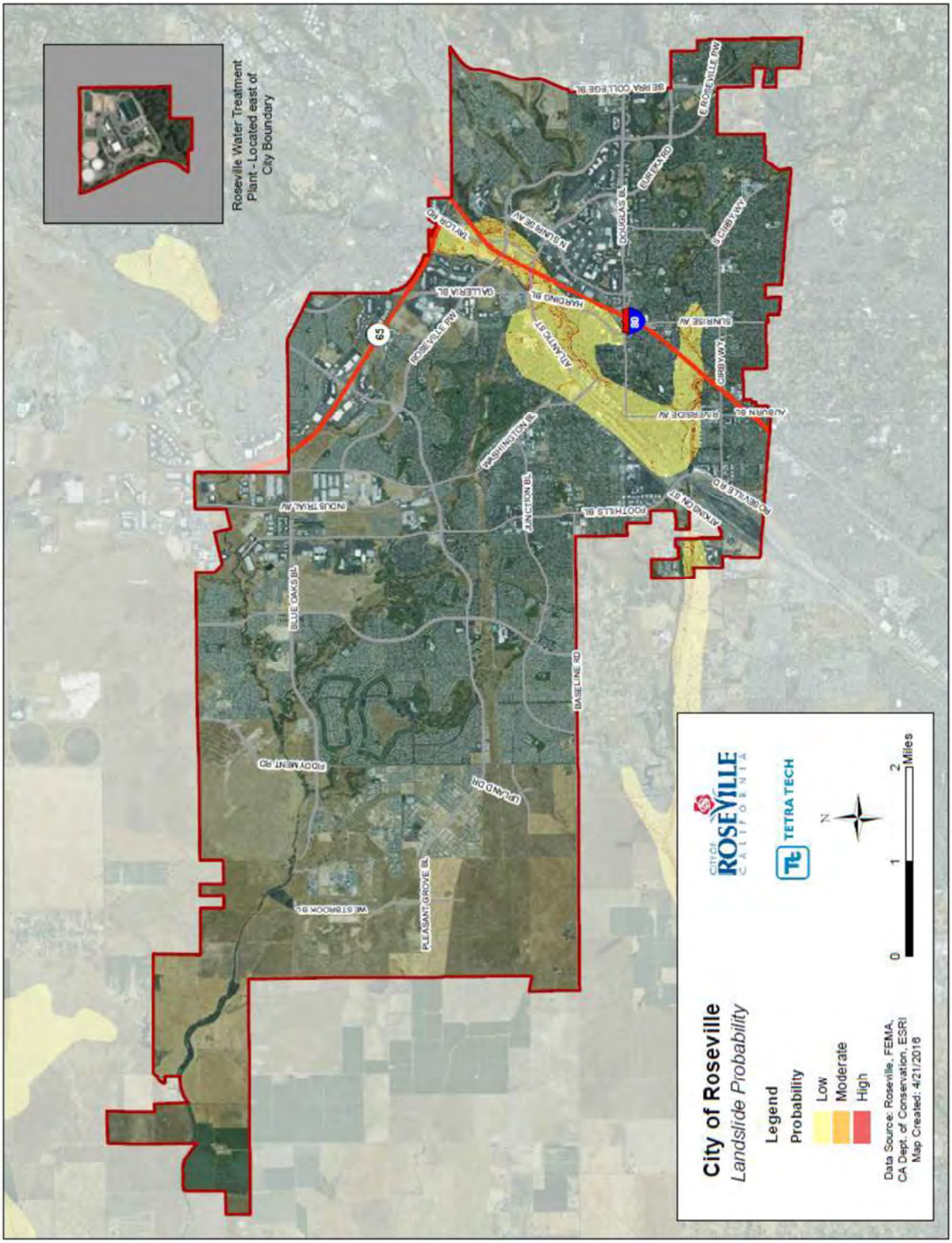


Figure 11-6. Roseville Area Landslide Hazard Map

11.2.5 Warning Time

Mass movements can occur suddenly or slowly. Some methods used to monitor mass movements can provide an idea of the type of movement and the amount of time prior to failure. It is also possible to determine what areas are at risk during general time periods. Assessing the geology, vegetation, and amount of predicted precipitation for an area can help in these predictions. However, there is no practical warning system for individual landslides. Correlations can be made based on soil type, slope and rainfall amount. No known correlations have been made for the Roseville planning area. The current procedure is to monitor situations on a case-by-case basis, and respond after an event has occurred. Generally accepted warning signs for landslide activity include the following:

- Springs, seeps, or saturated ground in areas that have not typically been wet before
- New cracks or unusual bulges in the ground, street pavements or sidewalks
- Soil moving away from foundations
- Ancillary structures such as decks and patios tilting and/or moving relative to the main house
- Tilting or cracking of concrete floors and foundations
- Broken water lines and other underground utilities
- Leaning telephone poles, trees, retaining walls or fences
- Offset fence lines
- Sunken or down-dropped road beds
- Rapid increase in creek water levels, possibly accompanied by increased turbidity (soil content)
- Sudden decrease in creek water levels though rain is still falling or just recently stopped
- Sticking doors and windows, and visible open spaces indicating jambs and frames out of plumb
- Unusual sounds, such as trees cracking or boulders knocking together
- A faint rumbling sound that increases in volume as a landslide nears.

11.3 SECONDARY HAZARDS

Landslides can cause several types of secondary effects, such as blocking access to roads, which can isolate residents and businesses and delay emergency response or commercial, public and private transportation. This could result in economic losses for businesses. Other potential problems resulting from landslides are power and communication failures. Utility poles on slopes can be knocked over, resulting in losses to power and communication lines. Landslides also have the potential of destabilizing the foundation of structures, which may result in monetary loss for residents. They also can damage rivers or streams, potentially harming water quality, fisheries and spawning habitat.

11.4 EXPOSURE

Figure 11-6 was used to estimate the exposure of population and structures to the landslide hazard.

11.4.1 Population

Using the percent of residential buildings exposed, multiplied by the estimated per-household population in 2014, it is estimated that there are 36 persons living in households exposed to the high landslide risk hazard and 140 persons exposed to the moderate landslide risk hazard. This represents 0.03 percent and 0.11 percent of the total population of the City, respectively.

11.4.2 Property

An estimated 12 structures are exposed to high landslide risk and 57 structures to moderate landslide risk. These high landslide risk structures have a total replacement cost value of $3,691,741, or 0.01 percent of the total

replacement cost value of the City. The moderate landslide risk structures have a total value of $49,714,043, or 0.17 percent of the total value of the City. These are residential, commercial and educational structures. These results are based on a spatial GIS exercise identifying all structure locations that intersect the high and moderate risk hazard zones.

11.4.3 Critical Facilities and Infrastructure

Facilities

An analysis of critical facilities inventory to determine exposure to the landslide hazard determined that two of the City's critical facilities are exposed to the landslide hazard.

Infrastructure

Roads and Bridges

A significant amount of infrastructure (roads, bridges and utilities) can be exposed to mass movements. Access to major roads is crucial to life-safety after a disaster event and can help to provide resilience during response and recovery operations. Landslides have the potential to block roads, causing isolation of all or part of the City. Roadway blockages caused by landslides can create traffic problems resulting in delays for emergency vehicles and public and private transportation. This could result in economic losses for businesses.

Landslide events can significantly impact bridges. They can knock out bridge abutments or significantly weaken the soil supporting a bridge, obstructing the bridge or making it hazardous for use. Bridges in areas of high landslide risk often provide the only ingress and egress to large areas and in some cases to isolated areas. None of the City bridges are considered to have exposure to the landslide hazard. However, bridges outside the City within the County are susceptible to landslides. Damage to one of these facilities could close off an access route to the City. These facilities have not been inventoried for this assessment.

Power Lines

Other potential problems resulting from landslides are power and communication failures creating problems for vulnerable populations or businesses and potential loss of life in emergency situations. Power lines are generally elevated above steep slopes, but the towers supporting them can be subject to landslides. A landslide could cause the soil underneath a tower to fail, causing it to collapse, and ripping down the lines. An inventory of these types of facilities was not available for this assessment.

11.4.4 Environment

Environmental problems as a result of mass movements can be numerous. Landslides fall into streams and significantly impact fish and wildlife habitat, as well as affecting water quality.

11.5 VULNERABILITY

11.5.1 Population

Due to the nature of census block group data, it is difficult to determine demographics of populations vulnerable to mass movements. In general, all persons exposed to landslides hazards are considered to be vulnerable.

11.5.2 Property

Loss estimates for the landslide hazard are not based on modeling using damage functions, because no such damage functions have been generated. Instead, loss estimates were developed representing 10 percent, 30 percent and 50 percent of the assessed value of exposed structures. This allows emergency managers to evaluate a range of potential economic impacts based on an estimate of the percent of damage to the building stock. Damage in excess of 50 percent is considered to be substantial by most building codes and typically requires total reconstruction of the structure. Table 11-1 and Table 11-2 list loss estimates to the general building stock in moderate and high landslide hazard areas.

Table 11-1. Loss Estimates for Buildings Vulnerable to High Landslide Hazard

Building Count	Assessed Value	10% Damage	30% Damage	50% Damage
12	$3,691,741	$369,174	$1,107,522	$1,845,871

Table 11-2. Loss Estimates for Buildings Vulnerable to Moderate Landslide Risk Hazard

Building Count	Replacement Cost	10% Damage	30% Damage	50% Damage
57	$49,714,043	$4,971,404	$14,914,212	$24,857,022

11.5.3 Critical Facilities and Infrastructure

Two identified critical facilities are exposed to the landslide hazard, based on the best available data. Several types of infrastructure are exposed to mass movements, including transportation, water and sewer and power infrastructure. At this time, all infrastructure and transportation corridors identified as exposed to the landslide hazard are considered vulnerable until more information becomes available.

11.5.4 Environment

The environment vulnerable to landslide hazard is the same as the environment exposed to the hazard.

11.6 FUTURE TRENDS IN DEVELOPMENT

The areas that are most vulnerable to the landslide hazard make up a small portion of the City of Roseville. Because these ravine areas in the southeastern portion of the City are considered to be non-developable and the probability of occurrence of this type of hazard is low due to the soil type in this region, this hazard should have little or no impact on future development and redevelopment trends. The City's current land use policies should also ensure that no future development or re-development would be impacted by this hazard.

The landslide risk exposure with in the planning did not increase over the performance period of the 2011 Plan. The value of the properties exposed to steep slope hazards increased by 12% which can be attributed to normal appreciation in property values observed for the Roseville planning area. Since there are currently no nationally recognized damage functions for landslide risk modeling, a comparative analysis of vulnerability was not performed. However, since there was no increase in risk exposure, the increase in vulnerability should coincide with the increase in value of the assets at risk.

11.7 REVIEW OF EXISTING ORDINANCES, PROGRAMS, AND PLANS

Since 1975, state law has required that a safety element be included as part of all general plans. In 1984, the state consolidated the safety and seismic elements into one element that includes seismic safety, geologic hazards, fire safety, and flooding. The seismic and geologic hazards component includes goals and policies to protect the

City's residents from danger associated with active faults, liquefaction, ground failure (landslides), and steep slopes.

The Safety Element of the Roseville General Plan includes components that address geologic hazards such as landslides. While the potential for geologic hazards such as landslides in Roseville is not high, the soil and geologic characteristics of the City continue to play an important role in determining safety procedures. Current policies and ordinances reflect the City's ongoing obligations to protect lives and property and include ongoing monitoring of seismic activity and periodic updating of plans for emergency events. Continued implementation of these polices and enforcement of City ordinances and General Plan policies will ensure that efforts are maximized for protecting the safety of Roseville's citizens from potential geologic safety hazards. The following policies identified in the Seismic and Geologic component of the Safety Element will mitigate the potential exposure to geologic hazards within Roseville:

- Continue to mitigate the potential impacts of geologic hazards through building plan review.
- Minimize soil erosion and sedimentation by maintaining compatible land uses, suitable to the existing environment.
- Develop appropriate building designs and implement appropriate construction techniques to decrease the impact of a landslide.
- Create and adopt slope development standards prior to or as part of the planning process for any area identified as having significant slope.
- Require contour grading, where feasible, and re-vegetation to mitigate the appearance of engineered slopes and to control erosion.

These policies are implemented through existing, ongoing programs that include the following:

- **California Building Code—**Through the Building Division of the Development Services Department, continue to enforce and keep abreast of the most recent updates to the CBC that include construction standards for seismic and geologic safety.
- **Development Review Process—**Refer any development proposal that may be impacted by grading, soil, or geologic issues to the Public Works Department. Consider the comments of the Public Works Department in the development review process. The environmental review for projects shall include a full inventory of potential grading impacts and any potential soil or geologic concerns, assessment of potential project impacts, and identification of mitigation and monitoring measures. Issues relating to slopes, liquefaction, ground failure and erosion shall be addressed. Project design, grading, and building construction techniques shall be used to minimize impacts. Sites that are determined to have significant slope shall be identified, and appropriate design restrictions shall be implemented to avoid the risk of erosion or landslide. Graded slopes shall be limited to 2:1 where feasible. Slopes that are less than 2:1 should be encouraged. The use of retaining walls or stepped building designs should be pursued as an alternative to high or steep slopes where feasible and desirable.
- **Grading Ordinance—**Enforce and regularly evaluate the Grading Ordinance. The Grading Ordinance includes standards for project construction and erosion control. This ordinance requires prompt re-vegetation of disturbed areas, avoidance of grading activities during wet weather, avoidance of disturbance in drainage ways, and other erosion control measures.
- **Specific Plans—**Ensure that specific plans are consistent with the goals and policies of the General Plan. Specific plans shall identify potential geologic, soil, and seismic hazards in the planning area and shall include measures to reduce the risk of such hazards. Proposed specific plans shall identify criteria for development on steep slope areas, as applicable, in order to ensure public safety and minimize environmental and aesthetic impacts.

- **Land Use Designation—**In areas where potentially significant soil and erosion impacts are identified, the City should consider open space or other appropriate land use designations, as specified in the Land Use Element, to minimize potential impacts.

11.8 SCENARIO

Due to the lack of significant exposure to this hazard, a scenario where a landslide would have a significant impact on the City of Roseville is currently unlikely. Mass movements are becoming more of a concern as development moves outside of city centers and into areas less developed in terms of infrastructure. Major mass movements in Placer County and areas surrounding Roseville occur as a result of soil conditions that have been affected by severe storms, groundwater or human development activities. After heavy rains, soils become saturated with water. As water seeps downward through upper soils that may consist of permeable sands and gravels and accumulates on impermeable silt, it will cause weakness and destabilization in the slope. As rains continue, the groundwater table rises, adding to the weakening of the slope. Gravity, poor drainage, a rising groundwater table and poor soil exacerbate hazardous conditions.

Roseville's most likely risk exposure to landslides is as a secondary risk associated with an earthquake or wildfire. The ground shaking that could occur during an earthquake could trigger landslides in the steep slope areas. This scenario could be further enhanced should an earthquake occur during a time when the soils are saturated due to repeated storm events. After a wildfire, the landscape becomes denatured and unable to absorb the impacts of repeated intense rainfall. This can cause the soil to become saturated and vulnerable to sliding.

11.9 ISSUES

Important issues associated with landslide hazards in Roseville include but are not limited to the following:

- The data and science regarding the mapping and assessment of landslide hazards is constantly evolving. As new data and science become available, assessments of landslide risk should be re-evaluated.
- The impact of climate change on landslides is uncertain. If climate change impacts atmospheric conditions, the exposure to landslide risks in Roseville could increase.

12. SEVERE WEATHER

12.1 GENERAL BACKGROUND

Most of the federal and state disaster declarations for the Roseville area and Placer County are related to severe weather conditions. Severe weather conditions vary greatly from the western portion of Placer County to the eastern portion, primarily due to variation in topography and elevation across the county. Heavy rainfall and snowfall result when humid air masses blow in from the ocean and move up the mountain ranges. Moist air, traveling inland on prevailing westerly winds, pushes up against the Sierra Nevada mountains, which wrings moisture out of the air as it rises, cools and condenses.

Roseville's location in the western, low-lying portion of the county helps explain why, at well below the 4,000 foot snowfall region, the City avoids the harshest of winter conditions that occur in eastern Placer County. Figure 12-1 shows Roseville's elevation of approximately 165 feet above sea level. Although the climate of Roseville is relatively mild, with an average of 257 sunny days each year, the City is near the foothills of the Sierra Nevada range and can experience severe weather resulting from rapid changes in topography.

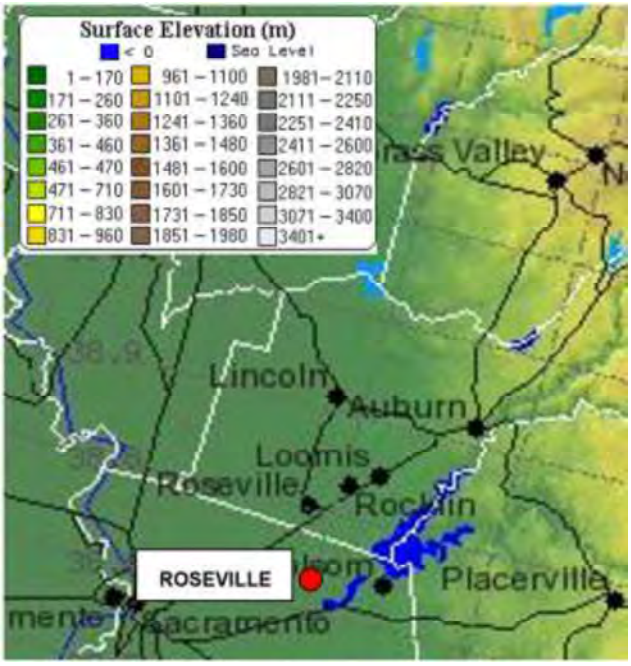


Figure 12-1. Roseville Regional Surface Elevation

DEFINITIONS

Thunderstorm—Typically 15 miles in diameter and lasting about 30 minutes, thunderstorms are underrated hazards. Lightning, which occurs with all thunderstorms, is a serious threat to human life. Heavy rains over a small area in a short time can lead to flash flooding. Strong winds, hail and tornadoes are also dangers associated with thunderstorms.

Tornado—Tornadoes are funnel clouds of varying sizes that generate winds more than 300 miles per hour. A tornado is formed by the turbulent mixing of layers of air with contrasting temperature, moisture, density and wind flow. The mixing layers of air account for most of the tornadoes occurring in April, May and June, when cold, dry air meets warm, moister air moving up from the south. They can affect an area up to a mile wide, with a path of varying length. Tornadoes can come from lines of cumulonimbus clouds or from a single storm cloud. They are measured using the Fujita Scale ranging from F0 to F6.

Windstorm—A storm featuring violent winds. Southwesterly winds are associated with strong storms moving onto the coast from the Pacific Ocean. Southern winds parallel to the coastal mountains are the strongest and most destructive winds. Windstorms tend to damage ridgelines that face into the winds.

12.1.1 Tornadoes

A tornado is a violently rotating column of air extending between, and in contact with, a cloud and the surface of the earth. Tornadoes are often (but not always) visible as a funnel cloud. On a local-scale, tornadoes are the most intense of all atmospheric circulations and wind can reach destructive speeds of more than 300 mph. A tornado's vortex is typically a few hundred meters in diameter, and damage paths can be up to 1 mile wide and 50 miles long. Figure 12-2, adapted from FEMA, illustrates the potential impacts and damage from tornadoes of different magnitude. Tornadoes can occur throughout the year at any time of day but are most frequent in the spring during the late afternoon. As shown in Figure 12-3, California has a relatively low risk compared to states in the Midwestern and Southern U.S.

12.1.2 Windstorms

Windstorms are generally short-duration events involving straight-line winds or gusts of over 50 mph, strong enough to cause property damage. Windstorms are especially dangerous in areas with significant tree stands and areas with exposed property, poorly constructed buildings, mobile homes (manufactured housing units), major infrastructure, and above-ground utility lines. A windstorm can topple trees and power lines, cause damage to residential, commercial and critical facilities, and leave tons of debris in its wake. There are seven types of damaging winds:

- **Straight-line winds—**Any thunderstorm wind that is not associated with rotation; this term is used mainly to differentiate from tornado winds. Most thunderstorms produce some straight-line winds as a result of outflow generated by the thunderstorm downdraft.
- **Downdrafts—**A small-scale column of air that rapidly sinks toward the ground.
- **Downbursts—**A strong downdraft with horizontal dimensions larger than 2.5 miles resulting in an outward burst or damaging winds on or near the ground. Downburst winds may begin as a microburst and spread out over a wider area, sometimes producing damage similar to a strong tornado. Although usually associated with thunderstorms, downbursts can occur with showers too weak to produce thunder.
- **Microbursts—**A small concentrated downburst that produces an outward burst of damaging winds at the surface. Microbursts are generally less than 2.5 miles across and short-lived, lasting only 5 to 10 minutes, with maximum wind speeds up to 168 mph. There are two kinds of microbursts: wet and dry. A wet microburst is accompanied by heavy precipitation at the surface. Dry microbursts, common in places like the high plains and the intermountain west, occur with little or no precipitation reaching the ground.
- **Gust front—**A gust front is the leading edge of rain-cooled air that clashes with warmer thunderstorm inflow. Gust fronts are characterized by a wind shift, temperature drop, and gusty winds out ahead of a thunderstorm. Sometimes the winds push up air above them, forming a shelf cloud or detached roll cloud.
- **Derecho—**A derecho is a widespread thunderstorm wind caused when new thunderstorms form along the leading edge of an outflow boundary (the boundary formed by horizontal spreading of thunderstorm-cooled air). The word "derecho" is of Spanish origin and means "straight ahead." Thunderstorms feed on the boundary and continue to reproduce. Derechos typically occur in summer when complexes of thunderstorms form over plains, producing heavy rain and severe wind. The damaging winds can last a long time and cover a large area.
- **Bow Echo—**A bow echo is a linear wind front bent outward in a bow shape. Damaging straight-line winds often occur near the center of a bow echo. Bow echoes can be 200 miles long, last for several hours, and produce extensive wind damage at the ground.

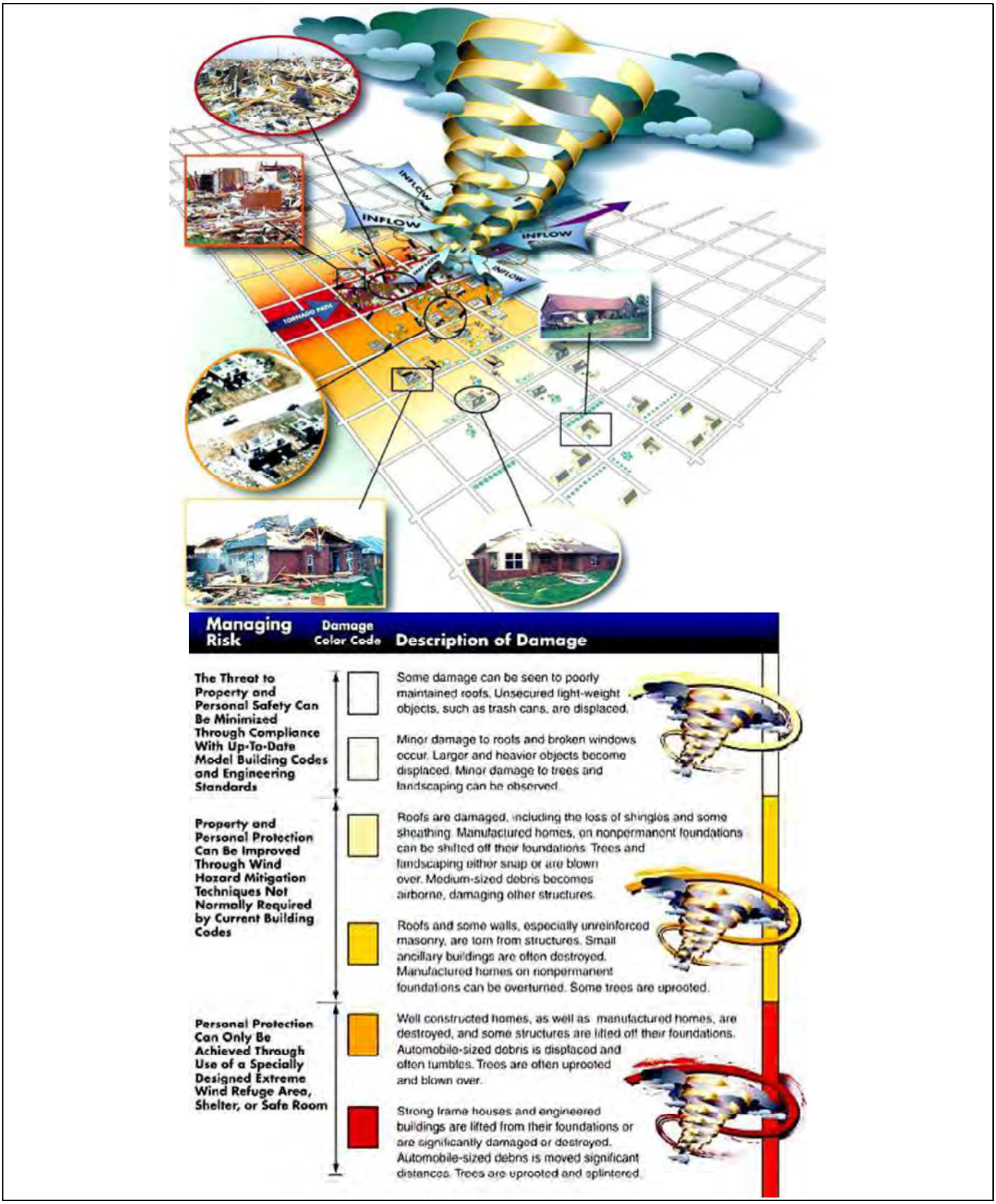


Figure 12-2. Potential Impact and Damage from a Tornado

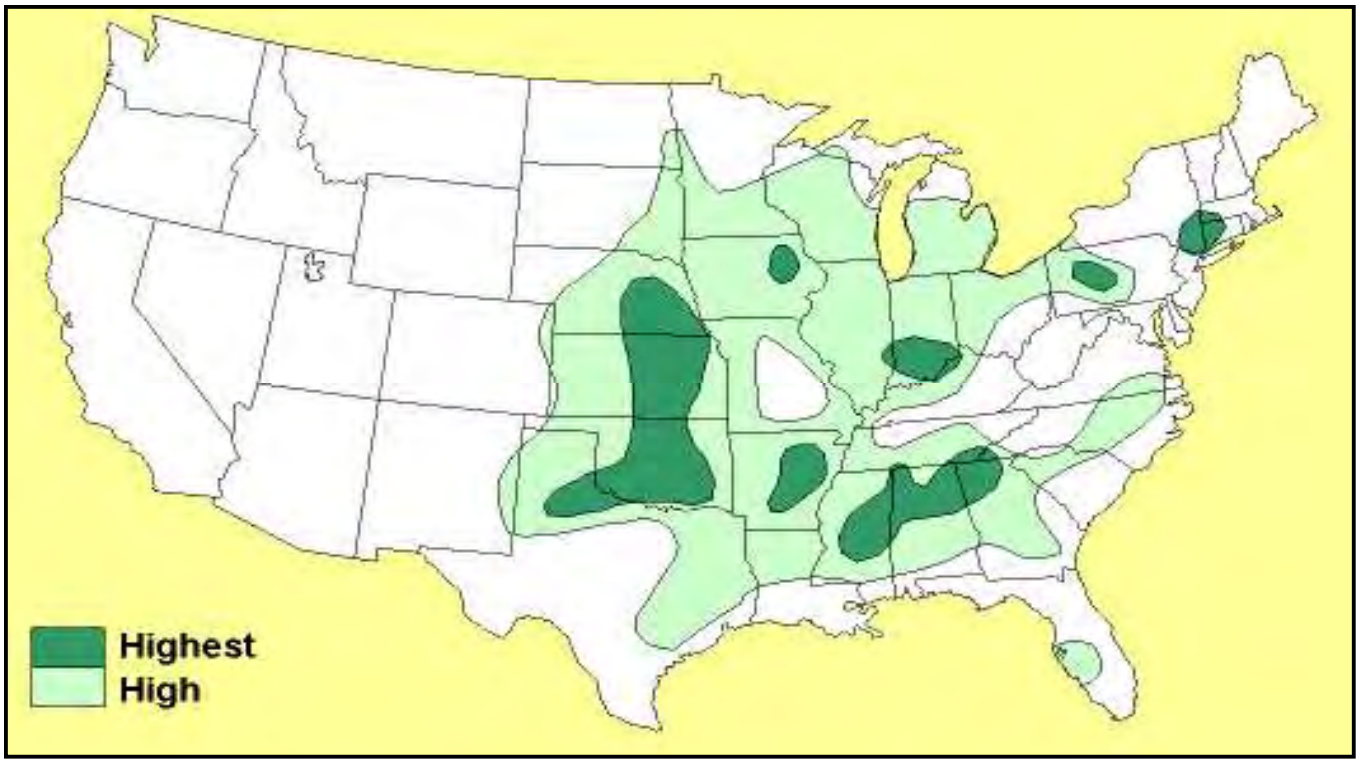


Figure 12-3. Tornado Risk Areas in the Coterminous United States

Windstorms can result in collapsed or damaged buildings, damaged or blocked roads and bridges, damaged traffic signals, streetlights and parks, and other damage. Wind speeds as low as 32 mph can cause structural damage, and winds of 100 mph can actually destroy wood-frame structures (Seattle Office of Emergency Management 2014). High winds can also cause direct losses to buildings, people, and vital equipment. There are direct consequences to the local economy resulting from windstorms related to both physical damage and interrupted services.

Wind pressure can create a direct and frontal assault on a structure, pushing walls, doors, and windows inward. Conversely, passing winds can create lift and suction forces that act to pull building components and surfaces outward. As positive and negative forces impact a building's doors, windows and walls, the result can be roof or building component failures and considerable structural damage. The effects of winds are magnified in the upper levels of multi-story structures.

Debris carried along by extreme winds can contribute directly to loss of life and indirectly to the failure of protective building envelopes. Falling trees and branches can damage buildings, power lines, and other property and infrastructure. Tree limbs breaking in winds of only 45 mph can be thrown over 75 feet, so overhead power lines can be damaged even in relatively minor windstorm events. During wet winters, saturated soils cause trees to become less stable and more vulnerable to uprooting from high winds. Utility lines brought down by summer thunderstorms have also been known to cause fires, which start in dry roadside vegetation. Electric power lines falling down to the pavement create the possibility of lethal electric shock.

Downed trees and power lines, and damaged property also can be major hindrances to emergency response and disaster recovery. Emergency response operations can be complicated when roads are blocked or when power supplies are interrupted. Industry and commerce can suffer losses from interruptions in electric service and from extended road closures.

Windstorms in Placer County are more probable during the fall through early spring. Because of the shape and orientation of the Sacramento Valley, prevailing winds are southerly. When atmospheric conditions are favorable, usually in conjunction with a significant storm tracking along the coast, these winds may combine and become strong enough to cause property damage and personal injury. The most significant windstorm in Northern California was the Columbus Day storm of 1962. Significant damage occurred along the coast and in the far northern part of the Sacramento Valley. Because Roseville lies far enough south in the valley, windstorms such as those during the 1962 Columbus Day Storm, typically do not intensify to damaging levels. It is rare for southwesterly winds flowing parallel to the Sierra Nevada Mountains to reach sustained gusts above 60 mph in the valley floor. The predicted wind speed given in wind warnings issued by the National Weather Service is for a one-minute average; gusts may be 25 to 30 percent higher.

Site-specific data on windstorms in Roseville are incomplete. Regionally, a few windstorm events have resulted in significant damage. The impacts of these events were felt to the north and east of Roseville. There have been a couple of instances of unusual wind bursts that resulted in some property damage. December 1993 saw a downburst of wind that did significant damage to a sound wall that was under construction. Another event occurred on January 1, 1995, when a wind gust through northwest Roseville snapped several power poles. Table 12-1 shows monthly wind records for Sacramento.

Table 12-1. Monthly Wind Records for Sacramento, California

Month	Year of Record	Fastest Wind Speed (miles per hour)	Month	Year of Record	Fastest Wind Speed (miles per hour)
January	1954	60	July	1956	36
February	1938	58	August	1954	38
March	1952	66	September	1965	42
April	1955	45	October	1950	68
May	1912	40	November	1953	70
June	1950	47	December	1952	70

Source: Masters-Bevan 2001.

12.1.3 Fog

Fog is a cloud near the ground that forms when air close to the ground can no longer hold all the moisture it contains. This occurs either when air is cooled to its dew point or the amount of moisture in the air increases. Heavy fog is hazardous because it can restrict surface visibility. Severe fog incidents can close roads, cause vehicle accidents, cause airport delays, and impair the effectiveness of emergency response. Financial losses associated with transportation delays caused by fog have not been calculated in the United States, but they are known to be substantial. Fog can occur almost anywhere during any season and is classified based on how it forms, which is related to where it forms. Certain seasons are more likely to have foggy days or nights based on a number of factors, including topography.

In Placer County, heavy fog occurs mostly during the midwinter. A low-lying, early morning “tule fog” can occur anytime during the wet, cold season. Tule fog or radiation (ground) fog is common on clear nights with little or no wind. It is caused by the rapid cooling of the Earth and corresponding drop in air temperature to the dew point. This type of fog is known as “valley fog” when it persists throughout the day and is thick. Table 12-2 summarizes dense fog events in the southern Sacramento valley. Given the nature of fog in the Roseville area, future severe or dense fog events are expected to happen on an annual basis, but are not expected to occur frequently.

Table 12-2. Monthly Dense Fog Occurrence

Month	Year of Record	Mean Number of Days	Maximum Number of Days
January	1961	9.9	23
February	1963[a]	5.3	13
March	1986	1.7	6
October	1962	1.4	11
November	1982	5.3	11
December	1989*	9.5	22
Annual	1962	33.8	64

a. Also occurred in previous years.
Source: Masters-Bevan 2001.

12.1.4 Heavy Rains, Thunderstorms and Lightning

Severe weather in the City of Roseville generally includes heavy rains and is periodically accompanied by strong winds, lightning, or hail. Heavy rains coupled with low temperatures or other severe weather conditions can result in increases in traffic accidents, disruptions in transportation, commerce, government, and education. Severe weather incidents can also cause utility outages due to falling trees or other debris, as well as injuries.

Roseville's Mediterranean type of climate is typified by nearly 90 percent of the annual precipitation occurring during a window of about 16 weeks. The most severe storms occur during the late fall to early spring. The climate pattern, coupled with the onshore flow of warm, moist Pacific air during the winter, can generate severe and prolonged periods of heavy rain.

Roseville experiences heavy rains every year. Some of these events may include thunderstorms. Thunderstorms are typically few in number and are more likely to appear in spring or late fall. Table 12-3 shows the average and record occurrence of thunderstorms in Sacramento between 1948 and 2008.

Table 12-3. Frequency of Thunderstorms in Sacramento, California, 1948 – 2008

Month	Year of Record	Number of Days with Thunderstorms	
		Average	Maximum
January	1970	0.4	3
February	1970	0.5	4
March	1992	0.8	4
April	1983	0.7	3
May	1967	0.3	3
June	1956	0.2	2
July	1989	0.2	2
August	1991[a]	0.2	2
September	1989[a]	0.5	2
October	1989[a]	0.3	2
November	1979*	0.3	3
December	1970	0.2	2
Annual	**1970**	**4.7**	**10**

a. Also occurred in previous years between January 1948 and December 2000.
Source: Masters-Bevan 2008.

NOAA classifies a thunderstorm as a storm with lightning and thunder produced by cumulonimbus clouds, usually producing gusty winds, heavy rain, and sometimes hail. Thunderstorms are usually short in duration (seldom more than 2 hours). Heavy rains associated with thunderstorms can lead to flash flooding during the wet or dry season.

According to the American Meteorological Society *Glossary of Meteorology*, thunderstorms are reported as light, medium, or heavy according to the following characteristics:

- Nature of the lightning and thunder
- Type and intensity of the precipitation, if any
- Speed and gustiness of the wind
- Appearance of the clouds
- Effect on surface temperature.

Lightning is an electrical discharge that results from the buildup of positive and negative charges within a thunderstorm. When the buildup becomes strong enough, lightning appears as a "bolt." This flash of light usually occurs within the clouds or between the clouds and the ground. A bolt of lightning reaches temperatures approaching 50,000ºF instantaneously. The rapid heating and cooling of air near the lightning causes thunder. Lightning is a major threat during a thunderstorm. In the United States, between 75 and 100 Americans are killed by lightning each year.

12.1.5 Ice and Freezing Rain

Ice and freezing rain are not part of the climate pattern in southern Sacramento valley. Periods have occurred where the daily minimum temperature has been at or below 32°F for several days. Yet the low temperatures reflect diurnal variations with clear skies, not part of a synoptic feature generating any precipitation. The bitterest cold snap on record, occurring December 9 to 15, 1935, was ended by the onset of a Pacific storm bringing warmer air. Although ice storms and freezing rains are a significant natural hazard, the extremely remote possibility of their occurrence in Roseville precludes any further discussion in this analysis.

12.2 HAZARD PROFILE

12.2.1 Past Events

Table 12-4 summarizes past severe weather events in Roseville and Placer County as recorded by the National Oceanic and Atmospheric Administration since 1958.

12.2.2 Location

Severe weather events have the potential to happen anywhere in Placer County. Communities in low-lying areas next to streams or lakes are more susceptible to flooding. Mountainous regions experience heavier snowfall and a greater risk of road closures. Wind events are most damaging to areas that are heavily wooded.

12.2.3 Frequency

The planning area can expect to experience exposure to some type of severe weather event at least annually.

Table 12-4. Severe Weather Events in Placer County since 1958 (NOAA 2015)

Location	Date	Type	Magnitude	Deaths or Injuries	Property Damage
Placer County	01/13/1957	Tornado	F0	0	0
Placer County	04/22/1967	Hail	0.00 Inches	0	0
Placer County	10/15/1972	Tornado	F0	0	0
Placer County	03/03/1983	Tornado	F0	0	0
Placer County	03/22/1983	Tornado	F1	0	$250,000
Placer County	04/23/1990	Tornado	F0	0	$2,500
Placer County	12/30/1992	Hail	0.50 inches	0	0
Description: *Severe thunderstorms produced golf ball-sized hail. Damage occurred at several auto dealers in Roseville.*					
Roseville	12/22/1996	Thunder Storm/Wind	0	0	0
Description: *Downburst winds snapped five 75-foot-high power poles into several pieces.*					
Roseville	01/22/1997	Flash Flood	0	0	0
Description: *Heavy rains on saturated soil caused flooding on Dry Creek and Linda Creek, damaging 21 homes.*					
Roseville	01/26/1997	Flash Flood	0	0	0
Description: *Heavy rain caused flooding on Dry Creek and Linda Creek, damaging 21 buildings.*					
Placer County	01/12/1998	Heavy Rain	N/A	0	0
Description: *Heavy rains caused widespread but minor flooding across the Sacramento Valley and nearby foothills.*					
Placer County	01/18/1998	Heavy Rain	N/A	2	0
Description: *A Pacific storm brought brief but heavy rain to the Sacramento Valley and surrounding foothills. 27,000 customers lost power at some time during the storm. Two teens were drowned when their car flipped into a flooded ditch near Loomis.*					
Roseville	01/22/2000	Heavy Rain	N/A	0	0
Description: *Rainfall totaling 5.43 inches fell in just over 48 hours.*					
Roseville	02/11/2000	Heavy Rain	N/A	0	$10,000
Description: *Heavy rain that persisted for nearly 72 hours was responsible for the closure of Granite Bay High School. The school lost power and phone service. Local businesses were affected by the flooding and closed as well.*					
Placer County	12/17/2005	Heavy Rain	N/A	0	0
Description: A series of storms brought heavy rainfall to Northern California. Five-day rainfall for Roseville was 2.99 inches.					
Placer County	01/01/2006	Severe Storm/Flood	N/A	0	$2,000,000
Description: *Storms brought heavy rain, mudslides, flooding, and high winds to Northern California. Levee overtopping, breaching, and river flooding occurred along numerous rivers, creeks, and streams. Several urban areas had significant street flooding. The Sacramento weir was opened for the first time since 1997. Airports were closed due to high winds and major road closures resulted from flooding and mudslides. Interstate 80 between Sacramento and Reno, NV, was closed for more than a day due to a mudslide, as were both directions of U.S. Highway 50 between Sacramento and South Lake Tahoe. Place County was among the counties declared in need of federal disaster assistance.*					
Placer County	07/25/2013	Hail	N/A	0	0
Description: *Strong to severe thunderstorms affected the Sierra and northeast California.*					
Roseville	03/36/2014	Tornado	EF0	0	0
Description: *EF0 tornado began in a field southwest of Roseville, but did not cause damage until it reached the Pleasant Grove Blvd housing developments in West Roseville. The winds were estimated to be 75 to 85 mph. Several windows were blown out from houses, 25 to 30 feet of fence was blown down, projectile damage to stucco occurred. The tornado lasted 5 to 10 minutes.*					
Roseville	05/14/2015	Heavy Rain	N/A	0	0
Description: *Thunderstorms brought local heavy rain and minor flooding. Unusually late winter snow fell in the Sierra, causing travel delays and chain controls over passes. Funnel clouds were reported with thunderstorms, but no touchdowns were confirmed. Street flooding was reported at Martin Road and East Roseville Parkway from a thunderstorm.*					

12.2.4 Severity

Severe weather disaster declarations for Placer County, as shown in Table 12-4, are often related to heavy rains, thunderstorms, and freezing temperatures. The most common problems associated with severe storms are immobility and loss of utilities. Fatalities are uncommon, but can occur. Roads may become impassable due to flooding, downed trees, or a landslide. Power lines may be downed due to high winds, and services such as water or phone may not be able to operate without power. Lightning can cause severe damage and injury. Windstorms have been known to cause damage to utilities.

Tornadoes are potentially the most dangerous of local storms, but they are not common in the Roseville vicinity. If a major tornado were to strike a populated area such as Roseville, damage could be widespread. Businesses could be forced to close for an extended period or permanently, fatalities could be high, many people could be homeless for an extended period, and routine services such as telephone or power could be disrupted. Buildings may be damaged or destroyed. Compared with other states, California ranks 32nd for frequency of tornadoes, last for number of deaths, 36th for injuries, and 31st for cost of damage. California ranks 44th for the frequency of tornados per square mile.

12.2.5 Warning Time

A meteorologist can often predict the likelihood of a severe storm. This can give several days of warning time. However, meteorologists cannot predict the exact time of onset or the severity of the storm. Some storms come on more quickly and have only a few hours of warning time.

12.3 SECONDARY HAZARDS

The most significant secondary hazards associated with severe weather are floods, falling and downed trees, landslides and downed power lines. Rapidly melting mountain snow combined with heavy rain can overwhelm natural and man-made drainage systems, causing overflow and property destruction. Landslides occur when the soil on slopes becomes oversaturated and fails.

12.4 EXPOSURE

12.4.1 Population

A lack of data separating severe weather damage from flooding and landslide damage prevented a detailed analysis for exposure and vulnerability. However, it can be assumed that the entire Roseville planning area is exposed to severe weather events. Certain areas are more exposed due to geographic location and localized weather patterns. Populations living at higher elevations with large stands of trees or power lines may be more susceptible to wind damage and black out, while populations living in low lying areas are at risk for flooding.

12.4.2 Property

All structures within Roseville are exposed to the potential impacts of severe weather.

12.4.3 Critical Facilities and Infrastructure

All critical facilities exposed to flooding are also likely exposed to severe weather. Additional facilities on higher ground may also be exposed to wind damage or damage from falling trees. The most common problem associated with severe weather is the loss of utilities. Downed power lines can cause blackouts, leaving large areas isolated. Phone, water and sewer systems may not function. Roads may become impassable due to ice or snow or from a secondary hazard such as landslides.

12.4.4 Environment

Severe storm events can drastically affect the physical environment, changing natural landscapes. Natural habitats such as streams and trees risk major damage and destruction during a severe storm. Prolonged rains can saturate soils and lead to slope failure. Flooding caused by severe weather can cause stream channel migration.

12.5 VULNERABILITY

There are currently no loss estimation tools with uniform damage functions for severe weather events. This can be attributed to the variety of impacts that severe weather events generate. Also, the severity of severe weather events varies by location. Since secondary effects of severe weather events include flooding, landslides or even wildfires in drier climates, the vulnerability assessments under those hazards can provide emergency managers a gage of the economic impact of severe weather events. For this section, the vulnerability to severe weather events is discussed qualitatively. Where possible, damage estimates are made using reasonable assumptions and best available data.

12.5.1 Population

Particularly vulnerable populations are the elderly, low income or linguistically isolated populations, people with life-threatening illnesses, and residents living in areas that are isolated from major roads. Power outages can be life threatening to those dependent on electricity for life support. These populations face isolation and exposure during severe weather events and could suffer more secondary effects of the hazard.

12.5.2 Property

All property is vulnerable during severe weather events, but structures in poor condition or constructed to low building code standards risk the most damage. The frequency and degree of damage will depend on specific locations. Those in higher elevations and on ridges may be more prone to wind damage. Those that are located under or near overhead lines or near large trees may be damaged in the event of a collapse.

Estimates of potential loss for the severe weather hazard are not based on damage functions, because no such damage functions have been generated. Instead, estimates were developed representing 10 percent, 30 percent and 50 percent of the assessed value of exposed structures. This allows emergency managers to select a range of potential economic impact based on an estimate of the percent of damage to the general building stock. Damage in excess of 50 percent is considered to be substantial by most building codes and typically requires total reconstruction of the structure. Table 12-5 lists the potential loss estimates to the general building stock.

Table 12-5. Loss Potential for Roseville Buildings Vulnerable to Severe Weather Hazard

	Building Count	Assessed Value	10% Damage	30% Damage	50% Damage
Residential	43,163	$18,695,442,494	$1,869,544,249	$5,608,632,748	$9,347,721,247
Commercial	1,811	$8,274,963,659	$827,496,366	$2,482,489,098	$4,137,481,830
Industrial	475	$1,160,642,905	$116,064,290	$348,192,871	$580,321,452
Agricultural	1	$28,530	$2,853	$8,559	$14,265
Religion	71	$250,600,927	$25,060,093	$75,180,278	$125,300,463
Government	92	$168,856,266	$16,885,627	$50,656,880	$84,428,133
Education	445	$1,091,399,472	$109,139,947	$327,419,842	$545,699,736
Total	**46,058**	**$29,641,934,254**	**$2,964,193,425**	**$8,892,580,276**	**$14,820,967,127**

12.5.3 Critical Facilities and Infrastructure

Incapacity and loss of roads are the primary transportation failures, most of which are associated with secondary hazards. Landslides that block roads are caused by heavy prolonged rains. High winds can cause significant damage to trees and power lines, with obstructing debris blocking roads, incapacitating transportation, isolating population, and disrupting ingress and egress. Of particular concern are roads providing access to isolated areas and to the elderly.

Prolonged obstruction of major routes due to landslides, debris, or floodwaters can disrupt the shipment of goods and other commerce. Large and prolonged storms can have negative economic impacts for an entire region.

Severe windstorms and downed trees or power lines can create serious impacts on power and above-ground communication lines. Broken power and communication lines would result in isolation because some residents would be unable to call for assistance.

12.5.4 Environment

The environment vulnerable to the severe weather hazard is the same as the environment exposed to the hazard.

12.6 FUTURE TRENDS IN DEVELOPMENT

The general building stock within the planning area increased by 17.7% with an increase in valuation from $21.967 billion to $29.641 billion (34.9%). This increase in valuation of the planning area was impacted by the areas recovery from the economic downturn of 2008. Since the entire planning area would be considered susceptible to earthquake, there was an increase in earthquake exposure over the performance period of the 2011 plan. However, the vulnerability of this new exposure should be considered to be low due to the application of strong building code standards that are contained within the International Building Code.

Many of the impacts associated with severe weather hazards can be addressed through proactive planning and the use of best available information in making land use decisions. Roseville has and will achieve this goal through the implementation of its General Plan. The General Plan serves as a long-term policy guide for the physical, economic, and environmental growth of the City. It includes a statement of the community's vision of its ultimate physical growth. Implementation of the General Plan, along with other programs such as Building Code enforcement, public information and early warning, will help Roseville to manage the probable impacts of severe weather hazards as the City grows in the future.

12.7 REVIEW OF EXISTING ORDINANCES, PROGRAMS, AND POLICIES

Roseville implements numerous programs and policies that can impact severe whether hazards. Like most programs and policies sited in this Plan, these are tied to the City's general plan. Maintenance of these existing programs is included in the action plan for this hazard mitigation plan.

12.8 SCENARIO

A worst-case event would involve prolonged high winds during an extreme rainstorm. Such an event would have both short-term and long-term effects. Initially, schools and roads would be closed due to flooding, downed tree obstructions, and downed power lines. Power outages would be common throughout the City. Some subdivisions in the City could experience limitations on ingress and egress. Continuing rains could produce flooding, overtopped culverts with ponded water on roads, and landslides on steep slopes. Flooding and landslides could further obstruct roads and bridges, further isolating residents.

12.9 ISSUES

In general, every household and resident in the City is likely to be exposed to severe weather, but some are more likely than others to experience isolation as a result. Those residing in higher elevations with limited transportation routes may have the greatest vulnerability to isolation from storms. Another group at risk is the portion of the population that is over the age of 65.

13. WILDFIRE

13.1 GENERAL BACKGROUND

13.1.1 Contributing Factors

A wildfire is any uncontrolled fire occurring on undeveloped land that requires fire suppression. Wildfires can be ignited by lightning or by human activity such as smoking, campfires, equipment use, and arson. The potential for wildfire is primarily influenced by the following factors:

- Fuel, which may include living and dead vegetation on the ground, along the surface as brush and small trees, and above the ground in tree canopies.
- Topography, which includes both slope and elevation.
- Air conditions, including temperature, relative humidity, wind speed and direction, cloud cover, precipitation amount and duration, and the stability of the atmosphere.

DEFINITIONS

Wildland-Urban Interface Area—An area susceptible to wildfires where wildland vegetation and urban or suburban development occur together. Examples include dispersed rural housing in forested areas.

Wildfire—A fire that causes uncontrolled destruction of forests, brush, field crops, grasslands, and real and personal property in non-urban areas.

How a fire behaves primarily depends on the following:

- Fuel—Lighter fuels such as grasses, leaves and needles quickly expel moisture and burn rapidly, while heavier fuels such as tree branches, logs and trunks take longer to warm and ignite. Trees killed or defoliated by forest insects and diseases are more susceptible to wildfire.
- Weather—Strong, dry winds produce extreme fire conditions. Such winds generally reach peak velocities during the night and early morning hours.
- Thunderstorm activity—The thunderstorm season typically begins in June with wet storms, and turns dry with little or no precipitation reaching the ground as the season progresses into July and August.
- Terrain—The topography of a region influences the amount and moisture of fuel; the impact of weather conditions such as temperature and wind; potential barriers to fire spread, such as highways and lakes; and elevation and slope of land forms (fire spreads more easily uphill than downhill).
- Time of Day—A fire's peak burning period generally is between 1 p.m. and 6 p.m.

Short-term loss caused by a wildfire can include the destruction of timber, wildlife habitat, scenic vistas, and watersheds. Long-term effects include smaller timber harvests, reduced access to affected recreational areas, and destruction of cultural and economic resources and community infrastructure. Vulnerability to flooding increases due to the destruction of watersheds. The potential for significant damage to life and property exists in areas designated as "wildland-urban interface areas," where development is adjacent to densely vegetated areas.

13.1.2 Local Conditions Related to Wildfire Hazard

Vegetation

The vegetation in Roseville can be broadly classified in three categories:

- There are large tracts of self-sustaining grasslands in the northern and western undeveloped edges of Roseville. Less extensive areas of grassland can be found in smaller, undeveloped areas scattered throughout the City. Most of the grasslands are non-native, following the effects of grazing and clearing for agricultural uses.
- Oak woodland, riparian and creek areas are found in proximity to Roseville's major stream channels where microclimates and alluvial soils provide ideal conditions for the deeper rooting shrubs and trees found in these habitats. Most woodland areas are relatively open, with little shrub growth.
- Seasonal wetlands in Roseville include intermittent drainages and vernal pools. Intermittent drainages are wet only in winter and dry during the summer, with scattered ponds; they may contain water from adjacent urban runoff. Vernal pools represent a significant seasonal wetland resource in Roseville.

Undeveloped Areas

The U.S. Army Corps of Engineers has required developers in Roseville to preserve areas of vernal pools that are dedicated to the City and maintained in perpetuity. These areas are to be left undisturbed and are typically open grassy areas during the hot summer months when the vernal pools are dry.

Preservation of open space, wetlands, natural parkways, riparian corridors along the City's watersheds, vernal pools and endangered species habitat have added to the inventory of vegetation susceptible to wildfire. The City of Roseville has 2,600 acres of dedicated open space within the city limits. Nearly 740 acres will be added on dedication of properties in the West Roseville Specific Plan. The City recently acquired the Reason Farms property in unincorporated Placer County, which will be the site for a retention basin projected to have water only eight days per year. The property will be preserved in perpetuity as open space with passive recreational uses planned, including biking, hiking, camping, and boating on a man-made lake. The Roseville Fire Department will assume fire protection duties for this significant piece of open space at a future date.

Fire-Fighting and Fire Prevention

Federal, state, county, city, and private agencies provide fire protection and firefighting services in California. Wildfires usually are extinguished while smaller than 1 acre, but they can spread to more than 100,000 acres and may require thousands of firefighters and several months to extinguish.

Roseville Fire Protection Services

The Roseville Fire Department is a fully functional agency that primarily provides fire suppression and emergency medical services for the urban environment of the City. The department operates eight stations. The department has eight paramedic engine companies, with a minimum staffing of three, two paramedic truck companies with a minimum staffing of four, and one battalion chief. The department also operates a hazardous materials response unit (cross-staffed the truck company); five grass/wildland units, and one technical rescue unit (cross-staffed by engine companies). The department maintains four reserve engines and one reserve truck.

Regional Services

Regional fire protection is provided by municipal fire departments and those assigned to specially designated lands outside city boundaries. The Placer County Fire Department provides fire protection to much of Placer County including west of the Roseville city limits. The South Placer Fire District serves unincorporated Placer County east of Roseville. The City of Rocklin Fire Department provides services within the City of Rocklin to the north and east of Roseville. The Sacramento Metropolitan Fire District provides fire protection to the City of Citrus Heights and the unincorporated Sacramento County areas to the south of Roseville.

State of California

The California Department of Forestry and Fire Protection (CAL FIRE) is charged with both assessing the threat of fire in California and suppressing fires on state and federal lands, while providing mutual aid if needed to communities that do not include public lands. The California Fire Plan formalizes much of the work that has been done to assess the threat of wildfire statewide. CAL FIRE's Fire and Resource Assessment Program (FRAP) assesses the amount and extent of California's forests and rangelands, analyzes their conditions and identifies alternative management and policy guidelines.

Firewise Communities

The national Firewise Communities program is a multi-agency effort involving homeowners, community leaders, planners, developers, and others to protect people, property and natural resources from the risk of wildfire before a fire starts. The program emphasizes community responsibility for planning a safe community and effective emergency response, and individual responsibility for safer home construction and design, landscaping and maintenance. Firewise Communities is directed and sponsored by the National Wildfire Coordinating Group, a consortium of organizations and federal agencies responsible for wildfire management in the U.S.

13.2 HAZARD PROFILE

13.2.1 Past Events

Fire history shows multiple wildfires in or near Roseville since the 1950s:

- In the 1950s, one fire occurred just east of the current location of Interstate 80 on the Roseville/Rocklin border, including parts of the Stoneridge area. A second fire occurred south of Douglas Boulevard where Roseville Parkway is now located.
- In the 1970s, a significant fire occurred in undeveloped grasslands along what is now Galleria Boulevard and Harding Boulevard in north central Roseville. Another fire occurred just outside the city limits on both sides of Cavitt-Stallman in the Loomis area.
- In the 1980s, five wildfires were mapped, including one in the grasslands of the North Central Roseville Specific Plan just north of Highway 65, where Pleasant Grove Boulevard is now located. Three grassland fires occurred west of Roseville, one just west of Fiddyment Road and two west of Fiddyment Road and south of Athens Road. A major fire occurred in 1983 where Baseline Road and Country Club Drive now intersect. The fire scorched 1,500 acres north past the current Blue Oaks Boulevard, stopping at Pleasant Grove Creek. The area is now developed with urban uses.
- The 2002 Sierra Fire in Loomis and Granite Bay was the largest in recent history near Roseville. The fire charred 900 acres of grass, brush and oaks in the area between Interstate 80 and Cavitt-Stallman Road. The fire destroyed six structures and threatened two schools. One hundred homes were evacuated, and more than 1,000 homes in both communities were threatened.
- On May 17, 2016, a grass fire broke out near Highway 65 north of Roseville. The fire, located at Athens Avenue and Industrial Boulevard, south of Lincoln in Placer County stretched to 169 acres.

Statewide, California experiences frequent significant wildfires. Most recently, the following two fires occurred:

- The 2003 Cedar fire in San Diego County burned 273,246 acres, destroyed 2,820 structures and directly resulted in 15 deaths. The fire was caused by human ignition.
- The 2015 Valley Fire in Lake County is considered the third worst fire in history, based on the number of structures damaged or destroyed. The fire consumed 75,781 acres and killed four people.

CAL FIRE maintains a website (http://www.calfire.ca.gov/general/firemaps/) with interactive maps that detail the fire history in California since 2011.

13.2.2 Location

State

CAL FIRE also developed an estimate of fire risk in designated wildland-urban interface areas, based on a variety of factors affecting fire frequency and fire behavior. The results are combined into a single assessment called fire threat. A significant fire threat is found throughout California, with 48 percent of the state's wildland area ranked as high, very high or extremely high. About 37 percent of the state has a moderate fire threat. Large areas of high threat are found in Southern California, the central coast, the lower elevations of the Sierra Nevada and much of the interior of northern California. Much of the fire threat is near densely populated areas and new development.

Regional

Wildfire safety is an increasing concern in the western Sierra foothills and valley as development continues in rural areas while grasslands and open space border urban areas. The potential for wildfire and urban wildfire is always present, with fire conditions from a combination of hot weather, an accumulation of vegetation, and low moisture content typically present in the warm fire season within the Central Valley and Sierra Nevada foothills. Wildfire risk in Placer County is primarily in the wildland-urban interface areas. A majority of Placer County is deemed to be a high or very high fire threat risk based on analysis by CAL FIRE, as shown on Figure 13-1. These are areas with dense vegetation, increasing elevation, and steep slopes in the foothills and the mountains of the Sierra Nevada Mountain Range.

CAL FIRE's FRAP website (http://frap.cdf.ca.gov/) includes maps of the communities most at risk for wildfire that are within 1.5 miles of a high or very high wildfire threat on federal or non-federal lands. The threat is based on the FRAP fuels and hazard data. The map identifies seven communities in Placer County not adjacent to federal lands that are at risk for wildfire, including the City of Roseville and communities adjacent to or within the Tahoe National Forest.

Local

The City of Roseville does not include any designated wildland-urban interface areas. A significant portion of the area around the City is developed. State maps show that the City has a moderate fire threat. While the City rarely has critical fire weather conditions, a combination of dry grasslands, the topography in northeast Roseville, and hot temperatures with limited rainfall could result in a risk of wildfire on occasion. The following are the most likely wildfire hazards in Roseville:

- Grassland fires on undeveloped properties in the West Roseville Specific Plan Area or west or north of Roseville
- Fires in northeast Roseville where significant slopes are adjacent to ravines and residential development
- Fires in open space and preserve areas within the developed sections of Roseville.

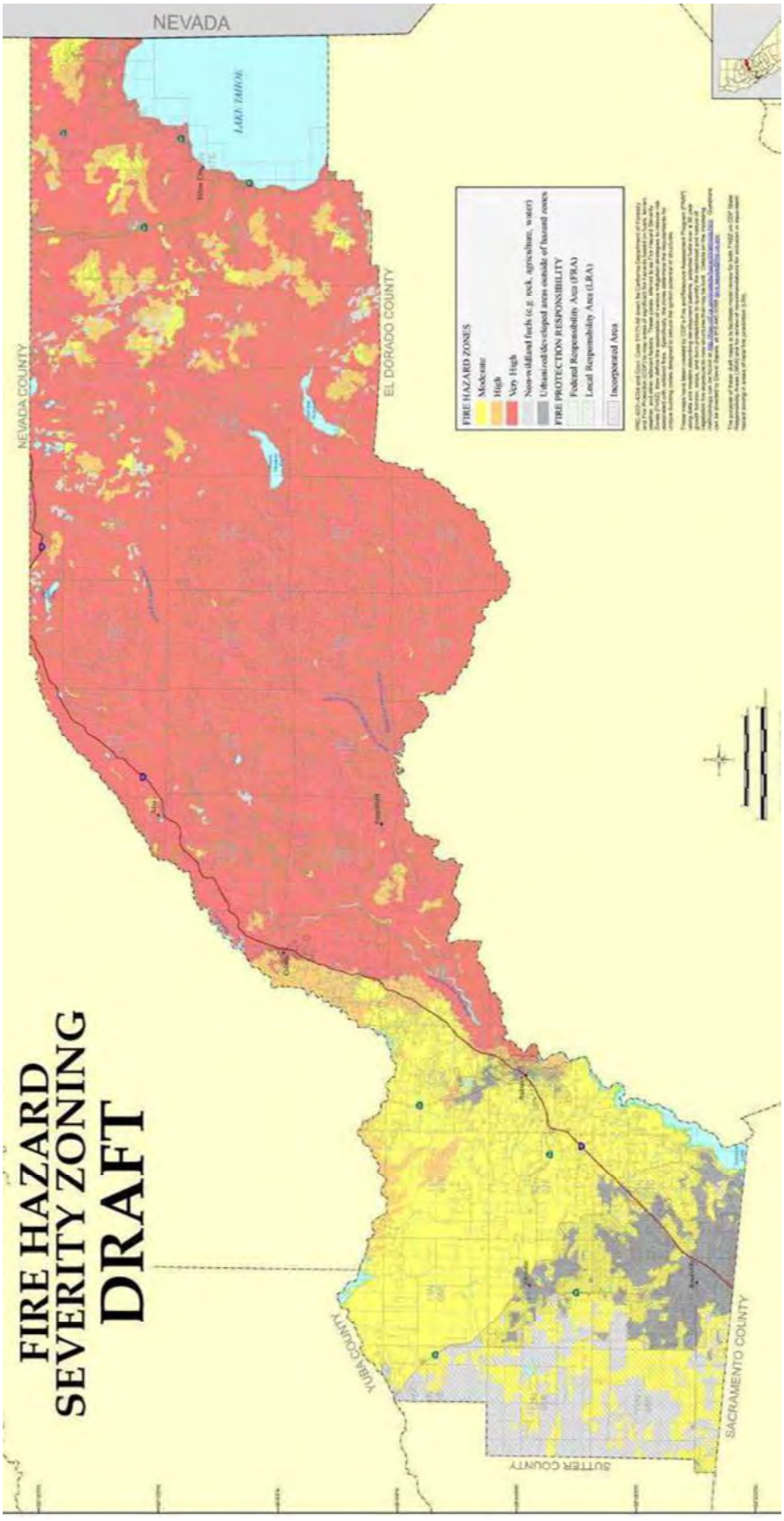


Figure 13-1. CAL FIRE FRAP Map for Placer County

Grassland Fires

Prior to August 2004, Roseville's northwestern boundary was Fiddyment Road. Since the annexation of 3,200 acres in West Roseville, the City now includes a significant amount of undeveloped non-native annual grassland with some riparian and oak woodland along Pleasant Grove Creek and Kaseberg Creek. The property to the west of Roseville along this border is also non-native annual grassland. The 2004 West Roseville Specific Plan Open Space Preserve Operations and Management Plan has provisions for reducing fire hazard if the preserve becomes a fire hazard. The preserve manager will work with the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service and the Roseville Fire Department to decide the best way to reduce the hazard. Fire breaks are allowed within the 50-foot buffer around the preserve. Fire breaks in other locations would require U.S. Army Corps of Engineers and U.S. Fish and Wildlife Service approval.

The Sierra Vista Specific Plan Area, annexed in January 2012, consists of largely nonnative, annual grasslands. The Sierra Vista Specific Plan Area will develop as urban uses, but will also contain 267 acres of preserve areas. A 50-foot wide open space buffer area is maintained at the perimeter of all open space preserves for fuel modification and fire management, among other uses. The Roseville Fire Department's Fire Station #5 serves as the primary responding area for this area.

Ravine Fires

The Stoneridge Specific Plan includes 1,089 acres of land that will include 2,882 dwelling units, along with office and commercial uses, schools, parks, and open space. Approximately 252 acres will be set aside as open space with an extensive network of bike trails. The main ingress and egress to the area is Secret Ravine Parkway, which will link Sierra College Boulevard with East Roseville Parkway. The ravines also border the Northeast Roseville Specific Plan Area, which is largely developed, with some construction continuing along the ravine edges.

The key topographic features in Stoneridge are the three ravines: Secret Ravine, False Ravine, and Miners Ravine. The creek at the base of Miner's Ravine flows year-round. The elevation of the property is among the highest in the City, ranging from 225 feet to 375 feet above sea level. Slopes in Miner's Ravine range from a 5-percent grade to a 26-percent grade.

Vegetation in the Stoneridge Specific Plan Area is primarily annual grasslands, oak woodlands, and oak riparian landscapes (see Figure 13-2). Annual grasses with scattered downed trees and limbs cover the ground. The overstory includes scattered oaks and a few other broad leaf trees. The riparian vegetation includes Blue Oak, Valley Oak and Interior Live Oak, along with willows, cottonwood, and ash trees. The vegetation on the plateaus between the three main ravines is primarily annual grasses. The ravines do not have a continuous fuel ladder from the ground vegetation to the overstory trees.



Figure 13-2. View of Ravine, Tree Canopy and Stoneridge Development

The 1999 Stoneridge Specific Plan Wildfire Safety Plan outlined the following risks resulting from development of the Plan Area (see Figure 13-3):

- Fire in the grass of the open space area was identified as the most serious wildfire threat for the Stoneridge Specific Plan. Extensive grass fuels in the open space areas will quickly ignite and fire will spread rapidly, especially in summer. The plan cites a fire history that has demonstrated that grass and other light fuels are a threat to fire risk for other vegetation types as well as people.
- Wildfire rate of spread can increase with steep slopes. The three ravines in the project area have moderate slopes that can cause a fast rate of wildfire spread.
- Risk of fire starts will increase with development. The greatest risk from fire ignitions will be in the open space areas as use of these areas by future residents and other members of the public increases. Bike trails, for example, will make open space areas more accessible than when the Plan Area was undeveloped.
- Initial work by the developer to reduce the amount of fuel in the area must be maintained over the long-term to keep fire risk in check.
- Home design and siting often do not adequately mitigate wildfire risk. Measures specific to development within the Plan Area have been adopted by the City and are being enforced at the building permit stage. Owners will be required to maintain a clearing of flammable vegetation around the structures, use only fire resistant materials for roofs and fences, and ensure adequate water for fire suppression.

The Stoneridge Wildfire Safety Plan outlines short and long-term mitigation measures to prevent or minimize the impact of wildfire in this area of Roseville. These are included in the mitigation section of this 2016 Plan.

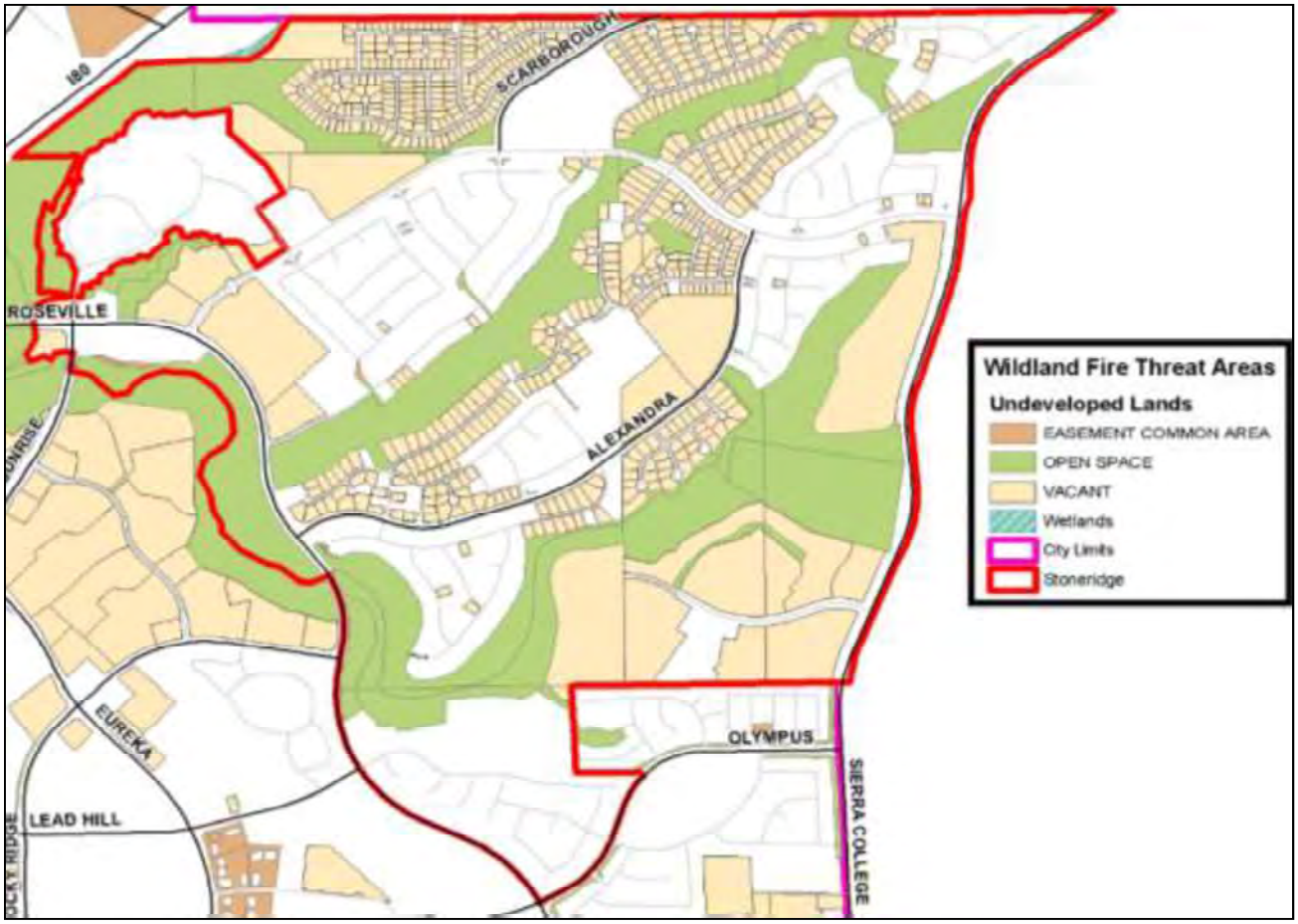


Figure 13-3. Stoneridge Specific Plan Wildfire Threat Areas

Open Space Fires

The City is adding new open space areas through dedication as part of the specific plan process. This will result in construction of new developments immediately adjacent to open space areas, which poses moderate risk to such developments. The Fire Department reviews these during the planning process, and fire safety provisions are accounted for in Specific Plan design guidelines and development agreements.

13.2.3 Frequency

The Roseville Fire Department maintains a database of every incident type responded to by Roseville fire personnel. Wildfires are tracked in four categories: natural or vegetation fire; forest, woods, or wildfire; brush or brush and grass fire; and grass fire. Table 13-1 provides the number of wildfire incidents recorded from 2011 to 2015. Placer County has had nearly 150 significant wildfires since 1908. In California, vegetation fires occur daily. Most are controlled and contained early, with limited damage.

Table 13-1. Wildfire Incident Counts—2011 to 2015

Incident Type	2011	2012	2013	2014	2015
Cultivated vegetation, crop fire	**–**	**1**	**3**	**3**	**2**
Cultivated trees or nursery stock fire	–	–	–	2	1
Cultivated vegetation, crop fire, other	–	1	3	1	1
Fire in mobile property used as fixed structure	**1**	**–**	**1**	**–**	**–**

Fire in mobile home used as fixed residence	–	–	1	–	–
Fire in portable building, fixed location	1	–	–	–	–
Natural Vegetation Fire	**47**	**54**	**70**	**62**	**53**
Brush, or brush and grass mixture fire	11	16	20	14	29
Forest, woods or wildland fire	–	1	2	1	–
Grass fire	24	23	26	29	18
Natural vegetation fire, other	12	14	22	18	6
Outside Rubbish Fire	**67**	**61**	**92**	**70**	**76**
Dumpster or other outside trash receptacle fire	16	8	9	12	17
Outside rubbish fire, other	18	19	39	34	27
Outside rubbish, trash or waste fire	32	34	44	23	32
Outside stationary compactor/compacted trash fire	1	–	–	1	–
Total	115	116	166	135	131

Source: City of Roseville Fire Department Incident Type Count Reports 2010-2015

13.2.4 Severity

Wildfires have never resulted in loss of life in Roseville, though some property damage has resulted from wildfire incidents, including some fences on occasion. CAL FIRE maps areas of significant fire hazard based on fuel, terrain, weather, and other relevant factors. The mapped fire hazard severity zones define the application of mitigation strategies to reduce risk associated with wildfires. Figure 13-4 shows fire hazard severity zones for the Roseville planning area. The City's wildfire hazard is rated as moderate. While the City is also a Community at Risk from Wildfire as designated on the State of California map, the Roseville Fire Department assessment in the General Plan concurs that wildfires in open space areas represent a moderate hazard. Most fires of this type are small and localized. The open space areas are typically easily accessible for fire suppression apparatus, and the response time is such that fires are suppressed rapidly.

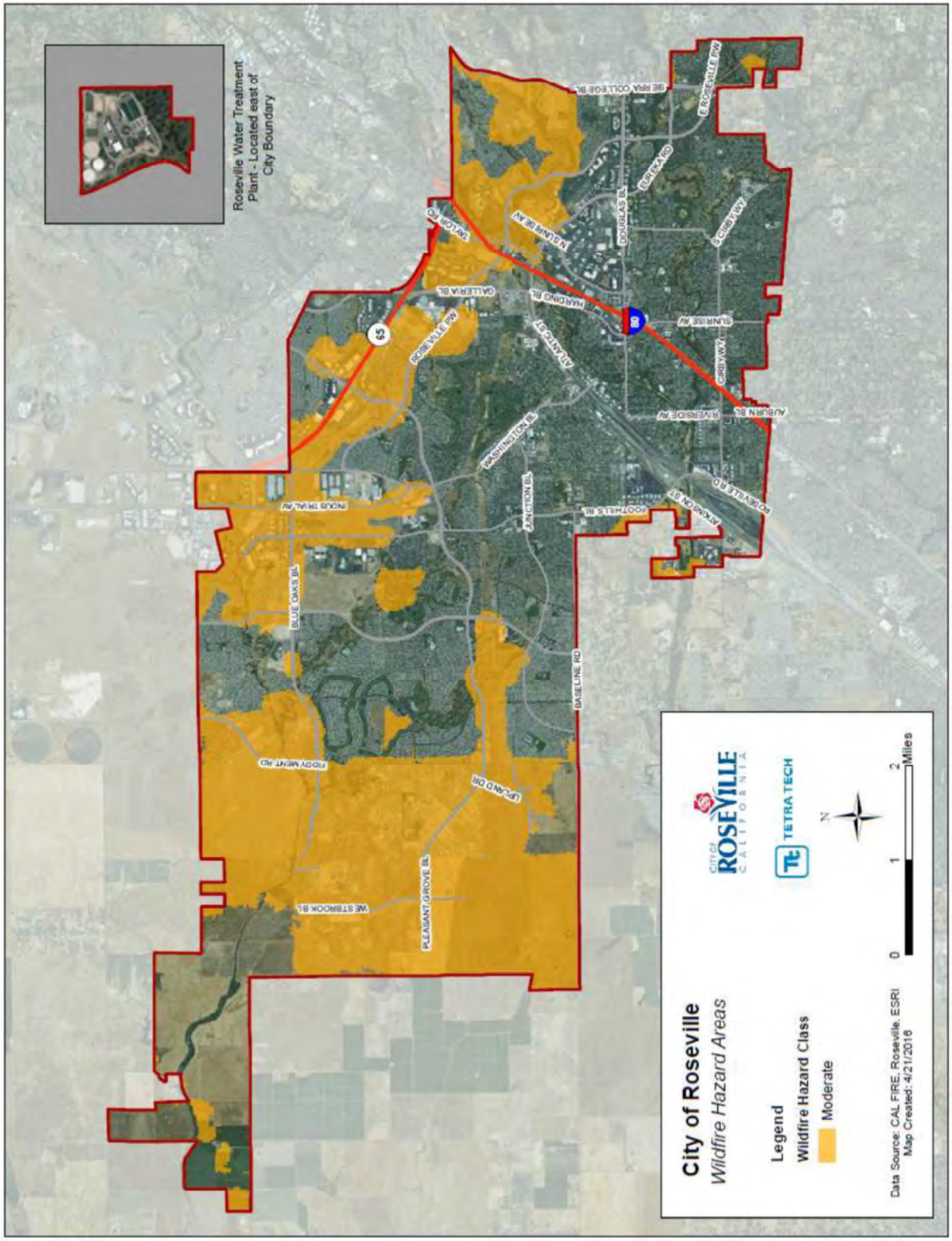


Figure 13-4. Fire Hazard Severity Zones in the Planning Area

13.2.5 Warning Time

Wildfires are typically caused intentionally or accidentally by humans. There is no way to predict when one might break out. Dry seasons and droughts greatly increase fire likelihood. If a fire breaks out and spreads rapidly, residents may need to evacuate within days or even hours. Once a fire has started, fire alerting is reasonably rapid in most cases. The spread of cellular and two-way radio communications has contributed to a significant improvement in warning time.

Since fireworks often cause brush fires, extra diligence can be taken around the Fourth of July when the use of fireworks is highest. Dry lightning may also trigger wildfires, so special attention can be paid during weather events that may trigger wildfires. Reliable National Weather Service lightning warnings are available on average 24 to 48 hours prior to a significant electrical storm. National Weather Service fire weather forecasts for the country (http://www.spc.noaa.gov/products/fire_wx) are monitored by local fire departments, including the City of Roseville Fire Department, to assess the risk for wildfire at any given time and enhance preparedness.

13.3 SECONDARY HAZARDS

Wildfires can generate a range of secondary effects, which in some cases may cause more widespread and prolonged damage than the fire itself. Fires can cause direct economic losses in the reduction of harvestable timber and indirect economic losses in reduced tourism. Wildfires cause the contamination of reservoirs, destroy transmission lines and contribute to flooding. They strip slopes of vegetation, exposing them to greater amounts of runoff. This in turn can weaken soils and cause major landslides several years after the wildfire. Most wildfires burn hot and for long durations that can bake soils, especially those high in clay content, thus increasing the imperviousness of the ground. This increases runoff generated by storm events, increasing the chance of flooding.

13.4 EXPOSURE

13.4.1 Population

Population could not be examined by fire hazard severity zone because census block group areas do not coincide with the fire risk areas. However, the planning team was able to create a population estimate using the structure count of buildings located within the highest-risk fire hazard severity zone for Roseville (moderate), and applying the census value for persons per household for Roseville (2.54). Using this approach, it is estimated that the population living within the moderate fire hazard severity zones is 29,178. This represents 22.7 percent of the total population for the City.

13.4.2 Property

Using the base mapping created to support the HAZUS-MH analyses, the planning team determined that there are 10,338 structures within the moderate fire hazard severity zones within the planning area, with the predominant use being residential. The total assessed value of these structures and their contents is $7.76 billion. This represents 26.2 percent of the total assessed value for the City.

13.4.3 Critical Facilities and Infrastructure

Critical facilities are public and private structures where vital community functions are conducted. If the facility is damaged or destroyed by wildfire, there could be severe consequences to public health and safety. The Roseville Fire Department, all first responders and mutual aid agencies would work to protect those facilities in areas where wildfire is a potential. Table 13-2 provides a list of critical facilities that are in potential wildfire areas.

Table 13-2. Critical Facilities and Infrastructure Adjacent to Potential Wildfire Areas

Facility Type	Number
Communications Facilities	29
Utilities	16
Fire Stations	4
Hazardous Materials Facilities	2
Bridges	21
Medical	1
Government	4
Religious	2
Schools	5

13.4.4 Environment

It can take decades or even centuries for ecosystems to recover from a wildfire, which can cause severe environmental impacts:

- **Damaged Fisheries**—Critical trout, salmon and steelhead fisheries can suffer from increased water temperatures, sedimentation, and changes in water quality.
- **Soil Erosion**—The protective covering provided by foliage and dead organic matter is removed, leaving the soil fully exposed to wind and water erosion. Accelerated soil erosion occurs, causing landslides and threatening aquatic habitats.
- **Spread of Invasive Plant Species**—Non-native woody plant species frequently invade burned areas. When weeds become established, they can dominate the plant cover over broad landscapes and become difficult and costly to control.
- **Disease and Insect Infestations**—Unless diseased or insect-infested trees are swiftly removed, infestations and disease can spread to healthy forests and private lands. Timely active management actions are needed to remove diseased or infested trees.
- **Destroyed Endangered Species Habitat**—Catastrophic fires can have devastating consequences for endangered species. For instance, the Biscuit Fire in Oregon destroyed 125,000 to 150,000 acres of spotted owl habitat.
- **Soil Sterilization**—Topsoil exposed to extreme heat can become water repellant, and soil nutrients may be lost. Some fires burn so hot that they can sterilize the soil.

13.5 VULNERABILITY

Structures, above-ground infrastructure, critical facilities and natural environments are all vulnerable to the wildfire hazard. There is currently no validated damage function available to support wildfire mitigation planning. Except as discussed in this section, vulnerable populations, property, infrastructure and environment are assumed to be the same as described in the section on exposure.

13.5.1 Population

There are no recorded incidents of loss of life from wildfires in Roseville, and the risk from wildfire has been deemed moderate by the State and the Roseville Fire Department. Given the immediate response times to reported fires, the likelihood of injuries and casualties is minimal; therefore, injuries and casualties were not estimated for the wildfire hazard.

Air pollution from wildfires can be a severe health hazard, especially for sensitive populations, including children, the elderly and those with respiratory and cardiovascular diseases. Smoke generated by wildfire consists of visible and invisible emissions that contain particulate matter (soot, tar and minerals), gases (carbon monoxide, carbon dioxide, nitrogen oxides), and toxics (formaldehyde, benzene). Emissions from wildfires depend on the type of fuel, the moisture content of the fuel, the efficiency of combustion, and the weather. Public health impacts associated with wildfire include difficulty in breathing, odor, and reduction in visibility.

Wildfire may also threaten the health and safety of those fighting the fires. First responders are exposed to the dangers from the initial incident and after-effects from smoke inhalation and heat stroke.

13.5.2 Property

Loss estimations for the wildfire hazard are not based on modeling utilizing damage functions, because no such damage functions have been generated. Instead, loss estimates were developed representing 10 percent, 30 percent and 50 percent of the assessed value of exposed structures. This allows emergency managers to select a range of economic impact based on an estimate of the percent of damage to the general building stock. Damage in excess of 50 percent is considered to be substantial by most building codes and typically requires total reconstruction of the structure. Table 13-3 lists the loss estimates for the exposed building stock.

Table 13-3. Potential Loss Estimates for the Wildfire Hazard

	Building Count	Assessed Value	10% Damage	30% Damage	50% Damage
Residential	9,792	$4,811,813,630	$481,181,363	$1,443,544,089	$2,405,906,815
Commercial	322	$2,309,864,426	$230,986,443	$692,959,328	$1,154,932,213
Industrial	108	$365,734,419	$36,573,442	$109,720,326	$182,867,209
Agricultural	0	$0	$0	$0	$0
Religion	5	$33,408,645	$3,340,865	$10,022,594	$16,704,323
Government	52	$79,624,825	$7,962,482	$23,887,447	$39,812,412
Education	59	$175,116,040	$17,511,604	$52,534,812	$87,558,020
Total	**10,338**	**$7,775,561,985**	**$777,556,198**	**$2,332,668,595**	**$3,887,780,992**

13.5.3 Critical Facilities and Infrastructure

Critical facilities of wood frame construction are especially vulnerable during wildfire events. A detailed vulnerability analysis for all critical facilities is on file with City staff and will not be published for review due to security reasons.

In the event of wildfire, there would likely be little damage to most infrastructure. Most roads and railroads would be without damage except in the worst scenarios. Power lines are the most at risk from wildfire because most poles are made of wood and susceptible to burning. Fires can create conditions that block or prevent access and can isolate residents and emergency service providers. Wildfire typically does not have a major direct impact on bridges, but it can create conditions in which bridges are obstructed. Many bridges in areas of high to moderate fire risk are important because they provide the only ingress and egress to large areas and in some cases to isolated neighborhoods.

13.6 FUTURE TRENDS IN DEVELOPMENT

Roseville is expected to grow considerably in the next 10 years. The moderate potential for wildfire in Roseville is not likely to lessen or prohibit development in Roseville.

The wildfire risk exposure with in the planning area increased by 54% at an increase in value of over $3 billion dollars. This increase in risk exposure can be attributed to the vast extent and location of the moderate fire severity zone within Roseville, and a population growth rate of 14.5% over the performance period of the prior plan. The planning area also saw in increase in assessed valuation of real property of over 34%. This increase in value can be attributed to the continued economic recovery from the 2008 economic down turn that had a significant impact on the State of California as well as the City of Roseville. Any increase in asset value will increase risk quotient when risk is being measured by looking at assets exposed as is with this Plan. However, the vulnerability of this new exposure should be considered to be low due to the application of strong building code standards that are contained within the California Fire Code.

13.7 REVIEW OF EXISTING PROGRAMS, PLANS AND ORDINANCES

The City of Roseville and Roseville Fire Department have adopted a number of policies, programs, plans and ordinances to meet the following fire protection goals detailed in the Roseville General Plan:

- Protect against the loss of life, property, and the environment by appropriate prevention and suppression measures.
- Provide emergency services in a well-planned, cost-effective, and professional manner through the best use of equipment, facilities and training available.

13.7.1 Fire Prevention Programs and Standards

Roseville Fire Prevention

Roseville fire prevention includes the fire marshal, hazardous materials officer, two senior fire inspectors, four fire inspectors and one public safety community relations coordinator (shared with the Police Department). The key role of these staff members is improving the safety and quality of life of the citizens of Roseville.

The Roseville Fire Department has an extensive work program to promote and implement fire prevention in developed and undeveloped areas of the City. These programs promote or provide the following services:

- Regular inspection and code enforcement
- Fire-safe roofing requirements
- Adequate access to and fire breaks adjoining open space areas
- Early warning devices such as automatic detection and reporting devices and smoke detectors
- Automatic fire suppression systems such as fire sprinkler systems
- Public education and information
- Code and ordinance development and updates
- Training and planning
- Fire investigation and data analysis
- Hazardous materials process and inspection.

Development Review Process

Section 16.16.050 of the Roseville Municipal Code specifies that all development plans be reviewed and approved by the Roseville Fire Department prior to construction. The code section states the following:

> "…complete plans, specifications, and information for new construction, remodeling, tenant improvements, or additions to buildings shall be submitted for review and approval prior to construction to the Chief or his/her designated representative having jurisdiction. Plan approval shall be required prior to the issuance of a Fire Department Inspection Record Card for those instances where such card may be

required. In addition to the submittal of hard copy plan sets, a digitized copy of the approved drawings for new buildings shall be submitted to the Fire Department for pre-fire documentation purposes. Said copy shall be submitted in an approved format."

The Roseville Fire Department is an integral part of the development planning and review process, with specific emphasis on the provision of access to lands for firefighting purposes, street access to all structures, fire prevention programs, and the enforcement of building and fire codes and City ordinances. The Fire Department also evaluates water supply for firefighting and fire suppression systems.

California Building Code

Roseville Municipal Code Title 16 has been adopted to enforce the 2013 California Building Code for all construction in the City. Roofing and building materials, construction techniques, wiring standards, and fire detection/warning devices are defined and enforced to minimize the risk of structural fire damage.

California Fire Code

Chapter 16.16 of the Roseville Municipal Code includes adoption of, reference to and amendments to the Uniform Fire Code. Last amended in 2013, the code provides specifications and standards for fire safety. Early warning devices such as automatic sprinkler systems, automatic detection and reporting devices, and smoke detectors are required as preventative measures to reduce the risk of fire. The code also states the amount of water needed for fire protection.

Weed Abatement Ordinance

Chapter 9.20 of the Roseville Municipal Code includes provisions for the abatement of weeds, dirt, rubbish, and rank growths. The ordinance specifies that weeds be eradicated by property owners to prevent the presence of fire fuels. Properly implemented, the ordinance ensures accessibility of firefighters to open space areas and creation of firebreaks that slow the spread of fire.

13.7.2 Adopted Service Levels for Response Time

Specific Plans

Roseville's specific plan process is used by the Fire Department to plan future fire station locations and response times based on the circulation systems, and to ensure that revenues from the Fire Service Construction Tax and General Fund are sufficient to provide fire protection services to the area and cumulatively city-wide. The Fire Department is involved in every specific plan process from the initial planning process to adoption, construction, and ongoing inspections.

Should there be significant fire-related concerns, the Fire Department may require supplemental analysis as a condition of the specific plan. For example, a mitigation measure for adoption of the Stoneridge Specific Plan required the preparation of the Stoneridge Plan Wildfire Safety Plan. The Safety Plan analyzes the factors contributing to the risk of wildfire in Stoneridge and mitigation measures to enhance fire prevention.

Capital Improvement Program

The Capital Improvement Program is a five-year plan updated annually with the City's fiscal year budget that includes all public projects under construction and planned within the five-year time frame. The Capital Improvement Program allocates funds from each of the revenue sources collected to pay for City facilities, services, and programs. Fire Department stations and apparatus are included in the Capital Improvement Program along with the status of the Fire Service Construction Tax current and projected revenues to ensure that fire stations are built and apparatus is procured to keep pace with development.

Fire Service Construction Tax

The Fire Service Construction Tax, approved by Roseville voters in 1984, requires that 1/2 percent of the value of any new construction be collected as part of the building permit fee and designated for fire suppression and protection. The funds must be spent on capital improvements such as fire stations, fire apparatus, and other Fire Department equipment. The funds may not be allocated to expenses such as salaries or training. The City's newer Specific Plan Areas include provisions that extend this tax collection to the buildout of each Plan Area.

Dedications, Fees, and Exactions

The City of Roseville, through the specific plan process, and if necessary as part of individual project approvals, requires the dedication of property and payment of fees or exactions. The Fire Department reviews the project proposals and may require dedication of land or payment of appropriate fees and exactions to help offset municipal costs for fire-related facilities and services. The City of Roseville requires the dedication of fire station sites through the specific plan process. Should revenues be deemed insufficient to fully support fire services, additional assessments may be required to ensure adequate protection in the future. For example, recent specific plans through development agreements require owners to pay a special assessment for public safety, including fire protection, as part of their annual property tax bills.

Water System Master Plan

The City of Roseville Environmental Utilities Department maintains and updates a distribution system model to ensure adequate water sources, quantities and water pressure, along with emergency backup systems to ensure maximum firefighting capacity.

Interagency Agreements

The City of Roseville Fire Department participates in the statewide mutual aid agreement, whereby the Fire Department will respond to any other department or district should the need arise. In addition, the Department maintains mutual aid agreements with other agencies, including agreements through Cal OES Mutual Aid Region IV and the Placer County Operational Area.

13.7.3 Annual Monitoring of Fire Department Service Levels

Program Performance Measures

The Roseville Fire Department compiles program performance measures as part of the City's annual budget to monitor service levels and address deficiencies before they become serious. The annual evaluation includes establishment of goals and objectives, formulation of key indicators relating to activities, and efficiencies that can be monitored throughout the year, along with a line item cost for the programs and objectives. The Fire Department budget and program performance measures include a review of fire service levels and department goals.

National Fire Incident Reporting System

The National Fire Incident Reporting System requires local fire departments to report fire service data. Performance indicators are routinely reviewed to evaluate capability and coverage, demand for service and trends. Key components of the system include GIS and mapping, fire incident reporting, emergency medical management, personnel and training management, inspection management, and equipment and supplies inventory management. Fire Department incident data are input into a computer database and submitted to the State Fire Marshal's Office per state standards. The data are also used by the City of Roseville to evaluate operations and track trends in fire service within the City.

13.7.4 Personnel Training

The Roseville Fire Department Training program includes dedicated staff and facilities to ensure that personnel are properly trained and updated as new techniques and equipment become available. The Fire Training staff provides training for all firefighters within the department at the City's state of the art training center (Figure 13-5). This training is the most important ingredient to the readiness of Roseville firefighters and emergency responders to fulfill their assigned mission. The Training Center is also used by other fire departments and local agencies on a fee-for-use basis. The training staff consists of one fire training officer.



Figure 13-5. City of Roseville Fire Training Center

13.7.5 Fire Investigation

Fires in the City of Roseville are investigated by Roseville Fire Department investigators. The program ensures proper investigation of the cause, origin, and circumstances of each fire; collects and preserves evidence; coordinates with authorities in detection, apprehension and prosecution of arsonists; and pursues each investigation to conclusion. Information is reported to the State Fire Marshal for inclusion in annual state reports.

13.7.6 Comprehensive Emergency Medical Services

The state requires a Multi-Hazard Function Plan that details response strategies for all types of emergencies. The plan addresses interagency cooperation, emergency functions, continuity of government, and public awareness. In addition, the plan provides for the operation of police, fire and health services, as well as transportation alternatives in the event of a multi-hazard emergency. The City's Emergency Plan conforms with the Standardized Emergency Management System and is approved by the City Council and Cal OES.

13.7.7 Accreditation Recommendation

The Commission on Fire Accreditation International provides a comprehensive system of fire and emergency service evaluation that helps local governments determine their risks and fire safety needs, evaluate the performance of the organizations involved and provide a method for continuous improvement. The self-assessment process covers 10 categories: governance and administration; assessment and planning; goals and objectives; financial resources; programs; physical resources; human resources; training and competency; essential resources; and external systems relations. Within these categories are several related performance indicators and core competencies that the agency must address. In completing the self-assessment process, agencies must develop a strategic or master plan as well as a standard of response coverage document.

The Roseville Fire Department staff spent more than four years on the self-assessment and preparing the materials for the accreditation. In June 2005 the Commission on Fire Accreditation International recommended accreditation for the Roseville Fire Department. Reaccreditation was obtained in 2010. Only 220 departments in the world are accredited, and only 16 in California.

13.8 SCENARIO

As the future growth of Roseville expands into wildland-urban interface areas, a wildfire in Roseville has the potential to cause significant damage to exposed areas. A major wildfire might begin with a wet spring, adding to fuels already present on the forest floor. Flashy fuels would build throughout the spring. The summer could see the onset of insect infestation. A dry summer could follow the wet spring, exacerbated by dry hot winds. Carelessness with combustible materials or a tossed lit cigarette, or a lighting storm could trigger a multitude of small isolated fires.

The embers from these smaller fires could be carried miles by hot, dry winds. The deposition zone for these embers would be deep in the forests and wildland-urban interface zones. Fires that start in flat areas move more slowly, but wind still pushes them. It is not unusual for a wild fire pushed by wind to burn the ground fuel and later climb into the crown and reverse its track. This is one of many ways that fires can escape containment, typically during periods when response capabilities are overwhelmed. These new small fires would likely merge. Suppression resources would be redirected from protecting the natural resources to saving remote subdivisions.

The worst-case scenario would include an active fire season throughout the American west, spreading resources thin. Firefighting teams would be exhausted or unavailable. Many federal assets would be responding to other fires that started earlier in the season. While local fire districts would be useful in the wildland-urban interface areas, they have limited wildfire capabilities or experience, and they would have a difficult time responding to the ignition zones. Even though the existence and spread of the fire is known, it may not be possible to respond to it adequately, so an initially manageable fire can become out of control before resources are dispatched.

To further complicate the problem, heavy rains could follow, causing flooding and landslides and releasing tons of sediment into rivers, permanently changing floodplains and damaging sensitive habitat and riparian areas. Such a fire followed by rain could release millions of cubic yards of sediment into streams for years, creating new floodplains and changing existing ones. With forests removed from the watershed, stream flows could double.

Floods that had been expected every 50 years may occur every couple of years. With streambeds unable to carry the increased discharge because of increased sediment, floodplain elevations would increase.

13.9 ISSUES

The major issues for wildfire are as follows:

- Public education and outreach to people living in or near the fire hazard zones should include information about and assistance with mitigation activities such as defensible space, and advance identification of evacuation routes and safe zones.
- Wildfires could cause landslides as a secondary natural hazard.
- Climate change could affect the wildfire hazard.
- Future growth into wildland-urban interface areas should continue to be managed.
- The Fire Department needs to continue to train on wildland-urban interface type events.
- Expand the City's vegetation management activities. This would include enhancement through expansion of the target areas as well as additional resources.
- Expand certifications and qualifications for Fire Department personnel. Ensure that all firefighters are trained in basic wildfire behavior, basic fire weather, and that all company officer and chief level officers are trained in the wildland command and strike team leader level.

14. HUMAN HEALTH HAZARDS

14.1 GENERAL BACKGROUND

Human health hazards include transmittable diseases and environmental hazards such as extreme weather. The following sections describe commonly recognized human health hazards.

14.1.1 Influenza

Influenza, commonly called flu, is a viral infection that attacks the respiratory system. Epidemics of the flu typically occur in the fall and winter. The U.S. Centers for Disease Control and Prevention (CDC) estimates that the 2014-2015 flu season for California was moderately severe, with high levels of outpatient illness and influenza-associated hospitalizations, particularly among adults 65 and older. The California Department of Public Health received 42,812 reports of cases tested positive for influenza.

Laboratory-confirmed influenza-associated deaths among patients under 65 have been reportable in California since the 2009 influenza pandemic. For the 2014-2015 flu season, there were 78 fatal cases of influenza-related illness statewide among those under 65. This number is significantly down from the 404 fatal cases during the 2013-2014 influenza season.

H1N1

In April 2009, the World Health Organization (WHO) issued a health advisory on an outbreak of influenza-like illness caused by a new subtype of influenza A (A/H1N1) in Mexico and the United States.

The disease spread rapidly, with the number of confirmed cases rising to 2,099 by May 7, despite aggressive measures taken against the disease by the Mexican government. On June 11, the WHO declared an H1N1 pandemic, marking the first global pandemic since the 1968 Hong Kong flu. On October 25, the U.S. declared H1N1 a national emergency. On August 10,

DEFINITIONS

Anthrax—A disease caused by the bacteria *Bacillus anthracis*. Most forms of the disease are lethal, and it affects both humans and other animals. There are effective vaccines against anthrax, and some forms of the disease respond well to antibiotic treatment.

Epidemic—The spread of an infectious disease beyond a local population, reaching people in a wider geographical area. Several factors determine whether an outbreak will become an epidemic: the ease with which the disease spreads from vectors, such as animals, to people and the ease with which it spreads from person to person.

Influenza—A viral infection that attacks the respiratory system; commonly called flu.

H1N1 "Swine Flu"—A subtype of the Influenza A virus that has mutated into various strains including the Spanish Flu strain, mild human flu strains, endemic pig strains, and various strains found in birds.

H5N1/H7N9 "Bird Flu"—A subtype of the Influenza A virus that causes the flu commonly known as "avian influenza" or "bird flu.

Pandemic—A worldwide epidemic.

Vector—An organism (such as an insect or rodent) that transmits pathogens that cause disease

Vector-Borne Illness—Diseases transmitted to people from insects and other animals. These include, but are not limited to, Hanta Virus, Plague, Tularemia, Lyme Disease, West Nile Virus and the Zika Virus.

Viral Hemorrhagic Fever (VHF)—A group of illnesses caused by a viral infection (usually restricted to a specific geographic area) resulting in fever and gastrointestinal symptoms followed by capillary hemorrhage. These include, but are not limited to, Ebola, Dengue Fever and Yellow Fever.

Severe Acute Respiratory Syndrome (SARS)—An infectious respiratory illness characterized by fever, dry cough, and breathing difficulties, often accompanied by headache and body aches; believed to be caused by a coronavirus.

Smallpox—An infection caused by the variola virus, a member of the poxvirus family. Throughout history, smallpox has been responsible for epidemics that resulted in large numbers of deaths. The last outbreak was in 1977. The disease was declared eradicated in 1980.

2010, the WHO International Health Regulations Emergency Committee declared an end to the 2009 H1N1 pandemic globally.

H1N1 viruses and seasonal influenza viruses are co-circulating in many parts of the world. It is likely that the 2009 H1N1 virus will continue to spread for years to come, like a regular seasonal influenza virus.

H5N1/H7N9

The highly pathogenic H5N1avian influenza virus is an influenza A subtype that occurs mainly in birds, causing high mortality among birds and domestic poultry. Outbreaks of highly pathogenic H5N1 among poultry and wild birds are ongoing in a number of countries.

H5N1 virus infections of humans are rare and most cases have been associated with direct poultry contact during poultry outbreaks. Rare cases of limited human-to-human spread of H5N1 virus may have occurred, but there is no evidence of sustained human-to-human transmission. Nonetheless, because all influenza viruses have the ability to change and mutate, scientists are concerned that H5N1 viruses one day could be able to infect humans more easily and spread more easily from one person to another, potentially causing another pandemic.

While the H5N1 virus does not now infect people easily, infection in humans is much more serious when it occurs than is infection with H1N1. More than half of people reported infected with H5N1 have died. Figure 14-1 summarizes human cases of the virus through 2013.

Source: World Health Organization

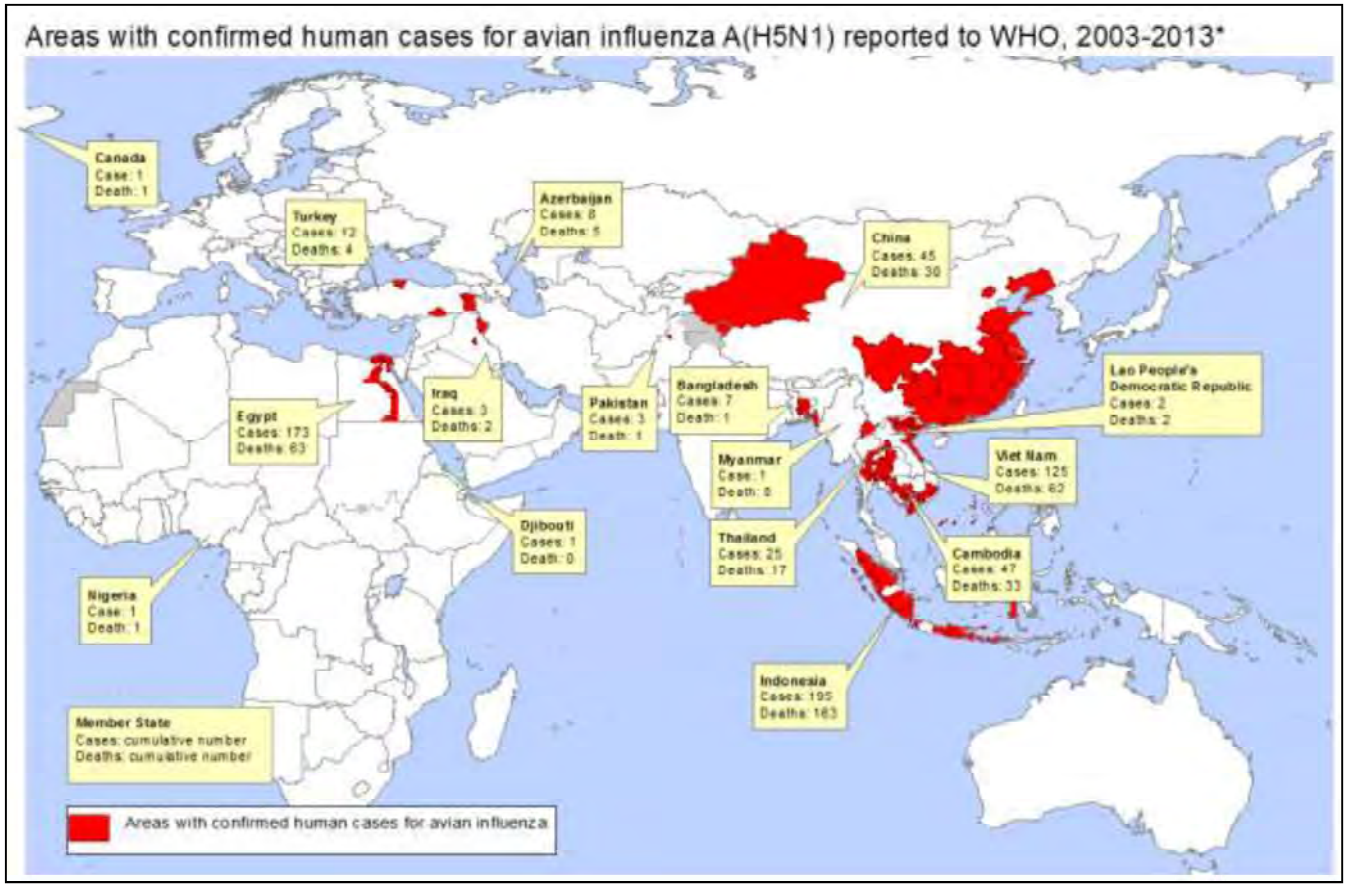


Figure 14-1. Areas with Confirmed H5N1 2003-2013

Infections in humans and poultry by a new avian influenza A virus (H7N9) continue to be reported in China. While mild illness in human cases has been seen, most patients have had severe respiratory illness and some have died. The only case identified outside of China was recently reported in Malaysia.

Source investigation by Chinese authorities is ongoing. Many of the people infected with H7N9 are reported to have had contact with poultry. However some cases reportedly have not had such contact. Close contacts of confirmed H7N9 patients are being followed to determine whether any human-to-human spread of H7N9 is occurring. No sustained person-to-person spread of the H7N9 virus has been found at this time. However, based on previous experience with avian flu viruses, some limited human-to-human spread of this the virus would not be surprising.

As of the publication of this document, H5N1 and the new H7N9 virus have not been detected in people or birds in the United States

14.1.2 Smallpox

Smallpox is a sometimes fatal infectious disease. There is no specific treatment, and the only prevention is vaccination. Symptoms include raised bumps on the face and body of an infected person. The oldest evidence of smallpox was found on the body of Pharaoh Ramses V of Egypt who died in 1157 BC.

Outbreaks have occurred from time to time for thousands of years, but the disease is now eradicated after a successful worldwide vaccination program. The last case of smallpox in the United States was in 1949. The last naturally occurring case in the world was in Somalia in 1977. As of the publication of this document, there are no cases of smallpox in the world. Currently only two locations in the world have samples of smallpox: the CDC in Atlanta and the Ivanovsky Institute of Virology in Russia.

After the disease was eliminated, routine vaccination among the general public was stopped. Therefore, any cases of smallpox in the world would be considered an immediate international emergency. In 2003, the Wisconsin Division of Public Health conducted an investigation of state residents who became ill after having contact with prairie dogs. The cases appeared in May and June of 2003, and symptoms in the human cases included fever, cough, pox-like rash and swollen lymph nodes. CDC laboratory test results indicated that the cause of the human illness was Monkeypox, an orthopox virus that could be transmitted by prairie dogs. This outbreak, and the potential use of smallpox as a weapon of bioterrorism, brought the fear of smallpox back to the forefront of the population. A detailed nationwide smallpox response plan created at the end of 2002 is designed to quickly contain a potential outbreak and vaccinate the population.

14.1.3 Viral Hemorrhagic Fevers

Viral hemorrhagic fevers (VHFs) are a group of illnesses caused by several distinct families of viruses. VHF describes a multisystem syndrome (multiple systems in the body are affected). Characteristically, the overall vascular system is damaged and the body's ability to regulate itself is impaired. These symptoms are often accompanied by hemorrhage (bleeding); however, the bleeding itself is rarely life-threatening. While some types of hemorrhagic fever viruses can cause relatively mild illnesses, many cause severe, life-threatening disease.

The viruses that cause VHFs are distributed over much of the globe. However, because each virus is associated with one or more particular host species, the virus and the disease it causes are usually seen only where the host species live. Some hosts, such as the rodent species carrying several of the New World arenaviruses, live in geographically restricted areas. Therefore, the risk of getting VHFs caused by these viruses is restricted to those areas. Other hosts range over continents, such as the rodents that carry viruses that cause the hantavirus pulmonary syndrome in North and South America, or the rodents that carry viruses that cause hemorrhagic fever with renal syndrome in Europe and Asia.

Ebola

The 2014 Ebola virus outbreak was unprecedented in geographical reach and impact on health care systems across the globe. This was the largest and deadliest Ebola virus outbreak ever recorded. It was the first time the West African countries of Guinea, Liberia, Sierra Leone, Nigeria, Mali, and Senegal saw the virus. Ebola is more common in Central African countries, such as the Democratic Republic of Congo and Sudan, where it was first discovered in 1976. It was also the first time that Ebola made it to the United States and Europe, prompting world-wide preparedness and response efforts. Figure 14-2 shows areas that ultimately were affected. The outbreak was closely monitored and traveler screenings were developed for those returning from West Africa.

Source: World Health Organization

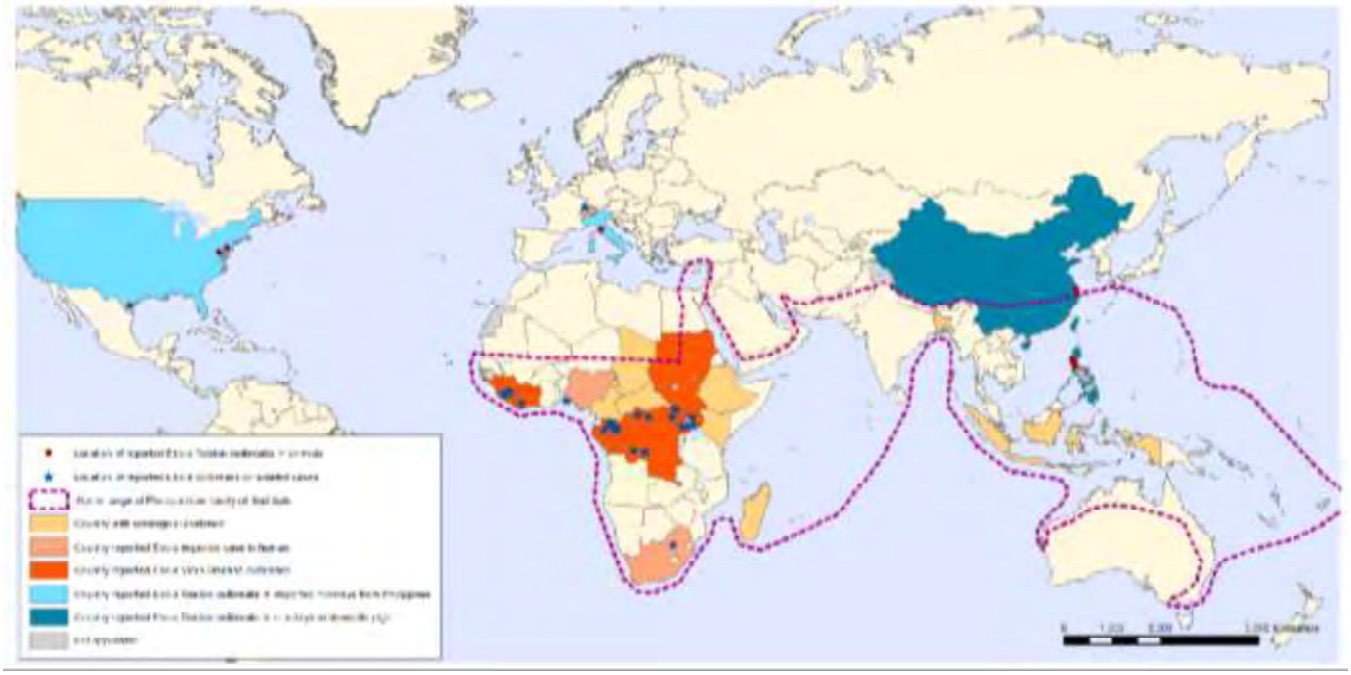


Figure 14-2. 2014 Distribution of Ebola Virus Outbreaks in Humans and Animals

In August 2014 two U.S. healthcare workers returned to the United States for treatment for Ebola. The case that most impacted the health care system in the United States was a patient diagnosed with Ebola in Dallas, Texas who died due to Ebola in October 2014. The nurse who provided care for him later tested positive for Ebola. This caused responses across the country from hospitals, emergency medical teams, fire departments and public health agencies to enhance isolation precautions, develop emergency policies, train with personal protective equipment and conduct multi-agency emergency exercises in case the spread of Ebola became a pandemic.

Before the 2014 outbreak, only 2,200 cases of Ebola had been recorded and 68 percent were fatal. Twenty percent of new Ebola infections were linked to burial traditions in which family and community members wash and touch dead bodies before burial. In Guinea, 60 percent of Ebola infections were linked to traditional burial practices. From 2014 to the publishing of this document, there have been no confirmed cases of Ebola in California.

Hantavirus

Hantavirus is a rodent-borne disease and one of the most important in California. It was discovered in 1993 in the southwestern U.S., and it has determined that the disease had been present, but unrecognized, at least as early as 1959. It has now been identified in over half of the states of the U.S. In 2013, seven cases of Hantavirus occurred in Yosemite National Park. Hantavirus has also been detected in the local Sierra Nevada region.

The hantavirus spreads when individuals touch or eat something contaminated with infected rodent urine, droppings or saliva. It can also be transmitted through aerosolization, which occurs when dried materials contaminated by infected rodent droppings or saliva are disturbed and brought up into the air and inhaled. Infected persons first develop symptoms one to two weeks, and up to five weeks, after exposure. Early symptoms include fever, headache, and muscle aches, especially in the thighs, hips, back, and shoulders. Other early symptoms include dizziness, chills, nausea, vomiting, diarrhea, and abdominal pain. After two to seven days of these symptoms, patients develop breathing difficulties that range from cough and shortness of breath to severe respiratory failure. Approximately 40 percent of hantavirus patients die from the disease.

From 2011 to the publishing of this document there have been 16 cases of hantavirus in California, including one case in Placer County.

14.1.4 Plague

Plague is a potentially fatal infectious disease of animals and humans caused by the *Yersinia pestis* bacterium. People usually get plague from being bitten by a flea that is carrying the plague bacterium or by handling an infected animal. Today, modern antibiotics are effective against plague, but if an infected person is not treated promptly, the disease is likely to cause illness or death.

Plague is an ancient disease but outbreaks throughout the world continue. Major plague epidemics occurred in the middle of the sixth century in Egypt, Europe and Asia; during the 14th century in Europe, following caravan routes; in the 18th century in Austria and the Balkans; and in the late 19th century worldwide (but mostly in China and India). Manchuria in 1910–1911 witnessed about 60,000 deaths due to pneumonic plague with a repeat in 1920–1921. A minor outbreak occurred as recently as the summer of 1994 in Surat, India, closely following an earthquake in September 1993. Globally, the WHO reports 1,000 to 3,000 cases of plague every year. Monitoring of mammals routinely occurs in California to mitigate potential plague (see Figure 14-3).

In North America, plague is found in certain animals and their fleas from the Pacific Coast to the Great Plains, and from southwestern Canada to Mexico. The last urban plague epidemic in the United States occurred in Los Angeles in 1924-25. Since then, human plague in the U.S. has occurred as mostly scattered cases in rural areas (an average of 10 to 15 persons each year per the CDC). Most human cases in the United States occur in northern New Mexico, northern Arizona, southern Colorado, California, southern Oregon, and far western Nevada.

From 2011 to the publishing of this document, there has been one case of plague in California, which occurred in Yosemite National Park.

14.1.5 Tick-Borne Disease

Ticks are small, insect-like creatures most often found in naturally vegetated areas. They feed by attaching to animals and humans, sticking their mouthparts into the skin, and sucking blood for up to several days. Ticks do not fall from trees, jump or fly. Most species are found on wild grasses and low plants. Adult ticks wait at the ends of grass or other foliage for a host to brush by so they may attach. Sometimes ticks carry bacteria or viruses that can be transmitted to a person while the tick is attached and feeding. There are 47 species of ticks in California, but only eight are known to commonly bite humans:

- Western blacklegged tick (*Ixodes pacificus*)
- American dog tick (*Dermacentor variabilis*)
- Pacific Coast tick (*Dermacentor occidentalis*)
- Wood tick (*Dermacentor andersoni*)
- Brown dog tick (*Rhipicephalus sanguineus*)
- *Ornithodoros hermsi*
- *Ornithodoros parkeri*
- *Ornithodoros coriaceus.*

Source: California Department of Public Health

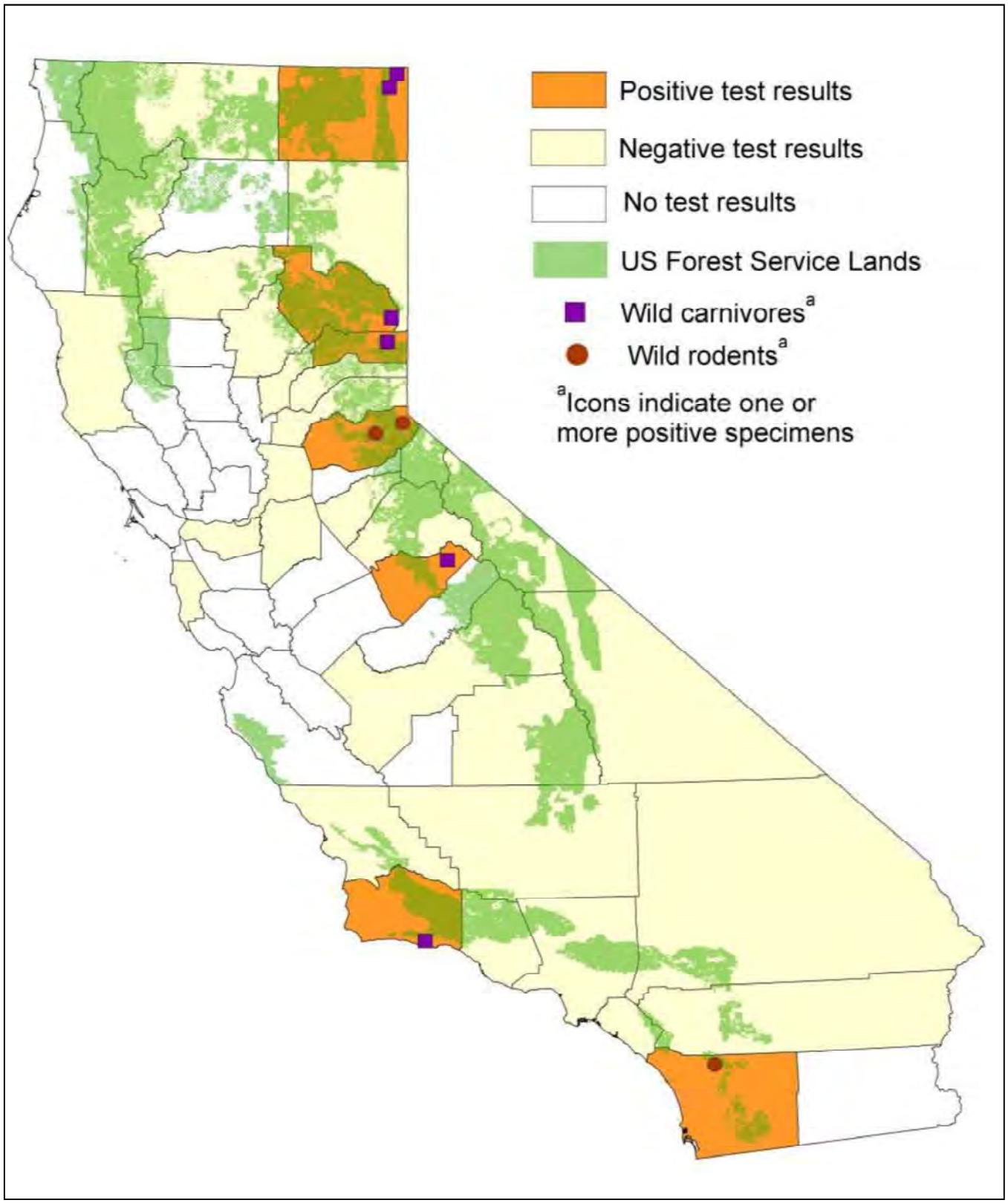


Figure 14-3. California 2014 *Yersinia Pestis* Results in Tested Mammals by County

Tularemia

Tularemia, named after Tulare County in California where it was first described in 1911, is a tick-borne disease of animals and humans caused by the bacterium *Francisella tularensis*. Tularemia is similar to plague, but is typically spread differently. While plague is usually spread to humans by fleas, humans usually become infected with Tularemia by tick and deer fly bites, skin contact with infected animals, ingestion of contaminated water or meat, or inhalation of contaminated dusts or aerosols. Symptoms vary depending upon the route of infection.

Rabbits, hares, and rodents are especially susceptible and often die in large numbers during outbreaks. Although Tularemia can be life-threatening, most infections can be treated successfully with antibiotics. Steps to prevent Tularemia include use of insect repellent, wearing gloves when handling sick or dead animals, and not mowing over dead animals. In the United States, naturally occurring infections have been reported from all states except Hawaii. From 2011to the publishing of this document there have been 11 cases of Tularemia in California.

Lyme Disease

Lyme disease, named after the city in Connecticut where it was first identified in 1975, is a tick-borne disease caused by the bacterium *Borrelia burgdorferi,* which normally lives in mice, squirrels and other small animals. It is transmitted among these animals and to humans through the bites of certain species of ticks. In the northeastern and north-central United States, the black-legged tick (or deer tick, *Ixodes scapularis*) transmits Lyme disease. In the Pacific coastal United States, the disease is spread by the western black-legged tick (*Ixodes pacificus*). Other major tick species found in the United States have not been shown to transmit the disease.

Typical symptoms include fever, headache, fatigue, and a skin rash. If left untreated, infection can spread to joints, the heart, and the nervous system. Lyme disease is diagnosed based on symptoms, physical findings (e.g., rash), and the possibility of exposure to infected ticks. Laboratory testing is helpful in later stages of the disease. Most cases of Lyme disease can be treated successfully with a few weeks of antibiotics. Steps to prevent Lyme disease include using insect repellent, removing ticks promptly, landscaping, and integrated pest management. The ticks that transmit Lyme disease can occasionally transmit other tick-borne diseases as well. From 2011 to the publishing of this document, there have been 458 cases of Lyme disease in California.

Rocky Mountain Spotted Fever

Rocky Mountain spotted fever is a potentially fatal tick-borne disease caused by the bacterium *Rickettsia rickettsii*. It is transmitted to humans by the bite of an infected American dog tick (*Dermacentor variabilis*), Rocky Mountain wood tick (*Dermacentor andersoni*), or brown dog tick (*Rhipicephalus sanguineus)*.

Typical symptoms include fever, headache, abdominal pain, vomiting, and muscle pain. A rash may also develop, but is often absent in the first few days, and in some patients, never develops. Rocky Mountain spotted fever can be a severe or even fatal illness if not treated in the first few days of symptoms. It can be treated successfully with a few weeks of antibiotics. Steps to prevent the disease include using insect repellent, removing ticks promptly, landscaping, and integrated pest management. The ticks that transmit Rocky Mountain spotted fever can occasionally transmit other tick-borne diseases as well. From 2011to the publishing of this document there have been 44 cases of Rocky Mountain spotted fever in California.

14.1.6 Mosquito-Borne Disease

Many of the 48 species of mosquitoes in California can carry disease. The City of Roseville actively supports the Placer County public outreach campaign and task force about the potential for mosquito-borne disease.

Malaria

Malaria is a sometimes fatal mosquito-borne disease caused by a parasite that commonly infects the *Anopheles* mosquito, which feeds on humans. People who contract malaria are typically very sick with high fevers, chills, and flu-like illness. Although malaria can be fatal, illness and death can usually be prevented.

On average 1,500 cases of malaria are diagnosed in the United States each year. The vast majority are in travelers and immigrants returning from countries where malaria transmission occurs, many from sub-Saharan Africa and South Asia. Although rare, cases of malaria have been reported in California. In many temperate areas, such as western Europe and the United States, economic development and public health measures have succeeded in eliminating malaria. However, most of these areas have *Anopheles* mosquitoes that can transmit malaria, and reintroduction of the disease is a constant risk.

Individuals in areas with malaria need to reduce their likelihood of being bitten by mosquitoes. Screens on windows and doors should be examined to confirm that they are in good repair. Repellents containing 20 to 30 percent DEET should be applied to exposed skin and clothing to keep mosquitoes from biting. From 2011to the publishing of this document there have been 44 cases of malaria in California.

West Nile Virus

West Nile virus (WNV) is a potentially serious mosquito-borne that may affect residents in the planning area. Experts believe WNV is established as a seasonal epidemic in North America that flares up in the summer and continues into the fall. WNV is a recent disease to affect California. Mosquitoes transmit the virus to birds, livestock and humans. As of January 2016, human-infection cases of the virus had been reported in all states of the continental U.S. except West Virginia, New Hampshire and Vermont, and those states had reported non-human infections. The Placer County West Nile Virus Task Force has had a strong and active role in the community since WNV arrived in 2004.

According to the CDC, approximately 80 percent of people who are infected with WNV will show no symptoms. Up to 20 percent have symptoms such as fever, headache, and body aches, nausea, vomiting, and sometimes swollen lymph glands or a skin rash on the chest, stomach and back. Symptoms can last for as short as a few days, though even healthy people have become sick for several weeks. About 1 percent of people infected with WNV will develop severe illness, with symptoms that can include high fever, headache, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, vision loss, numbness and paralysis. These symptoms may last several weeks, and neurological effects may become permanent. There is no specific treatment for WNV infection. In more severe cases, people may need to go to the hospital where they can receive supportive treatment including intravenous fluids, help with breathing and nursing care.

Individuals in areas with WNV need to reduce their likelihood of being bitten by mosquitoes. Screens on windows and doors should be examined to confirm that they are in good repair. Repellents containing 20 to 30 percent DEET should be applied to exposed skin and clothing to keep mosquitoes from biting.

From 2011 to the publishing of this document there have been 2,811 cases of WNV in California. Of those, 36 were from Placer County. Between 2005 and 2015, there were 5,205 cases of WNV in California, and Placer County had 82 cases, an average of 7.45 cases per year. Due to proactive mitigation of the hazard with mosquito abatement and education efforts, the number of confirmed cases has trended down. The first year the tracking began, there were 35 human cases of WNV in Placer County. In 2015, there were none. The agricultural nature of Placer County, with the potential for standing water to be present throughout the County, continues to put the planning area at risk from WNV and other mosquito-borne illnesses.

Dengue Fever

Dengue is a mosquito-borne disease caused by any of four closely related dengue viruses (DENV-1, DENV-2, DENV-3 and DENV-4). People get dengue from the bite of an infected mosquito. The mosquito becomes infected when it bites a person who has dengue virus in their blood. It takes a week or more for the dengue virus to replicate in the mosquito; then the mosquito can transmit the virus to another person when it bites. Dengue is transmitted by yellow fever mosquito (*Aedes aegypti)* and the Asian tiger mosquito *(Aedes albopictus)*. These mosquitoes are not native to California, but infestations have been reported in multiple counties in California. Dengue virus cannot be transmitted from person to person.

The main symptoms of dengue are high fever, severe headache, severe pain behind the eyes, joint pain, muscle and bone pain, rash, bruising, and sometimes mild bleeding from the nose or mouth. Generally, younger children and those with their first dengue infection have a milder illness than older children and adults. Severe dengue typically begins with signs and symptoms similar to dengue. Rather than recover, severe dengue patients proceed to experience more bleeding, severe pain in the abdomen, respiratory distress, and fluid accumulation in the abdomen and around the lungs as the smallest blood vessels (capillaries) begin to leak. If not treated, severe dengue can result in death. There is no specific treatment for dengue infection. Rest and fluids are generally sufficient for persons with dengue. Severe dengue may require hospitalization and intensive medical care.

Individuals in areas with dengue need to reduce their likelihood of being bitten by mosquitoes. Screens on windows and doors should be examined to confirm that they are in good repair. Repellents containing 20 to 30 percent DEET should be applied to exposed skin and clothing to keep mosquitoes from biting. From 2011 to the publishing of this document there have been 483 cases of dengue fever in California, with three of the cases in Placer County.

Zika Virus

Zika is a mosquito-borne disease. The most common symptoms of Zika are fever, rash, joint pain, and conjunctivitis (red eyes). The illness is usually mild, with symptoms lasting for several days to a week after being bitten by an infected mosquito. People usually do not get sick enough to go to the hospital, and they rarely die of Zika. For this reason, many people might not realize they have been infected. However, Zika virus infection during pregnancy can cause a serious birth defect called microcephaly, as well as other severe fetal brain defects. Once a person has been infected, he or she is likely to be protected from future infections.

Zika virus is transmitted by yellow fever mosquito (*Aedes aegypti)* and the Asian tiger mosquito *(Aedes albopictus)*. These mosquitoes are not native to California, but infestations have been reported in multiple counties in California. An *Aedes* mosquito can only transmit Zika virus after it bites a person who has this virus in their blood. Thus far in California, Zika virus infections have been documented only in people who were infected while traveling outside the United States or through sexual contact with an infected traveler. Zika virus is not spread through casual contact, but can be spread by infected men to their sexual partners. There is a growing association between Zika and microcephaly (abnormally small head and brain) in newborns, as well as Zika and Guillain-Barré Syndrome, a disease affecting the nervous system. Studies are ongoing to further evaluate these associations. From 2015 to the publishing of this document there has been no local mosquito-borne transmission of Zika virus in California.

Chikungunya

Chikungunya (pronounced chik-en-gun-ye) is an infectious mosquito-borne disease with symptoms that typically include fever and severe joint pain. It is caused by the chikungunya virus, which is transmitted by yellow fever mosquito (*Aedes aegypti)* and the Asian tiger mosquito *(Aedes albopictus)*. These mosquitoes are not native to California, but infestations have been reported in multiple counties in California. An *Aedes* mosquito can only transmit chikungunya virus after it bites a person who has this virus in their blood. A person with chikungunya is

not contagious. As of the publication of this document, chikungunya infections have been documented only in persons who were infected while traveling outside the United States.

14.1.7 Anthrax

Anthrax is a disease caused by *Bacillus anthracis*, a bacterium that forms spores (a spore is a cell that is dormant but may come to life with the right conditions). There are three forms of anthrax:

- **Cutaneous—**The first symptom is a small sore that develops into a blister. The blister then develops into a skin ulcer with a black area in the center. The sore, blister and ulcer do not hurt.
- **Gastrointestinal—**The first symptoms are nausea, loss of appetite, bloody diarrhea, and fever, followed by bad stomach pain.
- **Inhalation—**The first symptoms of inhalation anthrax are like cold or flu symptoms and can include a sore throat, mild fever and muscle aches. Later symptoms include cough, chest discomfort, shortness of breath, tiredness and muscle aches.

Anthrax is a naturally occurring illness and isolated cases occur all over the world yearly. Humans can become infected with anthrax by handling products from infected animals or by breathing in anthrax spores from infected animal products (such as wool). People can become infected with gastrointestinal anthrax by eating undercooked meat from infected animals. Anthrax does occur in California, and animals have tested positive; however, there have been no positive human cases of anthrax in California in the last 10 years. Anthrax can be treated successfully with antibiotics.

Anthrax can be used as a weapon, as happened in the United States in 2001, when anthrax was spread through the postal system by sending letters with powder containing anthrax spores. This caused 22 cases of anthrax infection and brought anthrax back into the public eye. From 2011 to the publishing of this document there have no cases of anthrax in California.

14.1.8 Severe Acute Respiratory Syndrome

Severe Acute Respiratory Syndrome (SARS) is a viral respiratory illness caused by a coronavirus (SARS-CoV). SARS was first reported in Asia in February 2003. Over the next few months, the illness spread to more than two dozen countries in North America, South America, Europe, and Asia before the global outbreak was contained. According to the WHO, 8,098 people worldwide became sick with SARS during the 2003 outbreak and 774 died. In the United States, only eight people had laboratory evidence of SARS-CoV infection. All of these people had traveled to parts of the world where SARS was present. SARS did not spread more widely in the United States.

In general, SARS begins with a high fever, headache, an overall feeling of discomfort and body aches. Some people also have mild respiratory symptoms at the outset. About 10 percent to 20 percent of patients have diarrhea. After two to seven days, SARS patients may develop a dry cough. Most patients develop pneumonia.

The main way that SARS seems to spread is by close person-to-person contact. The virus that causes SARS is thought to be transmitted most readily by respiratory droplets produced when an infected person coughs or sneezes. Droplet spread can happen when droplets from the cough or sneeze of an infected person are propelled a short distance (generally up to 3 feet) through the air and deposited on the mucous membranes of the mouth, nose, or eyes of persons nearby. The virus also can spread when a person touches a surface or object contaminated with infectious droplets and then touches his or her mouth, nose, or eyes. It is also possible that the SARS virus might spread more broadly through the air or by other ways that are not now known.

As of May 2005, according to the CDC, there was no remaining sustained SARS transmission anywhere in the world. However, CDC has developed recommendations and guidelines to help public health and healthcare

officials plan for and respond quickly to the reappearance of SARS if it occurs again. Lessons learned from the SARS outbreak helped healthcare facilities and communities successfully plan and respond to the 2009 H1N1 pandemic. The California Health and Safety Code lists SARS among the communicable diseases that must be reported to health authorities. Placer County is authorized to collect records and data, initiate disease control measures, control property and manage persons (including isolation and quarantine) for containment of communicable disease. From 2011 to the publishing of this document there have no cases of SARS in California.

14.1.9 Extreme Weather

From 2006 to 2010, more people in the U.S. died from extreme heat or extreme cold than from hurricanes, tornadoes, floods and earthquakes combined.The western United States is subject to many weather extremes. Severe spring storms can lead to risk of traumatic injuries, mudslides, flooding and property damage. Extreme heat can lead to dehydration and heat-related illness. Severe winter weather can lead to risk of traumatic injuries, hypothermia and icy conditions.

Severe Spring Storms

Thunderstorms cause most of the severe spring weather. Tornados are rare in California but can occur. Since 2011, a total of 44 tornadoes have occurred in California, one of them in Placer County. When these events occur unexpectedly, the risk of injury and death increases. Advance planning can decrease the risks. Citizens should pay close attention to changing weather conditions when there is a severe thunderstorm watch or warning.

Lightning strikes are a danger during thunderstorms. A lightning bolt is 6 to 8 centimeters in diameter, carrying between 10 and 100 million volts in 20 to 50 thousand amps of direct current. The duration is approximately one millisecond. Volts of 2 billion and 500 thousand amps have been measured. A lightning strike can cause death or injury to one or several persons. Long-term injuries from lightning strike can include memory and attention loss, chronic numbness, muscle spasm, stiffness, depression, hearing loss and sleep disturbance. Seventy percent of all lightning injuries and fatalities occur in the afternoon; 85 percent of victims are children and young men (age 10 to 35) engaged in outdoor recreation and work activities. Hikers, campers, backpackers, skiers, fishermen, and hunters are especially vulnerable.

Extreme Heat

California, Nevada and Arizona experience very high temperatures during the summer. Those susceptible to extreme heat may suffer heat-related illnesses:

- **Heat Exhaustion—**Heat exhaustion is a mild form of heat-related illness that can develop after several days of exposure to high temperatures and inadequate or unbalanced replacement of fluids. It is the body's response to an excessive loss of the water and salt contained in sweat. Those most prone to heat exhaustion are elderly people, people with high blood pressure, and people working or exercising in a hot environment.
- **Heat Cramps—**Heat cramps usually affect people who sweat a lot during strenuous activity. This sweating depletes the body's salt and moisture. The low salt level in the muscles may be the cause of heat cramps. Heat cramps may also be a symptom of heat exhaustion.
- **Heat Stroke—**Heat stroke is a severe, dangerous form of heat-related illness. It occurs when the body's temperature rises rapidly, the sweating mechanism fails, and the body is unable to cool down. Body temperature may rise to 106°F or higher within 10 to 15 minutes. Heat stroke can cause death or permanent disability if emergency treatment is not provided. This is a medical emergency.

Heat has caused 9,000 deaths in the United States from 1979 to 2013. Air-conditioning is the number one protective factor against heat-related illness and death. If a home is not air-conditioned, people can reduce their risk for heat-related illness by spending time in public facilities that are air-conditioned.

The California Office of Emergency Services has a comprehensive contingency plan for excessive heat emergencies. The plan describes state operations during heat-related emergencies and provides guidance for state agencies, local government, and non-governmental organizations in the preparation of heat emergency response plans and related activities. Placer County has an emergency contingency plan and participates in the opening of local cooling centers if extreme heat continues for an extended period of time.

Severe Winter Weather

When winter temperatures drop significantly below normal, staying warm and safe can become a challenge. Extremely cold temperatures often accompany a winter storm, which may also cause power failures and icy roads. Staying indoors as much as possible can help reduce the risk of car crashes and falls on the ice, but cold weather also can present hazards indoors. Many homes will be too cold, either due to a power failure or because the heating system is not adequate for the weather. When people must use space heaters and fireplaces to stay warm, the risk of residential fires increases, as well as the risk of carbon monoxide poisoning.

Extreme cold can bring on health emergencies in susceptible people, such as those without shelter or who are stranded, or who live in a home that is poorly insulated or without heat:

- **Hypothermia—**When exposed to cold temperatures, the body begins to lose heat faster than it can be produced. Prolonged exposure to cold will eventually use up the body's stored energy. The result is hypothermia, or abnormally low body temperature. Body temperature that is too low affects the brain, making the victim unable to think clearly or move well. This makes hypothermia particularly dangerous because a person may not know it is happening and will not be able to do anything about it. Warning signs of hypothermia include shivering, exhaustion, confusion, fumbling hands, memory loss, slurred speech, drowsiness, bright red cold skin, and very low energy.
- **Frostbite—**Frostbite is an injury to the body caused by freezing of the tissues. Frostbite causes a loss of feeling and color in affected areas. It most often affects the nose, ears, cheeks, chin, fingers, or toes. Frostbite can permanently damage the body, and severe cases can lead to amputation. The risk of frostbite is increased in people with reduced blood circulation and among people who are not dressed properly for extremely cold temperatures. A victim is often unaware of frostbite until someone else points it out because the frozen tissues are numb. Signs of frostbite may be a white or grayish-yellow skin area, skin that feels unusually firm or waxy and numbness.

Infants and the elderly are particularly at risk to cold temperatures, but anyone can be affected. If extreme winter weather conditions are expected for an extended period, Placer County has an emergency contingency plan to provide shelter and care areas to provide heating centers for those in need. Preventive action is the best defense against having to deal with extreme cold-weather conditions. Preparing homes and cars in advance for winter emergencies, and observing safety precautions during times of extremely cold weather can reduce the risk of weather-related health problems.

14.2 HAZARD PROFILE

The severity of human health hazards is dependent upon the hazard and the population exposed to it. As the population increases, so does the risk of exposure to hazards. The key to reducing the disease hazard is isolation so that the exposed population does not continue to spread the hazard to the uninfected population. For disease and weather-related human health hazards, promoting education and personal preparedness will help to mitigate and reduce the severity of the hazard.

14.2.1 Past Events

Communicable Diseases

The following is a summary of recent disease outbreak events:

- In the United States during the 2009 H1N1 influenza pandemic, there were 59,979,608 confirmed cases of the disease, 270,435 people hospitalized due to the illness and 12,271 deaths. In California, there were 4,134 people hospitalized due to the illness and 596 deaths. In Placer County, there were 45 confirmed cases, with 5 deaths due to the illness. The pandemic was mild compared to the Spanish Flu pandemic of 1918, which caused 100 million deaths worldwide—a total of 3 percent of the world's total population.
- West Nile Virus arrived in Placer County in July 2004. The first case was diagnosed in September 2004. The 56-year old patient was recovering from meningitis in the hospital when the test came back positive for WNV. From 2011 to the publishing of this document there have been 2,811 cases of WNV in California, 36 of them in Placer County
- There were two confirmed cases of SARS in California during the worldwide outbreak in 2002-2003, none of them in Placer County.
- From 2011 to the publishing of this document there have been 458 cases of Lyme disease in California, 4 of them in Placer County.
- From 2011 to the publishing of this document there have been 16 cases of hantavirus in California, including one in Placer County.
- As of the publishing of this document, no cases of tularemia or plague have been reported in Placer County, but cases of these diseases have been reported in California and nearby counties. Even though these hazards may not be endemic to the area, they can be brought into the planning region and are still considered to be a risk.

Extreme Weather

The following is a summary of recent extreme weather events that threatened human health:

- From 2006 to 2010, excessive heat exposure caused 3,332 deaths in the United States.
- In July 2006, California experienced a heat wave impacting the entire state. Coroners attributed 140 deaths to hyperthermia, and it has been estimated from other data that more than 600 heat-related deaths may have occurred over a 17-day period.
- From 2006 to 2010, hypothermia caused 6,660 deaths in the United States.
- From 2006 to 2010, lightning strikes caused 657 deaths in the United States.

14.2.2 Location

It is difficult to map the extent of human-health hazards compared to others, such as floods, wildfires and dam failures. All of the City of Roseville Planning Area is susceptible to the human health hazards discussed in this chapter. While some hazards, such as the West Nile Virus and Lyme disease, can have a geographic presence within the planning area, other diseases can cause exposure to the planning area from outside the local region. Roseville residents who travel can become exposed to diseases while abroad and bring the diseases back with them, potentially placing the region at risk for exposure. Extreme weather poses an equal human health hazard across the City.

14.2.3 Frequency

Communicable Disease

Due to increased air travel, the growing population and the country's aging population, the probability of a communicable disease epidemic or pandemic is a growing threat. Certain human health hazards, such as influenza, can be expected seasonably, with variations on specific strains year to year. Additionally, tick-borne diseases are likely to increase during spring and fall, when people participate in outdoor activities such as hiking. The frequency of other health hazards is difficult to establish and depends largely on the unique circumstances surrounding a localized outbreak and its subsequent expansion into epidemics and eventually pandemics.

Extreme Weather

Trauma due to injuries directly due to storms (such as motor vehicle collisions and falls), heat related illness and hypothermia are a factor of the weather and in some cases a technological hazard.

14.2.4 Severity

The severity of the human health hazard varies from individual to individual. Typically, young children and older adults are more susceptible to acquiring communicable diseases due to developing or diminishing immune systems or experiencing adverse effects to extreme weather conditions. These populations often experience the most severe of symptoms, as their immune systems are not capable of fighting off infection or efficiently regulating temperature. In general, severity varies depending on the pathology of the disease, the health of the infected, and the availability of treatments for alleviating symptoms or curing the disease.

14.3 SECONDARY HAZARDS

Human health hazards are not like natural hazards that have measurable secondary impacts, such as earthquakes, floods or wildfires. The largest secondary impact caused by human health hazards would be economic. Large outbreaks of any human health hazard could reduce the work force significantly, causing businesses and agencies to close or be greatly impacted.

Another secondary impact could be stigmatization. The fear of the human health hazard and fear of the unknown could lead to isolation, violence and self-inflicted injury. Hospitals and health care providers could be overwhelmed with the "worried well" seeking care and comfort. Providing key and critical information can reduce and mitigate this secondary risk.

14.4 EXPOSURE AND VULNERABILITY

14.4.1 Population

All citizens in the Roseville planning area could be susceptible to the human health hazards discussed in this chapter. A large outbreak or epidemic, a pandemic or a use of biological agents as a weapon of mass destruction could have devastating effects on the population of Roseville.

West Nile Virus and other mosquito-borne illnesses are a significant concern in the local wetlands and west of Roseville in the flooded rice fields. A concentrated at-risk population is on the western border of the city limits near the rice fields where the mosquitoes breed.

While all of the population in the planning area is considered at risk to the human health hazards discussed in this chapter, the young and the elderly, those with compromised immune systems, and those with special needs are

considered the most vulnerable. The City has a large elderly community with a concentration of older residents in areas such as Sun City Roseville. The introduction of a disease such as the plague or influenza could rapidly impact those at risk.

14.4.2 Property

None of the health hazards discussed in this chapter would have significant measurable impact on the structural environment or property of the planning area.

14.4.3 Critical Facilities and Infrastructure

None of the health hazards discussed in this chapter would have significant measurable impact on the critical facilities or infrastructure of the planning area. However, health care facilities (including long-term care and clinics and even veterinary offices) have adopted the recommended "all-hazards" approach to preparedness and have prepared for the health hazards addressed in this chapter.

The acute care hospitals in Roseville have collaborated, trained and planned on a local, regional, state and national level to provide immediate and comprehensive medical care to the citizens of Roseville and the greater western Placer County population. Emergency management and preparedness planning incorporates all response disciplines (fire, law, first responder ground and air ambulance agencies, public health, mental and spiritual health). Planning includes identifying shelters, alternate treatment facilities, isolation capacity and methods to immediately expand physical and human resources.

14.4.4 Environment

None of the health hazards discussed in this chapter would have significant measurable impact on the environment of the planning area. While many of the vectors of the health hazards discussed in this chapter (mosquitoes, rodents, fleas, ticks and deer flies) rely on local or regional environments for their survival, the human health hazard that they carry or potentially transmit would have no significant measurable impact on the environment.

14.4.5 Economy

The economic impact of a human health hazard could be localized to a single region or population, or could be widespread. The impact could be significant, depending on the hazard, number of cases and the availability of resources to care for those affected by the hazard. Other financial impacts could be absorbed or managed by the organization affected.

14.5 FUTURE TRENDS IN DEVELOPMENT

The potential for communicable diseases, vector-borne diseases or extreme weather in Roseville and the planning area is not likely to lessen or prohibit growth or development in Roseville.

14.6 REVIEW OF EXISTING ORDINANCES, PROGRAMS AND PLANS

14.6.1 Hospital Expansions to Care for Growing Populations

Kaiser Permanente operates medical facilities in Roseville as follows:

- In October 1998, Kaiser Permanente opened a 116-bed hospital on Eureka Road adjacent to its medical offices. Since then, the hospital increased the number of beds to 166 (not including the Women's and

Children's Center). In addition to the hospital, comprehensive outpatient, primary, and specialty care services are offered, as well as education, pharmacy, laboratory, radiology, optical, EKG, and physical therapy services at three sites in Roseville.
- Kaiser opened a 75,000 square-foot medical office building in Lincoln in October 2006.
- In December 2008, a $52 million expansion project was completed that quadrupled the size of the Kaiser Roseville emergency room and doubled the number of beds. The radiology department was tripled in size and provided with high tech rooms with advanced diagnostic tools.
- Kaiser Roseville's Women's and Children's Center opened in January 2009 and includes 174 beds, neonatal and pediatric intensive care units, and a second medical office building.
- Kaiser Roseville is a certified Stroke and STEMI (heart attack) Receiving Center.
- Kaiser's Roseville Medical Center was named as a "Top Hospital" on the 2015 Leapfrog Top Hospitals listing—a voluntary program recognizing hospitals that demonstrate success in minimizing mortality rates for high-risk procedures and preventing medical errors.

Sutter Roseville Medical Center operates medical facilities in Roseville as follows:

- The current Sutter Roseville Medical Center campus opened in 1997 and provides comprehensive community health and trauma care for more than seven counties.
- Sutter Roseville Medical Center provides critical care, cardiology, neurology, pulmonary and orthopedic services, a dedicated cancer center, a Family Birth Center, a Neo Natal Intensive Care Unit, wound care, a 24-hour emergency department and the Sutter Rehabilitation Institute, a 55-bed acute rehabilitation center with accreditation from the Commission on Accreditation of Rehabilitation Facilities
- Sutter Roseville Medical Center is an accredited regional Level II trauma center and designated disaster/medical control facility, as well as a certified Stroke Receiving Center, STEMI (heart attack) Receiving Center and National Disaster Medical Systems hospital.
- Sutter Roseville is in the process of expanding its emergency department, intensive care and trauma neuro intensive care units and inpatient and outpatient surgery programs.
- In 2015, Truven Health Analytics named Sutter Health and Sutter Health's Valley Area, which includes Sutter Roseville Medical Center, as two of the nation's top five performers among large health care systems in its 15 Top Health Systems study.

Past and future expansion of these medical centers will enhance the capacity and services offered to treat illness and injury in Roseville and the surrounding region.

14.6.2 Memorandums of Agreement

The following memorandums of agreement enhance Roseville's ability to respond to the human health hazard:

- Sutter Roseville Medical Center has a memorandum of agreement with the Department of Quarantine, a division of the CDC, to provide isolation treatment in the event of a highly contagious and virulent disease.
- Sutter Roseville Medical Center has cooperative memorandums of agreement with Beale Air Force Base and the Placer County Department of Health and Human Services to provide assistance and care in disaster and mass casualty incidents.
- Since 2013 Sutter Roseville Medical Center has been a designated one of the nation's 1,500 National Disaster Medical Systems Hospital by the Department of Defense, Department of Health and Human Services and the Department of Veteran's affairs. This designation can provide the facility and the region more rapid care and assistance if a catastrophe strikes.

- Kaiser Roseville and Sutter Roseville Medical Center are coalition members with Placer County Public Health in the Healthcare Emergency Coalition to prepare, train and exercise to provide services in mass casualty situations.

14.6.3 Integrated Emergency Response

FEMA and the Joint Commission for Accreditation of Healthcare Organizations (JCAHO) expect acute care facilities to provide planning for an "all hazard" disaster response and care for mass casualties, whether the incidents and events are naturally occurring, human caused, or a combination of both. JCAHO requires the integration of emergency response planning with local response agencies, ensuring that the community will receive the highest level of integrated response and protection available. These planning efforts are supported by local, regional, state and federal grant funding.

14.7 SCENARIO

A human health worst-case scenario for the planning area would be an epidemic or large-scale incident of any of the human health hazards discussed in this chapter. Medical treatment facilities in the planning area would be overwhelmed and taxed beyond their capabilities as the numbers of patients escalates. The impacts on the workforce within the planning area could have acute and long-term economic impacts on the primary employers in the planning area. First responders would be exposed to the human health hazards, which could deplete the medical workforce and could have profound impact on the potential escalation of the scenario.

14.8 ISSUES

Important issues associated with the human health hazards include but are not limited to the following:

- Prevention through vaccination and personal emergency and disaster preparation will help to reduce the impacts of human health hazards.
- Medical and response personnel need to be integrated in a unified command to provide care when needed in response to human health hazards.
- Medical and response personnel must be adequately trained and supplied.
- Up-to-date and functional all-hazard contingency planning should be carried out.
- A system needs to be in place for informing the public with a unified message about the human health hazard.
- Health agencies and facilities require surge capacity management and adaptation to the rising number and needs of the region.

15. HUMAN-CAUSED HAZARDS

15.1 GENERAL BACKGROUND

Although the DMA does not require an assessment of human-caused hazards, The City of Roseville is including human-caused hazards in this hazard mitigation plan for the following reasons:

- The City takes a proactive approach to disaster preparedness, especially in an effort to protect the public safety of all citizens.
- Preparation for and response to a human-caused disaster will involve many of the same staff training, critical decisions, and commitment of resources as for a natural hazard.
- The multi-hazard mitigation planning effort is an opportunity to inform the public about all hazards, including human-caused hazards.
- The likelihood of a human-caused hazard in Roseville is greater than several of the identified natural hazards in this Plan.
- The City has a Terrorism Contingency Plan (June 2004) and a Hazardous Materials Contingency Plan (September 2004) already in place with instructions for a response by City of Roseville first responders and staff of the emergency operations center.

Human-caused hazards fall into the following categories:

- Man-made hazards include acts of terrorism and cyber threats. These hazards are intentional, criminal, malicious acts.
- Technological hazards are incidents that arise from human activities such as the manufacture, transportation, storage and use of hazardous materials. These are accidental incidents with unintended consequences.

This report does not address human-caused hazards to the Roseville water treatment facilities, because the City evaluated those facilities in a separate report per EPA requirements. Information on that evaluation is available from the Roseville City Manager's office. In 2003, with input from the City of Roseville, Placer County conducted a State Homeland Security Assessment Survey to review terrorism vulnerabilities, personnel available to respond, and equipment needed. The resulting information is classified and available only to first responders at the time of an emergency (per state and federal laws).

DEFINITIONS

Acts of Terrorism—The unlawful use or threatened use of force or violence against people or property with the intention of intimidating or coercing societies or governments. Terrorism is either foreign or domestic, depending on the origin, base, and objectives of the terrorist or organization.

Technological Hazards—Hazards from accidents associated with human activities such as the manufacture, transportation, storage and use of hazardous materials.

Weapons of Mass Destruction—Chemical, biological, radiological, nuclear, and explosive weapons associated with terrorism.

Hazardous Material—A substance or combination of substances that, because of quantity, concentration, physical, chemical, or infectious characteristics, may cause or contribute to an increase in mortality or an increase in serious irreversible or incapacitating reversible illness, or pose a present or potential hazard to human life, property, or the environment. Hazardous waste is included in the City's working definition.

15.1.1 Man-Made Hazards

Terrorism and Weapons of Mass Destruction

The Federal Bureau of Investigation (FBI) categorizes terrorism in the United States as one of two types:

- Domestic terrorism involves groups or individuals whose terrorist activities are directed at elements of our government or population without foreign direction. The 1995 bombing of the Alfred P. Murrah federal building in Oklahoma City is an example of domestic terrorism. The FBI is the primary response agency for domestic terrorism. The FBI coordinates domestic preparedness programs and activities of the United States to limit acts posed by terrorists including the use of weapons of mass destruction (WMDs).
- International terrorism involves groups or individuals whose terrorist activities are foreign-based and/or directed by countries or groups outside the United States, or whose activities transcend national boundaries. Examples include the 1997 bombing of Mobil Oil's headquarters, the 1983 bombing of the U.S. Capitol, the 1993 bombing of the World Trade Center, and the September 11, 2001 attacks at the World Trade Center and the Pentagon.

The three key elements to defining a terrorist event are as follows:

- Activities involve the use of illegal force.
- Actions are intended to intimidate or coerce.
- Actions are committed in support of political or social objectives.

As detailed in the City's Terrorism Contingency Plan, at least three important considerations distinguish terrorism hazards from other types of hazards:

- In the case of chemical, biological and radioactive agents, their presence may not be immediately obvious, making it difficult to determine when and where they may have been released, who has been exposed, and what danger is present for first responders and emergency medical technicians.
- There is limited scientific understanding of how these agents affect the population at large.
- Terrorism evokes strong emotional reactions, ranging from anxiety to fear to anger to depression.

Those involved with terrorism response, including public health and public information staff, are trained to deal with the public's emotional reaction swiftly as response to the event occurs. The area of the event must be clearly identified in all emergency alert messages to prevent those not affected by the incident from overwhelming local emergency rooms and response resources, thereby reducing service to those actually affected. The public will be informed clearly and frequently about what government agencies are doing to mitigate the impacts of the event. The public will also be given clear directions on how to protect the health of individuals and families.

FEMA defines terrorism as the use of weapons of mass destruction, including biological, chemical, nuclear and radiological weapons; arson, incendiary, explosive and armed attacks; industrial sabotage and intentional hazardous materials releases; agro-terrorism; and cyber-terrorism (FEMA 386-7). The following are potential methods used by terrorists that could affect the City of Roseville as a direct target or collaterally:

- Conventional bomb
- Biological agent
- Chemical agent
- Nuclear bomb
- Radiological agent
- Arson/incendiary attack
- Armed attack
- Cyber-terrorism (see the cyber threats section of this profile)
- Agro-terrorism
- Intentional hazardous material release.

Table 15-1 provides a hazard profile summary for terrorism-related hazards. Most terrorist events in the United States have been bombing attacks, involving detonated or undetonated explosive devices, tear gas, pipe bombs, and firebombs.

Table 15-1. Event Profiles for Terrorism

Hazard	Application Mode[a]	Hazard Duration[b]	Static/Dynamic Characteristics[c]	Mitigating and Exacerbating Conditions[d]
Conventional Bomb	Detonation of explosive device on or near target; delivery via person, vehicle, or projectile.	Instantaneous; additional secondary devices, or diversionary activities may be used, lengthening the duration of the hazard until the attack site is determined to be clear.	Extent of damage is determined by type and quantity of explosive. Effects generally static other than cascading consequences, incremental structural failure, etc.	Overpressure at a given standoff is inversely proportional to the cube of the distance from the blast; thus, each additional increment of standoff provides progressively more protection. Terrain, forestation, structures, etc. can provide shielding by absorbing and/or deflecting energy and debris. Exacerbating conditions include ease of access to target; lack of barriers and shielding; poor construction; and ease of concealment of device.
Chemical Agent	Liquid/aerosol contaminants dispersed using sprayers or other aerosol generators; liquids vaporizing from puddles/ containers; or munitions.	Hours to weeks, depending on the agent and the conditions in which it exists.	Contamination can be carried out of the initial target area by persons, vehicles, water, and wind. Chemicals may be corrosive or otherwise damaging over time if not remediated.	Air temperature can affect evaporation of aerosols. Ground temperature affects evaporation of liquids. Humidity can enlarge aerosol particles, reducing inhalation hazard. Precipitation can dilute and disperse agents but can spread contamination. Wind can disperse vapors but also cause target area to be dynamic. The micro-meteorological effects of buildings and terrain can alter travel and duration of agents. Shielding in the form of sheltering in place can protect people and property from harmful effects.
Arson/ Incendiary Attack	Initiation of fire or explosion on or near target via direct contact or remotely via projectile.	Generally minutes to hours.	Extent of damage is determined by type and quantity of device, accelerant, and materials present at or near target. Effects generally static other than cascading consequences, incremental structural failure, etc.	Mitigation factors include built-in fire detection and protection systems and fire-resistive construction techniques. Inadequate security can allow easy access to target, easy concealment of an incendiary device, and undetected initiation of a fire. Non-compliance with fire and building codes, as well as failure to maintain existing fire protection systems, can substantially increase the effectiveness of a fire weapon.
Armed Attack	Tactical assault or sniping from remote location, or random attack based on fear, emotion, or mental instability.	Generally minutes to days.	Varies based on the perpetrators' intent and capabilities.	Inadequate security can allow easy access to target, easy concealment of weapons, and undetected initiation of an attack.
Biological Agent	Liquid or solid contaminants dispersed using sprayers/ aerosol generators or by point or line sources such as munitions, covert deposits, and moving sprayers.	Hours to years, depending on the agent and the conditions in which it exists.	Depending on the agent used and the effectiveness with which it is deployed, contamination can be spread via wind and water. Infection can spread via humans or animals.	Altitude of release above ground can affect dispersion; sunlight is destructive to many bacteria and viruses; light to moderate wind will disperse agents but higher winds can break up aerosol clouds; the micro-meteorological effects of buildings and terrain can influence aerosolization and travel of agents.

Hazard	Application Mode[a]	Hazard Duration[b]	Static/Dynamic Characteristics[c]	Mitigating and Exacerbating Conditions[d]
Agro-terrorism	Direct, generally covert contamination of food supplies or introduction of pests and/or disease agents to crops and livestock.	Days to months.	Varies by type of incident. Food contamination events may be limited to specific distribution sites, whereas pests and diseases may spread widely. Generally no effects on built environment.	Inadequate security can facilitate adulteration of food and introduction of pests and disease agents to crops and livestock.
Radiological Agent	Radioactive contaminants dispersed using sprayers/ aerosol generators, or by point or line sources such as munitions.	Seconds to years, depending on material used.	Initial effects will be localized to site of attack; depending on meteorological conditions, subsequent behavior of radioactive contaminants may be dynamic.	Duration of exposure, distance from source of radiation, and the amount of shielding between source and target determine exposure to radiation.
Nuclear Bomb	Detonation of nuclear device underground, at the surface, in the air, or at high altitude.	Light/heat flash and blast/shock wave last for seconds; nuclear radiation and fallout hazards can persist for years. Electromagnetic pulse from a high-altitude detonation lasts for seconds and affects only unprotected electronic systems.	Initial light, heat, and blast effects of a subsurface, ground or air burst are static and determined by the device's characteristics and employment; fallout of radioactive contaminants may be dynamic, depending on meteorological conditions.	Harmful effects of radiation can be reduced by minimizing the time of exposure. Light, heat, and blast energy decrease logarithmically as a function of distance from seat of blast. Terrain, forestation, structures, etc. can provide shielding by absorbing and/or deflecting radiation and radioactive contaminants.
Intentional Hazardous Material Release (fixed facility or transportation)	Solid, liquid, and/or gaseous contaminants released from fixed or mobile containers	Hours to days.	Chemicals may be corrosive or otherwise damaging over time. Explosion and/or fire may be subsequent. Contamination may be carried out of the incident area by persons, vehicles, water and wind.	Weather conditions directly affect how the hazard develops. The micro-meteorological effects of buildings and terrain can alter travel and duration of agents. Shielding in the form of sheltering in place can protect people and property from harmful effects. Non-compliance with fire and building codes, as well as failure to maintain existing fire protection and containment features, can substantially increase the damage from a hazardous materials release.

a. **Application Mode—**Application mode describes the human acts or unintended events necessary to cause the hazard to occur.
b. **Duration—**Duration is the length of time the hazard is present. For example, a chemical warfare agent such as mustard gas, if un-remediated, can persist for hours or weeks under the right conditions.
c. **Dynamic or Static Characteristics—**These characteristics of a hazard describe its tendency, or that of its effects, to either expand, contract, or remain confined in time, magnitude, and space. For example, the physical destruction caused by an earthquake is generally confined to the place in which it occurs, and it does not usually get worse unless aftershocks or other cascading failures occur; in contrast, a cloud of chlorine gas leaking from a storage tank can change location by drifting with the wind and can diminish in danger by dissipating over time.
d. **Mitigation and Exacerbating Conditions—**Mitigating conditions are characteristics of the target and its physical environment that can reduce the effects of a hazard. For example, earthen berms can provide protection from bombs; exposure to sunlight can render some biological agents ineffective; and effective perimeter lighting and surveillance can minimize the likelihood of someone approaching a target unseen. In contrast, exacerbating conditions are characteristics that can enhance or magnify the effects of a hazard. For example, depressions or low areas in terrain can trap heavy vapors, and a proliferation of street furniture (trash receptacles, newspaper vending machines, mail boxes, etc.) can provide hiding places for explosive devices.

Source: FEMA 386-7

The effects of terrorism can vary from loss of life and injuries to property damage and disruptions in services such as electricity, water supplies, transportation, or communications. Terrorist acts may have an immediate effect or a delayed effect. Terrorists often choose targets that offer limited danger to themselves and areas with relatively easy public access. Foreign terrorists look for visible targets where they can avoid detection before and after an attack such as international airports, large cities, major special events, and high-profile landmarks.

In dealing with intentional human-caused hazards, the unpredictability of human beings must be considered. People with a desire to perform criminal acts may seek out targets of opportunity that may not fall into established lists of critical areas or facilities. The City of Roseville first responders train not only to respond to organized terrorism events, but also to respond to random acts by individuals who, for a variety of reasons ranging from fear to emotional trauma to mental instability, may choose to harm others and destroy property.

While education, heightened awareness, and early warning of unusual circumstances may deter crime and terrorism, intentional acts that harm people and property are possible at any time. Public safety entities must react to the incident, locate, isolate and neutralize further damage, and conduct investigate to bring criminals to justice.

Cyber Threats

A cyber threat is an intentional and malicious crime that compromises the digital infrastructure of a person or organization, often for financial or terror-related reasons. Such attacks vary in nature and are perpetrated using digital mediums or sometimes social engineering to target human operators. Generally, attacks last minutes to days, but large-scale events and their impacts can last much longer. As information technology continues to grow in capability and interconnectivity, cyber threats become increasingly frequent and destructive. In 2014, internet security teams at Symantec and Verizon indicated that nearly 1 million new pieces of malware—malicious code designed to steal or destroy information—were created every day (Harrison 2015).

Cyber threats differ by motive, attack type and perpetrator profile. Motives range from the pursuit of financial gain to political or social aims. Cyber threats are difficult to identify and comprehend. Types of threats include using viruses to erase entire systems, breaking into systems and altering files, using someone's personal computer to attack others, or stealing confidential information. The spectrum of cyber risks is limitless, with threats having a wide-range of effects on the individual, community, organizational, and national threat (FEMA 2013).

This risk assessment includes cyber attacks and cyberterrorism under the inclusive hazard of cyber threats. The terms often are used interchangeably, though they are not the same. While all cyberterrorism is a form of cyber attack, not all cyber attacks are cyberterrorism.

Cyber Attacks

Public and private computer systems are likely to experience a variety of cyber attacks, from blanket malware infection to targeted attacks on system capabilities. Cyber attacks specifically seek to breach IT security measures designed to protect an individual or organization. The initial attack is followed by more severe attacks for the purpose of causing harm, stealing data, or financial gain. Organizations are prone to different types of attacks that can be either automated or targeted in nature. Table 15-2 describes the most common cyber attack mechanisms faced by organizations today.

Since 2013, a new type of cyber-attack is becoming increasingly common against individuals and small- and medium-sized organizations. This attack is called cyber ransom. Cyber ransom occurs when an individual downloads ransom malware, or ransomware, often through phishing or drive-by download, and the subsequent execution of code results in encryption of all data and personal files stored on the system. The victim then receives a message that demands a fee in the form of electronic currency or cryptocurrency, such as Bitcoin, for the decryption code (Figure 15-1).

Table 15-2. Common Mechanisms for Cyber Attacks

Type	Description
Socially Engineered Trojans	Programs designed to mimic legitimate processes (e.g. updating software, running fake antivirus software) with the end goal of human-interaction caused infection. When the victim runs the fake process, the Trojan is installed on the system.
Unpatched Software	Nearly all software has weak points that may be exploited by malware. Most common software exploitations occur with Java, Adobe Reader, and Adobe Flash. These vulnerabilities are often exploited as small amounts of malicious code are often downloaded via drive-by download.
Phishing	Malicious email messages that ask users to click a link or download a program. Phishing attacks may appear as legitimate emails from trusted third parties.
Password Attacks	Third party attempts to crack a user's password and subsequently gain access to a system. Password attacks do not typically require malware, but rather stem from software applications on the attacker's system. These applications may use a variety of methods to gain access, including generating large numbers of generated guesses, or dictionary attacks, in which passwords are systematically tested against all of the words in a dictionary.
Drive-by Downloads	Malware is downloaded unknowingly by the victims when they visit an infected site.
Denial of Service Attacks	Attacks that focus on disrupting service to a network in which attackers send high volumes of data until the network becomes overloaded and can no longer function.
Man in the Middle	Man-in-the-Middle attacks mirror victims and endpoints for online information exchange. In this type of attack, the attacker communicates with the victims, who believe they are interacting with a legitimate endpoint website. The attacker is also communicating with the actual endpoint website by impersonating the victim. As the process goes through, the attacker obtains entered and received information from both the victim and endpoint.
Malvertising	Malware downloaded to a system when the victim clicks on an affected ad.
Advanced Persistent Threat (APT)	An attack in which the attacker gains access to a network and remains undetected. APT attacks are designed to steal data instead of cause damage.

Source: Danielson 2015



Figure 15-1. Pop-Up Message Indicating Ransomware Infection

With millions of threats created each day, the importance of protection against cyber attacks becomes a necessary function of everyday operations for individuals, government facilities, and businesses. The increasing dependency on technology for vital information storage and the often automated method of infection means higher stakes for the success of measurable protection and education.

Cyberterrorism

Cyberterrorism is the use of computers and information, particularly over the Internet, to recruit others to an organization's cause, cause physical or financial harm, or cause a severe disruption of infrastructure service. Such disruptions can be driven by religious, political, or other motives. Like traditional terrorism tactics, cyberterrorism seeks to evoke very strong emotional reactions, but it does so through information technology rather than a physically violent or disruptive action. Cyberterrorism has three main types of objectives (Kostadinov 2012):

- **Organizational—**Cyberterrorism with an organizational objective includes specific functions outside of or in addition to a typical cyber attack. Terrorist groups today use the internet on a daily basis. This daily use may include recruitment, training, fundraising, communication, or planning. Organizational cyberterrorism can use platforms such as social media as a tool to spread a message beyond country borders and instigate physical forms of terrorism. Additionally, organizational goals may use systematic attacks as a tool for training new members of a faction in cyber warfare.
- **Undermining—**Cyberterrorism with undermining as an objective seeks to hinder the normal functioning of computer systems, services, or websites. Such methods include defacing, denying, and exposing information. While undermining tactics are typically used due to high dependence on online structures to support vital operational functions, they typically do not result in grave consequences unless undertaken as part of a larger attack. Undermining attacks on computers include the following (Waldron 2011):
    - Directing conventional kinetic weapons against computer equipment, a computer facility, or transmission lines to create a physical attack that disrupts the reliability of equipment.
    - Using electromagnetic energy, most commonly in the form of an electromagnetic pulse, to create an electronic attack against computer equipment or data transmissions. By overheating circuitry or jamming communications, an electronic attack disrupts the reliability of equipment and the integrity of data.
    - Using malicious code directed against computer processing code, instruction logic, or data. The code can generate a stream of malicious network packets that disrupt data or logic by exploiting vulnerability in computer software, or a weakness in computer security practices. This type of cyber attack can disrupt the reliability of equipment, the integrity of data, and the confidentiality of communications (Wilson 2008)
- **Destructive—**The destructive objective for cyberterrorism is what organizations fear most. Through the use of computer technology and the Internet, the terrorists seek to inflict destruction or damage on tangible property or assets, and even death or injury to individuals. There are no cases of pure cyberterrorism as of the date of this Plan.

15.1.2 Technological Hazards

Technological hazards are associated with human activities such as the manufacture, transportation, storage and the use of hazardous materials. Incidents related to these hazards are assumed to be accidental, with unintended consequences. Technological hazards in Roseville can be categorized as follows:

- Hazardous materials incidents
- Power utility losses
- Data and telecommunications disruptions

- Water and wastewater disruption
- Air and transportation accidents
- Infrastructure threats.

Hazardous Materials Incidents

Hazardous materials are present in nearly every city and county in the United States in facilities that produce, store, or use them. For example, water treatment plants use chlorine on-site to eliminate bacterial contaminants. Hazardous materials are transported along interstate highways and railways daily. Even the natural gas used in every home and business is a dangerous substance when a leak occurs. Except for severe weather and flooding, hazardous materials incidents are the hazards most likely to affect the City of Roseville.

Title 49 of the CFR lists thousands of hazardous materials, including gasoline, insecticides, household cleaning products, and radioactive materials. State regulated substances that have the greatest probability of adversely impacting the community are listed in the CCR, Title 19. The following are the most common type of hazardous material incidents:

- **Fixed-Facility Hazardous Materials Incident—**This is the uncontrolled release of materials from a fixed site capable of posing a risk to health, safety and property. It is possible to identify and prepare for a fixed-site incident because federal and state laws require those facilities to notify state and local authorities about what is being used or produced at the site.
- **Hazardous Materials Transportation Incident—**A hazardous materials transportation incident is any event resulting in uncontrolled release of materials during transport that can pose a risk to health, safety, and property. Transportation incidents are difficult to prepare for because there is little if any notice about what materials could be involved should an accident happen. Hazardous materials transportation incidents can occur anywhere, although most occur on major federal or state highways or major rail lines. In addition to materials such as chlorine that are shipped throughout the country by rail, thousands of shipments of radiological materials, mostly medical materials and low-level radioactive waste, travel by ground transportation across the United States. Many incidents occur in sparsely populated areas and affect very few people. There are occasions, however, of accidents in areas with much higher population densities, such as the January 6, 2005 train accident in Graniteville, South Carolina, that released chlorine gas killing nine, injuring 500, and causing the evacuation of 5,400 residents.
- **Interstate Pipeline Hazardous Materials Incident—**There are a significant number of interstate natural gas, heating oil, and petroleum pipelines running through California. These are used to provide natural gas to utilities in California and to transport these materials from production facilities to end users.

Power Utility Losses

A power failure is any interruption or loss of electrical service due to disruption of power generation or transmission caused by an accident, sabotage, natural hazards, equipment failure, or fuel shortage. These interruptions can last anywhere from a few seconds to several days. Power failures are considered significant only if the local emergency management organization is required to coordinate basic services such as the provision of food, water, and heating as a result. Power failures are common with severe weather and winter storm activity. However, for medically dependent residents, a power failure can present a life-threatening situation.

The City of Roseville Electric Utility is responsible for operating and maintaining the electrical transmission and distribution system in Roseville. The City supplies electricity to about 56,000 residential and business customers within the service area according to the 2014 Roseville Electric Annual Report. The distribution lines and substations deliver 324 megawatts during peak demand period from June through September.

Roseville Electric has the highest reliability in the country for municipal utilities of its size, due in large part to a redundant system with sophisticated interconnection between the facilities and immediate notification should failure occur along the distribution system. Through its load management program and load shedding agreements with large, local electric users, the City of Roseville avoided any outages during electric crises and brownouts that affected some parts of California in 2000 and 2001.

Roseville has taken a proactive approach to maintaining its reliability standards by building a local generation source—the Roseville Energy Park. The Roseville Energy Park is a natural-gas-fired, combined-cycle electrical generating facility located on an 8.9-acre site adjacent to the Pleasant Grove Wastewater Treatment Plant. Since operations began in 2007, the state-of-the-art, 160-megawatt power generation facility generates enough energy to meet 40 percent of the community's electricity needs.

Data and Telecommunications Disruptions

The loss of data and/or telecommunications is often a secondary hazard to natural and other human-caused hazards. Data and telecommunications provide a primary method for service to the community by the government and the private sector. A loss of data and telecommunications could result in loss of emergency dispatch capabilities, emergency planning services, infrastructure monitoring capabilities, access to statistical data, and loss of financial and personnel records. Losing the primary method of communication for emergency responders (radio) would severely disable their ability to respond in a timely and effective manner.

Water and Wastewater Disruption

Water or wastewater disruption is a secondary impact from a natural disaster or intentional act. The City of Roseville receives surface water from the Folsom Reservoir, a 1 million-acre-foot multi-purpose facility east of the City. A breach in the dam or the pipelines that carry water to the City's Water Treatment Plant on Barton Road in Granite Bay would have significant temporary impacts on the City until alternative water sources, including water from other regional purveyors and groundwater, are pumped and treated. Long-term disruption of the water source from Folsom Lake would have significant impacts on residences and businesses in Roseville should demand exceed secondary supplies and water conservation measures not provide enough relief to reduce demand to equal the secondary supplies.

Disruption of the City's wastewater collection and regional wastewater treatment plants at Dry Creek and Pleasant Grove Creek would also have significant citywide and regional impacts. Such disruption could result if the system were to be overwhelmed by a significant storm or discharge of materials in such quantities that the treatment plant could not adequately treat the waste. Natural hazards such as earthquake or flood, major power outages, or terrorism directed at the facilities and systems could disrupt the process of collecting and treating millions of gallons of waste. Wastewater treatment plants may also have emergencies internal to the plant such as oxygen deficiencies that render them incapable of treating waste. The disruption of service may also have significant environmental impacts on the waterways adjacent to the treatment plants.

Air and Transportation Accidents

Air and transportation accidents are incidents involving air or rail passengers resulting in death or serious injury. The region has a number of airports, including the Sacramento International Airport, as well as several smaller county or municipal airports and private air strips that enhance the potential for an air disaster.

Roseville features several major transportation routes, including Interstate 80 and Highway 65, both of which run through portions of the City. The potential for transportation accidents that block ingress, egress, and movement through the City is significant, as is the likelihood of hazardous material incidents resulting from a traffic accident.

15.1.3 Civil Disorder

Civil disorder refers to incidents that disrupt a community to the degree that law enforcement intervention is required to maintain public safety. These incidents are generally associated with controversial political, judicial, or economic issues and may occur at any time of the year, although statistics indicate that they are more frequent during summer. While Roseville has no history of civil disorder, large public gatherings associated with concerts or sports events have overburdened local law enforcement and fire protection resources in the past.

The effects of civil disorder vary with the type, severity, scope, and duration of event. Essential services (e.g., electricity, water, public transportation, communications) may be disrupted or property damage, injury and loss of life may occur. Facilities most at risk are government buildings, schools, utilities and correctional facilities.

15.2 HAZARD PROFILE

15.2.1 Past Events

State of California

Terrorism Events

According to the Governor's Office of Emergency Services Terrorism Response Plan, California has had a long history of defending the public against domestic and foreign terrorists. Domestic terrorist groups in California have been focused on political or social issues, while the limited internationally based incidents have targeted the state's immigrant communities due to foreign disputes. Advanced technologies and communication have allowed these groups to become more sophisticated and better organized, with remote members linked electronically.

Technological Hazard Incidents

No comprehensive source exists for technological hazard incidents in California. Given the complex system of transportation networks, the large population, and the number of businesses in California, incidents occur on a regular basis throughout the state, as reported by the news media.

Region

Terrorism Events

In 2005, development projects in Placer County were the subject of arson activity by an individual who claimed to be from the Earth Liberation Front or ELF, a splinter group of Earth First!, a radical environmental activist movement. ELF is a somewhat active domestic terrorism group that says it uses eco-sabotage to protect the Earth and to seek revenge on "those who are destroying the Earth and its inhabitants."

On December 3, 1999, the FBI arrested two anti-government militia members who planned a bomb attack at the Suburban Propane facility in Elk Grove, CA. The alleged plot involved a plan to blow up the Suburban Propane site, which stores about 24 million gallons of liquefied propane and is located one mile from residential homes. According to the Sacramento Bee, the plot resulted in heightened on-site security and a year-long investigation resulting in the two arrests.

Technological Hazard Incidents

Placer County and its incorporated cities have experienced many accidental hazardous materials incidents. Accidents involving high pressure gas lines in the County have caused injury and property damage. An underground Kinder Morgan pipeline failed in 2002, causing a significant spill of diesel fuel within a Rocklin

neighborhood adjacent to where the breach occurred (Former Roseville Fire Department Battalion Chief Jeff Carman, pers. com).

Air and Transportation Accidents

The Sacramento region was once the location of three large military installations: the Sacramento Army Depot, Mather Air Force Base and McClellan Air Force Base. All three have been decommissioned and transferred to civilian uses. The only active military installation is Beale Air Force Base, located to the north near Yuba City, California. A review of McClellan Fire Department history prior to the base closure identifies several responses to accidents near Roseville (see Table 15-3).

Table 15-3. Accidents Responded to by McClellan Fire Department, 1950-1980s

Timeframe	Incident
Early 1950s	Apparatus responded to Code 3 alarm at Travis Air Force Base for B-29 crash that involved a nuclear weapon
October 29, 1951	B-29 making an emergency landing crashed and caught fire on Runway 16 injuring 11 crewmen. One firefighter died.
Mid-1950s	EC-121 crashed near Watt Avenue and U Street in Sacramento
Mid-1960s	F-104 crashed next to Haggin Oaks Golf Course.
April 28, 1973	McClellan Fire Department responded to mutual aid at Roseville Rail Yard fire
1982	Multiple alarm fire including a chemical warehouse. Toxic smoke column closed Interstate 80 for several hours
Early 1980s	HH-53 helicopter crashed near PFE Road during an air show at McClellan Air Force Base. The helicopter was attempting a refueling operation with a C-130 refueler when the hose became entangled in the rotor.
Early 1980s	F-111 crashed near Woodland

Source: McClellan Fire Department History

While the risk of military aircraft accidents in the area has been reduced with the closure of McClellan Air Force Base, which was the closest military base to the City of Roseville, the region is not immune to air transportation accidents. On February 16, 2000, an aircraft crashed after take-off from the Sacramento Mather Airport in Rancho Cordova, California. The cargo flight was bound for Dayton, Ohio and all three crewmembers were killed. The cause of the accident was a mechanical failure. The aircraft crashed into an automobile salvage yard.

Local

Air and Transportation Accidents

On February 12, 2006, a Glasair II-S FT kit plane crashed into a home at 1302 Longfellow Drive in Roseville (see Figure 15-2). The pilot was reported to be performing aerial acrobatics when he lost control of the plane and it crashed. The pilot, his passenger, and a resident in the house were killed, and the home was determined to be a total loss. The fire spread to an adjacent home and caused significant damage, however the residents escaped injury.

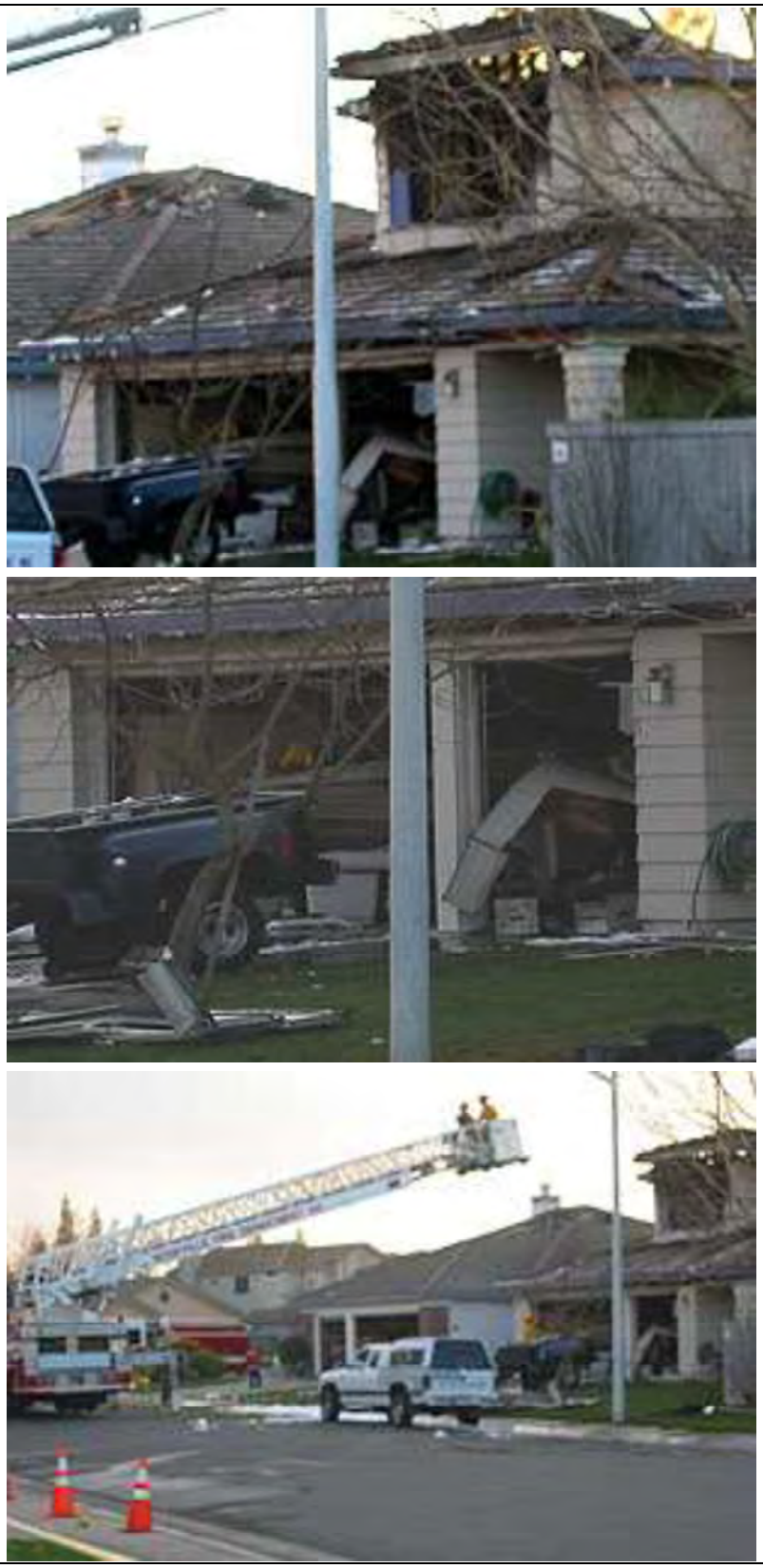


Figure 15-2. February 12, 2006 Aircraft Crash into Residence

Arson Events

On October 21, 2010, an arsonist set fire to the Roseville Galleria Mall that caused an estimated $55 million in property damage (see Figure 15-3). Police responded to the mall after a call from the tenant at GameSpot. They said a young male had entered, said he had a gun, and told them to get out. When police arrived, the male, who did not have a gun, had locked himself in the store. Once barricaded, he started a fire. The blaze destroyed an entire section of the mall, which is a core of the Sacramento economy. With over 240 stores operated by Westfield, the mall – built in 2000 and renovated in 2008 for $270 million – has generated $3.2 million in annual sales tax for the region. Reasons for the arson are unknown. The suspect suffered from mental illness.



Figure 15-3. October 21, 2010 Arson Fire at Galleria Mall

Terrorism Events

Terrorism incidents in Roseville have been limited to individuals seeking to cause damage at Roseville schools. Pipe bombs have been left at a school facility in one past occurrence. No WMDs have been used in a terrorist attack in Roseville.

Technological Hazard Incidents

The City of Roseville has had a number of accidental incidents at the Roseville Rail Yard, private businesses and City facilities. The Fire Department has been called to both the Oakmont High School pool and the Roseville Aquatics Center for chlorine leaks. Sewage spills have occurred on occasion and overflowed into the City's creeks. Roseville Rail Yard accidents have included derailments and leaks of toxic chemicals from transporting hazardous materials in the wrong type of railcars.

The worst human-caused disaster in Roseville's history occurred on April 28, 1973 when a train loaded with munitions bound for Vietnam caught fire in the Roseville Yard (see Figure 15-4). No lives were lost, but significant damage to property in Roseville and jurisdictions in Sacramento County occurred during the 18 hours of explosions. In 1997, a number of unexploded bombs were discovered at the yard during construction of a modernization project (see Figure 15-5).

Roseville's history parallels that of the transcontinental railroad. The federal government passed the act to build the transcontinental railroad in 1862 and shortly thereafter the Central Pacific Railroad was started in Sacramento in 1863. A northern route for the first transcontinental rail line was selected when the South seceded from the Union during the Civil War, and Trustees Charles Crocker, Mark Hopkins, Collis P. Huntington and Leland Stanford started construction on this northern line. The line extended from Sacramento to Rocklin by May 1864 and then construction across the Sierra Nevada Mountains began.

The first structure in Roseville was built in 1864 to serve as a freight and passenger depot for the fledgling railroad. In December 1905, a decision by the Central Pacific Railroad to move the division headquarters from Rocklin to Roseville meant a development boom for Roseville. The junction of the Central Pacific Railroad and the California Central, a north-south line became Roseville, where the largest artificial ice plant in the world operated to keep California's fruit and vegetables fresh as they were transported by rail car to the East. The Pacific Fruit Exchange Ice Plant operated from 1908 to 1974 when all of Southern Pacific's 21,000 rail cars were self-refrigerating.

During wartime, Roseville was a hub of activity as troops and war materials moved through the Roseville rail yards. Thousands of munitions shipments moved through Roseville during World Wars I and II, the Korean and Vietnam conflicts, and Desert Storm.

The largest human-caused disaster in the local area occurred on April 28, 1973 when a wooden floor in a munitions boxcar caught fire from brake shoe sparks. A train engine pulling 103 cars, including 21 Department of Defense freight cars with 7,056 Mark 81 bombs, was loaded at the Navy's ammunition depot in Hawthorne, Nevada on their way to western ports and the Vietnam War.

As the train pulled in to the Roseville yard just west of the Roseville city limits, one of the cars caught fire and the flames spread, igniting other freight cars on the tracks, which were 21 rails wide. Nearly every car was loaded with cargo including paint, lumber, and fertilizer. The most dramatic explosions occurred when cars carrying liquid propane caught fire resulting in explosions that blew out windows five miles away and could be heard 100 miles away. Metal and wood was thrown 3,000 feet into the air.

The result was a series of explosions that caused damages of more than $5.6 million in Roseville and the neighboring communities of Citrus Heights, Antelope, and North Highlands. No lives were lost, but over 100 people were treated for assorted cuts and bruises caused by broken glass and flying debris.







After 18 hours of explosions, Army munitions teams recovered 1,200 unexploded bombs scattered around the area and collected another 300 from rail cars. Aerial photographs from that time show a railroad smoldering and piled with twisted track, shattered cars, and scraps of metal from bomb casings. Much of the debris was buried in the 10-foot-deep craters left by the blast.

Milestones & Memories: the Story of Roseville, California, 1850-2000 by Leonard "Duke" Davis

Figure 15-4. 1973 Roseville Rail Yard Disaster

In 1997, Union Pacific Railroad began work on a $130 million project to modernize the Roseville train yard, including significant automation improvements and the replacement of 86 miles of track with 136 miles of new track.

During project grading, backhoe operators uncovered a Mark 81 bomb intact. Bomb disposal experts from Moffett Field in Mountain View, California were flown in by the Sacramento Sheriff's Department to dispose of the bomb, which they do by digging a pit and exploding the ordnance. When another eight bombs were discovered at the western end of the yard in Antelope, California unexploded ordnance experts from Moffett Field were called back and made the decision to place the bombs in pits and build berms around them. The Sacramento County Sheriff evacuated 300 to 400 homes near the rail yard, and at 2 a.m. blew up the bombs. The explosions shattered windows, cracked walls, and rained shrapnel through the roofs of nearby homes

In all, recovered materials included 16 unexploded MK 81 bombs; 11 partial fragments containing explosive residue; 8,625 pounds (4.31 tons) of bomb fragments; and 131,560 pounds (65.78 tons) of ferrous material. Experts found the bombs were not fused (armed), making them less likely to accidentally detonate. The bombs not destroyed on-site were packaged and transported to a facility in Colfax, Louisiana for detonation.



Figure 15-5. 1997 Bomb Discovery

With growth in the region and in trips through the region to tourist destinations such as the ski resorts at Lake Tahoe, the number of traffic accidents has been steadily increasing. Fatal traffic accidents since 2009 are shown in Table 15-4. Truck with trailer accidents account for a small percentage of the City's reported traffic accidents, but they represent the highest potential for hazardous materials incidents on roadways in the City of Roseville.

Table 15-4. Traffic Accident Counts—2009 to 2014

	2009	2010	2011	2012	2013	2014
Vehicles Involved in Fatal Accidents	10	8	8	12	10	1
Fatalities	6	6	5	6	2	1

Source: http://www.city-data.com/accidents/acc-Roseville-California.html

15.2.2 Location

Large population centers, high visibility tourist attractions, and critical infrastructure accessible to the public present security challenges of an ongoing nature in California. The network of highways, railways, ports and airports used to transport significant amounts of hazardous materials poses a significant technological hazards threat. Hazardous materials incidents may occur anywhere in Placer County. Multiple incidents may happen simultaneously, and all typically require a multi-agency, multi-jurisdictional response. The following sections describe the local areas with the greatest likelihood of hazardous materials incidents, as identified in the *Roseville Hazardous Materials Contingency Plan*.

Transportation Routes

The following transportation facilities have the potential to be affected by human-caused hazards:

- Interstate 80 and State Route 65 bisect the City.
- The J.R. Davis Yard in Roseville, the largest train yard west of the Mississippi, is a major Union Pacific switching center built in 1907 (see Figure 15-6). The 850-acre yard includes 136 miles of track. The site includes a former railcar rebuilding facility, the Antelope Yard, fueling areas, and diesel servicing facilities. The site has been designated as contaminated by the federal government, with substances including volatile organics, chlorinated solvents, polynuclear aromatic hydrocarbons, and heavy metals present due to decades of continuous use as a railroad repair and switching facility. Remediation is ongoing at the site.
- Sacramento International Airport in northwestern Sacramento County operates continuously with two major runways and thousands of passengers traveling via commercial and private airlines. Several major airlines operate out of Sacramento International Airport, with most flying light- to medium-weight passenger jets. Approach and takeoff patterns are usually over rural farmland; however, occasionally patterns are adjusted over more populated locations including Roseville. The City is more than 20 miles from Sacramento International Airport and is not in the direct flight path for the airport, although planes do cross Roseville continuously at high altitudes.
- Additional airports within a 20-mile radius of Roseville include the Lincoln and Auburn Airports in Placer County, Beale Air Force Base (34 miles to the north and the closest active military installation), McClellan Airfield, and the Yuba County airport. The instrument-landing approach to Runway 16 at McClellan crosses a portion of the western edge of the Sierra Vista Specific Plan Area. Aircraft on approach fly as low as 1,600 feet at Baseline Road (approximately 4 miles from the runway threshold). Aircraft using McClellan Airpark include aircraft as large as Boeing 747 and 707 aircraft, in addition to Coast Guard C-130s. Additionally, the National Guard flies T-38 aircraft and Blackhawk helicopters out of Mather Air Force Base.
- Sutter Roseville Medical Center maintains a helistop for critically injured patients flown to the hospital. At one time, the facility was limited to accepting one helicopter. If another patient was being transported

to the medical center, the Roseville Fire Department had to respond to the helipad and emergency medical personnel were on standby should anything occur with more than one helicopter using the helipad. The landing area has been expanded and now the helistop has the capacity to accept more than one helicopter at any one time.

- Emergency and public safety helicopter traffic as well as media aircraft and small commercial aircraft frequently fly over the interstates to respond to emergencies and provide public information via local news media.
- Roseville has a number of established truck routes with a higher potential for hazardous material incidents to occur as a result of traffic incidents, as shown in Figure 15-7.



Figure 15-6. The J.R. Davis Yard in Roseville, the Largest Train Yard West of the Mississippi

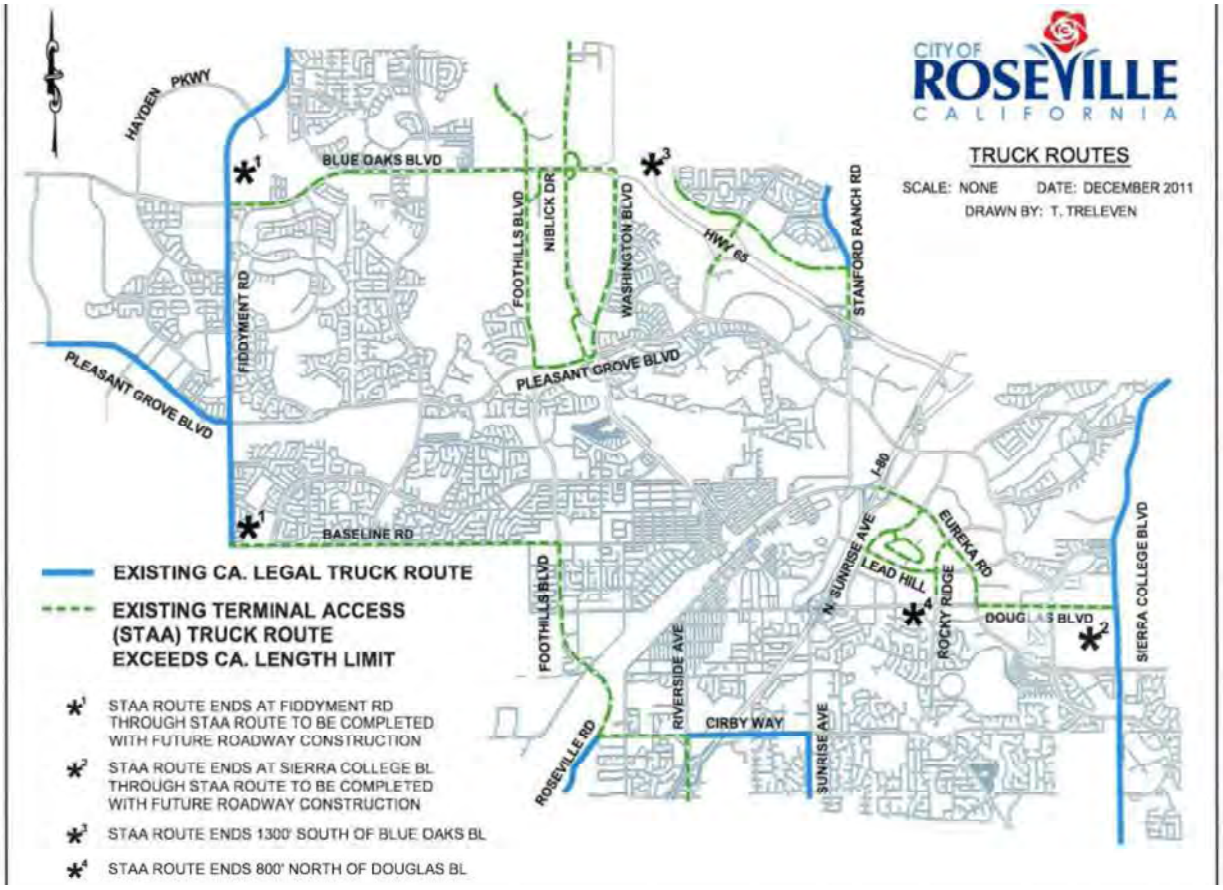


Figure 15-7. Roseville Truck Routes with High Potential for Hazardous Materials Incidents

Pipelines

The Kinder Morgan company owns 3 miles of pipelines generally parallel to the Union Pacific railroad tracks in Roseville that transport high volumes of natural gas through the City (Figure 15-8 shows the company's national pipelines). Other natural gas pipelines run along Interstate 80 with connections between Roseville and Chico. The route to Chico travels through residential areas from the tank farm in Rocklin. The trans-Sierra route from the tank farm in Rocklin to Reno roughly follows the same track as Interstate 80. Pacific Gas and Electric maintains natural gas pipelines in and through Roseville as well.

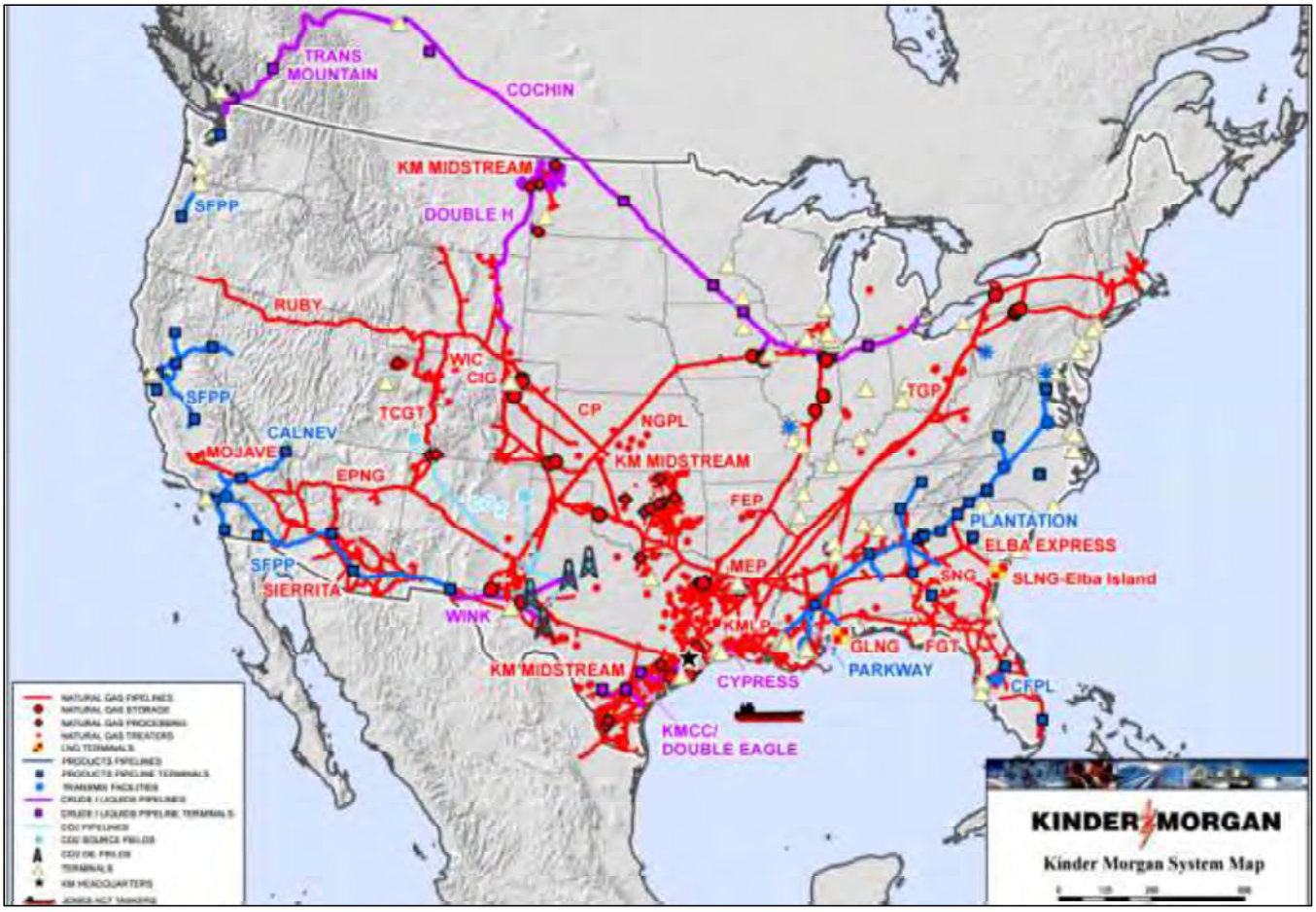


Figure 15-8. Kinder Morgan National Pipeline Map

Business and Industrial Areas

Retail, manufacturing and light industrial firms near State Route 65 (northeastern Roseville and the Sunset Industrial Area of Rocklin) are areas of concern. These facilities have the highest concentration of hazardous materials at fixed facilities in Roseville due to their manufacturing operations. Each business is required to file a detailed, confidential plan with the Roseville Fire Department regarding materials on-site and safety measures taken to protect the public.

Agricultural

Accidental releases of pesticides, fertilizers, and other agricultural chemicals may be harmful to both humans and the environment. Agricultural pesticides are transported daily in and around Roseville en route to their destination in rural areas of Placer County.

Illegal Drug Operations

Illegal operations such as laboratories for methamphetamine pose a significant hazard. Laboratory residues are often dumped along roadways or left in rented hotel rooms, creating a serious health hazard to unsuspecting individuals and to the environment.

Illegal Dumping Sites

Hazardous wastes such as used motor oil, solvents, or paint are occasionally dumped in remote areas of Placer County and Roseville or along roadways, creating a potential health hazard to unsuspecting individuals and to the environment.

Radioactive Materials

Licensed carriers transport radioactive materials along several transportation routes (Interstate 80 and the railroads) through the City of Roseville. The City is notified in advance of these shipments and commits resources as a standby measure should an accident occur.

15.2.3 Frequency

Terrorism

As of 2014, California's economy was the largest of any state in the U.S. Placer County's proximity to the state capitol presents unique conditions for terrorist attacks. The transportation, energy, and communications systems that cross the county have impacts on the local, regional, and even national economy. In general, the risks of a terrorist event involving a WMD are as follows:

- **Chemical—**The risk of a chemical event is present in the City of Roseville. The agricultural community in Placer County uses and stores significant amounts of chemicals for peaceful and productive means that could be used in destructive ways.
- **Explosives—**Pipe bomb and suspicious package events have occurred in Placer County and Roseville in the past. While none of the events has been identified as a WMD, the elements necessary to construct a WMD are readily available. Additionally, the agricultural communities maintain sufficient products and quantities for use in explosive events.
- **Radiological/Nuclear—**The major transportation arteries for vehicles or rail that cross through or near the City of Roseville contribute to the risk of a radiological event. Such products can pass unknown through any one of the regional transportation corridors.
- **Biological—**Anthrax incidents that occurred in the U.S. in October 2001 demonstrate the potential for spreading terror through biological WMDs. The introduction of Newcastle disease in the United States demonstrates how an agent can be introduced to livestock, causing harm to public health and the economy.
- **Combined Hazards—**WMD agents can be combined to have a greater total effect. When combined, the impacts of the event can be immediate and longer-term. Casualties will likely suffer from both immediate and long-term burns and contamination. Given the risks associated with chemical agents in Placer County and the City of Roseville, the possibility exists for such a combined event to occur.

Technological

Hazardous material incidents may occur at any time in the City of Roseville, given the presence of transportation routes bisecting the City, the location of businesses and industry that use hazardous materials, the presence of scattered illegitimate businesses such as clandestine drug laboratories at any given time, and the improper disposal of hazardous waste.

15.2.4 Severity

The severity of human-caused hazards could range from a minor transportation accident or power outage to a full-scale terrorist attack.

The term mass casualty incident (MCI) is often applied to transportation accidents involving air and rail travel, as well as multi-vehicle highway accidents. However, MCIs may also result from hazardous materials incidents or acts of violence, such as shootings or hostage situations. Effects may include serious injuries, loss of life, and associated property damage.

Because large numbers of patients may be involved, significant MCIs may tax local emergency medical and hospital resources, and therefore require a regional response. MCIs may occur throughout the City, day or night, at any time of the year: Interstate 80, State Route 65, and State Route 49 offer the potential for MCIs because of the heavy volume of traffic, although no highway or surface street in the City is exempt from this hazard.

The railroad tracks traversing Placer County, carrying Amtrak passengers as well as freight, also face the risk of an MCI, as do the air corridors above the county. Adverse weather may play a role in roadway, air, or rail accidents. MCIs may also result from acts of violence or terrorism, which could include a chemical, biological or radiological incident, contaminating persons and requiring mass decontamination.

In Placer County, an MCI is defined as any incident with three or more fatalities or critically injured. The first responders, including Roseville Fire, Roseville Police, and emergency room staffs at the local hospitals, follow the same protocol for an MCI whether the number of dead and injured is three, 30 or 300. Mutual aid is requested should Roseville be unable to respond appropriately with available personnel and equipment.

15.2.5 Warning Time

According to the Roseville Terrorism Contingency Plan, only 5 percent of all terrorism incidents are preceded by a warning. In the case of a technological hazard, accidents occur without predictability under circumstances that give responders little time to prepare.

15.3 SECONDARY HAZARDS

The largest secondary impact caused by human-caused hazards would be economic. Economic impacts from human-caused hazards are described in Section 15.5.5.

15.4 EXPOSURE

The risk assessment for this hazard is based on a facility's criticality and physical vulnerability:

- Criticality is a measure of the potential consequence of an accidental or terrorist event as well as the attractiveness of the facility to a potential adversary or threat. The criticality for each critical facility is based on the factors shown in Table 15-5.
- Vulnerability is a measure of the physical opportunity for an accident or an adversarial attack. This assessment takes into consideration physical design, existing countermeasures, and site layout. The vulnerability for each critical facility is based on the criteria shown in Table 15-6.

Table 15-5. Criticality Factors

Criterion	Low Criticality	Medium Criticality	High Criticality
Awareness[a]	Not known/Neighborhood	City/Region/County	State/National
Hazardous Materials[b]	None / limited and secure	Moderate to large and secure	Large, minimum or no security
Collateral Damage Potential[c]	None or low	Moderate/immediate area or within 1 mile radius	High/immediate area or within 1 mile radius

Site Population[d]	0 – 300	301 – 1,000	1,001 or greater
Public/ Emergency Function[e]	No emergency function, or could be used for emergency function in the future	Support emergency function—redundant site	Emergency function—critical service with or without redundancy

a. Awareness—How aware is the public of the existence of the facility, site, system, or location?
b. Hazardous Materials—Are flammable, explosive, biological, chemical and/or radiological materials present on site?
c. Collateral Damage Potential—What are the potential consequences for the surrounding area if the asset is attacked or damaged?
d. Site Population—What is the potential for mass causalities, based on the capacity of the facility.
e. Public or Emergency Functions—Does the facility perform a function during an emergency? Is this facility or function capable of being replicated elsewhere?

Table 15-6. Vulnerability Criteria

Criterion	Low Vulnerability	Medium Vulnerability	High Vulnerability
Accessibility[a]	Remote location, secure perimeter, tightly controlled access	Controlled access, protected or unprotected entry	Open access, unrestricted, patrolling security, sign restrictions
Automobile Proximity[b]	Not within 75' – 100'	Not within 25' – 50'	Adjacent or not within 10'
Asset Mobility[c]	Moves or is relocated frequently	Moves or is relocated occasionally	Permanent/Fixed
Proximity to other Critical Facilities[d]	Greater than 1.5 – 2 miles	Greater than 3/4 - 1 mile	Within 1/2 – 3/4 mile
Secure Design[e]	No areas for concealment of packages, air intakes are on roof, access ways are not under the structure.	Area of concealment present, greater than 25' from the structure; Air intakes located at least 10' above ground, may have under structure access drives.	Areas of concealment within 25', air intakes at ground level, under structure access drives.

a. Accessibility—How accessible is the facility or site to the public?
b. Automobile Proximity—How close can an automobile get to the facility? How vulnerable is the facility to a car bomb attack?
c. Asset Mobility—Is the facility or asset's location fixed or mobile? If mobile, how often is it moved, relocated, or repositioned?
d. Proximity to other critical facilities—If the facility is close to other critical facilities then there could be an increased probability of the facility receiving collateral damage.
e. Secure design—General evaluation of areas of obstruction, air intake locations, parking lot and road design and locations and other site design aspects.

15.4.1 Population

A human-caused hazard event could range from an isolated accident to a coordinated attack by multiple agents upon multiple targets. Large-scale incidents have the potential to kill or injure many citizens in the immediate vicinity, and may also affect people a relative distance from the initial event. Variables affecting exposure for a WMD attack and a hazardous material accident include the physical and chemical properties of the WMD, the ambient temperature, wind speed, wind direction, barometric pressure, and humidity.

Computer models are used by Roseville's Hazardous Materials teams to provide general data to first responders to advise evacuations or sheltering in place. With so many variables to determine "toxic endpoints" as defined by the California Environmental Protection Agency, distances are difficult to forecast. In general, those close to the City's transportation corridors or businesses with acutely hazardous materials are more at risk for some sort of effect. Each chemical incident will be different and the scenarios are too numerous to describe in this Plan.

Hazardous materials pose a significant risk to emergency response personnel. All potential first responders and follow-on emergency personnel in the City of Roseville currently are and will be properly trained to the level of emergency response actions required of their individual position at the response scene. Hazardous materials also pose a serious long-term threat to public health and safety, property and the environment.

15.4.2 Property

According to the City of Roseville's 2035 General Plan, there were 49,998 housing units in the City as of 2010. Single-family detached residential units account for 75.7 percent of the total developed residential units in Roseville according to the City's current General Plan. The total number of units by type of dwelling unit is shown in Table 15-7.

Table 15-7. Residential Dwelling Units in the City of Roseville as of 2012

Type of Unit	Existing Citywide Units
Single Family	35,809
Mobile Home	491
Multi-Family (>=3 units attached)	10,988
Total	**47,288**

Source: City of Roseville 2035 General Plan, Housing Element

Roseville has over 27 million square feet of developed non-residential land uses covering over 3,000 acres city-wide. A majority of this development has occurred since the mid-1980s when the specific plan process was established and large tracts of land were entitled for development. Roseville and Placer County are among the fastest growing communities in California, making them a higher profile target for terrorism. New development has been the target of arson fires and eco-terrorism in the County.

15.4.3 Critical Facilities and Infrastructure

There are no high profile federal or state buildings in Roseville. Critical facilities are limited to City facilities, Placer County facilities, and other government facilities such as the U.S. Post Office, private utility infrastructure and administrative offices, and medical facilities. Roseville's civic facilities are designed to welcome the public, with convenient parking and customer service areas. Except for the Roseville Police Facility, there are limited secure areas that are restricted to the public. Based on the criticality factors and vulnerability criteria described above, these facilities are all at risk because of their accessibility, automobile accessibility, and lack of a secure or hardened design.

Several of Roseville's critical emergency response facilities are located adjacent to the Roseville Rail Yard and pressurized underground pipelines, including the Roseville Civic Center, a primary location for City staff and services (see Figure 15-9), the Roseville Fire Department, which houses administration functions in Fire Station No. 1, and the City's emergency operations center. Significant regional critical facilities such as the Placer County courts and the main office for the U.S. Post Office are also close to the rail yard.



Figure 15-9. Roseville Civic Center

Several factors make gathering places such as the Roseville Civic Center vulnerable to human-caused hazards:

- All are accessible to the general public, to benefit aesthetically pleasing design and customer service.
- Design features, including types of building materials, and screened enclosures for mechanical equipment and solid waste, limit visibility and may contribute to the damage incurred should an intentional or accidental event occur.
- Automobile access is required in the design of most buildings in Roseville, with disabled access parking and easily accessible parking a valued feature.
- Most high population centers do not feature any limitations to access by the public or vehicles, although restricted access to large employment center sites with acutely hazardous materials is built into the design at these facilities.

15.4.4 Environment

The risk of human-caused hazards to the environment is considerable. Hazardous materials spilled along roads or railways could easily pollute rivers, streams, wetlands, riparian areas and adjoining fields. Other hazardous materials released into the air could severely impact plant and animal species. The City of Roseville recognizes this risk and has taken steps to reduce the risk exposure to the natural environment. By reducing the risk exposure to the built environment, the City will also mitigate potential losses to the natural environment.

15.5 VULNERABILITY

15.5.1 Population

Although human-caused hazards have not resulted in a large number of deaths in this area, this type of hazard can be deadly and widespread. Injuries and casualties were not estimated for this hazard. Any individuals exposed to human-caused hazards are considered to be at risk, particularly those working as first responder professionals.

15.5.2 Property

All structures in Roseville are physically vulnerable to a human-caused hazard. The emphasis on accessibility, the opportunity for roof access, driveways underneath some structures, unmonitored areas, the proximity of many structures to transportation corridors and underground pipelines, and the potential for a terrorist to strike any structure randomly all have an impact on the vulnerability of structures. Specific vulnerabilities are on file with the Roseville Fire Department as part of a State Homeland Security Assessment Survey and surveys conducted to complete this mitigation plan.

15.5.3 Critical Facilities and Infrastructure

Most critical facilities and infrastructure in Roseville would be vulnerable to human-caused hazards, including utilities, data and telecommunications systems, and transportation facilities.

15.5.4 Environment

The environment vulnerable to a human-caused hazard is the same as the environment exposed to the hazard. While human-caused disasters have caused significant damage to the environment, estimating damage can be difficult. Loss estimation platforms such as HAZUS-MH are not equipped to measure environmental impacts of these types of hazards. The best gauge of vulnerability of the environment would be a review of damage from past human-caused hazard events. Loss data for damage to the environment were not available at the time of this Plan update. Capturing this data from future events could be beneficial in measuring the vulnerability of the environment for future updates.

15.5.5 Economic impacts

Economic impacts from human-caused hazards could be significant. The cost of a terrorist act would be felt in terms of loss of life and property, disruption of business activity and long-term emotional impacts. Recovery would take significant resources at the local level.

Utility losses could cause a reduction in employment, wholesale and retail sales, utility repairs, and increased medical risks. The City may lose sales tax and property taxes, and the finances of private utility companies and the businesses that rely on them would be disrupted.

The economic impact of data and telecommunications losses can be great, as computer security breaches, crime conducted via the world wide web such as identify theft, and many more forms of human-caused economic losses occur daily. Millions of dollars are lost each year as criminals and cyberterrorists steal sensitive information and funds from individuals and organizations.

The economic impacts would be significant if a transportation facility were rendered impassable. The loss of a roadway or railway would have serious effects on the City's economy and ability to provide services. Loss of travel routes on Interstate 80 or State Route 65 would result in loss of commerce, and may impact the City's ability to provide emergency services to its citizens by delaying response times or limiting routes for equipment such as fire apparatus, police vehicles, and ambulances. Fuel deliveries would also be impacted.

The effects of re-routed traffic could also have a serious impact on local roadways. For example, the closure of the roadway at Folsom Dam has resulted in severe local traffic and the closure of businesses in downtown Folsom due to lack of traffic along the Dam Road route. Heavy traffic on routes through central Roseville already occur at peak commute times when Interstate 80 is congested. Traffic control may burden the City's Public Works Department. Mass transit services would be impacted as routes may be delayed or forced to be detoured, causing economic impacts on Roseville transit and on those who ride buses in Roseville.

15.6 FUTURE TRENDS IN DEVELOPMENT

The potential for human-caused hazards in Roseville is not likely to lessen or prohibit development in Roseville. The threat of human-caused hazards and the availability of Homeland Security Funds will influence future development of the City's critical facilities. Multi-purpose facilities such as the Mahany Library (which also includes a community center and the public access studio) can be used as both an emergency response command center on the west side of Roseville and an information center to inform the public through the internet and broadcast facilities that will be on site.

15.7 REVIEW OF EXISTING ORDINANCES, PROGRAMS, AND PLANS

15.7.1 City of Roseville Emergency Response Plan

Adopted on July 21, 2004 and updated in 2010, the Roseville Emergency Operations Plan addresses the planned response to emergency situations associated with natural disasters, technological (human-caused) emergencies, and war emergency operations in or affecting the City of Roseville. The plan is an operational plan as well as a reference document for pre-emergency planning and emergency operations. It establishes the following:

- An emergency management organization to mitigate any significant emergency or disaster affecting the City of Roseville
- Policies, responsibilities and procedures to protect the health and safety of citizens, public and private property, and the environment from the effects of natural and human-caused emergencies and disasters
- Operational concepts and procedures associated with field response to emergencies, emergency operations center activities, and the recovery process
- A framework for implementing the Standardized Emergency Management System in Roseville.

The Emergency Operations Plan outlines the natural and human-caused hazards most likely to occur in Roseville. It provides significant detail for each responding section assigned to City staff and mutual aid agencies prior to an emergency—management, operations, planning, logistics and finance. Roseville's Emergency Preparedness Manager conducts periodic tabletop and simulated exercises in conjunction with the Placer County Office of Emergency Services and affiliated agencies such as Sutter Roseville Medical Center and Kaiser Permanente Medical Center to ensure that staff is prepared and adequate resources are in place prior to any incident.

City of Roseville departments and other agencies providing emergency response within the City will review this plan at least annually in association with the Multi-Hazard Mitigation Steering Committee. A comprehensive review and subsequent gap analysis report was conducted on the Roseville Emergency Operations Plan in conjunction with the 2016 hazard mitigation planning process. Prioritized recommendations for revisions were provided to the City of Roseville.

15.7.2 City of Roseville Terrorism Contingency Plan

The City of Roseville Terrorism Contingency Plan was prepared in 2004 with grant funds provided through Cal OES by the U.S. Department of Homeland Security. The plan was prepared in collaboration with the Placer

County Office of Emergency Services, Placer County staff and representatives of the six incorporated cities in the Placer County Operational Area. The Terrorism Plan provides an overview of how the Emergency Operations Plan will be activated, how resources will be organized, and how staff will respond with state and federal resources. Specifically, the Terrorism Plan has the following provisions:

- Identifies how local, state, and federal response resources are integrated.
- Establishes a common response protocol to terrorist threats and events.
- Implements existing mutual aid programs.
- Outlines a unified strategic plan for all responders.

The Terrorism Plan is on file with the City of Roseville Fire Department. The City's Emergency Response Manager conducts training for all those assigned responsibilities as part of the plan in addition to coordinating with the Placer County Office of Emergency Services and other agencies charged with protecting the public in the event of a terrorist attack.

15.7.3 City of Roseville Hazardous Materials Contingency Plan

The Hazardous Materials Contingency Plan, completed in September 2004, identifies non-terrorist related hazardous materials responsibilities in order for the City to prepare, respond and recover from an event. The objectives of the Hazardous Materials Plan are as follows:

- Establish policies and responsibilities for protecting the health and safety of the general population and visitors in the City of Roseville and surrounding communities, the environment, and public and private property from the effects of accidental hazardous materials incidents.
- Identify the emergency response organizations that are responsible for managing hazardous materials incidents in or near the City of Roseville.
- Establish operational concepts for staffing, training, operating and supporting the City of Roseville hazardous materials team. The Hazardous Materials Plan is coordinated with the Placer Operational Interagency Response Team Hazard Plan.
- Direct all individuals, agencies, and departments referenced in the Hazardous Materials Plan to develop standard operating procedures and emergency response checklists that are consistent with the Hazardous Materials Plan and the City's Emergency Operations Plan.

15.7.4 State of California Certified Unified Program Agency

The City of Roseville is a State of California Certified Unified Program Agency. This designation identifies the City as a licensing agency for six hazardous-material-related programs. It enables the City of Roseville to implement its own hazardous materials emergency response program. Mutual aid agreements are also in place for incident response. Each business that responds yes to any of the following questions must submit a Unified Program Consolidated Form with facility information to the Roseville Fire Department:

- **Hazardous Materials—**Do you have on-site hazardous materials at or above 55 gallons for liquids, 500 pounds for solids, or 200 cubic feet for compressed gases, or the applicable threshold for an extremely hazardous substance specified in federal law; or do you handle radiological materials in quantities for which an emergency plan is required pursuant to applicable law?
- **Underground Storage Tank—**Do you have on-site underground storage tanks?
- **Above-Ground Storage Tank—**Do you have on-site above-ground storage tanks for storage of petroleum?
- **Hazardous Waste—**Do you operate a facility that generates, recycles, or treats hazardous waste, among other activities?

The Fire Department requires existing and proposed businesses to submit lists of hazardous materials they use. The list is maintained by the Fire Department Life Safety/Hazardous Materials Officer and updated periodically.

15.7.5 Roseville Police Department

Following the provisions and emergency response, mitigation, and recovery structure of the State Emergency Management System, the federally mandated National Incident Management System, and the National Response Plan, the Roseville Police Department is prepared to meet the challenge of intentional criminal acts, including acts of terrorism, as well as technological, accidental, or natural hazards in the following ways:

- Activation of local emergency response plans using multi-disciplinary resources, including but not limited to regional municipal and county law enforcement, the Joint Terrorism Task Force overseen by the FBI, the Department of Justice Anti-Terrorism Information Center, state and federal military personnel, and private resource agencies
- Deployment of local tactical resources to mitigate human-caused acts of terrorism or intentional business disruption, including SWAT, hostage negotiators, rapid containment team, the tactical communications team, and explosive ordnance personnel as necessary
- Use of the Crime Scene Investigations Unit for post-incident evidence collection and investigation
- Intake, processing, analysis, and investigation of all incidents with the potential for large-scale impact in a professional, timely manner.

15.7.6 Roseville Public Safety Communications

Communications personnel are prepared to take the following actions:

- Appropriately recognize and document citizens' reports of suspicious activity.
- Deploy appropriate resources to prevent, investigate, mitigate, and provide recovery services following incidents of human caused hazards, as well as natural and technological disasters.
- Coordinate resource management of personnel, equipment, and facilities during established crisis incidents.
- Work within the framework of the State Emergency Management System to provide emergency communications to field units and emergency operations personnel during emergency events.
- Deploy mutual aid assistance in support of local, state, and national entities during crisis incidents.
- Provide life-saving pre-arrival instructions on emergency medical incidents, both large-scale and of an individual nature.

15.7.7 Roseville Fire Department

Training

Roseville Fire Department personnel are highly trained to handle all aspects of emergency service. All first response personnel are trained in incident command, advanced firefighting skills, basic life support, essential rescue skills, and basic hazardous materials response. All first response personnel are trained to meet or exceed the following state training certification levels: Firefighter I & II, CPR, Emergency Medical Technician I, Hazmat First Responder Operations Decon and ICS 200.

To support these first responders, specialized teams of personnel are trained and certified in tower rescue, above/below grade rescue, confined space rescue, trench rescue, technical rescue, swift water rescue, dive rescue, specialized hazardous materials response, hazardous materials railcar and tank truck response, terrorism response, multi-casualty management, and advanced life support.

The department's staffing includes a full-time training officer who oversees the Fire Training Division. In addition to the training officer, the department draws from a cadre of state certified ICS, fire, EMS, hazmat and technical rescue instructors to conduct regular training exercises to maintain and enhance competency of personnel in all aspects of emergency response. The department also sends personnel to the National Fire Academy, California Specialized Training Institute, Hazmat Continuing Challenge and other off site programs for advanced certifications and training.

The Fire Department maintains a state-of-the-art training facility within the city limits. The Fire Training Center includes two classrooms, a six-story burn tower, command center and other specialized training props such as above- and below-grade vaults, tanks, cargo tanks and a rail tank car. The Roseville Fire Training Center has been state certified as a regional fire academy and for Hazardous Materials Technician / Specialist, Urban Search and Rescue Systems and Confined Space training.

In addition to training in-service response personnel, the Roseville Fire Training Center hosts a regional fire academy in cooperation with Sierra College. The Roseville Fire Training Center also provides regional training to other fire agencies, some of which are under contract with the Department of Homeland Security. Regular regional training includes the Hazardous Materials Technician / Specialist series, Low Angle Rope Rescue, Trench Rescue, Confined Space Rescue, and Urban Search and Rescue Systems I.

Response Time and Mutual Aid

The Roseville Fire Department is a fully functional agency that primarily provides fire suppression and emergency medical services for the urban environment of the City. The department operates eight stations. The department has eight paramedic engine companies, with a minimum staffing of three, two paramedic truck companies with a minimum staffing of four, and one battalion chief. The department also operates a hazardous materials response unit (cross-staffed the truck company); five grass/wildland units, and one technical rescue unit (cross-staffed by engine companies). The department maintains four reserve engines and one reserve truck.

The Fire Department has established a Standards of Response Coverage Plan that includes a travel time standard of 4 minutes from the time the apparatus leaves the station to the arrival of the first engine on scene. Due to significant growth in the City, additional fire stations are needed to achieve this response time. Fire Station 9 opened in May 2013 to serve the new development anticipated in West Roseville.

The City of Roseville has mutual aid agreements with local fire departments and districts in surrounding Placer County and Sacramento County. These personnel cooperate in the same training program as the City firefighters to ensure a high level of competency even with borrowed resources. The department participates in the statewide mutual aid system to bring additional resources from anywhere in California or the nation if this level of aid does not meet the incident needs.

Hazardous Materials Response

Hazardous Materials Listing

All hazardous materials handlers that store in excess of 55 gallons of liquid, 500 pounds of solids, or 200 cubic feet of gas are required to submit Hazardous Materials Management Business Plans to the Roseville Fire Department. These plans provide emergency contact information, site-specific chemical inventories, and vicinity and facility maps. Facilities storing materials that are "acutely" hazardous and in excess of the quantities in CCR, Title 19, Tables I, II or III must submit a more comprehensive Risk Management Plan, which includes off-site consequences analysis, maintenance, and training programs, and an executive summary. Owners/operators of above-ground tanks containing in excess of 660 gallons of petroleum hydrocarbons (or an aggregate quantity of 1,320 gallons) must comply with the California Aboveground Petroleum Storage Act, which requires the preparation of a spill prevention, control, and countermeasure plan.

Development Review Process

The Fire Department reviews any development proposal that may be impacted by or cause an impact related to the storage, handling, or disposal of hazardous materials. A Hazardous Materials Management Plan and, if necessary, a Risk Management Prevention Plan are required as part of the development process per state law. When considering any use, the City analyses the use of toxic or hazardous materials requiring the filing of a business plan for emergency response pursuant to Section 25503.5 of the California Health and Safety Code or materials identified in Section 5194, Title 8 of the CCR. All users must submit a list of hazardous and toxic materials with a qualified discussion of potential chronic and acute long-term health effects, including effects on children, and effects from acute short-term or chronic long-term exposure.

In addition, a plan must be submitted specifying procedures for mitigating the emissions of toxic substances and groundwater monitoring and for identifying methods of hazardous waste disposal. All projects must be reviewed for compliance with the Placer County Hazardous Waste Management Plan.

Intergovernmental Coordination

The Roseville Fire Department works cooperatively with other local and state agencies in a coordinated effort to inform and educate the public regarding the storage, handling, and disposal of household hazardous materials. This includes continued coordination with the Placer County Hazardous Materials Response Teams.

Hazardous Waste Drop-off

The City of Roseville partners with public and private entities to remove household hazardous waste from Roseville's waste stream. The disposals include the following:

- **Household Hazardous Waste Collection—**The Western Placer Waste Management Authority provides a collection service for household hazardous waste. Residents can transport waste to the Authority's facility north of Roseville or schedule a pickup through the Roseville Solid Waste Division.
- **Used Electronic Equipment—**The Materials Recovery Facility accepts old televisions and other electronic waste.
- **Used Motor Oil Recycling—**There are six locations in Roseville designated for used motor oil recycling drop-off.
- **Sharps (or Needles)—**Roseville residents who use medical needles for in-home care are encouraged to purchase sharps containers, which hold 100 needles, at a nominal cost from several drug stores in the City. Residents are asked to dispose of all medical needles and containers properly so they do not enter the waste stream.

Interagency Cooperation for Emergency Response

The City of Roseville Fire Department responds in accordance with the City of Roseville Hazardous Materials Emergency Response Plan to hazardous materials emergencies. Both the California Highway Patrol and the City of Roseville have developed a Hazardous Materials Emergency Plan that discusses the participants' responsibilities, organization and operation to be complied with in the event of a hazardous materials emergency, including clean-up and decontamination procedures.

Hazardous Materials Truck Route

The City of Roseville does not have specific truck routes for hazardous materials. The City does have established truck routes in the city limits, and in the event hazardous materials are to be transported within the city limits, a permit is required from the Roseville Police Department. Typically, trucks with bulk deliveries of hazardous materials use State Route 65 to Blue Oaks Boulevard and then access any of the north-south corridors, including

Washington Boulevard, Industrial Avenue, and Foothills Boulevard where local businesses use hazardous materials in their business activities.

Routes for hazardous materials are coordinated with the California Department of Transportation (Caltrans), the California Highway Patrol, and the Roseville Police, Fire, and Public Works Departments.

Since Blue Oaks Boulevard remains incomplete, there is a risk of hazardous material being transported on bulk trucks through residential areas to reach the Pleasant Grove Wastewater Treatment Plant and the Energy Park. The same is true for transportation of hazardous material to the Booth Road plant, but chlorine gas is no longer used for disinfection there (nor at other water plants serving Roseville).

Hazardous Materials Fee Program

The Roseville Fire Department has adopted a fee schedule for hazardous material permitting, storage, use, handling, and generation. The department also charges for fire and life safety inspections, plan review, and miscellaneous activities such as a Hazardous Materials Business Plan Review.

15.8 SCENARIO

Two human-caused hazard scenarios could have a significant impact on the City of Roseville:

- The first scenario would involve hazardous materials being transported via rail or highway (Interstate 80) across the planning area. The release of hazardous materials via intentional or unintentional means could impact large population centers within the City. Advance knowledge of these shipments and their contents would play a role in preparedness for this scenario, thus reducing its potential impact. The biggest issue in response to hazardous material is material identification and containment.
- The second scenario would be a terrorist event at a large gathering place such as a mall or event center. Terrorist events happen with little or no warning. With a population in excess of 120,000 people, Roseville does possess potential targets for terrorist activities. The City has taken steps to assess these sites as well as probable scenarios in its Terrorism Contingency Plan.

15.9 ISSUES

Future actions needed at the local level to address human-caused hazards include but are not limited to the following:

- Continue all facets of emergency preparedness training for police, fire, public works, and city manager/public information staff in order to respond quickly in the event of a human-caused disaster. Enhance awareness training for all City employees to recognize threats or suspicious activity in order to prevent an incident from occurring.
- Continue all facets of the City's hazardous materials team training and response through commitment of resources from the Fire Department budget and the addition of funding through the Sacramento Regional Homeland Security budget.
- Continue to improve response times for public safety throughout the City so as to reduce exposure to human-caused incidents. The City will maintain appropriate staffing levels of public safety personnel to address vulnerabilities identified in this chapter.
- Train first responders and all appropriate City staff to implement protocols contained in the City of Roseville Terrorism Response Plan.
- Continue to implement the City of Roseville Hazardous Materials Contingency Plan with enhancements as warranted by the type of uses in the City and new technologies in preventing hazardous materials incidents.

- Continue to work proactively with Union Pacific Railroad regarding the following:
  - Placards and labeling of containers
  - Emergency plans and coordination
  - Standardized response procedures
  - Notification of the types of materials being transported through Roseville on at least an annual basis
  - Random inspections of transporters as allowed by Union Pacific
  - Installation of mitigating techniques along the rail yard at critical locations
  - Routine hazard communication initiatives
  - Enhancing security along the rail corridor should the alert system go higher than Orange
  - Continuously looking to the use of safer alternative products to conduct rail transport operations.
- Continue regular testing of the alarm system along the Union Pacific railroad tracks in Central Roseville.
- Utilize Crime Prevention Through Environmental Design (CPTED) in future planning efforts as well as enhancing existing infrastructure and buildings to prevent or mitigate human-cause incidents. CPTED is an urban planning design process that integrates crime prevention with neighborhood design and community development. CPTED is based on the theory that the proper design and effective use of the built environment can reduce crime and the fear of crime and improve the quality of life. CPTED creates an environment where the physical characteristics, building layout, and site planning allow inhabitants to become key agents in ensuring their own security.
- Work with the private sector to enhance and create Business Continuity Plans in the event of an emergency.
- Relocate or construct a redundant Emergency Operations Center farther from the Roseville Rail Yard and floodplain.
- Maintain an emergency services information line that the public can contact 24 hours a day during an emergency incident to ask questions of emergency staff.
- Coordinate with all Roseville school districts to ensure that their emergency preparedness plans include preparation for human-caused incidents.
- Encourage local businesses to adopt Information Technology and telecommunications recovery plans.
- Promote 72-hour self-sufficiency through the Emergency Preparedness Manager's efforts, the Roseville website, Roseville Coalition of Neighborhood Associations, and other media.
- Continue to share the human-caused hazard risk and preparedness presentation given at the public meetings and City Council workshop as part of this preparedness effort.
- Maintain the on-line Citizens Advisory Panel of 2,400 households and periodically e-mail emergency preparedness information including human-caused hazard preparedness instructions and reminders.

Future actions needed at the regional level to address human-caused hazards include but are not limited to the following:

- Participate in regional, state and federal efforts to gather terrorism information at all levels and keep public safety officials briefed at all times regarding any local threats. Staff will then further develop response capabilities based on emerging threats.
- Participate in the Cal OES Disaster Resistant California annual conference and other training sessions sponsored by regional, state and federal agencies.
- Participate in regional training exercises per the requirements of Homeland Security Presidential Directive #8 in support of national preparedness. These training exercises, sponsored by the Sacramento Regional Office of Homeland Security, will test and evaluate the ability to coordinate the activities of city, county and state government first responders, volunteer organizations and the private sector in responding to terrorism and technological hazards. The trainings will enhance interagency coordination,

provide training to staff, test response and recovery capabilities, and activate the National Incident Management System and the mutual aid system.

- Review existing automatic/mutual aid agreements with other public safety agencies to identify opportunities for enhancement.

16. PLANNING AREA RISK RANKING

A risk ranking was performed for the hazards of concern described in this Plan. This risk ranking assesses the probability of each hazard's occurrence as well as its likely impact on the people, property, and economy of the planning area. When available, estimates of risk were generated with data from Hazus-MH or GIS analysis using methodologies promoted by FEMA. For hazards of concern with less robust datasets, qualitative assessments were used. The results are used in establishing mitigation priorities.

The climate change hazard was not ranked because its impacts are factored into each individual hazard and thus are peripherally included in this assessment. The human-health and human-caused hazards were not ranked because they are not considered natural hazards.

16.1 PROBABILITY OF OCCURRENCE

The probability of occurrence of a hazard is indicated by a probability factor based on likelihood of annual occurrence:

- High—Hazard event is likely to occur within 25 years (Probability Factor = 3)
- Medium—Hazard event is likely to occur within 100 years (Probability Factor =2)
- Low—Hazard event is not likely to occur within 100 years (Probability Factor =1)
- No exposure—There is no probability of occurrence (Probability Factor = 0)

The assessment of hazard frequency is generally based on past hazard events in the area. Table 16-1 summarizes the probability assessment for each hazard of concern for this Plan.

Table 16-1. Probability of Hazards

Hazard Event	Probability (high, medium, low)	Probability Factor
Dam Failure	Low	1
Drought	High	3
Earthquake	High	3
Flooding	Medium	2
Landslide	Low	1
Severe Weather	High	3
Wildfire	High	3

16.2 IMPACT

Hazard impacts were assessed in three categories: impacts on people, impacts on property and impacts on the local economy. Numerical impact factors were assigned as follows:

- **People**—Values were assigned based on the percentage of the total ***population exposed*** to the hazard event. The degree of impact on individuals will vary and is not measurable, so the calculation assumes for

simplicity and consistency that all people exposed to a hazard because they live in a hazard zone will be equally impacted when a hazard event occurs. An element of subjectivity can be used in assigning values for impacts on people. Impact factors were assigned as follows:

- High—50 percent or more of the population is exposed to a hazard (Impact Factor = 3)
- Medium—25 percent to 49 percent of the population is exposed to a hazard (Impact Factor = 2)
- Low—25 percent or less of the population is exposed to the hazard (Impact Factor = 1)
- No impact—None of the population is exposed to a hazard (Impact Factor = 0)

- **Property**—Values were assigned based on the percentage of the total ***property value exposed*** to the hazard event:

  - High—30 percent or more of the total assessed property value is exposed to a hazard (Impact Factor = 3)
  - Medium—15 percent to 29 percent of the total assessed property value is exposed to a hazard (Impact Factor = 2)
  - Low—14 percent or less of the total assessed property value is exposed to the hazard (Impact Factor = 1)
  - No impact—None of the total assessed property value is exposed to a hazard (Impact Factor = 0)

- **Economy**—Values were assigned based on the percentage of the total ***property value vulnerable*** to the hazard event. Values represent estimates of the loss from a major event of each hazard in comparison to the total assessed value of the property exposed to the hazard. For some hazards, such as wildfire, landslide and severe weather, vulnerability was considered to be the same as exposure due to the lack of loss estimation tools specific to those hazards. Loss estimates separate from the exposure estimates were generated for the earthquake and flood hazards using Hazus-MH.

  - High—Estimated loss from the hazard is 20 percent or more of the total exposed property value (Impact Factor = 3)
  - Medium—Estimated loss from the hazard is 10 percent to 19 percent of the total exposed property value (Impact Factor = 2)
  - Low—Estimated loss from the hazard is 9 percent or less of the total exposed property value (Impact Factor = 1)
  - No impact—No loss is estimated from the hazard (Impact Factor = 0)

Each category of impact was assigned a weighting factor to reflect its significance: impact on people was given a weighting factor of 3; impact on property was given a weighting factor of 2; and impact on the economy was given a weighting factor of 1. Table 16-2, Table 16-3 and Table 16-4 summarize the impacts for each hazard.

Table 16-2. Impact on People from Hazards

Hazard Event	Impact (high, medium, low)	Impact Factor	Multiplied by Weighting Factor (3)
Dam Failure	High	3	9
Drought[a]	None	0	0
Earthquake	High	3	9
Flooding	Low	1	3
Landslide	Low	1	3
Severe Weather	High	3	9
Wildfire	Medium	2	6

a. All people in the planning area would be exposed to drought, but the impact on the safety of individuals is expected to be minimal.

Table 16-3. Impact on Property from Hazards

Hazard Event	Impact (high, medium, low)	Impact Factor	Multiplied by Weighting Factor (2)
Dam Failure	High	3	6
Drought[a]	None	0	0
Earthquake	High	3	6
Flooding	Low	1	2
Landslide[b]	Low	0	0
Severe Weather	High	3	6
Wildfire	High	3	6

a. All properties in the planning area would be exposed to drought, but the impact on properties is expected to be minimal.
b. Impact on property is less than 0.5% and thus registers as 0.

Table 16-4. Impact on Economy from Hazards

Hazard Event	Impact (high, medium, low)	Impact Factor	Multiplied by Weighting Factor (1)
Dam Failure	High	3	3
Drought	Low	1	1
Earthquake	Low	1	1
Flooding	Low	1	1
Landslide	Low	1	1
Severe Weather	Low	1	1
Wildfire	Low	0	0

16.3 RISK RATING AND RANKING

The risk rating for each hazard was determined by multiplying the probability factor by the sum of the weighted impact factors for people, property and operations, as summarized in Table 16-5.

Based on these ratings, a priority of high, medium or low was assigned to each hazard. The hazards ranked as being of highest concern are earthquake, severe weather, and wildfire. Hazards ranked as being of medium concern are flood and dam failure. The hazards ranked as being of lowest concern are drought and landslide. Table 16-6 shows the hazard risk ranking.

Table 16-5. Hazard Risk Rating

Hazard Event	Probability Factor	Sum of Weighted Impact Factors	Total (Probability x Impact)
Dam Failure	1	18	18
Drought	3	1	3
Earthquake	3	16	48
Flooding	2	6	12
Landslide	1	4	4
Severe Weather	3	16	48
Wildfire	3	12	36

Table 16-6. Hazard Risk Ranking

Hazard Ranking	Hazard Event	Category
1	Severe Weather	High
2	Earthquake	High
3	Wildfire	High
4	Dam Failure	Medium
5	Flood	Medium
6	Landslide	Low
7	Drought	Low

Part 3. Mitigation Strategy

17. GUIDING PRINCIPLE, GOALS, OBJECTIVES, AND PREVIOUS ACTION STATUS

Hazard mitigation plans must identify goals for reducing long-term vulnerabilities to identified hazards (44 CFR Section 201.6(c)(3)(i)). For the purposes of this Plan, goals and objectives are defined as follows:

- **Goals** are general guidelines that explain what is to be achieved. They are usually broad-based, policy-type statements, long-term, and represent global visions. Goals help define the benefits that the Plan is trying to achieve. The success of the hazard mitigation plan should be measured by the degree to which its goals have been met (that is, by the actual benefits in terms of hazard mitigation).
- **Objectives** are short-term aims which, when combined, form a strategy or course of action to meet a goal. Unlike goals, objectives are specific and measurable.

After establishing a guiding principle for this hazard mitigation plan, the City of Roseville developed goals and objectives for the initial plan through discussions, research, and meetings of the Steering Committee and based on input from stakeholders and the public. Information for this process was garnered from the public involvement strategy, the risk assessment, and review of the California and Placer County hazard mitigation plans.

The Steering Committee identified seven goals, working from a catalog of goal statements created through review of other similar plans and FEMA planning guidance. Once the goals were established, objectives that meet multiple goals were selected through a similar exercise.

For the 2016 Plan, the Steering Committee reviewed the goals and objectives established for the previous plan to determine if they still fulfill the vision of reducing risk in the planning area. It was determined that the goals and objectives are still relevant to the vision.

17.1 GUIDING PRINCIPLE

A guiding principle or a mission statement for a plan is a written declaration of the plan's core purpose and focus. It normally remains unchanged over time, regardless of a change to the plan's goals or objectives. Though not required for DMA compliance, the incorporation of a guiding principle provides a clear, singular message that can be a focal point throughout all facets of the planning process. The City of Roseville developed the following guiding principle for 2016 to be carried through to subsequent updates to the hazard mitigation plan:

> *Through community partnerships, establish a plan to reduce vulnerability to hazards in order to protect the health, safety, welfare, and economy of the City.*

17.2 GOALS

The goals for the 2016 Plan, consistent with the hazards identified in this plan, are as follows:

- G-1: Protect lives and reduce injury.
- G-2: Promote hazard mitigation as an integrated policy.

- G-3: Protect the continuity of local government to ensure no significant disruption of services during or due to a disaster.
- G-4: Improve community emergency management preparedness, collaboration and outreach.
- G-5: Minimize or reduce damage to property, including critical facilities.
- G-6: Develop and implement mitigation strategies that optimize public funds in an efficient and cost-effective way.
- G-7: Monitor and support the natural environment's capacity to deal with the impacts of natural hazards, taking into account the potential impacts of global climate change.

17.3 OBJECTIVES

The Steering Committee selected the objectives listed in Table 17-1 to meet multiple goals. The objectives serve as a stand-alone measurement of a mitigation action rather than as a subset of a goal. Achievement of the objectives is a measure of the effectiveness of a mitigation strategy. The objectives are also used to help establish priorities.

Table 17-1. Objectives for 2011 Multi-Hazard Mitigation Plan

Objective Number	Objective Statement	Goals for which it can be applied
O-1	Consider the impacts of hazards on future land uses in the City of Roseville by coordinating with other planning mechanisms such as the General Plan and land-use code development.	1, 2, 5, 7
O-2	Protect and sustain reliable local emergency operations and communication facilities during and after disasters.	1, 3, 4
O-3	Develop new or enhance existing early warning response systems and plans.	1, 3, 4, 5
O-4	Seek to enhance emergency response capabilities through improvements to infrastructure and City programs.	1, 4, 5
O-5	Enhance the understanding of all present and future hazards that impact the City of Roseville and the risk they pose.	1, 3, 4, 5, 7
O-6	Seek mitigation projects that provide the highest degree of hazard protection at the least cost.	1, 5, 6
O-7	Seek to update information on natural, environmental, and human-caused hazards, vulnerabilities, and mitigation measures by coordinating planning efforts and creating partnerships with appropriate local, private, county, state, and federal agencies.	1, 2, 3, 4, 5, 7
O-8	Seek to implement codes, standards, and policies that will protect life and property, including natural habitat, from the impacts of hazards within the City of Roseville.	1, 2, 3, 5, 6
O-9	Educate the public on preparedness for and mitigation of potential impacts of hazards on the City of Roseville.	1, 2, 4
O-10	Support efforts to retrofit, purchase, or relocate structures in high hazard areas, including those known to be repetitively damaged.	3, 5, 6

17.4 STATUS OF PREVIOUS ACTIONS

The City of Roseville develops an annual Progress Report which includes the status of previous actions. This Progress Report details completed actions as well as those actions added outside of the 5-year update cycle. A copy of the 2015 Progress Report is located in Appendix B.

18. MITIGATION ALTERNATIVES

Catalogs of hazard mitigation alternatives were developed that present a broad range of alternatives to be considered for use in the planning area, in compliance with 44 CFR (Section 201.6(c)(3)(ii)). One catalog was developed for each hazard of concern evaluated in this Plan. The catalogs present alternatives that are categorized in two ways:

- By who would have responsibility for implementation:
  - Individuals (personal scale)
  - Businesses (corporate scale)
  - Government (government scale).
- By what the alternative would do:
  - Manipulate the hazard
  - Reduce exposure to the hazard
  - Reduce vulnerability to the hazard
  - Increase the ability to respond to or be prepared for the hazard.

Hazard mitigation actions recommended in this Plan were selected from among the alternatives presented in the catalogs. The catalogs provide a baseline of mitigation alternatives that are backed by a planning process, are consistent with the established goals and objectives, and are within the capabilities of the City of Roseville to implement. Some of these actions may not be feasible based on the selection criteria identified for this Plan. The purpose of the catalog was to provide a list of what could be considered to reduce risk of the flood hazard within the planning area. Actions in the catalog that are not included for the action plan were not selected for one or more of the following reasons:

- The action is not feasible.
- The action is already being implemented.
- There is an apparently more cost-effective alternative.
- The action does not have public or political support.

The catalogs for each hazard are presented in Table 18-1 through Table 18-9.

Table 18-1. Alternatives to Mitigate the Dam Failure Hazard

Personal-Scale	Corporate-Scale	Government-Scale
• **Manipulate the hazard:** ○ **None** • **Reduce exposure to the hazard:** ○ **Relocate out of dam failure inundation areas.** • **Reduce vulnerability to the hazard:** ○ **Elevate home to appropriate levels.** • **Increase the ability to respond to or be prepared for the hazard:** ○ **Learn about risk reduction for the dam failure hazard.** ○ **Learn the evacuation routes for a dam failure event.** ○ **Educate yourself on early warning systems and the dissemination of warnings.**	• **Manipulate the hazard:** ○ Remove dams. ○ Remove levees. ○ Harden dams. • **Reduce exposure to the hazard:** ○ Replace earthen dams with hardened structures. • **Reduce vulnerability to the hazard:** ○ Flood-proof facilities within dam failure inundation areas. • **Increase the ability to respond to or be prepared for the hazard:** ○ Educate employees on the probable impacts of a dam failure. ○ Develop a continuity of operations plan.	• **Manipulate the hazard:** ○ Remove dams. ○ Remove levees. ○ Harden dams. • **Reduce exposure to the hazard:** ○ Replace earthen dams with hardened structures ○ Relocate critical facilities out of dam failure inundation areas. ○ Consider open space land use in designated dam failure inundation areas. • **Reduce vulnerability to the hazard:** ○ Adopt higher regulatory floodplain standards in mapped dam failure inundation areas. ○ Retrofit critical facilities within dam failure inundation areas. • **Increase the ability to respond to or be prepared for the hazard:** ○ Map dam failure inundation areas. ○ Enhance emergency operations plan to include a dam failure component. ○ Institute monthly communications checks with dam operators. ○ Inform the public on risk reduction techniques ○ Adopt real-estate disclosure requirements for the re-sale of property located within dam failure inundation areas. ○ Consider the probable impacts of climate in assessing the risk associated with the dam failure hazard. ○ Establish early warning capability downstream of listed high hazard dams. ○ Consider the residual risk associated with protection provided by dams in future land use decisions.

Table 18-2. Alternatives to Mitigate the Drought Hazard

Personal-Scale	Corporate-Scale	Government-Scale
• **Manipulate the hazard:** ○ **None** • **Reduce exposure to the hazard:** ○ **None** • **Reduce vulnerability to the hazard:** ○ **Drought-resistant landscapes** ○ **Reduce water system losses** ○ **Modify plumbing systems (through water saving kits)** • **Increase the ability to respond to or be prepared for the hazard:** ○ **Practice active water conservation**	• **Manipulate the hazard:** ○ None • **Reduce exposure to the hazard:** ○ None • **Reduce vulnerability to the hazard:** ○ Drought-resistant landscapes ○ Reduce private water system losses • **Increase the ability to respond to or be prepared for the hazard:** ○ Practice active water conservation	• **Manipulate the hazard:** ○ Groundwater recharge through stormwater management • **Reduce exposure to the hazard:** ○ Identify and create groundwater backup sources • **Reduce vulnerability to the hazard:** ○ Reduce water system losses ○ Distribute water saving kits ○ Increase use of recycled water ○ Diversify water supply diversion points • **Increase the ability to respond to or be prepared for the hazard:** ○ Public education on drought resistance ○ Identify alternative water supplies for times of drought; mutual aid agreements with alternative suppliers ○ Implement drought contingency plan ○ Develop criteria “triggers” for drought-related actions ○ Improve accuracy of water supply forecasts

Table 18-3. Alternatives to Mitigate the Earthquake Hazard

Personal-Scale	Corporate-Scale	Government-Scale
• **Manipulate the hazard:** ○ **None** • **Reduce exposure to the hazard:** ○ **Locate outside of hazard area (off soft soils)** • **Reduce vulnerability to the hazard:** ○ **Retrofit structure (anchor house structure to foundation)** ○ **Secure household items that can cause injury or damage (such as water heaters, bookcases, and other appliances)** ○ **Build to higher design** • **Increase the ability to respond to or be prepared for the hazard:** ○ **Practice "drop, cover, and hold"** ○ **Develop household mitigation plan, such as creating a retrofit savings account, communication capability with outside, 72-hour self-sufficiency during an event** ○ **Keep cash reserves for reconstruction** ○ **Become informed on the hazard and risk reduction alternatives available.** ○ **Develop a post-disaster action plan for your household**	• **Manipulate the hazard:** ○ None • **Reduce exposure to the hazard:** ○ Locate or relocate mission-critical functions outside hazard area where possible • **Reduce vulnerability to the hazard:** ○ Build redundancy for critical functions and facilities ○ Retrofit critical buildings and areas housing mission-critical functions • **Increase the ability to respond to or be prepared for the hazard:** ○ Adopt higher standard for new construction; consider "performance-based design" when building new structures ○ Keep cash reserves for reconstruction ○ Inform your employees on the possible impacts of earthquake and how to deal with them at your work facility. ○ Develop a continuity of operations plan	• **Manipulate the hazard:** ○ None • **Reduce exposure to the hazard:** ○ Locate critical facilities or functions outside hazard area where possible • **Reduce vulnerability to the hazard:** ○ Harden infrastructure ○ Provide redundancy for critical functions ○ Adopt higher regulatory standards • **Increase the ability to respond to or be prepared for the hazard:** ○ Provide better hazard maps ○ Provide technical information and guidance ○ Enact tools to help manage development in hazard areas (e.g., tax incentives, information) ○ Include retrofitting and replacement of critical system elements in capital improvement plan ○ Develop strategy to take advantage of post-disaster opportunities ○ Warehouse critical infrastructure components such as pipe, power line, and road repair materials ○ Develop and adopt a continuity of operations plan ○ Initiate triggers guiding improvements (such as <50% substantial damage or improvements) ○ Further enhance seismic risk assessment to target high hazard buildings for mitigation opportunities. ○ Develop a post-disaster action plan that includes grant funding and debris removal components.

Table 18-4. Alternatives to Mitigate the Flooding Hazard

Personal-Scale	Corporate-Scale	Government-Scale
• **Manipulate the hazard:** ○ **Clear storm drains and culverts** ○ **Use low-impact development techniques** • **Reduce exposure to the hazard:** ○ **Locate outside of hazard area** ○ **Elevate utilities above base flood elevation** ○ **Use low-impact development techniques** • **Reduce vulnerability to the hazard:** ○ **Raise structures above base flood elevation** ○ **Elevate items within house above base flood elevation** ○ **Build new homes above base flood elevation** ○ **Flood-proof structures** • **Increase the ability to respond to or be prepared for the hazard:** ○ **Buy flood insurance** ○ **Develop household plan, such as retrofit savings, communication with outside, 72-hour self-sufficiency during and after an event**	• **Manipulate the hazard:** ○ Clear storm drains and culverts ○ Use low-impact development techniques • **Reduce exposure to the hazard:** ○ Locate critical facilities or functions outside hazard area ○ Use low-impact development techniques • **Reduce vulnerability to the hazard:** ○ Build redundancy for critical functions or retrofit critical buildings ○ Provide flood-proofing when new critical infrastructure must be located in floodplains • **Increase the ability to respond to or be prepared for the hazard:** ○ Keep cash reserves for reconstruction ○ Support and implement hazard disclosure for sale of property in risk zones. ○ Solicit cost-sharing through partnerships with others on projects with multiple benefits.	• **Manipulate the hazard:** ○ Maintain drainage system ○ Institute low-impact development techniques on property ○ Dredging, levee construction, and providing regional retention areas ○ Structural flood control, levees, channelization, or revetments. ○ Stormwater management regulations and master planning ○ Acquire vacant land or promote open space uses in developing watersheds to control increases in runoff • **Reduce exposure to the hazard:** ○ Locate or relocate critical facilities outside of hazard area ○ Acquire or relocate identified repetitive loss properties ○ Promote open space uses in identified high hazard areas via techniques such as: planned unit developments, easements, setbacks, greenways, sensitive area tracks. ○ Adopt land development criteria such as planned unit developments, density transfers, clustering ○ Institute low impact development techniques on property ○ Acquire vacant land or promote open space uses in developing watersheds to control increases in runoff • **Reduce vulnerability to the hazard:** ○ Harden infrastructure, bridge replacement program ○ Provide redundancy for critical functions and infrastructure ○ Adopt regulatory standards such as freeboard standards, cumulative substantial improvement or damage, lower substantial damage threshold; compensatory storage, non-conversion deed restrictions. ○ Stormwater management regulations and master planning. ○ Adopt “no-adverse impact” floodplain management policies that strive to not increase the flood risk on downstream communities. • **Increase the ability to respond to or be prepared for the hazard:** ○ Produce better hazard maps ○ Provide technical information and guidance ○ Enact tools to help manage development in hazard areas (stronger controls, tax incentives, and information) ○ Incorporate retrofitting or replacement of critical system elements in capital improvement plan ○ Develop strategy to take advantage of post-disaster opportunities ○ Warehouse critical infrastructure components ○ Develop and adopt a continuity of operations plan ○ Consider participation in the Community Rating System ○ Maintain and collect data to define risks and vulnerability ○ Train emergency responders ○ Create an elevation inventory of structures in the floodplain ○ Develop and implement a public information strategy ○ Charge a hazard mitigation fee ○ Integrate floodplain management policies into other planning mechanisms within the planning area. ○ Consider the probable impacts of climate change on the risk associated with the flood hazard ○ Consider the residual risk associated with structural flood control in future land use decisions ○ Enforce National Flood Insurance Program ○ Adopt a Stormwater Management Master Plan

Table 18-5. Alternatives to Mitigate the Landslide Hazard

Personal-Scale	Corporate-Scale	Government-Scale
• **Manipulate the hazard:** ○ **Stabilize slope (dewater, armor toe)** ○ **Reduce weight on top of slope** ○ **Minimize vegetation removal and the addition of impervious surfaces.** • **Reduce exposure to the hazard:** ○ **Locate structures outside of hazard area (off unstable land and away from slide-run out area)** • **Reduce vulnerability to the hazard:** ○ **Retrofit home** • **Increase the ability to respond to or be prepared for the hazard:** ○ **Institute warning system, and develop evacuation plan** ○ **Keep cash reserves for reconstruction** ○ **Educate yourself on risk reduction techniques for landslide hazards**	• **Manipulate the hazard:** ○ Stabilize slope (dewater, armor toe) ○ Reduce weight on top of slope • **Reduce exposure to the hazard:** ○ Locate structures outside of hazard area (off unstable land and away from slide-run out area) • **Reduce vulnerability to the hazard:** ○ Retrofit at-risk facilities • **Increase the ability to respond to or be prepared for the hazard:** ○ Institute warning system, and develop evacuation plan ○ Keep cash reserves for reconstruction ○ Develop a continuity of operations plan ○ Educate employees on the potential exposure to landslide hazards and emergency response protocol.	• **Manipulate the hazard:** ○ Stabilize slope (dewater, armor toe) ○ Reduce weight on top of slope • **Reduce exposure to the hazard:** ○ Acquire properties in high-risk landslide areas. ○ Adopt land use policies that prohibit the placement of habitable structures in high-risk landslide areas. • **Reduce vulnerability to the hazard:** ○ Adopt higher regulatory standards for new development within unstable slope areas. ○ Armor/retrofit critical infrastructure against the impact of landslides. • **Increase the ability to respond to or be prepared for the hazard:** ○ Produce better hazard maps ○ Provide technical information and guidance ○ Enact tools to help manage development in hazard areas: better land controls, tax incentives, information ○ Develop strategy to take advantage of post-disaster opportunities ○ Warehouse critical infrastructure components ○ Develop and adopt a continuity of operations plan ○ Educate the public on the landslide hazard and appropriate risk reduction alternatives.

Table 18-6. Alternatives to Mitigate the Severe Weather Hazard

Personal-Scale	Corporate-Scale	Government-Scale
• **Manipulate the hazard:** ○ **None** • **Reduce exposure to the hazard:** ○ **None** • **Reduce vulnerability to the hazard:** ○ **Insulate house** ○ **Provide redundant heat and power** ○ **Insulate structure** ○ **Plant appropriate trees near home and power lines ("Right tree, right place" National Arbor Day Foundation Program)** • **Increase the ability to respond to or be prepared for the hazard:** ○ **Trim or remove trees that could affect power lines** ○ **Promote 72-hour self-sufficiency** ○ **Obtain a NOAA weather radio.** ○ **Obtain an emergency generator.**	• **Manipulate the hazard:** ○ None • **Reduce exposure to the hazard:** ○ None • **Reduce vulnerability to the hazard:** ○ Relocate critical infrastructure (such as power lines) underground ○ Reinforce or relocate critical infrastructure such as power lines to meet performance expectations ○ Install tree wire • **Increase the ability to respond to or be prepared for the hazard:** ○ Trim or remove trees that could affect power lines ○ Create redundancy ○ Equip facilities with a NOAA weather radio ○ Equip vital facilities with emergency power sources.	• **Manipulate the hazard:** ○ None • **Reduce exposure to the hazard:** ○ None • **Reduce vulnerability to the hazard:** ○ Harden infrastructure such as locating utilities underground ○ Trim trees back from power lines ○ Designate snow routes and strengthen critical road sections and bridges • **Increase the ability to respond to or be prepared for the hazard:** ○ Support programs such as "Tree Watch" that proactively manage problem areas through use of selective removal of hazardous trees, tree replacement, etc. ○ Establish and enforce building codes that require all roofs to withstand snow loads ○ Increase communication alternatives ○ Modify land use and environmental regulations to support vegetation management activities that improve reliability in utility corridors. ○ Modify landscape and other ordinances to encourage appropriate planting near overhead power, cable, and phone lines ○ Provide NOAA weather radios to the public

Table 18-7. Alternatives to Mitigate the Wildfire Hazard

Personal-Scale	Corporate-Scale	Government-Scale
• **Manipulate the hazard:** ○ **Clear potential fuels on property such as dry overgrown underbrush and diseased trees** • **Reduce exposure to the hazard:** ○ **Create and maintain defensible space around structures** ○ **Locate outside of hazard area** ○ **Mow regularly** • **Reduce vulnerability to the hazard:** ○ **Create and maintain defensible space around structures and provide water on site** ○ **Use fire-retardant building materials** ○ **Create defensible spaces around home** • **Increase the ability to respond to or be prepared for the hazard:** ○ **Employ techniques from the National Fire Protection Association's Firewise Communities program to safeguard home** ○ **Identify alternative water supplies for fire fighting** ○ **Install/replace roofing material with non-combustible roofing materials.**	• **Manipulate the hazard:** ○ Clear potential fuels on property such as dry underbrush and diseased trees • **Reduce exposure to the hazard:** ○ Create and maintain defensible space around structures and infrastructure ○ Locate outside of hazard area • **Reduce vulnerability to the hazard:** ○ Create and maintain defensible space around structures and infrastructure and provide water on site ○ Use fire-retardant building materials ○ Use fire-resistant plantings in buffer areas of high wildfire threat. • **Increase the ability to respond to or be prepared for the hazard:** ○ Support Firewise community initiatives. ○ Create /establish stored water supplies to be used for firefighting.	• **Manipulate the hazard:** ○ Clear potential fuels on property such as dry underbrush and diseased trees ○ Implement best management practices on public lands. • **Reduce exposure to the hazard:** ○ Create and maintain defensible space around structures and infrastructure ○ Locate outside of hazard area ○ Enhance building code to include use of fire resistant materials in high hazard area. • **Reduce vulnerability to the hazard:** ○ Create and maintain defensible space around structures and infrastructure ○ Use fire-retardant building materials ○ Use fire-resistant plantings in buffer areas of high wildfire threat. ○ Consider higher regulatory standards (such as Class A roofing) ○ Establish biomass reclamation initiatives • **Increase the ability to respond to or be prepared for the hazard:** ○ More public outreach and education efforts, including an active Firewise program ○ Possible weapons of mass destruction funds available to enhance fire capability in high-risk areas ○ Identify fire response and alternative evacuation routes ○ Seek alternative water supplies ○ Become a Firewise community ○ Use academia to study impacts/solutions to wildfire risk ○ Establish/maintain mutual aid agreements between fire service agencies. ○ Create/implement fire plans ○ Consider the probable impacts of climate change on the risk associated with the wildfire hazard in future land use decisions

Table 18-8. Alternatives to Mitigate Health Hazards

Personal-Scale	Corporate-Scale	Government-Scale
• **Manipulate the hazard:** ○ **None** • **Reduce exposure to the hazard:** ○ **Eliminate or reduce environments on private property that favor mosquito infestation** • **Reduce vulnerability to the hazard:** ○ **Immunization** • **Increase the ability to respond to or be prepared for the hazard:** ○ **Get informed**	• **Manipulate the hazard:** ○ None • **Reduce exposure to the hazard:** ○ Eliminate or reduce environments on private property that favor mosquito infestation • **Reduce vulnerability to the hazard:** ○ Immunize employees • **Increase the ability to respond to or be prepared for the hazard:** ○ Inform employees on human health hazards	• **Manipulate the hazard:** ○ Mosquito abatement • **Reduce exposure to the hazard:** ○ Eliminate or reduce environments on public property that favor mosquito infestation • **Reduce vulnerability to the hazard:** ○ Immunize employees • **Increase the ability to respond to or be prepared for the hazard:** ○ Collaborate with the Placer County Health Department to ensure the health and welfare of the community ○ Public education on mosquito abatement and general human health issues

Table 18-9. Alternatives to Mitigate Human-Cause Hazards

Personal-Scale	Corporate-Scale	Government-Scale
• **Manipulate the hazard:** ○ **None** • **Reduce exposure to the hazard:** ○ **None** • **Reduce vulnerability to the hazard:** ○ **None** • **Increase the ability to respond to or be prepared for the hazard:** ○ **Increase awareness of vulnerability to threats** ○ **Neighborhood watch program** ○ **Keep informed** ○ **Develop an emergency response plan** ○ **Report suspicious activities**	• **Manipulate the hazard:** ○ None • **Reduce exposure to the hazard:** ○ Incorporate anti-terrorism and security mitigation measures in site and layout design of facilities ○ Consider site security in landscape design of facilities • **Reduce vulnerability to the hazard:** ○ Restrict access by implementing controlled access zones ○ Increase security measures ○ Install physical barriers around critical facilities ○ Employ parking restrictions as a means to reduce vulnerability • **Increase the ability to respond to or be prepared for the hazard:** ○ Become a partner (stakeholder) in mitigation and prevention ○ Educate employees ○ Develop an emergency response plan ○ Develop a Continuity of Operations Plan ○ Use liberal signage techniques to inform and increase capability of users of facilities	• **Manipulate the hazard:** ○ None • **Reduce exposure to the hazard:** ○ Construct new critical facilities with clear zones. ○ Retrofit existing critical facilities • **Reduce vulnerability to the hazard:** ○ Restrict access by implementing controlled access zones ○ Reduce single-point vulnerabilities such as: redundancy for critical lifelines and infrastructure ○ Install physical barriers around critical facilities ○ Provide regular education to personnel regarding cyber attacks • **Increase the ability to respond to or be prepared for the hazard:** ○ Educate public on threats and vulnerability ○ Enhance emergency response capability by contingency planning for specific events based on identified vulnerabilities ○ Consider performance-based zoning as a land use alternative to mitigate impacts of human-caused hazards ○ Employ Crime Prevention Through Environmental Design (CPTED techniques in design of public facilities ○ Consider providing incentives for mitigation ○ Develop a City THIRA ○ Establish secure communications between multiple entities to communicate sensitive information.

19. ACTION PLAN AND IMPLEMENTATION

19.1 HAZARD MITIGATION ACTION PLAN

The Steering Committee reviewed the catalogs of hazard mitigation alternatives and selected actions to be included in a hazard mitigation action plan. The selection of actions was based on the risk assessment of identified hazards of concern and the defined Roseville hazard mitigation goals and objectives. Table 19-1 lists the recommended hazard mitigation actions that make up the action plan. The timeframe indicated in the table is defined as follows:

- Short Term = to be completed in 1 to 5 years
- Long Term = to be completed in greater than 5 years
- Ongoing = currently being funded and implemented under existing programs.

Table 19-1. Action Plan

Hazards Addressed	Funding Options	Timeframe	Objectives Met	In Previous Plan? (# from previous plan)
Lead Agency: Central Services Department				
Action #F-20— Retrofit the City's Downtown library by sealing the exterior and installing a flood door to protect against flood damage should Dry Creek overspill the existing floodwall.				
Flood	Grant funding (PDM, HMGP, and FEMA) based on benefits exceeding costs	Long term	6, 10	Yes (F-21)
Lead Agency: City Council				
Action #HC-3—Seek to establish appropriate staffing levels of public safety personnel to address vulnerabilities identified through an incremental targeted study that provides immediate needs as well as anticipated needs in 1 year, 5 years, and 10 years.				
Human-Caused	General Fund	Short term	2, 4	Yes (HC-3)
Lead Agency: City Manager's Office				
Action #HH-3—Collaborate with the Placer County Mosquito Abatement District to review resource protection policies that conflict with human health protection in the City of Roseville and work to resolve these policy issues				
Human Health	Currently budgeted for under the General Fun	Short term	5, 6, 7, 9	Yes (HH-3)
Lead Agency: Public Affairs & Communications Department				
Action #HH-2—Support the public education efforts of the Placer County Health Department and the Placer Mosquito Abatement District				
Human Health	Currently budgeted for under the General Fund	Short term	5, 6, 7, 9	Yes (HH-2)
Action #MH-2—Continue to maintain the hazard mitigation page on City website that provides following types of information: • The Hazard Management Plan and its progress reports • Hazard-specific information • Mitigation information by hazard, with specific emphasis on private property • Emergency response and warning information • Links to county, state, and federal related agencies				
	General Fund; PDM grant funding	Short term	2, 3, 5, 6, 9	Yes (MH-2)
Lead Agency: Development Services Department				
Action #EQ-1—Perform building-specific, structural seismic vulnerability assessment of City-owned critical facilities constructed prior to 1980 (including infrastructure). Included in this assessment will be recommended mitigation alternatives that meet goals and objectives of this Plan.				
Earthquake	General Fund; Possible grant funding under PDM program	Long term	5, 10	Yes (EQ-1)
Action #EQ-2—Incorporate earthquake mitigation measures for private property into existing City-sponsored outreach programs such as printed media and the City's website.				
Earthquake	City General fund	Short term	1, 9, 10, 11	Yes (EQ-2)
Action #EQ-3—Reassess the overall vulnerability to the earthquake hazard using the best available science and technology as it becomes available. State-sponsored programs, Seismic Hazards Mapping Act, and future FEMA- sponsored initiatives are anticipated to create a wealth of knowledge regarding this hazard that did not exist during the preparation of this Plan.				
Earthquake	General Fund; Possible grant funding under PDM program	Short term	1, 5, 7, 9	Yes (EQ-3)
Action #F-1—The City shall designate all areas identified as the 100-year floodplain. The boundaries of the 100-year floodplain shall be as specified in the floodplain designations section of this component of the City's General Plan. Floodplain areas shall be preserved as specified in the open space and conservation element. Such preservation may include required dedication to the City. If needed, modify the City's ordinances to include floodplain use regulations consistent with the goals, policies, and implementation measures of the safety, land use, open space and conservation, and parks and recreation elements of the City's General Plan.				
Flood	Currently funded by General Fund allocation	Long term	1, 6, 7	Yes (F-1)

Hazards Addressed	Funding Options	Timeframe	Objectives Met	In Previous Plan? (# from previous plan)
Action #F-2—Refer any development proposal that has a direct or indirect impact on flood protection to Public Works for comment. In addition, forward such proposals to other agencies as applicable, including the U.S. Army Corps of Engineers, California Central Valley Flood Protection Board, FEMA, California Department of Fish and Wildlife, Placer County Resource Conservation District, and Placer County Flood Control District. Consider the comments of the agencies during the development review process.				
Flood	Currently funded by General Fund allocation	Short term	1, 5, 7	Yes (F-2)
Action #F-9—Ensure that future specific plans and specific plan amendments are consistent with the goals and policies of the General Plan. The specific plans shall include the designation and preservation of floodplain areas and adjacent habitat. Provisions shall be incorporated to ensure that public infrastructure, utilities, and emergency services remain functional during flood conditions. Such infrastructure and facilities include water, sewer and gas mains, telephone and electric lines, streets and bridges, hospitals, and fire and police stations. Financing mechanisms shall be explored to fund necessary flood protection improvements and maintenance. Development agreements may be used to secure implementation and funding provisions. (Specific plans have 100% cost recovery by developers).				
Flood	Specific plans have 100% cost recovery by developers	Long term	1, 6, 7, 8	Yes (F-9)
Action #F-11—Require a master drainage plan as part of the approval process for all specific plans and large development projects as determined by the Public Works director. The master drainage plan should consider cumulative regional drainage and flooding mitigation. The plan's intent is to ensure that the overall rate of runoff from a project does not exceed predevelopment levels. If necessary, this objective shall be achieved by incorporating run-off control measures to minimize peak flows and/or assistance in financing or otherwise implementing comprehensive drainage plans.				
Flood	General Fund; Developer-based funding under specific plan requirements	Long term	1, 6, 8	Yes (F-11)
Action #LS-2— Continue to implement policies adopted by the General Plan that promote open space land uses within identified steep slope areas of Roseville. The City of Roseville Northeast Roseville Specific Plan and Stoneridge Specific Plans include the identified steep slope areas within Roseville. Both Plan Areas have continuing development.				
Landslide	General Fund; Developer-based funding and specific plan requirements	Short term	1, 6, 8	Yes (LS-2)
Action #MH-1—Continue to maintain Office of Emergency Services certification of all City inspectors for post-disaster damage assessment.				
Multi-Hazard	General Fund	Short term	2, 7	Yes (MH-1)
Lead Agency: Environmental Utilities Department (EUD)				
Action #D-1—Perform a groundwater recharge feasibility study to determine the most cost-effective way to replenish groundwater resources within Roseville.				
Drought	Water utility funds; General fund; Developer-based funding under specific plan requirements	Long term	5, 6	Yes (D-1)
Action #D-2—Implement aquifer storage and recovery program that uses direct injection technique in areas identified as appropriate.				
Drought	Water Construction Fund	Long term	6, 8	Yes (D-2)
Action #D-3—Continue to implement the Environmental Utility Department's recycled water program and seek all opportunities to expand its coverage, currently focusing on urban growth areas. The City pumps recycled water through a system of purple pipes completely separate from potable (drinking water) pipes. The City pumps the recycled water to customers such as streetscapes, golf courses and parks, where it irrigates turf and shrubs. Using recycled water for uses such as landscape irrigation reduces demand on the potable water system, creating a more reliable water supply for the entire City. Recycled water is not subject to the effects of drought.				
Drought	Water utility rates, developer-based fees under specific plan requirements	Short term	6, 8	Yes (D-3)
Action #D-4—Promote active water conservation techniques and strategies to private property owners through Roseville-sponsored outreach projects such as printed media and the City's website.				
Drought	Currently funded by General Fund allocation	Short term	5, 9	Yes (D-4)
Action #HC-5—Address vulnerabilities identified in vulnerability assessment of water facilities performed by the Environmental Utilities Department in response to EPA initiative.				
Human-Caused	EUD CIP, and EPA grant funding	Long term	5, 7	Yes (HC-5)

Hazards Addressed	Funding Options	Timeframe	Objectives Met	In Previous Plan? (# from previous plan)
Action #SW-4—Enhance and implement strategies for debris management and removal during severe weather events.				
	General Fund	Short term	6, 8	Yes (SW-5)
Lead Agency: Information Technology Division				
Action #HC-9—Protect the City's data, technology infrastructure and staff against malicious cyber-attacks and Cyber terrorism, such as but not limited to: • Identity Theft • Virus/Malware/Ransomware/Spyware/Spam/Phishing • Network and system attacks • Web site hacking • Denial-of-service attacks				
Human-Caused	General Fund	Short term	2, 5, 7	Yes (HC-9)
Action #MH-7—Strive to maintain high availability of essential communication services				
Multi-Hazard	EUD CIP, General Fund	Ongoing	2, 3, 4, 7	Yes (MH-7)
Action #MH-8—Secure the City's physical locations that contain technology infrastructure				
Multi-Hazard	EUD CIP, General Fund	Ongoing	2, 3, 4, 7	Yes (MH-8)
Lead Agency: Parks, Recreation & Libraries Department: Open Space Division				
Action #F-12—Continue the Parks, Recreation & Libraries Department's regular creek maintenance program within the City's creeks and floodplain areas. This program clears and removes debris that could contribute to blockage and flooding and may include the removal of silt. This is only done in areas of high risk to flood damage or where property or facilities are threatened by flooding.				
Flood	Currently funded by General Fund allocation	Ongoing	8	Yes (F-12)
Action #F-21—Continue the Tree Mitigation Fund program administered by the Open Space Division in conjunction with non-profit organizations. The planting of oak trees in the open spaces adjacent to riparian zones increases infiltration and slows storm water surges.				
Flood	General Fund	Ongoing	1, 5, 7, 9	Yes (F-22)
Action #F-22—Manage beaver dam sites for flood control protection and habitat restoration after dam removal. One primary issue is impacts to floodwater capacity of creeks. Part of the desired comprehensive approach to beaver management includes establishment of quantitative and qualitative "carrying capacity," including acre-feet of flood capacity lost. Implement a standard monitoring and reporting process to track beaver dam locations, population, and impacts. Gain regulatory approval for beaver management techniques such as biological control and habitat manipulation using the most benign options first.				
Flood	Currently funded by General Fund allocation	Ongoing	1, 6, 8	Yes (F-23)
Action #WF-1—Continue "Goat Grazing" program for removal of grassland in areas of Roseville potentially vulnerable to wildfire. Implement goat grazing in City open space and preserve areas for fire and invasive plant species management and native plant restoration.				
Wildfire	General Fund; Community Facilities District funding; PDM grant funding	Ongoing	6, 9	Yes (WF-2)
Action #MH-4—Implement an "Adopt an Open Space" program in coordination with the open space management program. Develop "adoption contracts" with neighborhoods, organizations, businesses, etc., describing the level of stewardship and the terms of the "adoption." Publicize these activities through online resource directory and other media to encourage participation.				
Multi-Hazard	General Fund; Community Facilities District funding; PDM grant funding	Short term	1, 5, 7, 9	Yes (MH-4)
Action #MH-5—Develop and disseminate best practices information to private property owners whose land is adjacent to open space areas describing stewardship opportunities and owners' role in preserving beneficial uses of open space areas (including vernal pool grassland and creek or riparian uses). Offer classes to provide in-depth information, such as demonstration projects, techniques for ecologically friendly weed abatement and vegetation control, and creating a backyard habitat compatible with open space areas.				
Multi-Hazard	General Fund; PDM grant funding	Short term	1, 5, 7, 9	Yes (MH-5)
Action #MH-6—Work with the Roseville City School District, local high school districts, and non-profit organizations to promote ecology-oriented curricula and stewardship activities. Identify resource and administrative barriers that may be limiting schools' abilities to more actively participate in stewardship, and work collaboratively to identify solutions.				
Multi-Hazard	General Fund; PDM grant funding	Long term	1, 5, 7, 9	Yes (MH-6)

Hazards Addressed	Funding Options	Timeframe	Objectives Met	In Previous Plan? (# from previous plan)
Lead Agency: Police and Fire Department				
Action #DF-1—Create a dam failure element for the City's emergency response plan that includes a phased warning protocol in response to the findings of the Folsom Dam Containment Dike Risk Assessment.				
Dam Failure	General Fund; Department of Homeland Security (DHS) grant funding	Short term	2, 3, 4, 9	Yes (DF-1)
Action #F-19—Implement recommendation of Downtown Roseville Specific Plan to relocate the Public safety Building				
Flood	Grant funding (PDM, HMGP, and FEMA) based on benefits exceeding costs	Short term	6, 10	Yes (F-20)
Action #HC-1—Commit support to initiatives within the Sacramento-Roseville-Arden-Arcade Metropolitan Statistical Area; continue to seek funding from other federal sources to fund its initiatives				
Human-Caused	General Fund	Short term	2, 7	Yes (HC-1)
Action #HC-2—Enhance emergency response capability of City by contingency planning for specific events based on identified vulnerabilities.				
Human-Caused	General Fund; DHS grant funding	Short term	2, 3, 4, 9	Yes (HC-2)
Action #HC-4—Prepare a site-specific vulnerability assessment of City- owned critical facilities that use the best available science and technology with regards to human-caused hazards.				
Human-Caused	General Fund; DHS grant funding	Short term	2, 5, 7	Yes (HC-4)
Action #HH-1—Continue to collaborate with the Placer County Health Department to ensure the health and welfare of the community				
Human Health	Currently budgeted for under the General Fund	Short term	5, 6, 7, 9	Yes (HH-1)
Action #SW-3—Continue education/outreach programs to improve winter preparedness and minimize loss of life or injury.				
	General Fund	Short term	6, 9	Yes (SW-4)
Action #WF-2—Enhance existing City public outreach programs to include information on fire safety, defensible spaces, and areas of concern.				
Wildfire	General Fund; Grant funding under PDM program and HMGP	Short term	6, 9	Yes (WF-3)
Action #MH-3—Establish/maintain a post-disaster action plan to be part of the City Emergency operations plan that will include following elements: • Procedures for public information • Post-disaster damage assessment • Grant writing • Code enforcement • Redundant operations				
Multi-Hazard	General Fund; PDM Grant Funding	Short term	2, 3, 4, 7	Yes (MH-3)
Lead Agency: Public Works Department				
Action #F-3—Continue City participation in the National Flood Insurance Program and the Community Rating System (CRS). Seek CRS classification improvements within capabilities of City programs, including adoption and administration of FEMA-approved ordinances and flood insurance rate maps (FIRM).				
Flood	Currently funded by General Fund allocation	Short term	1, 5, 9	Yes (F-3)
Action #F-4—Maintain Roseville's compliance and good standing under the National Flood Insurance program.				
	General Fund	Short term	2, 3, 4, 5, 10	Yes (F-4)
Action #F-5—Continue the City's outreach program to flood-prone property owners and the citizens of Roseville, to help make them aware of the flood threat and how best to deal with them.				
Flood	Currently funded by General Fund allocation	Short term	5, 9	Yes (F-5)

Hazards Addressed	Funding Options	Timeframe	Objectives Met	In Previous Plan? (# from previous plan)
Action #F-6—Continue to pursue a regional approach to flood issues by remaining actively involved in the Placer County Flood Control District. This involvement includes cooperation in the development of a comprehensive regional database. Continue to participate in regional flooding studies, including the Auburn Creek/Coon Creek/Pleasant Grove Creek flood mitigation plan and the Dry Creek watershed flood control plan.				
Flood	Currently funded by General Fund allocation	Long term	1, 5, 7	Yes (F-6)
Action #F-7—Continue City coordination with other agencies on issues of flood control. Coordination between the City and adjacent jurisdictions occurs through several mechanisms, including distribution of development proposals for review and comment. Continue City cooperation with federal, state, and local agencies, including the U.S. Army Corps of Engineers, California Central Valley Flood Protection Board, FEMA, California Department of Fish and Wildlife, Placer County Resource Conservation District, and the Placer County Flood Control District.				
Flood	Currently funded by General Fund allocation	Short term	1, 5, 7	Yes (F-7)
Action #F-8—Continue to develop, implement, and expand the Flood Alert and Early Warning Program systems and integrate the systems with other local jurisdictions to form a regional warning program.				
Flood	General Fund; Possible grant funding (PDM, HMGP, and Flood Mitigation Assistance)	Long term	2, 3	Yes (F-8)
Action #F-10—Monitor and regularly update City flood studies, modeling, and associated land use, zoning, and other development regulations at a minimum of every 5 years or whenever information becomes available that would significantly modify previous data. New information could include new studies, change in City policy, consideration of a major development project or specific plan, or implementation of a flood control project.				
Flood	General Fund; FEMA map modernization; Developer-based funding and specific plan requirements	Long term	1, 5, 7	Yes (F-10)
Action #F-13—Continue annual inspection and maintenance program of City storm drain systems. Review after every major storm system function and performance. This program removes debris that could contribute to blockage of the storm drain system.				
Flood	Currently funded by General Fund allocation and; gas tax	Short term	8	Yes (F-13)
Action #F-14—Complete the final two phases of the Cirby/Linda/Dry Creek flood control project (Phase 1 and 2). Five of the seven phases of this project have been completed at a cost of about $18,000,000. The basis for determining viability of this project will be a benefit /cost analysis to determine if project meets federal grant eligibility requirements.				
Flood	General Fund; Impact fees; Grant funding (PDM and HMGP) based on benefits exceeding costs	Long term	6, 8, 10	Yes (F-14)
Action #F-15—Analyze alternative improvements to the Cirby/Linda/Dry Creek flood control project that may be cost effective in the flood-prone areas of Roseville: • Dry Creek from Darling Way to Riverside Avenue • Area on Dry Creek upstream of Folsom Road in the Columbia Avenue/Marilyn Avenue/Bonita Street area • Linda Creek near Champion Oaks Drive/Samoa Way/Hurst Way area • Cirby Creek in the Trimble Way/Zien Court area				
Flood	General Funds; Developer-based funds, grant funding (PDM, HMGP, and FEMA) based on benefits exceeding costs	Long term	6, 8, 10	Yes (F-15)
Action #F-16—Replace the Huntington Drive/Cirby Creek culvert with a bridge to protect Queens Court/Huntington Drive area. The Public Works Department oversees this project.				
Flood	General Fund; CIP, developer-based funds, grant funding (PDM, HMGP, and FEMA) based on benefits exceeding costs	Long term	6, 10	Yes (F-16)
Action #F-17—Divert the main drainage storm drain system down Crestmont Avenue to Cirby Way and then into Dry Creek so that the existing system will not exceed capacity. If system capacity is exceeded, the intersection on Cirby Way and Crestmont Avenue and nearby homes will flood during major flood events.				
Flood	General Fund; CIP, developer-based funds, grant funding (PDM, HMGP, and FEMA) based on benefits exceeding costs	Short term	6, 10	Yes (F-17)

Hazards Addressed	Funding Options	Timeframe	Objectives Met	In Previous Plan? (# from previous plan)
Action #F-18—Continue to promote and sponsor programs to buy out, relocate, and flood-proof existing flood-prone structures within Roseville.				
Flood	Grant funding (PDM, HMGP, and FEMA) based on benefits exceeding costs	Short term	6, 10	Yes (F-18)
Action #F-23 – Develop the City's multi-use, multi-benefit stormwater retention project within the Pleasant Grove Creek Watershed, the Reason Farms Stormwater Retention Project.				
Flood	Developer-based funds, grant funding (PDM, HMGP, and FEMA) based on benefits exceeding costs	Long term	6, 10	No
Action #HC-10 – Improve evacuation transportation routes within the City of Roseville by removing traffic constrictions.				
Human Caused	Developer-based funds, grant funding (PDM, HMGP, and FEMA) based on benefits exceeding costs	Long term	6, 10	No
Action #LS-1—Once California Geological Survey completes soils mapping for the Roseville vicinity under the Seismic Hazards Mapping Act, reassess landslide hazard using best available data to gauge the true vulnerability to this hazard.				
Landslide	General Fund; Developer-based funding and specific plan requirements; Possible grant funding under PDM program	Long term	1, 5, 7	Yes (LS-1)
Lead Agency: Roseville Electric				
Action #HC-6—Maintain compliance with California Energy Commission ("CEC") license conditions for the operations of the Roseville Energy Park ("REP") with respect to Hazardous Material Management				
Human-Caused	EUD CIP, General Fund	Short term	5, 7	Yes (HC-6)
Action #HC-7—Maintain compliance with state and local laws and regulations for the operation of the Roseville Power Plant #2.				
Human-Caused	EUD CIP, General Fund	Long term	2, 5, 7	Yes (HC-7)
Action #HC-8—Maintain compliance with North American Electric Reliability Corporation mandatory reliability standards related to plant operation, sabotage reporting and critical infrastructure protection (cyber security.				
Human-Caused	EUD CIP, General Fund	Short term	2, 5, 7	Yes (HC-8)
Action #SW-1—Continue the Shade Tree Program, an energy conservation rebate program provided by Roseville Electric				
Severe Weather	Roseville Electric operational budget	Short term	7, 9	Yes (SW-2)
Action #SW-2—Continue ongoing line clearing and weed abatement of electrical utility facilities in order to reduce public exposure to vegetation hazards and maintain higher reliability during severe weather conditions.				
Severe Weather	CIP	Short term	2	Yes (SW-3)
Action #SW-5—Continue to operate the Roseville Energy Park to support the City's electrical requirements and maintain service continuity during severe weather events.				
Severe Weather	EUD CIP, General Fund	Short term	5, 7	Yes (SW-6)
Action #SW-6— Continue to operate Roseville Power Plant #2 to support the City's electrical requirements and maintain service continuity during severe weather events.				
Severe Weather	General Fund	Short term	5, 7	Yes (SW-7)

19.1.1 Benefit-Cost Review

The action plan must be prioritized according to a benefit/cost analysis of the proposed projects and their associated costs (44 CFR, Section 201.6(c)(3)(iii)). The benefits of proposed projects were weighed against estimated costs as part of the project prioritization process. The benefit/cost analysis was not of the detailed variety required by FEMA for project grant eligibility under the Hazard Mitigation Grant Program (HMGP) and Pre-Disaster Mitigation (PDM) grant program. A less formal approach was used because some projects may not be implemented for up to 10 years, and associated costs and benefits could change dramatically in that time. Therefore, a review was performed of the apparent benefits versus the apparent cost of each project. Parameters were established for assigning subjective ratings (high, medium, and low) to the costs and benefits of these projects.

Cost ratings were defined as follows:

- **High—**Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).
- **Medium—**The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.
- **Low—**The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.

Benefit ratings were defined as follows:

- **High—**Project will provide an immediate reduction of risk exposure for life and property.
- **Medium—**Project will have a long-term impact on the reduction of risk exposure for life and property, or project will provide an immediate reduction in the risk exposure for property.
- **Low—**Long-term benefits of the project are difficult to quantify in the short term.

Using this approach, projects with positive benefit versus cost ratios (such as high over high, high over medium, medium over low, etc.) are considered cost-beneficial and are prioritized accordingly.

For many of the strategies identified in this action plan, the City may seek financial assistance under the HMGP or PDM programs, both of which require detailed benefit/cost analyses. These analyses will be performed on projects at the time of application using the FEMA benefit-cost model. For projects not seeking financial assistance from grant programs that require detailed analysis, the City reserves the right to define "benefits" according to parameters that meet the goals and objectives of this Plan.

19.1.2 Action Plan Prioritization

Table 19-2 lists the priority of each action, based on the qualitative benefit-cost review, the number of plan objectives achieved, and the availability of funding:

19.1.3 Analysis of Mitigation Actions

Each recommended action was classified based on the hazard it addresses and the type of mitigation it involves. Table 19-3 shows the classification based on this analysis.

19.2 ADOPTION

A hazard mitigation plan must include documentation of formal adoption by the governing body of the jurisdiction requesting federal approval of the plan (44 CFR Section 201.6.c.5). This Plan will be submitted to Cal OES and the ISO prior to adoption for a pre-adoption review. Once the Plan has been determined to comply with the criteria specified under the DMA, Cal OES will forward it to FEMA Region IX for review and approval.

ISO is responsible for determining compliance for the CRS program. Since this Plan will be a key element in the City meeting the prescribed requirements for a CRS rating of Class 1, ISO will be asked to review the Plan for CRS Activity 510 compliance. Once pre-adoption approval has been granted by Cal OES, FEMA Region IX and the ISO, the City will initiate its process to formally adopt the Plan.

Table 19-2. Prioritization of Mitigation Actions

Action #	# of Objectives Met	Benefits	Costs	Do Benefits Equal or Exceed Costs?	Is project Grant Eligible?	Can Project be Funded under Existing Programs/ Budgets?	Priority (High, Med., Low)[a]
DF-1	4	High	Low	Yes	Yes	Yes	High
D-1	2	Medium	Low	Yes	No	Yes	Medium
D-2	2	Medium	Medium	Yes	No	Yes	Medium
D-3	2	High	Low	Yes	No	Yes	High
D-4	2	High	Low	Yes	No	Yes	High
EQ-1	2	Medium	Medium	Yes	Yes	Yes	Medium
EQ-2	4	High	Low	Yes	No	Yes	High
EQ-3	4	Medium	Low	Yes	Yes	Yes	Medium
F-1	3	High	Low	Yes	No	Yes	High
F-2	3	High	Low	Yes	No	Yes	High
F-3	3	High	Low	Yes	No	Yes	High
F-4	5	High	Low	Yes	No	Yes	High
F-5	2	High	Low	Yes	No	Yes	High
F-6	3	High	Low	Yes	No	Yes	High
F-7	3	High	Low	Yes	No	Yes	High
F-8	2	High	Medium	Yes	Yes	Yes	Medium
F-9	3	High	Low	Yes	No	Yes	High
F-10	3	High	Medium	Yes	Yes	Yes	Medium
F-11	3	Medium	Medium	Yes	No	Yes	Medium
F-12	1	High	Medium	Yes	Yes	Yes	Medium
F-13	3	Medium	Low	Yes	No	Yes	Medium
F-14	3	High	High	Yes	Yes	No	Low
F-15	3	Medium	Medium	Yes	Yes	Yes	Medium
F-16	2	High	High	Yes	Yes	No	Low
F-17	2	High	Medium	Yes	Yes	No	Medium
F-18	2	High	Medium	Yes	Yes	No	Medium
F-19	2	Medium	High	No	Yes	No	Low
F-20	2	High	High	Yes	Yes	No	Low
F-21	4	High	Low	Yes	No	Yes	High
F-22	3	High	Low	Yes	No	Yes	High
F-23	2	High	High	Yes	Yes	No	Medium
LS-1	3	Low	Low	Yes	Yes	Yes	Low
LS-2	3	High	Low	Yes	No	Yes	High
SW-1	2	High	Low	Yes	No	Yes	High
SW-2	1	High	Low	Yes	No	Yes	High
SW-3	2	Medium	Low	Yes	No	Yes	Medium
SW-4	2	Medium	Medium	Yes	No	Yes	Medium
SW-5	2	High	Low	Yes	No	Yes	High
SW-6	2	High	Low	Yes	No	Yes	High
WF-1	2	High	Low	Yes	No	Yes	High
WF-2	2	Medium	Low	Yes	No	Yes	Medium
MH-1	2	Medium	Low	Yes	No	Yes	Medium

Action #	# of Objectives Met	Benefits	Costs	Do Benefits Equal or Exceed Costs?	Is project Grant Eligible?	Can Project be Funded under Existing Programs/ Budgets?	Priority (High, Med., Low)[a]
MH-2	5	High	Low	Yes	No	Yes	High
MH-3	4	Medium	Low	Yes	Yes	Yes	Medium
MH-4	4	Medium	Low	Yes	Yes	Yes	Medium
MH-5	4	Medium	Low	Yes	Yes	Yes	Medium
MH-6	4	Medium	Low	Yes	Yes	Yes	Medium
MH-7	4	High	Low	Yes	No	Yes	High
MH-8	4	High	Low	Yes	No	Yes	High
HC-1	2	Medium	Low	Yes	No	Yes	Medium
HC-2	4	Medium	Low	Yes	No	Yes	Medium
HC-3	2	High	Low	Yes	No	Yes	High
HC-4	3	Medium	Medium	Yes	Yes	Yes	Medium
HC-5	2	High	High	Yes	Yes	Yes	Low
HC-6	2	High	Low	Yes	Yes	Yes	High
HC-7	3	High	Low	Yes	No	Yes	High
HC-8	3	High	Low	Yes	No	Yes	High
HC-9	3	High	Low	Yes	No	Yes	High
HC-10	2	High	High	Yes	Yes	No	Medium
HH-1	4	Medium	Low	Yes	No	Yes	Medium
HH-2	2	High	Low	Yes	No	Yes	High
HH-3	4	High	Low	Yes	No	Yes	High

a. Priorities defined as follows:

- High Priority—A project that meets multiple objectives, has benefits that exceed cost, has funding secured or is an ongoing project and meets eligibility requirements for the HMGP or PDM grant program. High priority projects can be completed in the short term (1 to 5 years).
- Medium Priority—A project that meets goals and objectives, that has benefits that exceed costs, and for which funding has not been secured but that is grant eligible under HMGP, PDM or other grant programs. Project can be completed in the short term, once funding is secured. Medium priority projects will become high priority projects once funding is secured.
- Low Priority—A project that will mitigate the risk of a hazard, that has benefits that do not exceed the costs or are difficult to quantify, for which funding has not been secured, that is not eligible for HMGP or PDM grant funding, and for which the time line for completion is long term (1 to 10 years). Low priority projects may be eligible for other sources of grant funding from other programs.

Table 19-3. Analysis of Mitigation Actions

Hazard	Actions That Address the Hazard, by Mitigation Type[a]					
	Prevention[a]	Property Protection[b]	Public Education and Awareness[c]	Natural Resource Protection [d]	Emergency Services[e]	Structural Projects[f]
Dam Failure					DF-1	
Drought	D-1, D-2, D-3, D-4					
Earthquake	EQ-3	EQ-1	EQ-2			
Flooding	F-1, F-2, F-3, F-4, F-6, F-7, F-9, F-10, F-11, F-21, F-22	F-13, F-18, F-19, F-20	F-5	F-1, F-21, F-22, F-23	F-8, F-12	F-14, F-15, F-16, F-17, F-23
Landslide	LS-1, LS-2					
Severe Weather	SW-1, SW-6	SW-2, SW-4	SW-3		SW-5	
Wildfire	WF-1		WF-2			
Multiple Hazards	MH-2, MH-3, MH-4	MH-8	MH-5, MH-6	MH-4	MH-1, MH-7	
Health Hazards	HH-1, HH-2		HH-2			
Human-Caused Hazards	HC-3, HC-5, HC-6, HC-7, HC-8, HC-9	HC-4			HC-1, HC-2, HC-3, HC-8, HC-10	

a. **Prevention—**Government, administrative or regulatory actions that influence the way land and buildings are developed to reduce hazard losses. Includes planning and zoning, floodplain laws, capital improvement programs, open space preservation, and stormwater management regulations.
b. **Property Protection—**Modification of buildings or structures to protect them from a hazard or removal of structures from a hazard area. Includes acquisition, elevation, relocation, structural retrofit, storm shutters, and shatter-resistant glass.
c. **Public Education and Awareness—**Actions to inform citizens and elected officials about hazards and ways to mitigate them. Includes outreach projects, real estate disclosure, hazard information centers, and school-age and adult education.
d. **Natural Resource Protection—**Actions that minimize hazard loss and preserve or restore the functions of natural systems. Includes sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.
e. **Emergency Services—**Actions that protect people and property during and immediately after a hazard event. Includes warning systems, emergency response services, and the protection of essential facilities.
f. **Structural Projects—**Actions that involve the construction of structures to reduce the impact of a hazard. Includes dams, setback levees, floodwalls, retaining walls, and safe rooms.

Simultaneous with this process, the draft action plan will be sent to the following agencies with a request for review and comment:

- Placer County Office of Emergency Services
- City of Rocklin
- Sacramento County Department of Water Resources
- California Department of Water Resources
- City of Citrus Heights
- Placer County Flood Control District.

Final FEMA approval was granted on _____, 2016. The Roseville City Council adopted the Plan through Resolution ##-## on _____, 2016. A copy of the resolution is provided in Figure 19-1. The City of Roseville is considered eligible for the benefits afforded under the Disaster Mitigation Act as of this date.



Figure 19-1. Resolution Adopting the Roseville Hazard Mitigation Plan

19.3 PLAN MAINTENANCE STRATEGY

A hazard mitigation plan must present a plan maintenance process that includes the following (44 CFR Section 201.6(c)(4)):

- A method and schedule for monitoring, evaluating, and updating the mitigation plan
- A process for incorporating the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate
- A strategy for continuing public participation through the plan maintenance process.

This section details the formal process that will ensure that the hazard mitigation plan remains an active and relevant document and that the City of Roseville maintains its eligibility for applicable funding sources. The plan maintenance process includes a schedule for monitoring and evaluating the Plan annually and producing an updated plan every five years. This section also describes how public participation will be integrated throughout the plan maintenance and implementation process. It explains how the mitigation strategies outlined in this Plan will be incorporated into existing planning mechanisms and programs, such as comprehensive land-use planning processes, capital improvement planning, and building code enforcement and implementation. The Plan's format allows sections to be reviewed and updated when new data become available, resulting in a plan that will remain current and relevant.

Pursuant to 44CFR 201.6(c)(4)(i), the following matrix provides a synopsis of responsibilities for plan monitoring, evaluation, and update which are discussed in further detail in sections 19.3.1 to 19.3.4 of this Plan:

Task	Approach	Timeline	Lead Responsibility	Support Responsibility
Monitoring	Preparation of status updates and action implementation tracking as part of submission to the Steering Committee for annual progress report. Deputy City Manager or Designee is responsible for initiating status updates with identified secondary responsibility departments.	Annual (July-September)	Deputy City Manager or Designee	• Central Service Dept. • City Council • City Manager's Office • Public Affairs/Communication Dept. • Development Services Dept. • Environmental Utilities Dept. • Information Technology Div. • Parks/Rec/Libraries: Open Space Div. • Police and Fire Dept. • Public Works Dept. • Roseville Electric
Evaluation	Review the status of previous actions as submitted by the monitoring task lead and support entities noted above to assess the effectiveness of the plan; complete and finalize the Annual Progress Report.	Annual (September) – prior to CRS recertification process on October 1	Planning Team • City Manager's Office • Public Works • Fire Dept. • Development Svcs • Technical Consultant	Steering Committee • City Manager's Office • Public Works • Fire Dept. • Development Svcs • Communications • Public Volunteers • Local businesses/organizations

Task	Approach	Timeline	Lead Responsibility	Support Responsibility
Update	The Planning Team will call the Steering Committee to reconvene, at a minimum, every 5 years to guide a comprehensive update to review and revise the Plan.	Every 5 years or upon comprehensive update to General Plan or major disaster	Planning Team • City Manager's Office • Public Works • Fire Dept. • Development Svcs • Technical Consultant	Steering Committee • City Manager's Office • Public Works • Fire Dept. • Development Svcs • Communications • Public Volunteers • Local businesses/organizations

19.3.1 Plan Implementation

The hazard mitigation plan includes a range of action items to reduce losses from hazard events. Together, the action items provide a framework for activities that the City can choose to implement over the next five years. The effectiveness of the Plan depends on the incorporation of the action items into existing City plans, policies, and programs.

The Roseville City Manager's Office and the Development Services Department will be jointly responsible for monitoring the Plan's implementation and maintenance through existing City programs. The Deputy City Manager or designated appointee will assume lead responsibility for facilitating plan implementation and maintenance meetings. Although the City Manager's Office will have primary department responsibility for review, coordination, and promotion, plan implementation and evaluation will be a shared responsibility among all departments and agencies identified as lead agencies in the mitigation action plan (see Chapter).

19.3.2 Steering Committee

The Steering Committee is a volunteer body that contributed greatly to the development of the initial and updated plans. The initial committee oversaw the development of the initial plan and made recommendations on key elements of the Plan, including a maintenance strategy. An oversight committee with representation similar to the initial Steering Committee then took an active role in the maintenance strategy. By maintaining progress reports, and keeping the Plan dynamic, Roseville was able to successfully complete many of the actions identified in the initial action plan. A reactivated Steering Committee then oversaw development of the 2011 and 2016 Plan updates.

A Steering Committee of not more than 14 members, as determined by the Roseville City Manager's Office, should remain involved in key elements of the proposed maintenance strategy. The Steering Committee will convene annually to perform annual reviews of the updated plan and its implementation. The make-up of this Steering Committee will strive for no less than 50 percent representation from citizens, citizen groups, and stakeholders within the planning area. Previous and existing members will be given the option to remain involved in the process.

A technical subcommittee with a make-up similar to the subcommittee used for initial plan development could be used in the plan maintenance strategy, at the discretion of the planning team and the Steering Committee.

19.3.3 Annual Progress Report

The minimum task of the annual Steering Committee meetings will be the evaluation of the progress of the 2016 Plan. This review will include the following:

- Summary of any hazard events that occurred during the prior year and their impact on the planning area
- Review of successful mitigation actions identified in the 2016 Plan
- Brief discussion about why targeted strategies were not completed
- Re-evaluation of the action plan to determine if the timeline for identified projects needs to be amended (such as changing a long-term project to a short-term project because of funding availability)
- Recommendations for new projects
- Changes in or potential for new funding options (grant opportunities)
- Impacts of any other planning programs or actions in the City that involve hazard mitigation

The planning team created a template to guide the Steering Committee in preparing a progress report during the previous planning process. The Steering Committee will provide feedback to the planning team on items included in the template. The planning team will continue to use this progress report template to prepare a formal annual report on the progress of the 2016 Plan. This report will be used as follows:

- Posted on the City website on the page dedicated to the hazard mitigation plan
- Announced on multiple social media platforms
- Provided to the local media through a press release
- Presented to the Roseville City Council
- Provided as part of the CRS annual re-certification package.

The CRS program requires an annual recertification to be submitted by October 1 of every calendar year for which the community has not received a formal audit. To meet this recertification timeline, the planning team will strive to complete the progress report process between June and September every year.

19.3.4 Plan Update

Section 201.6.d.3 of 44 CFR requires that local hazard mitigation plans be reviewed, revised if appropriate, and resubmitted for approval in order to remain eligible for benefits awarded under the DMA. The City of Roseville intends to update its hazard mitigation plan on a 5-year cycle. This cycle may be accelerated to less than 5 years based on the following triggers:

- A Presidential Disaster Declaration that impacts the City of Roseville
- A hazard event that causes loss of life
- A comprehensive update of the City of Roseville General Plan

It will not be the intent of this update process to start from scratch and develop a complete new hazard mitigation plan. Based on needs identified by the planning team, this update will, at a minimum, include the following elements:

- The update process will be convened through a Steering Committee.
- The hazard risk assessment will be reviewed and updated using best available information and technologies.
- The action plan will be reviewed and revised to account for any actions completed, dropped, or changed and to account for changes in the risk assessment or new City policies identified under other planning mechanisms, as appropriate (such as the General Plan).
- The draft update will be sent to appropriate agencies and organizations for comment.

- The public will be given an opportunity to comment on the update prior to adoption.
- The Roseville City Council will adopt the updated Plan.

19.3.5 Continuing Public Involvement

The public will continue to be apprised of hazard mitigation actions through the City website and by providing copies of the annual progress reports to the media. Copies of the 2016 Plan will be distributed to the Roseville City Library System. Upon initiation of the update process, a new public involvement strategy will be initiated based on guidance from the Steering Committee. This strategy will be based on the needs and capabilities of the City at the time of the update. At a minimum, this strategy will include the use of local media outlets within the planning area.

19.3.6 Incorporation into Other Planning Mechanisms

The City began planning for the impacts of hazards through the Safety Element of its 1992 General Plan. The hazard mitigation plan update process provided the City with an opportunity to review and expand on policies contained in the General Plan. The City views the General Plan and the hazard mitigation plan as complementary documents that work together to reduce risk exposure to the citizens of Roseville. A comprehensive update to the General Plan will trigger an update to the hazard mitigation plan. Many of the ongoing recommendations identified in the 2016 Plan are programs recommended by the General Plan. Processes and programs that the City will coordinate with the hazard mitigation plan recommendations include the following:

- City emergency response plan
- Capital improvement programs
- Roseville municipal code
- Community design guidelines
- Stormwater management program

Some action items do not need to be implemented through regulation. Instead, these items can be implemented through the creation of new educational programs, continued interagency coordination, or improved public participation.

Plan Integration During the 2011 RMHMP Performance Period

The 2011 RMHMP identified 24 actions related to plan integration. Due to the nature of plan integration, these actions were identified as ongoing initiatives and were carried over into the 2016 Plan update. Plan integration actions remain ongoing, as they serve as a benchmark for annual progress reporting and encourage the use of the Plan as a living document. During the performance period of the 2011 plan, 23 of the identified actions resulted in measurable plan integration of 2011 RMHMP goals, risk assessment, or recommendations into the following plans and programs:

- Specific Plans and Specific Plan Amendments
- Master Drainage Plan requirements for Specific Plans
- Groundwater Environmental Impact Report
- Water Recycling Master Plan
- Debris Management Plan (Completed in conjunction with the 2016 planning process)

Specific information regarding how each of these plans and programs integrated 2011 RMHMP information is available in the 2015 Progress Report located in Appendix B.

Plan Integration for the 2016 Mitigation Action Plan

Implementation of the 2016 mitigation action plan has and will continue to enhance and expand the integration efforts of the 2011 Plan. Inter-agency coordination occurred through involvement by local, regional, state and federal stakeholders involved in and consulted with during the planning process. This coordination is expected to continue through Steering Committee activities, annual progress reporting, implementation coordination, and the continued public engagement.

As the plan is implemented, all City agencies will use information from this updated plan as the best available science and data on natural hazards impacting the City of Roseville. 24 actions related to plan integration have been recommended for continued implementation in this Plan.

REFERENCES

Cal-Adapt. 2016. http://cal-adapt.org/ Exploring California's Climate Change Research.

California Department of Water Resources (CA DWR). 2013. http://www.water.ca.gov/waterplan/ The California Water Plan

CA DWR. 2016. http://www.water.ca.gov/climatechange/ Climate Change

CA DWR. 2016a. http://www.water.ca.gov/damsafety/FAQAnswer/index.cfm Frequently Asked Questions

California Department of Finance. 2016. http://www.dof.ca.gov/Forecasting/Demographics/Estimates/e-1/ Population Estimates for Cities, Counties, and the State – January 1, 2015 and 2016

California Emergency Management Agency, et al. 2012. http://resources.ca.gov/docs/climate/APG_Understanding_Regional_Characteristics.pdf California Adaptation Planning Guide: Understanding Regional Characteristics.

CAL FIRE. 2012. http://frap.cdf.ca.gov/. California Department of Forestry and Fire Prevention. 2012. Fire and Resource Assessment Program. Website mapping and data, 2012.

Danielson, Tess. 2015. http://www.businessinsider.com/ransomware-is-everywhere-but-this-software-can-save-you-2015-10 How to avoid the curse of Ransomware.

Federal Emergency Management Agency (FEMA). 1982. http://www.archives.gov/federal-register/codification/executive-order/11988.html Executive Order 11988-Floodplain management

FEMA. 2001. Understanding Your Risks; Identifying Hazards and Determining your Risks. FEMA (386-2). August 2001

FEMA. 2002. Getting Started; Building support for Mitigation Planning; FEMA (386-1). September 2002

FEMA. 2003. Developing the Mitigation Plan; Identifying Mitigation Actions and Implementing Strategies. FEMA (386-3). April 2003

FEMA. 2003. Integrating Manmade Hazards into Mitigation Planning. FEMA (386-7). September 2003

FEMA. 2004. http://www.damsafety.org/media/Documents/PDF/fema-333.pdf Federal Guidelines for Dam Safety

FEMA. 2007. FEMA, National Flood Insurance Program, Community Rating System; CRS Coordinator's Manual FIA-15/2007 OMB No. 1660-0022

FEMA. 2013. http://www.fema.gov/news-release/2013/10/18/be-cyber-smart-stay-cyber-secure Be Cyber Smart, Stay Cyber Secure

FEMA. 2015. https://www.fema.gov/national-dam-safety-program National Dam Safety Program

FEMA. 2016. https://www.fema.gov/disasters Disaster Declarations

FEMA. 2016a. http://www.fema.gov/what-mitigation What is Mitigation?

Harrison, Virginia. 2015. http://money.cnn.com/2015/04/14/technology/security/cyber-attack-hacks-security/. CNN Money

Intergovernmental Panel on Climate Change. 2014. http://www.ipcc.ch/report/ar5/wg2/ Climate Change 2014: Impacts, Adaptation, and Vulnerability

International Strategy for Disaster Reduction. 11/11/2008. "Disaster Risk Reduction Strategies and Risk Management Practices: Critical Elements for Adaptation to Climate Change"

Iverson, R.M., 2004, Granular avalanches across irregular three-dimensional terrain: 1. theory and computation, Journal of Geophysical Research, v. 109, F01014, doi: 10.1029/2003JF000085. 14 p.

Kostadinov, Dimitar. 2012. http://resources.infosecinstitute.com/cyberterrorism-distinct-from-cybercrime/ Cyberterrorism Defined

Michigan Tech University. n.d. http://www.geo.mtu.edu/UPSeis/intensity.html How Are Earthquake Magnitudes Measured?

National Archives. 2016. http://www.archives.gov/federal-register/codification/executive-order/11990.html Executive Order 11990 -Protection of wetlands

NASA. 2016. http://climate.nasa.gov/vital-signs/carbon-dioxide/ Global Climate Change – Vital Signs of the Planet. Carbon Dioxide.

NASA. 2015. http://www.nasa.gov/audience/forstudents/5-8/features/nasa-knows/what-is-climate-change-58.html What are Climate and Climate Change?

NASA. 2004. http://www.nasa.gov/home/hqnews/2004/jul/HQ_04252_glaciers.html Retreating Glaciers Spur Alaskan Earthquakes

NOAA. 2016. https://www.ncdc.noaa.gov/stormevents/. NOAA, National Climatic Data Center website, Storm Events Database

Northern California Earthquake Data Center. 2014. UC Berkeley Seismological Laboratory. Dataset. doi:10.7932/NCEDC.

Office of Federal Lands Highway. United States Department of Transportation, Federal Highway Administration. 2016. https://flh.fhwa.dot.gov/programs/erfo/ Emergency Relief for Federally Owned Roads (ERFO)

Office of the Press Secretary. 2015. https://www.whitehouse.gov/the-press-office/2015/01/30/executive-order-establishing-federal-flood-risk-management-standard-and- Executive Order – Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input

Placer County. 2016. Placer County Local Hazard Mitigation Plan Update.

Placer County Office of Economic Development. 2014. Placer County Economic and Demographic Profile.

Rickenmann, Dieter and Weber, Daniel. 2000. ftp://ftp.wsl.ch/pub/rickenmann/Rickenmann-pdf/2000/Rickenmann-Weber-2000_DFHM.pdf Debris Flow Hazards Mitigation: Mechanics, Prediction, and Assessment.

Roseville. 2015. City of Roseville General Plan 2035.

Roseville. 2015a. Urban Water Management Plan.

Roseville. 2010. http://www.roseville.ca.us/visiting/history_of_roseville/default.asp History of Roseville on City of Roseville Website, accessed 2016

Roseville. n.d. https://www.roseville.ca.us/civicax/filebank/blobdload.aspx?blobid=18782 Sustainability Efforts

Roseville. 2010a. https://roseville.ca.us/civicax/filebank/blobdload.aspx?blobid=18854 Special Presentation – City of Roseville Communitywide Sustainability Action Plan.

Savage, S. B., and K. Hutter. 1991. Dynamics of avalanches of granular materials from initiation to run-out. Part 1: Analysis, Acta Mech., 86, 201–223, doi:10.1007/BF01175958.

Seattle Office of Emergency Management. 2014. http://www.seattle.gov/Documents/Departments/Emergency/PlansOEM/SHIVA/SHIVAv6.3Final.pdf Seattle Hazard Identification and Vulnerability Assessment.

Spatial Hazard Events and Losses Database for the United States maintained by the University of South Carolina's (USC) Hazard Research Lab

United States Army Corps of Engineers. 2011. http://planning.usace.army.mil/toolbox/library/ERs/ER1100_2_1156_28Oct11.pdf Safety of Dams - Policies and Procedures

United States Census. 2010. Data from 2010 U.S. Census. U.S. Census Bureau.

United States Census. 2016. http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml American FactFinder

United States Department of Transportation. n.d. https://www.environment.fhwa.dot.gov/projdev/tdmmitig2.asp Mitigation of Environmental Impacts

United States Environmental Protection Agency. 2013. https://www3.epa.gov/climatechange/glossary.html Glossary

United States Global Change Research Program. 2009. https://nca2009.globalchange.gov/ Global Change Impacts in the United States: 2009 Report

United States Geological Survey (USGS). 1989. http://pubs.usgs.gov/gip/earthq4/severity_text.html The Severity of an Earthquake. U.S. Government Printing Office: 1989-288-913.

USGS. 2008. An Atlas of ShakeMaps for Selected Global Earthquakes. U.S. Geological Survey Open-File Report 2008-1236. Prepared by Allen, T.I., Wald, D.J., Hotovec, A.J., Lin, K., Earle, P.S. and Marano, K.D.

USGS. 2010. PAGER—Rapid Assessment of an Earthquake's Impact. U.S. Geological Survey Fact Sheet 2010-3036. September 2010.

USGS. n.d. http://landslides.usgs.gov/learn/ls101.php Landslides 101

Washington Department of Ecology. 2014. http://www.ecy.wa.gov/programs/sea/landslides/about/about.html Puget Sound Landslides The website of the Washington Department of Ecology.

Weather Channel. 2016. https://weather.com/weather/monthly/l/USCA0957:1:US Roseville

Wilson, C. 2008. Botnets, Cybercrime, and Cyberterrorism. Federation of American Scientists.

GLOSSARY

ACRONYMS

Cal EMA—California Emergency Management Agency

CAL FIRE—California Department of Forestry and Fire Protection

Cal OES— California Office of Emergency Services

CBC—California Building Code

CCR—California Code of Regulations

CDBG-DR—Community Development Block Grant Disaster Recovery grants

CEQA—California Environmental Quality Act

CIP—Capital Improvements Plan

CFR—Code of Federal Regulations

CPTED—Crime Prevention Through Environmental Design

CRS—Community Rating System

DFIRM—Digital Flood Insurance Rate Map

DHS—Department of Homeland Security

DMA —Disaster Mitigation Act

DWR—Department of Water Resources

EOP—Emergency Operations Plan

EPA—U.S. Environmental Protection Agency

ESA—Endangered Species Act

EUD—Environmental Utilities Department

FEMA—Federal Emergency Management Agency

FIRM—Flood Insurance Rate Map

FRAP—Fire and Resource Assessment Program

GIS—Geographic Information System

HAZUS-MH—Hazards, United States-Multi Hazard

HMGP—Hazard Mitigation Grant Program

IBC—International Building Code

MCI—Multi-Casualty Incident

MM—Modified Mercalli Scale

MND— Mitigated Negative Declaration

NEHRP—National Earthquake Hazards Reduction Program

NFIP—National Flood Insurance Program
NIMS—National Incident Management System
NOAA—National Oceanic and Atmospheric Administration
OES—Office of Emergency Services
OSPOMP—Open Space Preserve Overarching Management Plan
PCFCD—Placer County Flood Control District
PCWA—Placer County Water Agency
PDM—Pre-Disaster Mitigation Grant Program
PGA—Peak Ground Acceleration
RMC—Roseville Municipal Code
SARS—Severe acute respiratory syndrome
SEMS—Standardized Emergency Management System
SFHA—Special Flood Hazard Area
SJWD—San Juan Water District
SPI—Standardized Precipitation Index
STEMI—ST-elevation myocardial infarction
UBC—Uniform Building Code
ULOP—Urban Level of Flood Protection
USBR—U.S. Bureau of Reclamation
USGS—United States Geological Survey
VHF— Viral Hemorrhagic Fevers
WMD—Weapon of Mass Destruction
WNV—West Nile Virus

DEFINITIONS

100-Year Flood: The term "100-year flood" can be misleading. The 100-year flood does not necessarily occur once every 100 years. Rather, it is the flood that has a 1 percent chance of being equaled or exceeded in any given year.. Thus, the 100-year flood could occur more than once in a relatively short period of time. The Federal Emergency Management Agency (FEMA) defines it as the 1 percent annual chance flood, which is now the standard definition used by most federal and state agencies and by the National Flood Insurance Program (NFIP).

Acre-Foot: An acre-foot is the amount of water it takes to cover 1 acre to a depth of 1 foot. This measure is used to describe the quantity of storage in a water reservoir. An acre-foot is a unit of volume. One acre foot equals 7,758 barrels; 325,829 gallons; or 43,560 cubic feet. An average household of four will use approximately 1 acre-foot of water per year.

Act of Terrorism: According to the Federal Bureau of Investigation (FBI), an act of terrorism is "a violent act or an act dangerous to human life, in violation of the criminal laws of the United States or of any state, to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social goals." Acts of terrorism are intentional, criminal, and malicious and can be foreign or domestic, depending on the origin, base, and objectives of the terrorist or organization. Acts of terrorism can involve the use of weapons of

mass destruction, arson, and incendiary, explosive, and armed attacks; industrial sabotage and intentional hazardous materials releases; agro-terrorism; and cyber-terrorism.

Asset: An asset is any man-made or natural feature that has value, including, but not limited to, people; buildings; infrastructure, such as bridges, roads, sewers, and water systems; lifelines, such as electricity and communication resources; and environmental, cultural, or recreational features such as parks, wetlands, and landmarks.

Base Flood: The flood having a 1% chance of being equaled or exceeded in any given year, also known as the "100-year" or "1% chance" flood. The base flood is a statistical concept used to ensure that all properties subject to the National Flood Insurance Program (NFIP) are protected to the same degree against flooding.

Basin: A basin is the area within which all surface water – whether from rainfall, snowmelt, springs, or other sources – flows to a single water body or watercourse. The boundary of a river basin is defined by natural topography, such as hills, mountains, and ridges. Basins are also referred to as "watersheds" and "drainage basins."

Benefit: A benefit is a net project outcome and is usually defined in monetary terms. Benefits may include direct and indirect effects. For the purposes of benefit-cost analysis of proposed mitigation measures, benefits are limited to specific, measurable, risk reduction factors, including reduction in expected property losses (buildings, contents, and functions) and protection of human life.

Benefit/Cost Analysis: A benefit/cost analysis is a systematic, quantitative method of comparing projected benefits to projected costs of a project or policy. It is used as a measure of cost effectiveness.

Benioff Earthquake: Sometimes called "deep quakes," these occur in the Pacific Northwest when the Juan de Fuca plate breaks up underneath the continental plate, approximately 30 miles beneath the earth's surface.

Building: A building is defined as a structure that is walled and roofed, principally aboveground, and permanently fixed to a site. The term includes manufactured homes on permanent foundations on which the wheels and axles carry no weight.

Capability Assessment: A capability assessment provides a description and analysis of a community's current capacity to address threats associated with hazards. The assessment includes two components: an inventory of an agency's mission, programs, and policies, and an analysis of its capacity to carry them out. A capability assessment is an integral part of the planning process in which a community's actions to reduce losses are identified, reviewed, and analyzed, and the framework for implementation is identified. The following capabilities were reviewed under this assessment:

- Legal and regulatory capability
- Administrative and technical capability
- Fiscal capability

Certified Unified Program Agency: An agency (such as the City of Roseville) certified to act as a licensing agency for six hazardous materials-related programs. The Certified Unified Program Agency enables the City of Roseville to implement its own hazardous materials emergency response program. Mutual aid agreements are also in place for incident response. Each business that deals with hazardous materials generally must submit a Unified Program Consolidated Form with facility information to the Roseville Fire Department.

Civil Disorder: Civil disorder results from incidents intended to disrupt a community to the degree that law enforcement intervention is required to maintain public safety. Civil disorder is generally associated with controversial political, judicial, or economic issues and events and may occur at any time, although statistics indicate that civil disorder is more frequent during the summer months. Although the City of Roseville does not

have a history of civil disorder or rioting, large public gatherings, often associated with concerts or sports events, have overburdened local law enforcement and fire protection resources in the past. The effects of civil disorder and riots vary and depend on the type of event and its severity, scope, and duration. Essential services (such as electricity, water, public transportation, and communications) may be disrupted, and property damage, injuries, and loss of life may occur.

Communicable Disease: For the purposes of this Plan, communicable diseases include severe acute respiratory syndrome (SARS), flu, small pox, and diseases carried by insects. Diseases carried by insects include plague (fleas), encephalitis, malaria, West Nile virus (mosquitoes), and Lyme disease (ticks).

Community Rating System (CRS): The CRS is a voluntary program under the NFIP that rewards participating communities (provides incentives) for exceeding the minimum requirements of the NFIP and completing activities that reduce flood hazard risk by providing flood insurance premium discounts.

Critical Facility: A critical facility is vital to the City's ability to provide essential services and protect life and property. Loss of a critical facility would result in a severe economic or catastrophic impact. Under the Roseville hazard mitigation plan definition, critical facilities include the following:

- Police stations, fire stations, vehicle and equipment storage facilities, and emergency operations centers needed for disaster response before, during, and after hazard events
- Public and private utilities and infrastructure vital to maintaining or restoring normal services to areas damaged by hazard events
- Hospitals, nursing homes, and housing likely to contain occupants who may not be sufficiently mobile to avoid death or injury during a hazard event
- Structures or facilities that produce, use, or store highly volatile, flammable, explosive, toxic, and/or water-reactive materials

Crustal Earthquake: Crustal quakes occur at a depth of 5 to 10 miles beneath the earth's surface and are associated with fault movement within a surface plate.

Dam: A dam is any artificial barrier or controlling mechanism that can or does impound 10 acre-feet or more of water.

Dam Failure: Dam failure refers to a partial or complete breach in a dam (or levee) that impacts its integrity. Dam failures occur for a number of reasons, such as flash flooding, inadequate spillway size, mechanical failure of valves or other equipment, freezing and thawing cycles, earthquakes, and intentional destruction.

Debris Avalanche: Volcanoes are prone to debris and mountain rock avalanches that can approach speeds of 100 mph.

Debris Flow: Dense mixtures of water-saturated debris that move down-valley; looking and behaving much like flowing concrete. They form when loose masses of unconsolidated material are saturated, become unstable, and move down slope. The source of water varies but includes rainfall, melting snow or ice, and glacial outburst floods.

Debris Slide: Debris slides consist of unconsolidated rock or soil that has moved rapidly down slope. They occur on slopes greater than 65 percent.

Depth of Flooding: The depth of flooding is difference between regulatory flood elevation and the elevation of the lowest grade adjacent to a structure.

Disaster Mitigation Act of 2000 (DMA); The DMA is Public Law 106-390 and is the latest federal legislation enacted to encourage and promote proactive, pre-disaster planning as a condition of receiving financial assistance under the Robert T. Stafford Act. The DMA emphasizes planning for disasters before they occur. Under the DMA, a pre-disaster hazard mitigation program and new requirements for the national post-disaster hazard mitigation grant program (HMGP) were established.

Drainage Basin: A basin is the area within which all surface water (whether from rainfall, snowmelt, springs, or other sources) flows to a single water body or watercourse. The boundary of a river basin is defined by natural topography, such as hills, mountains, and ridges. Drainage basins are also referred to as "watersheds" and "basins." The City of Roseville is located within portions of two major drainage basins: the Pleasant Grove Creek Basin and the Dry Creek Basin. Pleasant Grove Creek and its tributaries drain most of the western and central areas of the City, and the Dry Creek Basin and its tributaries drain the remainder of the City. The Dry Creek system has year-round flows in its major watercourses, and the Pleasant Grove Creek system is intermittent, with only seasonal flows. As a result, portions of the City lie within a flood hazard area. However, since 1950, there have been no reports of structural flood damage along Pleasant Grove Creek and there are presently no structures subject to flooding within the Pleasant Grove Creek Basin.

Drought: Drought is a period of time without substantial rainfall or snowfall from one year to the next. Drought can also be defined as the cumulative impacts of several dry years or a deficiency of precipitation over an extended period of time, which in turn results in water shortages for some activity, group, or environmental function. A hydrological drought is caused by deficiencies in surface and subsurface water supplies. A socioeconomic drought impacts the health, well being, and quality of life or starts to have an adverse impact on a region. Drought is a normal, recurrent feature of climate and occurs almost everywhere.

Duration: For the purposes of this Plan, duration is defined as the length of time that a hazard occurs. For example, the duration of a tornado can be minutes, but release of a chemical warfare agent such as mustard gas can persist for hours or weeks if not remediated.

Earthquake: An earthquake is defined as a sudden slip on a fault, volcanic or magmatic activity, and sudden stress changes in the earth that result in ground shaking and radiated seismic energy. Earthquakes can last from a few seconds to over 5 minutes, and have been known to occur as a series of tremors over a period of several days. The actual movement of the ground in an earthquake is seldom the direct cause of injury or death. Casualties may result from falling objects and debris as shocks shake, damage, or demolish buildings and other structures.

Exposure: Exposure is defined as the number and dollar value of assets considered to be at risk during the occurrence of a specific hazard.

Extent: The extent is the size of an area affected by a hazard.

Fire Behavior: Fire behavior refers to the physical characteristics of a fire and is a function of the interaction between the fuel characteristics (such as type of vegetation and structures that could burn), topography, and weather. Variables that affect fire behavior include the rate of spread, intensity, fuel consumption, and fire type (such as underbrush versus crown fire).

Fire Frequency: Fire frequency is the broad measure of the rate of fire occurrence in a particular area. An estimate of the areas most likely to burn is based on past fire history or fire rotation in the area, fuel conditions, weather, ignition sources (such as human or lightning), fire suppression response, and other factors.

Flash Flood: A flash flood occurs with little or no warning when water levels rise at an extremely fast rate

Flood Insurance Rate Map (FIRM): FIRMs are the official maps on which the Federal Emergency Management Agency (FEMA) has delineated the Special Flood Hazard Area (SFHA).

Flood Insurance Study: A report published by the Federal Insurance and Mitigation Administration for a community in conjunction with the community's Flood Insurance rate Map. The study contains such background data as the base flood discharges and water surface elevations that were used to prepare the FIRM. In most cases, a community FIRM with detailed mapping will have a corresponding flood insurance study.

Floodplain: Any land area susceptible to being inundated by flood waters from any source. A flood insurance rate map identifies most, but not necessarily all, of a community's floodplain as the Special Flood Hazard Area (SFHA).

Floodway: Floodways are areas within a floodplain that are reserved for the purpose of conveying flood discharge without increasing the base flood elevation more than 1 foot. Generally speaking, no development is allowed in floodways, as any structures located there would block the flow of floodwaters.

Floodway Fringe: Floodway fringe areas are located in the floodplain but outside of the floodway. Some development is generally allowed in these areas, with a variety of restrictions. On maps that have identified and delineated a floodway, this would be the area beyond the floodway boundary that can be subject to different regulations.

Fog: Fog refers to a cloud (or condensed water droplets) near the ground. Fog forms when air close to the ground can no longer hold all the moisture it contains. Fog occurs either when air is cooled to its dew point or the amount of moisture in the air increases. Heavy fog is particularly hazardous because it can restrict surface visibility. Severe fog incidents can close roads, cause vehicle accidents, cause airport delays, and impair the effectiveness of emergency response. Financial losses associated with transportation delays caused by fog have not been calculated in the United States but are known to be substantial.

Freeboard: Freeboard is the margin of safety added to the base flood elevation.

Frequency: For the purposes of this Plan, frequency refers to how often a hazard of specific magnitude, duration, and/or extent is expected to occur on average. Statistically, a hazard with a 100-year frequency is expected to occur about once every 100 years on average and has a 1 percent chance of occurring any given year. Frequency reliability varies depending on the type of hazard considered.

Fujita Scale of Tornado Intensity: Tornado wind speeds are sometimes estimated on the basis of wind speed and damage sustained using the Fujita Scale. The scale rates the intensity or severity of tornado events using numeric values from F0 to F5 based on tornado wind speed and damage. An F0 tornado (wind speed less than 73 miles per hour [mph]) indicates minimal damage (such as broken tree limbs), and an F5 tornado (wind speeds of 261 to 318 mph) indicates severe damage.

General Plan: California state law requires that every county and city prepare and adopt a comprehensive long-range plan to serve as a guide for community development. The plan must consist of an integrated and internally consistent set of goals, policies, and implementation measures. In addition, the plan must focus on issues of the greatest concern to the community and be written in a clear and concise manner. City actions, such as those relating to land-use allocation, annexations, zoning, subdivision and design review, redevelopment, and capital improvements, must be consistent with such a plan. The City of Roseville's general plan serves these purposes. As the principle planning document that directs the City's growth and land use, the general plan is as an integral part of the Roseville hazard mitigation plan. A technical update to Roseville's general plan was completed in January 2003.

Goal: A goal is a general guideline that explains what is to be achieved. Goals are usually broad-based, long-term, policy-type statements and represent global visions. Goals help define the benefits that a plan is trying to achieve.

The success of the Roseville hazard mitigation plan, once implemented, should be measured by the degree to which its goals have been met (that is, by the actual benefits in terms of actual hazard mitigation).

Geographic Information System (GIS): GIS is a computer software application that relates data regarding physical and other features on the earth to a database for mapping and analysis.

Hazard: A hazard is a source of potential danger or adverse condition that could harm people and/or cause property damage. Natural hazards include floods, winds, and earthquakes. Man-made hazards include acts of terrorism and hazardous material spills.

Hazardous Material: A hazardous material is a substance or combination of substances that (1) can cause or contribute to an increase in mortality or serious irreversible or incapacitating reversible illnesses, or (2) pose a present or potential hazard to human life, property, or the environment. Hazardous materials could cause these effects because of their quantity, concentration, or physical, chemical, or infectious characteristics. Hazardous waste is included in the City's working definition of hazardous material.

Hazardous Material Incident: This type of incident involves the accidental or intentional release of hazardous materials to the environment. Such incidents typically occur as fixed facility incidents or transportation incidents. It is possible to identify and prepare for a fixed facility incident because federal and state laws require facilities to notify state and local authorities about hazardous materials used or produced at the facility. Transportation incidents are more difficult to prepare for because there is little (if any) notice about the materials involved. Except for severe weather and flooding, hazardous materials incidents are the most likely hazards to affect the City of Roseville.

Hazard Mitigation Grant Program (HMGP): Authorized under Section 202 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, the HMGP is administered by FEMA and provides grants to states, tribes, and local governments to implement hazard mitigation actions after a major disaster declaration. The purpose of the program is to reduce the loss of life and property due to disasters and to enable mitigation activities to be implemented as a community recovers from a disaster

Hazards U.S. Hazard (HAZUS-MH) Loss Estimation Program: HAZUS-MH is a GIS-based program used to support the development of risk assessments as required under the DMA. The HAZUS-MH software program assesses risk in a quantitative manner to estimate damages and losses associated with natural hazards. HAZUS-MH is FEMA's nationally applicable, standardized methodology and software program and contains modules for estimating potential losses from earthquakes, floods, and wind hazards. HAZUS-MH has also been used to assess vulnerability (exposure) for other hazards facing Roseville.

Hydraulics: Hydraulics is the branch of science or engineering that addresses fluids (especially water) in motion in rivers or canals, works and machinery for conducting or raising water, the use of water as a prime mover, and other fluid-related areas.

Hydrology: Hydrology is the analysis of waters of the earth. For example, a flood discharge estimate is developed by conducting a hydrologic study.

Intensity: For the purposes of this Plan, intensity refers to the measure of the effects of a hazard.

Inventory: The assets identified in a study region comprise an inventory. Inventories include assets that could be lost when a disaster occurs and community resources are at risk. Assets include people, buildings, transportation, and other valued community resources.

Landslide: Landslides can be described as the sliding movement of masses of loosened rock and soil down a hillside or slope. Fundamentally, slope failures occur when the strength of the soils forming the slope exceeds the pressure, such as weight or saturation, acting upon them.

Large Gathering Places: For the purposes of this Plan, such places are defined as follows:

- Any facility listed as a Type A-2.1 in the California Uniform Building Code (UBC) because it has an assembly room with an occupant load of 300 or more without a stage (34 locations in Roseville)
- Any buildings listed as E-1 used for educational purposes through the 12th grade by 50 or more persons for more than 12 hours per week or 4 hours any 1 day (29 buildings in Roseville)
- Any facility likely to have an occupancy of greater than 300, such as a large employment centers, retail centers, cultural centers, and places of worship

Lightning: Lightning is an electrical discharge resulting from the buildup of positive and negative charges within a thunderstorm. When the buildup becomes strong enough, lightning appears as a "bolt," usually within or between clouds and the ground. A bolt of lightning instantaneously reaches temperatures approaching 50,000°F. The rapid heating and cooling of air near lightning causes thunder. Lightning is a major threat during thunderstorms. In the United States, 75 to 100 Americans are struck and killed by lightning each year (see http://www.fema.gov/hazard/thunderstorms/thunder.shtm).

Liquefaction: Liquefaction is the complete failure of soils, occurring when soils lose shear strength and flow horizontally. It is most likely to occur in fine grain sands and silts, which behave like viscous fluids when liquefaction occurs. This situation is extremely hazardous to development on the soils that liquefy, and generally results in extreme property damage and threats to life and safety.

Local Government: Any county, municipality, city, town, township, public authority, school district, special district, intrastate district, council of governments (regardless of whether the council of governments is incorporated as a nonprofit corporation under State law), regional or interstate government entity, or agency or instrumentality of a local government; any Indian tribe or authorized tribal organization, or Alaska Native village or organization; and any rural community, unincorporated town or village, or other public entity.

Magnitude: Magnitude is the measure of the strength of an earthquake, and is typically measured by the Richter scale. As an estimate of energy, each whole number step in the magnitude scale corresponds to the release of about 31 times more energy than the amount associated with the preceding whole number value.

Mass movement: A collective term for landslides, mudflows, debris flows, sinkholes and lahars.

Mitigation: A preventive action that can be taken in advance of an event that will reduce or eliminate the risk to life or property.

Mitigation Actions: Mitigation actions are specific actions to achieve goals and objectives that minimize the effects from a disaster and reduce the loss of life and property.

Nolte Future Floodplain: The Nolte Future Floodplain is the portion of the regulatory floodplain based on the Roseville City of Roseville Floodplain Analysis published by Nolte and Associates in August 1986. This analysis used hydrologic parameters that better represented the observed flooding scenarios that caused flooding in Roseville. The study also used hydrologic parameters based on projected growth for the region assuming total development of the watershed instead of existing conditions used by FEMA. This approach generated a floodplain area greater than that reflected of on the FIRM for portions of Roseville. Although this study was never formally adopted, it is used by the City as the best available information for regulatory and land- use programs such as the specific plan program and improvement standards.

Objective: For the purposes of this Plan, an objective is defined as a short-term aim that, when combined with other objectives, forms a strategy or course of action to meet a goal. Unlike goals, objectives are specific and measurable.

Peak Ground Acceleration: Peak Ground Acceleration (PGA) is a measure of the highest amplitude of ground shaking that accompanies an earthquake, based on a percentage of the force of gravity.

Preparedness: Preparedness refers to actions that strengthen the capability of government, citizens, and communities to respond to disasters.

Presidential Disaster Declaration: These declarations are typically made for events that cause more damage than state and local governments and resources can handle without federal government assistance. Generally, no specific dollar loss threshold has been established for such declarations. A Presidential Disaster Declaration puts into motion long-term federal recovery programs, some of which are matched by state programs, designed to help disaster victims, businesses, and public entities.

Probability of Occurrence: The probability of occurrence is a statistical measure or estimate of the likelihood that a hazard will occur. This probability is generally based on past hazard events in the area and a forecast of events that could occur in the future. A probability factor based on yearly values of occurrence is used to estimate probability of occurrence.

Regulatory Floodplain: This term refers to an area regulated by the City of Roseville as floodplain through its land-use regulations and improvement standards. It includes areas identified by FEMA and published on FIRMs and additional areas identified by Roseville as being susceptible to flooding. These areas are delineated based on detailed hydrologic and hydraulic floodplain modeling that meets or exceeds FEMA criteria for mapping and modeling floodplains. The flood event used to delineate these boundaries is referred to as "the regulatory flood" in this Plan to differentiate it from the "base flood" used by FEMA. The City of Roseville designates the 100-year floodplain area on its land-use map in accordance with best available floodplain information as determined by the Public Works Director. In many portions of the City, the Nolte Future Floodplain (May 1987) has been used to designate floodplain boundaries. When Nolte Future Floodplain information does not exist or does not represent the best available information, new floodplain information is generated by the project proponent. New floodplain information is generally developed (1) consistent with build-out development assumptions used by the Nolte Future Floodplain analysis, and (2) in compliance with the most recent Placer County floodplain manual. Floodplain boundaries can normally be terminated where the 100-year floodplain narrows to a width of 200 feet or less and where the associated drainage area is less than 300 acres. Precise termination of boundaries must be approved by the Public Works Director.

Repetitive Loss Property: Any NFIP-insured property that, since 1978 and regardless of any changes of ownership during that period, has experienced:

- Four or more paid flood losses in excess of $1000.00; or
- Two paid flood losses in excess of $1000.00 within any 10-year period since 1978 or
- Three or more paid losses that equal or exceed the current value of the insured property.

Return Period (or Mean Return Period): This term refers to the average period of time in years between occurrences of a particular hazard (equal to the inverse of the annual frequency of occurrence).

Riverine: Of or produced by a river. Riverine floodplains have readily identifiable channels. Floodway maps can only be prepared for riverine floodplains.

Risk: Risk is the estimated impact that a hazard would have on people, services, facilities, and structures in a community. Risk measures the likelihood of a hazard occurring and resulting in an adverse condition that causes

injury or damage. Risk is often expressed in relative terms such as a high, moderate, or low likelihood of sustaining damage above a particular threshold due to occurrence of a specific type of hazard. Risk also can be expressed in terms of potential monetary losses associated with the intensity of the hazard.

Risk Assessment: Risk assessment is the process of measuring potential loss of life, personal injury, economic injury, and property damage resulting from hazards. This process assesses the vulnerability of people, buildings, and infrastructure to hazards and focuses on (1) hazard identification; (2) impacts of hazards on physical, social, and economic assets; (3) vulnerability identification; and (4) estimates of the cost of damage or costs that could be avoided through mitigation.

Risk Ranking: This ranking serves two purposes, first to describe the probability that a hazard will occur, and second to describe the impact a hazard will have on the people, property, and economy of Roseville. Risk estimates for the City are based on the methodology that the City used to prepare the risk assessment for this Plan. The following equation shows the risk ranking calculation:

Risk Ranking = Probability + Impact (people + property + economy)

Robert T. Stafford Act: The Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 100-107, was signed into law on November 23, 1988. This law amended the Disaster Relief Act of 1974, Public Law 93-288. The Stafford Act is the statutory authority for most federal disaster response activities, especially as they pertain to FEMA and its programs.

Sinkhole: A collapse depression in the ground with no visible outlet. Its drainage is subterranean. It is commonly vertical-sided or funnel-shaped.

Slab: This refers to one or more layers of snow in which the grains are bonded together. A slab initially fails over a large area instead of at a single point.

Special Flood Hazard Area: The base floodplain delineated on a Flood Insurance Rate Map. The SFHA is mapped as a Zone A in riverine situations and zone V in coastal situations. The SFHA may or may not encompass all of a community's flood problems

Stakeholder: Business leaders, civic groups, academia, non-profit organizations, major employers, managers of critical facilities, farmers, developers, special purpose districts, and others whose actions could impact hazard mitigation.

Steering Committee: The Steering Committee is the Roseville City Council-approved group that oversaw all phases of the hazard mitigation plan's development. The members of this committee included key city personnel, citizens, and other stakeholders from within the planning area.

Stream Bank Erosion: Stream bank erosion is common along rivers, streams and drains where banks have been eroded, sloughed or undercut. However, it is important to remember that a stream is a dynamic and constantly changing system. It is natural for a stream to want to meander, so not all eroding banks are "bad" and in need of repair. Generally, stream bank erosion becomes a problem where development has limited the meandering nature of streams, where streams have been channelized, or where stream bank structures (like bridges, culverts, etc.) are located in places where they can actually cause damage to downstream areas. Stabilizing these areas can help protect watercourses from continued sedimentation, damage to adjacent land uses, control unwanted meander, and improvement of habitat for fish and wildlife.

Steep Slope: Different communities and agencies define it differently, depending on what it is being applied to, but generally a steep slope is a slope in which the percent slope equals or exceeds 25%. For this study, steep slope is defined as slopes greater than 33%.

Subduction Zone Earthquake: This type of quake occurs along two converging plates, attached to one another along their interface. When the interface between these two plates slips, a sudden, dramatic release of energy results, propagated along the entire fault line.

Sustainable Hazard Mitigation: This concept includes the sound management of natural resources, local economic and social resiliency, and the recognition that hazards and mitigation must be understood in the largest possible social and economic context.

Technical Subcommittee: This City of Roseville group convened to provide guidance, support, and feedback to the planning team during all phases of Roseville hazard mitigation plan development. The technical subcommittee consisted of key staff from City departments integral to implementing City programs pertinent to hazard mitigation.

Technological Hazard: A technological hazard arises from human activities such as the manufacture, transportation, storage, and use of hazardous materials. Technological hazards are assumed to be accidental in nature, with unintended consequences.

Thunderstorm: A thunderstorm is a storm with lightning and thunder produced by cumulonimbus clouds. Thunderstorms usually produce gusty winds, heavy rains, and sometimes hail. Thunderstorms are usually short in duration (seldom more than 2 hours). Heavy rains associated with thunderstorms can lead to flash flooding during the wet or dry seasons.

Tornado: A tornado is a violently rotating column of air extending between and in contact with a cloud and the surface of the earth. Tornadoes are often (but not always) visible as funnel clouds. On a local scale, tornadoes are the most intense of all atmospheric circulations, and winds can reach destructive speeds of more than 300 mph. A tornado's vortex is typically a few hundred meters in diameter, and damage paths can be up to 1 mile wide and 50 miles long.

Vulnerability: Vulnerability describes how exposed or susceptible an asset is to damage. Vulnerability depends on an asset's construction, contents, and the economic value of its functions. Like indirect damages, the vulnerability of one element of the community is often related to the vulnerability of another. For example, many businesses depend on uninterrupted electrical power. Flooding of an electric substation would affect not only the substation itself but businesses as well. Often, indirect effects can be much more widespread and damaging than direct effects.

Water Supply Strategy: A water supply strategy is a comprehensive approach to ensure water reliability for Roseville's customers. The City has a diverse set of water supply options, including surface water contracts, recycled water, and groundwater wells to ensure that even after a period of dry years, a combination of available water supplies and water conservation measures will ensure that the community has adequate water. The City has contracts for surface water with three agencies

Watershed: A watershed is an area that drains downgradient from areas of higher land to areas of lower land to the lowest point, a common drainage basin.

Weapon of Mass Destruction (WMD): WMDs include chemical, biological, radiological, nuclear, and explosive weapons associated with terrorism.

West Nile Virus: West Nile virus is a recent natural hazard affecting California. Mosquitoes transmit this potentially deadly disease to livestock and humans alike. West Nile virus first struck the northern hemisphere in Queens, New York, in 1999 and killed four people. In 2003, all 50 states warned of an outbreak from any of the 30 mosquito species known to carry it. From 62 severe cases in 1999, confirmed human cases of the virus spread

to 39 states in 2002 and killed 284 people. Less than 1 percent of those infected develop severe illness. People over 50 years of age appear to be at high risk for the severe aspects of the disease.

Wildfire: These terms refer to any uncontrolled fire occurring on undeveloped land that requires fire suppression. The potential for wildfire is influenced by three factors: the presence of fuel, topography, and air mass. Fuel can include living and dead vegetation on the ground, along the surface as brush and small trees, and in the air such as tree canopies. Topography includes both slope and elevation. Air mass includes temperature, relative humidity, wind speed and direction, cloud cover, precipitation amount, duration, and the stability of the atmosphere at the time of the fire. Wildfires can be ignited by lightning and, most frequently, by human activity including smoking, campfires, equipment use, and arson.

Windstorm: Windstorms are generally short-duration events involving straight-line winds or gusts exceeding 50 mph. These gusts can produce winds of sufficient strength to cause property damage. Windstorms are especially dangerous in areas with significant tree stands, exposed property, poorly constructed buildings, mobile homes (manufactured housing units), major infrastructure, and aboveground utility lines. A windstorm can topple trees and power lines; cause damage to residential, commercial, critical facilities; and leave tons of debris in its wake.

Zoning Ordinance: The zoning ordinance designates allowable land use and intensities for a local jurisdiction. Zoning ordinances consist of two components: a zoning text and a zoning map.

Appendix A. Public Outreach Materials

City of Roseville Survey: 2016 Hazard Mitigation Plan Update Questionnaire

1. Survey Introduction

City of Roseville Hazard Mitigation Questionnaire

A range of natural and man-made disasters can affect any community. The City of Roseville works diligently to mitigate threats and prepare for disasters, and has been recognized nationally for its level of excellence in the area of hazard mitigation. This ensures our community minimizes the impact of adversity and can recover as quickly as possible.

To remain at this high level of preparedness, we need your help to identify and plan for future disasters. Data collected through this survey will help the City of Roseville Multi-Hazard Mitigation Committee:

- **Assess our residents' level of awareness regarding disasters;**
- **Determine areas vulnerable to various types of disasters;**
- **Coordinate activities to reduce the risk of injury or property damage in the future; and,**
- **Update the City of Roseville Hazard Mitigation Plan.**

The City of Roseville Hazard Mitigation Plan is required to be updated every five years by the federal Disaster Mitigation Act of 2000.

The Plan details the risks of both natural and manmade hazards in Roseville and includes programs and projects that can help reduce the exposure of City residents and businesses should an event occur in Roseville. The Plan also makes the City eligible for federal pre-disaster and post-disaster assistance. The City has been very successful to date in securing funds for projects in Roseville to lessen the risks associated with natural hazards in Roseville.

This survey consists of three sets of questions: The first section consists of demographic information that will be used in evaluating the responses to the questionnaire. The second section is about the potential hazards near you and whether your knowledge of potential hazards influenced your decision to choose where you live. The last section is about your experience and knowledge of natural and manmade hazards in general, and steps your household has taken to prepare for disasters.

Thank you for taking the time to participate in the 2016 Hazard Mitigation Questionnaire!

City of Roseville Survey: 2016 Hazard Mitigation Plan Update Questionnaire

2. About You

First, please tell us about yourself. This information will aid the City's Multi-Hazard Mitigation Plan Steering Committee in evaluating the responses to this questionnaire. The answers will be used only for the preparation of this Plan and will not be provided to any other group or interest.

1. How much is your gross household income?

- ◯ $20,000 or less
- ◯ $20,001 to $49,999
- ◯ $50,000 to $74,999
- ◯ $75,000 to $99,999
- ◯ $100,000 or More

2. Do you work in Roseville?

- ◯ Yes
- ◯ No

3. Please indicate the primary language spoken in your household.

- ◯ English
- ◯ Spanish
- ◯ Other (please specify)
- ◯ Other Indo-European Language
- ◯ Asian and Pacific Island Languages

4. Which of the following digital media outlets do you subscribe to receive news and information about the City of Roseville?

Select all that apply.

- ☐ Facebook
- ☐ Twitter
- ☐ Nextdoor
- ☐ Other (please specify)
- ☐ E-mail and/or text messages
- ☐ Alert Roseville

City of Roseville Survey: 2016 Hazard Mitigation Plan Update Questionnaire

3. Location

Please tell us about where you live and if the potential impacts of natural or manmade hazards influenced your decision.:

* 5. Do you live in Roseville?

- Yes
- No

6. Do you own or rent your place of residence?

- Own
- Rent

7. How long have you lived in at your current residence?

- Less than a year
- 1 – 2 years
- 3 – 5 years
- 6 – 10 years
- 11 – 15 years
- 16 – 20 years
- More than 20 years
- I don't live in Roseville

* 8. When you moved into your home, did you consider the impact a natural or human-caused disaster could have on your home?

- Yes
- No

* 9. Was the presence of a natural hazard risk zone (e.g., dam failure zone, flood zone, landslide hazard area, high fire risk area) disclosed to you by a real estate agent, seller, or landlord before you purchased or moved into your home?

- Yes
- No

* 10. Is your residence located in or near a FEMA designated floodplain?

- Yes
- No
- Not Sure

11. Is your residence located in a dam failure zone?

- Yes
- No
- Not sure

* 12. Do you have flood insurance?

- Yes
- No
- Not Sure

* 13. Is your residence located near an earthquake fault?

- Yes
- No
- Not Sure

* 14. Do you have earthquake insurance?

Yes | No | Not Sure

* 15. Is your property located in an area at risk for wildfires?

Yes | No | Not Sure

16. Have you ever had problems securing homeowners or renters insurance due to risks from hazards?

Yes | No

If "yes," what hazard was the cause of the difficulty?

17. Do you support policies to restrict or prohibit development in designated hazard zones?

Yes | No

* indicates a question that requires an answer.

City of Roseville Survey: 2016 Hazard Mitigation Plan Update Questionnaire

4. Hazard Knowledge

The next set of questions is about your experience and knowledge of natural and manmade hazards and steps your household has taken to prepare for disasters:

18. Which of the following natural hazard events have you or has anyone in your household experienced within the past 20 years in Roseville? (Check all that apply)

- [ ] Dam Failure
- [ ] Drought
- [ ] Earthquake
- [ ] Epidemic/Pandemic (flu, avian flu, H1N1, West Nile)
- [ ] Extreme Heat
- [ ] Flood
- [ ] Freeze
- [ ] Landslide & Other Earth Movements (non-seismic induced landslides and earth movements;subsidence;sinkholes;geologic hazard)
- [ ] Severe Weather (wind, lightning, winter storm, etc.)
- [ ] Wildfire
- [ ] None
- [ ] Other (please specify)

* 19. How concerned are you about the following natural hazards in Roseville? (Please check one for each hazard)

	Not concerned	Somewhat concerned	Concerned	Very concerned	Extremely concerned
Dam Failure					
Drought					
Earthquake					
Epidemic/Pandemic (flu, avian flu, H1N1, West Nile, Ebola)					
Extreme Heat					
Flood					
Freeze					
Landslide & Other Earth Movements (non-seismic induced landslides and earth movements;subsidence;sinkholes;geologic hazard)					
Severe Weather (wind, lightning, winter storm, etc.)					
Wildfire					
Other Natural Hazard					

If you are concerned about a natural hazard not listed above, please specify.

* 20. How concerned are you with the following manmade hazards in Roseville? (Check all that apply)

	Not concerned	Somewhat concerned	Concerned	Very concerned	Extremely concerned
Energy Shortage					
Act of Terrorism					
Hazardous Materials Release					
Cyber Threats					
Other Human-Caused Hazard					

If you are concerned about a human-caused hazard not listed above, please specify.

* 21. The FEMA website - Ready.gov - provides important information on how to prepare you and your family in the event of a disaster.

How prepared is your household for a natural or human-caused hazard event? (Check one)

- ◯ Not at all Prepared
- ◯ Somewhat Prepared
- ◯ Adequately Prepared
- ◯ Well Prepared
- ◯ Very Well Prepared

* 22. How would you expect to be notified in case of an immediate threat caused by a natural or human-caused hazard.

Select all that apply.

- ☐ Television
- ☐ Radio
- ☐ Facebook
- ☐ Twitter
- ☐ Nextdoor
- ☐ Alert Roseville
- ☐ Other (please specify)

23. FEMA suggests that households have at least 3 days of food, water, and vital supplies (e.g. medications) in hand in the event of a disaster. How many days of food, water, and vital supplies does your family have on hand in the event of a disaster?

◯ 1 ◯ 2 ◯ 3 ◯ 4 ◯ 5 ◯ 6 ◯ 7 ◯ 8 ◯ 9 ◯ 10 ◯ None

24. How prepared are you to get along without electricity or natural gas for one to five days?

- ◯ Not at all prepared
- ◯ Somewhat prepared
- ◯ Very prepared

25. Where would you expect to find useful information to help you be prepared?

Select all that apply.

- ☐ Television
- ☐ Internet
- ☐ Social Media
- ☐ Newspaper/magazine
- ☐ Other (please specify)
- ☐ City of Roseville Public Library
- ☐ Public government meetings
- ☐ Schools/academic institutions

26. Which of the following steps has your household already undertaken to prepare for a natural or manmade disaster?

Select all that apply.

- [ ] Received first aid/CPR training
- [ ] Made a fire escape plan
- [ ] Designated a meeting place
- [ ] Identified utility shutoffs
- [ ] Community Emergency Response Training (CERT)
- [ ] Prepared a disaster supply kit
- [ ] Installed smoke detectors on each level of the house
- [ ] Stored food and water
- [ ] Stored flashlights and batteries
- [ ] Stored a battery-powered radio
- [ ] Stored a fire extinguisher
- [ ] Stored medical supplies (first aid kit, medications)
- [ ] Other (please specify)

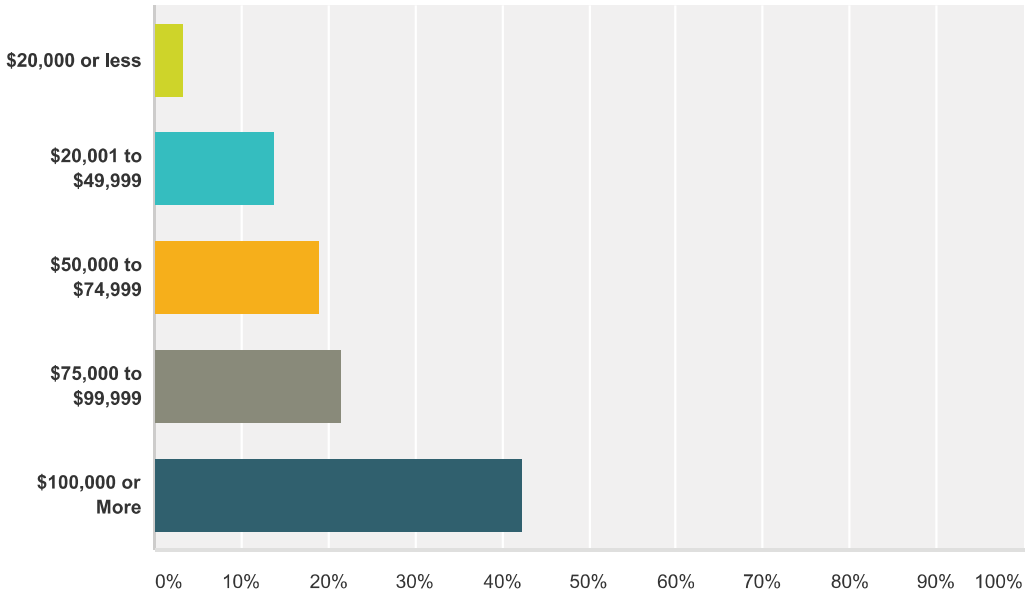
27. Please provide any additional comments you would like to share with the City of Roseville Planning Team.

* indicates a question that requires an answer.

28. If you would like to receive information regarding upcoming public events and other participatory opportunities regarding hazard mitigation, please provide your email address below.

Q1 How much is your gross household income?

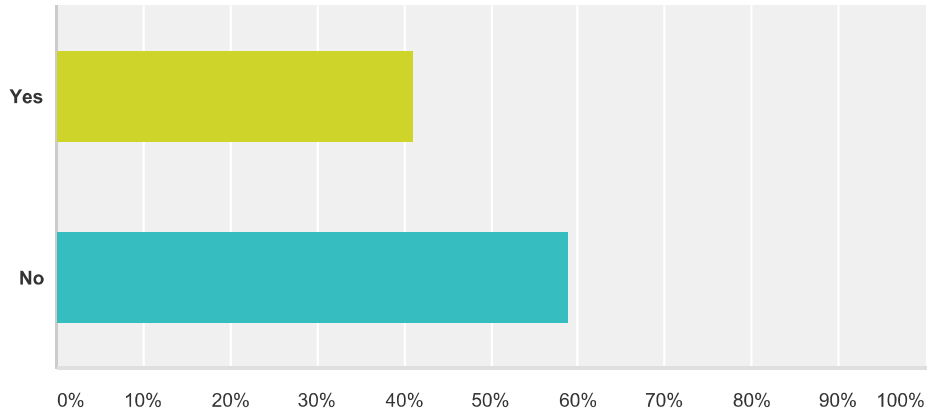
Answered: 641 Skipped: 30



Answer Choices	Responses	
$20,000 or less	3.28%	21
$20,001 to $49,999	13.73%	88
$50,000 to $74,999	19.03%	122
$75,000 to $99,999	21.53%	138
$100,000 or More	42.43%	272
Total		641

Q2 Do you work in Roseville?

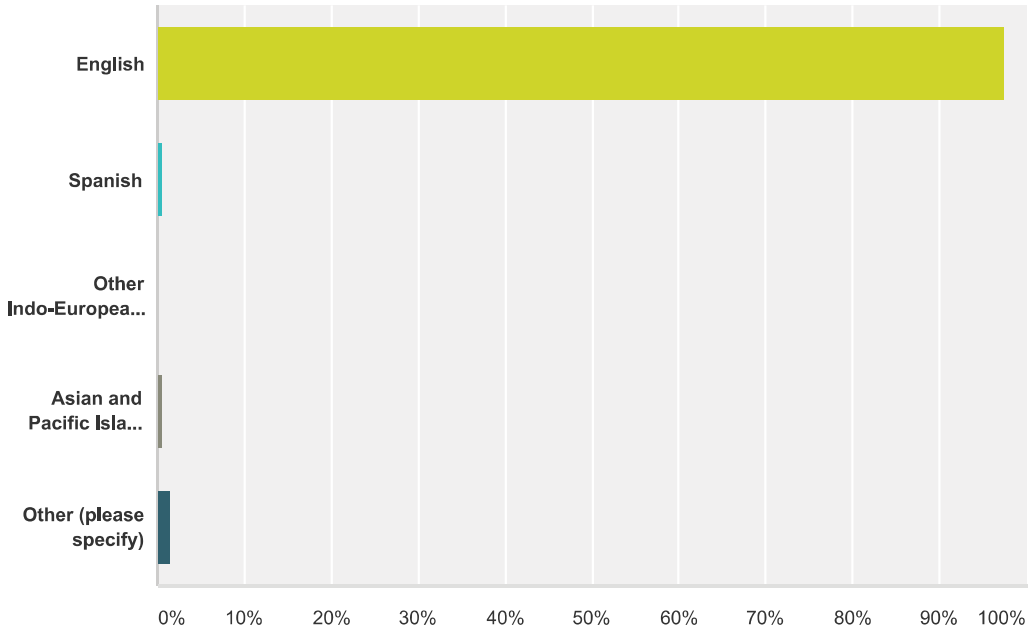
Answered: 650 Skipped: 21



Answer Choices	Responses	
Yes	**41.23%**	268
No	**58.77%**	382
Total		**650**

Q3 Please indicate the primary language spoken in your household.

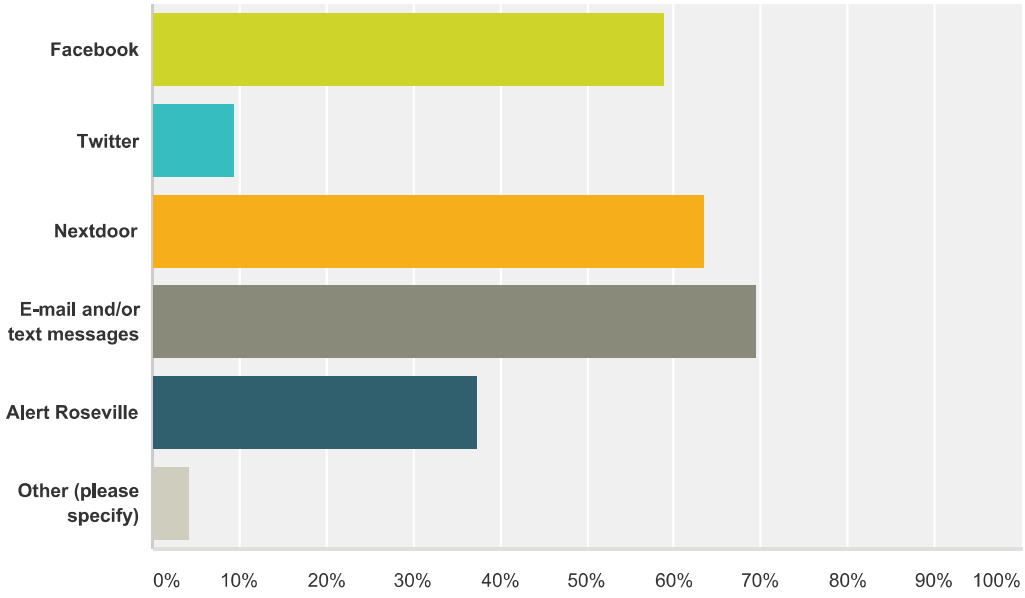
Answered: 662 Skipped: 9



Answer Choices	Responses	
English	97.43%	645
Spanish	0.60%	4
Other Indo-European Language	0.00%	0
Asian and Pacific Island Languages	0.60%	4
Other (please specify)	1.36%	9
Total		662

Q4 Which of the following digital media outlets do you subscribe to receive news and information about the City of Roseville? Select all that apply.

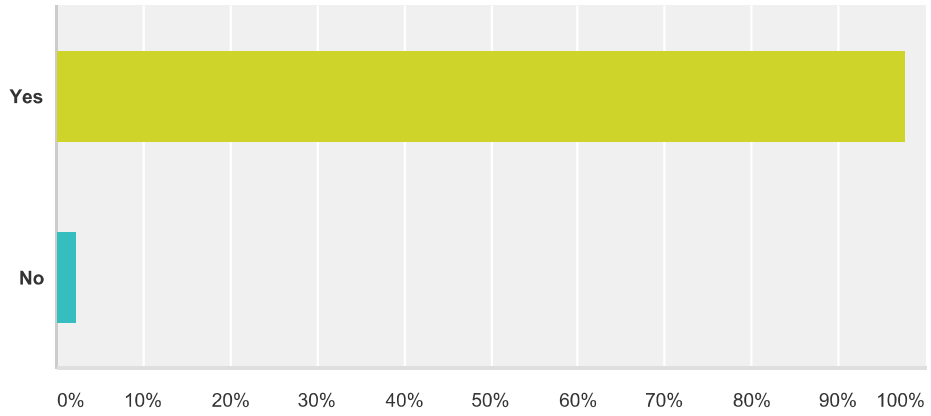
Answered: 658 Skipped: 13



Answer Choices	Responses	
Facebook	**58.97%**	388
Twitter	**9.42%**	62
Nextdoor	**63.37%**	417
E-mail and/or text messages	**69.45%**	457
Alert Roseville	**37.39%**	246
Other (please specify)	**4.10%**	27
Total Respondents: 658		

Q5 Do you live in Roseville?

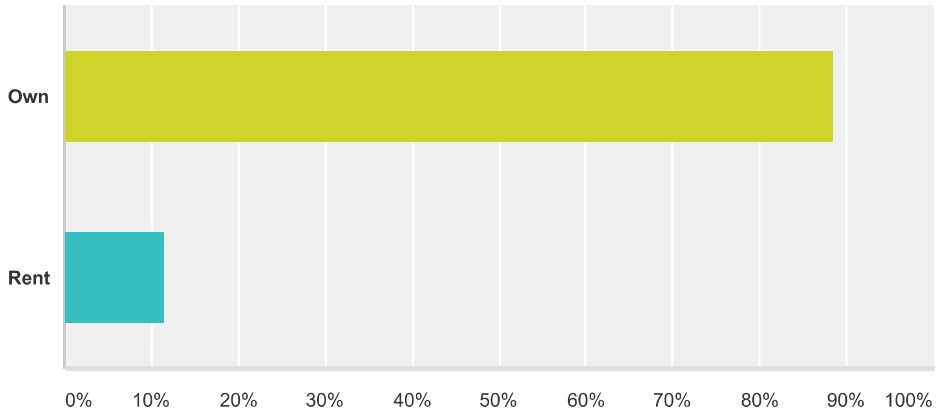
Answered: 646 Skipped: 25



Answer Choices	Responses	
Yes	**97.68%**	631
No	**2.32%**	15
Total		**646**

Q6 Do you own or rent your place of residence?

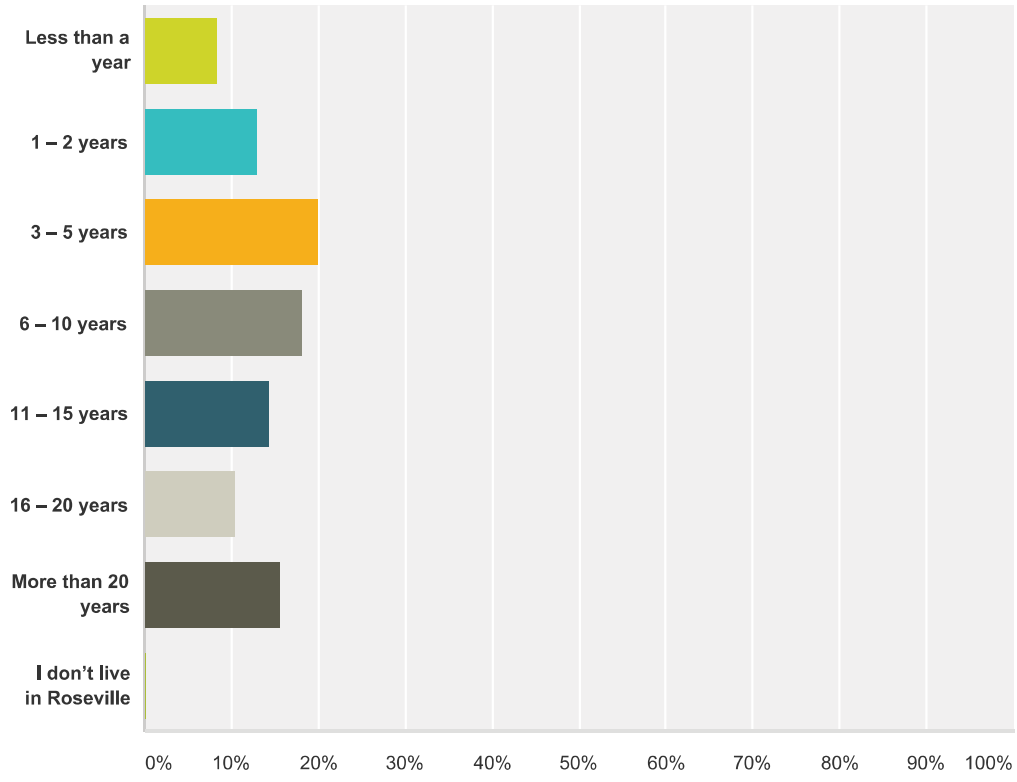
Answered: 641 Skipped: 30



Answer Choices	Responses	
Own	**88.46%**	567
Rent	**11.54%**	74
Total		**641**

Q7 How long have you lived in at your current residence?

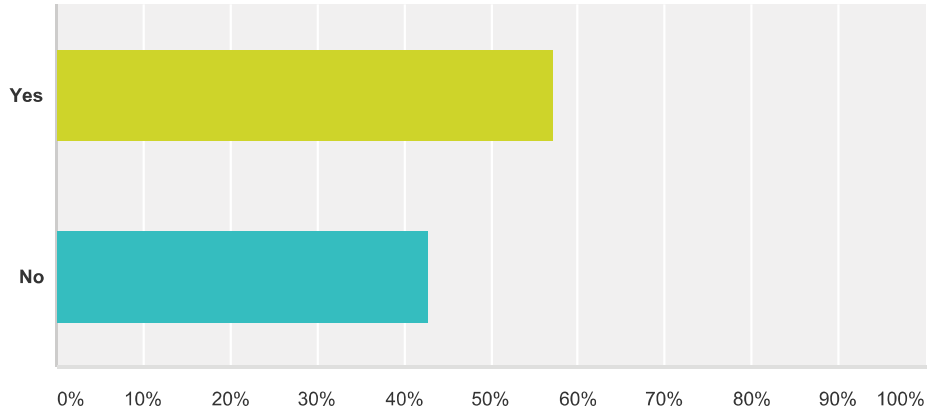
Answered: 642 Skipped: 29



Answer Choices	Responses	
Less than a year	**8.41%**	54
1 – 2 years	**12.93%**	83
3 – 5 years	**19.94%**	128
6 – 10 years	**18.22%**	117
11 – 15 years	**14.33%**	92
16 – 20 years	**10.44%**	67
More than 20 years	**15.58%**	100
I don't live in Roseville	**0.16%**	1
Total		**642**

Q8 When you moved into your home, did you consider the impact a natural or human-caused disaster could have on your home?

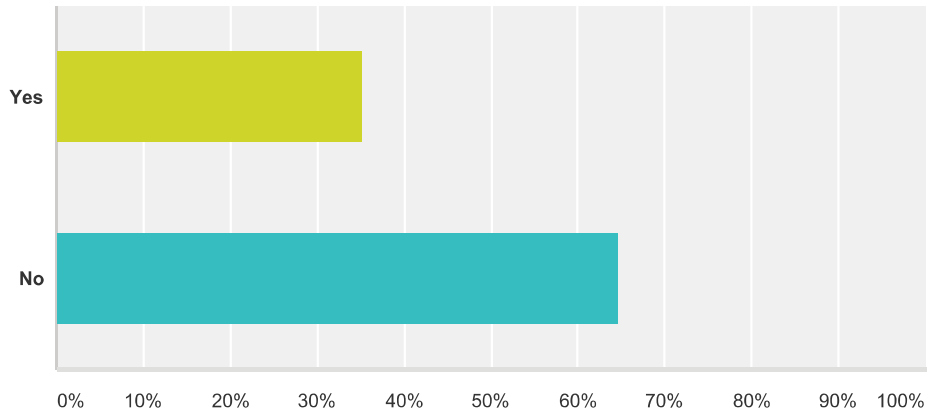
Answered: 646 Skipped: 25



Answer Choices	Responses	
Yes	**57.12%**	369
No	**42.88%**	277
Total		**646**

Q9 Was the presence of a natural hazard risk zone (e.g., dam failure zone, flood zone, landslide hazard area, high fire risk area) disclosed to you by a real estate agent, seller, or landlord before you purchased or moved into your home?

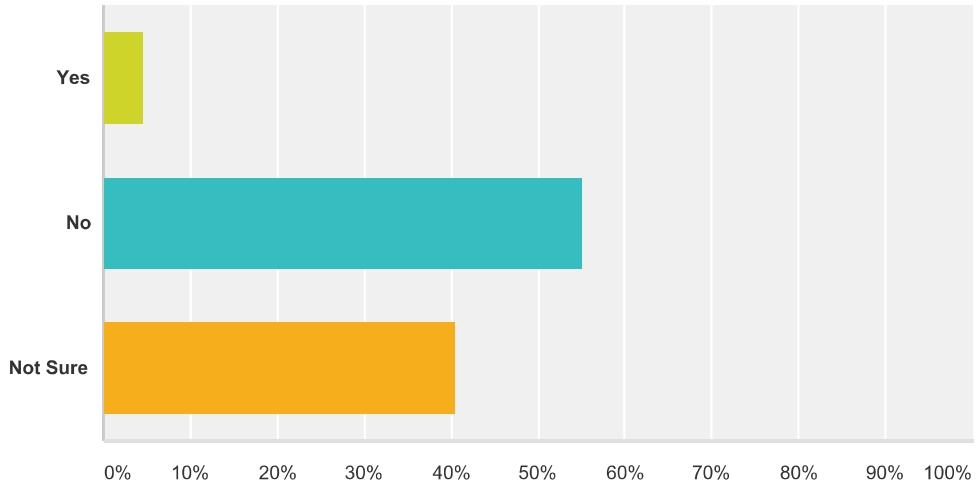
Answered: 646 Skipped: 25



Answer Choices	Responses	
Yes	**35.29%**	228
No	**64.71%**	418
Total		**646**

Q10 Is your residence located in or near a FEMA designated floodplain?

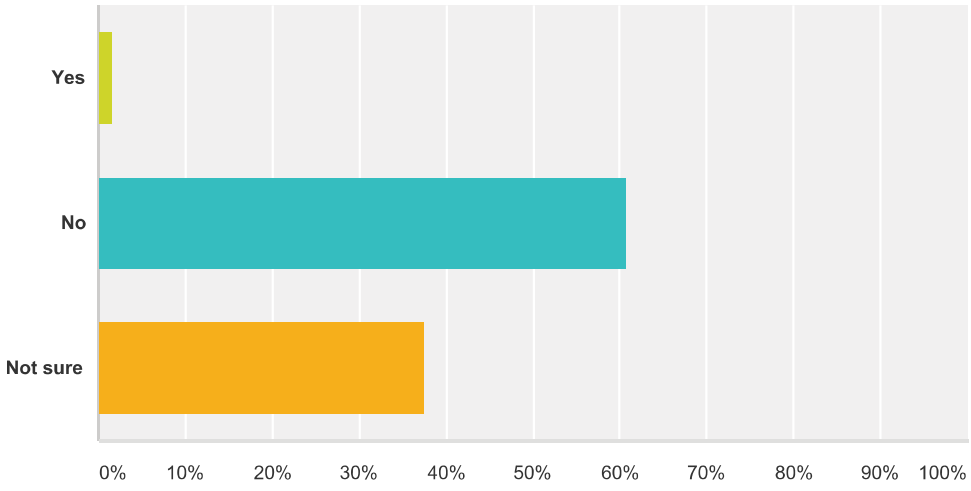
Answered: 646 Skipped: 25



Answer Choices	Responses	
Yes	**4.49%**	29
No	**55.11%**	356
Not Sure	**40.40%**	261
Total		**646**

Q11 Is your residence located in a dam failure zone?

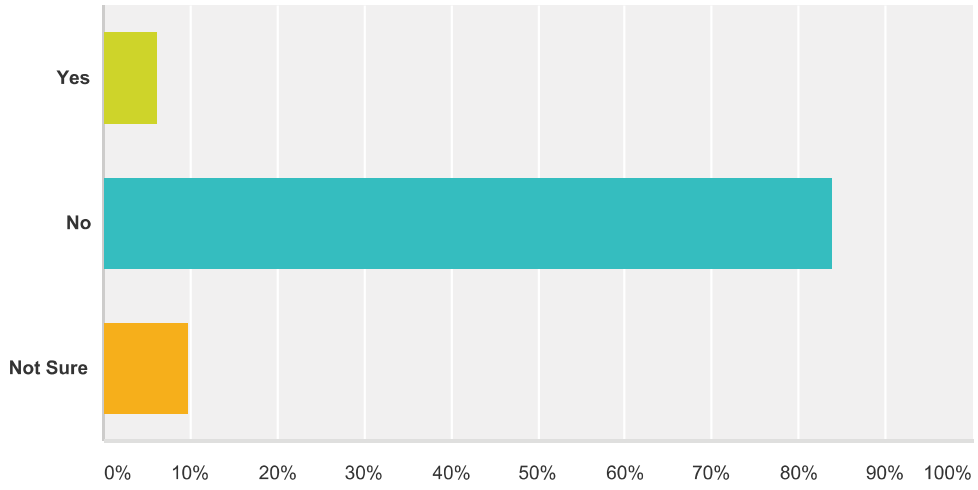
Answered: 642 Skipped: 29



Answer Choices	Responses	
Yes	**1.71%**	11
No	**60.75%**	390
Not sure	**37.54%**	241
Total		**642**

Q12 Do you have flood insurance?

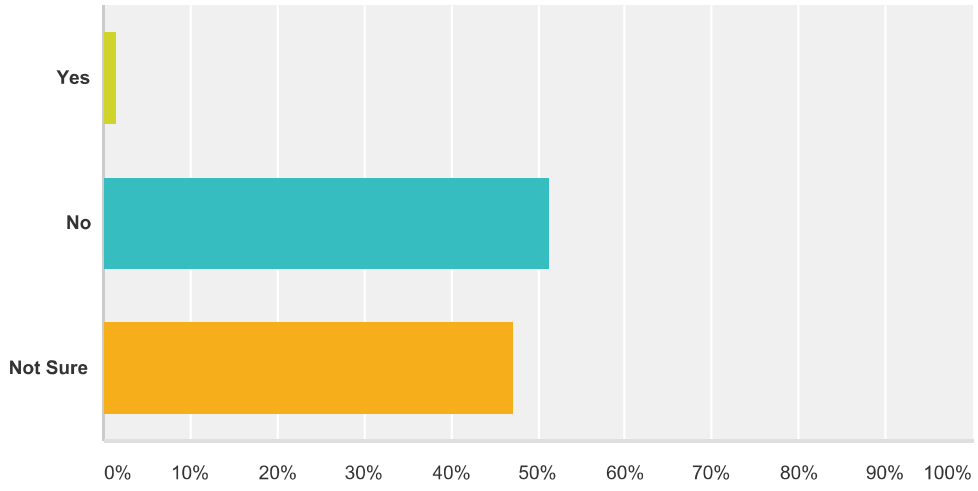
Answered: 646 Skipped: 25



Answer Choices	Responses	
Yes	**6.19%**	40
No	**83.90%**	542
Not Sure	**9.91%**	64
Total		**646**

Q13 Is your residence located near an earthquake fault?

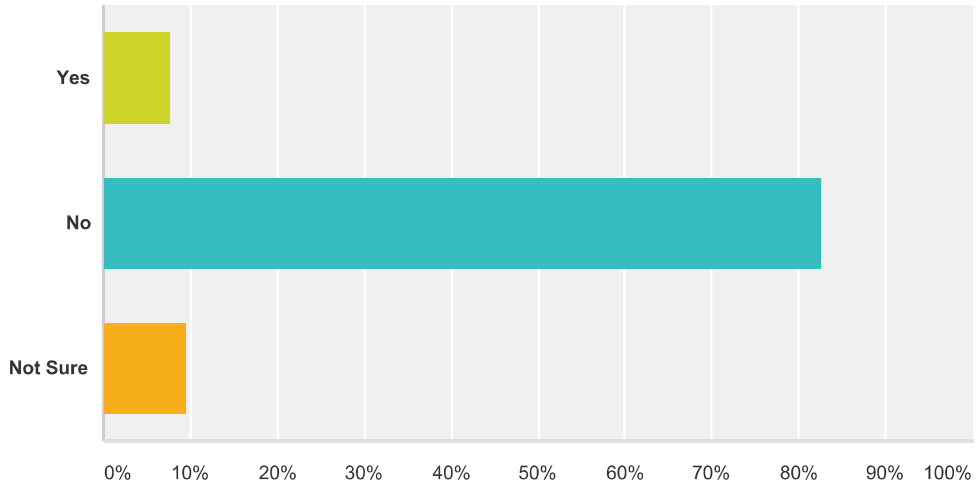
Answered: 646 Skipped: 25



Answer Choices	Responses	
Yes	**1.39%**	9
No	**51.39%**	332
Not Sure	**47.21%**	305
Total		**646**

Q14 Do you have earthquake insurance?

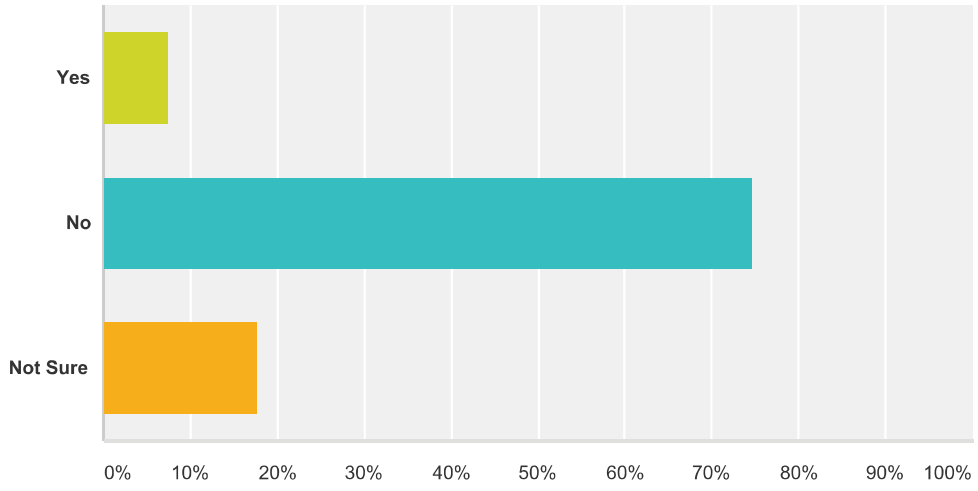
Answered: 646 Skipped: 25



Answer Choices	Responses	
Yes	**7.74%**	50
No	**82.66%**	534
Not Sure	**9.60%**	62
Total		**646**

Q15 Is your property located in an area at risk for wildfires?

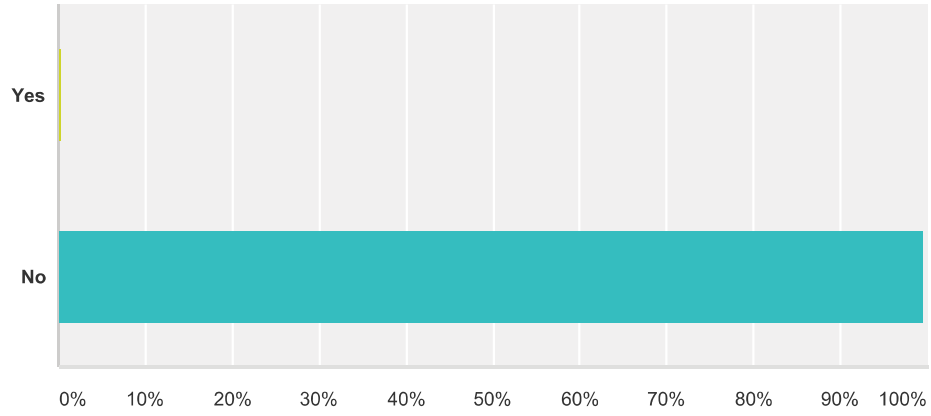
Answered: 646 Skipped: 25



Answer Choices	Responses	
Yes	**7.59%**	49
No	**74.77%**	483
Not Sure	**17.65%**	114
Total		**646**

Q16 Have you ever had problems securing homeowners or renters insurance due to risks from hazards?

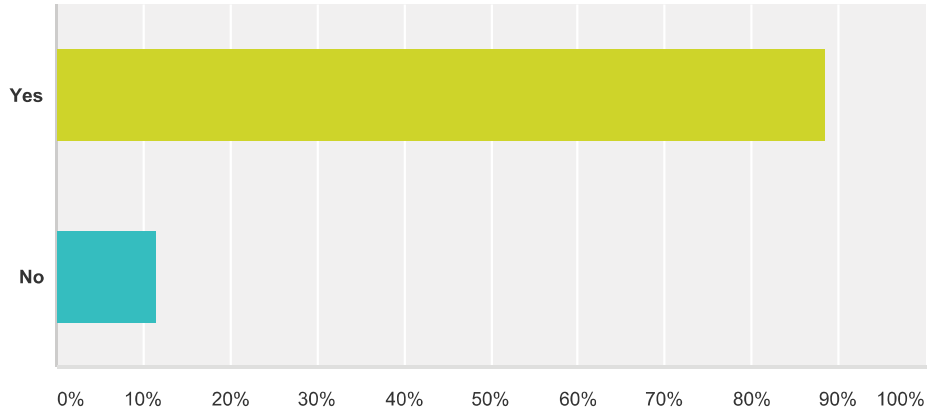
Answered: 641 Skipped: 30



Answer Choices	Responses	
Yes	**0.47%**	3
No	**99.53%**	638
Total		**641**

Q17 Do you support policies to restrict or prohibit development in designated hazard zones?

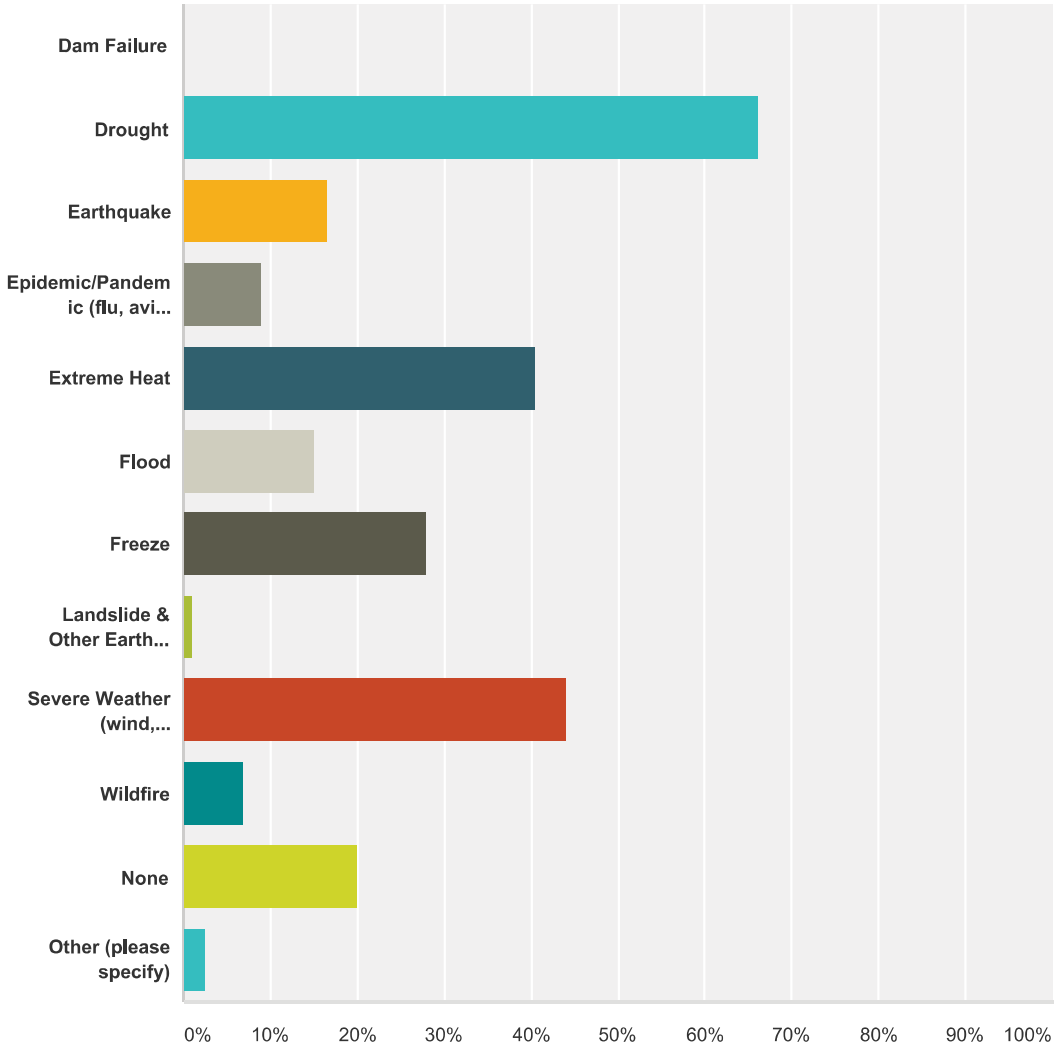
Answered: 623 Skipped: 48



Answer Choices	Responses	
Yes	**88.60%**	552
No	**11.40%**	71
Total		**623**

Q18 Which of the following natural hazard events have you or has anyone in your household experienced within the past 20 years in Roseville? (Check all that apply)

Answered: 556 Skipped: 115

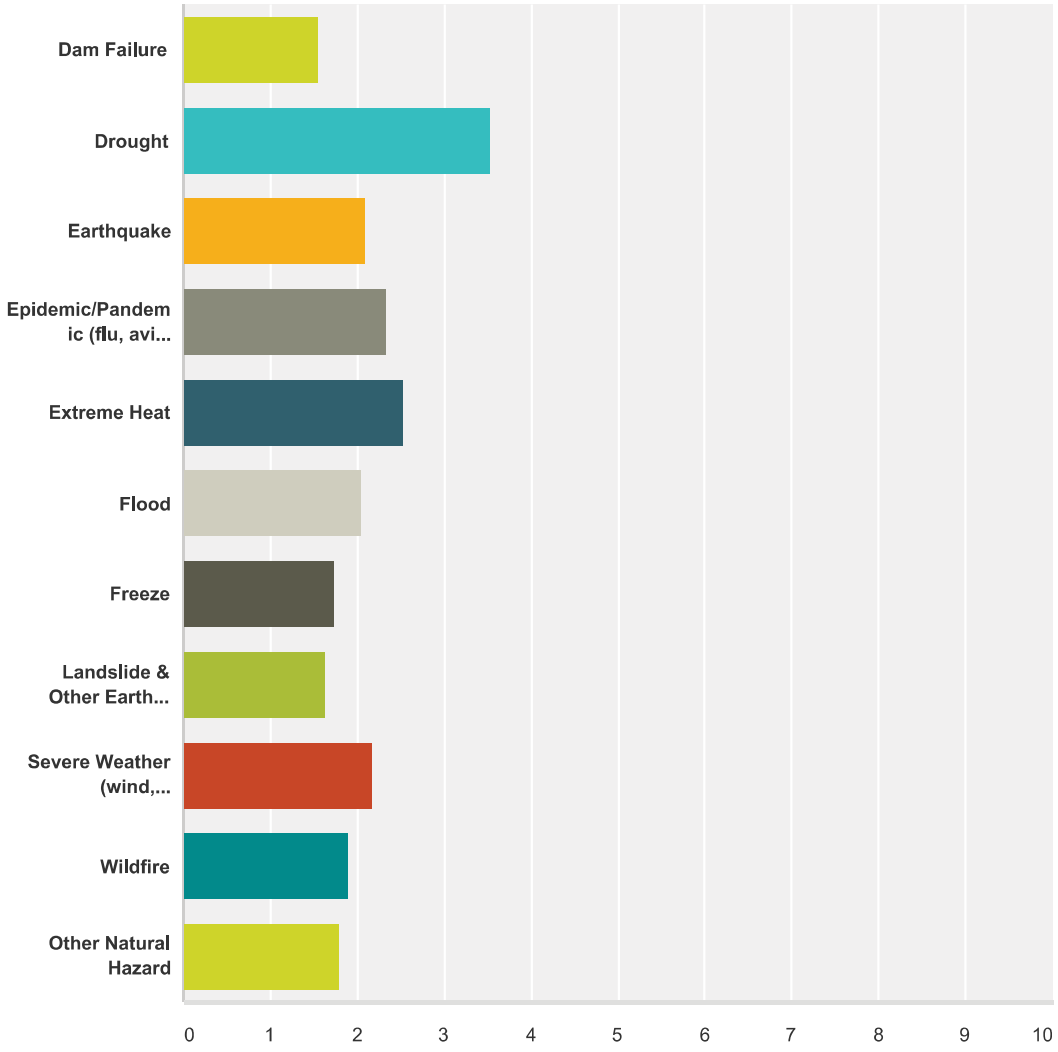


Answer Choices	Responses	
Dam Failure	0.00%	0
Drought	66.19%	368
Earthquake	16.55%	92
Epidemic/Pandemic (flu, avian flu, H1N1, West Nile)	8.99%	50
Extreme Heat	40.47%	225
Flood	15.11%	84
Freeze	27.88%	155

Landslide & Other Earth Movements (non-seismic induced landslides and earth movements;subsidence;sinkholes;geologic hazard)	**1.08%**	6
Severe Weather (wind, lightning, winter storm, etc.)	**44.06%**	245
Wildfire	**6.83%**	38
None	**19.96%**	111
Other (please specify)	**2.52%**	14
Total Respondents: 556		

Q19 How concerned are you about the following natural hazards in Roseville? (Please check one for each hazard)

Answered: 562 Skipped: 109

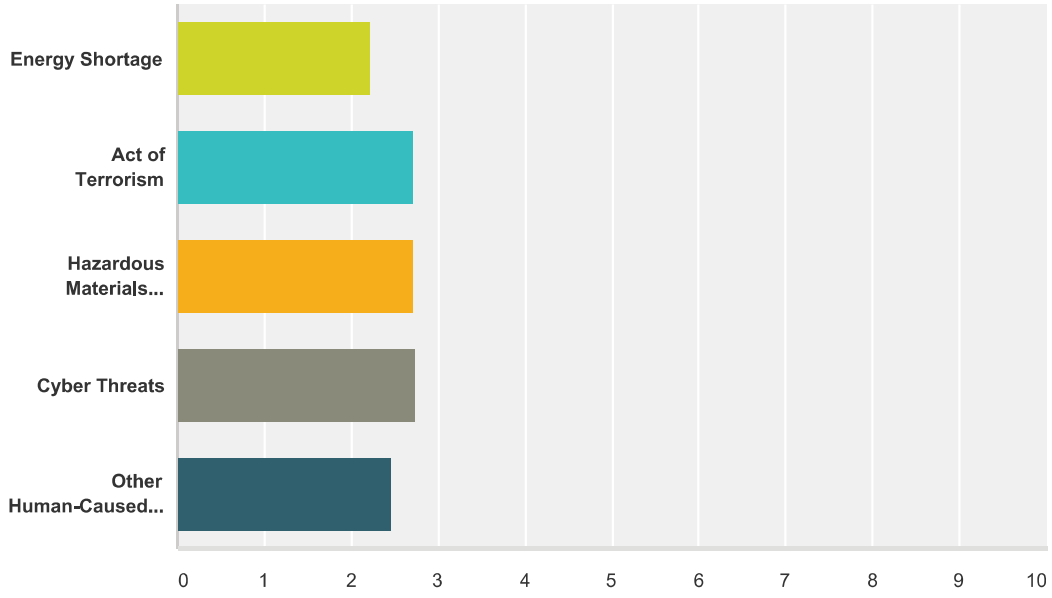


	Not concerned	Somewhat concerned	Concerned	Very concerned	Extremely concerned	Total	Weighted Average
Dam Failure	**64.76%** 351	**22.51%** 122	**8.86%** 48	**2.03%** 11	**1.85%** 10	542	1.54
Drought	**7.10%** 38	**12.15%** 65	**25.42%** 136	**32.52%** 174	**22.80%** 122	535	3.52
Earthquake	**32.15%** 172	**38.88%** 208	**20.00%** 107	**5.98%** 32	**2.99%** 16	535	2.09
Epidemic/Pandemic (flu, avian flu, H1N1, West Nile, Ebola)	**28.01%** 149	**31.58%** 168	**25.38%** 135	**8.46%** 45	**6.58%** 35	532	2.34
Extreme Heat	**24.54%** 132	**27.14%** 146	**26.02%** 140	**15.99%** 86	**6.32%** 34	538	2.52

Flood	**38.14%** 201	**32.83%** 173	**18.98%** 100	**6.07%** 32	**3.98%** 21	527	2.05
Freeze	**52.31%** 272	**29.23%** 152	**12.50%** 65	**4.04%** 21	**1.92%** 10	520	1.74
Landslide & Other Earth Movements (non-seismic induced landslides and earth movements;subsidence;sinkholes;geologic hazard)	**60.30%** 319	**25.33%** 134	**8.70%** 46	**3.21%** 17	**2.46%** 13	529	1.62
Severe Weather (wind, lightning, winter storm, etc.)	**30.78%** 165	**35.45%** 190	**22.95%** 123	**7.65%** 41	**3.17%** 17	536	2.17
Wildfire	**50.37%** 270	**25.19%** 135	**14.18%** 76	**5.22%** 28	**5.04%** 27	536	1.89
Other Natural Hazard	**53.80%** 262	**25.05%** 122	**13.76%** 67	**3.08%** 15	**4.31%** 21	487	1.79

Q20 How concerned are you with the following manmade hazards in Roseville? (Check all that apply)

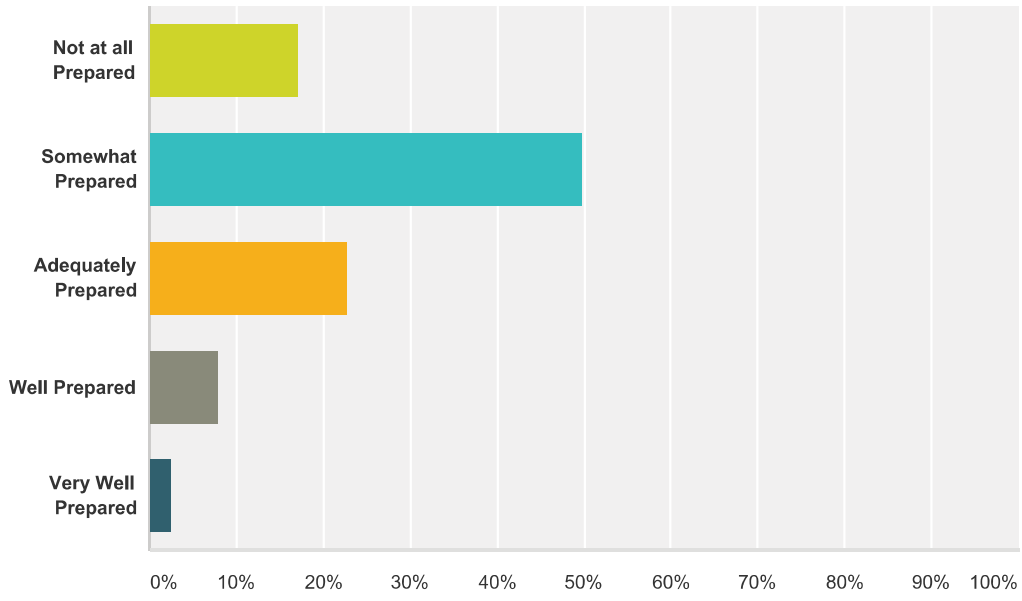
Answered: 562 Skipped: 109



	Not concerned	Somewhat concerned	Concerned	Very concerned	Extremely concerned	Total	Weighted Average
Energy Shortage	**28.30%** 150	**37.55%** 199	**22.83%** 121	**7.36%** 39	**3.96%** 21	530	2.21
Act of Terrorism	**16.76%** 90	**30.54%** 164	**26.63%** 143	**16.95%** 91	**9.12%** 49	537	2.71
Hazardous Materials Release	**15.92%** 85	**32.02%** 171	**26.97%** 144	**15.17%** 81	**9.93%** 53	534	2.71
Cyber Threats	**15.99%** 86	**29.93%** 161	**28.07%** 151	**17.47%** 94	**8.55%** 46	538	2.73
Other Human-Caused Hazard	**25.20%** 125	**29.84%** 148	**25.81%** 128	**11.49%** 57	**7.66%** 38	496	2.47

Q21 The FEMA website - Ready.gov - provides important information on how to prepare you and your family in the event of a disaster.How prepared is your household for a natural or human-caused hazard event? (Check one)

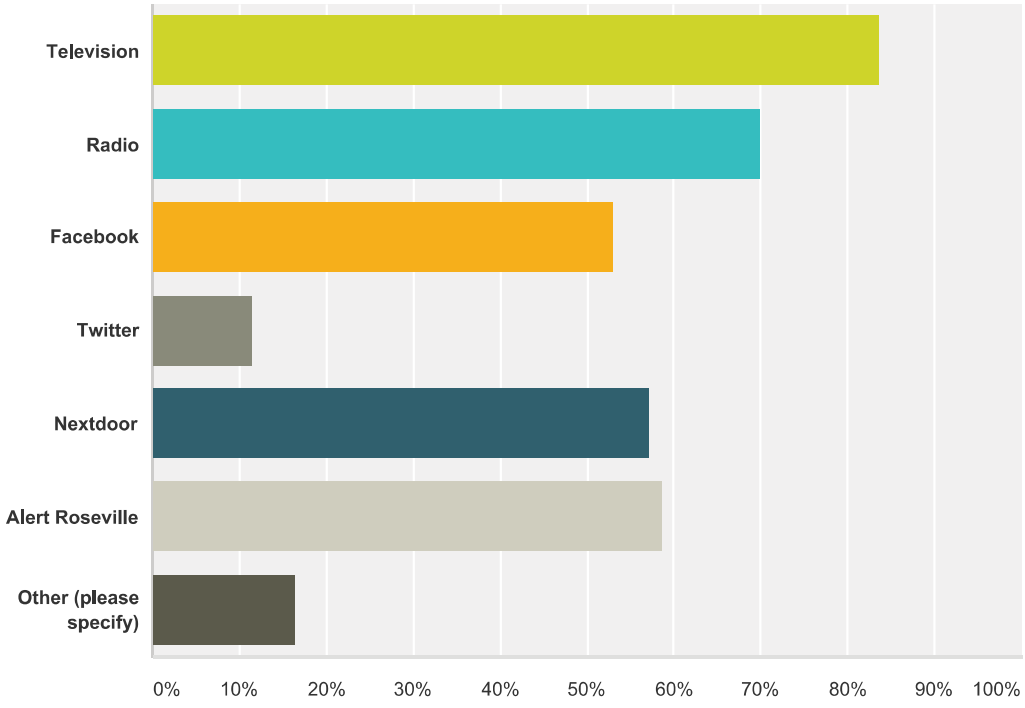
Answered: 562 Skipped: 109



Answer Choices	Responses	
Not at all Prepared	17.08%	96
Somewhat Prepared	49.82%	280
Adequately Prepared	22.78%	128
Well Prepared	7.83%	44
Very Well Prepared	2.49%	14
Total		562

Q22 How would you expect to be notified in case of an immediate threat caused by a natural or human-caused hazard.Select all that apply.

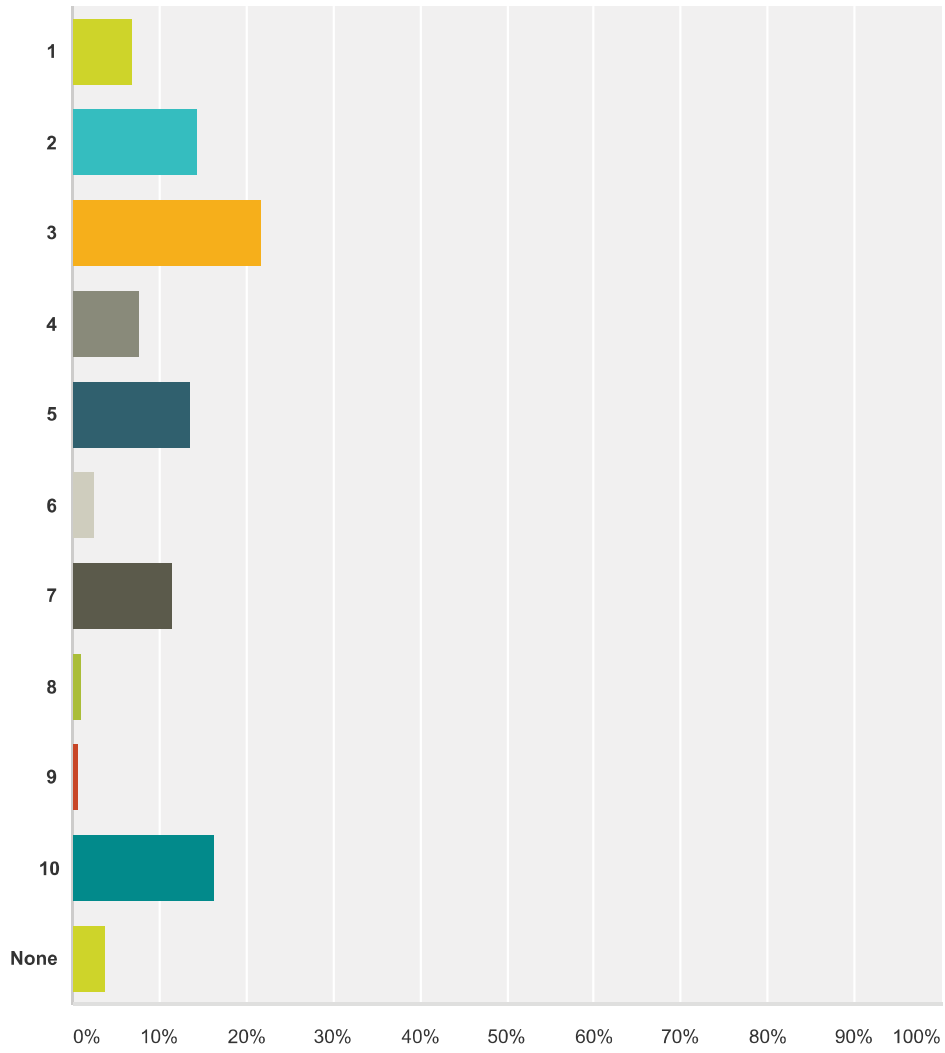
Answered: 562 Skipped: 109



Answer Choices	Responses	
Television	**83.81%**	471
Radio	**69.93%**	393
Facebook	**53.02%**	298
Twitter	**11.57%**	65
Nextdoor	**57.12%**	321
Alert Roseville	**58.72%**	330
Other (please specify)	**16.55%**	93
Total Respondents: 562		

Q23 FEMA suggests that households have at least 3 days of food, water, and vital supplies (e.g. medications) in hand in the event of a disaster. How many days of food, water, and vital supplies does your family have on hand in the event of a disaster?

Answered: 556 Skipped: 115

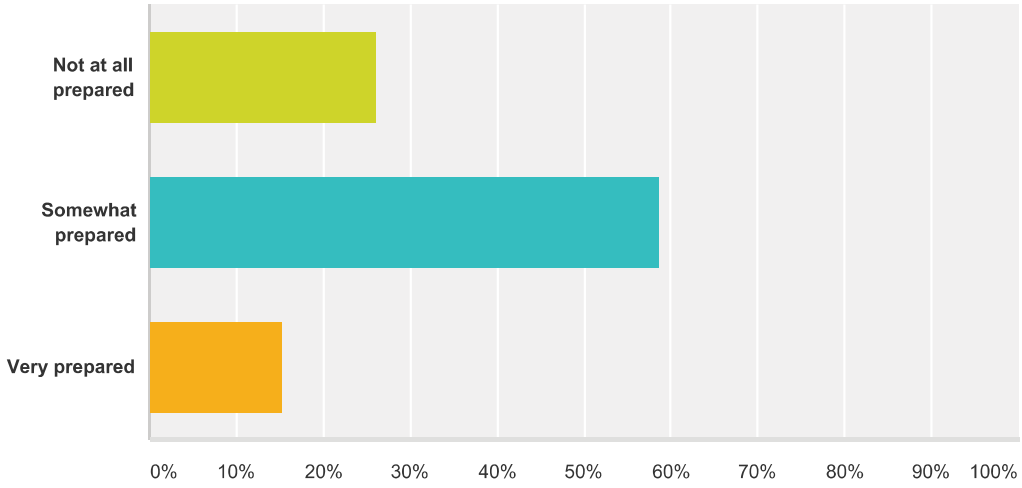


Answer Choices	Responses	
1	**6.83%**	38
2	**14.39%**	80
3	**21.76%**	121
4	**7.73%**	43
5	**13.67%**	76

6	**2.52%**	14
7	**11.51%**	64
8	**1.08%**	6
9	**0.54%**	3
10	**16.19%**	90
None	**3.78%**	21
Total		**556**

Q24 How prepared are you to get along without electricity or natural gas for one to five days?

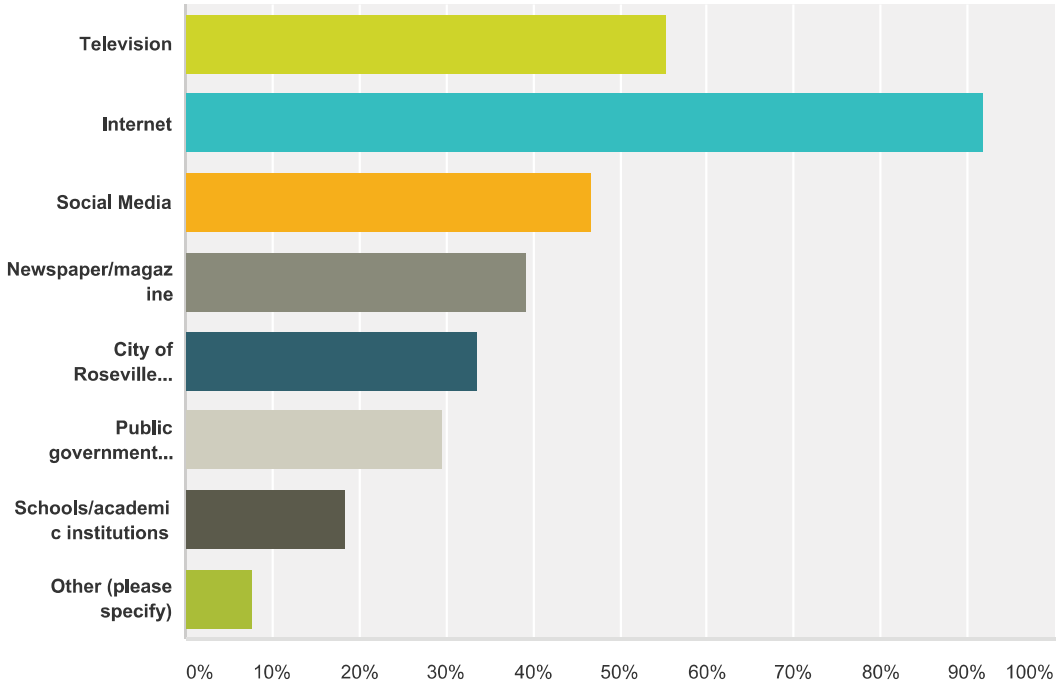
Answered: 558 Skipped: 113



Answer Choices	Responses	
Not at all prepared	**26.16%**	146
Somewhat prepared	**58.60%**	327
Very prepared	**15.23%**	85
Total		**558**

Q25 Where would you expect to find useful information to help you be prepared?Select all that apply.

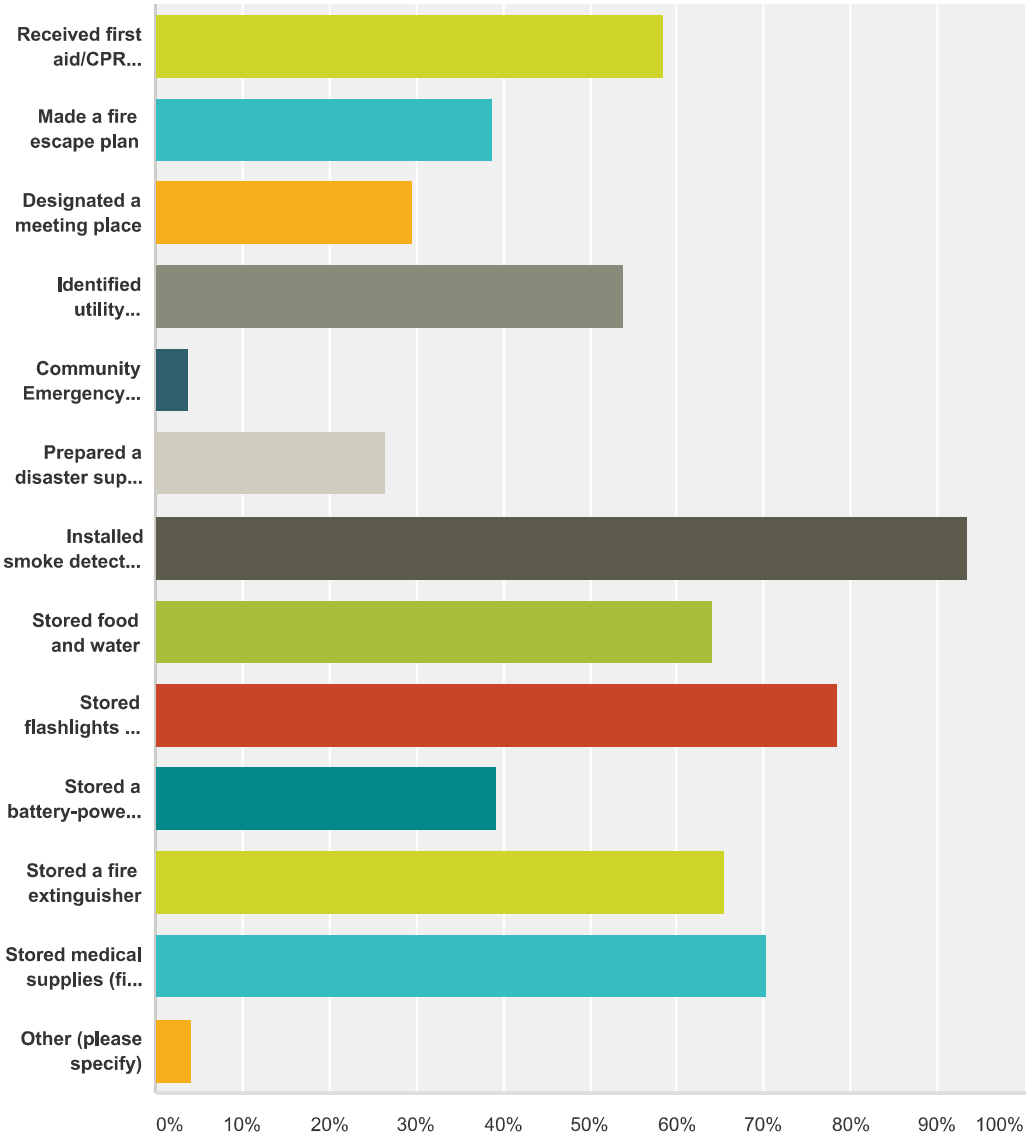
Answered: 560 Skipped: 111



Answer Choices	Responses	
Television	55.36%	310
Internet	91.79%	514
Social Media	46.79%	262
Newspaper/magazine	39.29%	220
City of Roseville Public Library	33.57%	188
Public government meetings	29.64%	166
Schools/academic institutions	18.39%	103
Other (please specify)	7.68%	43
Total Respondents: 560		

Q26 Which of the following steps has your household already undertaken to prepare for a natural or manmade disaster?Select all that apply.

Answered: 558 Skipped: 113



Answer Choices	Responses	
Received first aid/CPR training	**58.42%**	326
Made a fire escape plan	**38.89%**	217
Designated a meeting place	**29.57%**	165
Identified utility shutoffs	**53.94%**	301
Community Emergency Response Training (CERT)	**3.76%**	21

Prepared a disaster supply kit	**26.52%**	148
Installed smoke detectors on each level of the house	**93.55%**	522
Stored food and water	**64.16%**	358
Stored flashlights and batteries	**78.49%**	438
Stored a battery-powered radio	**39.25%**	219
Stored a fire extinguisher	**65.59%**	366
Stored medical supplies (first aid kit, medications)	**70.25%**	392
Other (please specify)	**4.12%**	23
Total Respondents: 558		

Q27 Please provide any additional comments you would like to share with the City of Roseville Planning Team.

Answered: 65 Skipped: 606

Q28 If you would like to receive information regarding upcoming public events and other participatory opportunities regarding hazard mitigation, please provide your email address below.

Answered: 223 Skipped: 448

From: City of Roseville <Roseville@public.govdelivery.com>
Sent: Tuesday, March 1, 2016 8:59 AM
To:
Subject: City of Roseville News - March 1, 2016





Downtown Roseville update

It will be a busy couple years for city building projects in Downtown Roseville. All of the projects are part of the Downtown Specific Plan designed through a community visioning process in 2009. The highly popular Vernon Street Town Square and roundabout at Washington Boulevard and Oak Street are examples of projects already completed in accordance with the plan.

Current projects include an office building at 316 Vernon Street, the Oak Street Parking facility, a new downtown Fire Station, three pedestrian bridges and bike trail connections through downtown.

Find out more



Leaks can run, but they can't hide! Every day during Fix a Leak Week, visit the Roseville Utility Exploration Center to learn where water-wasting leaks hide around home, and learn how to fix them. Use a dye tablet to find toilet leaks, get your hands on a variety of sprinklers, and enter for a chance to win a smart timer or other water-saving technology. Best of all, it is free.

For more information call 916-746-1550 or visit the Fix A Leak Week page.



Roseville explores creating waste into energy

Work is underway right now to develop a project that would one day help power one of the city's wastewater treatment plants or provide fleet vehicle fuel using Compressed Natural Gas (CNG). This project is in its infancy and more work is needed to see this effort become a reality. But we're hard at work behind the scenes to bring this project online within the next three to five years.

For more information



Download them now at roseville.ca.us/guide



Affordable Housing Information & Workshop

The City of Roseville Affordable Housing Program is offering down payment assistance for qualified households to purchase affordable homes at a new Lennar community in West Roseville.

The City and Lennar will host an affordable housing workshop to provide more information about the program, **5:30 p.m., Wednesday, March 9** in the Roseville City Council Chambers, 311 Vernon Street in Roseville.

Find out more.



Do you know your risk...

. . .when it comes to flood, earthquake or any natural or man made disaster here in Roseville? Do you and your family have a three day supply ...of food and water should a disaster occur?

While a range of natural and man-made disasters can affect any community, the City of Roseville is always taking steps to reduce the risk to residents and businesses. We need your input to remain prepared and ensure our community can recover as quickly as possible, should a disaster occur. Please help us by taking a few minutes to complete this community survey

---



Apply for up to $200 toward a new commuter bike

Apply for an opportunity to receive up to $200 toward a new commuter bike. Bucks for Bikes helps commuters start using an active, clean, traffic-relieving mode of travel—bicycling! **Submit your application by 5 p.m., Monday, March 21.** This is made possible by the City of Roseville and Placer County Transportation Planning Agency.

Find out more.



Superhero Storytime

We are all super heroes! Visit the Martha Riley Library on the 4th Tuesday of the month through May and we'll explore the everyday superheroes of our city. From 1-1:30 p.m., Miss Lisa will guide us through stories, songs, and activities to discover the super hero in you. Then, come explore the Utility Exploration Center from 1:30 - 2 p.m. to discover play time with special activities to help practice your superhero skills. These fun events are free.

For more information call 916-746-1550.



UPCOMING CITY MEETINGS

Meeting agendas and minutes

City Council Meeting - 7 p.m., Wednesday, March 2

Planning Commission Meeting - 7 p.m., Thursday, March 10

Parks and Recreation Commission Meeting - 7 p.m., Monday, March 7

Transportation Commission Meeting - 7 p.m., Tuesday, March 15

Public Utilities Commission Meeting - 7 p.m., Tuesday, March 22

Multi-Hazard Mitigation Plan Steering Committee Meeting - 5:30 p.m., Tuesday, March 1, Civic Center Meeting Rooms 1 & 2

Unless otherwise noted, Council and Commission meetings are held in the Roseville City Council Chambers at 311 Vernon Street. Meetings held in the City Council Chambers can be viewed live online or later on demand.

AlertRoseville

If we can't reach you, we can't alert you. Sign up now.

311 Vernon Street, Roseville, CA 95678

(916) 774-5200 | www.roseville.ca.us

Unsubscribe/Update profile

This email was sent to hdyda@roseville.ca.us using GovDelivery, on behalf of: City of Roseville · 311 Vernon St. Roseville · CA 95678

powered by govDELIVERY

From: City of Roseville <Roseville@public.govdelivery.com>
Sent: Tuesday, August 2, 2016 8:33 AM
To:
Subject: City of Roseville News - August 2, 2016





Roseville named 11th healthiest city in U.S.

Roseville is the 11th healthiest city in the United States, according to Niche.com.

The ranking provides a comprehensive assessment of the general levels of health among residents in Roseville.

This grade takes into account key indicators of personal health, such as smoking, excessive alcoholic consumption, rates of obesity, as well as the availability and proximity of fitness facilities, doctors, and mental health practitioners, in an attempt to measure an area's performance in health and fitness.

You can read more about the rankings here.



Roseville among 25 safest cities in the country

Roseville has been ranked among the 25 safest cities in the US! Niche.com ranked U.S. cities over 100,000 population for safety, based on FBI crime statistics.

Roseville Police Chief Daniel Hahn said, “It takes more a good police department to create a safe city. It also takes city leaders who put public safety first; and a community that won’t settle for anything less, and is willing to get involved to make it happen. We’re very blessed in Roseville to have all three.”

See the rankings here.



Roseville recognized as national flood protection leader

FEMA has again been recognized Roseville as the national leader in flood preparation. Roseville is the only city in the country to hold FEMA's top flood control rating. Roseville's top rating means flood insurance discounts of up to 45% for residents and businesses.

Find out more



National Night Out is tonight

National Night Out is considered America's night out against crime.

We encourage you to lock your home and connect with your neighbors at one of the 40 National Night Out community events in Roseville.

Not sure if your neighborhood is hosting an NNO party? Visit the Roseville Coalition of Neighborhood Associations website at www.RCONA.org to contact your neighborhood association.

Find out more



Talk trash with Curby

You know where trash comes from, but where does it go? Join the Utility Exploration Center **Saturday, August 27** for free family fun at Curby's Waste-a-Palooza!

Fight the unflushables in the Sewer Swim, defend against Trashville and talk trash with Curby to test your knowledge in our quiz show. Challenge yourself in the game room where you can reuse, rethink, recycle and help knock out excess waste.

Grab a water repair LEGO® City set for just $10 (while supplies last) in the activity room for a fun build-it activity!

Find out more

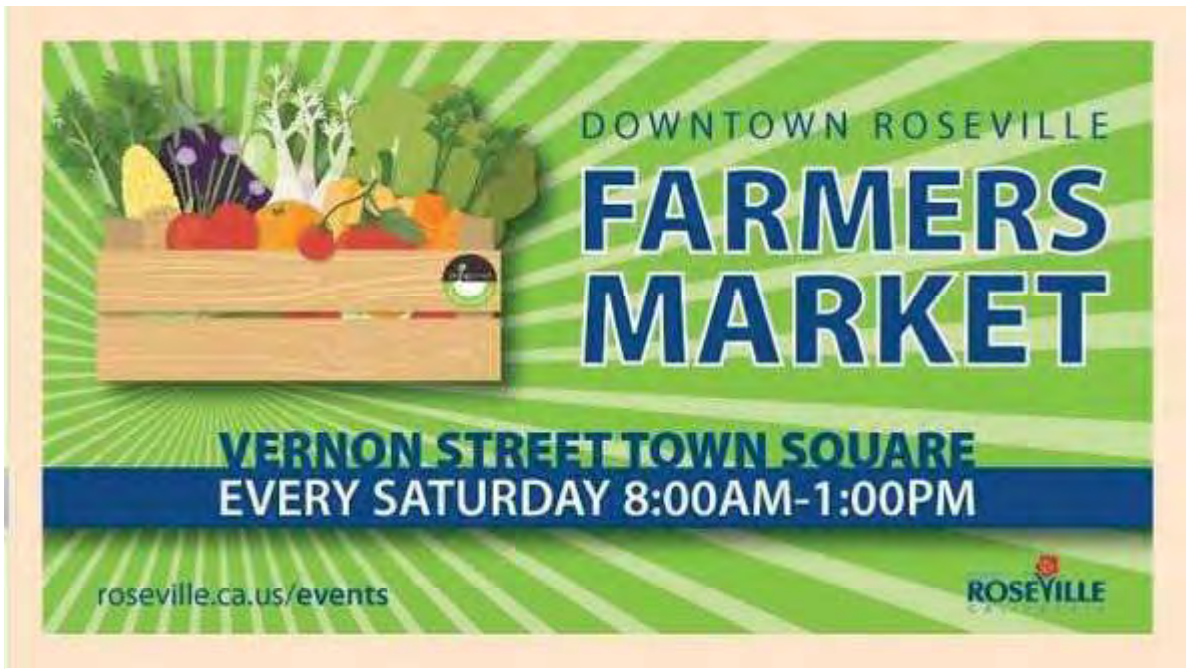


Tired of the traffic backups?

Traffic is one of the topics we hear most about from you. There is a plan to raise about $1.6 billion to fund highway projects, public transit expansion, local street maintenance and improvements including Highway 65 widening and the Highway 65 / I-80 interchange.

With other funding being more difficult to obtain, a ballot measure to increase retail sales tax by a half percent to raise funds for transportation improvements in Placer County was placed on the November 8, 2016, presidential general election ballot by the Placer County Board of Supervisors.

Find out more



Street resurfacing ahead for parts of Roseville

Resurfacing is scheduled **to begin late summer/fall** for residential streets in the Foothills/Junction and West Park neighborhoods.



Some more heavily traveled roads in Roseville will also be resurfaced this summer. The specific roads and schedule can be found here.

Regular roadway maintenance reduces the need for major costly street repairs in the future by protecting Roseville streets.

Check out this short video to learn more about how we prioritize road maintenance.



Tri County Job Fair to be held August 18

The Tri County Job Fair provides an excellent opportunity for job seekers to meet with businesses within the region and demonstrate their qualifications. This year's event will be held from **9 a.m. - noon, Thursday, August 18 at William Jessup University.**

For more information and to register

Learn about planned changes to 916 area code

The 916 area code we use in Roseville is expected to use up its available prefixes by December 2018. The California Public Utilities Commission (CPUC) will be holding a public meeting to discuss proposed changes and to get public feedback on their plan at **1 p.m., Tuesday, August 16** in the Roseville Civic Center's Meeting Rooms 1 & 2.

The CPUC is proposing adding an additional area code to the region. The proposal would allow current customers to keep their area code. Beginning in June 2018, customers requesting new phone numbers may be assigned a new area code.

Find out more

Comment on city's Draft Multi-Hazard Mitigation Plan

You are invited to review and provide comments on the 2016 City of Roseville Multi-Hazard Mitigation Plan.

This plan details the risks of both natural and manmade hazards in Roseville and includes programs and projects to help reduce the exposure of city residents and businesses should an event occur. By having a plan in place, Roseville is eligible for federal pre-disaster and post-disaster assistance.

Input on the plan can be submitted through Friday, August 19, 2016.

View the plan and find out more



UPCOMING CITY MEETINGS

Meeting agendas and minutes

City Council Meeting - 7 p.m., Wednesday, August 3

Planning Commission Meeting - 7 p.m., Thursday, August 11

Parks and Recreation Commission Meeting - September meeting canceled

Transportation Commission Meeting - August meeting canceled

Public Utilities Commission Meeting - 7 p.m., Tuesday, August 23

Unless otherwise noted, Council and Commission meetings are held in the Roseville City Council Chambers at 311 Vernon Street. Meetings held in the City Council Chambers can be viewed live online or later on demand.

AlertRoseville

If we can't reach you, we can't alert you. Sign up now.

311 Vernon Street, Roseville, CA 95678

(916) 774-5200 | www.roseville.ca.us

Unsubscribe/Update profile

This email was sent to hdyda@roseville.ca.us using GovDelivery, on behalf of: City of Roseville · 311 Vernon St. Roseville · CA 95678

powered by govDELIVERY

From: City of Roseville <Roseville@public.govdelivery.com>
Sent: Tuesday, August 16, 2016 9:18 AM
To:
Subject: City of Roseville News - August 16, 2016





Be safe heading back to school

All Roseville-area high school and elementary schools will be back in session this week. That means traffic around those schools will be congested.

Read on for a refresher course on back-to-school safety.

Walking or biking to school is a great idea. To combat the common fear that walking to school isn't safe, City of Roseville traffic engineers and the Safe Routes to School Coordinators have designated safe routes for students of all ages and abilities.

Learn about our Safe Routes to School program



Unemployment rate drops to 3.8 percent in Roseville



The unemployment rate in Roseville is in the lowest 4 percent in the state, 20th of 482 cities in California.

“The leading job sector is healthcare, and healthcare-related businesses,” said Roseville Economic Development Director Chris Robles.

“We have Kaiser, the largest employer in the city, and then Sutter is also one of our top employers. Then we have Adventist Health, which is also a significant employer in the city. Their west coast headquarters are here in Roseville.”

"A part of Roseville’s economic growth is correlated with education levels; namely a more educated work force. The local population over age 25 with a bachelor’s degree or higher was over 39 percent as of 2014 – a growth margin of 5 percent since 2010, correlating with the increase in educated workforce members and growing employment figures."

Read more in this article from the Roseville Press Tribune.





Talking traffic

Traffic is one of the topics we hear most about from you. There is a plan to raise about $1.6 billion to fund highway projects, public transit expansion, local street maintenance and improvements including Highway 65 widening and the Highway 65 / I-80 interchange.

With other funding being more difficult to obtain, a ballot measure to increase retail sales tax by a half percent to raise funds for transportation improvements in Placer County was placed on the November 8, 2016, presidential general election ballot by the Placer County Board of Supervisors.

Find out more



Woodcreek Oaks widening project workshop

We invite you to a community workshop to learn more about the Woodcreek Oaks Widening Project. The project team will be available to answer questions in an informal format.

Exhibits showing the project features and anticipated schedule will be on display.

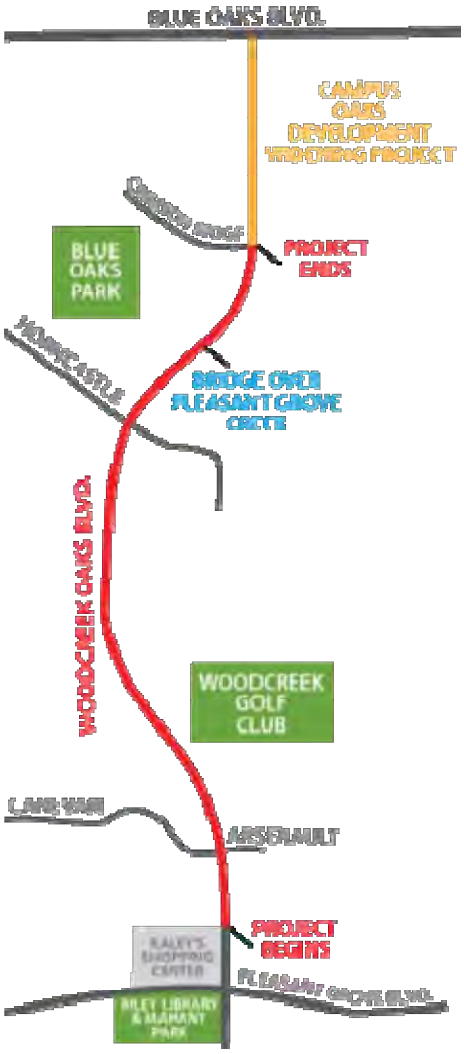
Wednesday, August 24
5 - 7 p.m.
Martha Riley Library, Reading Room 3
1501 Pleasant Grove Blvd

The proposed project will widen the segment of Woodcreek Oaks Boulevard, from Crimson Ridge way south to 600 feet north of Pleasant Grove Boulevard, into the median to a four lane road.

This project also proposes to widen the bridge over the south branch of Pleasant Grove Creek to accommodate the additional roadway.

The new Campus Oaks development will widen Woodcreek Oaks Boulevard from Blue Oaks Blvd south to Crimson Ridge Way, and is expected to be constructed by the end of 2016.

Find out more





Trail resurfacing this week

Portions of Roseville trails system will be resurfaced this week. Notices of the upcoming closures will be posted at the trail entrances. While the resurfacing is underway, barricades will mark where the trails are closed. After the resurfacing is complete and the trail has reopened to the public, striping and sweeping will be performed.

Find out more

Street resurfacing ahead for parts of Roseville

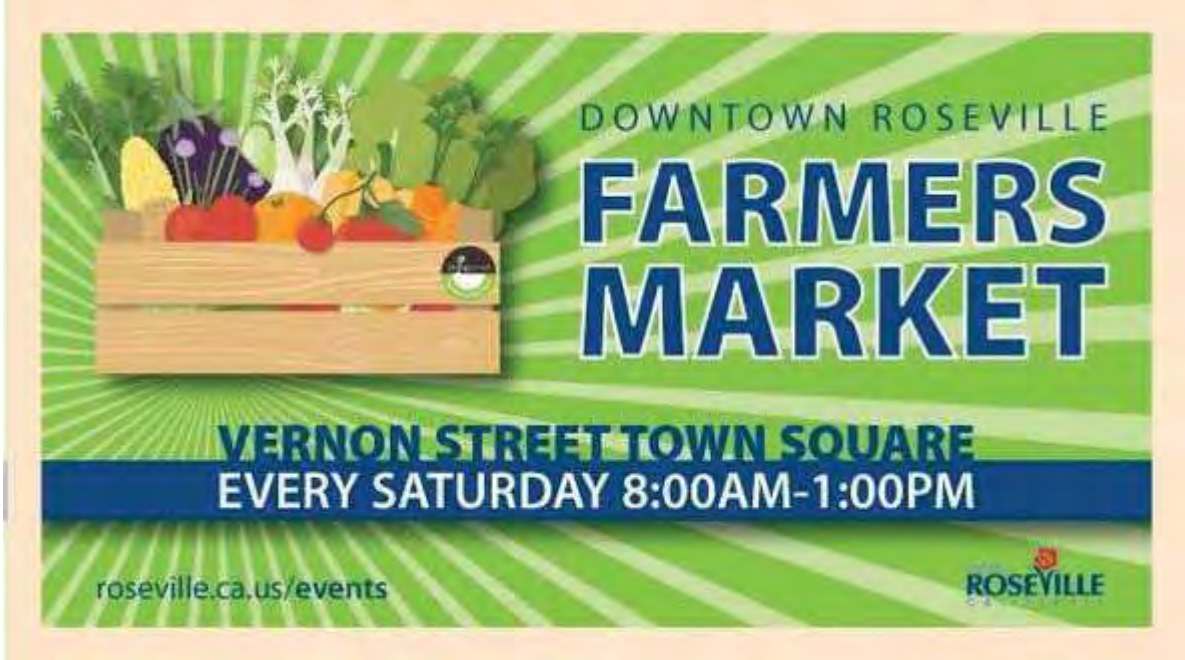


Resurfacing is scheduled **to begin late summer/fall** for residential streets in the Foothills/Junction and West Park neighborhoods.

Some more heavily traveled roads in Roseville will also be resurfaced this summer. The specific roads and schedule can be found here.

Regular roadway maintenance reduces the need for major costly street repairs in the future by protecting Roseville streets.

Check out this short video to learn more about how we prioritize road maintenance.





Tri County Job Fair to be held August 18

The Tri County Job Fair provides an excellent opportunity for job seekers to meet with businesses within the region and demonstrate their qualifications. This year's event will be held from **9 a.m. - noon, Thursday, August 18 at William Jessup University.**

For more information and to register



Comment on city's Draft Multi-Hazard Mitigation Plan

You are invited to review and provide comments on the 2016 City of Roseville Multi-Hazard Mitigation Plan.

This plan details the risks of both natural and manmade hazards in Roseville and includes programs and projects to help reduce the exposure of city residents and businesses should an event occur. By having a plan in place, Roseville is eligible for federal pre-disaster and post-disaster assistance.

Input on the plan can be submitted through Friday, August 19, 2016.

View the plan and find out more



UPCOMING CITY MEETINGS

Meeting agendas and minutes

City Council Meeting - 7 p.m., Wednesday, August 17

Planning Commission Meeting - 7 p.m., Thursday, August 25

Parks and Recreation Commission Meeting - September meeting canceled

Transportation Commission Meeting - August meeting canceled

Public Utilities Commission Meeting - 7 p.m., Tuesday, August 23

Senior Commission Workshop - 11 a.m., Tuesday, August 23 at Maidu Community Center

Unless otherwise noted, Council and Commission meetings are held in the Roseville City Council Chambers at 311 Vernon Street. Meetings held in the City Council Chambers can be viewed live online or later on demand.

AlertRoseville

If we can't reach you, we can't alert you. Sign up now.

311 Vernon Street, Roseville, CA 95678

(916) 774-5200 | www.roseville.ca.us

Unsubscribe/Update profile

This email was sent to hdyda@roseville.ca.us using GovDelivery, on behalf of: City of Roseville · 311 Vernon St. Roseville · CA 95678

powered by govDELIVERY get the word out.

Appendix B. 2015 Progress Report

Roseville Multi-Hazard Mitigation Plan
2015 PROGRESS REPORT

Reporting Period

August 2014 through July 2015

Background

Following a tradition of progressive and innovative planning, the City of Roseville City Council approved an update to the Roseville Multi-Hazard Mitigation Plan (RMHMP) on January 3, 2011. The RMHMP details the City's vision for reducing risk from all hazards, identifying resources, information, and strategies for risk reduction. In accordance with requirements of the Disaster Mitigation Act of 2000, the City completed a 10-month process to update its 2005 RMHMP in a way that provided as many tangible benefits for the City as possible from a single planning effort. These benefits are associated with grant funding eligibility and maintaining the nation's only Class 1 rating under FEMA's Community Rating System (CRS). The plan was approved by FEMA Region IX for compliance with Section 201.6, Chapter 44 of the Code of Federal Regulations on March 28, 2011. By completing this process, the City complied with the Disaster Mitigation Act and maintained eligibility for hazard mitigation grant funding opportunities afforded under the Robert T. Stafford Act. The plan is available to the public through the City of Roseville Public Library online at the following website:

https://www.roseville.ca.us/fire/preparedness/hazard_mitigation_plan.asp

Benefits of Mitigation Planning

Maintenance of this plan enables the City of Roseville to pursue hazard mitigation grant funding administered by FEMA under the Robert T Stafford Act. A FEMA-approved Hazard Mitigation Plan is a principal prerequisite for this funding. Roseville has leveraged funding from this program in the past to significantly reduce the City's risk associated with natural hazards.

Summary Overview of the Plan's Progress

The performance period for the Hazard Mitigation Plan began on March 28, 2011, with FEMA's final approval. The initial performance period for this plan is 5 years, with an update anticipated before March 2016. As of the most recent reporting period, the performance period is 82 percent complete. The Hazard Mitigation Plan identified 63 hazard mitigation initiatives to be pursued during the 5-year performance period. As of the most recent reporting period, the following progress can be reported:

- 51 out of 63 initiatives (81%) reported ongoing action toward completion.
- 10 out of 63 initiatives (16%) reported no action taken.
- 1 out of 63 initiatives (2%) was completed.
- 1 initiative was removed due to elimination of a program.

Purpose

The purpose of this report is to provide the Roseville City Council, stakeholders and citizens an annual update on implementation of the action plan identified in the RMHMP. The objective of the annual evaluation is to ensure a continuous planning process that keeps the RMHMP dynamic and responsive to the needs of the stakeholders. This report was prepared by the planning team. It was reviewed and confirmed by the RMHMP Steering Committee, in accordance with Section 7.4 of the Plan, at the Steering Committee's annual meeting on November 3, 2015. This report discusses the following:

- Natural hazard events that have occurred within the last year
- Changes in risk exposure within the planning area
- Mitigation success stories
- Review of the action plan
- Changes in capability in the planning area that could impact plan implementation
- Recommendations for changes/enhancement

The RMHMP Steering Committee

The update to the RMHMP was overseen by a steering committee appointed by the Roseville City Council and made up of stakeholders in the planning area. During the plan's development, the Steering Committee agreed that it would remain as a body to oversee the maintenance of the plan as established in Chapter 7. The Steering Committee continues to exist and function as organized in its established ground rules. At a minimum, it provides technical review and oversight on development of the annual progress report. It is anticipated the Steering Committee's role in overall plan implementation will evolve, based on the hazard mitigation needs of the city. Annual turnover in its membership is monitored via the progress report. For this reporting period, the Steering Committee membership is as indicated in Table 1.

TABLE 1
2015 STEERING COMMITTEE MEMBERS

Name	Title	Jurisdiction or Agency
Rob Jensen	Acting City Manager	City Manager's Office
Jason Rizzi	Emergency Preparedness Manager	Fire Department
Wayne Wiley	Associate Planner	Development Services Dept.
Carl Walker	Senior Engineer/Floodplain Manager	Public Works Dept.
Helen Dyda	Public Information Specialist	Communications Dept.
Grace Keller	Resident	Community Emergency Response Team
Erik Angle	Emergency Preparedness Program	Sutter Roseville Medical Center
Brenette Macintosh	Safety Officer	Consolidated Communications
Mark Lacher	Risk Manager	Consolidated Communications
Mark Smith	Resident	RCONA Treasurer
Rod Rodriguez	Senior Emergency Services Specialist	Placer County OES
Rick Stalker	Stalker & Burnett RE Group	Placer County Association of Realtors
Michael Algots	Manager - Hazardous Materials	Union Pacific Railroad

Natural Hazard Events in the Planning Area

During the reporting period, the following hazard events affected the planning area:

- Due to the continuation of drought conditions, in May 2015, the City of Roseville announced further water-use restrictions for Roseville water customers. The restrictions were placed in response to Governor Brown's Executive Order and the State Water Resources Control Board's drought emergency action requiring a 25 percent statewide water-use reduction goal. In order to meet the State's goal, City of Roseville water customers were required to reduce water consumption by 28 percent over their use in 2013. For residential customers, the most noticeable change includes watering day restrictions for outdoor irrigation. Watering days for residential turf will be limited to two days per week, Monday and Friday only, before 10 a.m. and after 8 p.m. Commercial customers will have watering days limited to Monday and Thursday.

  In addition to restricted watering days, Roseville also incorporated additional water-use reduction strategies to achieve more water savings:

  – Water waste is prohibited.

  – Washing hardscape is prohibited, unless for health and safety concerns.

  – New or expanded landscape is limited to drought tolerant trees, shrubs and ground-cover irrigated on a drip irrigation system.

  – Fountains, ponds and decorative pools must be drained (unless ponds contain fish.)

  – Covers are required for all new pools and spas.

  – Low volume drip irrigation systems that irrigate at less than two gallons per hour are exempt from day of week watering restrictions.

- December 10-12, 2014: Over a three-day period, from December 10th to December 12, 2014, The National Weather Service forecasted a major winter storm to impact Northern California. All reasonable data from the National Weather Service estimated that the City of Roseville would receive 3.6 inches of rain from the storm event. Additionally, severe winds were forecasted to be a major factor in the event. In preparation of the storm event, the City of Roseville Fire Department chose to activate a Limited Emergency Operations Center (LEOC) at the Fire Department Administrative Headquarters, located at 401 Oak Street. The LEOC was staffed for a 36-hour period. The Placer County Office of Emergency Services was also activated during the storm event.

Changes in Risk Exposure in the Planning Area

The RMHMP update addressed the probable impact of the following natural hazard events in the City of Roseville:

- Dam failure
- Drought
- Earthquake
- Flood
- Landslides
- Human-caused hazards
- Human health hazards
- Severe weather
- Wildland fire

There was an F-0 tornado occurrence during the reporting period. Damage associated with the event was minimal. The occurrence of this event should be acknowledged in future updates to the risk assessment for

this plan. There were no other events during the reporting period that would alter or change the probability of occurrence or ranking of risk for the natural hazards addressed by the RMHMP.

Mitigation Success Stories

During the current reporting period, the City had a number of mitigation success stories that reflect the City's commitment to multi-hazard mitigation and the philosophy that the City Council and staff are responsible for the good stewardship of City resources.

Deployment of Everbridge Notification System and Alert Roseville

Using a Homeland Security grant, the City, along with Placer, Sacramento, and Yolo counties, implemented the Everbridge Mass Notification system. This is a robust and popular system that is used globally. The system will be used for both emergency and non-emergency notification of the public. In preparation for the deployment, over 100 city staff members from 13 city departments were trained in its use. Special courses were designed for public safety officials, including dispatchers, fire department chief officers, and police managers.

"Alert Roseville" (aka "Opt-In") went live in August 2014. This internet site was established to help members of the public register their contact information into the Everbridge system. A significant media and outreach program was developed to advertise the importance of getting this information from the public. The "Opt-In" portal will be explained at every public education event the Fire Department attends. Currently approximately 2,050 public members are signed up in the "Opt-In" portion of Everbridge. A significant increase is anticipated with the aggressive outreach program. To make this system really effective, the City will actively pursue getting those residents with primary cell phone service signed up to the Everbridge system. This is a high priority for the City.

Emergency Operation Center Drills, Incident Activations, and Training

Establishment of the Emergency Management Team

In October 2014, the City of Roseville established the Emergency Management Team, which is a standing committee, whose mission is to plan and prioritize emergency preparedness activities, training, and facilities of the City's Emergency Management Organization. The Emergency Management is comprised of at least one member of each City department and meets monthly to:

- Develop the organizational framework for implementation of the California Standardized Emergency Management System (SEMS) and the National Incident Management System (NIMS) within the City of Roseville.
- Ensure that each City department has the resources and training to function effectively in the roles outlined in the City's Emergency Operations Plan (EOP).
- Plan and develop a minimum of two Emergency Operations Center (EOC) exercises annually.
- Develop and maintain EOC facilities that provide an effective location to conduct EOC operations.
- Develop and maintain technology resources within the EOC necessary to gather and disseminate information effectively.

Preseason Flood Coordination

On October 30, 2014, City Floodplain Management staff presented the 2014-15 Preseason Flood Coordination and Severe Weather Plan Update to the City's Emergency Management Team. The update

included information on the 2014-15 winter weather outlook from the Climate Prediction Center and an overview of the changes to the City's Flood Warning & Response Plan. The most significant change to the Flood Warning & Response Plan was the addition of a Floodwall & Levee Failure component to the Plan.

EOC Activation—Levee Failure Exercise

On May 11, 2015, City Emergency Management staff conducted a four-hour EOC activation drill. This exercise was a full activation of the Emergency Management Organization, including Department Operations Centers (DOC). The exercise centered on a levee failure scenario, which included the flooding of an assisted living facility. This exercise emphasized the need for multiple Incident Actions Plans from various City departments.

Roseville Galleria Exercise

On May 27, 2015 the Roseville and Rocklin Regional SWAT Team, Roseville Rapid Containment Team, Explosive Ordnance Disposal Team, Placer County Special Enforcement Team, FBI and Roseville Fire Department's Tactical Medics, conducted a full scale training exercise at the Roseville Galleria. This was the third straight year Roseville's Public Safety teams and the Galleria have come together for critical incident planning and response training. This year's exercise was designed to address responses to improvised explosive devices by Public Safety and Galleria personnel.

The drill required unified command for organizing and deploying resources, coordinated response to multiple threats, and the ability to establish inter-operable communications across the agencies. Each FBI Field Office across the country was required to conduct a similar drill in coordination with local resources and our city was selected by FBI-Sacramento to be the lead partner agency out of all of the cities in the Sacramento FBI Field Office which covers most of the Central Valley from Fresno up to Oregon. Our drill was the first drill conducted in the country under this training requirement and was monitored from FBI HQ in Washington DC.

MCI 2015—Countywide First Responder Exercise

On June 17, 2015 the Roseville Police and Fire Department, Rocklin Fire, South Placer Fire, American Medical Response, the National Guard, the Officer of Emergency Services and the Sutter Roseville Medical Center all participated in a regional planning and training exercise at Sutter Roseville. The exercise was centered on a mock helicopter crash. Public Safety's planning and training objectives included the development of a unified command structure as identified by the Incident Command Structure as well as planning and response to security needs on the hospital's grounds.

Terrorism Threat Assessments

On May 7, 2014 Roseville Police Department staff performed a threat assessment of Roseville Electric's Power Plant, consisting of a "real-world "vulnerability and site security test at that location with unsuspecting employees Electric personnel.

A similar terrorism threat assessment was conducted in October 2014 at the Civic Center as well as Roseville Fire Station #1. Locations for the threat assessment were expanded to include Fire Stations #2, #5, and #9. Roseville Police Department plans to conduct future assessments for Fire Stations #3 and #4 in July and August of 2015.

Community Preparedness Education

In support of Homeland Security Presidential Directive/HSPD-8, the Sutter-Roseville Medical Center (SRMC) Emergency Preparedness Program rolled out the "Emergency Preparedness and You" community education program. This program focused on how individuals can be safe and prepared when disasters

strike. A version of this program was also rolled-out to healthcare staff, to provide staff readiness and add resiliency. To date, the SRMC Emergency Preparedness Program has provided training for over two hundred students.

Reorganization of the Emergency Operations Center

The City's Emergency Preparedness Manager, working closely with the Central Services and Information Technology—GIS staff, have revised the layout of the City's Emergency Operations Center, and have included new technology to assist with the presentation and dissemination of geographic information during an EOC activation. Computers with access to GIS data and overhead projector displays have replaced the use of ineffective Plexiglas-topped tables and grease pens to supplement Planning Section briefings within the EOC. The new technology also allows for better communication between the EOC and the City's Department Operation Centers, located throughout the City.

Department of Water Resources—Flood Fight Methods Training

On March 18, 2015 State of California Department of Water Resources staff provided a one-day Flood Fight Methods training exercise for the City's Public Works—Street Maintenance and Park Maintenance—Open Space Division staff. The Flood Fight Methods training is designed to assist public agencies with the implementation of corrective temporary methods utilized while combatting flood-related problems. The training consisted of four hours of classroom presentation and an afternoon of instruction on the techniques used to construct various sandbag structures and erosion protection methods.

Sutter Roseville Medical Center (SRMC)

Sutter Roseville Medical Center (SRMC) prides itself in the quality it provides in the realm of patient care and excelling above national standards and best practice. The **SRMC Emergency Preparedness Program** is no different. Disasters strike daily all over the globe. California is no exception. For the benefit of the staff, patients, visitors and the community and with the strong support of our leadership and the Emergency Preparedness Committee, SRMC continues on the ongoing journey of Emergency Preparedness and quality best practices. In the past year, SRMC has demonstrated the following in **Mitigation Success Stories** in Emergency Preparedness:

- **Master Exercise Practitioner (MEP) Certification:** The SRMC EP Coordinator completed the national level certification from FEMA/DHS as that of **Master Exercise Practitioner (MEP)**. With this this certifies that the coordinator has obtained and demonstrated competency in high level of disaster exercise design, from Table Top; functional and Full Scale Disaster Exercise. Due to the difficulty in being accepted into this program and the challenge of the program, as of now there are only 2,300 individuals certified with MEP in the country.
- **National Level Instructor Certification:** The SRMC EP Coordinator completed the national level certification from FEMA/DHS as that of a national level **Certified Instructor**. The course is conducted in two phases: fundamental principles and applied principle. During the fundamental principles phase participants receive an overview of adult learning, task analysis, risk and hazard analysis, learning objectives and lesson plans, communication skills, instructional delivery and multimedia, testing and evaluations, and after action reviews. Then, during the applied principles phase, participants put these lessons into practice through a series of practice training sessions. With this this certifies that the coordinator has obtained and demonstrated competency and the ability to interact and instruct adult learners.
- **Disaster Education:** Sutter Roseville Medical Center (SRMC) EP Program prides itself on education. Our education program for 2015 is holding 45 courses on Emergency Preparedness and has also worked with TEEX and FEMA for bringing their courses and staff here to teach as well. The EP Program coordinator had the honor of teaching a lecture at the FEMA National Training

Center in February of 2014 and March 2015 teaching lectures at the Emergency Nurse's Association (ENA) and Association of Critical Care Nurses (AACN) conference in April 2014 and July 2015. Annually in December, SRMC hosts the EMS-a-Palooza educational event at the facility. Speakers from all aspects of emergency care, from Trauma, Burns and Pediatrics, provide presentations to not only Sutter Health staff but all of our hospitals throughout the region and our EMS community partners. The Emergency Preparedness Program Coordinator for Sutter Roseville Medical Center which provided an in-depth lecture on lecture on **Active Shooter Response for EMS and Healthcare.**

- **Disaster Exercises:** Sutter Roseville Medical Center (SRMC) held 20 Disaster exercises in the past year. These exercises are based on the identified Risks from our annual Hazard Vulnerability Assessment (HVA). Some exercises worthy of note due to their exceptional Interagency Cooperation and Participation were:
  - **2014 Ebola Response Exercise:** This tested the facility's ability to manage victims infected by the Ebola Virus Disease. This drill assisted in the designing and development of the EVD Response Training Program for SRMC.
  - **2015 Helipad Emergency Response Blackhawk Crash Exercise:** As SRMC is the Primary Receiving facility for the Air National Guard with back country rescues, SRMC held a **two-day** Full Scale Exercise which tested our ability to manage not only a surge of victims from a massive earthquake caused landslide but also a crash onto the helipad of a Medical Blackhawk Helicopter. This exercise had the participation with Roseville Fire Department, Rocklin Fire Department, Roseville Police Department and the California Air National Guard.
- **Emergency Preparedness Development- Hospital Incident Command System (HICS) Update:** The SRMC Emergency Preparedness Coordinator was selected by the California Emergency Management Authority (EMSA) to be a member of the national level committee that assisted in the development and review of the Hospital Incident Command System 2014 Updates. These updates are utilized all across the country at hospitals for incident response.
- **Emergency Preparedness Development- Hazardous Materials and Decontamination for Healthcare Facilities Course Update:** The SRMC Emergency Preparedness Coordinator was selected by the California State Training Institute (CSTI) to be a member of the committee that assisted in the development and review of the Hazardous Materials and Decontamination for Healthcare Facilities 2014 Course updates. These updates are utilized all across the country at hospitals for hazardous materials incident response. Additionally, portions of the plan from SRMC in regards to Vulnerable Populations was included in the teaching materials as **Best Practice** examples.
- **Emergency Preparedness Development- Management of Aggressive Behavior (MAB) Program and Course Update:** The SRMC Emergency Preparedness Coordinator, with Regional Safety and Security, on management and development team for the new and updated Violence in the Workplace Training Course and Policy Development and representing Sutter Health at CalOSHA Meetings. This will ensure the facility and Sutter Health is compliant with HSC 1257.8 and 1257.9 and with the new AB 1299 and drafted potential changes that were submitted to Cal OSHA related to SB 1299.
- **Community Involvement- Placer County Emergency Medical Control Committee Chair:** The SRMC Emergency Preparedness Coordinator is the co-chair of the Placer County Emergency Medical Control Committee. In this role, the chair coordinates meetings with all responders from the Placer County Region and reviews and approves policies and procedures for the region.
- **Community Involvement-City of Roseville Police and Fire Safety Fair:** The SRMC Emergency Preparedness Coordinator partnered with the City of Roseville Police Department and the city of Roseville Fire Department for their Second Annual City of Roseville Police and Fire Safety Fair. In this SRMC EP Program and SRMC had a booth on Emergency Preparedness, Safety and the medical center itself. On this day, over 500 brochures, coloring books on safety and emergency preparedness

were handed out. Also, 300 Bike Safety Lights were handed out as well. Due to our active participation, the City of Roseville Police Department donated $500.00 back to our Foundation to be used for Trauma or emergency Services.

2014 Ebola Response

Emerging Infectious diseases, such as the 2014 Ebola virus outbreak, can significantly impact the health and safety of the citizens of Roseville. With the outbreak being monitored for a potential spread to California, the Roseville Fire Department (RFD) worked cooperatively with its regional partners to develop operational procedures and to obtain the necessary equipment to respond safely if necessary. The RFD continues to be proactive with its regional partners on training, protective equipment and is prepared to respond to an Ebola outbreak, or any other emerging infectious disease.

Oil Train Response Plan

The City of Roseville is situated in a rail corridor that connects the Sierra Nevada Mountains to the San Francisco Bay. With the increased production of crude oil in North America, shipments have increased in recent years with the commodity currently traveling through the City of Roseville. The Roseville Fire Department (RFD) working with cooperating agencies throughout Placer and Nevada Counties developed an operational plan to respond to a rail emergency involving crude oil transport. The plan is maintained by the county of Placer Office of Emergency Services and is incorporated in regional training exercises.

Review of the Action Plan

This section reviews the action plan and lists the status of each initiative from the hazard mitigation plan, grouped by the agency or department responsible for its completion. The action plan matrix in Table 2 provides the following information:

- Initiative number and brief summary; initiative numbers are coded by hazard type as follows:
  - DF = dam failure
  - D = drought
  - EQ = earthquake
  - F = flood
  - HC = human-caused hazards
  - HH = human health hazards
  - LS = landslides
  - SW = severe weather
  - WF = wildland fire
  - MH = multiple hazards
- Indication of whether any action has been taken
- Current timeline
- Indication of whether the project priority has changed
- Status (complete, ongoing or no progress)
- Comments, including the following information:
  - Was any element of the initiative carried out during the reporting period?
  - If no action was completed, why?
  - Is the timeline for implementation for the initiative still appropriate?
  - If the initiative was completed, does it need to be changed or removed from the action plan?

Part 4 of the plan provides detailed descriptions of each initiative and the prioritization process.

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Central Services Department Initiatives				
Initiative #F-21—Retrofit the city's Downtown library by sealing the exterior and installing a flood door to protect against flood damage should Dry Creek overspill the existing floodwall.				
No	Long Term	No	No action was completed on this initiative during the reporting period. Priority and time line remain as assigned. Project priority should be changed to medium and time line should be cahnged to long-term pendiong the indentification of funding for this project.	No Progress
City Council Initiatives				
Initiative #HC-3—Seek to establish appropriate staffing levels of public safety personnel to address vulnerabilities identified.				
Yes	Short Term	No	The Police and Fire Chiefs meet quarterly with the City Manager to discuss staffing levels and needs based on current trends, population growth, and calls for service. The Police Department Completed a "Request for Proposals," titled, Roseville Police Department Staffing Study. This RFP requested a professional, independent firm to assess the adequacy of current staffing levels for both sworn and non-sworn staff in the police department, and a sound methodology to project future staffing. Police and City Attorney staff reviewed the submittals and conducted interviews. The PD selected Matrix Consulting to complete the Staffing Study, which was approved by the City Council in October, 2015. The study is scheduled to commence in November, 2015.	Ongoing
City Manager's Office Initiatives				
Initiative #HH-3—Collaborate with the Placer County Mosquito Abatement District to review resource protection policies that conflict with human health protection in the City of Roseville and work to resolve these policy issues				
Yes	Short Term	No	The Placer Mosquito Abatement District and Roseville Environmental Coordinator is working together to both protect open space and wetland areas while limiting the amount of habitat for mosquitoes and vectors.	Ongoing
Public Affairs & Communications Department Initiatives				
Initiative #HH-2—Support the public education efforts of the Placer County Health Department and the Placer Mosquito Abatement District				
Yes	Short Term	No	The City supports the public education efforts of the Health Department and Mosquito Abatement District through print, government access television, social media channels, and web materials. The City has also had significant assistance from the District on public outreach efforts for rodent control through presentations at neighborhood meetings. The Placer Mosquito Abatement District purchased a building in Roseville at 2021 Opportunity Drive and moved a majority of the operations to Roseville. This will enhance the availability of resources in closer proximity to Roseville residents and the mosquito-breeding areas west of Roseville.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #MH-2—Continue to maintain the hazard mitigation page on City website that provides following types of information: • The Hazard Management Plan and its progress reports • Hazard-specific information • Mitigation information by hazard, with specific emphasis on private property • Emergency response and warning information • Links to county, state, and federal related agencies				
Yes	Short Term	No	This is an on-going action. The City continues to maintain its website as specified in the plan maintenance section of the plan. The website can be viewed at: http://www.roseville.ca.us/fire/preparedness/hazard_mitigation_plan.asp	Ongoing
Development Services Department Initiatives				
Initiative #EQ-1—Perform building-specific, structural seismic vulnerability assessment of City- owned critical facilities constructed prior to 1980 (including infrastructure). Included in this assessment will be recommended mitigation alternatives that meet goals and objectives of this plan.				
No	Long Term	Yes	Major construction on any city-owned building would require an assessment of the seismic vulnerability. The City will be applying for a Planning Grant under FEMA's various Hazard Mitigation Grant programs. This initiative will be included in the scope of work for updating the risk assessment to the plan. Priority should be changed to medium while timeline should be changed to long-term	No Progress
Initiative #EQ-2—Incorporate earthquake mitigation measures for private property into existing City-sponsored outreach programs such as printed media and the City's website.				
Yes	Short Term	No	The California Building Officials (CALBO) website has consumer web pages and one in particular regarding Seismic Safety. The site will be upgraded and improved over time with more value to the average consumer regarding measures to improve earthquake safety.	Ongoing
Initiative #EQ-3—Reassess the overall vulnerability to the earthquake hazard using the best available science and technology as it becomes available. State-sponsored programs, Seismic Hazards Mapping Act, and future FEMA-sponsored initiatives are anticipated to create a wealth of knowledge regarding this hazard that did not exist during the preparation of this plan.				
Yes	Short Term	No	Council has updated the maps for the Roseville area. The Public Works Department and Building Division anticipate review and implementation of the new mapping in conjunction with the International Building Council in 2008. The seismic risk assessment of the plan was updated using FEMA's enhanced HAZUS model (MR04) during the plan update process. The 2010 California Building Code based upon the International Building Code has been adopted by the City.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #F-1—The City shall designate all areas identified as the 100-year floodplain. The boundaries of the 100-year floodplain shall be as specified in the floodplain designations section of this component of the city's general plan. Floodplain areas shall be preserved as specified in the open space and conservation element. Such preservation may include required dedication to the City. If needed, modify the City's ordinances to include floodplain use regulations consistent with the goals, policies, and implementation measures of the safety, land use, open space and conservation, and parks and recreation elements of the City's general plan.				
Yes	Long Term	No	The city continued to implement its ongoing protocols and standard for identifying, mapping, and preserving the 100 yr floodplain during this reporting period. This initiative will continue to be implemented on an on-going basis, with a high priority. To comply with the new state Urban Level of Flood Protection, the City has contracted with a qualified engineering firm to determine the 200-year water surface elevation for the City's streams and areas that could potentially be inundated with 3 feet or more of floodwater during a 200-yr storm event.	Ongoing
Initiative #F-2—Refer any development proposal that has a direct or indirect impact on flood protection to Public Works for comment. In addition, forward such proposals to other agencies as applicable, including the U.S. Army Corps of Engineers, California Central Valley Flood Protection Board, FEMA, California Department of Fish and Game, Placer County Resource Conservation District, and Placer County Flood Control District. Consider the comments of the agencies during the development review process.				
Yes	Short Term	No	The city continued to implement its ongoing protocols and standard for reviewing flooding impacts that may be caused by new developments and forward such developments to other agencies as applicable during this reporting period. This initiative will continue to be implemented on an ongoing basis, with a high priority. The PCFCD has completed a region-wide update of the Dry Creek Watershed Flood Control Plan in November 2011.	Ongoing
Initiative #F-9—Ensure that future specific plans and specific plan amendments are consistent with the goals and policies of the general plan. The specific plans shall include the designation and preservation of floodplain areas and adjacent habitat. Provisions shall be incorporated to ensure that public infrastructure, utilities, and emergency services remain functional during flood conditions. Such infrastructure and facilities include water, sewer and gas mains, telephone and electric lines, streets and bridges, hospitals, and fire and police stations. Financing mechanisms shall be explored to fund necessary flood protection improvements and maintenance. Development agreements may be used to secure implementation and funding provisions. (Specific plans have 100% cost recovery by developers).				
Yes	Long Term	No	The city continued to implement its protocols and standard for reviewing proposed public infrastructure, utilities, and other emergency services so that they would remain functional during flood during this reporting period. This initiative will continue to be implemented on an ongoing basis, with a high priority. The Sierra Vista and Creekview Specific Plans were adopted by the City. The Amoruso Ranch and Placer Ranch Specific Plans are currently begin processed. The areas designated as floodplain and/or natural resource conservation areas will be preserved as permanent open space, consistent with General Plan policy and this action item.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #F-11—Require a master drainage plan as part of the approval process for all specific plans and large development projects as determined by the Public Works director. The master drainage plan should consider cumulative regional drainage and flooding mitigation. The plan's intent is to ensure that the overall rate of runoff from a project does not exceed predevelopment levels. If necessary, this objective shall be achieved by incorporating run-off control measures to minimize peak flows and/or assistance in financing or otherwise implementing comprehensive drainage plans.				
Yes	Long Term	No	Master Drainage plans and flood studies have been prepared for the Sierra Vista and Creekview Specific Planning areas. The City is working with developers to prepare these studies for the Amoruso Ranch and Placer Ranch Specific Plans. The priority and timeline for this initiative will remain as assigned	Ongoing
Initiative #LS-2— Continue to implement policies adopted by the general plan that promote open space land uses within identified steep slope areas of Roseville. The City of Roseville Northeast Roseville Specific Plan and Stoneridge Specific Plans include the identified steep slope areas within Roseville. Both plan areas have continuing development.				
Yes	Short Term	No	The City of Roseville Northeast Roseville Specific Plan and Stoneridge Specific Plans include the identified steep slope areas within Roseville. Both plan areas have continuing development. When individual projects are submitted, for example a housing development along a ravine in the Stoneridge area, all City development departments and the Fire Department enforce the General Plan, Specific Plan, City construction standards and individual project conditions to protect the steep slope open space that is dedicated to the City as part of the final maps for the projects.	Ongoing
Initiative #MH-1—Continue to maintain Office of Emergency Services certification of all City inspectors for post-disaster damage assessment.				
Yes	Short Term	No	All building inspectors are certified by the Office of Emergency Services and have been recertified this year. The Building Division will continue to make sure staff keeps their certifications updated and that the certifications are documented per the International Accreditation requirements.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Environmental Utilities Department Initiatives				
Initiative #D-1—Perform a groundwater recharge feasibility study to determine the most cost-effective way to replenish groundwater resources within Roseville.				
Yes	Long Term	No	The City completed a program-wide Environmental Impact Report review under the California Environmental Quality Act requirements. The Environmental Impact Report was adopted by the City Council on March 21, 2012. The City received an operating permit from the State Water Quality Control Board in 2012. The City has implemented this action by injecting excess treated surface water into two existing wells in 2013 and is constructing two additional groundwater wells with partial grant funding by the California Department of Water Resources. A long term ASR operations plan is being developed. The City is also the lead agency within the Western Placer Groundwater Management Plan area.	Ongoing
Initiative #D-2—Implement aquifer storage and recovery program that uses direct injection technique in areas identified as appropriate.				
Yes	Long Term	No	EU has implemented this action by injecting treated drinking water into two wells in early 2013. Two more wells will be completed in 2014 to increase the injection capabilities, and a long term ASR operations plan is being developed.	Ongoing
Initiative #D-3—Continue to implement the Environmental Utility Department's recycled water program and seek all opportunities to expand its coverage, currently focusing on urban growth areas. The City pumps recycled water through a system of purple pipes completely separate from potable (drinking water) pipes. The City pumps the recycled water to customers such as streetscapes, golf courses and parks, where it irrigates turf and shrubs. Using recycled water for uses such as landscape irrigation reduces demand on the potable water system, creating a more reliable water supply for the entire City. Recycled water is not subject to the effects of drought.				
Yes	Short Term	No	A Water Recycling Master Plan has been developed and is being implemented. This includes expanding recycled water in the region as well as finding opportunities in the existing service areas. Recycled water is considered as a resource in all new development areas being considered.	Ongoing
Initiative #D-4—Promote active water conservation techniques and strategies to private property owners through Roseville-sponsored outreach projects such as printed media and the City's website.				
Yes	Short Term	No	Conservation efforts are an ongoing initiative of the Water Division and have been increased and accelerated in all areas due to the unprecedented drought conditions facing the state.	Ongoing
Initiative #F-19—Set back and raise the sewer ponds levees at the Dry Creek Sewer Plant so raw sewage will not enter Dry Creek.				
Yes	Short Term	No	The construction of the Dry Creek Wastewater Treatment Plan Levee Relocation Project was completed in November 2011.	Complete

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #HC-5—Address vulnerabilities identified in vulnerability assessment of water facilities performed by the Environmental Utilities Department in response to EPA initiative.				
Yes	Long Term	No	A Water System Security CIP was completed several years ago by the Environmental Utilities Department and continues to be updated as new facilities come on line. The project enhanced the physical security of water facilities with video monitoring and access control. Timeline for this initiative has been changed from long-term to on-going.	Ongoing
Initiative #SW-5—Enhance and implement strategies for debris management and removal during severe weather events.				
Yes	Short Term	No	No change in the debris management and removal strategy that adopted in 2009. The Parks and Open Space Divisions implemented an Emergency action plan for storm situations. The Open Space Division Department purchased a new bucket truck this fiscal year that aids in the removal of hazardous and storm damaged trees.	Ongoing
Information Technology Department Initiatives				
Initiative #HC-9—Protect the city's data, technology infrastructure and staff against malicious cyber-attacks and Cyber terrorism, such as but not limited to: • Identity Theft • Virus/Malware/Spyware/Spam • Network and system attacks • Web site hacking • Denial-of-service attacks				
Yes	Short Term	No	The Information Technology Department uses several strategies and technologies to combat Cyber-attacks including: • Anti-phishing capability • Internet content filtering • PCI-DSS compliance • Virus, malware, spyware and spam scanning • Perimeter firewalls report and prevent intrusions • Secure authentication • Encryption • EOC Cyber Security Incident Exercises	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #MH-7—Strive to maintain high availability of essential communication services				
Yes	Short Term	No	For the Communication and Information Systems: The city has multiple, fully functional data centers which provide redundant hardware infrastructure. In the event of an extended outage; procedures are in place to restore essential communication and information services. The city's primary radio system has redundant components throughout. In addition the Police and Fire departments have alternative and independent systems in case the primary system fails. One of the current production data centers is scheduled to be relocated at the end of the 2016 calendar year. This move will reduce the risk of flooding as it moves the critical technology infrastructure further away from the nearby creek. The City is at present, working on an enterprise wide Business Impact Analysis study. This report will look at all information systems and services to evaluate and rank the level of impact to the City. This Business Impact Analysis report will be the primary input to developing a revised, more comprehensive Disaster Recovery/Business Continuity Plan.	Ongoing
Initiative #MH-8—Secure the city's physical locations that contain technology infrastructure				
Yes	Short Term	No	Both of the cities data centers are armed with perimeter alarm systems and internal and external security cameras. Also access to these sites is restricted to a limited number of city employees. In addition, vendors and visitors will be required to sign in and be escorted.	Ongoing
Parks and Recreation Department Open Space Division Initiatives				
Initiative #F-12—Continue the Parks and Recreation Department's regular creek maintenance program within the City's creeks and floodplain areas. This program clears and removes debris that could contribute to blockage and flooding and may include the removal of silt. This is only done in areas of high risk to flood damage or where property or facilities are threatened by flooding.				
Yes	Long Term	No	The city continued to implement its ongoing protocol of inspecting and maintaining its creeks and streams during the reporting period. The Department of Fish and Wildlife executed a five-year Routine Maintenance Agreement with the City in April 2010 for work that is ongoing this summer. During the reporting period, the City of Roseville worked with the Placer County Resource Conservation District to remove Red Sesbania from stream segments within the Dry Creek basin. This initiative will continue to be implemented on an ongoing basis, with a higb priority. The City will continue to seek grant funding opportunities from FEMA and state agencies, when available, to assist in funding Arundo eradication along infested stream channels in the Dry Creek watershed.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #F-22—Continue the Tree Mitigation Fund program administered by the Open Space Division in conjunction with non-profit organizations. The planting of oak trees in the open spaces adjacent to riparian zones increases infiltration and slows storm water surges.				
Yes	Short Term	No	The Tree Mitigation program for native oak woodland restoration uses oak mitigation funds for projects in the open spaces. Over 7000 trees have been planted to date.	Ongoing
Initiative #F-23—Manage beaver dam sites for flood control protection and habitat restoration after dam removal. One primary issue is impacts to floodwater capacity of creeks. Part of the desired comprehensive approach to beaver management includes establishment of quantitative and qualitative "carrying capacity," including acre-feet of flood capacity lost. Implement a standard monitoring and reporting process to track beaver dam locations, population, and impacts. Gain regulatory approval for beaver management techniques such as biological control and habitat manipulation using the most benign options first.				
Yes	Short Term	No	The Park Maintenance—Open Space Division continues to use a Geographical Information Systems (GIS) database for tracking beaver dam locations and coordinates beaver removal per the City's Beaver Management Policy and Nuisance Abatement Ordinance.	Ongoing
Initiative #WF-2—Continue "Goat Grazing" program for removal of grassland in areas of Roseville potentially vulnerable to wildfire. Implement goat grazing in City open space and preserve areas for fire and invasive plant species management and native plant restoration.				
Yes	Short Term	No	The Fire Department and the Open Space Division continue working together to implement a goat grazing program. Approximately 400 goats have been utilized for the grazing of open space preserves. Goats provide an innovative, environmentally sensitive way to reduce fire fuel load by keeping open space vegetation under control. Projects completed in 2012-2013 include the open space area located east of Dry Creek near Lincoln Estates to Linda Creek. Grazing reduces fuel load by removing thatch and thinning woody plants and also removes non-native vegetation.	Ongoing
Initiative #MH-4—Implement an "Adopt an Open Space" program in coordination with the open space management program. Develop "adoption contracts" with neighborhoods, organizations, businesses, etc., describing the level of stewardship and the terms of the "adoption." Publicize these activities through online resource directory and other media to encourage participation.				
Yes	Long Term	No	During the reporting period, the City has implemented an "Adopt a Creek" program. The Adopt a Creek program is administered by the City's Park Maintenance—Open Space Division. The City publicizes the program at the following website: http://www.roseville.ca.us/eu/stormwater_management/public_involvement_opportunities.asp	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #MH-5—Develop and disseminate best practices information to private property owners whose land is adjacent to open space areas describing stewardship opportunities and owners' role in preserving beneficial uses of open space areas (including vernal pool grassland and creek or riparian uses). Offer classes to provide in-depth information, such as demonstration projects, techniques for ecologically friendly weed abatement and vegetation control, and creating a backyard habitat compatible with open space areas.				
No	Short Term	Yes	No actions towards the completion of this initiative were completed during the reporting period. This will continue to be a short-term initiative with a high priority pending funding.	No Progress
Initiative #MH-6—Work with the Roseville City School District, local high school districts, and non-profit organizations to promote ecology-oriented curricula and stewardship activities. Identify resource and administrative barriers that may be limiting schools' abilities to more actively participate in stewardship, and work collaboratively to identify solutions.				
No	Short Term	No	No actions towards the completion of this initiative were completed during the reporting period. This will continue to be an ongoing initiative with a medium priority pending funding.	No Progress
Police and Fire Department Initiatives				
Initiative #DF-1—Create a dam failure element for the City's emergency response plan that includes a phased warning protocol in response to the findings of the Folsom Dam Containment Dike Risk Assessment.				
Yes	Short Term	Yes	The City of Roseville and the Placer County Office of Emergency Services has obtained a grant from the California Department of Water Resources to fund revisions to the City's and County's Dam Failure Emergency Response Plan under the DWR Flood Emergency Response Project grant program. The funding will assist in creating a dam failure element in the City's Emergency Response Plan during the next year.	Ongoing
Initiative #F-20—Implement recommendation of Downtown Roseville Specific Plan to relocate the Public safety Building				
Yes	Short Term	No	The City plans to grade the parking lot and building pad for the future relocation of Fire Station #1 in 2014. The fire station will be relocated from it's current location at the intersection of Oak Street and Grant Street to the intersection of Oak Street and Lincoln Street. Building construction is planned to begin in 2015.	Ongoing
Initiative #HC-1—Commit support to Sacramento Urban Area Security Initiative; continue to seek funding from other federal sources to fund its initiatives				
Yes	Short Term	No	Roseville hosts various training courses designed to support the regional Urban Areas Security Initiative (UASI) program. The City hosts a lot of classes for the UASI and they provide us with free seats in the classes in return. The Fire Chief continues to participate on the Joint Terrorism task Force Executive Committee (JTTF). The Police Department continues to support and participate in the Joint Terrorism Task Force by having three officers identified as liaisons to the Sacramento Regional Threat Assessment Center (SacRTAC). These officers communicate with the SacRTAC and disseminate security unclassified information to Roseville officers.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #HC-2—Enhance emergency response capability of City by contingency planning for specific events based on identified vulnerabilities.				
Yes	Short Term	No	The Fire Department's Hazmat Team has completed one Type I recertification since 2006 and is currently in the process of going through another one right now. The City's Training Division has determined that all new employees who are required to have the basic and intermediate level of ICS training (ICS 100, 200, 700, 800) obtain training and certification through FEMA's Online Emergency Management Institute's Independent Study program. Certificates are provided at the completion of the courses, and maintained in the form of individual transcripts by FEMA. Audits for compliance are completed by the training division annually. Those employees required to have advanced level ICS courses (ICS 300, 400) have been identified by the City's Training Division based on NIMS requirements. ICS 300-400 training is provided annually in multiple 16-hour blocks. The FEMA exercise mandates have been meet and exceeded. In October of 2009, the H1N1 virus EOC activation was completed and included the activation of a South Placer Point of Distribution (POD) for the H1N1 virus vaccination. In May of 2010, the EOC was activated for the "MCI 2010 Homeland Security Exercise" comprising of the cities of Roseville, Rocklin and surrounding jurisdictions. In 2011, the City participated in the "Golden Guardian" full scale exercise that was hosted by California Emergency Management Agency (CalEMA). This scenario centered on a catastrophic release of Folsom Lake due to a dam failure. In 2012 the EOC staff conducted an enhanced tabletop exercise that practiced Continuity of Operations Plans (COOP). The exercise scenario included a major explosion of a natural gas main in the Civic Center area. Again in 2012, the city participated and hosted the "MCI 2012 Homeland Security Exercise" that included a major chemical release with a fast moving vapor cloud into neighboring jurisdictions. This was a full scale exercise with a complete activation of the entire EOC staff.	Ongoing
Initiative #HC-4—Prepare a site-specific vulnerability assessment of City- owned critical facilities that use the best available science and technology with regards to human-caused hazards.				
Yes	Short Term	No	Through the California Emergency Management Agency, Critical Infrastructure Protection Section and the 2008 Buffer Zone Protection Program, an assessment of the Sutter Roseville Medical Center was conducted. While SRMC is not city-owned, it is designated the City's medical provider.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #HH-1—Continue to collaborate with the Placer County Health Department to ensure the health and welfare of the community				
Yes	Short Term	No	The City Manager's Office, Fire Department, and Communications Division collaborate with the Placer County Health Department on issues that affect the health and welfare of Roseville residents and visitors.	Ongoing
Initiative #SW-4—Continue education/outreach programs to improve winter preparedness and minimize loss of life or injury.				
Yes	Short Term	No	Educational materials are included on the city's web site on an ongoing basis, as well as a weekly tip sheet sent to all local media (print/broadcast). Web content is available to any viewer with a personal computer and Internet access. Typically there is also at least one city-authored column in the Roseville Press-Tribune on this topic per year—which reaches 40,000 readers.	Ongoing
Initiative #WF-3—Enhance existing City public outreach programs to include information on fire safety, defensible spaces, and areas of concern.				
Yes	Short Term	No	The Fire Department continually evaluates the efficiency and effectiveness of its public education programs. Comparison with other accredited fire agencies reveals that our performance standards meet those of other agencies. Outreach efforts include seasonal safety messages through the media and City website. Public education programs have been reduced, with the primary focus being assembly type presentations at several elementary schools. The fire department has taken an active role in the Neighborhood Association Meetings by having the on-duty staff to attend when possible. This allows the department to update it's citizens on various services and programs, as well as allows the citizens to voice any questions or concerns they have.	Ongoing
Initiative #MH-3—Establish/maintain a post-disaster action plan to be part of the City Emergency operations plan that will include following elements: • Procedures for public information • Post-disaster damage assessment • Grant writing • Code enforcement • Redundant operations				
No	Short Term	No	No action was taken on this initiative during the reporting period. The City is still committed to completing this action in the performance period of the plan. However, the City will pursue grants to complete this task.	No Progress

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Public Works Department Initiatives				
Initiative #F-3—Continue City participation in the National Flood Insurance Program and the Community Rating System (CRS). Seek CRS classification improvements within capabilities of City programs, including adoption and administration of FEMA-approved ordinances and flood insurance rate maps (FIRM).				
Yes	Short Term	No	The City of Roseville continued to participate in the CRS program, and re-certified its participation during the reporting period. The City's CRS Class I classification became effective on October 1, 2006. Flood Insurance policy holders within the City for property owners in flood areas will receive up to a 45% premium reduction based on the classification. Roseville is the first and only CRS Class 1 community in the nation. This initiative will continue to be implemented on an ongoing basis, with a high priority. The City has maintained its Class 1 rating through the reporting period.	Ongoing
Initiative #F-4—Maintain Roseville's compliance and good standing under the National Flood Insurance program.				
Yes	Short Term	No	A Community Assistance Visit (CAV) was last performed on the City of Roseville on November 1, 2011. The CAV is the principle means by which FEMA monitors a community's NFIP compliance. This CAV found that the City was in full compliance and in is in good standing under the NFIP.	Ongoing
Initiative #F-5—Continue the City's outreach program to flood-prone property owners and the citizens of Roseville, to help make them aware of the flood threat and how best to deal with them.				
Yes	Short Term	No	This is an on-going action that is a part of the City's CRS program.	Ongoing
Initiative #F-6—Continue to pursue a regional approach to flood issues by remaining actively involved in the Placer County Flood Control District. This involvement includes cooperation in the development of a comprehensive regional database. Continue to participate in regional flooding studies, including the Auburn Creek/Coon Creek/Pleasant Grove Creek flood mitigation plan and the Dry Creek watershed flood control plan.				
Yes	Long Term	No	The City continued to be actively involved in the Placer County Flood Control District (PCFCD) and participate in regional flooding studies during this reporting period. Staff from the Floodplain Management Division attends the meetings on a monthly basis and a Councilmember serves on the District Board. The PCFCD is developing the Antelope Creek Flood Control Project, which is a regional flood control project, located within the City of Roseville. City staff will be assisting the PCFCD with the development and construction of the regional flood control project, scheduled for construction in 2015. This initiative will continue to be implemented on an ongoing basis, with a high priority.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #F-7—Continue City coordination with other agencies on issues of flood control. Coordination between the City and adjacent jurisdictions occurs through several mechanisms, including distribution of development proposals for review and comment. Continue City cooperation with federal, state, and local agencies, including the U.S. Army Corps of Engineers, California Central Valley Flood Protection Board, FEMA, California Department of Fish and Game, Placer County Resource Conservation District, and the Placer County Flood Control District.				
Yes	Short Term	No	The City continued to coordinate with other outside agencies on issues of flood control during this reporting period. The coordination typically occurs on a project-by-project basis and agencies are included in the meetings based on their particular jurisdiction or expertise. This initiative will continue to be implemented on an on-going basis, with a high priority. The City is also actively involved with the State's new Flood-Safe program.	Ongoing
Initiative #F-8—Continue to develop, implement, and expand the Flood Alert and Early Warning Program systems and integrate the systems with other local jurisdictions to form a regional warning program.				
Yes	Long Term	No	The City continues to develop, implement, and expand the Flood Alert system. New "ALERT" software was installed and the Flood Warning web site was updated. Durig the reporting period, the City and the Placer County Flood Control District applied a State Department of Water Resources Flood Emergency Response Projects grant to upgrade the Flood Alert System data transmission system to the "ALERT-2" protocol. While the grant application was not sucessful during the current grant cycle, the City and PCFCD will apply for funding in future grant cycles. This initiative will continue to be implemented on an ongoing basis with a high priority.	Ongoing
Initiative #F-10—Monitor and regularly update City flood studies, modeling, and associated land use, zoning, and other development regulations at a minimum of every 5 years or whenever information becomes available that would significantly modify previous data. New information could include new studies, change in City policy, consideration of a major development project or specific plan, or implementation of a flood control project.				
Yes	Long Term	No	The City has updated the Pleasant Grove Creek flood studies. The City also participated with the 2011 update to PCFCD's Dry Creek flood study. The studies have also determined the 200-year WSE to comply with the implementation of the Urban Level of Flood Protection criteria. The priority and timeline for this initiative will remain as assigned.	Ongoing
Initiative #F-13—Continue annual inspection and maintenance program of City storm drain systems. Review after every major storm system function and performance. This program removes debris that could contribute to blockage of the storm drain system.				
Yes	Short Term	No	The City continued to implement its ongoing protocol of inspecting and maintaining its storm drain system during the reporting period. This initiative will continue to be implemented on an ongoing basis with a high priority.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #F-14—Complete the final two phases of the Cirby/Linda/Dry Creek flood control project (Phase 1 and 2). Five of the seven phases of this project have been completed at a cost of about $18,000,000. The basis for determining viability of this project will be a benefit /cost analysis to determine if project meets federal grant eligibility requirements.				
No	Long Term	No	No actions towards the completion of this initiative were completed during the reporting period. This will continue to be a long-term initiative with a low priority pending funding.	No Progress
Initiative #F-15—Analyze alternative improvements to the Cirby/Linda/Dry Creek flood control project that may be cost effective in the flood-prone areas of Roseville: • Dry Creek from Darling Way to Riverside Avenue • Area on Dry Creek upstream of Folsom Road in the Columbia Avenue/Marilyn Avenue/Bonita Street area • Linda Creek near Champion Oaks Drive/Samoa Way/Hurst Way area • Cirby Creek in the Trimble Way/Zien Court area				
No	Long Term	No	No actions towards the completion of this initiative were completed during the reporting period. This will continue to be a long-term initiative with a low priority pending funding. The City continues to pursue opportunities to acquire flood prone properties and remove them from the floodplain as a viable alternative to structural flood control.	No Progress
Initiative #F-16—Replace the Huntington Drive/Cirby Creek culvert with a bridge to protect Queens Court/Huntington Drive area. The Public Works Department oversees this project.				
No	Long Term	Yes	The City is continuing to research grants that may be available for this project. The City has the 25% match for the project. The priority for this project has been changed to medium and the time line has been changed to long term pending the identification of funding for this project.	No Progress
Initiative #F-17—Divert the main drainage storm drain system down Crestmont Avenue to Cirby Way and then into Dry Creek so that the existing system will not exceed capacity. If system capacity is exceeded, the intersection on Cirby Way and Crestmont Avenue and nearby homes will flood during major flood events.				
Yes	Short Term	No	Funds were allocated for this initiative in the 07/08 capital improvements budget but were diverted to fix a culvert on Atlantic Street in downtown Roseville rather than replacing this culvert. A portion of the project, consisting of the 48-inch outfall into Linda Creek and the storm drain pipe crossing South Cirby Way at the intersection of Piedmont Way, was constructed in 2010. The priority and timeline for this initiative will remain as assigned. Funding was replaced with the approval of the FY 2011/12 budget.	Ongoing
Initiative #F-18—Continue to promote and sponsor programs to buy out, relocate, and flood-proof existing flood-prone structures within Roseville.				
Yes	Short Term	No	The City will continue to pursue the acquisition of additional target properties with a high priority. The City has targeted the property on Riverside Dr for grant funding under the FY-2013 HMA grant cycle. Completion of this project will be contngent upon grant award.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #LS-1—Once California Geological Survey completes soils mapping for the Roseville vicinity under the Seismic Hazards Mapping Act, reassess landslide hazard using best available data to gauge the true vulnerability to this hazard.				
No	Long Term	No	There was no mapping performed by CAGS in the Roseville vicinity under the Seismic Hazards Mapping Act during the reporting period. Time line and priority for this project will remain unchanged, pending action by CAGS.	No Progress
Roseville Electric Initiatives				
Initiative #HC-6—Maintain compliance with California Energy Commission ("CEC") license conditions for the operations of the Roseville Energy Park ("REP") with respect to Hazardous Material Management				
Yes	Short Term	No	The operation of the REP is in compliance with the CEC license conditions including the preparation of a Business Plan and a Risk Management Plan (RMP) submitted to the City's Fire Department and the CEC. In addition, a Vulnerability Assessment has been prepared and Site Security measures have been implemented to ensure that neither the REP site nor a shipment of hazardous material is the target of unauthorized access.	Ongoing
Initiative #HC-7—Maintain compliance with state and local laws and regulations for the operation of the Roseville Power Plant #2.				
Yes	Long Term	No	All operating and compliance permits are being maintained by the power generation staff. Compliance with state and local laws is an ongoing practice.	Ongoing
Initiative #HC-8—Maintain compliance with North American Electric Reliability Corporation mandatory reliability standards related to plant operation, sabotage reporting and critical infrastructure protection (cyber security.				
Yes	Short Term	No	Establishing compliance through development, implementation and adherence to policies and procedures	Ongoing
Initiative #SW-1—Continue ongoing program of conversion of overhead utilities to underground service.				
Yes	Short Term	No	This Program is no longer being implemented by the City. Action should be removed from action plan at the next update.	No Progress
Initiative #SW-2—Continue the Shade Tree Program, an energy conservation rebate program provided by Roseville Electric				
Yes	Short Term	No	Although temporarily suspended due to the drought, this ongoing program will continue upon reactivation to offer Roseville residents a rebate for trees that they select, purchase and plant at their own convenience. Rebates are limited to 6 trees per household and available to Roseville Electric customers only.	Ongoing
Initiative #SW-3—Continue ongoing line clearing and weed abatement of electrical utility facilities in order to reduce public exposure to vegetation hazards and maintain higher reliability during severe weather conditions.				
Yes	Short Term	No	This is an ongoing program of Roseville Electric to both protect the public from hazards and to maintain the reliability of electricity service to Roseville Electric's more than 56,000 customers.	Ongoing

TABLE 2. ACTION PLAN MATRIX				
Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #SW-6—Continue to operate the Roseville Energy Park to support the City's electrical requirements and maintain service continuity during severe weather events.				
Yes	Short Term	No	The Roseville Energy Park (REP), which opened in October 2007, is producing power and provides additional electric support to meet the City's electrical needs. In the event of a transmission line outage, the REP will help maintain electric service continuity. The Operations Department's Emergency Action Plan (EAP) specifically addresses severe weather operations in Section 5.9. The severe weather EAP will ensure continuity of operations while securing the safety of personnel and equipment.	Ongoing
Initiative #SW-7— Continue to operate Roseville Power Plant #2 to support the City's electrical requirements and maintain service continuity during severe weather events.				
Yes	Short Term	No	Roseville Power Plant #2 is operated from the Roseville Energy Park Control Room. The Operations Department's Emergency Action Plan (EAP) specifically addresses severe weather operations in Section 5.9. The severe weather EAP will ensure continuity of operations while securing the safety of personnel and equipment.	Ongoing

Planning Area Changes That May Impact Plan Implementation

The planning area for the City changed with the adoption of 3 new Specific plans. The impacts of these changes will be addressed at the next update to this plan.

Recommendations for Changes or Enhancements

Based on the review of this report by the RMHMP Steering Committee, the following recommendations will be noted for future updates or revisions to the plan.

- The Information Technology Department has recommended that Initiatives MH-3 and MH-7 be combined into a single initiative
- Include information on the potential impacts of the Biggerts/Waters Flood Insurance Reform Act in annual mailings to floodplain residents.
- Continue to hold a pre-rainy season meeting with all key departments and stakeholders, such as the meeting held on December 10, 2013 to review the City's Flood Warning & Response Plan.
- Continue to train with WebEOC to enhance communication with the county. Continue to offer classes prior to every EOC exercise; last year over 100 city staff received a WebEOC refresher class.
- Try to better forecast impacts on city storm drains from debris accumulations.
- Consider training in street closure in a flood scenario for street workers.

- Data from stream gauges was not a representation of actual emergencies in the field. During flooding events, field observers should be deployed to known street flooding locations, even if no gauge information indicates flooding at those locations.
- Continue to evaluate (and add as appropriate) new social media channels, which have proven essential for public and media communication in emergencies.
- The growth of recreational access to and residential units adjacent to the Pleasant Grove Creek oak forest in the Woodcreek, Crocker Ranch, and Fiddyment Farms neighborhoods increases the frequency, risk, and human impact of wildland fires. These increases may require fire and safety personnel reviews of first responder vehicle access to newly populated sections of the creek, updates of resident fire emergency notification and evacuation procedures, and creation or updates of interagency coordination procedures for resident relocation.
- Create different wording for the WebEOC initiative
- Enhance the drought hazard profile based on new information available on current drought situation in CA.
- Enhance human caused hazard profile to include discussion on cyber-terrorism.
- Create separation between natural and non-natural hazards of concern in part II of the plan

Public review notice: *The contents of this report are considered to be public knowledge and have been prepared for total public disclosure. Copies of the report have been provided to the Roseville City Council and local media outlets. The report is also posted on the City of Roseville Multi-Hazard Mitigation Plan website. Any questions or comments regarding the contents of this report should be directed to:*

Jason Rizzi
City of Roseville
311 Vernon St.
Roseville, CA 95678
(916) 774-5802
jrizzi@roseville.ca.us

Appendix C. Steering Committee Meeting Information

TETRA TECH

MEETING SUMMARY

Date of Meeting:	November 3, 2015
Subject:	1st Steering Committee (SC) meeting
Project Name:	City of Roseville Multi-Hazard Mitigation Plan –Update
In Attendance:	**Steering Committee**- Grace Keller (Chair), Rob Jensen, Jason Rizzi, Wayne Wiley, Carl Walker, Brian Jacobson (for Helen Dyda), Erik Angle, Brenette Macintosh, Mark Lacher, Rod Rodriguez, Rick Stalker, Jim Williams **Planning Team**- Rob Flaner
Not Present:	Mark Smith, Michael Algots
Summary Prepared by:	Rob Flaner- 11/17/2015
Project No.:	103S4157
Quorum- Yes or No	Yes

Item	Action

Welcome and Introductions

- Chair, Grace Keller opened the meeting with brief group introduction.
- Round table introductions by all in attendance.
- Agenda was reviewed with no request for changes.
- There were no members of the public present and no public comment received by the Committee.
- Handouts provided included: Agenda, 2015 Progress report, work-plan for the plan update, Steering Committee ground rules, table of contents from the 2011 Multi-hazard mitigation plan.

Why are you here? Purposes for planning

Rob Flaner, the City's planning consultant from Tetra Tech, Inc. provided the committee and overview of the drivers for a hazard mitigation plan, and the Steering Committee's role in the process. There are 2 principle drivers for the City having a hazard mitigation plan; the Disaster Mitigation Act of 2000 (DMA) and the Community Rating System (CRS).

- **The DMA**- Federal legislation that stipulates that communities must have an approved all hazard mitigation plan to eligible for certain federal grant programs administered by the Federal Emergency Management Agency (FEMA). The City of Roseville has leveraged many of these grant programs in the past and wanted to continue to be eligible to pursue that funding, so it developed its hazard mitigation plan.
- **The CRS**- This is a FEMA program that is part of the National Flood Insurance Program (NFIP) that rewards participating communities for exceeding the minimum requirements of the NFIP

Item	Action

by lowering the costs of flood insurance in participating communities. Communities are rated on a scale of 1-10, with class 1 being the best with up to a 45% reduction in flood insurance premiums. The City of Roseville is the nation's highest rated community, and the only CRS class 1. To achieve that designation, the City need to have a mitigation plan that met very prescriptive planning requirements

So utilizing these 2 drivers, the City developed its 1st hazard mitigation plan in 2005. That plan was updated in 2010, which is now being updated with this process. FEMA and CRS require that these plans be reviewed and updated every 5 years. Each of the planning processes were overseen bay steering committee made up of community stakeholders city officials. This plan update process will follow suit and has been scripted to meet CRS class 1 planning requirements.

2015 Annual progress report

The City has prepared a 2015 annual progress report for the 2011 Multi-hazard Mitigation plan in accordance with the plan maintenance chapter (chapter 7) of the plan. The progress report provides and overview of the plan and provides a status report of the 63 initiatives that were identified in the 2011 plan.

The performance period for the Hazard Mitigation Plan began on March 28, 2011, with FEMA's final approval. The initial performance period for this plan is 5 years, with an update anticipated before March 2016. As of the most recent reporting period, the performance period is 82 percent complete. The Hazard Mitigation Plan identified 63 hazard mitigation initiatives to be pursued during the 5-year performance period. As of the most recent reporting period, the following progress can be reported:

- 51 out of 63 initiatives (81%) reported ongoing action toward completion.
- 10 out of 63 initiatives (16%) reported no action taken.
- 1 out of 63 initiatives (2%) was completed.
- 1 initiative was removed due to elimination of a program.

The SC review the progress report, and made the following recommendations for changes before transmittal to City Council:

- Add a short write-up on the Ebola exercise conducted during the reporting period to the hazard events section.
- Add a short write-up about the City's "Oil by Rail" plan in the mitigation success story section of the plan.
- Rob was asked to provide an overview of all the recommended changes/enhancements for the plan from the prior progress reports to the SC at the next meeting.

Erik Angle will write a paragraph about the Ebola exercise

Jason Rizzi will write a paragraph about the Oil by Rail Plan

Rob Flaner will provide a summary of all the annual recommendations from the annual plans to the next meeting

Item	Action
After the discussion on the progress report, the SC approved the report as amended for transmittal to City Council (Motion – Jason Rizzi, Second – Rob Jensen). Carl Walker will present the Progress Report to Council via GIM on or before December 16th.	Carl Walker will present the Progress Report to Council via GIM on or before December 16th
2015/2016 Plan Update Work plan Rob went over the scope of work for the plan update. The handout provided to the SC was the actual contact scope of work from Tetra Tech's contract with the City. The work plan is broken down in to 6 phases: • Phase 1-Organize and review • Phase 2-Update/Enhance the Risk Assessment • Phase 3-Engage the Public • Phase 4- PPI Framework • Phase 5-Assemble the updated Plan • Phase 6- Plan Adoption	
The current plan will expire on March 28, 2016. Plan expiration is not a big issue, unless the City's current pending grant application for the acquisition of 645 Riverside Dr. is not funded prior to March 28, 2016. This grant application has been held up by FEMA due to procedural requirements. Both Rob and Carl do not believe, that plan expiration will be an issue for this grant, however, they will seek clarification for both CalOES and FEMA Region IX. There may be a need to expedite the timeline for this project based on direction received from FEMA and the State.	Rob and Carl will reach out to CalOES and FEMA region IX to determine if an expedited schedule is warranted in order to process the grant for 645 Riverside Dr.
Steering Committee Ground Rules Since Steering Committee meetings will be conducted as open public meetings, the SC will need to have established ground rules for operation during the plan update process. The ground rules confirmed by the SC for the last plan update were provided to the SC. Rob went thru each of the components of the ground rules to make sure the current SC understood their application, and to seek input for changes or enhancements. The following changes were recommended by the SC for the 2015/2016 SC ground rules: • Grace Keller was re-confirmed as Chairperson, and Wayne Wiley was confirmed as Vice-Chairperson for the next performance period of the plan. • The quorum for the SC will remain as 50% plus 1, which will be 8 members for this plan update process. • SC members will have the option to designate an alternate and these alternates will have full voting privileges when they attend a SC meeting in the place of a primary SC member. SC members wishing to designate an alternate will inform the planning team by Friday, November 20th.	SC members wishing to designate an alternate should inform planning team by Friday, November 20th, 2015.

Item	Action
• The city's standard protocol for receiving public comment at City Council meetings was incorporated in to the ground rules. • The standard meeting date/time will strive for the 1st Tuesday of each month, from 6:00 to 8:00 PM at the Roseville City offices at 311 Vernon St.	
The SC voted to approve the ground rules as amended (Motion – Rick Stalker, Second – Mark Lacher). Carl will make sure that the final ground rules are posted on the Mitigation Plan website as soon as possible.	Carl to poste the final ground rules on the mitigation plan website.
Hazards of Concern The table of contents from the last plan illustrating the hazards of concern addressed was provided to the SC as a hand out. Rob explained that local hazard mitigation plans are required to be consistent with the State Hazard Mitigation plan as far as the hazards of concern addressed by a plan. So in other words, id the State plan says that Placer County and the City of Roseville is susceptible to a certain hazard, then the Roseville and Placer County plans should assess those hazards in their individual mitigation plans. The 2011 Roseville Multi-Hazard Mitigation Plan assessed: Dam Failure, Drought, Earthquake, Flood, Human Caused hazards, Human health hazards, Landslide, severe weather, and wildfire. These hazards were consistent with the last CA State hazard Mitigation plan.	
The Steering Committee was asked to do some homework prior to the next SC meeting as follow: All to read Chapter 11-18 of the 2011 plan and answer the following questions: • Is there another hazard we need to assess? • Since California will have Climate Change (Future Conditions) as a stand-alone risk, how should we accomplish that in our plan? All to read Goal section and answer the following questions: • Are the Goals still valid? • Do we need to add any new Goals? All to review the Annual reports for the last five years.	SC members to do homework as described.
Meeting was adjourned at 8:00 PM The next Steering Committee meeting is:	

Item	Action

November 30th from 6:00 PM to 8:00 PM
Roseville City Hall
311 Vernon St., Roseville, CA 95678

TETRA TECH

MEETING SUMMARY

Date of Meeting:	November 30, 2015
Subject:	2nd Steering Committee (SC) meeting
Project Name:	City of Roseville Multi-Hazard Mitigation Plan –Update
In Attendance:	**Steering Committee**- Grace Keller (Chair), Rob Jensen, Jason Rizzi, Wayne Wiley, Carl Walker, Helen Dyda, Erik Angle, Brenette Macintosh, Mark Lacher, Rick Stalker, Jim Williams, Paul Holt, Joe Van Zant **Planning Team**- Rob Flaner
Not Present:	Mark Smith, Rod Rodriguez, Michael Algots
Summary Prepared by:	Rob Flaner- 12/14/2015
Project No.:	103S4157
Quorum- Yes or No	Yes

Item	Action

Welcome and Introductions

- Vice-Chair, Wayne Wiley opened the meeting with a brief group introduction.
- Round table introductions by all in attendance.
- Agenda was reviewed with no request for changes.
- Meeting summary for Steering Committee (SC) Meeting #1 were reviewed and approved.
- There were no members of the public present and no public comment received by the SC.
- Handouts provided included: Agenda, Meeting #1 summary, example guiding principles and mission statements, the 2012 plan Goals and Objectives, Planning area map for the 2016 plan update, recommendations for changes and enhancements from the 2015 annual progress report.
- Chair, Grace Keller assumed leadership of the meeting upon her arrival.

Progress Report Recommendations

At the last SC meeting, the committee requested to see the changes and enhancement sections from the past progress reports. Rob provided the SC a handout that summarized the notations for changes and enhancements to the plan from the 2012 through 2014 progress reports. Rob led a discussion with the SC on what recommendations for changes or enhancements should be included in the 2015 progress report. The following recommendations were requested by the SC:

Item	Action
• Create different wording for the WebEOC initiative • Enhance the drought hazard profile based on new information available on current drought situation in California. • Enhance the human-caused hazard profile to include a discussion on cyber-terrorism. • Enhance the human health hazard profile to include a discussion on Ebola. • Create separation between natural and non-natural hazards of concern in part II of the plan. Rob and Carl will finalize the 2015 progress report for posting on the City website and submittal to the City Council Carl asked the SC to review the planning area map that was provided as a handout. Carl explained to the SC that the planning area for the City has changed dramatically since the initial planning effort in 2005. The City has and will continue to grow that the direction of its General Plan and Specific Planning process. The map handout illustrated the new specific plan areas that will need an assessment in the 2016 update. **<u>Confirm the Hazards of Concern</u>** The SC was asked at the last meeting to review the 2012 Roseville HMP and the 2013 CA State Hazard Mitigation plan and come to this meeting prepared to confirm the hazards of concern to be addressed by the 2016 plan update. After discussion of their observations from this review, the SC confirmed the following hazards of concern for the 2016 plan update, inclusive of the newly identified cyber terrorism and Ebola components of human-caused and human health hazards, respectively: • Dam Failure • Drought • Earthquake • Flood • Human caused - Terrorism & Weapons of Mass Destruction - Technological - Civil Disorder - ***Cyber terrorism*** • Human Health - Influenza - Small Pox - Viral Hemorrhagic Fevers - Plague - Tularemia - Mosquito-borne Disease - Lyme Disease	Rob and Carl to final finalize the 2015 progress report for posting on the City website and submittal to City Council

Item	Action

  - Anthrax
  - Severe Acute Respiratory Syndrome
  - Extreme weather
  - ***Ebola***
- Landslide
- Severe Weather
- Wildfire-to include a discussion/profile on air quality issues

Additionally, the 2016 update will include a stand-alone chapter on climate change that will discuss qualitatively the possible impacts of climate change on each of the above hazards of concern. There will be separation created in the plan between the natural and non-natural hazards since they will be profiled and ranked differently. The risk ranking of the plan will only consider the natural hazards of concern.

Guiding Principle/ Vision/Mission Statement

A guiding principle or a mission statement for a plan is a written declaration of a plan's core purpose and focus that normally remains unchanged over time, regardless of a change to the plan's goals or objectives. Rob explained to the SC that the last 2 versions of the Roseville Hazard Mitigation plan did not identify a guiding principle or mission statement. These are not required components for DMA compliance, however, Rob explained to the SC that they are beneficial, as they provide a clear, singular message that can be the focal point for public engagement. Rob explained to the SC that he was unaware as to why the past Steering Committees chose to not identify a guiding principle, however, this SC could identify one for the 2016 update. The SC received a handout that listed several example mission statements from other planning efforts for reference and review. After reviewing the handout, Rob asked the SC if they wanted a guiding principle/ statement for the 2016 plan update. The consensus of the SC agreed on identifying a guiding principle. After discussion, the SC settled on the following guiding principle for the 2016 plan update:

Through community partnerships, establish a plan to reduce vulnerability to hazards in order to protect the health, safety, welfare, and economy of the City.

Confirm Goals

The SC received a handout that listed the 7 goals from the 2012 plan. Rob explained that the initial 2005 plan included 7 goals that were slightly enhanced during the 2012 plan update process. Rob asked the SC to review the 7 goals and identify any additions, deletions, or enhancements to the goals for the 2016 update. One change was requested by the SC. This change involved replacing "maintain, enhance, and restore" with "monitor and support" on Goal #7. The SC confirmed the following goals for the 2016 plan update:

Item	Action

G-1: Protect lives and reduce injury.

G-2: Promote hazard mitigation as an integrated policy.

G-3: Protect the continuity of local government to ensure no significant disruption of services during or due to a disaster.

G-4: Improve community emergency management preparedness, collaboration and outreach.

G-5: Minimize or reduce damage to property, including critical facilities.

G-6: Develop and implement mitigation strategies that optimize public funds in an efficient and cost-effective way.

G-7: Monitor and support the natural environment's capacity to deal with the impacts of natural hazards, taking into account the potential impacts of global climate change.

Confirm Objectives

The SC received a handout that listed the 10 objectives from the 2012 plan. Rob explained that the initial 2005 plan included 10 objectives that were slightly enhanced during the 2012 plan update process. Rob asked the SC to review the 10 objectives and identify any additions, deletions, or enhancements to the goals for the 2016 update. The SC requested minor changes to objectives # 5, 7, and 10. The SC confirmed the following objectives for the 2016 plan update:

O-1: Consider the impacts of hazards on future land uses in the City of Roseville by coordinating with other planning mechanisms such as the general plan and land-use code development.

O-2: Protect and sustain reliable local emergency operations and communication facilities during and after disasters.

O-3: Develop new or enhance existing early warning response systems and plans.

O-4: Seek to enhance emergency response capabilities through improvements to infrastructure and City programs.

O-5: Enhance the understanding of all present and future hazards that may impact the City of Roseville and the risk they pose.

O-6: Seek mitigation projects that provide the highest degree of hazard protection at the least cost.

O-7: Seek to update information on natural, environmental, and human-caused hazards, vulnerabilities, and mitigation measures by coordinating

Carl to post the final Guiding Principle, Goals and Objectives on the City HMP website

Item	Action

planning efforts and creating partnerships with appropriate local, private, county, state, and federal agencies.

O-8: Seek to implement codes, standards, and policies that will protect life and property, including natural habitat, from the impacts of hazards within the City of Roseville.

O-9: Educate the public on preparedness for and mitigation of potential impacts of hazards on the City of Roseville.

O-10: Support efforts to retrofit, purchase, or relocate structures in high hazard areas, including those known to be repetitively damaged.

Public Involvement Strategy

Discussion on this topic was tabled until the next meeting due to the lack of time.

The meeting adjourned at 8:00 PM

The next Steering Committee meeting is:

January 5th from 6:00 PM to 8:00 PM
Roseville City Hall
311 Vernon St., Roseville, CA 95678

TETRA TECH

MEETING SUMMARY

Date of Meeting:	January 5, 2016
Subject:	3rd Steering Committee (SC) meeting
Project Name:	City of Roseville Multi-Hazard Mitigation Plan –Update
In Attendance:	**Steering Committee**- Grace Keller (Chair), Jason Rizzi, Wayne Wiley, Carl Walker, Helen Dyda, Erik Angle, Brenette Macintosh, Mark Lacher, Joe Van Zant, Rick Stalker, Michael Algots, Jim Williams, Paul Holt, Dom Casey, Jamie Garret **Planning Team**- Rob Flaner, Jessica Cerutti
Not Present:	Rob Jensen, Rod Rodriguez
Summary Prepared by:	Jessica Cerutti – 01/08/16
Project No.:	103S4157
Quorum- Yes or No	Yes

Item	Action

Welcome and Introductions

- Chair Grace Keller opened the meeting with a brief group introduction.
- Round table introductions by all in attendance.
- Agenda was reviewed with no request for changes.
- Meeting summary for Steering Committee (SC) Meeting #2 were reviewed and approved.
- There were no members of the public present and no public comment received by the SC.
- Handouts provided included: Agenda, Meeting #2 summary, Critical Facilities definition, Risk Assessment Update, Copy of the City of Roseville 2010 Public Survey.

Risk Assessment Update

Rob opened the discussion on the risk assessment (RA) update by indicating little change. He said that Tetra Tech is still data mining and addressing identified data gaps.

Rob and Carl revealed that they are adjusting the RA to reflect the Preliminary Flood Insurance rate Map (PFIRM) as the best available data for this plan update. Carl explained that the updated RA for flood will use the PFIRM received from FEMA on December 28th as the basis of the flood RA instead of the current effective FIRM. Carl said that the PFIRM provides a new study on Pleasant Grove Creek and will be best suited for inclusion into the 2016 plan update for enhanced future impact assessments.

Item	Action
Public Involvement Strategy *CRS Requirements* Rob reviewed the Community Rating System (CRS) requirements for public engagement, noting that the City of Roseville is already fulfilling most requirements through inviting public participation during committee meetings and maintaining a public facing website. He stressed that such initiatives must be maintained and public engagement must continue.	
To survey or not to survey Rob presented the SC with the 2010 Roseville HMP public survey and posed the question of whether or not the survey should be updated and distributed for the 2016 initiative. He said that to truly reap the benefits of the survey, the public must be provided a minimum of 30 days to maximize participation. He stressed that distribution of the survey may not necessarily be conducive to the expedited timeline for HMP completion, noting that the current target submission to FEMA is March 2016. This led to a discussion on the ramifications of extending the target submission. Rob mentioned that the City is still able to submit a LOI with an expired plan. Additionally, he said that HMGP approval can take anywhere from 6-8 months after initial submission. Carl noted that the only project that may be affected by an extended submission of the HMP to FEMA would be the acquisition project associated with 645 Riverside. Rob added that the City should be afforded some latitude regarding this project due to the lag in progress caused by CalOES and FEMA. At this point, Carl suggested to extend the HMP process to afford ample time to maximize public participation.	SC to review the previous survey by January 8 and return comments to Jessica.
Grace noted that the Flood Control District and FEMA will be meeting during late January and recommended engaging FEMA to be put on the agenda. Jason followed up by recommending that participating in RCONA meeting may be beneficial for furthering public outreach.	Carl and Jason to introduce the Roseville HMP initiative and public survey to the County CCO meeting, if possible.
PPI Subcommittee Rob initiated a discussion regarding the next item on the agenda – the Program for Public Information (PPI). He noted that this is an option for additional CRS credit. Given the City's current outreach initiatives, Rob said that it makes sense to capture them in a formalized program. He said that the PPI would be an annex to the plan, as the process for PPI planning will extend beyond the 2016 HMP effort. Carl requested additional information regarding the PPI, after which the subcommittee will meet – tentatively at the end of January. The PPI subcommittee is tentatively identified as follows: • Carl Walker • Jason Rizzi • Helen Dyda • Jamie Garrett • Rick Stalker • Paul Holt • Michael Algots	Jessica to develop and send an overview of the PPI initiative, inclusive of requirements and considerations.

Item	Action

Confirm Critical Facilities Definition

Next, Rob reviewed the previous iterations of the critical facility definitions from the 2005 and 2010 plans. He stated that, at a minimum, the City should use the CRS standard definition. He provided additional examples for review and asked the SC for their views on the definition. The SC agreed that the standard definition should be used with some modification. The following definition was constructed and subsequently approved by the SC with a motion to approve from Joseph Van Zant and a second from Rick Stalker:

> *A structure or other improvement, public or private, that, because of its function, size, service area, or uniqueness, has the potential to cause serious bodily harm, extensive property damage, or disruption of vital socioeconomic activities if it is destroyed or damaged or if its functionality is impaired. Critical facilities may include, but is not limited to, health and safety facilities, utilities, government facilities, hazardous materials facilities, and transportation infrastructure.*

General Plan Update/New CA General Planning Law

Wayne updated the SC on current general Plan initiatives, including a discussion of SB 379. During this discussion, Wayne indicated that SB 379 will require a climate change component beginning with the first plan adopted after January 2017. As a result, the 2016 mitigation planning initiative will not be required to contain climate change, however Rob indicated that the previously discussed climate change chapter will serve as a segue into the post-2017 requirement.

Emergency Operations Plan Review

Rob indicated that the EOP review was currently underway. He stressed that an anticipated gap will include disabilities, access, and functional needs issues given the recent string of Americans with Disabilities Act lawsuits taking place around the country.

Debris Management Plan

Jessica introduced the SC to the debris management planning initiative. She provided the SC with an overview of debris management operations and stressed the need for a strong plan that follows recently updated Public Assistance Program and Policy Guide 10-point Debris Management Plan Checklist. Paul and Mike volunteered to serve on the debris management planning committee given their advanced knowledge of hazardous materials and debris management practices.

Jessica to send out the 10-point Debris Management Checklist for SC review and reference.

Jason to include Paul and Mike in the debris management planning process.

Item	Action
As a final action before meeting adjournment, Rick requested a copy of the SC contact information. The meeting adjourned at 7:47 PM The next Steering Committee meeting is: **February 2nd from 6:00 PM to 8:00 PM** **Roseville City Hall** **311 Vernon St., Roseville, CA 95678**	Carl to send Rick SC contact information

TETRA TECH

MEETING SUMMARY

Date of Meeting:	February 2, 2016
Subject:	4th Steering Committee (SC) meeting
Project Name:	City of Roseville Multi-Hazard Mitigation Plan –Update
In Attendance:	**Steering Committee**- Grace Keller (Chair), Jason Rizzi, Wayne Wiley, Carl Walker, Helen Dyda, Brenette Macintosh, Mark Lacher, Joe Van Zant, Rick Stalker, Michael Algots, Jim Williams, Paul Holt, Jaime Garret **Planning Team**- Rob Flaner, Jessica Cerutti
Not Present:	Rob Jensen, Rod Rodriguez, Erik Angle, Dom Casey
Summary Prepared by:	Jessica Cerutti – 02/08/16
Project No.:	103S4157
Quorum- Yes or No	Yes

Item	Action

Welcome and Introductions

- Chair Grace Keller opened the meeting with a brief group introduction.
- Agenda was reviewed with no request for changes.
- Meeting summary for Steering Committee (SC) Meeting #3 were reviewed and approved.
- There were no members of the public present and no public comment received by the SC.
- Handouts provided included: Agenda, Meeting #3 summary, Debris Management Plan Checklist, Risk Assessment Update, 2016 Roseville Public Questionnaire, PPI Overview, 2011 Mitigation Catalog.

Risk Assessment Update

Rob opened the discussion on the risk assessment (RA) update by thanking Carl for the receipt of additional data, including flood data that provided the missing links on the assessor's data. Rob indicated that this missing data provides a key for making the overall RA more robust.

Next, Rob mentioned that there were previous issues with the LiDAR data, stating that the data received was not based on a bare earth model. He then said that Carl was able to acquire the formatted bare earth LiDAR model that FEMA is using for the Preliminary DFRIM, which will further strengthen the RA.

Rob next stated that the RA results will be available by the next SC meeting. During the next meeting, these results will be reviewed for the earthquake, flood, and dam failure hazards with all updated inventories. He said that

Rob to provide RA results by Feb. 26th

Item	Action
review of this information is key, as it will be the primary deliverable to share with the public. Rob said that Tetra Tech will work towards getting the SC the RA data by Friday, February 26th in order to provide an opportunity for SC review prior to the next meeting. He said that this data will come from Hazus and explained that the RA used a user defined, more specific model than simply using the Hazus pre-identified data. He requested that the SC review the RA methodology from the previous plan in preparation of reviewing the 2016 RA data.	SC to review the previous plan methodology for RA in preparation of 2016 RA review.
Next, Rob talked about the hazard layers, saying that some datasets were provide by the California Geological Survey. He also spoke about the dam failure hazard, reminding the SC that this profile was originally developed during the previous planning process. He said that this hazard focused on analysis and results, but did not include specific mapping due to operational security. The SC agreed that general evacuation and inundation maps with arrows are permissible, but no specific mapping should be used that identifies definitive locations of the dam failure hazard due to security concerns.	
Public Involvement Strategy *Survey* The SC reviewed the final survey for distribution and discussed the timeline for deploying the survey in relation to the remaining timeline for the project. Jason recommended that communications should take the lead on deploying the survey through various means. Helen suggested running the survey for approximately 2 weeks. She also indicated that they would provide a follow up email and post to potential respondents before the survey is closed to remind potential participants to take the survey.	Helen and Jaime to deploy the survey via social media platforms and other channels.
Public Meeting Rob then began a discussion on the public meeting. He said that the public meeting is dependent upon the availability of RA data. Grace recommended the use of the Utility Center. Jason said that he would check with the Parks and Rec Department to find out Center availability, but recommended against late March due to Spring Break, noting that many residents will likely be out of town during this time. Helen and Jaime recommended adding an option at the end of the survey where residents could provide their email address to remain informed on upcoming public meetings.	Jessica to add email option to end of survey.
Rob requested information regarding the potential format of the public meeting. The SC agreed that an open house format would be the best. Potential booth participants could include RCONA, Union Pacific, Red Cross, CERT, and others. Jason mentioned the Saturday open houses for the fire department as a potential vehicle for a captive audience. Helen recommended the Earth Day festivities on April 16th as a possible vehicle for the public meeting. In addition, she indicated that the Food Truck Mania event would be an ideal time to advertise for the public meeting	SC will provide input regarding the Planning Team's recommendations for a tentative schedule and begin preliminary event planning in March.

Item	Action

Public Involvement - PPI

Carl started the conversation about the PPI by saying that the City would like to make the PPI more of an all hazards program that fulfills CRS requirements while simultaneously providing additional outreach considerations on other hazard issues. Jessica indicated that this is an ideal program, noting that a PPI allows for CRS credit based on topics outside of the six priority topics. She said that these additional topics can be general preparedness, all-hazards based.

Jessica then took the SC through an overview of the PPI development process. She reviewed each of the seven steps, beginning with the establishment of a PPI Committee. She noted that at the previous SC meeting, a list of tentative PPI committee members was discussed. From this list, the final committee will be selected based on CRS requirements.

Jess and Carl to discuss final PPI committee.

Jessica then discussed Step 2 of the process, drawing attention to the need to identify target areas and target audiences. She noted that this next step can only be conducted after the development of the RA which will allow the PPI committee to make a data-based determination on what specific areas to target. She reviewed the rest of the requirements of the PPI, including a reiteration on topics and annual review requirements

Alternatives Analysis

Rob next discussed the alternatives analysis, bringing the SC's attention to the previous Mitigation Catalog. Rob reminded the SC that this catalog development is part of the statutory requirement to develop a comprehensive range of alternatives considered for actions in the plan. He noted that the catalog separates actions into a personal, corporate, and governmental scale and identifies opportunities to reduce risk.

Rob mentioned that the SC did not perform a Strengths, Weaknesses, Opportunities, and Obstacles (SWOO) session during the last planning process (2011 MHMP Update) and asked the SC if they would like to conduct a SWOO session for the 2016 initiative. He reminded the SC that they last SWOO session was held nearly 10 years ago, and that some risks have changed. For example, he noted that during the initial planning process, dam risk was unknown. New RA results will provide a better understanding of the dam hazard and how they relate to SWOO.

Jason requested best practices from other jurisdictions and their SWOO results as a reference, noting that while some risks need to be reassessed as part of the catalog process, others have remained the same. Rob recommended an abbreviated SWOO session during the next SC meeting,

Item	Action

for all-hazards, but specifically recommended focusing on newly identified risks, such as dam failure and cyber threats.

Grace asked Rob to conduct a sample SWOO to give the SC an idea of what to expect during the next meeting. Rob used Health Hazards as a sample:

- Strengths
  - Active community, parks and rec, available health programs
- Weaknesses
  - Homeless population
  - Elderly population – unable to call for help, alone in houses
- Opportunities
  - Change in potential funding to establish a program
  - Identify new opportunities to reduce risk
  - Seniors First – visitors already trained, opportunity for coordination
- Obstacles
  - Limited funding
  - Organizational resources lacking

With no further comments, the meeting adjourned at 8:00 PM

The next Steering Committee meeting is:

March 1st from 5:30 PM to 8:00 PM
Roseville City Hall
311 Vernon St., Roseville, CA 95678

TETRA TECH

MEETING SUMMARY

Date of Meeting:	March 1, 2016
Subject:	5th Steering Committee (SC) meeting
Project Name:	City of Roseville Multi-Hazard Mitigation Plan –Update
In Attendance:	**Steering Committee**- Grace Keller (Chair), Jason Rizzi, Wayne Wiley, Carl Walker, Erik Angle, Helen Dyda, Brenette Macintosh, Mark Lacher, Joe Van Zant, Rick Stalker, Michael Algots, Jim Williams, Jaime Garret **Planning Team**- Rob Flaner, Jessica Cerutti
Not Present:	Rob Jensen, Rod Rodriguez, Dom Casey
Summary Prepared by:	Jessica Cerutti – 03/10/16
Project No.:	103S4157
Quorum- Yes or No	Yes

Item	Action

Welcome and Introductions

- Chair Grace Keller opened the meeting with a brief group introduction.
- Agenda was reviewed with no request for changes.
- Meeting summary for Steering Committee (SC) Meeting #4 were reviewed and approved.
- Two members of the public were presented and invited to comment at this time.
    - Both members of the public expressed interest in the planning process. On indicated an increased interest in understanding the concept of the plan, including how manmade hazard such as cyber are terrorism will be incorporated. SC members offered additional information regarding the background of hazard mitigation planning, including the emphasis on natural hazards.
- Handouts provided included: Agenda, Meeting #4 Summary, Preliminary Risk Assessment Results, and Preliminary Public Information Survey Results.

Risk Assessment Update

Rob opened the discussion on the risk assessment (RA) update by reviewing the essential terminology regarding the risk assessment data provided in the handout. He reminded the SC that FEMA is looking to quantify risk and avoided loss in monetary amounts. He reviewed the definition of assets in General Building Stock and Critical facilities. He noted that general building stock is where residents live and shop on a daily basis while critical infrastructure refers to the definition decided upon by the SC during SC Meeting #2.

Item	Action

Next, Rob reviewed the purpose of HAZUS – the program used to conduct the Roseville risk assessment. He noted that the updated risk assessment used HAZUS 5.1 and updated inventory, including new LiDAR data based on terrain and an updated value of identified assets. Additionally, Rob noted that the updated risk assessment contains new loss estimations for dam failure, earthquake, and flood. Rob said that expected changes occurred with the inclusion of better data, specifically regarding an increased floodplain due to the annexation of Sierra Vista and Creekview and new shake maps for seismic assessment.

From there, Rob explained that the actual risk ranking is based on HAZUS outputs on a level 2-user defined level. He explained that this meant that the assessment was conducted on a property-specific level instead of a general block level. Rob noted that this granular level of assessment provides increased capability for informed hazard ranking and overall mitigation planning.

Rob next reviewed the results of each hazard run, noting that the assessment is not complete for all anticipated models – particularly for landslide due to soil class discrepancies and the 10-, 50-, and 500-year flood scenarios. Rob noted that outside of flood and earthquake, the other hazards are given an estimate on potential damages in table format due to existing limitations in the HAZUS program.

Rob said that the April 16th Earth Day HAZUS work stations will rely on correct information in order to provide information to the public.

Public Involvement Strategy

Earth Day

Next, Rob reviewed the public outreach strategy, noting that Roseville's April 16th Earth Day event at Mahany Park will be the foundation for the first public meeting. He explained the format, saying that there will be two HAZUS workstations, easels displaying maps, and hard copies of the survey available for attendees to complete. Carl and Jason discussed the issues associated with displaying information related to the dam failure hazard. Carl noted that the public survey results indicated a need to provide some information on dam failure, but consideration must be made regarding the exposure of potentially sensitive information.

Carl to confirm SC participation in Earth Day activities.

Additionally, Rob requested the involvement of the SC as support staff during the Earth Day activities from 10:00am to 3:00pm. Carl requested that the SC sign up for times in which they would be available to support the initiative. The SC provided an initial schedule to Carl at this time. Carl also suggested the possibility of including a raffle giveaway to encourage participation, noting that an emergency preparedness Go-Bag would be a beneficial prize.

Rob closed the discussion on Earth Day by noting that the SC would not meet during the month of April due to the Earth Day event.

Survey Results

Item	Action
Jessica reviewed the initial survey results. She stressed that the purpose of this survey was twofold: to assess the understanding of hazards at a community level and to assess the specific concerns for the community. She drew attention to the associated handout and noted that Jaime and Helen's public outreach resulted in 653 responses. First, Jessica reviewed the respondent top choices for receiving news and information about the City, noting that email and text messaging was the top selection for information, next was the social media platform, Nextdoor, followed Facebook, and Alert Roseville. Next, Jessica noted that nearly 98% of respondents live in Roseville, and over half of the respondents work outside of Roseville. Jessica explained that this is a key factor in outreach, as families may be separated during a disaster. Jessica noted that while most respondents were aware of their location within or outside of a floodplain, approximately 40% were not sure. She described this as an indication of a need for additional outreach that can be targeted during the development of the PPI. Likewise, a large percentage (approximately 38%) indicated that they were unsure whether their residence was located in a dam failure zone or not. Jessica reviewed the assessment of the public top natural hazard threats. Drought was the top hazard threat, followed by extreme temperatures, epidemic, severe weather, earthquake, flood, wildfire, freeze and other hazards. She noted that multiple respondents cited radon as a natural hazard of concern. The SC agreed to take this information into consideration during the next LHMP update and possible include radon exposure as a future hazard of concern.	Tetra Tech to update hazard mitigation Best Practices based on SWOO results.

SWOO Session

Rob led the SC in the conduction of the SWOO Session. He began the session by explaining that the SC will focus on an overall programmatic assessment of Roseville, followed by a hazard specific assessment for the hazards of dam failure and cyber threats.

With no further comments, the meeting adjourned at 8:00 PM

The next Steering Committee meeting is:

August 2nd from 6:00 PM to 8:00PM
Roseville City Hall
311 Vernon St., Roseville, CA 95678

TETRA TECH

MEETING SUMMARY

Date of Meeting:	August 2, 2016
Subject:	6th Steering Committee (SC) meeting
Project Name:	City of Roseville Multi-Hazard Mitigation Plan –Update
In Attendance:	**Steering Committee**- Grace Keller (Chair), Jason Rizzi, Wayne Wiley, Carl Walker, Helen Dyda, Erik Angle, Brenette Macintosh, Mark Lacher, Joe Van Zant, Rick Stalker, Michael Algots, Jim Williams, **Public:** Michael Zasso **Planning Team**- Rob Flaner, Jessica Cerutti
Not Present:	Rob Jensen, Rod Rodriguez, Dom Casey, Jaime Garret
Summary Prepared by:	Jessica Cerutti – 08/17/2016
Project No.:	103S4157
Quorum- Yes or No	Yes

Item	Action

Welcome and Introductions

- Chair Grace Keller opened the meeting with a brief group introduction.
- Agenda was reviewed with no request for changes.
- Meeting summary for Steering Committee (SC) Meeting #5 were reviewed and approved.
- There were no public comment received by the SC.
- Handouts provided included: Agenda, Meeting #3 summary, Draft RMHMP.

Project Overview

Rob Flaner began the discussion by indicating that the SC Meeting 6 doubled as a public meeting to review the Draft RMHMP. Carl stated that the public review period started on July 18th and would end on August 19th with an anticipated submittal to CalOES and FEMA by August 29th. From there, Carl said that Approval Pending Adoption is expected by October 18, with a target date to present the plan before City Council on November 2nd.

From there, Rob, provided an overview of the entire process and plan. He noted that this plan is a requirement to apply for certain federal funding programs – namely mitigation programs. Rob noted that the specific process undertaken by the City was driven by Community Rating System (CRS) requirements.

Item	Action

Rob continued by explaining that the risk assessment conducted as part of this process is the hub of the mitigation wheel. He said that risk is probability multiplied by impact, and that the resulting ranking allowed the City to compare results and categorize hazards as high, medium, or low risk,

Rob next described the capability assessment. He said that the capability assessment serves a dual purpose. One purpose is to identify existing drivers and support for implementing mitigation strategies. The second purpose is to identify potential deficiencies that could be remedied as a mitigation item. He noted debris management as an example. He explained that the City identified the need for a debris management plan as a result of the previous capability assessment. As a result, a debris management plan was recommended and subsequently completed by the City.

Next, Rob described the importance of goals and objectives. He reminded the SC that this initiative is the third comprehensive update undertaken by the City. He noted that the goals and objectives from the previous plan were carried over into the 2016 plan with some minor adjustments to focus on climate change.

Finally, Carl and Wayne described the process for CEQA, namely the initial study/mitigated negative declaration designation (IS/MND). They indicated that pursuit of the IS/MND was based on the expectation that projects identified in the Plan would undergo a full CEQA review once they are initiated.

Public Involvement Strategy

During the discussion on public engagement, Jessica noted that a large part of the success of Roseville's 2016 public engagement strategy was due to the successful implementation of Nextdoor as an outreach tool. She noted that the survey received a strong response in correlation with Nextdoor releases. Carl thanked the efforts of Helen and Jaime in coordinating the public outreach efforts.

Action Items/Next Steps

- Finalize plan based on public comments
- Submit to CalOES/FEMA for Review

With no further comments, the meeting adjourned at 7:00pm

Exhibit B – City of Roseville Municipal Code 14.09

Roseville Municipal Code

Title 14 PUBLIC UTILITIES

Chapter 14.09 WATER CONSERVATION

14.09.010 Short title.

This chapter may be cited as the Water Conservation and Drought Mitigation Ordinance. (Ord. 5311 § 2, 2014; Ord. 2413 § 2, 1991.)

14.09.020 General provisions.

A. Purpose. The purpose of this chapter is to ensure compliance with all federal, state and local requirements relating to water conservation and drought mitigation for the protection of public health, safety and welfare by:

1. Reducing the per capita water consumption throughout the City of Roseville (the "city") during years of normal precipitation and during years of drought;

2. Protecting and conserving the city's supply of water during specified times of emergency and/or crisis;

3. Minimizing and/or eliminating the waste of water through voluntary compliance or punitive action, if necessary;

4. Promoting the use of drip irrigation and other low volume irrigation methods that reduce outdoor water use by applying water more efficiently than traditional irrigation methods;

5. No person shall use, or cause to be used, any city water for landscape irrigation between the hours of 10:00 a.m. and 8:00 p.m., unless the city manager, or designee provides prior written consent to a different time limitation. A waiver may be granted for turf areas if the landscape contains too many irrigation valves to complete an irrigation event within the watering window.

6. Upon city declaration of a water shortage, the city manager, or designee, may impose revised and/or additional limitations on outdoor water use, as specified in Section 14.09.040, and no person shall use, or cause to be used, city water in violation of such limitations while the water shortage remains in effect.

B. Scope. The provisions of this chapter shall apply to all customers, users and/or recipients (hereinafter "users") of the city's potable and recycled water service within the city's territorial limits.

C. Administration and Enforcement. The city manager, or designee, including, but not limited to, an enforcement officer as defined herein, shall administer, implement, and enforce the provisions of this chapter. For purposes of this chapter an "enforcement officer" means any city employee or agent of the city with the authority to enforce any provision of this chapter and the authority to make any decision on behalf of the city manager required or called for by this chapter.

D. Compliance. All provisions of this chapter are subject to the compliance procedures set forth in this chapter unless otherwise expressly stated herein.

E. Notification. The city manager, or designee, shall determine the means by which the city shall notify its water users of drought stage determinations and any applicable upgrade or downgrade of such determinations or restrictions. Notification may be achieved through mass media, newspaper, public notice, mailings, utility billings or by any combination of such notice, or by other means as determined by

the city manager, or designee. (Ord. 5491 § 1, 2015; Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.030 Definition of water waste.

Any of the following acts or omissions, whether willful or negligent, shall constitute the waste of water:

A. Causing or permitting water to leak, discharge, flow or run to waste into any gutter, sanitary sewer, watercourse or public or private storm drain, or to any adjacent property, from any tap, hose, faucet, pipe, sprinkler, pond, pool, waterway, fountain or nozzle. In the case of irrigation, "discharge," "flow" or "run to waste"

means that the earth intended to be irrigated has been saturated with water to the point that excess water flows over or through the earth to waste. In the case of washing, "discharge," "flow" or "run to waste" means that water in excess of that necessary to wash, wet or clean the dirty or dusty object, such as an automobile, sidewalk, or parking area, flows to waste.

B. Allowing water fixtures (including, but not limited to, toilets, faucets, shower heads) or heating or cooling devices to leak or run to waste.

C. Maintaining ponds, waterways, decorative basins or swimming pools without water recirculation devices.

D. Backwashing so as to discharge to waste swimming pools, decorative basins or ponds in excess of the frequency necessary to ensure the healthful condition of the water or in excess of that required by standards for professionally administered maintenance or to address structural considerations, as determined by the city manager, or designee.

E. Operation of an irrigation system that applies water to an impervious surface or that is in disrepair.

F. Use of a water hose not equipped with a control nozzle capable of completely shutting off the flow of water except when positive pressure is applied.

G. Irrigation of landscaping during rainfall or 48 hours after a measurable rain event.

H. Overfilling of any pond, pool or fountain which results in water discharging to waste. (Ord. 5491 § 2, 2015; Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 3834 § 3, 2002; Ord. 2413 § 2, 1991.)

14.09.040 Water conservation and drought stages.

The following water conservation and drought stages are hereby established:

A. Basic Water Conservation Stage ("Basic Stage"). The basic stage shall exist when the city's water supply is adequate to meet all projected demands as determined by the city manager, or designee.

B. Stage One Drought. A stage one drought shall exist when the city's water supply is adequate to meet 90 percent of projected demands as determined by the city manager, or designee. An objective of a stage one drought condition is to reduce water usage up to 10 percent. Water shortage surcharges shall be implemented as set forth in Section 14.08.095.

C. Stage Two Drought. A stage two drought shall exist when the city's water supply is adequate to meet 80 percent of projected demands as determined by the city manager, or designee. An objective of a stage two drought condition is to reduce water usage up to 20 percent. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095.

D. Stage Three Drought. A stage three drought shall exist when the city's water supply is adequate to meet 70 percent of projected demands as determined by the city manager or designee. An objective of a stage three drought condition is to reduce water usage up to 30 percent. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095.

E. Stage Four Drought. A stage four drought shall exist when the city's water supply is adequate to meet 60 percent of projected demands as determined by the city manager or designee. An objective of a stage four drought condition is to reduce water usage up to 40 percent. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095.

F. Stage Five Drought. A stage five drought shall exist when the city's water supply is adequate to meet 50 percent or less of projected demands as determined by the city manager, or designee. An objective of a stage five drought condition is to reduce water usage up to 50 percent. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095. (Ord. 5491 § 3, 2015; Ord. 5311 § 2, 2014; Ord. 4724 § 3, 2009; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.050 Determination of drought staging—Effect of well water.

In determining the water conservation and drought stage in effect, the city manager, or designee, shall take into account only surface water available and able to be delivered from the Bureau of Reclamation and the Placer County Water Agency. Well water shall not be considered. In the event that this would result in a determination of a stage three drought or higher, groundwater wells may be activated to increase the supply to a stage two drought level. However, in no case shall well water be considered as an alternative to declaration of a stage one or stage two drought. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.060 Basic stage restrictions.

During the basic water conservation stage, the following restrictions shall be in force:

Water shall be used for beneficial purposes only; all unnecessary and wasteful uses (as defined in Section 14.09.030) of water are prohibited.

A. Water shall be confined to the user's property and shall not be allowed to run off to adjoining properties, or to the roadside or to the gutter. Care shall be taken not to water past the point of saturation.

B. Free-flowing hoses for all uses are prohibited. Automatic shut-off devices shall be attached on any hose or filling apparatus in use.

C. All leaks (including irrigation systems, pipes, fixtures, pools, ponds, fountains and waterways) shall be repaired within five calendar days or less if warranted by the severity of the problem as determined in the discretion of the city manager, or designee.

D. All pools, spas, and ornamental fountains/ponds shall be equipped with a recirculation pump and shall be constructed to be leak-proof. Pool draining and refilling shall be allowed only to the extent

required for health, maintenance, or structural considerations, and must otherwise comply with all applicable federal, state and local stormwater management program requirements, including, but not limited to, the urban stormwater quality management and discharge control ordinance set forth in Chapter 14.20 of Title 14 of the City of Roseville Municipal Code.

E. Landscaping.

1. All landscaping installed in the City of Roseville shall comply with the water efficient landscape requirements adopted by resolution of the city council.

2. Irrigation of new landscaping shall be allowed on any day of the week for a period of 30 days after the new landscaping is planted, unless the city manager, or designee, provides prior written consent to extend this time period based on plant type and the season when the new landscaping is planted. After the 30 days, irrigation days and run times should be decreased to settings appropriate for an established landscape.

3. Upon city declaration of a water shortage, the city manager may impose revised and/or additional limitations on the irrigation of new landscaping, as specified in Sections 14.09.060 through 14.09.100, and no person shall use, or cause to be used, city water in violation of such limitations while the water shortage remains in effect. A waiver may be granted to irrigate during an establishment period for actively used turf areas and/or sports fields. Allowance shall also be made for irrigation testing and repairs.

F. All site reviews shall include an evaluation of using recycled water. Recycled water shall be required if economically feasible. (Ord. 5491 § 4, 2015; Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2762 § 1, 1993; Ord. 2413 § 2, 1991.)

14.09.070 Stage one drought restrictions.

During a stage one drought, the following restrictions may be required, as determined by the city manager and upon notification pursuant to Section 14.09.020(E):

A. All basic stage restrictions required by Sections 14.09.030 and 14.09.060 shall continue in place, except to the extent they are replaced by more restrictive conditions imposed by this section.

B. Residential users and non-residential users shall reduce water usage up to 10 percent.

C. Residential water users shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of November – last day of February: up to one day per week irrigation on Monday of each week, if needed.

2. 1st day of March – last day of April and 1st day of September – last day of October: up to two days per week irrigation on Monday and Friday of each week, if needed.

3. 1st day of May – last day of August: up to three days per week irrigation on Monday, Wednesday and Friday of each week, if needed.

D. Nonresidential water users (including without limitation, commercial, industrial, church, cemeteries, and publicly owned users) shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of November – last day of February: up to one day per week irrigation on Monday of each week, if needed.

2. 1st day of March – last day of April and 1st day of September – last day of October: up to two days per week irrigation on Monday and Thursday of each week, if needed.

3. 1st day of May – last day of August: up to three days per week irrigation on Monday, Thursday and Saturday of each week, if needed.

E. The limitations specified in subsections C and D shall not apply to a properly functioning low volume landscape irrigation system, the irrigation on container plants, or to the irrigation of new landscaping that is subject to the provisions of Section 14.09.060(E). Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

F. References in this section to any day of the week shall mean the period beginning at 12:00 a.m. on that day and ending 24 hours later.

G. City park sites shall, as an aggregate, reduce usage up to 10 percent.

H. Washing streets, parking lots, driveways, sidewalks or buildings, except as necessary for health or sanitary purposes or pursuant to a term or condition in a permit issued by a state or federal agency, is prohibited.

I. Water shall not be served at restaurants except by request.

J. Water shortage surcharges shall be implemented as set forth in Section 14.08.095. (Ord. 5491 § 5, 2015; Ord. 5311 § 2, 2014; Ord. 4724 § 3, 2009; Ord. 4629 § 1, 2008; Ord. 2817 § 1, 1994; Ord. 2636 § 1, 1992; Ord. 2413 § 2, 1991.)

14.09.080 Stage two drought restrictions.

During a stage two drought, the following restrictions may be required, as determined by the city manager and upon notification pursuant to Section 14.09.020(E):

A. All basic stage and stage one restrictions required by Sections 14.09.060 and 14.09.070 shall continue in place, except to the extent they are replaced by more restrictive conditions imposed by this section.

B. Residential users and non-residential landscapes shall reduce water usage up to 20 percent.

C. City park sites shall, as an aggregate, reduce usage up to 20 percent.

D. Residential water users shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of November – last day of February: up to one day per week irrigation on Monday of each week, if needed.

2. 1st day of March – last day of April and 1st day of September – last day of October: up to two days per week irrigation on Monday and Friday of each week, if needed.

3. 1st day of May – last day of August: up to three days per week irrigation on Monday, Wednesday and Friday of each week, if needed.

E. Nonresidential water users (including without limitation, commercial, industrial, church, cemeteries, and publicly owned users) shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of November – last day of February: up to one day per week irrigation on Monday of each week, if needed.

2. 1st day of March – last day of April and 1st day of September – last day of October: up to two days per week irrigation on Monday and Thursday of each week, if needed.

3. 1st day of May – last day of August: up to three days per week irrigation on Monday, Thursday and Saturday of each week, if needed.

F. The limitations specified in subsections D and E shall not apply to a properly functioning low volume landscape irrigation system, the irrigation on container plants, or to the irrigation of new landscaping that is subject to the provisions of Section 14.09.060(E). Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

G. References in this section to any day of the week shall mean the period beginning at 12:00 a.m. on that day and ending 24 hours later.

H. Washing of vehicles or boats is prohibited except:

1. When using a hose that is equipped with a control nozzle capable of completely shutting off the flow of water except when positive action or pressure to maintain the flow of water is applied; or

2. When washed in either an automatic or manual commercial car wash that recirculates its water and uses high pressure/low volume wash systems.

3. Temporary car washes, held for fundraising purposes, are encouraged to partner with an automatic commercial car wash that recirculates its water and uses high pressure/low volume wash systems. If run independently, the participants must use a hose nozzle that completely shuts off the flow of water when not in use and must comply with all applicable federal, state and local stormwater management program requirements, including, but not limited to, the urban stormwater quality management and discharge control ordinance set forth in Chapter 14.20 of Title 14 of the City of Roseville Municipal Code.

I. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095. (Ord. 5491 § 6, 2015; Ord. 5311 § 2, 2014; Ord. 4724 § 3, 2009; Ord. 4629 § 1, 2008; Ord. 2611 § 1, 1992.)

14.09.090 Stage three drought restrictions.

During a stage three drought, the following restrictions may be required, as determined by the city manager and upon notification pursuant to Section 14.09.020(E):

A. All basic stage, stage one, and stage two restrictions required by Sections 14.09.060, 14.09.070 and 14.09.080 shall continue in place, except to the extent they are replaced by more restrictive conditions imposed by this section.

B. Residential users and non-residential landscapes are to reduce water usage up to 30 percent.

C. City park sites shall, as an aggregate, reduce usage up to 30 percent.

D. Residential water users shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of September – last day of April: up to one day per week irrigation on Monday of each week, if needed.

2. 1st day of May – last day of August: up to two days per week irrigation on Monday and Friday of each week, if needed.

E. Nonresidential water users (including without limitation, commercial, industrial, church, cemeteries, and publicly owned users) shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of September – last day of April: up to one day per week irrigation on Monday of each week, if needed.

2. 1st day of May – last day of August: up to two days per week irrigation on Monday and Thursday of each week, if needed.

F. The limitations specified in subsections D and E shall not apply to a properly functioning low volume landscape irrigation system, the irrigation on container plants, or to the irrigation of new landscaping that is subject to the provisions of Section 14.09.060(E). Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

G. References in this section to any day of the week shall mean the period beginning at 12:00 a.m. on that day and ending 24 hours later.

H. New or expanded landscaping is limited to drought-tolerant trees, shrubs, and ground-cover and be irrigated using a low volume irrigation system. No new turf shall be planted, hydroseeded, or laid, unless prior written consent is received from the city manager. Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

I. Except where recycled water is used, golf courses shall reduce irrigation up to 30 percent.

J. All decorative fountains, decorative (i.e., nonswimming) pools, and decorative waterways shall be drained and made dry. Such fountains, pools, and waterways shall not be refilled until the city has returned to the basic water conservation stage. Fountains, ponds or pools that are filled with recycled water are not subject to this provision. Decorative ponds that contain fish as a feature shall be exempt from this restriction as long as the system is maintained in good working order with measures taken to reduce the volume of makeup water required for evaporative losses.

K. Except where recycled or other non-potable water is used or as otherwise provided in this subsection, use of water for dust control is prohibited. Dust control shall be augmented by hardened, temporary travel routes with materials that are accepted by the city manager, city engineer, or designee. Potable water is allowed for construction water only where and to the extent required for public health and safety reasons.

L. New swimming pools and spas may be filled after construction using customer's metered water at then existing water rates. All new pools must include a means for minimizing evaporative loss, such as a pool cover, at time of final inspection by the city. After being filled with water for the first time, all pools and spas shall be subject to the requirements of Section 14.09.060(D).

M. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095. (Ord. 5491 § 7, 2015; Ord. 5311 § 2, 2014; Ord. 4724 § 3, 2009; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.100 Stage four drought restrictions.

During a stage four drought, the following restrictions may be required, as determined by the city manager and upon notification pursuant to Section 14.09.020(E):

A. All basic stage, stage one, stage two, and stage three restrictions required by Sections 14.09.060, 14.09.070, 14.09.080 and 14.09.090 shall continue in place, except to the extent they are replaced by more restrictive conditions imposed by this section.

B. Residential customers and non-residential landscapes are to reduce water usage up to 40 percent.

C. City park sites shall, as an aggregate, reduce usage up to 40 percent.

D. Residential water users shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of September – last day of April: No irrigation allowed.

2. 1st day of May – last day of August: up to one day per week irrigation on Monday, if needed.

E. Nonresidential water users (including without limitation, commercial, industrial, church, cemeteries, and publicly owned users) shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of September – last day of April: No irrigation allowed.

2. 1st day of May – last day of August: up to one day per week irrigation on Monday of each week, if needed.

F. The limitations specified in subsections D and E shall not apply to a properly functioning low volume landscape irrigation system, the irrigation on container plants, or to the irrigation of new landscaping that is subject to the provisions of Section 14.09.060(E). Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

G. References in this section to any day of the week shall mean the period beginning at 12:00 a.m. on that day and ending 24 hours later.

H. Installation of any new landscaping is prohibited unless irrigation is provided through connection to an active recycled water system. In the case of new construction, the city's building official will issue a temporary final upon completion of the structural development of the property. When the city has returned to a stage two drought restriction, landscaping installation can be completed and a building final will become available upon inspection by the city.

I. Except where recycled water is used, golf courses shall reduce irrigation up to 40 percent.

J. Automobiles or equipment shall be washed only at commercial establishments that recycle their water or by equipment and means that separates debris and recycles wash water for continual use.

K. Existing pools shall not be emptied and refilled using city water unless required for health or safety reasons until the city has returned to a stage two drought restriction. Pools may be re-filled only to the extent necessary to replace evaporative losses.

L. No commitments shall be made to provide water service as part of any new land use entitlement (general plan, specific plan or amendments requesting new water allocations) until the city has returned to a stage two drought restriction. Currently approved specific plans with accompanying development agreements and projects or properties that have received water allocations in advance of full entitlements may be issued building permits so long as they comply with the remainder of this chapter.

M. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095. (Ord. 5491 § 8, 2015; Ord. 5311 § 2, 2014; Ord. 4724 § 3, 2009; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.110 Stage five drought restrictions.

During a stage five drought, the following restrictions may be required, as determined by the city manager and upon notification pursuant to Section 14.09.020(E):

A. All basic stage, or stage one, stage two, stage three and stage four restrictions required by Sections 14.09.060, 14.09.070, 14.09.080, 14.09.090 and 14.09.100 shall continue in place, except to the extent they are replaced by more restrictive conditions imposed by this section.

B. Residential users are to reduce water usage up to 50 percent.

C. Except where recycled water is used, water users shall reduce landscape irrigation as follows:

1. Turf shall not be irrigated.

2. Trees and shrubs may be irrigated with a properly functioning low volume landscape irrigation system or by use of a handheld hose equipped with a nozzle capable of completely shutting off the flow of water except when positive action or pressure to maintain the flow of water is applied. Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

D. Filling new or existing swimming pools and spas with city water is prohibited.

E. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095. (Ord. 5491 § 9, 2015; Ord. 5311 § 2, 2014; Ord. 4724 § 3, 2009; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.120 Determination of drought tolerance.

Where this chapter permits or prohibits acts based upon whether or not a planting, tree, shrub, or groundcover is “drought tolerant” the determination shall be made based upon Sunset’s *Western Garden Book* (most recent edition), or UC Davis Arboretum’s “All Stars” plant database (www.arboretum.ucdavis.edu). Where this chapter permits or prohibits acts based upon whether a form of

irrigation is “low volume drip irrigation” the determination shall be made by the director, or designee, whose determination shall be final. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.130 Determination of landscape water consumption reductions.

Whenever this chapter requires a reduction in consumption of water for irrigation purposes, the base year for measurement shall be the last year that the basic water conservation stage was in effect or a date specified by the Governor or state agency. If that data is not available for a property, allocations will be based on water use for similar properties. The city manager or designee may elect to base a reduction on the base year or on a landscape water consumption calculation if use was, in the city manager’s or designee’s, sole opinion, either excessive or extraordinarily low. For landscaping installed subsequent to the base year, the calculations shall be based on landscape water consumption calculations submitted with the landscape plan, or water consumption the previous year, whichever is less. (Ord. 5491 § 10, 2015; Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2817 § 1, 1994; Ord. 2413 § 2, 1991.)

14.09.140 Violations.

It is unlawful for any user and/or person to violate any provision or fail to comply with any of the requirements of this chapter. Causing, permitting, aiding, abetting or concealing a violation of any provision of this chapter shall constitute a violation of this chapter. A violation of the provisions of this chapter shall occur irrespective of the negligence or intent of the violator and a violation of or failure to comply with any of the requirements of this chapter may be charged as either an infraction or a misdemeanor in the discretion of the city attorney. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 3834 § 3, 2002; Ord. 2413 § 2, 1991.)

14.09.150 Enforcement authority.

A. Whenever the city manager, or designee (including, but not limited to, an enforcement officer), determines that a user and/or person has violated any provision of, or failed to meet a requirement of, this chapter, an administrative citation pursuant to Chapter 2.50 or a written compliance order pursuant to Chapter 2.52 may be issued to any user and/or person responsible for the violation.

B. Any compliance order issued may require without limitation any or all of the following:

1. The allocation of a particular amount of water to a given user and/or person responsible for the violation;
2. The issuance of a fine;
3. The installation of a flow restriction device;
4. The performance of monitoring, analyses, and reporting;
5. That violations shall cease and desist; and/or
6. The discontinuation of water service.

The compliance order shall set forth a deadline within which the requirements of the compliance order must be completed. Said compliance order shall further advise that, should the violator fail to comply with the compliance order within the established deadline, a hearing on the compliance order shall be set.

(Ord. 5491 § 11, 2015; Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 3034 § 3, 2002; Ord. 2817 § 1, 1994; Ord. 2413 § 2, 1991.)

14.09.160 Hearing.

If full compliance is not achieved within the time specified in the compliance order, a hearing on the compliance order shall be set pursuant to Chapter 2.52. All penalties and remedies authorized by Chapter 2.52 shall apply to violations of this chapter. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.170 Appeal.

Any user and/or person receiving a compliance order under Section 14.09.150 may appeal the determination of the director, or designee, to a hearing panel drawn from the membership of the board of appeals. The notice of appeal must be received by the city's environmental utilities department within 10 days from the date of the compliance order. Notice of hearing and hearing on the appeal will be conducted pursuant to the requirements of Chapter 2.52. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.180 Separate offense for each day.

Any user and/or person that violates any provision of this chapter shall be guilty of a separate offense for each and every day during any portion of which any such user and/or person commits, continues, permits, or causes a violation thereof, and shall be punished accordingly. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.190 Public nuisance.

In addition to the enforcement processes and penalties hereinbefore provided, any condition caused or permitted to exist in violation of any of the provisions of this chapter is a threat to public health, safety, and welfare, and is declared and deemed a nuisance, and may be summarily abated or restored by the city at the violator's expense, and/or a civil action to abate, enjoin, or otherwise compel the cessation of such nuisance may be initiated and/or taken by the city. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.200 Remedies not exclusive.

Remedies under this chapter are in addition to and do not supersede or limit any and all other remedies, civil or criminal. The remedies provided for herein shall be cumulative and not exclusive. (Ord. 5311 § 2, 2014; Ord. 4629 § 2, 2008.)

14.09.210 Judicial review.

Any decision of the hearing panel shall be final. Any user and/or person aggrieved by an order of the hearing panel may obtain review of the order in the Superior Court by filing with the Court a petition for

writ of mandate within 90 days pursuant to California Code of Civil Procedure Section 1094.6. (Ord. 5311 § 2, 2014; Ord. 4629 § 2, 2008.)

14.09.220 Chapter severable.

The provisions of this chapter are severable. The city council declares that it would have adopted the remainder of this chapter even if any of its provisions are declared unlawful or unenforceable. (Ord. 5311 § 2, 2014; Ord. 4629 § 2, 2008.)

Exhibit C – Adoption Resolution

A copy of the adoption resolution will be included in the adopted version of the Water Shortage Contingency Plan.

Appendix L – Roseville Municipal Code 14.09

Roseville Municipal Code

Title 14 PUBLIC UTILITIES

Chapter 14.09 WATER CONSERVATION

14.09.010 Short title.

This chapter may be cited as the Water Conservation and Drought Mitigation Ordinance. (Ord. 5311 § 2, 2014; Ord. 2413 § 2, 1991.)

14.09.020 General provisions.

A. Purpose. The purpose of this chapter is to ensure compliance with all federal, state and local requirements relating to water conservation and drought mitigation for the protection of public health, safety and welfare by:

1. Reducing the per capita water consumption throughout the City of Roseville (the "city") during years of normal precipitation and during years of drought;

2. Protecting and conserving the city's supply of water during specified times of emergency and/or crisis;

3. Minimizing and/or eliminating the waste of water through voluntary compliance or punitive action, if necessary;

4. Promoting the use of drip irrigation and other low volume irrigation methods that reduce outdoor water use by applying water more efficiently than traditional irrigation methods;

5. No person shall use, or cause to be used, any city water for landscape irrigation between the hours of 10:00 a.m. and 8:00 p.m., unless the city manager, or designee provides prior written consent to a different time limitation. A waiver may be granted for turf areas if the landscape contains too many irrigation valves to complete an irrigation event within the watering window.

6. Upon city declaration of a water shortage, the city manager, or designee, may impose revised and/or additional limitations on outdoor water use, as specified in Section 14.09.040, and no person shall use, or cause to be used, city water in violation of such limitations while the water shortage remains in effect.

B. Scope. The provisions of this chapter shall apply to all customers, users and/or recipients (hereinafter "users") of the city's potable and recycled water service within the city's territorial limits.

C. Administration and Enforcement. The city manager, or designee, including, but not limited to, an enforcement officer as defined herein, shall administer, implement, and enforce the provisions of this chapter. For purposes of this chapter an "enforcement officer" means any city employee or agent of the city with the authority to enforce any provision of this chapter and the authority to make any decision on behalf of the city manager required or called for by this chapter.

D. Compliance. All provisions of this chapter are subject to the compliance procedures set forth in this chapter unless otherwise expressly stated herein.

E. Notification. The city manager, or designee, shall determine the means by which the city shall notify its water users of drought stage determinations and any applicable upgrade or downgrade of such determinations or restrictions. Notification may be achieved through mass media, newspaper, public notice, mailings, utility billings or by any combination of such notice, or by other means as determined by

the city manager, or designee. (Ord. 5491 § 1, 2015; Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.030 Definition of water waste.

Any of the following acts or omissions, whether willful or negligent, shall constitute the waste of water:

A. Causing or permitting water to leak, discharge, flow or run to waste into any gutter, sanitary sewer, watercourse or public or private storm drain, or to any adjacent property, from any tap, hose, faucet, pipe, sprinkler, pond, pool, waterway, fountain or nozzle. In the case of irrigation, "discharge," "flow" or "run to waste"

means that the earth intended to be irrigated has been saturated with water to the point that excess water flows over or through the earth to waste. In the case of washing, "discharge," "flow" or "run to waste" means that water in excess of that necessary to wash, wet or clean the dirty or dusty object, such as an automobile, sidewalk, or parking area, flows to waste.

B. Allowing water fixtures (including, but not limited to, toilets, faucets, shower heads) or heating or cooling devices to leak or run to waste.

C. Maintaining ponds, waterways, decorative basins or swimming pools without water recirculation devices.

D. Backwashing so as to discharge to waste swimming pools, decorative basins or ponds in excess of the frequency necessary to ensure the healthful condition of the water or in excess of that required by standards for professionally administered maintenance or to address structural considerations, as determined by the city manager, or designee.

E. Operation of an irrigation system that applies water to an impervious surface or that is in disrepair.

F. Use of a water hose not equipped with a control nozzle capable of completely shutting off the flow of water except when positive pressure is applied.

G. Irrigation of landscaping during rainfall or 48 hours after a measurable rain event.

H. Overfilling of any pond, pool or fountain which results in water discharging to waste. (Ord. 5491 § 2, 2015; Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 3834 § 3, 2002; Ord. 2413 § 2, 1991.)

14.09.040 Water conservation and drought stages.

The following water conservation and drought stages are hereby established:

A. Basic Water Conservation Stage ("Basic Stage"). The basic stage shall exist when the city's water supply is adequate to meet all projected demands as determined by the city manager, or designee.

B. Stage One Drought. A stage one drought shall exist when the city's water supply is adequate to meet 90 percent of projected demands as determined by the city manager, or designee. An objective of a stage one drought condition is to reduce water usage up to 10 percent. Water shortage surcharges shall be implemented as set forth in Section 14.08.095.

C. Stage Two Drought. A stage two drought shall exist when the city's water supply is adequate to meet 80 percent of projected demands as determined by the city manager, or designee. An objective of a stage two drought condition is to reduce water usage up to 20 percent. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095.

D. Stage Three Drought. A stage three drought shall exist when the city's water supply is adequate to meet 70 percent of projected demands as determined by the city manager or designee. An objective of a stage three drought condition is to reduce water usage up to 30 percent. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095.

E. Stage Four Drought. A stage four drought shall exist when the city's water supply is adequate to meet 60 percent of projected demands as determined by the city manager or designee. An objective of a stage four drought condition is to reduce water usage up to 40 percent. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095.

F. Stage Five Drought. A stage five drought shall exist when the city's water supply is adequate to meet 50 percent or less of projected demands as determined by the city manager, or designee. An objective of a stage five drought condition is to reduce water usage up to 50 percent. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095. (Ord. 5491 § 3, 2015; Ord. 5311 § 2, 2014; Ord. 4724 § 3, 2009; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.050 Determination of drought staging—Effect of well water.

In determining the water conservation and drought stage in effect, the city manager, or designee, shall take into account only surface water available and able to be delivered from the Bureau of Reclamation and the Placer County Water Agency. Well water shall not be considered. In the event that this would result in a determination of a stage three drought or higher, groundwater wells may be activated to increase the supply to a stage two drought level. However, in no case shall well water be considered as an alternative to declaration of a stage one or stage two drought. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.060 Basic stage restrictions.

During the basic water conservation stage, the following restrictions shall be in force:

Water shall be used for beneficial purposes only; all unnecessary and wasteful uses (as defined in Section 14.09.030) of water are prohibited.

A. Water shall be confined to the user's property and shall not be allowed to run off to adjoining properties, or to the roadside or to the gutter. Care shall be taken not to water past the point of saturation.

B. Free-flowing hoses for all uses are prohibited. Automatic shut-off devices shall be attached on any hose or filling apparatus in use.

C. All leaks (including irrigation systems, pipes, fixtures, pools, ponds, fountains and waterways) shall be repaired within five calendar days or less if warranted by the severity of the problem as determined in the discretion of the city manager, or designee.

D. All pools, spas, and ornamental fountains/ponds shall be equipped with a recirculation pump and shall be constructed to be leak-proof. Pool draining and refilling shall be allowed only to the extent

required for health, maintenance, or structural considerations, and must otherwise comply with all applicable federal, state and local stormwater management program requirements, including, but not limited to, the urban stormwater quality management and discharge control ordinance set forth in Chapter 14.20 of Title 14 of the City of Roseville Municipal Code.

E. Landscaping.

1. All landscaping installed in the City of Roseville shall comply with the water efficient landscape requirements adopted by resolution of the city council.

2. Irrigation of new landscaping shall be allowed on any day of the week for a period of 30 days after the new landscaping is planted, unless the city manager, or designee, provides prior written consent to extend this time period based on plant type and the season when the new landscaping is planted. After the 30 days, irrigation days and run times should be decreased to settings appropriate for an established landscape.

3. Upon city declaration of a water shortage, the city manager may impose revised and/or additional limitations on the irrigation of new landscaping, as specified in Sections 14.09.060 through 14.09.100, and no person shall use, or cause to be used, city water in violation of such limitations while the water shortage remains in effect. A waiver may be granted to irrigate during an establishment period for actively used turf areas and/or sports fields. Allowance shall also be made for irrigation testing and repairs.

F. All site reviews shall include an evaluation of using recycled water. Recycled water shall be required if economically feasible. (Ord. 5491 § 4, 2015; Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2762 § 1, 1993; Ord. 2413 § 2, 1991.)

14.09.070 Stage one drought restrictions.

During a stage one drought, the following restrictions may be required, as determined by the city manager and upon notification pursuant to Section 14.09.020(E):

A. All basic stage restrictions required by Sections 14.09.030 and 14.09.060 shall continue in place, except to the extent they are replaced by more restrictive conditions imposed by this section.

B. Residential users and non-residential users shall reduce water usage up to 10 percent.

C. Residential water users shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of November – last day of February: up to one day per week irrigation on Monday of each week, if needed.

2. 1st day of March – last day of April and 1st day of September – last day of October: up to two days per week irrigation on Monday and Friday of each week, if needed.

3. 1st day of May – last day of August: up to three days per week irrigation on Monday, Wednesday and Friday of each week, if needed.

D. Nonresidential water users (including without limitation, commercial, industrial, church, cemeteries, and publicly owned users) shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of November – last day of February: up to one day per week irrigation on Monday of each week, if needed.

2. 1st day of March – last day of April and 1st day of September – last day of October: up to two days per week irrigation on Monday and Thursday of each week, if needed.

3. 1st day of May – last day of August: up to three days per week irrigation on Monday, Thursday and Saturday of each week, if needed.

E. The limitations specified in subsections C and D shall not apply to a properly functioning low volume landscape irrigation system, the irrigation on container plants, or to the irrigation of new landscaping that is subject to the provisions of Section 14.09.060(E). Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

F. References in this section to any day of the week shall mean the period beginning at 12:00 a.m. on that day and ending 24 hours later.

G. City park sites shall, as an aggregate, reduce usage up to 10 percent.

H. Washing streets, parking lots, driveways, sidewalks or buildings, except as necessary for health or sanitary purposes or pursuant to a term or condition in a permit issued by a state or federal agency, is prohibited.

I. Water shall not be served at restaurants except by request.

J. Water shortage surcharges shall be implemented as set forth in Section 14.08.095. (Ord. 5491 § 5, 2015; Ord. 5311 § 2, 2014; Ord. 4724 § 3, 2009; Ord. 4629 § 1, 2008; Ord. 2817 § 1, 1994; Ord. 2636 § 1, 1992; Ord. 2413 § 2, 1991.)

14.09.080 Stage two drought restrictions.

During a stage two drought, the following restrictions may be required, as determined by the city manager and upon notification pursuant to Section 14.09.020(E):

A. All basic stage and stage one restrictions required by Sections 14.09.060 and 14.09.070 shall continue in place, except to the extent they are replaced by more restrictive conditions imposed by this section.

B. Residential users and non-residential landscapes shall reduce water usage up to 20 percent.

C. City park sites shall, as an aggregate, reduce usage up to 20 percent.

D. Residential water users shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of November – last day of February: up to one day per week irrigation on Monday of each week, if needed.

2. 1st day of March – last day of April and 1st day of September – last day of October: up to two days per week irrigation on Monday and Friday of each week, if needed.

3. 1st day of May – last day of August: up to three days per week irrigation on Monday, Wednesday and Friday of each week, if needed.

E. Nonresidential water users (including without limitation, commercial, industrial, church, cemeteries, and publicly owned users) shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of November – last day of February: up to one day per week irrigation on Monday of each week, if needed.

2. 1st day of March – last day of April and 1st day of September – last day of October: up to two days per week irrigation on Monday and Thursday of each week, if needed.

3. 1st day of May – last day of August: up to three days per week irrigation on Monday, Thursday and Saturday of each week, if needed.

F. The limitations specified in subsections D and E shall not apply to a properly functioning low volume landscape irrigation system, the irrigation on container plants, or to the irrigation of new landscaping that is subject to the provisions of Section 14.09.060(E). Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

G. References in this section to any day of the week shall mean the period beginning at 12:00 a.m. on that day and ending 24 hours later.

H. Washing of vehicles or boats is prohibited except:

1. When using a hose that is equipped with a control nozzle capable of completely shutting off the flow of water except when positive action or pressure to maintain the flow of water is applied; or

2. When washed in either an automatic or manual commercial car wash that recirculates its water and uses high pressure/low volume wash systems.

3. Temporary car washes, held for fundraising purposes, are encouraged to partner with an automatic commercial car wash that recirculates its water and uses high pressure/low volume wash systems. If run independently, the participants must use a hose nozzle that completely shuts off the flow of water when not in use and must comply with all applicable federal, state and local stormwater management program requirements, including, but not limited to, the urban stormwater quality management and discharge control ordinance set forth in Chapter 14.20 of Title 14 of the City of Roseville Municipal Code.

I. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095. (Ord. 5491 § 6, 2015; Ord. 5311 § 2, 2014; Ord. 4724 § 3, 2009; Ord. 4629 § 1, 2008; Ord. 2611 § 1, 1992.)

14.09.090 Stage three drought restrictions.

During a stage three drought, the following restrictions may be required, as determined by the city manager and upon notification pursuant to Section 14.09.020(E):

A. All basic stage, stage one, and stage two restrictions required by Sections 14.09.060, 14.09.070 and 14.09.080 shall continue in place, except to the extent they are replaced by more restrictive conditions imposed by this section.

B. Residential users and non-residential landscapes are to reduce water usage up to 30 percent.

C. City park sites shall, as an aggregate, reduce usage up to 30 percent.

D. Residential water users shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of September – last day of April: up to one day per week irrigation on Monday of each week, if needed.

2. 1st day of May – last day of August: up to two days per week irrigation on Monday and Friday of each week, if needed.

E. Nonresidential water users (including without limitation, commercial, industrial, church, cemeteries, and publicly owned users) shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of September – last day of April: up to one day per week irrigation on Monday of each week, if needed.

2. 1st day of May – last day of August: up to two days per week irrigation on Monday and Thursday of each week, if needed.

F. The limitations specified in subsections D and E shall not apply to a properly functioning low volume landscape irrigation system, the irrigation on container plants, or to the irrigation of new landscaping that is subject to the provisions of Section 14.09.060(E). Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

G. References in this section to any day of the week shall mean the period beginning at 12:00 a.m. on that day and ending 24 hours later.

H. New or expanded landscaping is limited to drought-tolerant trees, shrubs, and ground-cover and be irrigated using a low volume irrigation system. No new turf shall be planted, hydroseeded, or laid, unless prior written consent is received from the city manager. Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

I. Except where recycled water is used, golf courses shall reduce irrigation up to 30 percent.

J. All decorative fountains, decorative (i.e., nonswimming) pools, and decorative waterways shall be drained and made dry. Such fountains, pools, and waterways shall not be refilled until the city has returned to the basic water conservation stage. Fountains, ponds or pools that are filled with recycled water are not subject to this provision. Decorative ponds that contain fish as a feature shall be exempt from this restriction as long as the system is maintained in good working order with measures taken to reduce the volume of makeup water required for evaporative losses.

K. Except where recycled or other non-potable water is used or as otherwise provided in this subsection, use of water for dust control is prohibited. Dust control shall be augmented by hardened, temporary travel routes with materials that are accepted by the city manager, city engineer, or designee. Potable water is allowed for construction water only where and to the extent required for public health and safety reasons.

L. New swimming pools and spas may be filled after construction using customer's metered water at then existing water rates. All new pools must include a means for minimizing evaporative loss, such as a pool cover, at time of final inspection by the city. After being filled with water for the first time, all pools and spas shall be subject to the requirements of Section 14.09.060(D).

M. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095. (Ord. 5491 § 7, 2015; Ord. 5311 § 2, 2014; Ord. 4724 § 3, 2009; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.100 Stage four drought restrictions.

During a stage four drought, the following restrictions may be required, as determined by the city manager and upon notification pursuant to Section 14.09.020(E):

A. All basic stage, stage one, stage two, and stage three restrictions required by Sections 14.09.060, 14.09.070, 14.09.080 and 14.09.090 shall continue in place, except to the extent they are replaced by more restrictive conditions imposed by this section.

B. Residential customers and non-residential landscapes are to reduce water usage up to 40 percent.

C. City park sites shall, as an aggregate, reduce usage up to 40 percent.

D. Residential water users shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of September – last day of April: No irrigation allowed.

2. 1st day of May – last day of August: up to one day per week irrigation on Monday, if needed.

E. Nonresidential water users (including without limitation, commercial, industrial, church, cemeteries, and publicly owned users) shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of September – last day of April: No irrigation allowed.

2. 1st day of May – last day of August: up to one day per week irrigation on Monday of each week, if needed.

F. The limitations specified in subsections D and E shall not apply to a properly functioning low volume landscape irrigation system, the irrigation on container plants, or to the irrigation of new landscaping that is subject to the provisions of Section 14.09.060(E). Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

G. References in this section to any day of the week shall mean the period beginning at 12:00 a.m. on that day and ending 24 hours later.

H. Installation of any new landscaping is prohibited unless irrigation is provided through connection to an active recycled water system. In the case of new construction, the city's building official will issue a temporary final upon completion of the structural development of the property. When the city has returned to a stage two drought restriction, landscaping installation can be completed and a building final will become available upon inspection by the city.

I. Except where recycled water is used, golf courses shall reduce irrigation up to 40 percent.

J. Automobiles or equipment shall be washed only at commercial establishments that recycle their water or by equipment and means that separates debris and recycles wash water for continual use.

K. Existing pools shall not be emptied and refilled using city water unless required for health or safety reasons until the city has returned to a stage two drought restriction. Pools may be re-filled only to the extent necessary to replace evaporative losses.

L. No commitments shall be made to provide water service as part of any new land use entitlement (general plan, specific plan or amendments requesting new water allocations) until the city has returned to a stage two drought restriction. Currently approved specific plans with accompanying development agreements and projects or properties that have received water allocations in advance of full entitlements may be issued building permits so long as they comply with the remainder of this chapter.

M. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095. (Ord. 5491 § 8, 2015; Ord. 5311 § 2, 2014; Ord. 4724 § 3, 2009; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.110 Stage five drought restrictions.

During a stage five drought, the following restrictions may be required, as determined by the city manager and upon notification pursuant to Section 14.09.020(E):

A. All basic stage, or stage one, stage two, stage three and stage four restrictions required by Sections 14.09.060, 14.09.070, 14.09.080, 14.09.090 and 14.09.100 shall continue in place, except to the extent they are replaced by more restrictive conditions imposed by this section.

B. Residential users are to reduce water usage up to 50 percent.

C. Except where recycled water is used, water users shall reduce landscape irrigation as follows:

1. Turf shall not be irrigated.

2. Trees and shrubs may be irrigated with a properly functioning low volume landscape irrigation system or by use of a handheld hose equipped with a nozzle capable of completely shutting off the flow of water except when positive action or pressure to maintain the flow of water is applied. Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

D. Filling new or existing swimming pools and spas with city water is prohibited.

E. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095. (Ord. 5491 § 9, 2015; Ord. 5311 § 2, 2014; Ord. 4724 § 3, 2009; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.120 Determination of drought tolerance.

Where this chapter permits or prohibits acts based upon whether or not a planting, tree, shrub, or groundcover is “drought tolerant” the determination shall be made based upon Sunset’s *Western Garden Book* (most recent edition), or UC Davis Arboretum’s “All Stars” plant database (www.arboretum.ucdavis.edu). Where this chapter permits or prohibits acts based upon whether a form of

irrigation is “low volume drip irrigation” the determination shall be made by the director, or designee, whose determination shall be final. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.130 Determination of landscape water consumption reductions.

Whenever this chapter requires a reduction in consumption of water for irrigation purposes, the base year for measurement shall be the last year that the basic water conservation stage was in effect or a date specified by the Governor or state agency. If that data is not available for a property, allocations will be based on water use for similar properties. The city manager or designee may elect to base a reduction on the base year or on a landscape water consumption calculation if use was, in the city manager’s or designee’s, sole opinion, either excessive or extraordinarily low. For landscaping installed subsequent to the base year, the calculations shall be based on landscape water consumption calculations submitted with the landscape plan, or water consumption the previous year, whichever is less. (Ord. 5491 § 10, 2015; Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2817 § 1, 1994; Ord. 2413 § 2, 1991.)

14.09.140 Violations.

It is unlawful for any user and/or person to violate any provision or fail to comply with any of the requirements of this chapter. Causing, permitting, aiding, abetting or concealing a violation of any provision of this chapter shall constitute a violation of this chapter. A violation of the provisions of this chapter shall occur irrespective of the negligence or intent of the violator and a violation of or failure to comply with any of the requirements of this chapter may be charged as either an infraction or a misdemeanor in the discretion of the city attorney. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 3834 § 3, 2002; Ord. 2413 § 2, 1991.)

14.09.150 Enforcement authority.

A. Whenever the city manager, or designee (including, but not limited to, an enforcement officer), determines that a user and/or person has violated any provision of, or failed to meet a requirement of, this chapter, an administrative citation pursuant to Chapter 2.50 or a written compliance order pursuant to Chapter 2.52 may be issued to any user and/or person responsible for the violation.

B. Any compliance order issued may require without limitation any or all of the following:

1. The allocation of a particular amount of water to a given user and/or person responsible for the violation;
2. The issuance of a fine;
3. The installation of a flow restriction device;
4. The performance of monitoring, analyses, and reporting;
5. That violations shall cease and desist; and/or
6. The discontinuation of water service.

The compliance order shall set forth a deadline within which the requirements of the compliance order must be completed. Said compliance order shall further advise that, should the violator fail to comply with the compliance order within the established deadline, a hearing on the compliance order shall be set.

(Ord. 5491 § 11, 2015; Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 3034 § 3, 2002; Ord. 2817 § 1, 1994; Ord. 2413 § 2, 1991.)

14.09.160 Hearing.

If full compliance is not achieved within the time specified in the compliance order, a hearing on the compliance order shall be set pursuant to Chapter 2.52. All penalties and remedies authorized by Chapter 2.52 shall apply to violations of this chapter. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.170 Appeal.

Any user and/or person receiving a compliance order under Section 14.09.150 may appeal the determination of the director, or designee, to a hearing panel drawn from the membership of the board of appeals. The notice of appeal must be received by the city's environmental utilities department within 10 days from the date of the compliance order. Notice of hearing and hearing on the appeal will be conducted pursuant to the requirements of Chapter 2.52. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.180 Separate offense for each day.

Any user and/or person that violates any provision of this chapter shall be guilty of a separate offense for each and every day during any portion of which any such user and/or person commits, continues, permits, or causes a violation thereof, and shall be punished accordingly. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.190 Public nuisance.

In addition to the enforcement processes and penalties hereinbefore provided, any condition caused or permitted to exist in violation of any of the provisions of this chapter is a threat to public health, safety, and welfare, and is declared and deemed a nuisance, and may be summarily abated or restored by the city at the violator's expense, and/or a civil action to abate, enjoin, or otherwise compel the cessation of such nuisance may be initiated and/or taken by the city. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.200 Remedies not exclusive.

Remedies under this chapter are in addition to and do not supersede or limit any and all other remedies, civil or criminal. The remedies provided for herein shall be cumulative and not exclusive. (Ord. 5311 § 2, 2014; Ord. 4629 § 2, 2008.)

14.09.210 Judicial review.

Any decision of the hearing panel shall be final. Any user and/or person aggrieved by an order of the hearing panel may obtain review of the order in the Superior Court by filing with the Court a petition for

writ of mandate within 90 days pursuant to California Code of Civil Procedure Section 1094.6. (Ord. 5311 § 2, 2014; Ord. 4629 § 2, 2008.)

14.09.220 Chapter severable.

The provisions of this chapter are severable. The city council declares that it would have adopted the remainder of this chapter even if any of its provisions are declared unlawful or unenforceable. (Ord. 5311 § 2, 2014; Ord. 4629 § 2, 2008.)

Appendix M – Roseville Municipal Code 14.08.090, 14.08.095, 14.08.100

Roseville Municipal Code

Title 14 PUBLIC UTILITIES

Chapter 14.08 WATER

14.08.090 Service charges for metered service.

There shall be due and payable the following monthly charges, upon submission of the bill by the city to the owner of the property supplied with service, for all treated water measured by meters for residential, commercial, industrial and manufacturing or other purposes:

A. Monthly Quantity Rates. Effective July 5, 2019 and July 1, 2020, the monthly quantity rates on billings shall be as follows:

	Effective 7/5/2019	Effective 7/1/2020
Potable water usage (per 100 cubic feet)	$1.30	$1.34
Recycled water usage (per 100 cubic feet)	$0.65	$0.67

B. Monthly Service Charges. Effective July 5, 2019 and July 1, 2020, the monthly service charges on billings shall be as follows:

Meter Size (inches)	Peak Flow Rate (gallons per minute)	Effective 7/5/2019	Effective 7/1/2020
Up to 3/4	30	$27.26	$28.08
1	50	$42.07	$43.34
1-1/2	100	$79.09	$81.47
2	160	$123.51	$127.22
3	350	$264.20	$272.13
4	630	$471.52	$485.67
6	1300	$967.61	$996.64
8	2800	$2,078.26	$2,140.61
10	4200	$3,114.89	$3,208.31

C. The total amount due and payable shall be the sum of the monthly service charge plus the quantity rate. The monthly service charge is due and payable regardless of whether water has been consumed. The service charge shall be the greater of the charge based on the meter size or flow rate, with the following exceptions:

1. No service charge shall be made for fire service that has backflow prevention with detector check devices approved by the environmental utilities director.

2. No service charge shall be made for recycled water utility back-up systems that are required for reliability only and have backflow prevention and metering approved by the environmental utilities director. This exclusion does not extend to systems that are regularly required as part of normal operation. The recycled water operation shall be responsible for water volumetric charges for these services and any costs associated with meter maintenance.

D. For purposes of charging for treated water measured by meters:

1. A residential account is defined as a single metered water service which serves three or less dwelling units.

2. A nonresidential account is defined as a single metered water service which serves more than three dwelling units, or serves commercial, industrial, manufacturing, irrigation or other nonresidential land uses.

E. For single-family residential services that require automatic fire protection systems pursuant to Section 16.16.120, the increased meter size will not be assessed an additional charge associated with the fire protection system requirement. Service charges shall be based on the required service size as determined by the Uniform Plumbing Code without consideration for any fire protection system required by Section 16.16.120. (Ord. 6100 § 3, 2019; Ord. 5837 § 2, 2017; Ord. 5610 § 2, 2016; Ord. 5174 § 2, 2013; Ord. 4957 § 1, 2011; Ord. 4724 § 2, 2009; Ord. 4680 § 1, 2008; Ord. 4639 § 1, 2008; Ord. 4508 § 1, 2007; Ord. 4473 § 1, 2006; Ord. 4263 § 2, 2005; Ord. 4001 § 3, 2003; Ord. 3964 § 1, 2003; Ord. 3756 § 1, 2001; Ord. 3687 § 1, 2001; Ord. 3101 § 1, 1997; Ord. 2708 § 1, 1993; Ord. 1953 § 1, 1986; Ord. 1918 § 1, 1985; Ord. 1418 § 8, 1978; Ord. 1239 § 1, 1974; prior code § 27.14.)

14.08.095 Water rate surcharge and excess water use charge.

Effective on billings as of May 1, 2009, all quantity rates identified in Section 14.08.090, but not recycled water, will be subject to the water shortage surcharges and excess water use charges identified as follows when the drought stages identified and set forth in Sections 14.09.070 through 14.09.110 are declared, provided that the city manager determines that imposition of such charges is required under the identified drought stage.

Summary of Water Shortage Rate Charges			
Stage	**Water Use Restriction**	**Water Shortage Surcharge (*1)**	**Excess Water Use Charge (*2)**
First Year of a Water Shortage			
Stage 1	10%	None	None
Stage 2	20%	15%	None
Stage 3	30%	33%	25%
Stage 4	40%	45%	50%
Stage 5	50%	60%	100%

Summary of Water Shortage Rate Charges			
Stage	**Water Use Restriction**	**Water Shortage Surcharge (*1)**	**Excess Water Use Charge (*2)**
Subsequent Year(s) of a Water Shortage			
Stage 1	10%	15%	None
Stage 2	20%	20%	25%
Stage 3	30%	40%	50%
Stage 4	40%	50%	100%
Stage 5	50%	75%	200%

Notes:
(*1) The water shortage surcharge (identified hereafter) shall be added to all quantity rates identified in Section 14.08.090 as applicable, according to drought stage.
(*2) In addition to the applicable water shortage surcharge, an excess water use charge shall be added to water rates identified in Section 14.08.090, according to drought stage.

(Ord. 5837 § 3, 2017; Ord. 5311 § 1, 2014; Ord. 4724 § 2, 2009; Ord. 3101 § 1, 1997; Ord. 2414 § 1, 1991.)

14.08.095 Water rate surcharge and excess water use charge.

Effective on billings as of May 1, 2009, all quantity rates identified in Section 14.08.090, but not recycled water, will be subject to the water shortage surcharges and excess water use charges identified as follows when the drought stages identified and set forth in Sections 14.09.070 through 14.09.110 are declared, provided that the city manager determines that imposition of such charges is required under the identified drought stage.

Summary of Water Shortage Rate Charges			
Stage	**Water Use Restriction**	**Water Shortage Surcharge (*1)**	**Excess Water Use Charge (*2)**
First Year of a Water Shortage			
Stage 1	10%	None	None
Stage 2	20%	15%	None
Stage 3	30%	33%	25%
Stage 4	40%	45%	50%
Stage 5	50%	60%	100%
Subsequent Year(s) of a Water Shortage			
Stage 1	10%	15%	None
Stage 2	20%	20%	25%
Stage 3	30%	40%	50%

Summary of Water Shortage Rate Charges			
Stage	**Water Use Restriction**	**Water Shortage Surcharge (*1)**	**Excess Water Use Charge (*2)**
Stage 4	40%	50%	100%
Stage 5	50%	75%	200%

Notes:
(*1) The water shortage surcharge (identified hereafter) shall be added to all quantity rates identified in Section 14.08.090 as applicable, according to drought stage.
(*2) In addition to the applicable water shortage surcharge, an excess water use charge shall be added to water rates identified in Section 14.08.090, according to drought stage.

(Ord. 5837 § 3, 2017; Ord. 5311 § 1, 2014; Ord. 4724 § 2, 2009; Ord. 3101 § 1, 1997; Ord. 2414 § 1, 1991.)

14.08.100 Flat water rates.

The following service charges shall apply to flat rate consumers that the environmental utilities director determines are not cost effective to assign metered rates. The environmental utilities director shall conduct a water use study for consumers whom he or she determines may not be reasonably metered, and the director shall assign such consumers to an appropriate service rate level as set forth in this section. Water service rates for flat rate residential consumers shall be due and payable on a monthly basis according to the appropriate grouping set out in this section.

Effective July 5, 2019, and July 1, 2020, the flat rates on billings shall be as follows:

Nonmetered or Flat Service Charges	**Effective 7/5/2019**	**Effective 7/1/2020**
Single-family lots under 4,900 square feet; each mobile home unit not within a park maintaining its own distribution system and service; each dwelling unit of duplexes, triplexes, fourplexes, unmetered apartments and other multiple living units; other detached living units; and offices and stores with less than peak use of 250 gallons per day	$37.38	$38.51
Single-family lots 4,901 to 8,900 square feet	$42.13	$43.40
Single-family lots 8,901 to 12,000 square feet	$45.79	$47.17
Single-family lots 12,001 to 15,000 square feet	$49.36	$50.85
Single-family lots existing before July 1, 1977, which are in excess of 15,000 square feet	$54.36	$58.16
Mobile home parks, per living unit	34.47	35.51
All those single-family lots over 15,000 square feet, created on or after July 1, 1977, shall be metered pursuant to Section 14.08.105		

(Ord. 6100 § 5, 2019; Ord. 5837 § 4, 2017; Ord. 5610 § 3, 2016; Ord. 5174 § 2, 2013; Ord. 4957 § 1, 2011; Ord. 4724 § 2, 2009; Ord. 4508 § 1, 2007; Ord. 4263 § 2, 2005; Ord. 3964 § 1, 2003; Ord. 3756, § 2, 2001; Ord. 3687 § 1, 2001; Ord. 3101 § 1, 1997; Ord. 2708 § 1, 1993; Ord. 1918 § 1, 1985; Ord. 1418 § 9, 1978; Ord. 1239 § 2, 1974; prior code § 27.15.)

Appendix N – CalWEP BMP Compliance Reports

Contact Information Update

Date	4/29/20
Water District	City of Roseville
District Address	2005 Hilltop Circle, Roseville, CA 95747
District Website	www.roseville.ca.us

Conservation Coordinator

First Name	Bobby
Last Name	Alvarez
Title	Water Conservation Administrator
Phone	(916) 746-1710
Email	balvarez@roseville.ca.us

General Manager

First Name	Sean
Last Name	Bigley
Title	Assistant Environmental Utilities Director
Phone	(916) 774-5513
Email	sbigley@roseville.ca.us

Other Contact

First Name	Jennifer
Last Name	Sbaffi
Title	Customer Service Supervisor
Phone	(916) 746-1707
Email	jsbaffi@roseville.ca.us

Gallons Per Capita Water Reduction

Reporting Year	2019
Data Year	2019

What was your GPCD the last 5 years?

Year	GPCD
2019	190.50
2018	190.90
2017	194.08
2016	177.32
2015	165.79

If not using programmatic method of water efficiency, what is your district implementing to reduce water use? Provide a brief narrative.

City of Roseville does use a programmatic method of water efficiency.

If your district's GPCD is not declining, please provide a narrative of why and what your district will be doing to accomplish water usage savings.

The City of Roseville's GPCD is declining.

Metering With Commodity Rates

Are all connections metered? ○ Yes ◉ No ○ NA

If not 100% metered, please provide a narrative of why and when your district will be fully metered.

The City of Roseville implemented a Meter Retrofit Program beginning in 2001 and concluding in 2011, whereby 99%+ of the City's service connections were retrofitted with meters, either individually or with master meters. In general, accounts were left unmetered where site plumbing issues make it challenging, if not practically impossible, to provide an individual meter to the account location at that time.

Currently, the remaining <1% of unmetered services are retrofitted as part of an ongoing

Are all metered connections billed by water usage? ◉ Yes ○ No ○ NA

If no, please provide a brief narrative of why and when your district will be billing by water usage?

Retail Conservation Pricing

Is your district billing utilizing conserving rate structure? ○ Yes ◉ No ○ NA

Website to billing rate structure	http://qcode.us/codes/roseville/

If no, please provide a brief narrative of why or when your district will be implementing a conserving rate structure.

As a component of its meter retrofit program, the City adopted conservation pricing for water on all metered accounts from 2011 through 2015. To comply with Proposition 218 requirements, a law passed in California, the City transitioned to a per-use, uniform rate billing structure in February 2016.

Water Waste Prohibition

Water Waste Ordinance (●) Yes ( ) No ( ) NA

Ordinance Website Address	http://qcode.us/codes/roseville/

Other Pertinent Links

	Title	Website
1	City of Roseville Water Efficiency Website	https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=8905954
2	City of Roseville Water Efficiency - Report Water Waste	https://roseville.maps.arcgis.com/apps/GeoForm/index.html?appid=d1a535cf27c845449697c6cf563d0469
3		
4		
5		

Brief Comments/Narrative

The City currently restricts water waste within its service area. Roseville Municipal Code Chapter 14.09, Water Conservation Ordinance, defines water waste and associated penalties of continued infractions. Per the ordinance, customers in violation are provided a series of notifications at one week intervals: first a courtesy notice, second an administrative warning, and finally a formal citation. If the situation is not remedied by the time specified in the formal citation, additional measures can be taken to force compliance. These measures include fines, water restrictions, low flow devices, or discontinued service.

Water Loss Control

Water Loss Program? (●) Yes ( ) No ( ) NA

If not using AWWA Water Audit Software, brief description of program and/or link to website.

City of Roseville uses AWWA Water Audit Software.

AWWA Water Audit Software? (●) Yes ( ) No ( ) NA

Water Audit Data Validity Score	68/100
Data Validity Level	III (51-70)
Date of Last Analysis	2018

Brief Comments/Narrative

In 2009 the City began using AWWA Water Loss software to develop an annual water loss audit. Results from the audit have helped the City identify where in the distribution process leaks are occurring. When coupled with detailed pipeline information stored in the City's asset management system, audit information helps identify leak-prone areas of the City's distribution system.

These areas are then targeted for annual visual and auditory leak detection surveys to isolate individual areas of leakage. Once isolated, the City's responses include corrosion monitoring programs, service cathodic protection and/or replacement. The City's asset management software is then updated with identified leaks, which in turn provides more information useful for prioritization of future rehabilitation programs.

Public Outreach

Briefly list/describe your Public Outreach Programs:

	Title	Website
1	News stories on main page	http://roseville.ca.us/
2	Green Living Workshops	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=15390262
3	Mulch Mayhem	http://roseville.ca.us/workspaces/One.aspx?objectId=12537136&contextId=9754960
4	Water Efficiency Rebates	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=11491211
5	EU Today newsletter	http://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=87 17422
6	Landscape makeover contest	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=8944823
7	Regional Water Authority's Water Efficiency Program	www.bewatersmart.info
8	EPA Water Sense Partner, Fix-a-Leak Week	www.epa.gov
9		
10		

Brief Comments/Narrative

See website links for additional information.

School Education Programs

Briefly list/describe your School Education Programs:

	Title	Website
1	Be Water Smart News	www.bewatersmart.info
2	Water, the Never Ending Cycle (water cycle program)	http://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=8715907
3	Hydro Heroes (1st-3rd grade program)	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=8968185
4	Water Warriors (1st-3rd grade program)	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=8968201
5	H2Own (4th-6th grade program)	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=8968181
6	Keepin' It Clean (4th-6th grade program)	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=8968188
7	Planet Protectors comic books and lesson plans for Kindergarten	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=8940700
8	Water Spots video contest for high school students	http://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=8715907
9	Living Rivers of the Sacramento Valley Program	http://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=8715907
10	Utility Exploration Center Exhibits	http://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=8715907

Brief Comments/Narrative

Utility Exploration Center interactive exhibits teaching about water efficiency; website resources and links; teacher training workshops; other educational initiatives for various school-age groups.

Planet Protectors comic books and lesson plans (pre/post activities) for our Kindergarten Program, Hydro Heroes, Water Warriors, H2Own and Keepin it Clean; Sac Bee newspaper supplement "Water, the Never Ending Cycle".

Water Spots video contest for high school students (water efficiency theme); Living Rivers of the Sacramento Valley Program (watershed, human impacts, uses).

Residential Programs

Briefly list/describe your Residential Programs:

	Title	Website
1	Cash for Grass Rebate	http://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10126299
2	Showerhead Replacement	http://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10783212
3	Faucet Aerators Replacement	http://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10783212
4	Toilet Flapper Replacement	http://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10783212
5	Water Wise Housecalls	http://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10783212
6	Weather Based Controller Rebate	http://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10126299
7	Door Hangers	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=8905954
8	Water Waste Patrols	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=8905954
9	Irrigation Efficiency Rebate	http://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10126299
10		

Are your programs effective? (●) Yes ( ) No ( ) NA

Has your district reached program participation saturation? ( ) Yes (●) No ( ) NA

Brief Comments/Narrative

The City's Water Efficiency programs reach approximately 1000 residences per year, with continued efforts to engage the community and residents in rebate programs, water efficiency education, as well as best practices of water resource management. The City continues its effort to reach residents via water efficiency rebate programs, free water wise house call services, water waste patrol and outreach.

Commercial, Institutional, and Industrial Programs

Briefly list/describe your CII Programs:

	Title	Website
1	Landscape Conversion and Irrigation Upgrade Rebate	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10126299
2	Food Service One Stop Water Efficiency Rebate	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10126299
3	Customized Rebate Program	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10126299
4	Water Wise Evaluation Interior	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10866145
5	Water Wise Evaluation Exterior	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10866145
6	Water Budget Evaluation	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10866145
7	Water Waste Patrols	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=8905954
8		

Are your programs effective? (●) Yes ( ) No ( ) NA

Has your district reached program participation saturation? ( ) Yes (●) No ( ) NA

Brief Comments/Narrative

The City continues its water efficiency efforts by engaging the commercial community with multiple programs and outreach. Our water wise evaluations are one of our most valuable water saving services.

Landscape Programs

Briefly list/describe your Landscape Programs:

	Title	Website
1	Cash for Grass Rebate	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10126299
2	Irrigation Efficiency Rebate	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10126299
3	Weather Based Irrigation Controller Rebate	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10126299
4	Green Gardening Events	https://roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=15390262
5	Water Wise Evaluation Exterior	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10866145
6	DIY Landscape Workshops	https://roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=15390262
7	Landscape Conversion and Irrigation Upgrade Rebate	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10126299
8	Water Efficient Landscape Ordinance (WELO)	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=8905954
9		
10		

Are your programs effective? (●) Yes ( ) No ( ) NA

Has your district reached program participation saturation? ( ) Yes (●) No ( ) NA

Brief Comments/Narrative

The City's Water Efficiency programs reach approximately 1000 residences and approximately 1000 commercial sites for landscape-related visits per year, with continued efforts to engage the community and residents in rebate programs, water efficiency education, as well as best practices of water resource management. The City continues its effort to reach residents and commercial customers via water efficiency rebate programs, free water wise house call services, commercial site evaluations, water waste patrol and outreach.

Contact Information Update

Date	4/1/19
Water District	City of Roseville
District Address	2005 Hilltop Circle, Roseville CA 95747
District Website	www.roseville.ca.us

Conservation Coordinator

First Name	Bobby
Last Name	Alvarez
Title	Water Conservation Administrator
Phone	(916)746-1710
Email	balvarez@roseville.ca.us

General Manager

First Name	Sean
Last Name	Bigley
Title	Acting Water Utility Manager
Phone	(916)774-5513
Email	sbigley@roseville.ca.us

Other Contact

First Name	Jennifer
Last Name	Sbaffi
Title	Acting Administrative Analyst
Phone	(916)746-1707
Email	jsbaffi@roseville.ca.us

Gallons Per Capita Water Reduction

Reporting Year	2018
Data Year	2018

What was your GPCD the last 5 years?

Year	GPCD
2018	190.9
2017	194.08
2016	177.32
2015	165.79
2014	201.45

If not using programmatic method of water efficiency, what is your district implementing to reduce water use? Provide a brief narrative.

City of Roseville Water Conservation Ordinance Chapter detailing drought stages and restriction on water use to comply with the Governor's Executive Order and State Water Resource Control Board direction. http://qcode.us/codes/roseville/

Water Efficient Landscape Ordinance (WELO): http://qcode.us/codes/roseville/

CA Green Building Code included in our standards:

http://www.roseville.ca.us/gov/development_services/building/current_code_n_design_criteria.asp

The City uses its Asset Management System to detect leak-prone areas and then schedules projects to repair sections of mainline in those areas. The City also works

If your district's GPCD is not declining, please provide a narrative of why and what your district will be doing to accomplish water usage savings.

The City of Roseville's GPCD is not currently declining. This is primarily due to the recovery from drought conditions following the 2014-2015 drought period. While GPCD numbers have been slowly increasing, the City continues efforts to educate residents on the principles and best practices of Water Efficiency and Conservation. The City is already in compliance with targets for 20% water use reduction by the year 2020 by a significant margin, in accordance with SBX7-7.

Metering With Commodity Rates

Are all connections metered? ○ Yes ◉ No ○ NA

If not 100% metered, please provide a narrative of why and when your district will be fully metered.

The City of Roseville implemented a Meter Retrofit Program beginning in 2001 and concluding in 2011, whereby 99%+ of the City's service connections were retrofitted with meters, either individually or with master meters. In general, accounts were left unmetered where site plumbing issues make it challenging, if not practically impossible, to provide an individual meter to the account location at that time.

Currently, the remaining <1% of unmetered services are retrofitted as part of an ongoing

Are all metered connections billed by water usage? ◉ Yes ○ No ○ NA

If no, please provide a brief narrative of why and when your district will be billing by water usage?

Retail Conservation Pricing

Is your district billing utilizing conserving rate structure? ○ Yes ◉ No ○ NA

Website to billing rate structure	Roseville Municipal Code Chapter 14.08.090; http://qcode.us/codes/roseville/

If no, please provide a brief narrative of why or when your district will be implementing a conserving rate structure.

As a component of its meter retrofit program, the City adopted conservation pricing for water on
all metered accounts from 2011 through 2015. To comply with Proposition 218 requirements, the
City transitioned to a per-use, uniform rate billing structure in February 2016.

Water Waste Prohibition

Water Waste Ordinance ◉ Yes ○ No ○ NA

Ordinance Website Address	http://qcode.us/codes/roseville/

Other Pertinent Links

	Title	Website
1	City of Roseville Water Efficiency Website	https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=8905954
2	City of Roseville Water Efficiency - Report Water Waste	https://roseville.maps.arcgis.com/apps/GeoForm/index.html?appid=d1a535cf27c845449697c6cf563d0469
3		
4		
5		

Brief Comments/Narrative

The City currently restricts water waste within its service area. Roseville Municipal Code Chapter 14.09, Water Conservation Ordinance, defines water waste and associated penalties of continued infractions. Per the ordinance, customers in violation are provided a series of notifications at one week intervals: first a courtesy notice, second an administrative warning, and finally a formal citation. If the situation is not remedied by the time

Water Loss Control

Water Loss Program? ◉ Yes ○ No ○ NA

If not using AWWA Water Audit Software, brief description of program and/or link to website.

AWWA Water Audit Software? ◉ Yes ○ No ○ NA

Water Audit Data Validity Score	67/100
Data Validity Level	III (51-70)
Date of Last Analysis	2017

Brief Comments/Narrative

In 2009 the City began using AWWA Water Loss software to develop an annual water loss audit. Results from the audit have helped the City identify where in the distribution process leaks are occurring. When coupled with detailed pipeline information stored in the City's asset management system, audit information helps identify leak-prone areas of the City's distribution system. These areas are then targeted for annual visual and auditory leak detection surveys to isolate individual areas of leakage. Once isolated, the City's responses include corrosion monitoring programs, service cathodic protection and/or replacement. The City's asset management software is then updated with identified leaks, which in turn provides more

Public Outreach

Briefly list/describe your Public Outreach Programs:

	Title	Website
1	News stories on main page	http://roseville.ca.us/
2	Green Living Workshops	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=15390262
3	Mulch Mayhem	http://roseville.ca.us/workspaces/One.aspx?objectId=12537136&contextId=9754960
4	Earth Day	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=11491211
5	Water Efficiency Rebates	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=11491211
6	EU Today newsletter	http://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=87 17422
7	Landscape makeover contest	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=8944823
8	Regional Water Authority's Water Efficiency Program	www.bewatersmart.info
9		
10		

Brief Comments/Narrative

School Education Programs

Briefly list/describe your School Education Programs:

	Title	Website
1	Be Water Smart News	www.bewatersmart.info
2	Water, the Never Ending Cycle (water cycle program)	http://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=87 15907
3	Hydro Heroes (1st-3rd grade program)	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=8968185
4	Water Warriors (1st-3rd grade program)	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=8968201
5	H2Own (4th-6th grade program)	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=8968181
6	Keepin' It Clean (4th-6th grade program)	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=8968188
7	Planet Protectors comic books and lesson plans for Kindergarten	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=8940700
8	Water Spots video contest for high school students	http://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=87 15907
9	Living Rivers of the Sacramento Valley Program	http://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=8715907
10	Utility Exploration Center	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=8715907

Brief Comments/Narrative

Utility Exploration Center interactive exhibits teaching about water efficiency; website resources and links; teacher training workshops

Planet Protectors comic books and lesson plans (pre/post activities) for our Kindergarten Program, Hydro Heroes, Water Warriors, H2Own and Keepin it Clean; Sac Bee newspaper supplement "Water, the Never Ending Cycle".

Water Spots video contest for high school students (water efficiency theme); Living Rivers of the Sacramento Valley Program (watershed, human impacts, uses).

Residential Programs

Briefly list/describe your Residential Programs:

	Title	Website
1	Cash for Grass Rebates	https://www.roseville.ca.us/rebates
2	Showerhead Replacements	https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10126299
3	Faucet Aerators	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=10160801
4	Landscape Water Surveys	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=10866100
5	Residential Irrigation Efficiency Housecalls	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=10160801
6	Leak Detection Surveys	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=8945467
7	WaterSense Spec Toilets Installed	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=8945467
8	Door Hangers	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=890595
9	Water Waste Patrols	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=10160801
10		

Are your programs effective? (●) Yes ( ) No ( ) NA

Has your district reached program participation saturation? ( ) Yes (●) No ( ) NA

Brief Comments/Narrative

The City's Water Efficiency programs reach approximately 1000 residences per year, with continued efforts to engage the community and residents in rebate programs, water efficiency education, as well as best practices of water resource management. Specifically, the City has reached saturation with respect to showerhead replacements and faucet aerators, with continued efforts to promote the Cash for Grass and Smart Irrigation Controller incentives.

Commercial, Institutional, and Industrial Programs

Briefly list/describe your CII Programs:

	Title	Website
1	High Efficiency Toilet Rebates	https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=8905872
2	High Efficiency Urinal Rebates	https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=8905872
3	High Efficiency Clothes Washer Rebates	https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=8905872
4	Commercial Laundry Retrofits	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=8904588
5	Car Wash Reclamation Systems	https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=8905872
6	Commercial Water Audits	http://members.questline.com/FacilityAssessment.aspx?accountID=2631
7	Green Gardening Events	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10126299
8		

Are your programs effective? (●) Yes ( ) No ( ) NA

Has your district reached program participation saturation? ( ) Yes (●) No ( ) NA

Brief Comments/Narrative

Landscape Programs

Briefly list/describe your Landscape Programs:

	Title	Website
1	Cash for Grass Rebates	https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10126299
2	Irrigation Retrofits	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10126299
3	Smart Irrigation Controllers	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10126299
4	Green Gardening Events	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10126299
5	Landscape Water Surveys	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10126299
6		
7		
8		
9		
10		

Are your programs effective? (●) Yes ( ) No ( ) NA

Has your district reached program participation saturation? ( ) Yes (●) No ( ) NA

Brief Comments/Narrative

make Bobby give us good language for cool workshops

Appendix O – Adoption Resolutions and Submission

A copy of the adoption resolution will be provided in the final version of the 2020 Urban Water Management Plan.

Appendix P – DWR UWMP Checklist

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location
10608.20(e)	Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	Baselines and Targets	Chapter 5	Appendix F
10608.22	Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5 year baseline. This does not apply if the suppliers base GPCD is at or below 100.	Baselines and Targets	Section 5.7.2	Appendix F
10608.24(a)	Retail suppliers shall meet their water use target by December 31, 2020.	Baselines and Targets	Section 5.7	Appendix G
10608.24(d)(2)	If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment.	Baselines and Targets	Sections 5.2 and 5.5.7	Appendix G
10608.36	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.	Baselines and Targets	Section 5.1	NA
10608.4	Retail suppliers shall report on their progress in meeting their water use targets. The data shall be reported using a standardized form.	Baselines and Targets	Section 5.8 and App E	Appendix G
10631(e)(1)	Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years.	Demand Management Measures	Sections 9.2 and 9.3	Section 9.1
10631(e)(2)	Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program.	Demand Management Measures	Sections 9.1 and 9.3	NA
10608.26(a)	Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets.	Plan Adoption, Submittal, and Implementation	Chapter 10	Section 10.2 Section 10.3
10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.	Plan Adoption, Submittal, and Implementation	Section 10.2.1	Appendix B

10621(f)	Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.	Plan Adoption, Submittal, and Implementation	Sections 10.3.1 and 10.4	Appendix O
10635(c)	Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 60 days after the submission of the plan to DWR.	Plan Adoption, Submittal, and Implementation	Sections 8.12, 10.4	Appendix K: Exhibit C
10642	Provide supporting documentation that the urban water supplier made the plan and contingency plan available for public inspection, published notice of the public hearing, and held a public hearing about the plan and contingency plan.	Plan Adoption, Submittal, and Implementation	Sections 10.2.2, 10.3, and 10.5	Appendix B
10642	The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.	Plan Adoption, Submittal, and Implementation	Section 10.2	Appendix B
10642	Provide supporting documentation that the plan and contingency plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Section 10.3.1	Appendix O, Appendix K: Exhibit C
10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Plan Adoption, Submittal, and Implementation	Section 10.5	Appendix O
10644(a)(1)	Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption.	Plan Adoption, Submittal, and Implementation	Section 10.6	Appendix O
10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Plan Adoption, Submittal, and Implementation	Sections 10.4.1 and 10.4.2	Appendix O
10645(a)	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.5	Appendix O
10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its water shortage contingency plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.6	Appendix K: Exhibit C
10620(b)	Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.	Plan Preparation	Section 2.1	Section 2.1

10620(d)(2)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan Preparation	Section 2.5.2	Section 2.4
10642	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan.	Plan Preparation	Section 2.6	Appendix B
10630.5	Each plan shall include a simple description of the supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information.	Summary	Chapter 1	Executive Summary
10631(a)	Describe the water supplier service area.	System Description	Section 3.1	Section 3.2
10631(a)	Describe the climate of the service area of the supplier.	System Description	Section 3.3	Section 3.3
10631(a)	Provide population projections for 2025, 2030, 2035, 2040 and optionally 2045.	System Description	Section 3.4	DWR Table 3-1
10631(a)	Describe other social, economic, and demographic factors affecting the supplier's water management planning.	System Description	Section 3.4	Section 3.4.2
10631(a)	Describe the land uses within the service area.	System Description	Section 3.5	Section 3.5
10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Sections 3.4 and 5.4	DWR Table 3-1
10631(b)	Identify and quantify the existing and planned sources of water available for 2020, 2025, 2030, 2035, 2040 and optionally 2045.	System Supplies	Section 6.2.8	DWR Table 6-8 DWR Table 6-9
10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.2	DWR Table 6-1 COR Table 7-C
10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe drought.	System Supplies	Section 6.2	Section 7.2
10631(b)(2)	When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies.	System Supplies	Section 6.1	Section 6.11
10631(b)(3)	Describe measures taken to acquire and develop planned sources of water.	System Supplies	Section 6.1	Section 6.12

10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of plan authorization	System Supplies	Section 6.2.2	Section 6.3.2
10631(b)(4)(B)	Describe the groundwater basin.	System Supplies	Section 6.2.2	Section 6.3.1
10631(b)(4)(B)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump.	System Supplies	Section 6.2.2	Section 6.3.1
10631(b)(4)(B)	For unadjudicated basins, indicate whether or not the department has identified the basin as a high or medium priority. Describe efforts by the supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	System Supplies	Section 6.2.3	Section 6.3.1
10631(b)(4)(C)	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	System Supplies	Section 6.2.4	Section 6.3.3
10631(b)(4)(D)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System Supplies	Section 6.2	Section 6.12.2
10631(c)	Describe the opportunities for exchanges or transfers of water on a short-term or long- term basis.	System Supplies	Section 6.7	Section 6.10
10631(f)	Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and for a period of drought lasting 5 consecutive water years.	System Supplies	Section 6.8	Section 6.12
10631(g)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.6	Section 6.9
10631(h)	Retail suppliers will include documentation that they have provided their wholesale supplier(s) - if any - with water use projections from that source.	System Supplies	Section 2.5.1	Appendix A
10631(h)	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types.	System Supplies	Section 2.5.1	NA

10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System Supplies (Recycled Water)	Section 6.2	Section 6.5.1
10633(c)	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Section 6.2	Section 6.7
10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System Supplies (Recycled Water)	Section 6.2	Section 6.8
10633(e)	Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	System Supplies (Recycled Water)	Section 6.2	Section 6.7
10633(f)	Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System Supplies (Recycled Water)	Section 6.2	Section 6.8
10633(g)	Provide a plan for optimizing the use of recycled water in the supplier's service area.	System Supplies (Recycled Water)	Section 6.2	Section 6.8
10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Section 4.2	COR Table 4-A DWR Table 4-1, 4-2, 4-3
10631(d)(3)(A)	Report the distribution system water loss for for each of the 5 years preceding the plan update.	System Water Use	Section 4.3	COR Table 4-D DWR Table 4-4
10631(d)(3)(C)	Retail suppliers shall provide data to show the distribution loss standards were met.	System Water Use	Section 4.2	4.2.6
10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier.	System Water Use	Section 4.5	COR Table 4-G
10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water Shortage Contingency Planning	Chapter 8	Appendix K: Exhibit C
10632(a)(2)(A)	Provide the written decision-making process and other methods that the supplier will use each year to determine its water reliability.	Water Shortage Contingency Planning	Section 8.2	WSCP Table 5
10632(a)(2)(B)	Provide data and methodology to evaluate the supplier’s water reliability for the current year and one dry year pursuant to factors in the code.	Water Shortage Contingency Planning	Section 8.2	WSCP Table 5 Steps 1-8

10632(a)(3)(A)	Define six standard water shortage levels of 10, 20, 30, 40, 50 percent shortage and greater than 50 percent shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply.	Water Shortage Contingency Planning	Section 8.3	WSCP Table 4
10632(a)(3)(B)	Suppliers with an existing water shortage contingency plan that uses different water shortage levels must cross reference their categories with the six standard categories.	Water Shortage Contingency Planning	Section 8.3	WSCP Table 4
10632(a)(4)(A)	Suppliers with water shortage contingency plans that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Water Shortage Contingency Planning	Section 8.4	WSCP Section 1.5
10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water Shortage Contingency Planning	Section 8.4	WSCP Table 6
10632(a)(4)(C)	Specify locally appropriate operational changes.	Water Shortage Contingency Planning	Section 8.4	WSCP Section 1.5
10632(a)(4)(D)	Specify additional mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions are appropriate to local conditions.	Water Shortage Contingency Planning	Section 8.4	WSCP Table 6
10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Water Shortage Contingency Planning	Section 8.4	WSCP Table 6
10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Water Shortage Contingency Planning	Section 8.5	WSCP Table 5
10632(a)(5)(B) 10632(a)(5)(C)	Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications.	Water Shortage Contingency Planning	Section 8.5, 8.6	WSCP Table 5
10632(a)(7)(A)	Describe the legal authority that empowers the supplier to enforce shortage response actions.	Water Shortage Contingency Planning	Section 8.7	WSCP Section 1.2
10632(a)(7)(B)	Provide a statement that the supplier will declare a water shortage emergency Water Code Chapter 3.	Water Shortage Contingency Planning	Section 8.7	WSCP Table 5: Step 11

10632(a)(7)(C)	Provide a statement that the supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency.	Water Shortage Contingency Planning	Section 8.7	WSCP Table 2: Step 12
10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	Section 8.8	WSCP Section 1.6
10632(a)(8)(B)	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions	Water Shortage Contingency Planning	Section 8.8	WSCP Section 1.7
10632(a)(8)(C)	Describe the cost of compliance with Water Code Chapter 3.3: Excessive Residential Water Use During Drought.	Water Shortage Contingency Planning	Section 8.8	WSCP Section 1.7
10632(a)(9)	Retail suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance.	Water Shortage Contingency Planning	Section 8.9	WSCP Table 2 Step 15
10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the water shortage contingency plan to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Water Shortage Contingency Planning	Section 8.10	WSCP Table 2 Step 16
10632(b)	Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.	Water Shortage Contingency Planning	Section 8.11	WSCP Table 6
10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water Supply Reliability Assessment	Section 7.4	Section 7.2.5
10634	Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability.	Water Supply Reliability Assessment	Chapter 7	Section 7.1.2
10635(a)	Assess the water supply reliability during normal, dry, and multiple dry water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years.	Water Supply Reliability Assessment	Section 7.3	DWR Table 7.2 DWR Table 7.3 DWR Table 7.4
10635(b)	Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.	Water Supply Reliability Assessment	Section 7.3	DWR Table 7.5

10635(b)(1)	Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts 5 consecutive years.	Water Supply Reliability Assessment	Section 7.3	Section 7.2.5
10635(b)(2)	Include a determination of the reliability of each source of supply under a variety of water shortage conditions.	Water Supply Reliability Assessment	Section 7.3	COR Table 7-D
10635(b)(3)	Include a comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.	Water Supply Reliability Assessment	Section 7.3	DWR Table 7.5
10635(b)(4)	Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change condition, anticipated regulatory changes, and other locally applicable criteria.	Water Supply Reliability Assessment	Section 7.3	Section 7.2.1

COUNCIL COMMUNICATION

CC #: 1548
File #: 0800-02

Title:	Draft 2020 Urban Water Management Plan – Public Hearing for Consideration of Adoption
Contact:	Trevor Joseph 916-746-1708 tjoseph@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 10.2.

RECOMMENDATION TO COUNCIL

Staff recommends City Council consider the adoption of the Draft 2020 Urban Water Management Plan (UWMP). If found acceptable, City Council shall adopt a resolution to adopt the UWMP and authorize staff to submit the UWMP to the California Department of Water Resources (DWR) as final.

It is staff's recommendation that this agenda item should be considered with and presented following the public hearing to receive comments on the Draft 2020 UWMP and a public hearing to review and receive comments and consider the adoption of a Draft Water Shortage Contingency Plan (WSCP). The WSCP ultimately is included in Chapter 8 of the UWMP but must be presented and considered separately. For this reason, the Draft WSCP has been placed as a separate agenda item as documented in separate Council Communications (CC).

Staff recommends ordering these items as follows:

1. Public Hearing – Draft 2020 UWMP (described within a separate CC)
2. Public Hearing – Draft WSCP (described within a separate CC)
3. Adoption Hearing – Draft WSCP (described within a separate CC)
4. **Adoption Hearing – Draft 2020 UWMP (described within this CC)**

Specifically these public hearings allow for 1) community input regarding the urban retail water supplier's implementation for complying with the requirements of the California Water Code (CWC), 2) consider of the economic impacts of the urban retail water supplier's implementation plan for complying with the CWC, and 3) City provided information on their baseline values, water use targets and compliance, and implementation plan.

After the public hearing, the UWMP may be adopted as prepared or as modified after the hearing or hearings at City Council's direction.

BACKGROUND

Beginning in 1985, DWR has required water purveyors delivering water to at least 3,000 customers to prepare an UWMP and update the plan at five-year intervals. The last plan was developed and approved for 2015 and included all City boundaries as they existed at that time.

With ongoing and recent updates to the DWR Guidebook for Urban Water Suppliers, it was determined that City staff would collaborate with a consultant, Waterworks Engineers, Inc., on the development of the 2020 document update. Effort began in December 2020 with collection of significant quantity of information, continuing through a staff review process, and resulting in the proposed plan.

Following the severe drought of 2012-2016, the State of California Legislature sought to expand the water shortage contingency analysis under former law and mandated that a WSCP be adopted by suppliers. The California Water Code recognizes WSCPs as a critical tool during a drought emergency and grants that the State defer to locally adopted WSCPs, to the extent practicable.

FISCAL IMPACT

Conservation programs are a condition of City water contracts, regional agreements, and a matter of State law with the passage of SB X7-7 in 2009. Planning continues to be done on an annual basis and is included in all rate analyses and proposed budgets.

ENVIRONMENTAL REVIEW

The proposed activity is statutorily exempt from the California Environmental Quality Act (CEQA). CEQA does not apply to the preparation and adoption of Urban Water Management plans (California Water Code §10652). The proposed plan would not affect water supplies for fish and wildlife, or expand or add water supplies, and therefore no further environmental review is required.

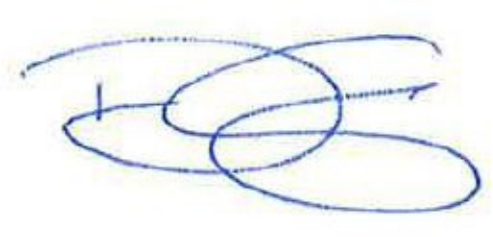
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Goal F - Invest in well-planned infrastructure and growth

Respectfully Submitted,

Trevor Joseph, Hydrogeologist

Richard Plecker, Environmental Utilities Director



Dominick Casey, City Manager

ATTACHMENTS:

Description

Resolution 21-280

Attachment A - Water Urban Management Plan Part 1

Attachment A - Water Urban Management Plan Part 2

Attachment A - Water Urban Management Plan Part 3

Attachment A - Water Urban Management Plan Part 4

RESOLUTION NO. 21-280

ADOPTING THE URBAN WATER MANAGEMENT PLAN AND AUTHORIZING STAFF TO SUBMIT TO THE CALIFORNIA DEPARTMENT OF WATER RESOURCES

WHEREAS, the Urban Water Management Plan Act requires every urban water supplier providing water for municipal purposes to more than 3,000 customers to develop and submit an Urban Water Management Plan (UWMP) every five years to the California Department of Water Resources (DWR); and

WHEREAS, with ongoing and recent updates to the DWR Guidebook for Urban Water Suppliers, staff collaborated with a consultant on the development of the 2020 UWMP update; and

WHEREAS, the City has prepared and circulated for public review the UWMP, and a properly noticed public hearing regarding said Plan was held by the City Council on June 16, 2021.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Roseville that the UWMP is hereby adopted and ordered filed with the City Clerk; and

BE IT FURTHER RESOLVED that the Mayor is hereby authorized and directed to file the UWMP with the California Department of Water Resources within 30 days after this date.

PASSED AND ADOPTED by the Council of the City of Roseville this____day of _____, 20_, by the following vote on roll call:

AYES COUNCILMEMBERS:

NOES COUNCILMEMBERS:

ABSENT COUNCILMEMBERS:

_____
MAYOR

ATTEST:

_____
City Clerk



DRAFT 2020 URBAN WATER MANAGEMENT PLAN

CITY OF ROSEVILLE CALIFORNIA

City of Roseville
Draft 2020 Urban Water Management Plan

May 2021

Prepared by Water Works Engineers, LLC
Colleen Boak, PE
Esmeralda Diego

Checked by:
Tim Durbin, PE
Cindy Bertsch, PE

Table of Contents

Chapter 1 Urban Water Management Plan Purpose and Description 1-1
1.1 California Legislation 1-1
1.2 Updates to 2020 UWMP 1-2
1.2.1 Lay Description 1-2
1.2.2 Water Loss Reporting 1-2
1.2.3 Energy Use Information 1-2
1.2.4 Groundwater Supplies Coordination 1-2
1.2.5 Five Consecutive Dry-Year Water Reliability Assessment 1-2
1.2.6 Drought Risk Assessment 1-2
1.2.7 Water Shortage Contingency Plan 1-3
1.2.8 Seismic Risk 1-3
1.3 Benefits of UWMP Reporting 1-3
1.4 Plan Organization 1-3
Chapter 2 Plan Preparation 2-1
2.1 Basis for Preparing a Plan 2-1
2.2 Individual or Regional Planning and Compliance 2-1
2.3 Fiscal or Calendar Year and Units of Measure 2-2
2.4 Coordination and Outreach 2-2
2.4.1 Wholesale and Retail Coordination 2-2
2.4.2 Coordination with Other Agencies and the Community 2-3
Chapter 3 System Description 3-1
3.1 General Description 3-1
3.1.1 Transmission 3-1
3.1.2 Water Treatment 3-1
3.1.3 Storage 3-2
3.1.4 Distribution Network 3-3
3.1.5 Groundwater Wells 3-3
3.1.6 Interties 3-4
3.2 Service Area 3-5
3.3 Service Area Climate 3-7
3.4 Service Area Population and Demographics 3-7
3.4.1 Service Area Population 3-7
3.4.2 Social, Economic, and Demographic Factors 3-8
3.5 Land Uses within the Service Area 3-8
Chapter 4 Water Use Characterization 4-1
4.1 Non-Potable Versus Potable Water Use 4-1
4.2 Past, Current, and Projected Water Use by Sector 4-1
4.2.1 Water Use Sectors Listed in Water Code 4-1
4.2.2 Water Use Sectors in Addition to Those Listed in Water Code 4-2
4.2.3 Past Water Use 4-2
4.2.4 Current Water Use 4-3

4.2.5 Projected Water Use 4-3
4.2.6 Distribution System Water Losses 4-7
4.2.7 Estimating Future Water Savings 4-9
4.2.8 Characteristic Five-Year Water Use 4-10
4.3 Water Use for Lower Income Housing 4-10
4.4 Climate Change Considerations 4-11
Chapter 5 SBX7-7 Baselines, Targets, and 2020 Compliance 5-1
5.1 Baselines and Targets 5-1
5.2 Service Area Population 5-2
5.3 Gross Water Use 5-2
5.4 2020 Compliance Daily Per-Capita Water Use 5-2
5.5 Regional Alliance 5-3
Chapter 6 Water Supply Characterization 6-1
6.1 Surface Water 6-1
6.2 Purchased and Imported Water 6-1
6.2.1 Contract Supplies – Vulnerabilities and Restrictions 6-2
6.2.2 Water Forum Agreement 6-2
6.2.3 Other Available Water Purchases 6-2
6.3 Groundwater 6-3
6.3.1 Groundwater Basin Description 6-3
6.3.2 Groundwater Management 6-3
6.3.3 Historical Groundwater Production 6-5
6.3.4 Aquifer Storage and Recovery 6-5
6.4 Stormwater 6-6
6.5 Wastewater and Recycled Water 6-6
6.5.1 Wastewater Collection, Treatment, and Disposal 6-7
6.6 Recycled Water System 6-10
6.6.1 Recycled Water Coordination 6-10
6.7 Recycled Water Beneficial Uses 6-10
6.8 Actions to Encourage and Optimize Future Recycled Water Use 6-12
6.9 Desalinated Water Opportunities 6-13
6.10 Exchanges or Transfers 6-13
6.11 Supply Management 6-14
6.12 Future Water Projects 6-14
6.12.1 Purchased or Imported Water 6-14
6.12.2 Groundwater and ASR Program 6-15
6.13 Summary of Existing and Planned Sources of Water 6-16
6.14 Climate Change Impacts to Supply 6-19
6.14.1 Local Climate Change Outlook 6-19
6.14.2 Regional Climate Studies 6-19
6.14.3 Projected Future Conditions 6-20
Water Supply Reliability 6-23

6.15 Energy Intensity 6-25
Chapter 7 Water Service Reliability and Drought Risk Assessment 7-1
7.1 Constraints on Water Sources 7-1
7.1.1 Legal Constraints 7-1
7.1.2 Water Quality Constraints 7-1
7.1.3 Physical Constraints 7-1
7.1.4 Other Constraints 7-2
7.2 Water Supply Reliability Assessment 7-5
7.2.1 Potable Water Supply and Demand Assessment 7-5
7.2.2 Comparison of Supply and Demand 7-9
7.2.3 Recycled Water Supply and Demand Comparison 7-9
7.2.4 Total Water Supply and Demand Comparison 7-10
7.2.5 Deficit Mitigation 7-12
7.3 Regional Supply and Reliability 7-12
Chapter 8 Water Shortage Contingency Plan 8-1
Chapter 9 Demand Management Measures 9-1
9.1 Demand Management Measures 9-1
9.1.1 Water Waste Prevention Ordinances 9-2
9.1.2 Metering 9-2
9.1.3 Conservation Pricing 9-2
9.1.4 Public Education and Outreach 9-3
9.1.5 Regional Water Authority – Outreach and Education 9-4
9.1.6 Programs to Assess and Manage Distribution System Real Loss 9-8
9.1.7 Water Conservation Program Coordination Staffing Support 9-8
9.2 Other Demand Management Measures 9-8
9.2.1 Residential Conservation Programs 9-9
9.2.2 Commercial, Industrial, Institutional Conservation Programs 9-10
9.3 Planned Implementation to Achieve Water Use Targets 9-11
9.4 Members of the California Urban Water Conservation Council 9-12
Chapter 10 Plan Adoption and Submittal 10-1
10.1 Inclusion of all 2020 Data 10-1
10.2 Notice of Public Hearing 10-1
10.3 Public Hearing and Adoption 10-2
10.4 Plan Submittal 10-2
10.5 Public Availability 10-2
10.6 Public Implementation 10-2
10.7 Amending an Adopted UWMP 10-2
10.8 California Water Code Requirements 10-2

City of Roseville Tables

COR Table 2-A Outreach with Local and Regional Agencies 2-3

COR Table 3-A Potable Water Storage Tanks 3-2
COR Table 3-B Potable Water Pump Stations 3-3
COR Table 3-C Existing Operational Wells 3-4
COR Table 3-D Interties with Neighboring Water Suppliers 3-4
COR Table 3-E Monthly Average Climate Data from 2016 through 2020 3-7
COR Table 3-F City of Roseville 2019 Population by Race 3-8
COR Table 3-G Residential Land Uses and Development Guidelines 3-9
COR Table 3-H Non-Residential Land Uses and Development Guidelines 3-9
COR Table 4-A Past Potable Water Use Volumes by Sector. 4-3
COR Table 4-B Unit Demand Factors for Land Use Type 4-5
COR Table 4-C Specific Plan Water Demands at Buildout by Water Use Sector. 4-5
COR Table 4-D 12 Month Water Loss Audit Reporting for 2015-2019 4-7
COR Table 4-E Loss Reported in AWWA Water Audit for 2017-2019. 4-8
COR Table 4-F Five consecutive year unconstrained demand. 4-10
COR Table 4-G 2020 Affordable Housing Water Use 4-10
COR Table 4-H Affordable Housing Water Use Projections 4-11
COR Table 6-A Surface Water Supply Summary 6-1
COR Table 6-B Projected Change in Precipitation and Temperature Over the American River Basin Study Area Between 1980-2009 and 2070-2099 6-22
COR Table 6-C Change in Hydrologic Indicators Between Historical Observations and Projected Future Hydrology 6-23
COR Table 6-D Energy Intensity Reporting 6-25
COR Table 7-A Water Forum Agreement Hydrologic Year Types 7-3
COR Table 7-B Reliability Assessment Year Type Characterization 7-5
COR Table 7-C Groundwater Supply Availability by Year Type. 7-7
COR Table 7-D Potable Supply Availability by Year Type 7-8
COR Table 9-A Regional Rebates and Installations from 2016 through 2020. 9-6

Department of Water Resources Tables

DWR Table 2-1 2-1
DWR Table 2-2 2-2
DWR Table 2-3 2-2
DWR Table 2-4 2-3
DWR Table 3-1 3-8
DWR Table 4-1 4-3
DWR Table 4-2 4-6
DWR Table 4-3 4-7
DWR Table 4-4 4-8
DWR Table 4-5 4-9
DWR Table 5-1 5-2
DWR Table 5-2 5-3

DWR Table 6-1 6-5
DWR Table 6-2 6-8
DWR Table 6-3 6-9
DWR Table 6-4 6-11
DWR Table 6-5 6-12
DWR Table 6-6 6-13
DWR Table 6-7 6-16
DWR Table 6-8 6-17
DWR Table 6-9 6-18
DWR Table 7-1 7-6
DWR Table 7-2 7-10
DWR Table 7-3 7-10
DWR Table 7-4 7-11
DWR Table 7-5 7-12
DWR Table 10-1 10-1

Figures

Figure 3-1. City of Roseville Water Treatment Plant Treatment Train 3-2
Figure 3-2 Service Area Map 3-6
Figure 4-1 Existing and Projected Service Area Population 4-6
Figure 6-1 Urban Groundwater Infrastructure Schematic 6-6
Figure 7-1 Water Forum Agreement Supply Limitations 7-3

Appendices

Appendix A – Notifications to Wholesale Suppliers
Appendix B – Public and Agency Outreach
Appendix C – Land Use Element
Appendix D – AWWA Water Loss Audits
Appendix E – Proposed Water Loss Standards
Appendix F – 2015 SBX7-7 Verification Form
Appendix G – 2020 SBX7-7 Compliance Form
Appendix H – Intent to Retain Control of Conserved Water
Appendix I – Regional 2020 Wastewater Systems Evaluation Report
Appendix J – 2015 USBR Record of Decision
Appendix K – Water Shortage Contingency Plan
Appendix L – Roseville Municipal Code 14.09
Appendix M – Roseville Municipal Code 14.08.090, 14.08.095, 14.08.100
Appendix N – CalWEP BMP Compliance Reports
Appendix O – Adoption Resolutions and Submission
Appendix P – DWR UWMP Checklist

Abbreviations

Acre(s)	ac
Acre Feet	AF
Acre Feet Per Year	AF/yr
American Community Survey	ACS
American River Basin	Basin
American River Basin Study	ARBS or Study
Aquifer Storage Recovery	ASR
Average Dry Weather Flow	ADWF
Barton Road Water Treatment Plant	BRWTP
California Department of Finance	CDoF
California State Groundwater Elevation Monitoring Program	CASGEM
California Water Code	CWC
California-American Water Company	Cal-Am
Central Valley Project Municipal and Industrial Water Shortage Policy	CVP M&I WSP
Citrus Heights Water District	CHWD
City of Roseville	COR or Roseville
City of Roseville Water Utility	City
Compressed Natural Gas	CNG
Cubic Feet Per Second	cfs
Degrees Fahrenheit	°F
Department of Water Resources	DWR
Drought Risk Assessment	DRA
Dwelling Unit	DU
Environmental Impact Statement	EIS
Environmental Utilities	EU
Equivalent Dwelling Unit	EDU
Gallons Per Day per Dwelling Unit	Gpd/DU
Gallons Per Minute	gpm
Groundwater Management Plan	GWMP
Groundwater Sustainability Agency	GSA
Groundwater Sustainability Plan	GSP
Hot Scenarios	HD, HW
Maximum Contaminant Level	MCL
Middle Fork Project	MFP
Million Gallon(s)	MG
Million Gallons Per Day	MGD
Model Water Efficient Landscape Ordinance	MWELO
Municipal and Industrial	M&I
National Pollutant Discharge Elimination System	NPDES
Operations Criteria and Plan	OCAP

Parts Per Million	ppm
Potential Evapotranspiration	PET
Placer County Water Agency	PCWA
Pounds Per Square Inch	psi
Regional Drought Contingency Plan/ Regional Water Reliability Plan	RWRP
Sacramento Suburban Water District	SSWD
San Juan Water District	SJWD
Senate Bill X7-7	SB X7-7
South Placer Municipal Utilities District	SPMUD
South Placer Wastewater Authority	SPWA
State of California Legislature	Legislature
State Water Project	SWP
Sustainable Groundwater Management Act	SGMA
Thousand Acre-Feet	TAF
United States Bureau of Reclamation	USBR
United States Bureau of Reclamation	USBR
Urban Water Management Plan	UWMP
Urban Water Management Plan Guidebook 2020	Guidebook
Urban Water Retail Supplier	Supplier
Warm Scenarios	WD, WW
Wastewater Treatment Plant	WWTP
Water Demand Tracking Tool	Tool
Water Forum Agreement	WFA
Water Shortage Contingency Plan	WSCP
Water Storage Investment Program	WSIP
Water Treatment Plant	WTP
Western Placer Groundwater Sustainability Agency	WPGSA

Executive Summary

ES. 1 Introduction

An Urban Water Management Plan (UWMP) is the legal and technical water management foundation for suppliers throughout California. A UWMP combines information from various sources that inform water supply and demand such as projects pertaining to local land use planning, regional water supply, infrastructure, and demand management. The City of Roseville Water Utility (City) participates in UWMP updates every five years, as required by law. Each UWMP update addresses all requirements pertaining to urban retail water suppliers in accordance with the Urban Water Management Planning Act and the Water Conservation Act of 2009, also referred to as Senate Bill X7-7 (SB X7-7). Information contained in this 2020 UWMP includes the component listed in the following section.

ES. 2 Plan Components

The plan consists of the following components:

- **Chapter 1:** The basis for preparing a plan and the new requirements.
- **Chapter 2:** Summary of how the plan is prepared and coordination with the public and other local and regional authorities.
- **Chapter 3:** A description of the City's treatment facilities and distribution infrastructure, as well as a description of the population and area served by the City.
- **Chapter 4:** Quantification of water use for the 5-years preceding the plan update and water use projections for a 20-year planning horizon.
- **Chapter 5:** Supporting data for compliance with SB X7-7.
- **Chapter 6:** Description of existing and planned water supplies and water supply management.
- **Chapter 7:** A drought risk assessment (DRA), which analyzes water supplies and demands in a single year or multiple years of a water shortage.
- **Chapter 8**: The Water Shortage Contingency Plan (WSCP), which outlines the process that the City will execute in the event of a water shortage.
- **Chapter 9:** Demand measures that the City integrates and plans to integrate into its regular operations to address increasing demands.
- **Chapter 10:** Record of the process by which the UWMP was adopted, submitted, and implemented with the intention of making the plan widely available to the City's customers and the public.

ES. 3 Basis for Plan Preparation and Coordination

Urban water retail suppliers (suppliers) who either deliver 3,000-acre feet (AF) or more of water or have over 3,000 service connections are required to submit a UWMP. In 2020 the City had 46,112 service connections and supplied a total of 31,896 AF to its customers and therefore is required to prepare and submit an UWMP.

In preparation of the UWMP the City coordinated with the U.S. Bureau of Reclamation (USBR), Placer County Water Agency (PCWA), and San Juan Water District (SJWD), all of which supply water to the city on a wholesale basis. The City also actively sought involvement from the public and other local water agencies. Neighboring water retail suppliers and the community were informed of a public hearing to be held June 16, 2021. In this public

hearing the plan will be presented, and attendees are encouraged to share questions and concerns prior to the presentation of the UWMP in the City Council meeting which will be held on June 16, 2021, during which the plan will be adopted.

ES. 4 System and Supply Description

Raw water from Folsom Lake, the City's primary water source, is conveyed to the City's water treatment plant located in the Granite Bay area and is then distributed through the City's 600 miles of water mains to customers. Other water facilities that the City maintains include potable water storage tanks, pump stations, interties to exchange water with other water agencies, and groundwater wells.

The City receives its contract supplies purchased from USBR, PCWA, and SJWD through Folsom Reservoir. The City currently has 8 wells, 6 of which are in service, and is planning to expand their groundwater program as a means to having a more robust water supply available in the event of a water shortage condition. The City is also considering contract amendments with water agencies that would increase overall water supply resilience.

ES. 5 Past and Projected Water Use

The City supplies water to customers for the following water use sectors:

- Commercial
- Industrial
- Institutional and Governmental
- Multi-Family Residential
- Single Family Residential
- Landscape

The UWMP characterizes water use by sector for the years preceding the plan update as well as projections of water use for the next 25 years. Projections in the 2020 UWMP differ significantly from 2015 projections as a result of the rapid development pace observed in Roseville since the last plan update. When the 2015 UWMP was prepared the City of Roseville's General Plan anticipated that buildout of planned development would be reached in 2065. The City of Roseville updated the General Plan in August 2020 and current estimations, reflecting the pace of development, now indicate buildout of planned development will be complete by 2035. The City has taken a long-term approach to its overall water strategy planning and has planned for a population of up to 198,000 for 2035. The actual volume of water used by each sector for 2020 and updated water use projections through the year 2045 are summarized in ES Table 1.

ES Table 1 Actual 2020 Water Use and Projected Water Use through the Year 2045.

Water Use Sector	2020	2025	2030	2035	2040	2045
Commercial	2,630	6,135	6,508	7,017	7,017	7,017
Industrial	254	4,175	4,726	5,123	5,123	5,123
Institutional/ Governmental	412	8,904	9,494	10,321	10,321	10,321
Multi-Family	1,416	1,752	2,029	2,725	2,725	2,725
Single Family	17,115	22,564	24,508	26,281	26,281	26,281
Landscape	6,422	644	765	805	805	805
Losses	1,600	1,429	1,401	1,587	1,587	1,587
Groundwater recharge	597	1,560	2,720	3,350	3,350	3,350
Total	**30,445**	**47,163**	**52,151**	**57,210**	**57,210**	**57,210**
NOTES: All values are in AF/yr. Values represent potable water use only.						

ES. 6 SB X7-7

SB X7-7 called for a 20% reduction of water use from all retail water suppliers by the year 2020. In the 2015 UWMP the City calculated a 10-year and 5-year baseline period to determine an average baseline gallon per capita per day (GPCD) water use. This baseline demand was calculated to be 309 GPCD in accordance with the SB X7-7 standard methods. The 2020 target compliance water demand was 247 GPCD, a 20% reduction of the baseline. In 2020 the average demand for the City was 203 GPCD, which represents an approximately 34% reduction of the baseline demand. As such, the City is compliant with SB X7-7.

ES. 7 Supply Reliability and Drought Risk Assessment and Water Shortage Contingency Plan

A supply reliability and drought risk assessment were performed. The assessments considered the supply available for a single-year and five-year consecutive drought period for both the near-term and long-term. The supply availability was compared to the total water use to determine if a deficit is projected for any of the conditions. The supply availability is subject to seasonal and climatic shortages and so in a dry or critically dry years increasing limitations are placed on the City for volume of water that they receive from Folsom Lake. The supply and drought risk assessment demonstrated that there may be minor deficits in supply versus demand conditions under certain drought related circumstances. These minor shortages may occur in the near-term extended drought scenario as well as over the longer term for both extended and single year drought conditions. The highest level of deficiency identified represents less than 8% of the annual demand and can be remedied by the simple application of basic conservation measures, estimated to achieve 13% savings. The results of the drought risk assessment are summarized in ES Table 2.

ES Table 2 Near-Term and Long-Term Drought Risk Assessment Summary

Drought Type Assessed	Deficit Range	Description of Anticipated Deficit
Near-Term 5 Consecutive Dry Years	1,647	Deficit Expected in fifth year only
Long-Term Single Dry Year	1,647 – 1,824	Deficit expected in 2025-2045
Long-Term 5 Consecutive Dry Years	7 – 4,904	Deficit expected in fourth year for 2025-2045
	1,647 – 1,824	Deficit expected in fifth year of drought for 2025-2045
NOTES: All values are in AF/yr.		

To mitigate the projected deficits in a water shortage, a Water Shortage Contingency Plan (WSCP) was prepared. The WSCP outlines the procedures that the City will take annually to determine whether there will be a water deficit based on projected water demand and supply availability. If a deficit is anticipated the City will formally declare a water shortage emergency condition of varying levels dependent on the severity of the deficit. The declaration of the water shortage emergency condition will trigger a set of demand reduction actions that is to be carried out by the City and all water users. These demand reduction actions are set forth in the Roseville Municipal Code Chapter 14.09 Water Conservation and Drought Mitigation Ordinance. The legal authority of the City to enforce compliance with the demand reduction actions is granted by the Water Conservation and Drought Mitigation Ordinance.

ES. 8 Demand Management Measures

Aside from the demand reduction actions of the Water Conservation and Drought Mitigation Ordinance, the City has taken a proactive approach to managing demand under normal conditions as well. Demand management measures include accurate metering through a meter retrofit program which was implemented from 2001 to 2011, public education and outreach, and regional rebate programs for efficient water use fixtures. System losses, typically losses due to leaks in the pipe network, can account for a significant portion of water demand. The City continues to be proactive in its approach to address leaks in the system and reduce the overall losses, including an active acoustic leak detection program to identify and repair leaks throughout the distribution system, working to reduce overall system losses.

ES. 10 Plan Adoption and Submittal

The 2020 UWMP will be presented to City Council on June 16, 2021 for adoption. The 2020 UWMP will subsequently be submitted to the California Department of Water Resources for compliance with the Urban Water Management Planning Act. Copies of the plan have been made publicly available at the City's offices and an electronic version is also available for review and download on the City's website: www.roseville.ca.us/UWMP.

Chapter 1 Urban Water Management Plan Purpose and Description

This chapter introduces the Urban Water Management (UWMP) including legislation requiring urban water retail suppliers to submit UWMPs, necessary information required to be reported in the 2020 UWMP, an overview of the changes to legislation since the 2015 City of Roseville UWMP, and a description of benefits to the supplier and its customers in completing a UWMP.

1.1 California Legislation

The Urban Water Management Planning Act was enacted in 1983 by the State of California Legislature (Legislature). The law established the requirement that an urban water supplier (supplier), providing municipal water to over 3,000 customers or 3,000 acre-feet (AF) annually, adopt an UWMP every five years. The aim of the Urban Water Management Planning Act was to address declarations and findings of the California Water Code (CWC):

California Water Code Section 10610.2

(a) The Legislature finds and declares all of the following:

(1) The waters of the state are a limited and renewable resource subject to ever-increasing demands.

(2) The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.

(3) A long-term, reliable supply of water is essential to protect the productivity of California's businesses and economic climate, and increasing long-term water conservation among Californians, improving water use efficiency within the state's communities and agricultural production, and strengthening local and regional drought planning are critical to California's resilience to drought and climate change.

(4) As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years now and into the foreseeable future, and every urban water supplier should collaborate closely with local land-use authorities to ensure water demand forecasts are consistent with current land-use planning.

(5) Public health issues have been raised over a number of contaminants that have been identified in certain local and imported water supplies.

(6) Implementing effective water management strategies, including groundwater storage projects and recycled water projects, may require specific water quality and salinity targets for meeting groundwater basins water quality objectives and promoting beneficial use of recycled water.

(7) Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.

(8) Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.

(9) The quality of source supplies can have a significant impact on water management strategies and supply reliability.

Additionally, efforts aimed at protecting California's water supply were expanded in 2009 with Senate Bill X7-7 (SB X7-7), where Governor Schwarzenegger called for a 20% reduction statewide in per capita water use by 2020.

1.2 Updates to 2020 UWMP

Since the reporting of the 2015 UWMP, there have been various requirements added by the Legislature to the CWC. Subsequent chapters of this report will provide necessary information to address requirements applicable to the City. The major new requirements are described in the following sections.

1.2.1 Lay Description

Pursuant to Section 10630.5, all plans are now required to include a lay description. This description shall include how much water the City has on a reliable basis, anticipated demands for the foreseeable future, the City's plan to meet those future demands, any challenges that the City will face in the future, and other information that will provide the public with an understanding of the City's 2020 UWMP.

The requirement for this lay description is met in the executive summary.

1.2.2 Water Loss Reporting

Pursuant to Section 10631(d)(3)(C), the 2020 UWMP shall include past water loss for the 5-years preceding the plan. The 2015 UWMP included water loss data from 2015 only.

1.2.3 Energy Use Information

Pursuant to 10631.2, the 2020 UWMP shall include any information related to the amount of energy consumed in various water processed to estimate the energy intensity.

1.2.4 Groundwater Supplies Coordination

Pursuant to 10631(b)(4)(A), if groundwater is identified as a source of water available to the supplier the 2020 UWMP shall coordinate with the current version of any groundwater sustainability plan adopted pursuant to 10720, Sustainable Groundwater Management Act, or any other authority for groundwater management for basins underlying the service area.

1.2.5 Five Consecutive Dry-Year Water Reliability Assessment

Pursuant to 10631(f), suppliers must now include a description of actions they will implement for a period of drought lasting five consecutive water years as opposed to the 2015 UWMP requirement, which was for multiple dry water years.

1.2.6 Drought Risk Assessment

Pursuant to 10635(b), all suppliers are required to include a drought risk assessment (DRA) in the UWMP. Interim updates to the DRA may be conducted by the supplier within the five-year cycle of the UWMP update.

1.2.7 Water Shortage Contingency Plan

Pursuant to Section 10632, every urban water supplier shall prepare and adopt a water shortage contingency plan (WSCP). The WSCP shall be included in the 2020 UWMP but is to be adopted separate from the UWMP with the intent that it be updated as needed independently of the UWMP.

1.2.8 Seismic Risk

Pursuant to 10632.5, suppliers shall include a seismic risk assessment and mitigation in the UWMP to assess vulnerabilities of the supplier's facilities. The seismic risk assessment and mitigation plan shall be updated when the UWMP is updated.

1.3 Benefits of UWMP Reporting

UWMP reporting for the City is required by the state and is a critical document for ensuring that the City remains compliant with various regulations. Additionally, completion of a UWMP demonstrating that the City addresses the requirements of the CWC is necessary to be eligible for any Department of Water Resources (DWR) administered grant or loan. Completion of the most recent UWMP may also be required for other state funding.

Beyond establishing grant or loan eligibility the UWMP is intended to be a useful tool for the supplier and the public. Thoughtful preparation of the plan provides the supplier an opportunity for forward thinking and planning, ensuring that their water supply remains robust in the future and continues to meet the dynamic needs of its customers. Throughout plan preparation the City, other suppliers, and local and regional authorities are encouraged to coordinate with one another creating a greater understanding of the region's water demands, ultimately promoting mindful utilization of the state's water resources.

1.4 Plan Organization

This UWMP was prepared in part by use of guidance issued by DWR via the *Urban Water Management Plan Guidebook 2020* (Guidebook). Organization of the plan chapters closely follows the suggested organization in the Guidebook. Where appropriate, submittal tables provided by DWR are used to report data; these tables are denoted by the suffix, "DWR Table". Additional data reporting is done in City of Roseville Tables denoted by the suffix, "COR Table".

Chapter 2 Plan Preparation

This chapter provides an overview of the process by which the plan was prepared and the coordination that was carried out.

2.1 Basis for Preparing a Plan

The City of Roseville Water Utility (City) is a public water system (PWS), which is a system that provides drinking water for human consumption through pipes or other constructed conveyances. The City serves over 3,000 customers and delivers over 3,000 AF annually and as such is required to submit a UWMP. Metrics for total number of customers and volume of water supplied in the City's service area for 2020 are provided in DWR Table 2-1. The UWMP is required to be reviewed and updated every five years; preparation of this UWMP is an update to the most recent UWMP, adopted by the City of Roseville in 2016. As a water retail supplier, the City is also required to comply with the requirements of SB X7-7. This UWMP establishes the City's compliance with the Urban Water Management Planning Act and SB X7-7.

DWR Table 2-1

Submittal Table 2-1 Retail Only: Public Water Systems			
Public Water System Number	Public Water System Name	Number of Municipal Connections 2020	Volume of Water Supplied 2020
3110008	City of Roseville	46,112	30,445
	TOTAL	46,112	30,445
NOTES: All volumes are in AF. Units of measure remain consistent throughout the UWMP as reported in DWR Table 2-3.			

2.2 Individual or Regional Planning and Compliance

The CWC provides mechanisms for participating in area-wide regional, watershed or basin-wide urban water management planning. Per *Department of Water Resources Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use* (DWR Methodologies), water suppliers who receive water from a shared wholesale supplier may form a regional alliance. Although the City and its neighboring water suppliers practice regional water supply planning, the City has not formed a regional alliance with other water suppliers for compliance with SB X7-7. The City has prepared an individual UWMP, reporting solely on its own distribution service area and will not adopt a Regional Urban Water Management Plan (RUWMP), stated in DWR Table 2-2.

DWR Table 2-2

Submittal Table 2-2: Plan Identification			
Select Only One	**Type of Plan**		**Name of RUWMP or Regional Alliance** *if applicable*
☑	**Individual UWMP**		
	☐	Water Supplier is also a member of a RUWMP	
	☐	Water Supplier is also a member of a Regional Alliance	
☐	**Regional Urban Water Management Plan (RUWMP)**		

2.3 Fiscal or Calendar Year and Units of Measure

General metrics for plan preparation are provided in DWR Table 2-3.

DWR Table 2-3

Submittal Table 2-3: Supplier Identification	
Type of Supplier (select one or both)	
☐	Supplier is a wholesaler
☑	Supplier is a retailer
Fiscal or Calendar Year (select one)	
☑	UWMP Tables are in calendar years
☐	UWMP Tables are in fiscal years
If using fiscal years provide month and date that the fiscal year begins (mm/dd)	
Units of measure used in UWMP (select from drop down)	
Unit	AF

2.4 Coordination and Outreach

This section discusses the City's coordination with other agencies and the public.

2.4.1 Wholesale and Retail Coordination

Pursuant to CWC Section 10631(j) the City is to coordinate with wholesale supply agencies that provide the City with water. The City has water supply contracts with Placer County Water Agency (PCWA), San Juan Water District (SJWD), and the U.S. Bureau of Reclamation (USBR). As a retail supplier the City has informed the three agencies

of projected water use in five-year increments for the next 20 years. Documentation of this coordination is provided in Appendix A. DWR Table 2-4 lists those three agencies that the City has coordinated with.

DWR Table 2-4

Submittal Table 2-4 Retail: Water Supplier Information Exchange
The retail Supplier has informed the following wholesale supplier(s) of projected water use in accordance with Water Code Section 10631.
Wholesale Water Supplier Name
U.S. Bureau of Reclamation
Placer County Water Agency
San Juan Water District

2.4.2 Coordination with Other Agencies and the Community

The City has actively sought to coordinate preparation of the UWMP with local and regional agencies and the general public. The City recognizes that how it currently utilizes and plans to utilize its water supply affects not only its own customers, but customers served by neighboring water agencies and individuals or groups that rely on private wells. As the City is dedicated to the responsible and sustainable management of local and regional water resources it has invited participation from the agencies listed in COR Table 2-A. Documentation of this coordination is provided in Appendix B. On February 16, 2021, the City noticed the neighboring cities and counties that preparation of the 2020 UWMP update had begun. Additionally, the City will hold a public hearing on June 16, 2021 to introduce the 2020 UWMP to the public and solicit feedback and answer questions regarding the plan.

COR Table 2-A Outreach with Local and Regional Agencies

Agency Name	Agency Type
U.S. Bureau of Reclamation	Wholesale Supplier
Placer County Water Agency	Water Supplier
San Juan Water District	Water Supplier
California American Water	Water Supplier
Citrus Heights Water District	Water Supplier
Sacramento Municipal utility District	Water Supplier
Sacramento Suburban Water District	Water Supplier
City of Roseville, City Manager	Local City
Placer County Public Works Department	Local County
Placer County Community Development Resource Agency	Local County
Regional Water Authority Sacramento	Regional Organization

Chapter 3 System Description

This chapter provides a description of the system including information on the distribution system; service area boundary; service area climate; service area population, demographics, and socioeconomics; and land uses within the service area.

3.1 General Description

The City of Roseville Water Utility (City) is a public utility owned and operated by the City of Roseville, which is on the interstate 80 corridor, approximately 15 miles northeast of downtown Sacramento California. The City obtains its surface water from Folsom Lake through wholesale purchase primarily from the United States Bureau of Reclamation (USBR) and additional water contracts with Placer County Water Agency (PCWA) and San Juan Water District (SJWD). The City also maintains and operates several production well sites that provide additional water supply reliability to the City with plans to construct more.

3.1.1 Transmission

The City has a diversion capacity of 150 cubic feet per second (cfs) or 96 million gallons per day (MGD) at Folsom Dam. From the pump station raw water is conveyed through parallel pipelines; the original 84-inch diameter pipeline constructed at the same time as the pump station and a 72-inch diameter pipeline completed in 2010 as a joint effort between the City and other water purveyors. The common facilities split at the "Hinkel Y", and thereafter raw water is conveyed through parallel pipelines – a 60-inch diameter pipeline and a 48-inch diameter pipeline – to the City's water treatment plant.

3.1.2 Water Treatment

The City's single water treatment plant (WTP), located within the City but in the Granite Bay area, has a capacity of 100 MGD. There are no plans to expand the WTP as the WTP is sized just above the pumping capacity of the Folsom Dam pump station. The WTP is a conventional treatment plant. The treatment processes include flocculation and sedimentation, clarification, filtration, and disinfection. The treatment train, beginning with the intake at Folsom Lake, is shown in Figure 3-1.

Sedimentation takes place in three parallel clarifiers. The chemicals injected as part of the flocculation and sedimentation processes are caustic soda, alum, and a cationic polymer. Sedimentation takes place in three separate parallel clarifiers. There are 12 anthracite sand filters, which combined have a maximum filtration rate of about 83,000 gallons per minute (gpm). The clear wells have a total volume of 358,500 gallons. Disinfection is achieved using sodium hypochlorite. The City also adds fluoride to treated water at a concentration of 0.7 parts per million (ppm) prior to distribution.

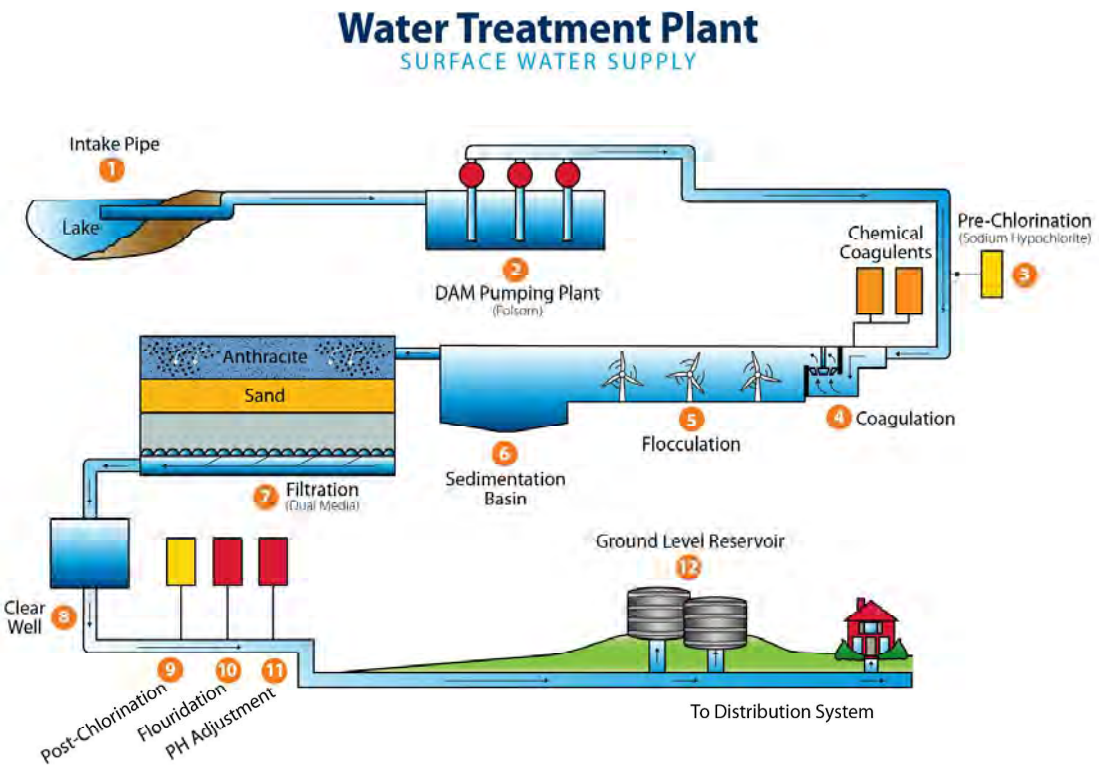


Figure 3-1. City of Roseville Water Treatment Plant Treatment Train

3.1.3 Storage

The City currently utilizes 6 potable water storage tanks, which are critical for maintaining water supply and system pressure during typical demand fluctuations, peak demand fluctuations, and emergency demands. The six water storage tanks have a total nominal capacity of 32 million gallons (MG). The City is also actively constructing two additional water storage tanks which will add a combined capacity of 12 MG, bringing the total storage capacity to 44 MG. The capacity of each tank is listed in COR Table 3-A.

COR Table 3-A Potable Water Storage Tanks

Facility	Existing or Future	Year Constructed	Type	Pressure Zone Served	Capacity (MG)
WTP	Existing	1971	Steel	1, 2, 4, 5	2
WTP	Existing	1990	Pre-Stressed Concrete	1, 2, 4, 5	4
WTP	Existing	2004	Pre-Stressed Concrete	1, 2, 4, 5	6
Northeast	Existing	1998	Pre-Stressed Concrete	1, 2, 4, 5	10
Northeast	Existing	2009	Pre-Stressed Concrete	1, 2, 4, 5	7.25
Halverson	Existing	2008	Pre-Stressed Concrete	2	2.9
West Side	Future	2022	Pre-Stressed Concrete	4	12

3.1.4 Distribution Network

The City maintains a distribution network consisting of approximately 600 miles of pressure pipe ranging from 1 inch to 72 inches in diameter. The network of pipe delivers potable water from the WTP to the City's customers to meet water demands during average day, maximum day, and peak hour conditions. The City aims to operate its system at a minimum pressure of 50 pounds per square inch (psi). Under existing conditions, the City mostly meets the minimum pressure criterion, with few instances where the minimum criteria are not met. These instances are not considered to be significant enough to impact the quality of customer's water service.

There are several specific plans for the City of Roseville which are in the process of being developed or will be developed in coming years. The City will serve these customers through new facilities which were designed during project development and that will be constructed by the developer and incorporated into the City's distribution network. The West Side Tank site will include a pump station with a pumping capacity of 20 MGD at the end of this construction phase, which is anticipated to be completed in 2022, but is designed to have a maximum capacity of 26.6 MGD at buildout. The existing and planned pump stations are summarized in COR Table 3-B.

COR Table 3-B Potable Water Pump Stations

Facility	Existing or Future	Pressure Zone Served
Dual Purpose Pump Station	Existing	1, 2
Highland Reserve North Pump Station	Existing	5
Pleasant Grove Pump Station	Existing	1
Pacific Fruit Express (PFE) Pump Station	Existing	Emergency Intertie
West Side Pump Station	Future	4

3.1.5 Groundwater Wells

The City currently operates 6 groundwater wells, which have a combined capacity of approximately 17,500-acre feet per year (AF/yr) or 15.6 MGD. Capacities of each operational well site are listed in COR Table 3-C. During the 2015 drought the water level in Folsom Lake was the lowest on record, which resulted in fluctuations in water supply. Consequently, the City sought to expand the existing ground water supply program to decrease reliability on Folsom Lake and to provide flexibility. To do so the City plans to utilize Aquifer Storage and Recovery (ASR) technology. ASR is the recharge of water in an aquifer through specially designed groundwater wells and recovery of water from that same well or others after time has passed. During times when there are excess surface water supplies, surface water can be injected using the ASR production wells and extracted during dry periods or when additional surface water is needed for the environment or other beneficial needs. Four of the existing operational wells have ASR capabilities, and the City plans to construct 6 additional wells with ASR capabilities by 2035.

COR Table 3-C Existing Operational Wells

Facility	Install/Rehab Date	Well Depth (Feet)	Zone Served	Pumping Capacity (MGD)
Darling Way, No. 4	1958/ 1999	303	1	1.3
Oakmont, No. 5	1978/ 1999	360	1	2.1
Diamond Creek, No. 6	2002	460	4	4.0
Woodcreek North, No. 7	2008	440	1	2.2
Hayden Parkway, No. 8	2015	520	4	3.1
Blue Oaks Boulevard, No. 12	2015	490	4	3.2

3.1.6 Interties

There are 17 interties with the surrounding jurisdictions of PCWA, SJWD, California-American Water Company (Cal-Am), Citrus Heights Water District (CHWD), and Sacramento Suburban Water District (SSWD). Each intertie is listed in COR Table 3-D.

COR Table 3-D Interties with Neighboring Water Suppliers

Intertie Agency	Facility	Year Constructed	Operational Control Agency	Control Valve Size (Inches)	Agency Receiving Water	Avg. Days/ Yr. Utilized 2015-2020	Days Utilized 2020
SJWD	WTP	1996	Roseville	16	Roseville	>1	0
	Eureka	1999	Roseville	12	Roseville	0	0
	Cavitt Stallman	1999	Roseville	12	Roseville	0	0
PCWA	Five Star	1995	PCWA	12	Roseville	0	0
	Stoneridge	1998	Roseville	12	PCWA	274	274
	Highland Park	2000	Roseville	12	PCWA	0	0
	Pleasant Grove	2000	PCWA	12	Roseville	0	0
	Industrial – Tinker	1989	Roseville	16	Roseville	361	361
	Bianchi Estates	2000	PCWA	12		365	365
Cal-Am	Crowder	2001	Cal-Am	12	Cal-Am	365	365
	PFE	2005	Roseville	16	Cal-Am	354	365
	Vernon Oaks	1988	Roseville	12	Cal-Am	0	0
	Vineyard Rd	1990	Cal-Am		Cal-Am	365	365
CHWD	Orlando	1989	Roseville	6	CHWD	0	0
	Blossom Hill	1986	Roseville	10	CHWD	0	0
	Fairway	2017	Roseville	8	CHWD	0	0
SSWD	PFE/ North Antelope	2005	Roseville	20	Both	0	0

3.1.6.1 San Juan Water District Interties

The three interties that exist between the City and SJWD under normal operations remain closed and are only intended for emergency use. The intertie at the WTP delivers water from SJWD to the City only. The Eureka and Cavitt Stallman interties deliver water to and from the City.

3.1.6.2 Placer County Water Agency Interties

All interties between the City and PCWA, except for the Bianchi estates intertie, can deliver water into the City. The Highland Park and Pleasant Grove interties cannot deliver water from the City to PCWA, but the other four remaining interties can. Through these interties a maximum of 11.5 MGD can be delivered to the City and 12.0 MGD can be delivered to PCWA. Three of the six PCWA interties under normal operations remain opened. The Stoneridge intertie regularly pumps water from the City to PCWA. The Bianchi Estates intertie is regularly kept open as it feeds PCWA's Bianchi Estates system and is the only source of supply for that area. The Industrial- Tinker intertie is normally open in order to deliver water from PCWA to Cal-Am through the Crowder and PFE interties.

3.1.6.3 California American Water Company Intertie

Only the PFE intertie can deliver water to the City and is intended for emergency use with a maximum capacity of 3.5 MGD. Both the Crowder intertie and Vineyard interties cannot deliver water to the city. All three interties can deliver water from the City to Cal-Am and are normally open with a total maximum capacity of 8.35 MGD. The water that is delivered to the Crowder and Vineyard Rd interties is from the PCWA Tinker intertie.

3.1.6.4 Citrus Heights Water District

The three interties between the City and CHWD can all be used to deliver water to and from the City. All three are intended for emergency use and under normal operating conditions remain closed.

3.1.6.5 Sacramento Suburban Water District Intertie

The intertie between the City and SSWD is part of regional development of conjunctive use programs. During an emergency or drought years, the PFE pump station will pump water from SSWD's service area into zone 1 of the City. Likewise, this intertie can be used to deliver water from the City to SSWD. A mutual aid agreement between the City and SSWD is currently being developed.

3.2 Service Area

The City's service area boundary lies within the limits of the City of Roseville. There are a few small areas within the city limits that are served by PCWA, SJWD, and CHWD. The service area is approximately 3,150 acres (ac). The service area and the facilities mentioned in section 3.1 are shown in Figure 3-2.

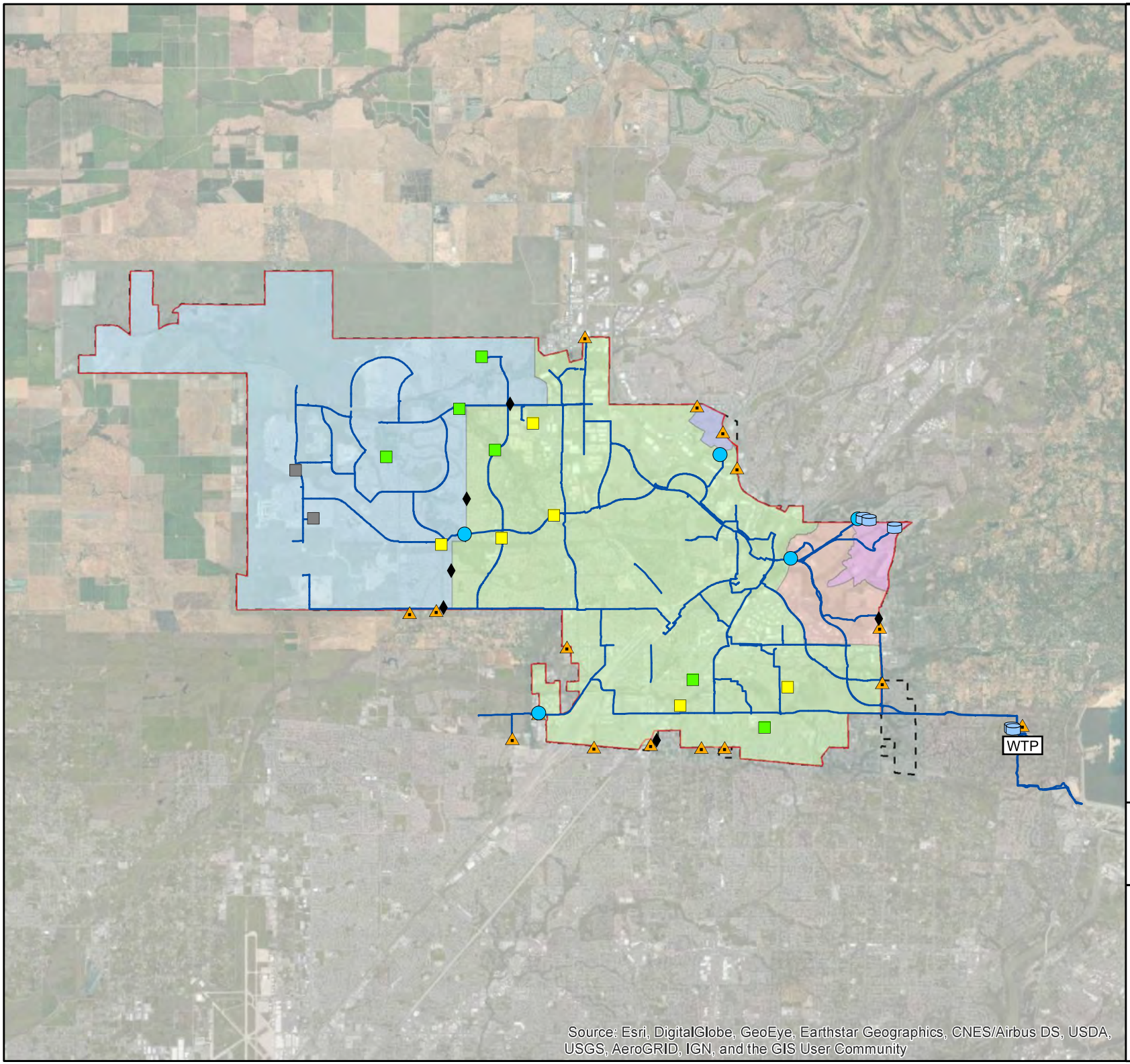


Figure 3-2 Service Area Map

WATERWORKS ENGINEERS

CITY OF ROSEVILLE CALIFORNIA

3.3 Service Area Climate

The service area experiences cool and humid winters and hot and dry summers. The City of Roseville's climate is similar to the City of Sacramento, which is in close proximity. Historical climate data was obtained from California Irrigation Management Information System (CIMIS) for station 155, which is located in Sacramento, for the reporting period of this UWMP and is summarized in COR Table 3-E. The average monthly temperature from 2016 to 2020 ranged from 39.8 degrees Fahrenheit (°F) to 95.1 °F. Typically the wet season begins in October and ends in May, with an average annual total precipitation of 13.3 inches.

COR Table 3-E Monthly Average Climate Data from 2016 through 2020

Month	Average Minimum Temperature (°F)	Average Maximum Temperature (°F)	Average Temperature (°F)	Average Monthly Precipitation (inches)
January	42.7	56.3	49.5	3.6
February	42.5	61.7	52.1	1.7
March	46.3	64.7	55.5	2.3
April	50.6	73.3	62.0	0.8
May	54.2	80.6	67.4	0.8
June	59.2	90.5	74.9	0.0
July	60.9	95.1	78.0	0.0
August	61.3	92.4	76.9	0.0
September	58.9	87.5	73.2	0.0
October	51.7	78.2	65.0	0.7
November	44.7	65.0	54.9	1.2
December	39.8	56.7	48.3	2.1
Averages	51.1	75.2	63.1	1.1

3.4 Service Area Population and Demographics

This section describes the population, demographic, and employment conditions of the City's water service area during the reporting period of the UWMP as well as future projections through 2045.

3.4.1 Service Area Population

Water use is directly tied to a service area's population and analyzing population growth and development trends is critical for the City's planning of water distribution facilities and infrastructure. Current and projected service area population estimates are provided in DWR Table 3-1. These projections differ from total population as a small number of City residents are served by adjacent water purveyors. The projections were estimated in coordination with the City of Roseville's General Plan, direct input from the City of Roseville's Planning Division, and previous studies performed by the City's Environmental Utilities Division. Methods for estimating population projections are further discussed in 5.2.

DWR Table 3-1

Submittal Table 3-1 Retail: Population - Current and Projected						
Population Served	2020	2025	2030	2035	2040	2045
	140,187	151,742	170,526	193,190	193,190	193,190

3.4.2 Social, Economic, and Demographic Factors

The City of Roseville's population in 2019, according to the American Community Survey (ACS), was reported to be 68.2% White alone (not Hispanic or Latino), 14.5% Hispanic or Latino, 10.1% Asian alone, 2.8% Black alone, and all other race categories were less than 1%. A summary of all race categories surveyed is provided in COR Table 3-F. The United States Census Bureau reports that the median household income from 2015-2019 was $89,082. ACS reports that in 2019 8.4% of the population was in poverty and 16.5% of the population was 65 years of age and over. The social, economic, and demographic factors are not believed to affect water management and planning.

COR Table 3-F City of Roseville 2019 Population by Race

Race Category	Percentage
American Indian and Alaska Native alone, not Hispanic or Latino	0.3%
Asian alone, not Hispanic or Latino	10.1%
Black alone, not Hispanic or Latino	2.8%
Hispanic or Latino	14.5%
Native Hawaiian and other Pacific Islander alone, not Hispanic or Latino	0.1%
White alone, not Hispanic or Latino	68.2%
Some other race alone, not Hispanic or Latino	0.0%
Two or more races alone, not Hispanic or Latino	3.9%

3.5 Land Uses within the Service Area

A new requirement of the California Water Code, since the 2015 UWMP was published, requires that land use projections be coordinated with other local and regional land use authorities.

> *California Water Code 101631.*
>
> *(a) The description shall include the current and projected land uses within the existing or anticipates service area affecting the supplier's water management planning. Urban water suppliers shall coordinate with local or regional land use authorities to determine the most appropriate land use information, including, where appropriate, land use information obtained from local or regional land use authorities, as developed pursuant to Article 5 (commencing with section 65300) of Chapter 3 of Division 1 of Title 7 of the Government Code.*

In August 2020, the City of Roseville completed its update to the General Plan, with a planning horizon that extends into 2035. The General Plan includes the Land Use Element, which is provided in Appendix C. The Land

Use Element discusses existing and future land use conditions, with an intended purpose of setting guidelines for managing land use change. The City of Roseville has both residential and non-residential land uses; density and intensity guidelines for each land use type respectively are set forth in the Land Use Element. The land use categories as well as corresponding characteristics from the Land Use Element are summarized in COR Table 3-G and COR Table 3-H.

COR Table 3-G Residential Land Uses and Development Guidelines

Land Use Category	Dwelling Units Per Acre	Estimated Population Per Gross Acre
Low-Density Residential (LDR)	0.5 – 6.9	1.45 – 20.1
Medium-Density Residential (MDR	7.0 – 12.9	20.3 – 37.41
High-Density Residential (HDR)	≥ 13	≥ 27.3

COR Table 3-H Non-Residential Land Uses and Development Guidelines

Land Use Category	Floor to Area Ratio
Neighborhood Commercial (NC)	20% - 40%
Community Commercial	20% - 40%
Regional Commercial	20% - 40%
Business Commercial	20% - 40%
Light Industrial	20% - 50%
Tech/ Business Park	20% - 50%
General Industrial	20% - 50%
Transfer Station	Varies
Central Business District	≤ 300%
Public/ Quasi-Public	Varies

Chapter 4 Water Use Characterization

This chapter provides a description and quantification of the City's past and current water use and future water use projections through the year 2045. Projections provided herein were coordinated with other local and regional planning documents in an effort to develop reliable water use projections.

4.1 Non-Potable Versus Potable Water Use

The City utilizes both potable and non-potable water to meet the diverse water needs of the customers within the service area. Potable water is water that is safe to drink and meets all California drinking water regulations per Title 22. The City's potable water supplies consist of surface water treated at the WTP, groundwater from various wells throughout the City that is chemically treated on site, finished water wheeled from other agencies through interties, and raw water received from other agencies through interties which is subsequently treated at the WTP.

Additionally, the City supplies recycled water, which is non-potable water for approved uses. Recycled water is wastewater that is treated to Title 22 disinfected tertiary standards. The City operates two wastewater treatment plants (WWTPs), Dry Creek and Pleasant Grove, both of which treat wastewater to the high standard required of recycled water. The recycled water produced at the WWTPs is distributed in a separate system from the potable water system and is utilized for landscape irrigation, environmental releases, cooling water, and construction uses.

Lastly, the City delivers raw water, which is also non-potable, to Linda Creek outside of the City's service area. Raw water is untreated water that is used in its natural state or with minimal treatment. The City is required to discharge 404 AF to Linda Creek as part of its instream flow commitment. The City does not deliver raw water to any of its customers within the service area.

4.2 Past, Current, and Projected Water Use by Sector

The following sections describe and quantify past, current, and projected water use. Water uses are delineated by various sectors. Additionally, the new requirement of the 2020 UWMP requiring quantification of system water losses for the five years preceding this plan are reported as follows.

4.2.1 Water Use Sectors Listed in Water Code

Water Code Section 10631(d) requires that water uses be identified for at least the ten following sectors; definitions for each of the sectors are adapted from those provided in the Guidebook.

- **Single-family residential** – A single family dwelling unit. A lot with a free-standing building containing one dwelling unit that may include a detached secondary dwelling. This is a retail demand.
- **Multifamily** – Multiple dwelling units contained within one building or several buildings within one complex. This is a retail demand.
- **Commercial** – A water user that provides or distributes a product or service. Water Code 10608.12(d). This is a retail demand.
- **Industrial** – Water user that is primarily a manufacturer or processor of materials as defined by the North American Industry Classification System (NAICS) code sectors 31 to 33, inclusive, of an entity that is a water user primarily engaged in research and development. Water Code Section 10608.12(h). This is a retail demand.

- **Institutional and governmental** – A water user dedicated to public service. This type of user includes, among other users, higher-education institutions, schools, courts, churches, hospitals, government facilities, and nonprofit research institutions per Water Code Section 10608.12(i). This is a retail demand.
- **Landscape** – Water connections supplying water solely for landscape irrigation. Such landscapes may be associated with multi-family, commercial, industrial, or institutional/governmental sites, but are considered a separate water use sector if the connection is solely for landscape irrigation. This is a retail demand.
- **Sales to other agencies** – These are water sales made to another agency. Projected sales may be based on projected demand provided by the receiving water supplier. This is a wholesale demand.
- **Saline Water Intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof** – *Conjunctive use* is a water management strategy where surface water and groundwater are managed together to increase the total water supply. For purposes of the UWMP, conjunctive use is seen as a management strategy rather than as a water use. This type of water use is best reported as groundwater recharge. *Groundwater recharge* can occur through both natural and artificial means. In the context of this UWMP, artificial groundwater recharge is the managed and intentional replenishment of natural groundwater supplies using techniques such as infiltration basins or injection wells. Water used for groundwater banking or storage may also be reported using this sector. If all, or a portion of, the groundwater recharge is subsequently pumped out of the basin in the same year, that water is reported as a supply from groundwater. *Saline water intrusion barrier* is the practice of injecting water into a freshwater aquifer to prevent the intrusion of saltwater. These may be either a wholesale or retail demand. The City currently does not have any demands under this water use sector.
- **Agricultural** – Water used for commercial agricultural irrigation. Water used for processing agricultural products (e.g., food, beverage, or textile manufacturing) may also be considered industrial process water. This may be either a wholesale or retail demand. The City currently does not have any demands under this water use sector.
- **Distribution system water losses** – Losses that were reported in accordance with the 12-month water loss for each of the prior five years.

4.2.2 Water Use Sectors in Addition to Those Listed in Water Code

Presently, the City has no additional water use sectors outside of the ten listed in CWC. Furthermore, the City expects that future water use will be restricted to the same sectors by which water is currently used based on land use projections from the Land Use Element.

4.2.3 Past Water Use

Past potable water use by sector was analyzed to estimate water use projections into the next 25 years, as required by the CWC. By examining past water use, trends can be understood such as, effects of temporary use restrictions during drought years, effects of long-term demand management measures, and the changing profile of service connections by water use sector. Past water uses from the last two UWMP years, 2010 and 2015, as well as the five years preceding this plan are summarized in COR Table 4-A.

COR Table 4-A Past Potable Water Use Volumes by Sector.

Water Use Sector	2010	2015	2016	2017	2018	2019
Commercial	2,042	1,930	2,101	2,218	2,565	3,021
Industrial	891	934	954	921	797	276
Institutional and Governmental	667	561	650	770	384	393
Multi-Family	2,196	1,464	1,556	1,569	1,376	1,358
Single-Family	15,836	11,680	13,215	14,674	15,303	15,387
Landscape	5,534	4,152	4,691	5,491	5,656	5,974
Other (1)	272	–	–	–	–	–
Total	27,438	20,721	23,176	25,643	26,081	26,409
NOTES: (1) In 2015 and subsequent years thereafter, all water demands are characterized by water use sectors defined in the CWC. All Volumes are in AF.						

4.2.4 Current Water Use

The City's potable and non-potable water uses for 2020 by sector are reported in DWR Table 4-1. There are no existing potable or non-potable demands for the use types of saline barriers, conjunctive use, or agricultural.

DWR Table 4-1

Submittal Table 4-1 Retail: Demands for Potable and Non-Potable Water - Actual			
Use Type	2020 Actual		
Water Use Sector	Additional Description	Level of Treatment	Volume
Commercial	Including non-metered	Drinking Water	2,630
Industrial	Including non-metered	Drinking Water	254
Institutional/Governmental	Including non-metered	Drinking Water	412
Multi-Family	Including non-metered	Drinking Water	1,416
Single Family	Including non-metered	Drinking Water	17,115
Landscape	Including non-metered	Drinking Water	6,422
Losses	Including non-metered	Drinking Water	1,600
Sales/Transfers/Exchanges to other Suppliers	Including non-metered	Drinking Water	1,451
Groundwater recharge	Excludes groundwater pumped and supplied to distribution system.	Drinking Water	597
Sales/Transfers/Exchanges to other Suppliers	Discharge to Linda Creek and water wheeled on behalf of SJWD	Raw Water	404
		TOTAL	32,300
NOTES: All volumes are in AF. Losses are for potable water only. The 2020 Water Audit has not been validated at the time of plan preparation and final losses reported in the validated Water Audit may differ.			

4.2.5 Projected Water Use

The City frequently completes studies aimed at understanding future water use demands to determine the reliability of system supplies and identify and plan for any vulnerabilities. As stated in 3.4.1, the service area population directly impacts water use demands. To estimate projected water use through 2045, the following approach and resources were utilized:

Assumptions:

- The Planning Division's population projection from the 2020 General Plan Land Use Element was utilized, which estimates a population of 198,000 at buildout of all planned development.
- Based on coordination with the City of Roseville's Planning Division, assumed that all planned development would be complete by 2035.
- Assumed that the population past 2035 would remain constant at 198,000 through 2045.
- An estimated 1,843 dwelling units in the City of Roseville are not served by the City. The number of dwelling units are estimated based on other utility accounts.

Population Projection and Water Use Projection Steps

1. Calculated the population not served by the City by multiplying the number of dwelling units and California Department of Finance (CDoF) household multiplier.
2. Subtracted the population not served by the City from the total CDoF City of Roseville population to obtain the service area population for 2016 through 2020.
3. Estimated the current percentage of development for each specific plan from aerial imagery.
4. Input current percentage of development into the City of Roseville's Environmental Utilities (EU) Department's Water Demand Tracking Tool, which calculates buildout water usage for each specific plan. Water use in the Tool is calculated by applying unit demand factors, specific to land use categories, to each of the dwelling units Demand factors and total water use for all specific plans are provided in COR Table 4-B and COR Table 4-C, respectively.
5. Plotted the service area population from 2016 through 2020 and the projected population for 2035 to approximate the population for 2025 and 2030 (Figure 4-1). The resultant population projections were previously summarized in DWR Table 3-1.
6. Updated the Water Demand Tracking Tool development percentage for 2025 and 2030 to reflect population projections and for 2035 to reflect 100% at buildout.

COR Table 4-B Unit Demand Factors for Land Use Type

Residential Land Use Categories	Unit Demand Factor (gpd/DU)
Low Density Residential 1 – LDR1 (<3.5 DUs/Acre)	728
Low Density Residential 2 – LDR2 (3.5 to 5 DUs/Acre)	600
Low/Medium Density Residential 1 – LMDR1 (>5 to 6 DUs/Acre)	521
Low/Medium Density Residential 2 – LMDR2 (>6 to 8 DUs/Acre)	430
Medium Density Residential – MDR (>8 to 12 DUs/Acre)	323
High Density Residential – HDR1 (>12 to 16 DUs/Acre)	288
High Density Residential – HDR2 (>16 DUs/Acre)	177
Non-Residential Land Use Categories	**Unit Demand Factor**
Community Commercial/Retail	2598
Business Professional	2598
Light Industrial	2598
Industrial	2562
Railyard	109
Elementary School	3454
High School	4069
Public/Quasi Public	1780
Parks	2988
Open Space/Right of Way	0

COR Table 4-C Specific Plan Water Demands at Buildout by Water Use Sector.

Specific Plan	Commercial (AF/yr)	Industrial (AF/yr)	Institutional/ Governmental (AF/yr)	Multi-Family (AF/yr)	Single Family (AF/yr)	Landscape (AF/yr)	Total (AF/yr)
Infill	2,232	2,625	6,070	552	8,898	0	20,377
DTRSP	780	7	124	15	92	0	1,018
RSGW	83	0	0	34	57	0	173
SE	530	0	441	393	1,270	0	2,633
NE	1,769	0	65	0	474	0	2,309
STRSP	115	0	335	148	1,481	0	2,079
NCRSP	1,457	226	546	444	1,610	0	4,283
HRNSP	470	0	312	180	701	0	1,663
NWRSP	378	0	1,596	338	4,847	0	7,159
DWSP	37	0	1,273	20	2,056	0	3,386
NI	220	3,718	195	99	826	0	5,057
NRSP	225	0	644	165	2,859	0	3,893
WRSP	231	255	1,465	615	5,648	1,074	9,289
SVSP	623	0	499	335	2,538	0	3,995
CVSP	56	0	88	108	745	0	997
ARSP	150	0	110	187	940	0	1,386

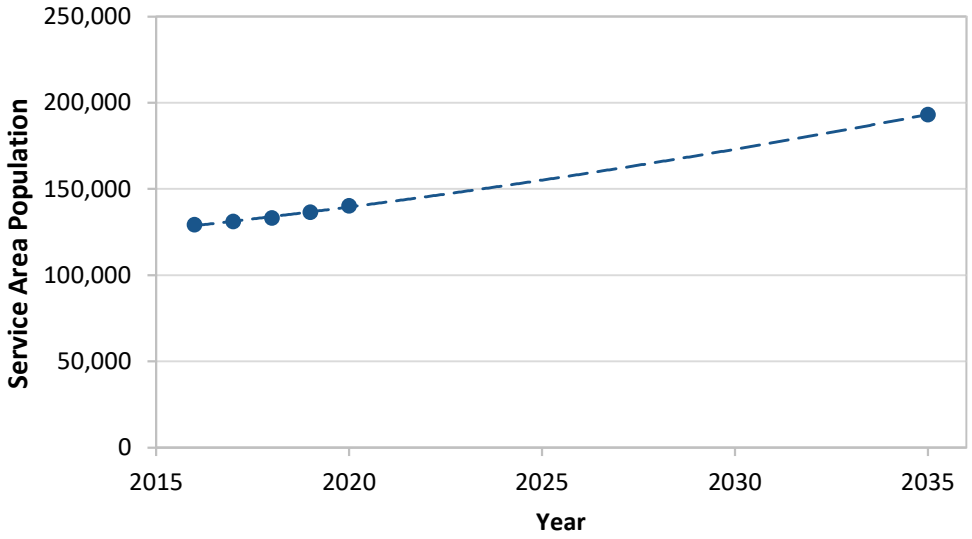


Figure 4-1 Existing and Projected Service Area Population

DWR Table 4-2

Submittal Table 4-2 Retail: Use for Potable and Non-Potable Water - Projected

Use Type	Additional Description (as needed)	Projected Water Use				
		2025	2030	2035	2040	2045
Commercial	Potable water, including non-metered	6,135	6,508	7,017	7,017	7,017
Industrial	Potable water, including non-metered	4,175	4,726	5,123	5,123	5,123
Institutional/Governmental	Potable water, including non-metered	8,904	9,494	10,321	10,321	10,321
Multi-Family	Potable water, including non-metered	1,752	2,029	2,725	2,725	2,725
Single Family	Potable water, including non-metered	22,564	24,508	26,281	26,281	26,281
Landscape	Potable water, including non-metered	644	765	805	805	805
Losses	Potable water	1,429	1,401	1,587	1,587	1,587
Sales/Transfers/Exchanges to other Suppliers	Potable water, including non-metered	0	0	0	0	0
Groundwater recharge	Potable water	1,560	2,720	3,350	3,350	3,350
Sales/Transfers/Exchanges to other Suppliers	Raw Water, Discharge to Linda Creek and water wheeled on behalf of SJWD	404	404	404	404	404
	TOTAL	50,572	47,567	52,555	57,614	57,614

NOTES: The city has no contracts for transfer for 2025 through 2045, as of yet. Projections are inclusive of lower income residential water demands. All values are in AF.

Total Gross water use projections, inclusive of recycled water, are provided in DWR Table 4-3. Recycled water demand is further characterized in DWR Table 6-4 of Chapter 6

DWR Table 4-3

Submittal Table 4-3 Retail: Total Gross Water Use (Potable and Non-Potable)						
	2020	2025	2030	2035	2040	2045
Potable Water, Raw Water	32,300	47,567	52,555	57,614	57,614	57,614
Recycled Water Demand	3,768	4,022	4,435	4,933	4,933	4,933
TOTAL WATER USE	36,068	51,589	56,990	62,547	62,547	62,547
NOTES: All values are in AF. Values include potable and non-potable water use.						

4.2.6 Distribution System Water Losses

Distribution system water losses are the difference between the volume of water that is delivered into the potable drinking water distribution system and actual consumption. Losses are always present in a water system due to pipe leaks, unauthorized connections or use, faulty meters, and unmetered institutional and governmental water use. Each year the City characterizes its water loss in accordance with the American Water Works Association (AWWA) Water Audit Method. CWC requires urban retail water suppliers to conduct and submit validated water loss audit reports annually to DWR on October 1st following the reporting year. Final Water Audit and Validation Reports are available for 2016 through 2019 and provided in Appendix D. As the UWMP is required to be submitted prior to the due date of the Water Audit, values for 2020 stated herein are approximate and may be altered in the final submission of the 2020 Water Audit. Distribution system water losses for five years preceding the plan update from 2015-2019 are summarized in COR Table 4-D and estimated water loss for 2020 is given in DWR Table 4-4.

COR Table 4-D 12 Month Water Loss Audit Reporting for 2015-2019.

Reporting Period Start Date (mm/yyyy)	Volume Water Loss (AF)
01/2015	2,127.52
01/2016	2,330.47
01/2017	2,682.94
01/2018	2,140.95
01/2019	1,865.24

DWR Table 4-4

Submittal Table 4-4 Retail: 12 Month Water Loss Audit Reporting	
Reporting Period Start Date	Volume of Water Loss*
01/2020	1,599.23
** Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.*	
NOTES: All Volumes are in AF. The 2020 Water Audit has not been validated at the time of plan preparation and final water losses reported in the validated Water Audit may differ.	

An update to the CWC requires that 2020 UWMPs and all UWMPs submitted thereafter include data showing whether the urban retail water supplier met the distribution loss standards enacted by the California State Water Resources Control Board (SWRCB) pursuant to Section 10608.34. At the time of plan preparation, the SWRCB has not adopted performance loss standards. Proposed water loss performance standards will set a maximum allowable water loss in gallons per connection per day for the City. The proposed baseline water loss is an average of the 2017 through 2019 water loss and is calculated to be 41.0 gallons per connection per day and the proposed performance standard to be met by 2028 is 22.3 gallons per connection per day Appendix E. Water loss in gallons per connection per day for 2017 through 2020 is shown in COR Table 4-E.

COR Table 4-E Loss Reported in AWWA Water Audit for 2017-2019.

AWWA Loss Category	2017	2018	2019	2020 [(1)]
Apparent Loss	8.02	8.01	7.90	9.78
Real Loss	46.89	34.97	28.78	21.19
Water Loss	54.91	42.98	36.68	30.97
NOTES: All values are gallons per connection per day. [(1)] The 2020 Water Audit has not been validated at the time of plan preparation and final water loss reported in the validated Water Audit may differ.				

The data from 2017 through 2020 demonstrate that the City annually reduced water loss measured as gallons per connection per day. The City continues to prioritize and allocate resources to detecting and repairing leaks in the distribution to reduce water loss. Over the last five years the City has increased the accuracy of reported losses through a process of quantifying the City's authorized unmetered use of water for institutional and governmental operations, which had previously gone unquantified and were reported as water loss. These municipal functions include fire suppression, street sweeping, hydraulic utility excavation, and others. In dedicating resources to tracking and understanding these internal uses, consumption of water for these authorized uses has not been reduced or restricted and the services continue, as necessary. The City anticipates that it is on track to meet the performance standard by 2028.

Note that in DWR Table 4-2 the projected water loss in 2030 and thereafter was calculated by multiplying the performance standard by the estimated number of service connections and for 2025 an intermediate water loss

multiplier of 27.09 gallons per connection per day was used. 2025 through 2045 number of service connections were estimated using the same ratio of 2020 total number of service connections to 2020 population.

4.2.7 Estimating Future Water Savings

As noted in DWR Table 4-2 and the following DWR Table 4-5, water use projections do consider future water savings and lower income residential demands.

DWR Table 4-5

Submittal Table 4-5 Retail Only: Inclusion in Water Use Projections	
Are Future Water Savings Included in Projections?	Yes
Sections where citations of the codes, ordinances, utilized in demand projections are found.	4.2.7.1 4.2.7.2 4.2.7.3
Are Lower Income Residential Demands Included in Projections?	Yes

The unit demand factors and resultant demands calculated by the EU department in COR Table 4-B and COR Table 4-C do not account for reduced demand from conservation measures. However, based on previous years' demand data, the City has observed that passive conservation measures have resulted in an approximate 25% reduced demand from what was projected. This 25% demand reduction is reflected in DWR Table 4-2 for the potable water use categories of Commercial, Industrial, Institutional/ Governmental, Multi-Family, Single Family, and Landscape. Conservation measures are described in the subsequent sections.

4.2.7.1 Compliance with Water Efficient Landscape Requirements

New development areas are required to reduce landscape area and calculated water demands as part of the process for land use approval, as required by the California Code of Regulations Title 23, Division 2 Chapter 2.7 Model Water Efficient Landscape Ordinance (MWELO). The City of Roseville's own standards have additional requirements for Water Efficient Landscaping, which can be found in Chapter 14.18 of the Roseville Municipal Code (available via the City's website).

4.2.7.2 Increased Utilization of Recycled Water

The City of Roseville requires recycled water to be used in most land use development areas currently being planned, and for construction water during drought years. Future required use includes landscaping associated with commercial, industrial, multi-family, parks, and transportation corridors. Guidelines for Recycled Water Service are outlined in Roseville Municipal Code Chapter 14.17 (available via City's website).

4.2.7.3 Implementation of Low Water Use Fixtures

Section 16.01.100 (A.) of the Roseville Municipal Code (available via City's website) states that: "The 2019 California Building Standards Code is hereby adopted by the City of Roseville Municipal Code."

Additionally, the mandatory CALGreen building standards code promotes conservation through the use of appliances and fixtures such as high-efficiency toilets, faucet aerators, and on-demand water heaters.

4.2.8 Characteristic Five-Year Water Use

The California Water Code Section 10635(a) requires that in addition to calculating water use projections over the next 20 years, in five-year increments, that suppliers perform a drought risk assessment lasting five consecutive years. The projected unconstrained demand for 2021-2025 is estimated in table COR Table 4-F. Unconstrained demand is demand absent any water supply or usage restrictions but does include the conservation practices for new construction, outlined in the previous section. This projection informs the drought risk assessment, which is detailed in Chapter 7 .

COR Table 4-F Five consecutive year unconstrained demand.

Gross Water Use	2021	2022	2023	2024	2025
Potable Water, Raw, Other Non-Potable	35,353	38,407	41,460	44,513	47,567
Recycle Raw Water Demand	3,819	3,870	3,920	3,971	4,022
NOTES: All volumes are in AF.					

4.3 Water Use for Lower Income Housing

Policy LU5.5, of the Land Use Element, strives to uphold the City of Roseville's Affordable Housing Goal by requiring that a minimum of 10% of all new housing units cost no more than 30% of the total monthly income of very low-, low-income, and moderate-income households. The City of Roseville EU Department annually coordinates with the Planning Division to gather data related to low-income housing metrics. The total number of affordable housing units in 2020 was 3,103, of which 633 were single family residences and 2,470 were multi-family residences. The water demands for low-income housing for 2020 were estimated by multiplying the number of single family and multi-family units by the average unit demand factor for low to medium density residential and high density residential, respectively, then reducing it by 20% to account for conservation efforts. These estimations are summarized in COR Table 4-G.

COR Table 4-G 2020 Affordable Housing Water Use

Unit Demand Factors	
Average Low to Medium Density Residential Factor for Single Family Units	520.4 (gpd/DU)
Average High Density Residential Factor for Multi-Family Units	232.5 (gpd/DU)
2020 Affordable Housing Water Use	
Single Family Residential	295 (AF/yr)
Multi-Family Residential	516 (AF/yr)
Total	645 (AF/yr)

As stated in DWR Table 4-5, the water use projections of DWR Table 4-2 are inclusive of water use for lower income households. The estimated water demand by sector for each specific plan, in COR Table 4-C, included affordable housing water use in the single family and multi-family water use calculations, which was used to derive the water use projections in DWR Table 4-2. The portion of water from those projections to be used by affordable housing units is shown in COR Table 4-H. As 10% of all new housing construction is required to be allocated to affordable housing, 10% of the difference between each of the five-year projections was added to the preceding period to estimate how much water would be used by low-income housing.

COR Table 4-H Affordable Housing Water Use Projections

Housing Type	2025	2030	2035	2040	2045
Multi-Family Residential	329	356	426	426	426
Single-Family Residential	1,061	1,255	1,433	1,433	1,433
Total Affordable Housing Units	1,390	1,612	1,859	1,859	1,859
NOTES: All values are in AF/yr.					

4.4 Climate Change Considerations

All projections included in Chapter 4 are representative of unconstrained demand except for passive conservation efforts described in 4.2.7. However, consideration of effects that climate change may have on demand projections and water supply and reliability is a critical aspect of ensuring that the City is well positioned to meet future demands. The City's primary water source is surface water from Folsom Lake and the City recognizes that the reliability of this source is reduced during dry years or a drought. A comprehensive study aimed at understanding how climate change will impact the American River Basin, from which the City receives its surface water supplies, was performed in 2020 and is included in Section 6.14.2. The effects of climate change on water supplies are considered in future plans for the groundwater program, a drought risk assessment, and a Water Shortage Contingency Plan**,** which are provided herein.

Chapter 5 SBX7-7 Baselines, Targets, and 2020 Compliance

With the adoption of the Water Conservation Act of 2009, also known as Senate Bill X7-7 (SB X7-7), the State of California is required to achieve a 20% reduction in urban per capita water use by December 31, 2020. Additionally, incremental progress towards meeting the goal was required to be demonstrated in the 2015 UWMP. The 2015 UWMP calculated gallons per capita per day (GPCD) water use and confirmed that the 2015 interim target was met, and that progress was being made toward meeting the water use target for 2020. This chapter summarizes baselines and targets, which were quantified in previous UWMPs, and confirms that the City's 2020 water use is compliant with SB X7-7 legislation.

5.1 Baselines and Targets

The City first addressed SB X7-7 in the 2010 UWMP, where baseline per capita water use, the 2015 interim target, and 2020 target were established and adopted. For the 2015 UWMP update the Department of Water Resources issued guidance that there were significant discrepancies between the CDoF estimated 2010 population and the 2010 population as determined by the 2010 U.S Census, which could result in poor baseline population estimates. Consequently, the City and other water suppliers were required to recalculate baseline population that had been reported in the 2010 UWMP and to modify the 2015 and 2020 targets accordingly.

SB X7-7 requires each urban water retailer to determine their baseline daily per capita water use measured in GPCD, over a 10-year or 15-year baseline period. The 10-year baseline period is defined as a continuous 10-year period ending no earlier than December 31, 2004 and no later than December 31, 2010. SB X7-7 also defines that for suppliers which met a minimum of 10% of their 2008 water demand through recycled water that the baseline could be extended to a maximum of a 15-year baseline period. Only 8.76% of the City's demand was met with recycled water in 2008, consequently the City used a 10 consecutive year period for its baseline. Additionally, SB X7-7 requires that a 5-year baseline per capita water demand be calculated over a 5 consecutive year period ending no earlier than December 31, 2007 and no later than December 31, 2010. Given the requirements the City used the following baseline periods:

- 10-year Baseline Period: 1995-2004
- 5-year Baseline Period: 2003-2007

Since the 2015 UWMP was completed, the City has experienced no changes to the service area that would require recalculation of baseline or targets; there have been annexations for new construction, but these do not trigger recalculation requirements. Baselines and targets are summarized in DWR Table 5-1. The 2015 SB X7-7 Verification Form, which provides tables for detailed calculations of baselines and targets, is provided in Appendix F.

DWR Table 5-1

Submittal Table 5-1 Baselines and Targets Summary from SB X7-7 Verification Form				
Baseline Period	Start Year	End Year	Average Baseline GPCD	Confirmed 2020 Target
10-15 year	1995	2004	309	247
5 Year	2003	2007	295	

5.2 Service Area Population

To correctly calculate compliance water use in GPCD, the population served by the City must be calculated. The method for 2020 service area population was briefly described in Section 4.2.5 and is further explained herein. The 2020 U.S. Census data were not available at the time of plan preparation and could not be used for population estimates, as such the City of Roseville population for 2020 was obtained from CDoF.

The CDoF population estimate for cities utilizes ACS data to distribute the 2010 U.S. census housing units into CDoF's standard housing types. Number of housing unit estimates are respective of new construction, annexations, demolition, and conversions. CDoF coordinates with both local jurisdictions and the U.S. Census Bureau to obtain housing unit change data. For 2020, CDoF estimated that the total population for the City of Roseville was 145,163. However, there are a few areas in the City of Roseville that are not served by the City. The population of the area not served was estimated by determining the total number of households in those areas and applying the household multiplier. The number of households was approximated based on utility information from other City of Roseville departments and the household multiplier was obtained from CDoF. The resulting population for the areas not served by the City is 4,976 and this was subtracted from the CDoF total population to obtain a 2020 service area population of 140,187.

5.3 Gross Water Use

Annual gross water use is defined by the CWC as the volume of water, treated or untreated, that enters the distribution system except for the following: recycled water, the net volume of water placed into long term storage, water conveyed by the retailer for use by another supplier, water delivered for agricultural use, and process water for industrial use if industrial water use is a significant percentage of overall water use. The volume of recycled water used within the City's service area is reported separate from potable water and is excluded from all gross water use volumes reported herein. No other exclusions or deductions were used in the calculation of the baseline gross water use and so are not included in the calculation of the 2020 gross water use.

5.4 2020 Compliance Daily Per-Capita Water Use

The 2020 compliance daily per capita water use (in GPCD) was calculated in accordance with Methodology 4 of DWR's *Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use* document. The SB X7-7 Compliance Form is a set of tables containing calculations demonstrating that the City met the 2020 target and achieved a 20% reduction from its baseline and is provided in Appendix G. 2020 GPCD and target compliance are also summarized in DWR Table 5-2.

DWR Table 5-2

Submittal Table 5-2: 2020 Compliance from SB X7-7 2020 Compliance Form				
2020 GPCD			2020 Confirmed Target GPCD	Did Supplier Achieve Targeted Reduction for 2020? Y/N
Actual 2020 GPCD	2020 TOTAL Adjustments	Adjusted 2020 GPCD		
203	0	203	247	Yes
NOTES: No allowable adjustments were applicable to the City.				

CWC Section 10608.24(d)(1) allows for adjustments to be made for factors outside of the supplier's control when determining compliance. Such factors include differences in evapotranspiration and rainfall, substantial changes to commercial or industrial water use due to increased business output and economic development, and substantial changes to institutional water use resulting from extraordinary events. No adjustments were made to the City's 2020 GPCD, as noted in DWR Table 5-2, and the City was able to demonstrate compliance without adjustments.

5.5 Regional Alliance

The City has complied with SB X7-7 and UWMP requirements as an individual supplier and has elected to not participate in a Regional Alliance.

Chapter 6 Water Supply Characterization

This chapter catalogues and describes the various water resources and supplies available to the City of Roseville including contract supplies from other agencies, surface water, groundwater, storm water, wastewater, and recycled water, as well as water transfers. The supply source, origin, quality, quantity, and impacts of climate change on availability for each source are discussed within this section.

6.1 Surface Water

The City's primary water supply contracts are and have historically been comprised of high-quality surface water received through Folsom Reservoir according to the terms of the City's water supply contracts with the US Bureau of Reclamation (USBR), Placer County Water Agency (PCWA), and San Juan Water District (SJWD). Since these supplies are not considered self-supplied and are instead purchased through other agencies, they are described in Section 6.2 Purchased and Imported Water.

6.2 Purchased and Imported Water

The City has historically relied heavily on its water supply contracts with Placer County Water Agency, the US Bureau of Reclamation, and San Juan Water District. All four untreated surface water contract entitlements for American River water total 66,000 acre-feet per year (AF/yr). The City's current contract and supplies of are outlined in COR Table 6-A.

COR Table 6-A Surface Water Supply Summary

Contract Supply	Supply Type	Quantity	Availability
USBR	Raw Surface Water	32,000 AF	Subject to CVP M&I Usage Policy(1)
PCWA	Raw Surface Water	30,000 AF	All Year Types
SJWD	Raw Surface Water	800 AF	Normal or Wet Hydrologic Years
SJWD	Raw Surface Water	3,200 AF	Normal or Wet Hydrologic Years
(1) The City's USBR Supply is subject in any year to determinations of allotments based on unimpaired inflow to Folsom Reservoir and downstream operations.			

Water supplies from all three source agencies outlined above are received through the same point location at Folsom Dam. Folsom Lake has been the primary source of water supply for the City of Roseville since 1971. Surface water from the American River is collected and diverted at the Folsom Lake Pumping Plant located at Folsom Dam. The City receives supplies from all four of its raw water contract entitlements through the Folsom Lake Municipal and Industrial (M&I) Intake at this facility.

Untreated water supplies received at this point are conveyed by gravity or pumped by USBR depending on lake level through two parallel pipelines (84-inch and 72-inch) to the City's Barton Road Water Treatment Plant (BRWTP), with a capacity for treatment of volumes up to 100 MGD. The 72-inch pipeline was constructed in 2010 to increase redundancy and reliability of this critical supply route, in partnership with SJWD. Additionally, the City has 19 intertie facilities with neighboring agencies through which water supplies may be transferred under normal

water year conditions as well as emergency or drought conditions. In the future, the City is exploring options with PCWA to facilitate receipt of treated water directly through existing and/or new intertie facilities.

6.2.1 Contract Supplies – Vulnerabilities and Restrictions

The City's contract supply with the USBR as part of the Central Valley Project is subject to yearly assignments based on each year's hydrologic conditions. Each year the City is informed in April of the determined percentage allotment of the full 32,000 AF allowed by the contract terms. This determination is made based on the unimpaired inflow of runoff into Folsom Reservoir. This supply is therefore highly vulnerable to climate change and its impacts on rainfall and snowpack conditions upstream of Folsom Reservoir in the Sierra Nevada Mountains. In recent years, this allotment has varied significantly on an annual basis and the City has undertaken dedicated efforts to examine alternatives for increasing water supply reliability in all year types.

The City's contract supply with PCWA is available in all hydrologic year types; it is also conveyed from the Middle Fork Project (MFP) through Folsom Reservoir and received as raw water at the same diversion point at Folsom Dam. The City is currently exploring potential future purchase of additional treated water supply received directly from PCWA to complement the raw water contract supply. PCWA's future Ophir Water Treatment Plant may provide up to 3,360 AF to the City in the future. The City is also currently engaged with PCWA to explore improvements to existing intertie facilities to expand and diversify opportunities for the transfer of supplies not dependent on the diversion facility at Folsom Dam.

The City has two water supply contracts with SJWD totaling 4,000 acre-feet. This supply is only available in Normal or Wet Year types and is received either through Folsom Reservoir or through interties with SJWD.

The City's surface water supplies are all dependent upon the operation of Folsom Reservoir by the US Bureau of Reclamation; the dam that creates the reservoir was originally constructed with a primary purpose of flood control, not water supply, and is still operated according to that primary function. The importance of this facility has led the City to examine options for redundancy, resilience, and or improvements with respect to the intake, and best practices in terms of management of its other water resources.

6.2.2 Water Forum Agreement

The City is a member of the Sacramento River Forum and a signatory to the Water Forum Agreement (WFA). Accordingly, the City has agreed to limit its diversions from the upper American River to 58,900 AF/yr during Normal and Wet water years, and to between 58,900 AF/yr and 43,800 AF/yr in Drier and Driest water years. The City is responsibly committed to the Water Forum Agreement but maintains the position that "By instituting programs to conserve water, it abandons no right, title or interest in or to any City water rights, contractual entitlements or any appurtenant rights necessary to exercise such water rights or entitlements," as described by Resolution No. 09-64, Declaring an Intent to Retain Control of Conserved Water (Appendix H).

6.2.3 Other Available Water Purchases

The City may choose to purchase Article 3F water from the Bureau of Reclamation when such supply is available. This supply source is typically only available in winter and spring months as it is generally considered "excess flow" released by the USBR above and beyond the entitlements of downstream users. In 2019 the City exercised this option and used approximately 950 AF of Article 3F water as part of their ASR program to inject and recharge the

aquifer. This effort represented a continued commitment to provide not only water supply reliability for the City's residents but also to support Conjunctive Use to aid in regional water supply reliability.

6.3 Groundwater

In recent years, the City has taken significant steps to expand and strengthen their Groundwater Program to broaden the City's water supply portfolio. The City currently owns and maintains 6 operational groundwater wells, with 6 additional wells planned for development in the next 10 years, and one planned destruction. Four of the 6 operational wells are capable of Aquifer Storage and Recovery (ASR) whereby treated water is injected into the underlying aquifer for later extraction and use. Currently, the City plans to design all new wells with ASR capability, as the City moves toward a more evenly distributed reliance on diverse water resources and regional sustainability.

Groundwater is considered to be available for use as part of Roseville's water supply portfolio in all year types including Normal, Single-Dry, or Five Consecutive Year Drought scenarios. Importantly, groundwater will be a critical resource in future drought years as it supplements increasingly vulnerable surface water supplies.

6.3.1 Groundwater Basin Description

The City is located over the North American Subbasin of the Sacramento Valley Groundwater Basin. The North American Subbasin (DWR Groundwater Basin Number 5-21.64) is located in the eastern central portion of the Sacramento Groundwater Basin, encompassing portions of Sutter, Placer, and Sacramento Counties. As of 2020, the Basin is listed by DWR as high priority in large part due to the population in the basin and existing and projected future groundwater use, but the basin has neither been adjudicated nor is it considered in overdraft or critical overdraft conditions.

Groundwater elevations in the subbasin along the Placer/Sacramento County line declined at a rate of 1 to 1.5 feet per year for multiple decades until approximately the mid-1990s. Some of the largest decreases have occurred in the area of the former McClellan Air Force Base. From 1995, groundwater elevations were stabilized, and the declining elevation trend was dampened due to groundwater management activities stemming from the Water Forum Agreement restraining further increases in groundwater pumping and implementation of in-lieu banking in the region. Groundwater elevations in Sutter and northern Placer counties generally remain stable, although some wells in southern Sutter County have experienced declines.

In addition, the subbasin has historically been pumped by agricultural and urban users. Recently, in some areas of the subbasin, agricultural land has been and is being developed and converted to urban uses. At this time, the subbasin is operating within the current estimate of sustainable yield.

6.3.2 Groundwater Management

The City actively manages groundwater resources both internally in coordination with land use planning and growth projections as well as regionally in accordance with the provisions of the Sustainable Groundwater Management Act. These efforts are discussed in the following subsections.

6.3.2.1 Western Placer County Groundwater Management Plan

A Groundwater Management Plan (GMP) was completed in November of 2007 in accordance with Senate Bill (SB) 1938 and Assembly Bill (AB) 3030 in cooperation with PCWA, City of Lincoln, and California American Water. The GMP is available through the PCWA website: Western Placer Groundwater Management Plan.

6.3.2.2 Sustainable Groundwater Management Act (SGMA)

The Sustainable Groundwater Management Act of 2014, or SGMA, was a three-bill legislative package composed of AB 1739 (Dickinson), SB 1168 (Pavley), and SB 1319 (Pavley). The package was passed in September 2014 and contains a framework for sustainable management of groundwater supplies by local agencies, with a limited role for state intervention if local agencies fail to meet the requirements of SGMA. SGMA lays out a process and a timeline for local authorities to achieve sustainable management of high and medium priority groundwater basins throughout the state. It also provides tools, authorities, and deadlines to achieve statewide sustainable groundwater management. For local agencies involved in implementation, the requirements are significant and will take years to accomplish. DWR has the responsibility to evaluate local agency progress, while the SWRCB may intervene if DWR determines that local agencies fail to make progress and achieve the requirements of SGMA. Essentially, local agencies who volunteer to comply with SGMA must form as Groundwater Sustainability Agencies (GSAs) and prepare, adopt, and implement a Groundwater Strategic Plan (GSP) that meets the requirements of SGMA.

More specifically, critical required steps include the formation of GSAs within two years of when SGMA became effective; the adoption of GSPs within 5-7 years depending on the status of the basin in question (in critical overdraft condition or not); and preparation, adoption and implementation of a GSP(s) that achieves the sustainability goal within 20 years of plan adoption.

SGMA applies to basins or subbasins designated by DWR as high or medium-priority, based on a statewide prioritization that uses criteria including population, importance and amount of groundwater pumped, extent of irrigated agriculture dependent on groundwater, and other criteria. DWR's final Basin Prioritization findings indicate that there are 127 of California's 515 groundwater basins and subbasins which are high and/or medium-priority. These high and medium-priority basins account for 96% of California's annual groundwater pumping and include 88% of the state's population. The priority ranking for the North American sub-basin of the Sacramento Valley groundwater basin is 24 out of the state's 515 basins, with an overall ranking score of 22.5 and a designation of High Priority.

The City is well along the path of SGMA compliance, having joined the West Placer Groundwater Sustainability Agency (WPGSA) consisting of the City of Lincoln, Placer County Water Agency, Nevada Irrigation District, and the County of Placer. The WPGSA is one of a group of five GSAs formed within the North American Subbasin that consist of West Placer Groundwater Sustainability Authority, Sacramento Groundwater Authority, South Sutter Water District, Sutter County, and Recreation District 1001 GSAs. All five of these GSAs will prepare and submit one joint GSP for the entire Subbasin. This GSP will be submitted to DWR in advance of the January 31, 2022 deadline for high-priority basins not currently in critical overdraft.

6.3.3 Historical Groundwater Production

Until recently, groundwater had not been utilized by the City under normal year conditions. In the 2015 UWMP, the City's groundwater wells were identified for use only in drought or emergency conditions, with minimal pumping for the purpose of maintenance or demonstration of the City's ASR program. Over the last five years, the City has worked to advance and expand the groundwater infrastructure and groundwater program to provide additional water supply reliability.

Beginning in 2018, the City began to regularly operate existing groundwater infrastructure specifically by pumping small volumes of groundwater from the City's production wells and serving that water into the distribution system as part of the maintenance plan. In 2019 and 2020, the City was able to store excess surface water through the use of ASR production wells by injecting that water into the aquifer. As the City continues to develop this program and look to the future of sustainable supply, groundwater pumping patterns will continue to evolve. A summary of the amount of groundwater pumped by the City over the past five years is provided in DWR Table 6-1.

DWR Table 6-1

Submittal Table 6-1 Retail: Groundwater Volume Pumped						
☐	Supplier does not pump groundwater. The supplier will not complete the table below.					
☐	All or part of the groundwater described below is desalinated.					
Groundwater Type	Location or Basin Name	2016	2017	2018	2019	2020
Alluvial Basin	North American Sub-basin of the Sacramento Valley Groundwater Basin 5-21.64	0	0	16.6	23.37	201.1
	TOTAL	0	0	17	23	201
NOTES: Water pumped from Roseville groundwater wells does not need to be desalinated.						

6.3.4 Aquifer Storage and Recovery

The City considers development of a diverse and drought resistant water supply portfolio of primary importance. To this end, the City has invested in both planning and capital improvements develop their Aquifer Storage and Recovery (ASR) Program into a highly functional and critical component of the Water Utility's future. The ASR Program utilizes groundwater pumping infrastructure along with existing water supplies to increase reliability. ASR wells are capable of injecting treated surface water from the distribution system into the groundwater aquifer for later extraction and use. A schematic of wells equipped for ASR within an urban environment, accessing the underlying aquifer for groundwater, is provided in Figure 6-1.

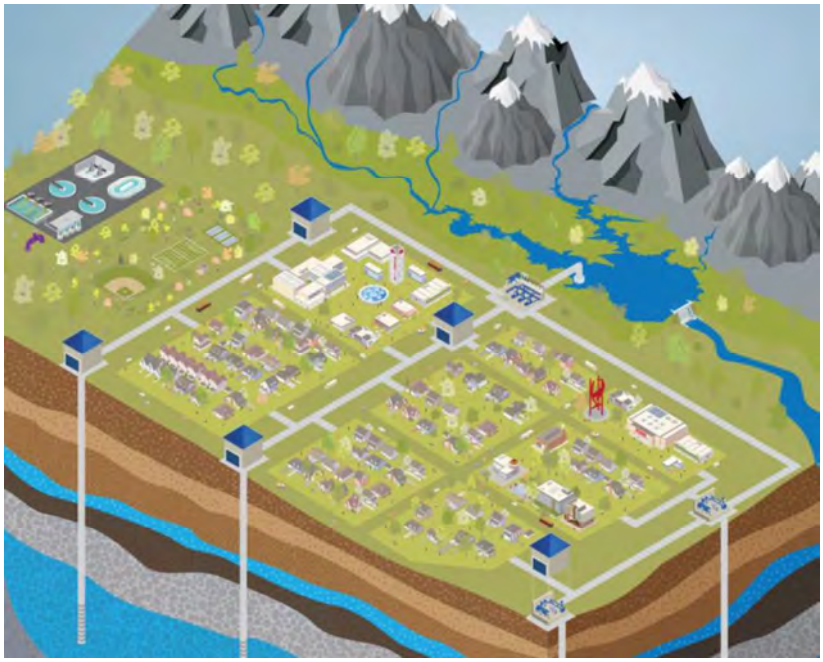


Figure 6-1 Urban Groundwater Infrastructure Schematic

ASR production wells can be used seasonally (i.e. throughout the water year) or periodically over many years to create a "groundwater bank", storing surface water supplies within the aquifer in times of abundance (wet season or years) for use in times of scarcity (dry season or years). An important component of an ASR Program is to maintain consistent and detailed records of groundwater levels within the aquifer and extraction/injection volumes. This information is used to ensure the groundwater basin is managed sustainably providing water supply reliability benefits while avoiding impacts to the groundwater basin. The City is a committed leader in the region with respect to the development of potential future cooperative water banking and responsible regional resource management.

6.4 Stormwater

At this time, the City does not employ any active stormwater recovery measures. In recent years, the City has invested in studies to determine whether stormwater recapture represents a possible resource for future diversity in groundwater recharge projects. Considerations include water rights, timing and quantity of available runoff, property rights, and water quality, among others. Given the complexity of the issues pertaining to stormwater capture or surface spreading, the City continues to conduct analyses to determine the feasibility of this option in the future.

6.5 Wastewater and Recycled Water

The City currently owns and operates two regional wastewater treatment facilities that treat wastewater flows collected from the City, South Placer Municipal Utilities District (SPMUD), and some areas of unincorporated Placer County. This section provides information on wastewater management, as well as its current and potential reuse as a recycled water resource.

6.5.1 Wastewater Collection, Treatment, and Disposal

The South Placer Wastewater Authority (SPWA) was created under a Joint Powers Agreement in October 2000 and is comprised of the City of Roseville, South Placer Municipal Utilities District, and the County of Placer. The SPWA oversees policy for funding regional wastewater infrastructure. The City collaborates with the regional partners on forward planning and best practices for the management of these regional facilities.

The wastewater collection and treatment facilities within the City's service area are maintained and operated by City staff. The wastewater collection facilities outside of the City's service area are maintained by the other SPWA agencies (Placer County and SPMUD). Wastewater outside of the City's service area but within the SPWA Service Area Boundary is conveyed through trunk sewers to the City's wastewater treatment facilities located within the City limits. Metering stations are located at the City's service area boundaries to account for the wastewater entering the City's collection system originating from Placer County and SPMUD collection areas.

The City owns and operates on behalf of the SPWA the Dry Creek Wastewater Treatment Plant (Dry Creek WWTP) and the Pleasant Grove Wastewater Treatment Plant (Pleasant Grove WWTP). Both plants discharge tertiary treated wastewater to surface water. Dry Creek WWTP discharges to Dry Creek while the Pleasant Grove WWTP discharges to Pleasant Grove Creek. The two wastewater treatment plants serve an area that extends beyond the City boundaries.

The Dry Creek WWTP provides tertiary-level wastewater treatment. The treatment consists of screening, grit removal, primary clarification, aeration, nitrification and denitrification, secondary clarification, filtration, and ultraviolet disinfection. Disinfected tertiary-treated wastewater from the Dry Creek WWTP meets Title 22 regulations for full, unrestricted use. The current (2020) average dry weather flow (ADWF) is approximately 8.5 MGD, of which approximately 65%, or 5.5 MGD comes from the City of Roseville.

The plant is currently authorized to discharge up to 18 MGD ADWF into Dry Creek under the Municipal General Order. The Dry Creek WWTP discharge is assigned Municipal General Order enrollee number R5-2017-0085-004 and National Pollutant Discharge Elimination System (NPDES) permit No. CAG585001. Per the State Water Resources Control Board Division of Water Rights, the City is required to maintain an instream flow of four million gallons per day discharge to Dry Creek. Disinfected tertiary treated wastewater from the Dry Creek WWTP meets Title 22 regulations for full, unrestricted use. The Dry Creek WWTP currently (2020) produces 1,063 AF/yr of recycled water. A portion of recycled water from Dry Creek is discharged into a gravity line that supplies a school and Morgan Creek Golf Course, both of which are located in Placer County, outside the City's water service area. The remainder of recycled water from the Dry Creek WWTP is pumped into the recycled water distribution system and used within the City's water service area.

The Pleasant Grove WWTP currently (2020) treats approximately 8.1 MG ADWF with approximately 65% or 5.3 MGD coming from the City of Roseville. The Pleasant Grove WWTP provides disinfected tertiary-level treatment through the process of screening, grit removal, secondary aeration, secondary clarification, filtration, and ultraviolet disinfection. The Pleasant Grove WWTP discharge is assigned Municipal General Order enrollee number R5-2017-0085-005 and National Pollutant Discharge Elimination System Permit No. CAG585001. There are no instream flow requirements for Pleasant Grove Creek.

Disinfected tertiary-treated wastewater from Pleasant Grove WWTP meets Title 22 regulations for full, unrestricted use. The Pleasant Grove WWTP currently (2020) produces 2,434 AF/yr of recycled water that is pumped into the recycled water distribution system and used within the City's service area boundary.

Pleasant Grove WWTP is currently undergoing construction of a major capital improvement project which began in November 2019 and is expected to be complete in 2022. The project includes an increase in treatment capacity from 9.5 MGD up to 12 MGD. Improvements to the treatment process include the addition of primary clarification, waste activated sludge thickening, and anaerobic digestion. This project represents significant improvement to the capacity of the Pleasant Grove WWTP with important components of long-term resilience and improved efficiency of the City's utilities.

The project also includes important improvements which benefit the environmental and create renewable energy resources. Methane from anaerobic digestion will be converted to a renewable compressed natural gas (CNG) to fuel the City's growing solid waste fleet and fuel new microturbines that generate electricity for plant usage. The project includes a receiving facility for energy-dense wastes to enhance methane production.

As previously described, both treatment plants are regional wastewater facilities and as such, wastewater is generated both inside and outside of the City from a combination of residential and non-residential sources. A summary of the volume of wastewater processed at and discharged from each of the City's wastewater treatment plant in 2020 is provided in DWR Table 6-2 and DWR Table 6-3.

DWR Table 6-2

Submittal Table 6-2 Retail: Wastewater Collected Within Service Area in 2020						
100%	Percentage of 2020 service area covered by wastewater collection system					
100%	Percentage of 2020 service area population covered by wastewater collection system					
Wastewater Collection			**Recipient of Collected Wastewater**			
Wastewater Collection Agency	Wastewater Volume Metered or Estimated?	Volume of Wastewater Collected from UWMP Service Area 2020	Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area?	Is WWTP Operation Contracted to a Third Party?
City of Roseville	Metered	5,958	City of Roseville	Pleasant Grove WWTP	Yes	No
City of Roseville	Metered	6,501	City of Roseville	Dry Creek WWTP	Yes	No
Total Wastewater Collected from Service Area in 2020:		12,459				
NOTES: All volumes are in AF. Approximately 65% of the flow received at the Dry Creek WWTP and 65% of the flow received at the Pleasant Grove WWTP originates in the City's water service area.						

DWR Table 6-3

Submittal Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2020

Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Method of Disposal	Wastewater Generated Outside the Service Area Treated?	Treatment Level	2020 volumes				
						Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area	Instream Flow Permit Requirement
Pleasant Grove WWTP	Pleasant Grove Creek	Creek	River or creek outfall	Yes	Tertiary	9,166	6,491	2,434	0	0
Dry Creek WWTP	Dry Creek	Creek	River or creek outfall	Yes	Tertiary	10,001	7,902	956	378	4,481
					Total	19,167	14,393	3,119	378	4,481

NOTES: All volumes are in AF.
100% of influent flow received at both WWTPs is treated and discharged within the City's service area boundary.

6.6 Recycled Water System

6.6.1 Recycled Water Coordination

The City regards recycled water as a valuable resource that is a key component of the City's overall water supply portfolio. The City operates its recycled water system and program in coordination with its regional wastewater partners, including South Placer Municipal Utilities District and Placer County. The City has been successfully irrigating landscaped areas throughout the City \and planning recycled water implementation as part of new development surrounding the City. The City prepared the 2016 Recycled Water Systems Evaluation to position the City for implementing the next phases of recycled water projects as new users within the City come online, and as the various UGA's plan for and install recycled water infrastructure.

The City operates the recycled water program though the requirements of Master Reclamation Permit Order 97-147 (Permit). The Permit implements the reclamation criteria of the City's Title 22 disinfected tertiary recycled water. Current uses of recycled water within the City include irrigation of landscapes and golf courses, industrial cooling for the Roseville Energy Park, and construction purposes such as dust control and soil compaction. Recycled water is also conveyed outside the City's water service area for golf course and landscape irrigation.

The City has prepared the South Placer Regional Wastewater 2020 Systems Evaluation Report (Appendix I), which delineates the current and projected service area boundary, including Urban Growth Areas expected to be added in the near future as development continues. The report provides baseline and projected characterizations of its regional wastewater and recycled water systems. The Systems Evaluation Report was updated to address recent annexations by the SPWA partner agencies, planning revisions, as well as changes in wastewater characteristics and flows. Recycled water supplies and availability are directly linked to the planning and operation of the wastewater treatment plants and must be managed and planned in coordination. The City and its SPWA partners continue utilizing recycled water supplies is to promote responsible water supply management. Beneficial use of available disinfected tertiary treated Title 22 recycled water allows surface water and groundwater supplies to be applied to potable uses.

All agency elements for a reuse program within the City boundary, including land planning, development, wastewater treatment, and water supply, are a part of the City of Roseville government organization.

6.7 Recycled Water Beneficial Uses

The City's recycled water program predominantly serves landscape irrigation customers. The City currently delivers recycled water to golf courses, parks, schools, and many miles of streetscape for landscape irrigation within the City's potable water service area. The City also provides recycled water to a school and a golf course outside of the City's potable water service area. The City delivers recycled water to the Roseville Energy Park, which is owned and operated by the City of Roseville Electric Utility, for industrial cooling purposes. Landscapes at both regional wastewater treatment plants also use recycled water for irrigation purposes. Recycled water can be used for construction purposes such as dust control and soil compaction.

The current and projected direct beneficial uses of recycled water in the City's water service area are shown in DWR Table 6-4.

DWR Table 6-4

Submittal Table 6-4 Retail: Recycled Water Direct Beneficial Uses Within Service Area										
Name of Supplier Producing (Treating) the Recycled Water:		City of Roseville								
Name of Supplier Operating the Recycled Water Distribution System:		City of Roseville								
Beneficial Use Type	Potential Beneficial Uses of Recycled Water	Amount of Potential Uses of Recycled Water	General Description of 2020 Uses	Level of Treatment	2020	2025	2030	2035	2040	2045
Landscape irrigation (excludes golf courses)	Landscape irrigation of public areas and medians.	3,164	Landscape irrigation of public areas and medians.	Disinfected Tertiary	1,336	1,446	1,625	1,841	1,841	1,841
Golf course irrigation	Irrigation	2,577	Excludes golf course usage outside service area boundary.	Disinfected Tertiary	1,744	1,888	2,121	2,403	2,403	2,403
Industrial use	Industrial cooling	310	Roseville Energy Park (REP) cooling water use.	Disinfected Tertiary	310	310	310	310	310	310
Other	Morgan Creek Golf Course	348	Irrigation	Disinfected Tertiary	378	378	378	378	378	378
				Total:	3,768	4,022	4,435	4,933	4,933	4,933
				2020 Internal Reuse	yes					
NOTES: All values are reported in AF.										

The uses listed in DWR Table 6-4 include use of recycled water supply as well as required discharges. Recycled water uses represent demands within the City's service area boundary including all approved specific plans. The 4 million gallon per day required discharge to Dry Creek as an instream flow requirement totaling 4,480 AF/yr is not shown in DWR Table 6-4.

A comparison of the 2020 actual use of recycled water to what was projected for use in 2020 in the 2015 UWMP is provided in DWR Table 6-5.

DWR Table 6-5

Submittal Table 6-5 Retail: 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual		
Use Type	**2015 Projection for 2020**	**2020 Actual Use**
Landscape irrigation (excludes golf courses)	1,923	1,336
Golf course irrigation	1,378	1,744
Industrial use	1,120	310
Total	4,421	3,390
NOTES: All values are in AF. Golf course irrigation does not include golf course irrigation outside the City's service area (Morgan Creek Golf Course)		

6.8 Actions to Encourage and Optimize Future Recycled Water Use

As of 2020, the peak recycled water production in July is approximately equal to the peak recycled water demand in July. For the City to further expand recycled water usage during the irrigation season, additional recycled water must be made available. This will most likely be accomplished through expansion of operational storage, with the necessary storage volume dependent on actual demand requirements. Therefore, the City will continue to evaluate in-City and regional recycled water demands and consider its ability to provide recycled water for future projects.

It is the policy of the City that where the use of recycled water is feasible, appropriate, and acceptable to all applicable regulatory agencies, the City will require an owner or customer to use recycled water for approved uses. The City has other methods of encouraging recycled water use including a rate discount and public education. The recycled water rate for customers is currently 50 percent of the potable water rate. The City also implements an extensive public education campaign to educate its customers about the reliability and other benefits of recycled water. Another major benefit to customers of using recycled water is that it can be used reliably in times of drought. In the event the City imposes drought restrictions on uses, such as irrigation and construction, recycled water is exempt from these restrictions. Under certain drought stages, the City would mandate the use of recycled water for construction purposes.

One target of future recycled water use is new development, as stated in DWR Table 6-6. A major hindrance to expanding use of recycled water in existing developments is lack of infrastructure. Installing new infrastructure in existing areas is exceedingly expensive. The City requires use of recycled water for all commercial irrigation services in newly developing master planned areas. This is feasible because the recycled water infrastructure can

be installed as part of the original project. Additionally, the City is considering expanding recycled water distribution to entities both within and outside the potable water service area.

DWR Table 6-6

Submittal Table 6-6 Retail: Methods to Expand Future Recycled Water Use			
Page 6-12	Page location of recycled water use narrative in UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
Developer Agreements	Per City of Roseville development standards, recycled water must be incorporated into future construction.	2020-2045	1,165
		Total	1,165
NOTES: All values are in AF.			

6.9 Desalinated Water Opportunities

There are no opportunities for the development of desalinated water within the City's service area as a future supply source. The City is not located near any bodies of water that would allow for the option.

6.10 Exchanges or Transfers

The City maintains an on-demand treated water system that is used for municipal and industrial purposes. The City maintains direct treated water interties with five surrounding jurisdictions, as described in Section 2.2.3. The City can transfer water between jurisdictions through these interties or access water to supplement its distribution system. These facilities are designed to be used for wheeling water through the service area or for demand shortage assistance.

As a condition of the Water Forum Agreement, the City has entered into a re-operation agreement with PCWA for up to 20,000 AF to be used when Roseville's surface diversion is cut back. In general, the agreement calls for PCWA to release up to an additional 20,000 AF to the American River on an annual basis during time of reduced water availability in the system. This water is to maintain flows in the Lower American River (Nimbus Dam to Sacramento River), and therefore is not available for the City's use. This re-operation water is considered a transfer, although the ultimate user of the water, if any, has not been identified as part of the agreement - only that the water would be marketed when it was identified as available. It is possible there could be multiple users as the water will flow to the Delta and theoretically be available to all Delta water users.

Also, as a condition of the Water Forum Agreement, the City has committed to not take the entire amount of contracted water from the Upper American River. As a result of having 66,000 AF/yr of water available through various contracts and a commitment to take no more than 58,900 AF/yr from the American River Watershed, there is an opportunity to find a long-term transfer for the 7,100 AF/yr with a user downstream of the confluence of the American and Sacramento Rivers. The Water Code definition of short- and long-term conditions are that short-term is considered for a period of one year or less and long-term is for a period of more than one year.

6.11 Supply Management

The City has historically relied primarily on their suite of surface water contracts, supplying high quality water through the City-owned Barton Road Water Treatment Plant, and serving the City's population through gravity flow. In most year types, the City will continue to rely primarily on these supply sources for the bulk of potable water supply. Of these surface water contracts, the City employs supplies through the USBR contract as a first priority each year, pulling next from the PCWA contract as needed. Each year allocations from the USBR are subject to variation, resulting in potential differences in the duration and quantity of supply pulled from this contract annually.

City Water Utility staff plan to utilize groundwater infrastructure differently in Normal and Dry hydrologic years. In general, Roseville plans to use groundwater infrastructure in accordance with sustainable groundwater management goals and objectives. In a Normal year, this means that the City plans to extract up to the quantity of water banked in that year. In drought years, the City may find the need to operate its wells more significantly to meet demands when significant impacts are seen to surface water supplies. This is outlined further in Chapter 7. As the City continues to install more ASR wells into the coming decade, provisions of the municipal code will be updated to reflect their groundwater strategy.

6.12 Future Water Projects

The City has taken a proactive approach to ensuring resource diversity with a focus on surface water contracts, strong groundwater infrastructure, and highly collaborative regional presence in water planning and future conjunctive use. Future water supply project opportunities, including diversifying the purchasing or importing of water, expansion of the City's groundwater and ASR program, and regional cooperative conjunctive use are discussed in the following sections.

6.12.1 Purchased or Imported Water

In addition to the current contract with PCWA for 30,000 AF/yr of surface water, the City is evaluating and may enter an agreement with PCWA for additional treated surface water supplies available in all hydrologic year types. The treated PCWA water would be supplied by PCWA's future Ophir Water Treatment Plant (Ophir WTP) which will treat water from the Middle Fork Project. The Ophir WTP will be constructed in phases, with the first phase expected to be operational by 2035 and provide an estimated 10 MGD total supply to all customers. Additional phases will be evaluated as PCWA wholesale customers need new supply. The City may purchase up to 3 MGD of normal year capacity from the Ophir WTP, equivalent to 3,360 AF/yr of treated surface water supply.

The City is also exploring future opportunities for water transfers with regional partner agencies in an effort to diversify regional water management strategies in conjunction with responsible groundwater management practices. In 2019, the City executed an agreement for pilot water transfer program with Sacramento Municipal Utilities District (SMUD). This agreement allowed for an annual water transfer for up to 6,000 AF for three years. The transfer allows Roseville to use wet season higher flows to recharge the groundwater aquifer for later season extraction and use. The transfer was executed consistent with Water Forum Agreement policies and goals, as well as an excellent precedent for regional conjunctive use strategies. The City may look to renew this transfer or evaluate similar opportunities in coming years to provide drought resiliency and support the sustainable management of groundwater.

6.12.2 Groundwater and ASR Program

The City has historically relied upon groundwater resources only as a backup supply in times of shortage. Over the last few years and in response to lessons learned during the 2015 drought, changing climate conditions, and the overall need for further diversity and reliability of water supply, the City has invested in efforts to operationalize and expand its groundwater program as a regular part of its water supply portfolio in all year types. Along this vein, the City developed a Groundwater Strategic Plan in an effort to evaluate current infrastructure, potential new well sites, further understand the condition and accessibility of the aquifer within the City's service area boundary, and how groundwater planning would look moving forward. The result of these planning efforts has been the identification of 6 future well sites throughout the City's Pressure Zones 1 and 4, with a heavier emphasis on infrastructure on in Pressure Zone 1. Conceptual design and siting have been completed for these future well sites, with exploratory drilling. The City plans to install these wells and their topside improvements within the next 5-10 years, all with ASR capability to enhance flexibility of operations and expand the City's conjunctive use capabilities. For planning purposes, each well is assumed to extract a nominal 1,750 GPM, with a final production value to be determined upon production well drilling and development. These 6 future wells are expected to represent a total of 16,936 AF/yr of additional water supplies.

Four of the City's six existing wells have ASR injection capability, and at this time the City plans for future wells to also be ASR capable. The ASR Program will not only allow the City to change the pattern of water withdrawal from Folsom Reservoir from peak demand times in the summer to times when water is more available (i.e. the winter) but could also be used as a replacement for surface water in WFA dry/drier years. The expected future water supply programs are listed in DWR Table 6-7.

DWR Table 6-7

Submittal Table 6-7 Retail: Expected Future Water Supply Projects or Programs						
Name of Future Projects or Programs	Joint Project with other suppliers?		Description	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Supplier
	Yes/ No	Agency Name (if applicable)				
Regional Conjunctive Use	Yes	Various	Regional water banking and aquifer storage and recovery projects.	2025	All Year Types	Not Yet Determined
Production/ASR Well Program Expansion	No		Development of up to 6 new production wells with ASR capability.	2035	Potentially, All Year Types	14,431
Ophir Water Treatment Plant	Yes	PCWA	Partnership with PCWA in the development of additional treated water capacity for purchase through existing interties.	2035	All Year Types	3,360
PCWA-Roseville Cooperative Water Reliability Project	Yes	PCWA	Partnership with PCWA to optimize and improve existing interties to increase supply transfer volumes and reliability.	2025	All Year Types	Not Yet Determined
NOTES: All values are in AF.						

6.13 Summary of Existing and Planned Sources of Water

The City's current planned sources of water can be summarized as such:

- The City is currently contracted to purchase 66,000 total AF/yr of American River water diverted from Folsom Lake with certain restrictions (see Chapter 7).
- The City intends to purchase an additional treated water supply from PCWA of 3,360 AF/yr as part of their Ophir Water Treatment Plant project.
- The City neither currently uses nor plans to use surface water that is not mentioned above.
- The City maintains groundwater wells for normal, drought year, and emergency supply. Four of the City's 6 existing active production wells possess ASR capability.
- The City does not currently use storm water as a potable water offset. The City is investigating future opportunities to use stormwater in other beneficial ways.
- The City currently utilizes and has future plans to expand recycled water usage.
- The City neither currently uses nor plans to use desalinated water.
- The City maintains direct treated water interties with four surrounding jurisdictions for use in emergency or water transfer situations.

The actual 2020 water supplies for the City are summarized in DWR Table 6-8 and the future projected water supplies for the City are summarized in DWR Table 6-9.

DWR Table 6-8

Submittal Table 6-8 Retail: Water Supplies — Actual			
Water Supply	Additional Detail on Water Supply	2020	
		Actual Volume	Water Quality
Purchased or Imported Water	US Bureau of Reclamation	24,375	Drinking Water
Purchased or Imported Water	Placer County Water Agency	9,409	Drinking Water
Purchased or Imported Water	San Juan Water District	0	Drinking Water
Groundwater (not desalinated)	City of Roseville owned production wells	201	Drinking Water
Recycled Water	Recycled water produced by City of Roseville WWTPs	3,497	Recycled Water
	Total	37,482	
NOTES: All values are in AF.			

DWR Table 6-9

Submittal Table 6-9 Retail: Water Supplies — Projected

Water Supply	Additional Detail on Water Supply	Projected Water Supply									
		2025		2030		2035		2040		2045	
Water Supply		Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield
Purchased or Imported Water	USBR - CVP Contract Supply	32,000	32,000	32,000	32,000	32,000	32,000	32,000	32,000	32,000	32,000
Purchased or Imported Water	PCWA - Middle Fork Project Supply	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000
Purchased or Imported Water	SJWD	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000
Other	Water Forum Limitation on American River Supply Diversion	-7,100		-7,100		-7,100		-7,100		-7,100	
Purchased or Imported Water	PCWA - Potential Future Purchase (OPHIR WTP)	0	0	0	0	3,360	3,360	3,360	3,360	3,360	3,360
Groundwater (not desalinated)	Groundwater Wells	1,560	7,920	2,720	12,570	3,350	14,430	3,350	14,430	3,350	14,430
Recycled Water	South Placer Wastewater Authority	4,791	4,791	5,269	5,269	5,643	5,643	5,958	5,958	6,383	6,383
	Total	65,311	77,991	66,869	82,309	69,283	86,103	69,598	86,418	70,023	86,843

NOTES: Under normal year operations, the City intends to manage groundwater use sustainably through the active recharge of surface water through the ASR Program. Values shown above assume a 3-month injection window and an equal volume of extraction. New ASR well infrastructure is expected to be operational by 2030, with additional wells installed by 2035.
All values are in AFY.

6.14 Climate Change Impacts to Supply

6.14.1 Local Climate Change Outlook

The City has acknowledged and incorporated many recent lessons learned from the last 10 years of climate related impacts to the reliability of its water supply. Beginning with the extended drought early in the decade, culminating with the extreme shortages experienced in 2015, Roseville has seen unprecedented curtailments of water supply and how important diversity of sources, diversion locations, and other options become when regular supply is interrupted.

It is expected that regional reductions in Sierra Nevada snowpack will continue and worsen in the coming years, creating uncertainty of surface water supplies – specifically the contract Roseville holds with USBR for 32,000 AF annually which can be curtailed down to 0% depending on each year's hydrologic outcome. Further, in drought years a lack of inflow to Folsom Reservoir can reduce water surface elevations significantly and quickly, with the possibility of exposing the intake facility at the dam.

The City's surface water supplies will be more vulnerable to declining snowpack in coming years, with potential for severe limitations in single dry years as well as periods of persistent drought. Integrating cross-seasonal groundwater management (injecting in times of excess for extraction in times of scarcity) will provide much needed resilience in the face of shifting climate conditions.

With these things in mind, the City has taken steps to operationalize its groundwater infrastructure and work toward beneficial use (injection) of excess wet season supplies in preparation for seasonal shortages in surface supply. It is important to note that Roseville is not simply planning to draw from the aquifer to offset its surface water contracts, but rather that they are making concurrent plans to recharge this aquifer and bank supply before the need arises. It is this type of forward planning that Roseville brings to the regional stage in helping the group of agencies relying on these same supply sources to move toward a more sustainable outlook. Diversity of operations and supply sources allow a more flexible approach to each year's specific hydrologic conditions and water demand.

6.14.2 Regional Climate Studies

In 2020, the American River Basin (Basin) region conducted a climate change study in partnership with local water purveyors and the USBR. The purpose of the American River Basin Study (ARBS or Study) was to develop data, tools, analyses, identify supply-demand imbalances, and climate change adaptation strategies specific to the Basin. Under the "new normal" of a changing climate, the ARBS aims to improve the resolution of regional climate change data and to develop regionally specific mitigation and adaptation strategies. As a participant of the study, and service area contained within the Study Area, the following summarizes climate change findings pertinent for the region. More detail, along with the approved study can be found at www.pcwa.net/planning/arbs.

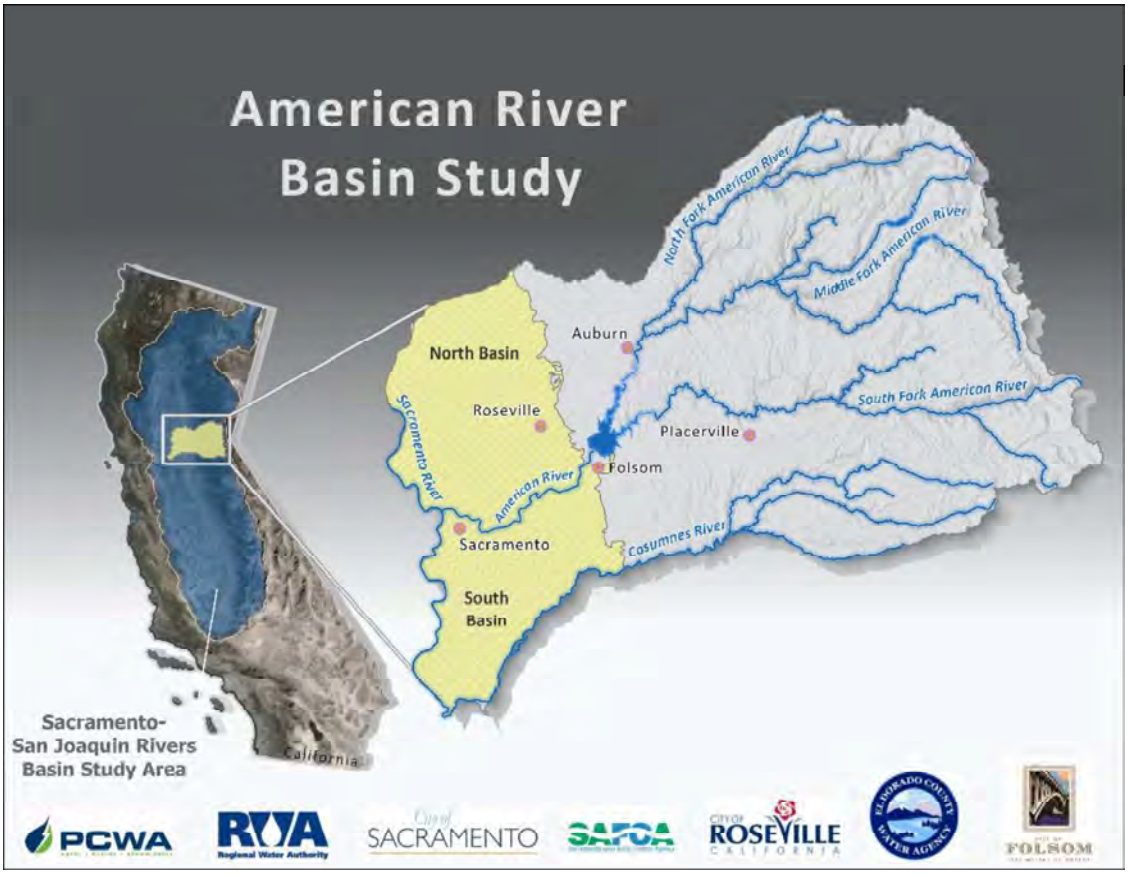


Figure 6-2 American River Basin Study Area

The Study Area is bounded by the Sierra Nevada mountain range to the east, the Feather and Sacramento rivers to the west, the Bear River to the north, and the Cosumnes River to the south (see Figure 6-2). In addition to the American River Watershed, the Study Area encompasses the North and South American Groundwater Subbasins, and Non-Federal Partners' service areas outside of the American River Watershed.

6.14.3 Projected Future Conditions

Analysis of projected future climate conditions in the American River Basin and development of climate scenarios for the ARBS were based on an ensemble of bias-corrected and spatially downscaled climate projections[1]. This ensemble has been used by the California Water Commission and DWR as the primary source of climate projection information in several recent studies, including the Water Storage Investment Program (WSIP) and California's Fourth Climate Change Assessment (Pierce et.al., 2018). Projected future climate conditions were evaluated and characterized based on the ensemble of downscaled climate projections.

[1] Climate projections were developed using Global Climate Models from the Coupled Model Intercomparison Project Phase 5 (CMIP5) and downscaled using Localized Constructed Analogs (LOCA) method projected and coupled with two future emission scenarios (RCP 4.5 and RCP 8.5) available from Dr. David Pierce at the Scripps Institution of Oceanography.

Hydrology scenarios were used to develop streamflow inputs to CalSim 3.0, which was then used to evaluate changes in water supplies, demands, and management throughout the CVP and State Water Project (SWP), including the Study Area. Demands for each water purveyor largely relied upon water purveyor's information provided in Regional Drought Contingency Plan/Regional Water Reliability Plan (RWRP) (Regional Water Authority, 2017) and 2015 UWMPs.

6.14.3.1 Temperature

Surface air temperatures are projected to increase steadily, with average summer temperatures increasing by approximately 7.2 degrees Fahrenheit (°F) by the end of the 21st century (see Figure 6-3), and winter temperatures increasing by 4.9°F. Projections of daily maximum and minimum temperatures suggest similar warming trends during all seasons, with maximum temperatures projected to increase as much as 7.3°F during the summer months.

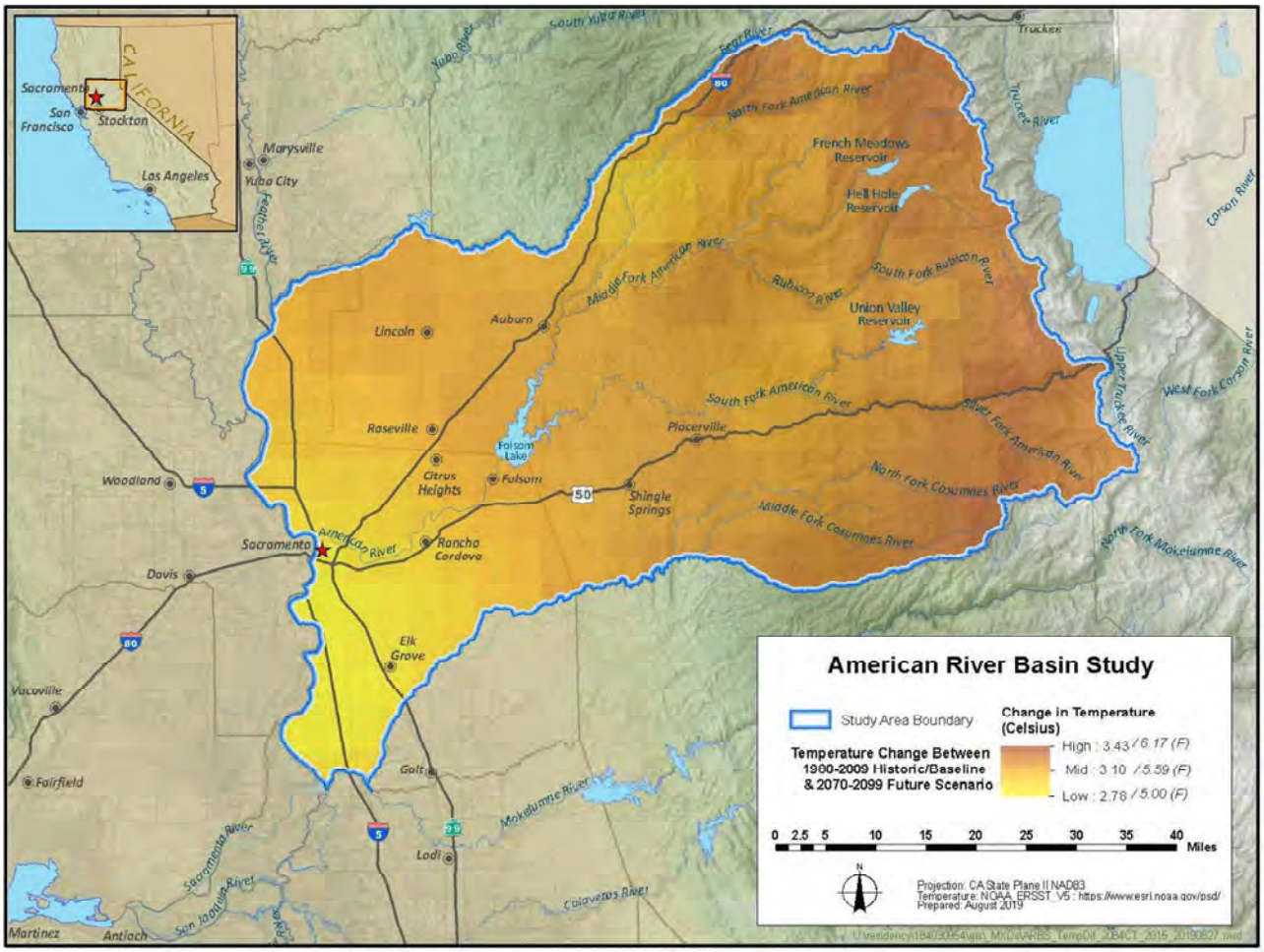


Figure 6-3 Projected Changes in July Temperature between Historical (1980-2009) and End of Century Under Central Tendency Climate Change

6.14.3.2 Precipitation

Annual precipitation projections show no significant trend in the median of change over the 21st century. Many of the available GCM projections show change in precipitation, but there is no consistency in the magnitude and

direction of projected change between models. Approximately half of the projections indicate a minor increase in annual precipitation and half indicate a minor decrease, highlighting the large uncertainty in future precipitation over this region. Although lacking clear trend in projected annual precipitation, by the end of the 21st century the average fall and spring precipitation is expected to decrease, with winter and summer precipitation increasing. Increasing variability is also projected in winter and fall precipitation. A summary of these projections is provided in COR Table 6-B.

COR Table 6-B Projected Change in Precipitation and Temperature Over the American River Basin Study Area Between 1980-2009 and 2070-2099

Season	Percent Change in Basin-Averaged Annual Mean Precipitation (%)	Change in Basin-Averaged Annual Mean Daily Air Temperature (°F)	Change in Annual Mean of Daily Maximum Air Temperature (°F)	Change in Annual Mean of Daily Minimum Air Temperature (°F)
Fall	-6.0	5.8	6.1	5.5
Winter	4.7	4.9	5.0	4.8
Spring	-11.9	5.8	6.3	5.1
Summer	10.4	7.2	7.3	7.0

6.14.3.3 Snowpack

Snow water equivalent (SWE) is a key indicator of water supplies in this region, where runoff is largely influenced by snowmelt. The increasing variability in precipitation combined with increases in surface air temperatures are key drivers in projections of a reduction in annual average SWE. Average SWE is forecasted to decrease by 50-85% across all climate scenarios and future time periods. In addition, areas that accumulate snow above Folsom Reservoir are also projected to have up to a 12-inch decrease in maximum snowpack by end of the century.

6.14.3.4 Evapotranspiration

Potential evapotranspiration (PET) serves as a key indicator of landscape water demands, including consumptive use by evaporation and transpiration from bare soil, water surfaces, native vegetation, and crops. Average annual PET is expected to increase 1.2 to 6.2 inches across all climate scenarios and future time periods. PET is strongly correlated with air temperature and thus expected to increase more under the hot scenarios (HD, HW) than under the warm scenarios (WD, WW).

6.14.3.5 Runoff

Watershed runoff is a direct indicator of local water supply available, as well as to statewide CVP-SWP system. Climate change projections indicate a pronounced shift in the distribution of runoff from May and June to earlier in the season (December to March), implying a transition in precipitation from snow to rainfall and/or earlier snowmelt and increasing the amount of runoff during the winter months. Peak runoff is expected to shift by more than a month earlier by mid to late century (Figure 6-4). Spring runoff will decrease due to reduced winter snowpack. Similar to the precipitation scenarios, there is large uncertainty in projected runoff where the 'wet' scenarios suggest an increase in annual runoff and the 'dry' scenarios suggest a decrease in annual runoff. The projected changes in basin wide runoff range from an increase of 486 thousand acre-feet (TAF) under the warm-wet scenario to a decrease of 203 TAF under the hot-dry scenario by the end of the century.

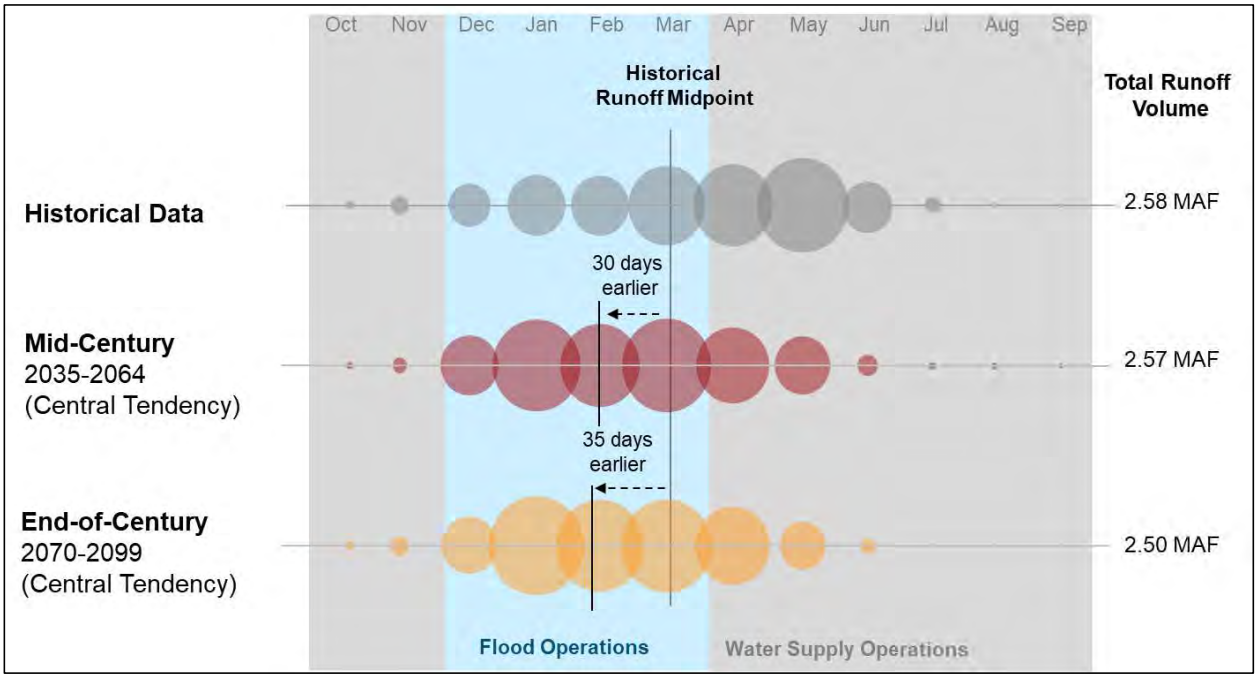


Figure 6-4: Distribution of Average Monthly Runoff for Historical Record (1922-2015) and Future Projections Under Central Tendency Climate Scenario

The change in annual climatic and hydrologic indicators between historical baseline observations (1915 to 2015) and projected future conditions for the ARBS area are listed in COR Table 6-C.

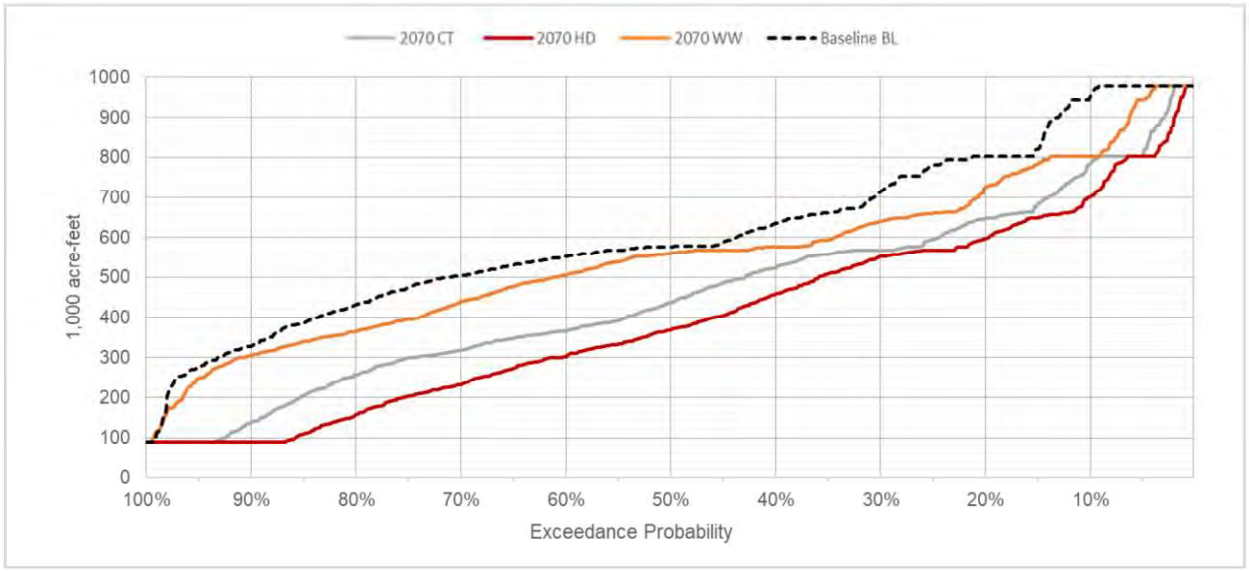
COR Table 6-C Change in Hydrologic Indicators Between Historical Observations and Projected Future Hydrology

Time Period	Climate Scenario	Precip (in)	T_{avg} (°F)	T_{max} (°F)	T_{min} (°F)	PET (in)	SWE_{avg} (in)	SWE_{max} (in)	Runoff (TAF)
1915-2015	Historical Observations	38.2	54.8	67.8	35.6	42.8	1.5	5.7	1,458
2040-2069	Warm-Wet	1.9	4	6.2	1.6	1.6	-0.7	-2.3	701
	Central Tendency	0.1	5	8.1	2.1	2.7	-0.9	-2.8	-2
	Hot-Dry	-2.8	6.2	10.4	2.7	3.7	-1.1	-3.4	-206
2055-2084	Warm-Wet	3.8	4.7	7.4	2	2	-0.8	-2.5	199
	Central Tendency	-1.1	6.3	11.1	2.6	4.1	-1.08	-3.5	-93
	Hot-Dry	-3.4	7.9	13.3	3.7	5	-1.2	-3.8	-185
2070-2099	Warm-Wet	7	5.4	8.3	2.5	1.8	-0.9	-2.9	486
	Central Tendency	-0.6	6.5	11	2.8	3.9	-1	-3.3	-54
	Hot-Dry	-4.6	8.9	15.7	4.1	6.2	-1.3	-4.3	-203

Water Supply Reliability

Changing climate conditions in the Sierra Nevada Mountains threaten the volume of water stored in the snowpack and the timing of runoff entering Folsom Reservoir. Consequently, they can also affect the critical role of Folsom Reservoir in the CVP Operations. Reliance on Folsom Reservoir is expected to increase commensurate with the

impact of sea level rise on salinity in the Delta. Modeling of these factors has illustrated that, without operational adjustments, Folsom Reservoir is projected to have lower end of conservation season (end of September) storage levels and approach "dead pool" more often under most future climate scenarios (see Figure 6-4). Similarly, increased early season runoff would increase flood risks along the Lower American River, leaving less water in the upper watershed available during water supply operations.



Key:
Baseline BL = Historic Conditions, 2070 CT = Central Tendency 2070 Climate Scenario, HD = Hot-Dry 2070 Climate Scenario, WW = Warm-Wet 2070 Climate Scenario

Figure 6-5 Exceedance Plot of Folsom Reservoir Storage (end of September) Under Future Climate Change

Under the 2070 level of development, the ARBS projects a supply-demand imbalance of 63 to 78 TAF/year in the Upper Basin (or Foothills Area) without further conservation or management actions. In the Lower Basin, groundwater extraction is expected to increase by 62 to 155 TAF/year to offset the projected imbalance, which would affect groundwater sustainability.

Based on the water supply and demand imbalance results, the region's water supply reliability has vulnerabilities. The ARBS assessed several adaptation portfolios for addressing the range of vulnerabilities and future supply-demand imbalances for the Study Area for regional benefits. Portfolios analyzed were:

1. Foundational Institutions
2. No Assurances for Long-term CVP Water Contract
3. Alder Creek Storage and Conservation Project
4. Sacramento River Diversion Project
5. Federally Recognized Groundwater Bank (North and South Basin)
6. Folsom Dam Raise with Groundwater Banking (South Basin)
7. Modified Flow Management Standard

The seven formulated adaptation portfolios were quantitatively evaluated using CalSim 3 to alleviate supply-demand imbalances and benefits to the region. The Study's intent was not focused on individual water-supplier's portfolio, but rather how the region could plan to increase regional reliability. The precise composition, scale,

operations, partnerships, funding, and governance to advance these project concepts will require further evaluations and coordination among Basin interests, including USBR, DWR, and SWRCB.

While climate change does have an impact on the basin, impacts are largely seen closer to the end of the century, and not within the timeline of the UWMP. Through proactive adaptation management actions, the Study highlights ways for the region to alleviate climate change impacts by the end of century. Therefore, in consideration of the timeline of the UWMP, the City of Roseville does not reflect any climate change impacts in supply and demand scenarios within this Plan.

6.15 Energy Intensity

A new requirement of the CWC, pursuant to 10631.2. (a), for 2020 UWMPs is that suppliers must include information that can be used to calculate energy intensity of their water service. Typically, a large portion of energy consumed in municipalities is dedicated to the conveyance, treatment, distribution, and storage of water. Maintaining water systems involves numerous pumps, motors, and other equipment which run for most or all hours of the day year-round. Because the water operations consume a significant amount of energy, these facilities can be a substantial contributor to greenhouse gas emissions in communities. Understanding how much energy is consumed at the City's various facilities is critical to ensure that the City is mindfully and efficiently utilizing energy resources.

An analysis of the energy intensity, which is the amount of energy consumed per the volume of potable water supplied, is provided in COR Table 6-D.

COR Table 6-D Energy Intensity Reporting

Start Date for Reporting Period	1/1/2020	Sum of Water Management Processes
End Date	12/31/2020	
Volume of Water Entering Process (AF)		32,300
Energy Consumed (kWh)		10,419,600
Energy Intensity (kWh/AF)		322.60
NOTES: Values include only water management processes that are under the City's operational control.		

The City treats and distributes the majority of its potable supply with the significant aid of gravity flow, from Folsom through the WTP and out into the distribution network throughout the City's service area. Data collected to support the analysis included in COR Table 6-D were primarily sourced from energy consumption billing data for the City's conveyance, treatment, distribution, and storage facilities for potable water. Where data was not available, estimates were made based upon similar facilities as well as calculations proportionate to the volume of water involved in the facility process. Some of the City's conveyance or distribution facilities do not have power sources or are owned by the adjacent utility and therefore do not represent consumption included in the calculation above.

Chapter 7 Water Service Reliability and Drought Risk Assessment

This chapter describes the long-term reliability of the City's water supply portfolio in all hydrologic year types through the year 2045. The City's existing and planned water management strategies and options for increasing the reliability of water supplies are also addressed. Shorter term reliability planning that may require immediate action, such as drought or a catastrophic supply interruption, is addressed in the Water Shortage Contingency Plan.

7.1 Constraints on Water Sources

This section addresses potential legal, environmental, water quality, and climatic effects on the reliability of water supply sources through the year 2045.

7.1.1 Legal Constraints

The City does not anticipate legal factors to affect the reliability of recycled water or purchased water supply within the planning horizon of this UWMP.

There are no existing legal constraints that limit groundwater pumping and the groundwater basin is not currently adjudicated. However, as an updated sustainable yield for the subbasin has yet to be defined under SGMA, the legal authority to enforce the sustainable yield of the subbasin has not been created, and the basin is subject to the users' cooperation in managing the basin until a formal authority is created. The City actively participates in regional discussions regarding best practices and cooperative management of water resources. These issues and concerns are being discussed in forums like the Regional Water Authority and as part of the Western Placer County Groundwater Management Plan along with sustainable groundwater management objectives and activities. The collaborative group of City of Roseville, PCWA, City of Lincoln, and California American Water is responsible for and has been identified as the responsible entity for monitoring groundwater levels meeting requirements of the 2009 SB X7-6 California State Groundwater Elevation Monitoring Program (CASGEM) program. Information gathered as part of this program was included in the groundwater model that was developed to support the ASR application with the Regional Water Quality Control Board to determine impacts of proposed extractions and injections related to groundwater levels in the region.

7.1.2 Water Quality Constraints

The City's water supply portfolio consists of high-quality surface water, recycled water, and groundwater resources. In some areas of the City, iron and manganese can be found in native groundwater at concentrations both above and below the secondary taste and odor maximum contaminant level established for these constituents. The City monitors groundwater quality closely, to ensure water provided for potable use does not exceed these standards.

7.1.3 Physical Constraints

The physical constraints of recycled water, surface water, and groundwater are discussed in the following sections.

7.1.3.1 Recycled Water

Recycled water is physically constrained by flows into the City's wastewater treatment plants. It is therefore seasonally available in higher quantities when demands are lowest during the wet season. The distribution

network of "purple pipe" is also a physical constraint for this supply source, as it only exists in the western portion of the City. Access to recycled water and its availability to offset potable needs are therefore, limited by physical access to this pipe network.

7.1.3.2 Surface Water

The City has identified its Folsom Lake intake as a likely physical constraint on current surface water supplies. All three surface water contract supplies are received through this point of diversion, making it a critical facility for the reliability of Roseville's surface water supply. If the water level of Folsom Lake were to drop close to or below the intake elevation as it nearly did in 2015, the City would not be able to divert water without additional infrastructure. The City is also able to receive supply through interties in emergency conditions; however, the WTP represents the primary diversion point. As a result of this vulnerability and lessons learned in the 2015 drought year, the City is actively exploring cooperative efforts with Folsom diversion and operation partners to duplicate or lower the intake facility to alleviate this concern. The City is likewise examining options for alternate diversion points or use of interties to increase reliability of physical water supply access.

The capacities of the Folsom Dam diversion, Roseville Water Treatment Plant, and distribution systems are sufficient to divert, treat, and convey the projected surface water demands. A 150 cubic feet per second (cfs) capacity limitations at the USBR pumping plant, which was agreed to based on recent pumping plant improvements, is sufficient to provide water to meet the City's needs.

7.1.3.3 Groundwater

The physical constraints on the current groundwater supply are the pumping capacities of existing wells. The total pumping capacities from all the six wells are about 11,050 GPM, approximately 15.9 MGD, per Chapter 3 . The City plans to install 6 additional wells by 2035 to provide additional groundwater supplies. Currently, the City plans to design all new wells with ASR capability to allow for greater groundwater banking and extraction capability throughout seasonal variations in surface water supply availability. Many of these planned well sites have been reassessed and relocated to areas of the City's surface are with more advantageous groundwater conditions as well as hydraulics with respect to the distribution network. Installation of wells higher in the hydraulic grade area of the system will allow for a greater downstream sphere of influence for this infrastructure and more flexible system operation in times of reliance on groundwater.

7.1.4 Other Constraints

Aside from legal and physical constraints, several other considerations affect the availability and reliability of Roseville's water supply portfolio. The City's purchased surface water supply is subject to reductions during dry years (seasonal and climatic shortages) pursuant to the Water Forum Agreement (WFA), the USBR Operations Criteria and Plan (OCAP), and the Central Valley Project Municipal and Industrial Water Shortage Policy (CVP M&I WSP). These agreements and programs are discussed in greater detail in the following subsections.

7.1.4.1 Sacramento Water Forum Agreement

The Sacramento Water Forum is a diverse group of business and agricultural leaders, citizen groups, and environmentalists, water managers, and local governments working together to balance two co-equal objectives:

1. **Provide a reliable and safe water supply for the Sacramento region's long-term growth and economic health.**
2. **Preserve the fishery, wildlife, recreational and aesthetic values of the Lower American River.**

The City, along with several other Sacramento-area water suppliers are signatory to the January 2000 Water Forum Agreement which includes Purveyor Specific Agreements, with the most recent revisions affected to these agreements in 2015. The Water Forum Agreement provides the framework for how water resources, including surface water and groundwater supplies would be used in the region, through the year 2030. The City's Purveyor Specific Agreement includes limitations on City surface water diversions from the American River under various hydrologic conditions. The Water Forum categorized water years into three types, all of which are defined in terms of the projected March through November unimpaired flow into Folsom Reservoir. These hydrologic year types are as follows in COR Table 7-A.

COR Table 7-A Water Forum Agreement Hydrologic Year Types

Year Type	Unimpaired Flow into Folsom Reservoir
Normal/Average or Wet Year	Greater than or equal to 950,000 AF
Drier Year	Between 400,000 and 950,000 AF
Driest/Critically Dry Year	Less than 400,000 AF

Although Roseville's water contract entitlements total 66,000 AF/yr, the City's diversions from the American River are limited by the WFA in normal/wet years, drier, and driest years. In normal/wet years, the City has agreed to limit surface water diversions from the American River to 58,900 AF/yr. In driest or critically dry years, the maximum diversion from the American River is limited to 43,800 AF/yr. In drier years, the City may divert an amount between 43,800 and 58,900 AF/yr from the American River, calculated linearly depending on the unimpaired flow into Folsom Reservoir, as shown in Figure 7-1.

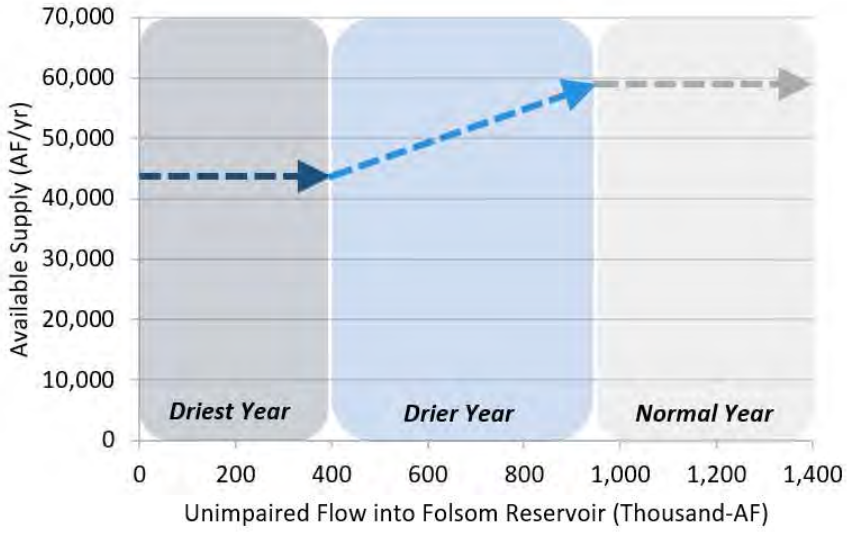


Figure 7-1 Water Forum Agreement Supply Limitations

It is important to note that during the drier and driest years, the City has an agreement with PCWA to release an additional 20,000 AF/yr of water down the American River on the City's behalf through re-operation of PCWA's American River Middle Fork Project (MFP). This 20,000 AF/yr of water is not part of the City's contracted supply of 66,000 AF/yr. The intent of the MFP re-operational releases during drier and driest years is to mitigate environmental impacts resulting from increased diversions above 1995 baseline levels.

7.1.4.2 USBR Operations Criteria and Plan

In addition to the WFA, the City's USBR water is also subject to restrictions as detailed in the 2004 Long Term Central Valley Project Operations and Criteria Plan (location on USBR's website). Chapter 5 of the OCAP entitled "Operations Forecasting" states that CVP allocations can be affected by:

- Forecasted reservoir inflows and Central Valley hydrologic water supply;
- Current amounts of storage in upstream reservoirs and in San Luis Reservoir;
- Projected water demands in the Sacramento Valley;
- Instream and Delta regulatory requirements;
- Annual management of 3406(b)(2) resources (related to fish and wildlife); and/or
- Efficient use of CVP-SWP export capacity through Joint Point of Diversion flexibility.

The OCAP includes a requirement that contractors be informed by USBR no later than February 15 of any possible deficiency in supplies that year. Since 1992, increasing constraints placed on operations by legislative and ESA requirements have made water delivery to CVP contractors more difficult, with recent drought conditions further impacting deliveries. Additionally, it is important to note that the City's USBR water deliveries may be curtailed purely based on downstream Delta conditions, irrespective of available upstream supply.

7.1.4.3 Central Valley and Industrial Water Shortage Policy

Upon a condition of shortage as determined by the OCAP, the CVP M&I WSP details the "incremental steps" by which available M&I water supply is allocated to the CVP water service contractors. From the November 2015 USBR news release, elements of the CVP M&I WSP include:

- Define water shortage terms and conditions for applicable CVP water service contractors, as appropriate.
- Determine the quantity of water made available to CVP water service contractors that, together with the M&I water service contractors' drought water conservation measures and other non-CVP water supplies, would assist the M&I water service contractors in their efforts to protect public health and safety during severe or continuing drought.
- Provide information to CVP water service contractors for their use in water supply planning and development of drought contingency plans.

The Final Environmental Impact Statement (EIS) describes the existing setting, alternatives for future operations under the CVP M&I WSP, and potential environmental impacts of each alternative. USBR selected Alternative 4, the Preferred Alternative, which comprises the Updated CVP M&I Water Shortage Policy developed by USBR with stakeholder input received during preparation of the Final EIS.

The decision will allow USBR the greatest degree of flexibility to address CVP water service contractors' needs during a Condition of Shortage while recognizing that CVP deliveries are subject to the amount of CVP water available. The Updated CVP M&I WSP also provides clarity to the terms, conditions, and procedures of the CVP M&I WSP. A copy of the November 2015 Final Record of Decision is included in Appendix J.

7.2 Water Supply Reliability Assessment

This section addresses the reliability of the City's water supply in average, single dry, and multiple dry water years. The City uses the following water year definitions from the DWR 2020 Guidebook:

COR Table 7-B Reliability Assessment Year Type Characterization

Year Type	Description
Average or Normal Year	A single year or averaged range of years that most closely represents the average water supply available to the Supplier.
Single Dry Year	The year that represents the lowest water supply available to the Supplier.
Five Consecutive Year Drought	The driest five-year historical sequence for the supplier.

The reliability of the potable and recycled water supplies is discussed in the following sections and are compared to the projected potable and recycled water demand.

7.2.1 Potable Water Supply and Demand Assessment

This section provides an assessment of the City's expected water supply and demand for Normal Year, Single Dry Year, and Five Consecutive Year Drought scenarios, based on data available at the time of publication of this UWMP, and discusses the City plans to mitigate potential supply deficits.

The City has identified the following base water years to represent the Year Types:

- **Average or Normal Year**: 2017
- **Single Dry Year**: 2015
- **Five Consecutive Year Drought**: 2011 - 2015

This City has identified these base water years based heavily on lessons learned through the droughts experienced in the last 10 years. In 2017, 100% of the typical contract supply was available, making it a good candidate to represent an average or normal year. In 2015, the City experienced a 75% curtailment of their USBR contract value – a source which had been considered highly reliable until that time. With only a 25% allotment, this represents the lowest experienced water supply level in Roseville's history. The time period between 2011 and 2015 represented multiple years of drought conditions and the lowest average available water supply experienced by the City, and therefore has been identified to represent the five consecutive year drought condition. Supply volumes for base years are provided in DWR Table 7-1.

DWR Table 7-1

Submittal Table 7-1 Retail: Basis of Water Year Data (Reliability Assessment)			
Year Type	Base Year	Available Supplies if Year Type Repeats	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location _____	
		☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available	% of Average Supply
Average Year	2017	64,279	100%
Single-Dry Year	2015	49,739	77%
Consecutive Dry Years 1st Year	2011	64,279	100%
Consecutive Dry Years 2nd Year	2012	59,430	92%
Consecutive Dry Years 3rd Year	2013	59,480	93%
Consecutive Dry Years 4th Year	2014	51,531	80%
Consecutive Dry Years 5th Year	2015	49,942	78%
NOTES: Groundwater is not utilized as a significant source of supply until a Drought Stage 3 is declared by the City. Totals include recycled water which is assumed to be available in all year types. All volumes are in AF.			

The City intends to use their groundwater supply differently in different year types. Under Normal Year conditions, the City intends to inject groundwater at an overall net benefit to the aquifer, or at most to extract groundwater up to the amount injected. In times of drought however, as in a Single Dry Year, or multi-year drought condition, the City can and will utilize their groundwater infrastructure as a larger percentage of overall supply. These assumptions and the resulting groundwater availability by year type are outlined in COR Table 7-C.

COR Table 7-C Groundwater Supply Availability by Year Type.

Groundwater Supplies and Management by Year Type					
Well Data	Operational ASR Wells	6	10	11	11
	Total Annual Extraction Capacity	17,600	28,000	32,100	32,100
	Total Annual Injection Capacity	7,000	12,100	14,900	14,900
Year Type	**Assumptions**	**2020**	**2030**	**2035**	**Buildout**
Normal	In a Normal Year, the City would only typically extract less than or equal to the volume injected. The injection window is estimated at **3 months** for the wet season when additional volume might be available, and **90% capacity** would be assumed to account for 10% down time for maintenance.	1,560	2,720	3,350	3,350
Single Dry	In a Single Dry Year, the City would expect to pump for **6 months** of the year at 9**0% capacity** to allow for 10% down time for maintenance.	7,920	12,570	14,430	14,430
Year 5 of a Multi-Year Drought	In the 5th year of a 5 -Year Drought, the City would expect to pump for **6 months** of the year at 9**0% capacity** to allow for 10% down time for maintenance.	7,920	12,570	14,430	14,430
NOTES: All values are in AF.					

The availability of total water supply from each source by hydrologic year type is outlined in COR Table 7-D.

COR Table 7-D Potable Supply Availability by Year Type

Potable Water Supply Availability by Source and Hydrologic Year Type						
Supply Source	**2020 (current)**	**2025**	**2030**	**2035**	**2040**	**2045**
NORMAL WATER YEAR						
USBR	32,000	32,000	32,000	32,000	32,000	32,000
PCWA	30,000	30,000	30,000	30,000	30,000	30,000
SJWD	4,000	4,000	4,000	4,000	4,000	4,000
Water Forum Limitation	-7,100	-7,100	-7,100	-7,100	-7,100	-7,100
PCWA (Future)	0	0	0	3,360	3,360	3,360
Groundwater	1,560	1,560	2,720	3,350	3,350	3,350
Total	60,460	60,460	61,620	65,610	65,610	65,610
SINGLE DRY YEAR						
USBR	8,000	8,000	8,000	8,000	8,000	8,000
PCWA	30,000	30,000	30,000	30,000	30,000	30,000
SJWD	0	0	0	0	0	0
Water Forum Limitation	0	0	0	0	0	0
PCWA (Future)	0	0	0	3,360	3,360	3,360
Groundwater	7,920	7,920	12,570	14,431	14,431	14,431
Total	45,920	45,920	50,570	55,791	55,791	55,791
FIVE CONSECUTIVE YEAR DROUGHT - YEAR 1						
USBR	32,000	32,000	32,000	32,000	32,000	32,000
PCWA	30,000	30,000	30,000	30,000	30,000	30,000
SJWD	4,000	4,000	4,000	4,000	4,000	4,000
Water Forum Limitation	-7,100	-7,100	-7,100	-7,100	-7,100	-7,100
PCWA (Future)	0	0	0	3,360	3,360	3,360
Groundwater	1,560	1,560	2,720	3,350	3,350	3,350
Total	60,460	60,460	61,620	65,610	65,610	65,610
FIVE CONSECUTIVE YEAR DROUGHT - YEAR 2						
USBR	24,000	24,000	24,000	24,000	24,000	24,000
PCWA	30,000	30,000	30,000	30,000	30,000	30,000
SJWD	0	0	0	0	0	0
PCWA (Future)	0	0	0	3,360	3,360	3,360
Water Forum Limitation	0	0	0	0	0	0
Groundwater	1,560	1,560	2,720	3,350	3,350	3,350
Total	55,560	55,560	56,720	60,710	60,710	60,710

FIVE CONSECUTIVE YEAR DROUGHT - YEAR 3						
USBR	24,000	24,000	24,000	24,000	24,000	24,000
PCWA	30,000	30,000	30,000	30,000	30,000	30,000
SJWD	0	0	0	0	0	0
Water Forum Limitation	0	0	0	0	0	0
PCWA (Future)	0	0	0	3,360	3,360	3,360
Groundwater	1,560	1,560	2,720	3,350	3,350	3,350
Total	55,560	55,560	56,720	60,710	60,710	60,710
FIVE CONSECUTIVE YEAR DROUGHT - YEAR 4						
USBR	16,000	16,000	16,000	16,000	16,000	16,000
PCWA	30,000	30,000	30,000	30,000	30,000	30,000
SJWD	0	0	0	0	0	0
Water Forum Limitation	0	0	0	0	0	0
PCWA (Future)	0	0	0	3,360	3,360	3,360
Groundwater	1,560	1,560	2,720	3,350	3,350	3,350
Total	47,560	47,560	48,720	52,710	52,710	52,710
FIVE CONSECUTIVE YEAR DROUGHT - YEAR 5						
USBR	8,000	8,000	8,000	8,000	8,000	8,000
PCWA	30,000	30,000	30,000	30,000	30,000	30,000
SJWD	0	0	0	0	0	0
Water Forum Limitation	0	0	0	0	0	0
PCWA (future)	0	0	0	3,360	3,360	3,360
Groundwater	7,920	7,920	12,570	14,431	14,431	14,431
Total	45,920	45,920	50,570	55,791	55,791	55,791

NOTES: Groundwater more significantly relied on in single dry years and year 5 of a five consecutive year drought condition.
All values are in AF.

7.2.2 Comparison of Supply and Demand

A comparison of projected water supply and demand during Normal, Single Dry, and Five Consecutive Year Drought conditions are included in DWR Table 7-2, DWR Table 7-3, and DWR Table 7-4. It is important to note that in all scenarios shown in these tables, Normal Year demands are shown. As outlined in Chapter 4 , passive demand reduction savings are incorporated into the demand projections themselves; however, no specific conservation effort to reduce demands in a drought year have been shown in these tables in order to depict the most basic comparison of supply and demand in these year types. As shown, there is an adequate water supply in all normal years. In single dry years and in certain multiple dry years, water supply deficit may occur.

7.2.3 Recycled Water Supply and Demand Comparison

The City's recycled water supply is an important resource as it is considered to be 100% reliable in all water year types. Recycled water supply has been set equal to the projected recycled water demand in these analyses because showing a surplus recycled water supply would mask potential potable water shortages.

7.2.4 Total Water Supply and Demand Comparison

A comparison of projected total (potable and recycled) water supply and demand during a normal water year is included in DWR Table 7-2. As shown, there is an adequate water supply in normal years to meet demands through 2045.

DWR Table 7-2

Submittal Table 7-2 Retail: Normal Year Supply and Demand Comparison					
	2025	2030	2035	2040	2045
Supply totals	64,482	66,055	70,543	70,543	70,543
Demand totals	51,589	56,990	62,547	62,547	62,547
Difference	12,893	9,065	7,996	7,996	7,996
NOTES: An additional 3,360 AF of supply from the PCWA Ophir WTP is assumed to become available in all year types as of 2035. The City plans to have 4 new wells operational by 2030 with an additional 2 following by 2035, as well as the destruction of 1 existing. Supply and demand include Recycled Water. All volumes are in AF.					

A comparison of projected water supply and demand during a Single Dry Year is included in DWR Table 7-3.

DWR Table 7-3

Submittal Table 7-3 Retail: Single Dry Year Supply and Demand Comparison					
	2025	2030	2035	2040	2045
Supply totals*	49,942	55,005	60,723	60,723	60,723
Demand totals*	51,589	56,990	62,547	62,547	62,547
Difference	(1,647)	(1,985)	(1,824)	(1,824)	(1,824)
NOTES: An additional 3,360 AF of supply from the PCWA Ophir WTP is assumed to become available in all year types as of 2035. The City plans to have 4 new wells operational by 2030 with an additional 2 following by 2035, as well as the destruction of 1 existing. Supply and demand include Recycled Water. All volumes are in AF.					

A comparison of projected water supply and demand during a Five Consecutive Year Drought is included in DWR Table 7-4.

DWR Table 7-4

Submittal Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison						
		2025	2030	2035	2040	2045
First year	Supply totals	64,482	66,055	70,543	70,543	70,543
	Demand totals	51,589	56,990	62,547	62,547	62,547
	Difference	12,893	9,065	7,996	7,996	7,996
Second year	Supply totals	59,582	61,155	65,643	65,643	65,643
	Demand totals	51,589	56,990	62,547	62,547	62,547
	Difference	7,993	4,165	3,096	3,096	3,096
Third year	Supply totals	59,582	61,155	65,643	65,643	65,643
	Demand totals	51,589	56,990	62,547	62,547	62,547
	Difference	7,993	4,165	3,096	3,096	3,096
Fourth year	Supply totals	51,582	53,155	57,643	57,643	57,643
	Demand totals	51,589	56,990	62,547	62,547	62,547
	Difference	(7)	(3,835)	(4,904)	(4,904)	(4,904)
Fifth year	Supply totals	49,942	55,005	60,723	60,723	60,723
	Demand totals	51,589	56,990	62,547	62,547	62,547
	Difference	(1,647)	(1,985)	(1,824)	(1,824)	(1,824)
NOTES: An additional 3,360 AF of supply from the PCWA Ophir WTP is assumed to become available in all year types as of 2035. The City plans to have 4 new wells operational by 2030 with an additional 2 following by 2035, as well as the destruction of 1 existing. Supply and demand include Recycled Water. All volumes in AF.						

As stated in DWR Table 7-4, there is sufficient supply to meet demands in Normal Years through 2045. In Single Dry Years and some extended drought years, shortages do occur. DWR Table 7-2, DWR Table 7-3, and DWR Table 7-4 include recycled water supply and demand. The remaining deficits shown will be mitigated by potable water conservation measures implemented as part of the Water Shortage Contingency Plan.

7.2.5 Deficit Mitigation

Depending on the raw water supply available from USBR, and in accordance with the WFA, deficits in potable water supply may occur in a single dry year or the latter stages of an extended drought condition. As shown in DWR Table 7-3 and DWR Table 7-4, the greatest potential deficit between available supply and demand would occur in Year 4 of a Five Consecutive Year Drought condition.

One potential strategy to alleviate deficiencies shown above is indicated in DWR Table 7-5. In DWR Table 7-5, the potential volume of water resulting from potable water demand reductions are shown.

DWR Table 7-5

Submittal Table 7-5: Five-Year Drought Risk Assessment Tables to address Water Code Section 10635(b)

	2021	2022	2023	2024	2025
Total Water Use	39,172	42,276	45,380	48,484	51,589
Total Supplies	64,279	59,430	59,480	51,531	49,942
Surplus/Shortfall w/o WSCP Action	25,107	17,153	14,100	3,047	(1,647)
Planned WSCP Actions (use reduction and supply augmentation)					
WSCP - supply augmentation benefit	0	0	0	0	0
WSCP - use reduction savings benefit	0	0	0	0	6,659
Revised Surplus/(shortfall)	25,107	17,153	14,100	3,047	5,013
Resulting % Use Reduction from WSCP action	0%	0%	0%	0%	13%

NOTES: Supply and demand totals include Recycled Water. Demand reductions actions only apply to the portion of total water use that is potable and not to the recycled water.

The City will determine the needed balance between water conservation and groundwater pumping on a case-by-case basis consistent with the City's Municipal Code. The City also continues to plan for and analyze opportunities for water supply projects or exchanges that would increase the reliability of the raw water supplies diverted from the American River.

7.3 Regional Supply and Reliability

All water consumed by the City comes from local supply sources. No water is imported from other regions, nor does the City anticipate importing water from other regions throughout the UWMP planning period. However, the City is actively engaged in multiple planning projects and coordination intended to strengthen water supply reliability throughout the Sacramento area, in addition to investing in long-term water storage projects like the future Sites Reservoir. Projects like Sites will not provide direct benefit in terms of water supply to Roseville; however, as a regional project it promises to strengthen the Northern California water portfolio as a whole, providing benefit to all who operate within this sphere. The City is a committed regional partner in working to solve supply shortage issues before they become a critical reality, with climate change and increasingly limited supply sources at the crux of the issue. The City will continue these efforts into the future and work with its partner agencies to find the best path forward.

Chapter 8 Water Shortage Contingency Plan

Following the severe drought of 2012-2016, the State of California Legislature sought to expand the water shortage contingency analysis under former law and mandated that a Water Shortage Contingency Plan (WSCP) be adopted by suppliers. A copy of the WSCP is provided in Appendix K.

Chapter 9 Demand Management Measures

This chapter describes the City's historical and existing water conservation program, status of implementation of Demand Management Measures (DMMs), and projected future conservation implementation. The CWC requires that the UWMP include a comprehensive description of historical, current, and projected water conservation programs.

> *CWC 10631 (e) Provide a description of the supplier's water demand management measures. This description shall include all of the following:*
>
> *(1) (A) For an urban retail water supplier, as defined in Section 10608.12, a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years. The narrative shall describe the water demand management measures that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.*
>
> *(B) The narrative pursuant to this paragraph shall include descriptions of the following water demand management measures:*
>
> *(i) Water waste prevention ordinances.*
>
> *(ii) Metering.*
>
> *(iii) Conservation pricing.*
>
> *(iv) Public education and outreach.*
>
> *(v) Programs to assess and manage distribution system real loss.*
>
> *(vi) Water conservation program coordination and staffing support.*
>
> *(vii) Other demand management measures that have a significant impact on water use as measured in gallons per capita per day, including innovative measures, if implemented.*

In previous UWMPs, a substantial amount of data was required to document a water supplier's progress in implementing fourteen specific DMMs. In 2014, Assembly Bill 2067 simplified, clarified, and updated reporting requirements for DMMs. Starting with the 2015 UWMP, focus has turned away from detailed descriptions of each of the fourteen DMMs and has turned to water conservation measures that are being implemented to achieve compliance with SB X7-7. For retail agencies, the number of DMMs has been reduced from fourteen to six (plus an "other" category). A narrative description of the status of the DMMs and how the DMMs will help the water supplier achieve its SBX7-7 water use targets is required. Detailed data are not required.

Members of the CUWCC may include their reporting in the UWMP, but a narrative is also required.

9.1 Demand Management Measures

The six DMMs required to be discussed in the 2020 include the following:

- Water waste prevention ordinances;
- Metering;
- Conservation pricing;
- Public Education and outreach;
- Programs to assess and manage distribution system real loss; and
- Water conservation program coordination and staffing support.

For each DMM, the current program is described, followed by a description of how the DMM was implemented over the previous five years and the planned implementation to achieve the water use targets required by SB X7-7, which is discussed in Chapter 5

9.1.1 Water Waste Prevention Ordinances

The City currently restricts water waste within its service area. Roseville Municipal Code Chapter 14.09, Water Conservation Ordinance (Appendix L), defines water waste and associated penalties of continued infractions. Per the ordinance, customers in violation are provided a series of notifications at one-week intervals: first a courtesy notice, second an administrative warning, and finally a formal citation. If the situation is not remedied by the time specified in the formal citation, additional measures can be taken to enforce compliance. These measures include fines, water restrictions, low flow devices, or discontinued service. In addition, the City may waive the courtesy notice and administrative warning in times of drought.

To enforce the Water Waste Ordinance, the City employs two 1,500 hour/year conservation workers to patrol within the service area limits. The City has also employed contract help at night to conduct water waste patrols. These patrol efforts are ramped up and down seasonally according to the intensity of landscape water usage. In addition, full-time City staff patrol for water waste as part of their normal job duties. In addition to patrols by City staff, the City has an online reporting mechanism that allows customers to report observed water waste anonymously. Customers can visit www.roseville.ca.us/waterwaste and submit an electronic form, which is then further investigated by City staff.

Implementation of this DMM is ongoing and expected to help the City achieve its water use targets by minimizing the nonessential uses of water so that the water is available to be used for human consumption, sanitation, and fire protection.

9.1.2 Metering

A meter retrofit program was developed and implemented from 2001 to 2011. Implementation of metered rates began immediately on all residential metered connections established after January 1, 2002, with the remaining retrofitted homes transitioned in large blocks as retrofits were completed. Customers were provided water use information for a period of one year before transition to volumetric billing began.

The metering DMM helps Roseville achieve its water use targets by providing accurate water use information to both the customer and the City. Higher than normal comparative usage triggers outreach to customers who may have leaks, as well as awareness of efficient water use practices. Overall, metering assists the City in managing customer water use and leak detection efforts.

9.1.3 Conservation Pricing

As a component of its meter retrofit program, the City adopted conservation pricing for water on all metered accounts from 2011 through 2015. Later, and to comply with Proposition 218 requirements, the City transitioned to a per-use, uniform billing rate structure in February 2016. A complete list of service charges, excess water use charges, and water rates are included in Roseville Municipal Code Sections 14.08.090 Service Charges for Metered Service through 14.08.100 Flat Water Rates. This information is included in Appendix M.

Implementation of this DMM is expected to help the City achieve its water use targets by ensuring water customers pay the true cost of water. The City regularly analyzes this cost of water production, capital improvement project needs, level of service requirements and other costs of operating the water system during regular rate studies. Where adjustments need be made, extensive public education efforts are undertaken to maintain transparency of utility operations and funding to support any required rate changes. Sufficient revenue will continue to be available to fund water system operations, maintenance, and water conservation programs.

9.1.4 Public Education and Outreach

The City promotes water conservation and other resource efficiencies in coordination with the Regional Water Authority (RWA), Roseville Electric, and Roseville's Public Information Department. The City distributes information through paid advertisements, television commercials, featured segments on the local government access channel, the internet (through the City's website and streaming video), the City's Utility Exploration Center, several water efficient workshops each year, movie theater ads, newsletters, bill inserts, mill messages, brochures, vehicle decals, community outreach events, community speaker bureaus, and yearly special events.

9.1.4.1 Customer Water Usage Portal

The City plans to implement a customer portal as part of the implementation of Advanced Metering Infrastructure (AMI) which is currently underway. This portal will provide residents with an ability to view their past usage and identify any changes in use patterns that may indicate leaks or opportunities for implementing cost savings by conserving water.

9.1.4.2 Utility Exploration Center

In 2008, the City's utilities jointly funded and created the Roseville Utility Exploration Center (UEC). In addition to serving as a "storefront" for the utilities, the Center is used by the City for community outreach and environmental education. Designed for an interactive experience, the UEC hosts multiple hands-on exhibits with a "learning lab" for demonstrations, presentations, and workshops. Topics include water conservation and watershed protection, energy efficiency, waste reduction, and wastewater management.

Since opening, the Utility Exploration Center has hosted over 640,000 program participants, with approximately 5,000 student (preschool through sixth grade) to the exhibit hall; partnered with cultural, recreational, and utility-related organizations to create a lively series of changing events, workshops, and activities; and connected with residents in a variety of off-site outreach activities.

The Center is housed within the Gold LEED (Leadership in Energy and Environmental Design) certified Martha Riley Library building, which was the first building in Placer County to be so honored. Future plans include the "Inspiration Garden," an outdoor learning space created in partnership with Roseville's Water Efficiency division, with a goal of encouraging more residents to adopt water-wise gardening practices. The garden is planned for completion by summer 2021. Plans are also underway to update the original visitor center exhibits. A larger outdoor project, originally called the IDEAscape, would further expand exhibits to include topics such as river-friendly landscaping and irrigation, utility systems, solar energy, and watershed protection. The project is currently on hold but is anticipated for completion by 2030.

9.1.4.3 Student Outreach

In addition to Regional Water Authority (RWA) student outreach programs, the City independently provides presentations, conservation materials, and facility tours to local schools.

9.1.5 Regional Water Authority – Outreach and Education

In addition to local public education and outreach programs, the City also participates in a regional public education and outreach program through the Regional Water Authority (RWA). RWA is a joint powers authority formed in 2001 to promote collaboration on water management and water supply reliability programs in the greater Sacramento, Placer, El Dorado, Yolo, and Sutter counties. In collaboration with 19 water provider members and other wastewater, stormwater, and energy partners, RWA formed the Water Efficiency Program (WEP) in 2001 to bring cost effectiveness through economies of scale to public education and outreach activities.

The WEP operates on an average annual budget of $530,000 and is supplemented by grant funding. Grants are an important funding resource for the Program. Since 2003, the Program has been awarded $13.2 million in grant funding for public outreach and education as well as a variety of rebate programs, fixture direct install programs, system water loss, individualized customer usage reports, large landscape budgets and more. Of those funds, $3.8 million was awarded between 2016 and 2020.

The main function of the WEP is to develop and distribute public outreach messages to customers in the region by collaborating with its water provider members. The Program distributes these messages on a regional scale through regional media and advertising buys and was honored with the United States Environmental Protection Agency WaterSense Excellence in Education and Outreach Award in 2016. From 2016-2020, the WEP created a series of public outreach campaigns. A summary of each campaign and highlighted achievements is as follows.

Following the historic 2015 California drought, the WEP launched the “Rethink Your Yard” Campaign in 2016 with a focus on prioritizing landscape watering, putting trees first and transitioning thirsty lawn and landscaping to beautiful, low water use, River-Friendly landscapes. The Program advertised the campaign through online ads, social media, commercial radio, Raley Field (local baseball stadium) and local billboards. The campaign featured local homeowners with their newly redesigned yards on billboards throughout the region.

The campaign launched in 2017 focused on encouraging customers to understand and deliver the amount of water their landscape really needs and to make permanent equipment changes to improve efficiency such as installing weather-based irrigation controllers, more efficient sprinklers and drip irrigation. The Program partnered on this messaging with local nurseries through a “Get Growing this Fall” initiative to encourage residents to plant in the fall when days are cooler and plants don’t need as much water to establish roots.

From 2018 through 2020, the regional campaign focused on tackling the landscape overwatering problem with a “Check and Save” message encouraging residents to check the soil moisture with a moisture meter before turning on sprinklers. To support this message, the Program provided free froggy moisture meters via an online request form and at events. In 2019, WEP distributed 3,000 moisture meters to customers throughout the region.

These campaigns are implemented through both paid advertising buys and earned media from public service announcements (PSAs). Every year the campaigns can be heard on local radio stations such as Capital Public Radio

and online through google, Facebook and YouTube advertisements. From 2016-2020, the WEP public outreach campaigns produced:

- Radio Advertising (2016-2020)
  3,443 radio advertisements ran
  17.2 million impressions

- Digital Advertising (Facebook, Google Display Network and Spotify) (2016-2020)
  24.3 million impressions
  262,900 clicks

- Additional advertising (billboards in 2016)
  1.8 million digital advertisements ran
  51.6 million impressions

- Public Service Announcements (Television and Radio) (2016-2020)
  20 million impressions
  $570,000 in value had they been purchased as advertising

The Program also continues messaging through its own Facebook page. From 2016-2020, the Program created about 60 Facebook posts a year featuring water saving tips and other relevant information. The WEP hosted several Facebook sweepstake contests including: Tree Hugger in 2016, where participates submitted pictures hugging a tree to raise awareness about the importance of healthy trees and the Under/Over Debate in 2020, where participates were asked to weigh in what is the proper way to hang toilet paper to raise awareness of toilet leaks. The winner of the Under/Over Debate sweepstakes received a case of toilet paper delivered via mail and gift card to a local hardware store.

The Program continues to utilize the public outreach website bewatersmart.info to reach customers throughout the region. The website contains regional and local water provider information on rebates and services, top ways to save, an interactive watering and water waste information map, a water-wise gardening database, recent press releases, the Sacramento Smart Irrigation Scheduler tool, and more. Educational information and customer services were modified to address the COVID pandemic in 2020 including online water efficiency lessons for kids, a list of nurseries that offered curbside pickup, virtual water wise house calls and numerous virtual educational customer workshops. Between 2016 and 2020, the website averaged 96,000 unique visitors per year.

For more targeted outreach, the Program distributed quarterly e-newsletters to participating residents. The e-newsletters are filled with water savings tips, upcoming events, and other interesting articles. They are usually timed around changes in the weather to help signal the need for residents to adjust their irrigation systems, such as day light savings coupled with a message to dial back sprinkler systems. The e-newsletter reaches 6,300 households.

Every year the WEP selects 3 public events to attend for the public to interact with local water efficiency staff. These events provide an opportunity for the region to communicate its messages in person. Events have included the Sacramento Home & Landscape Show at Cal Expo, Creek Week, Harvest Day, Farm-to-Fork Festival, and several Earth Day events. Additionally, RWA, in coordination with participating local water providers, hosts an annual

Mulch Mayhem event in which customers can pick up a truck load of free mulch from selected locations throughout the region. All in-person regional events were canceled in 2020 due to the COVID pandemic.

The Program is also very active in communicating to local media outlets such as the Sacramento Bee. Between 2016 and 2020, RWA issued 50 press releases on WEP activities and regionally significant news and participated in nearly 30 radio public affairs interviews. The RWA and the WEP were mentioned in dozens of news articles published by local and regional media outlets both within and outside of the Sacramento region during the same time frame.

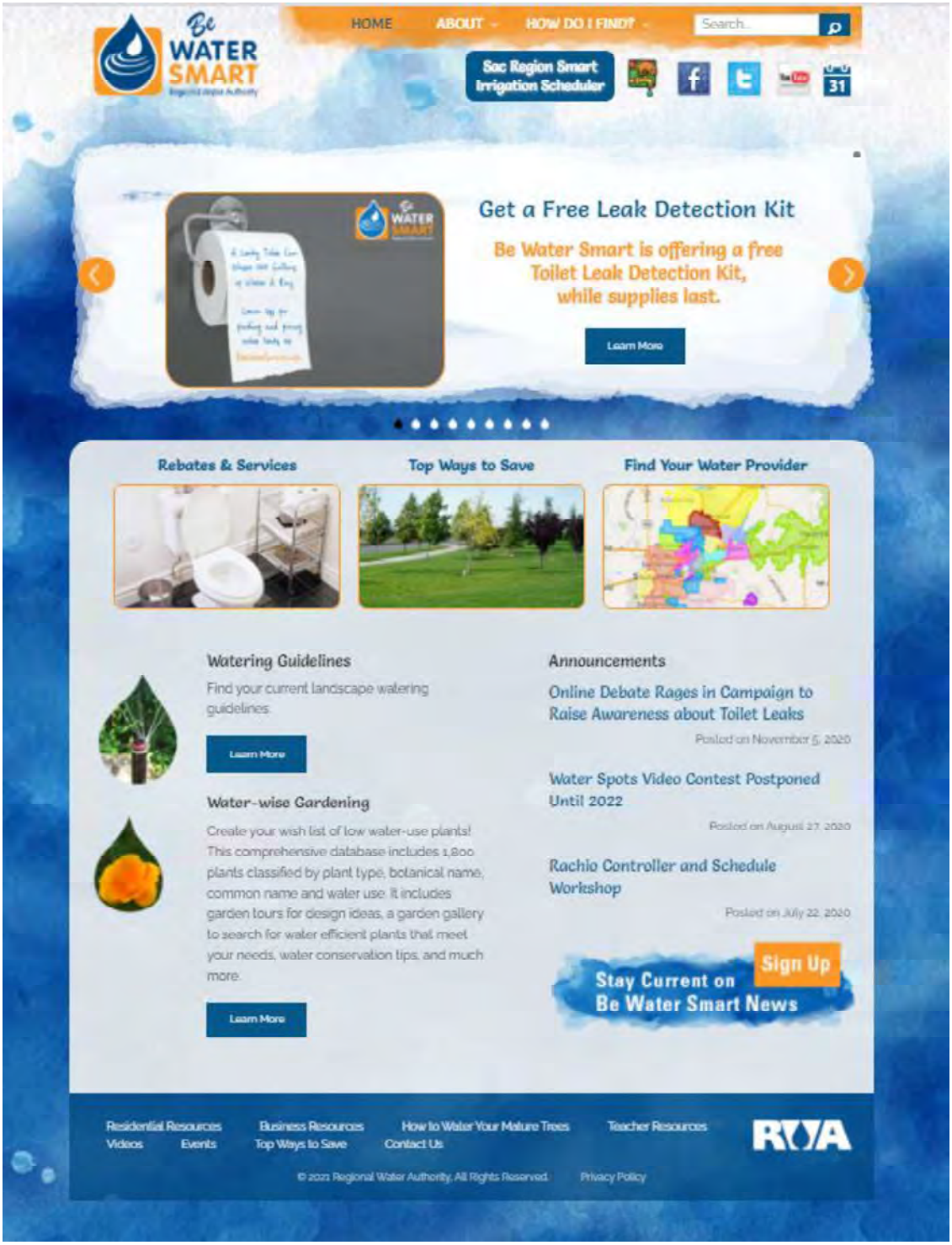
To support public outreach messaging and water savings tips, the Program also coordinated several regional rebate programs, which were partially funded by state and federal grants. A variety of rebate options were provided including toilets, clothes washers, and irrigation efficiencies (full summary in COR Table 9-A). Collectively, these rebates and installations will produce an estimated lifetime (10 years) savings of 6 billion gallons of water and 6.4 million kilowatt hours of energy.

COR Table 9-A Regional Rebates and Installations from 2016 through 2020.

Rebate/Installation Type	2016	2017	2018	2019	2020	Lifetime Water Savings per Type 2016-2020 (MG)	Lifetime Energy Savings per Type 2016-2020 (kWh)**
High Efficiency Clothes Washers Rebates	491	480	453	366	518	111.2	118,094
High Efficiency Toilets Rebates	4,494	3,124	2,255	1,868	904	512.3	544,076
Smart Irrigation Controllers Rebates	245	358	801	556	1,298	667.9	709,299
Irrigation Efficiencies Rebates*	21,271	5,879	5,548	1,724	NA	3,786.4	4,021,178
Turf Replacement Rebates (square feet)	376,613	584,535	236,064	85,375	NA	474.6	503,980
Toilet Direct Installation	1,943	4,542	968	NA	NA	237.4	252,066
Showerhead Direct Installation	1,141	2,512	704	NA	NA	222.6	236,447
Faucet Aerators Direct Installation	1,162	4,314	317	NA	NA	18.5	19,648
Urinal Direct Installation	NA	403	73	NA	NA	10.2	10,878
Total Water Savings per year/Lifetime (MG)	285.9	138.2	104.4	42.9	32.8	6,041.1	
Total Energy Savings per year/Lifetime (kWh)**	303,626	146,717	110,915	45,509	34,799		6,415,665
* Includes: pressure regulator equipment, pipe and pipe fittings, drip or low volume equipment, and sprinkler heads or nozzles.							
**Regional average of 1,062 kilowatt hours per MG							
kWh = kilowatt hours							
MG = million gallons							
NA = no funding available							
Lifetime = 10 years							

In addition to public outreach, the Program also coordinates school education activities. Since 2012, the Program has hosted the Water Spots Video Contest for high school and middle school students. The WEP provides a new contest theme each year and provides the region's teacher and students with relevant facts and images to help develop 30 second video PSAs. Students submit their videos to RWA who hosts a panel of local celebrities including Monica Woods from ABC 10 to decide on a first, second and third place winner. The top 10 scoring videos are then posted online for public voting to select a "people's choice" winner as well. Both teachers and student receive cash prizes and the winning videos are played at Raley Field during River Cats games and in select movie theaters throughout the region. The winning PSAs are incorporated into the WEP's media activities as well. Past themes include *WATER MYTHS BUSTED!, H2o Hero, and Show Off Your Water Smarts.* Between 2016 and

2019, 450 videos were submitted (average of 90 videos a year). The 2020 Water Spots Video Contest was canceled due to the COVID pandemic.



9.1.6 Programs to Assess and Manage Distribution System Real Loss

The City maintains a comprehensive water audit and leak-detection program to assess, identify, and repair potable distribution system losses.

In 2009, the City began using AWWA Water Loss software to develop an annual water loss audit. The City continues to employ this method in compliance with Senate Bill 555, validating the annual audit for accuracy prior to submission to DWR each year by the regulatory deadline of October 1. Results from the audit have helped the City identify where in the distribution process leaks are occurring. This information is coupled with detailed pipeline information stored in the City's asset management and GIS system. Audit information helps identify potentially leak prone areas of the City's distribution system for focused rehabilitation or repair projects. The City has recently implemented a proactive auditory leak detection program by City crew members in addition to the audit analyses to identify leaks. Additionally, an independent desktop analysis of potential areas of loss is planned for the coming year. Once these areas are isolated, responses include corrosion monitoring programs, service cathodic protection, relining and/or replacement. The City's asset management software is then updated with identified leaks, which in turn provides more information useful for prioritization of future rehabilitation programs. In 2020, the City began design of a project to rehabilitate 8 miles of water main in the downtown area to improve the function and longevity of the mains, reducing water loss through older pipes in this area of town.

The City also employs a third-party leak detection service on an annual basis to perform focused auditory surveys for leaks, in addition to in-house training and leak detection processes executed by City operations staff throughout their regular maintenance operations. In combination, these measures and projects employed to identify and reduce system leakage offer the City a comprehensive and proactive approach to the reduction of lost water supply.

9.1.7 Water Conservation Program Coordination Staffing Support

In addition to the employees mentioned in Section 9.1.1, the City employs other individuals as members of the City's internal water conservation program team. Member qualifications include: Certified Landscape Irrigation Auditor (CLIA) certification, Water Distribution Operator D-2 certification, and extensive irrigation system management experience.

In compliance with DWR's UWMP guidelines, the cull contact information for the City's Water Conservation Administrator is listed below:

Bobby Alvarez
Water Conservation Administrator
City of Roseville, Environmental Utilities Department
916-746-1710 (office)
BAlvarez@roseville.ca.us

9.2 Other Demand Management Measures

In addition to the six DMMs described above, the City also implements the following programs:

- Residential Water Wise House Calls

- Residential HET Replacement Program
- Residential Irrigation Rebates
- Residential Cash for Grass Rebates
- Commercial Irrigation Water "Budgets"
- Commercial Irrigation Audit
- Commercial Cash for Grass Rebates
- Commercial Custom Rebate
- Commercial Irrigation Improvements Rebates
- Commercial Food Service Water Efficiency Rebates
- Commercial Landscape Water Use Reviews
- Commercial Interior Water Use Audits
- Commercial Water Waste "Night Patrols"
- Commercial HET Replacement Program

These programs are described in Section 9.2.

9.2.1 Residential Conservation Programs

The City implements several programs to reduce the consumption of water to its residents. The activities of these various programs are described in the following subsections. Implementation of these programs is expected to help the City achieve its water use targets by reducing the amount of water consumed by its residential customers.

9.2.1.1 Water Wise House Calls

The City provides a free home water use inspection service known as the Water Wise House Call Program. Inspections are conducted by trained water conservation technicians and help identify potential water savings for the customer.

Single-family inspections are approximately one hour in length and consist of an indoor and outdoor evaluation. During the interior portion of the inspection, the technician measures flow rates of existing plumbing fixtures (offering high-efficiency alternatives if necessary), checks all fixtures and appliances for leaks, and provides information on the City's currently available rebate programs (further described in Sections 9.1.2, 9.1.3, and 9.1.4).

Following the indoor evaluation, the technician then conducts an outdoor inspection. A typical outdoor inspection tests sprinkler system efficiency, distribution uniformity, pool equipment, as well as an evaluation for leaks via pressure test. Following the sprinkler test, soil moisture probes are utilized to optimize irrigation scheduling through adjustment of the residence's irrigation controller.

Finally, water use information is reviewed, and the customer is provided with suggested corrective actions, information regarding the City's rebate programs, and educational material on how to further water conservation.

In addition to local advertising, Water Wise House Calls are actively marketed to high water use customers by the City's Water Efficiency Division. In 2020, modifications were made to this program to adhere to recommended safety procedures in consideration for the global health crisis caused by COVID-19. Adjusted Water Wise House Calls continue to be conducted in a safe manner for both residents and City employees.

9.2.1.2 Residential High Efficiency Toilet Replacement Program

The City first established a HET rebate program in 2008. Residents can receive up to $100 for replacing an older (pre-1992), non-conserving toilet with a new 1.28 gallon per flush model. Rebates are offered on a first come/first service basis to customers on an annual basis, and the program is advertised regularly on Roseville's Channel 11, bill inserts, conservation articles, newsletters, and the City's website. Customers can also obtain an application by request through the mail or at special events and City office public counters.

The City continued this rebate until 2018 when market saturation caused the water savings realized by this program to diminish significantly. This program is currently under reevaluation to determine whether the current terms and conditions bear revision to reinstate the program. Each year new opportunities are explored, and existing rebate programs evaluated for effectiveness as the City works to offer a suite of available opportunities to residents.

9.2.1.3 Residential Cash for Grass

In 2008, Roseville created a turf replacement program titled "Cash for Grass" that provides incentive for customers to replace their turf with water efficient landscaping. Turf is purchased at $1.00 per square foot up to $1,000 per residential site. To comply, participants must not only remove their turf but also install a low-volume irrigation system to irrigate their new water efficient landscape.

9.2.2 Commercial, Industrial, Institutional Conservation Programs

The City implements several programs to reduce the consumption of water to its commercial, industrial, and institutional customers. The activities of these various programs are described in the following subsections. Implementation of these programs is expected to help the City achieve its water use targets by reducing the amount of water consumed by its non-residential customers.

9.2.2.1 Irrigation Water "Budgets"

The City has developed water "budgets" for the majority of its dedicated irrigation accounts (including those owned by the City). These budgets were created using the City's geographical information system (GIS) to determine irrigated landscape area and then field verified for accuracy. The budget reports, produced monthly, show the site's actual water use compared to the estimated water use based on site demographics. If a site's water usage is significantly greater than expected, City staff may request the site's owner complete a site water audit.

9.2.2.2 Irrigation Audit

Similar to Water Wise House Calls, the City provides a free landscape audit service for irrigation customers upon request. Staff evaluates the irrigation system and makes recommendations for improvement. Rebates are available to further incentivize the customer to make improvements to their irrigation systems.

The City will continue to implement this program and will consider expansion based on the past years' participation.

9.2.2.3 Commercial Cash for Grass

Similar to the Residential Cash for Grass Program, the City offers rebates to commercial customers for replacing turf with water efficient landscaping. Commercial customers can receive $2.00 per square foot.

9.2.2.4 Commercial Irrigation Improvement Rebates

The City offers a suite of rebate opportunities for commercial irrigation customers including for conversion to drip irrigation, high efficiency nozzles, self-adjusting controllers, pressure regulators, as well as installation of irrigation submeters for a total potential rebate value of $15,000 for those who meet the established criteria for their projects. Applications for these rebates are easily accessed through the City's website with clear outlines of qualifying equipment and labor for ease of submission.

9.2.2.5 Commercial Food Service Water Efficiency Rebates

The City also offers a series of rebates available to commercial customers in the food service industry, with a "One-Stop Program" through which they can apply for applicable benefits on the purchase and replacement of cooking appliances (steamers and combination ovens), sanitation equipment (dishwashers), as well as refrigeration equipment (ice machines) with improved efficiency.

9.2.2.6 Customized Rebate Program

In addition to the above rebates, the Customized Rebate Program helps commercial, industrial, and institutional customers save money with financial incentives on capital expenditures for retrofit of existing equipment with more water-efficient technologies. This program applies to hardware upgrades including equipment and technology for space cooling, refrigeration, laundry, cleaning, and flushing. The customized rebate amount is derived by measuring current usage of the process compared to the water usage of the new retrofitted process. Water savings are estimated using the number of days operated per year and the expected life of the equipment (capped at 10 years). Total amount of saved water is rebated at $0.50 per 100 cubic feet. Rebates will be paid on a first-come, first served basis until program funds are depleted.

9.2.2.7 Commercial Interior Water Use Audit

The Commercial Interior Water Use Audit assists commercial properties in lowering water, wastewater, and energy costs. A facility review identifies equipment inefficiencies and provides a detailed report of all inefficiencies and corresponding recommendations.

9.2.2.8 Night Patrols

The City has implemented a Night Patrol program during peak water usage months that helps to identify commercial water waste after normal business hours. Patrols are typically conducted several nights per week.

9.2.2.9 Commercial High Efficiency Toilet Replacement Program

Similar to the Residential High Efficiency Toilet Replacement Program, commercial customers can receive up to $175 for replacing an older (pre-1992), non-conserving toilet with a new 1.28 gallon per flush model.

9.3 Planned Implementation to Achieve Water Use Targets

In most instances, helping customers understand the savings that can be achieved and methods available to achieve these savings is enough to motivate change. Through the above DMMs, the City can help customers

identify these savings, which in turn helps the City to achieve its water use targets. Additionally, the City will continue to work with the Parks Department, area school districts, landscape contractors, and property managers to improve water use efficiency.

9.4 Members of the California Urban Water Conservation Council

In 1991 (amended September 16, 1999), an MOU regarding urban water conservation in California was made that formalizes an agreement between DWR, water utilities, environmental organizations, and other interested groups to implement Best Management Practices (BMPs) and make a cooperative effort to reduce the consumption of California's water resources. This MOU is administered by the California Water Efficiency Partnership (CalWEP).

In 1991, Roseville became a voluntary signatory of CalWEP's MOU (formerly the California Urban Water Conservation Council or CUWCC). Since becoming a signatory to the MOU, the City has implemented and promoted its water use efficiency programs to help customers reduce water demand. The City reports to CalWEP on its coverage of the recommended BMPs on a calendar year basis.

The Urban Water Management Planning Act (Water Code Section 10631 (j)) allows for an urban retail water agency that is a signatory member of CalWEP to meet the DMM requirements by documenting that CalWEP has determined the urban water agency is complying (coverage) with all of the provisions of the MOU. Documentation of the City's compliance is provided in Appendix N.

Chapter 10 Plan Adoption and Submittal

This chapter provides information regarding the notification, public hearing, and adoption of the plan.

10.1 Inclusion of all 2020 Data

Because 2020 is the final compliance year for SB X7-7, the 2020 UWMPs must contain data through the end of 2020. If a water supplier bases its accounting on a fiscal year (July through June) the data must be through the end of the 2020 fiscal year (June 2020). If the water supplier bases its accounting on a calendar year, the data must be through the end of the 2020 calendar year (December 2020).

As indicated in Chapter 1, the City uses a calendar year for the water supply and demand accounting, and therefore this 2020 UWMP includes data through December 2020.

10.2 Notice of Public Hearing

The City provided 60-day notice of the preparation of its 2020 UWMP, and the notice of the 2020 UWMP Public Hearing to the cities and counties listed in DWR Table 10-1.

DWR Table 10-1

Submittal Table 10-1 Retail: Notification to Cities and Counties		
City Name	60 Day Notice	Notice of Public Hearing
City of Roseville	☑	☑
County Name	60 Day Notice	Notice of Public Hearing
Placer County	☑	☑

Other agencies notified included the following:

- California American Water
- Citrus Heights Water District
- Placer County Water Agency
- Regional Water Authority
- San Juan Water District
- Sacramento Municipal Utilities District
- Sacramento Suburban Water District
- US Bureau of Reclamation

Public hearing notifications for adopting the Plan were published in the local newspaper (Roseville Press Tribune) and on the City's website. Copies of the published Notice of Public Hearing will be included in Appendix B.

10.3 Public Hearing and Adoption

The City has encouraged community and public interest involvement in the Plan update through the use of public meetings and web-based communication. Copies of the City's outreach efforts are included in Appendix B.

The public hearing will provide an opportunity for all City water users and the general public to become familiar with the Urban Water Management Plan as well as the Water Shortage Contingency Plan and ask questions about its contents. In addition, the hearing presents an opportunity for the public to learn about or comment on the City's continuing plans for providing a reliable, safe, high-quality water supply. Copies of the draft Urban Water Management Plan, including the Water Shortage Contingency Plan, are available for public inspection on the City's website. The public hearing will be held on June 16, 2021.

Copies of the adoption resolutions will be provided in Appendix O, in the final UWMP and WSCP.

10.4 Plan Submittal

A copy of the 2020 UWMP will be submitted to DWR within 30 days of adoption and by July 1, 2021. The adopted UWMP will be submitted electronically to DWR using the WUEdata submittal tool. A CD or hardcopy of the adopted 2020 UWMP will also be submitted to the California State Library.

No later than 30 days after adoption, a copy of the adopted 2020 UWMP, including the Water Shortage Contingency Plan, will be provided to the cities and counties to which the City provides water.

10.5 Public Availability

No later than 30 days after submittal to DWR, copies of this 2020 UWMP will be available for public review at the City's public offices. An electronic copy of this Plan will also be available for review and download on the City's website: www.roseville.ca.us/UWMP.

10.6 Public Implementation

This Plan will be the source document for any Senate Bill 610 Water Supply Assessment or Senate Bill 221 Water Supply Verifications required for any proposed projects between 2021 and 2025 that are subject to the California Environmental Quality Act (CEQA) and would demand an amount of water equivalent or greater than the amount of water by a 500-dwelling unit project. This Plan will also be the source document for water demand projections and water supply availability. Lastly, this Plan will provide guidance and direction on development of new local supplies and implementation of water conservation programs and recycled water expansion to meet the requirements of the Water Conservation Act.

10.7 Amending an Adopted UWMP

If the City amends its 2020 UWMP or the Water Shortage Contingency Plan contained therein, copies of amendments or changes to the plans will be submitted to DWR, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

10.8 California Water Code Requirements

Demonstration of compliance with all applicable requirements of the California Water Code pertaining to Urban Water Management Plan and Water Shortage Contingency Plan is provided in Appendix P. Appendix P was developed based on the UWMP Checklist provided in the Guidebook and is organized by subject.

Appendix A – Notifications to Wholesale Suppliers

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

May 25, 2021

Mr. Jeremy Shepard, Director of Technical Services
Placer County Water Agency
PO Box 6570
Auburn, CA 95604-6570

RE: City of Roseville 2020 Urban Water Management Plan Demand Projections

Dear Mr. Shepard:

We sent notice earlier this year to inform you that the City of Roseville (City) Water Utility had begun preparation of the 2020 Urban Water Management Plan. In accordance with California Water Code Section 10631, as the City is a retail water supplier receiving water from your agency, we have provided you with projected water use through 2045 in the below table.

Supply Source	2025	2030	2035	2040	2045
Placer County Water Agency Existing Contracts	30,000 AF	30,000 AF	30,000 AF	33,360 AF	33,360 AF
Placer County Water Agency Future Ophir WTP	–	–	Up to 3.6 MGD	Up to 3.6 MGD	Up to 3.6 MGD

A complete draft of the 2020 Urban Water Management Plan, which is inclusive of the newly required Water Shortage Contingency Plan, can be accessed at www.roseville.ca.us/UWMP. A public hearing of the Water Shortage Contingency Plan and Urban Water Management Plan will be held on June 16th at 6 pm. We encourage you to attend the public hearing which will be held through video conferencing. For information regarding broadcasting of the meeting and providing public comment please visit the City's website at https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=16870417.

Should you wish to contact the City regarding either of the plans, you may do so by writing or emailing to the undersigned below. Thank you.

Sincerely,



Trevor Joseph, P.G., C.Hg.
Hydrogeologist
City of Roseville
Environmental Utilities Department
TJoseph@roseville.ca.us

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

May 25, 2021

Mr. Paul Helliker, General Manager
San Juan Water District
9935 Auburn-Folsom Road
Granite Bay, CA 95764

RE: City of Roseville 2020 Urban Water Management Plan Demand Projections

Dear Mr. Helliker:

We sent notice earlier this year to inform you that the City of Roseville (City) Water Utility had begun preparation of the 2020 Urban Water Management Plan. In accordance with California Water Code Section 10631, as the City is a retail water supplier receiving water from your agency, we have provided you with projected water use through 2045 in the below table.

Supply Source	2025	2030	2035	2040	2045
San Juan Water District	4,000 AF	4,000 AF	4,000 AF	4,000 AF	4,000 AF

A complete draft of the 2020 Urban Water Management Plan, which is inclusive of the newly required Water Shortage Contingency Plan, can be accessed at www.roseville.ca.us/UWMP. A public hearing of the Water Shortage Contingency Plan and Urban Water Management Plan will be held on June 16th at 6 pm. We encourage you to attend the public hearing which will be held through video conferencing. For information regarding broadcasting of the meeting and providing public comment please visit the City's website at https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=16870417.

Should you wish to contact the City regarding either of the plans, you may do so by writing or emailing to the undersigned below. Thank you.

Sincerely,



Trevor Joseph, P.G., C.Hg.
Hydrogeologist
City of Roseville
Environmental Utilities Department
TJoseph@roseville.ca.us

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

May 25, 2021

Mr. Drew Lessard, Area Manager
Central California Area Office
7794 Folsom Dam Road
Folsom, CA 95630

RE: City of Roseville 2020 Urban Water Management Plan Demand Projections

Dear Mr. Lessard:

We sent notice earlier this year to inform you that the City of Roseville (City) Water Utility had begun preparation of the 2020 Urban Water Management Plan. In accordance with California Water Code Section 10631, as the City is a retail water supplier receiving water from your agency, we have provided you with projected water use through 2045 in the below table. The City plans to make full beneficial use of each year's allotments.

Supply Source	2025	2030	2035	2040	2045
US Bureau of Reclamation	32,000 AF	32,000 AF	32,000 AF	32,000 AF	32,000 AF

A complete draft of the 2020 Urban Water Management Plan, which is inclusive of the newly required Water Shortage Contingency Plan, can be accessed at www.roseville.ca.us/UWMP. A public hearing of the Water Shortage Contingency Plan and Urban Water Management Plan will be held on June 16th at 6 pm. We encourage you to attend the public hearing which will be held through video conferencing. For information regarding broadcasting of the meeting and providing public comment please visit the City's website at https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=16870417.

Should you wish to contact the City regarding either of the plans, you may do so by writing or emailing to the undersigned below. Thank you.

Sincerely,



Trevor Joseph, P.G., C.Hg.
Hydrogeologist
City of Roseville
Environmental Utilities Department
tjoseph@roseville.ca.us

From:	Joseph, Trevor
To:	Jeremy Shepard; Darin Reintjes
Cc:	York, Linda; Bigley, Sean
Subject:	City of Roseville 2020 Urban Water Management Plan Demand Projections
Date:	Tuesday, May 25, 2021 12:09:00 PM
Attachments:	PCWA_Technical Services Director ldy.pdf image001.png

Hi Jeremy and Darin –

Please see the attached letter as part of the Urban Water Management Plan requirements informing PCWA of our projected water use.

Regards,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
Environmental Utilities
c: (916) 517-2578

Corporation Yard | 2005 Hilltop Circle | Roseville, CA | 95747



From:	Joseph, Trevor
To:	Helliker, Paul (San Juan Water District); Zlotnick, Greg (San Juan Water Distict)
Cc:	Bigley, Sean; York, Linda
Subject:	City of Roseville 2020 Urban Water Management Plan Demand Projections
Date:	Tuesday, May 25, 2021 12:10:41 PM
Attachments:	SJWD_General Manager ldy.pdf image001.png

Hi Paul and Greg –

Please see the attached letter as part of the Urban Water Management Plan requirements informing SJWD of our projected water use.

Regards,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
Environmental Utilities
c: (916) 517-2578

Corporation Yard | 2005 Hilltop Circle | Roseville, CA | 95747

From:	Joseph, Trevor
To:	DLessard@usbr.gov
Cc:	Bigley, Sean; York, Linda
Subject:	City of Roseville 2020 Urban Water Management Plan Demand Projections
Date:	Tuesday, May 25, 2021 12:07:37 PM
Attachments:	image001.png USBR_Area Manager ldy.pdf

Hi Drew –

Please see the attached letter as part of the Urban Water Management Plan requirements informing the USBR of our projected water use.

Regards,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
Environmental Utilities
c: (916) 517-2578

Corporation Yard | 2005 Hilltop Circle | Roseville, CA | 95747

Appendix B – Public and Agency Outreach

CITY OF ROSEVILLE CALIFORNIA

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

February 12, 2021

S. Audie Foster, General Manager
California American Water
4701 Beloit Drive
Sacramento, CA 95838

RE: City of Roseville 2020 Urban Water Management Plan

Dear S. Audie Foster:

The City of Roseville (City) water utility has begun preparing the 2020 Urban Water Management Plan, which must be completed by July 1, 2021. In accordance with California Water Code Section 10642, we are writing to notify you that preparation is underway and to encourage your active input and involvement in the process.

Prior to Board adoption of the plan a public hearing will be held, and we will notify you of the date, time, and location of the meeting. We will also make a draft of the 2020 Urban Water Management Plan available to your agency in advance of the public hearing.

If you wish to contact the City about its review process, you may do so by writing to the undersigned or by email to jtmarks@roseville.ca.us. Thank you.

Sincerely,

Jason Marks

Jason Marks, P.E.
Senior Engineer
City of Roseville
Environmental Utilities Department

CITY OF ROSEVILLE CALIFORNIA

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

February 12, 2021

Mr. Hilary Straus, General Manager
Citrus Heights Water District
6230 Sylvan Road
Citrus Heights, CA 95610

RE: City of Roseville 2020 Urban Water Management Plan

Dear Mr. Straus:

The City of Roseville (City) water utility has begun preparing the 2020 Urban Water Management Plan, which must be completed by July 1, 2021. In accordance with California Water Code Section 10642, we are writing to notify you that preparation is underway and to encourage your active input and involvement in the process.

Prior to Board adoption of the plan a public hearing will be held, and we will notify you of the date, time, and location of the meeting. We will also make a draft of the 2020 Urban Water Management Plan available to your agency in advance of the public hearing.

If you wish to contact the City about its review process, you may do so by writing to the undersigned or by email to jtmarks@roseville.ca.us. Thank you.

Sincerely,

Jason Marks

Jason Marks, P.E.
Senior Engineer
City of Roseville
Environmental Utilities Department

CITY OF ROSEVILLE CALIFORNIA

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

February 12, 2021

Mr. Dominick Casey, City Manager
City of Roseville
311 Vernon Street
Roseville, CA 95678

RE: City of Roseville 2020 Urban Water Management Plan

Dear Mr. Casey:

The City of Roseville (City) water utility has begun preparing the 2020 Urban Water Management Plan, which must be completed by July 1, 2021. In accordance with California Water Code Section 10642, we are writing to notify you that preparation is underway and to encourage your active input and involvement in the process.

Prior to Board adoption of the plan a public hearing will be held, and we will notify you of the date, time, and location of the meeting. We will also make a draft of the 2020 Urban Water Management Plan available to your agency in advance of the public hearing.

If you wish to contact the City about its review process, you may do so by writing to the undersigned or by email to jtmarks@roseville.ca.us. Thank you.

Sincerely,

Jason Marks

Jason Marks, P.E.
Senior Engineer
City of Roseville
Environmental Utilities Department

CITY OF ROSEVILLE CALIFORNIA

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

February 12, 2021

Mr. Jeremy Shepard, Director of Technical Services
Placer County Water Agency
PO Box 6570
Auburn, CA 95604-6570

RE: City of Roseville 2020 Urban Water Management Plan (UWMP)

Dear Mr. Shepard:

We have received your letter dated November 19, 2020 and at this time have no known objection to the proposed summary for the 2020 UWMP. The City of Roseville (City) water utility has begun preparing the 2020 Urban Water Management Plan. In accordance with California Water Code Section 10642, we are writing to notify you that preparation is underway and to encourage your active input and involvement in the process.

Prior to Board adoption of the plan a public hearing will be held, and we will notify you of the date, time, and location of the meeting. We will also make a draft of the 2020 Urban Water Management Plan available to your agency in advance of the public hearing.

If you wish to contact the City about its review process, you may do so by writing to the undersigned or by email to jtmarks@roseville.ca.us. Thank you.

Sincerely,

Jason Marks

Jason Marks, P.E.
Senior Engineer
City of Roseville
Environmental Utilities Department

CITY OF ROSEVILLE CALIFORNIA

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

February 12, 2021

Peter Kraatz, Assistant Director
Placer County Public Works Department
3901 County Center Drive, Suite 220
Auburn, CA 95603

RE: City of Roseville 2020 Urban Water Management Plan

Dear Mr. Kraatz:

The City of Roseville (City) water utility has begun preparing the 2020 Urban Water Management Plan, which must be completed by July 1, 2021. In accordance with California Water Code Section 10642, we are writing to notify you that preparation is underway and to encourage your active input and involvement in the process.

Prior to Board adoption of the plan a public hearing will be held, and we will notify you of the date, time, and location of the meeting. We will also make a draft of the 2020 Urban Water Management Plan available to your agency in advance of the public hearing.

If you wish to contact the City about its review process, you may do so by writing to the undersigned or by email to jtmarks@roseville.ca.us. Thank you.

Sincerely,

Jason Marks

Jason Marks, P.E.
Senior Engineer
City of Roseville
Environmental Utilities Department

CITY OF ROSEVILLE CALIFORNIA

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

February 12, 2021

Lehigh Chavez, Environmental Coordinator
Placer County Community Development Resource Agency
3901 County Center Drive
Auburn, CA 95603

RE: City of Roseville 2020 Urban Water Management Plan

Dear Lehigh Chavez:

The City of Roseville (City) water utility has begun preparing the 2020 Urban Water Management Plan, which must be completed by July 1, 2021. In accordance with California Water Code Section 10642, we are writing to notify you that preparation is underway and to encourage your active input and involvement in the process.

Prior to Board adoption of the plan a public hearing will be held, and we will notify you of the date, time, and location of the meeting. We will also make a draft of the 2020 Urban Water Management Plan available to your agency in advance of the public hearing.

If you wish to contact the City about its review process, you may do so by writing to the undersigned or by email to jtmarks@roseville.ca.us. Thank you.

Sincerely,

Jason Marks

Jason Marks, P.E.
Senior Engineer
City of Roseville
Environmental Utilities Department

CITY OF ROSEVILLE CALIFORNIA

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

February 12, 2021

Regional Water Authority
5620 Birdcage Street, Suite 180
Citrus Heights, CA 95610

RE: City of Roseville 2020 Urban Water Management Plan

Dear RWA Members:

The City of Roseville (City) water utility has begun preparing the 2020 Urban Water Management Plan, which must be completed by July 1, 2021. In accordance with California Water Code Section 10642, we are writing to notify you that preparation is underway and to encourage your active input and involvement in the process.

Prior to Board adoption of the plan a public hearing will be held, and we will notify you of the date, time, and location of the meeting. We will also make a draft of the 2020 Urban Water Management Plan available to your agency in advance of the public hearing.

If you wish to contact the City about its review process, you may do so by writing to the undersigned or by email to jtmarks@roseville.ca.us. Thank you.

Sincerely,

Jason Marks

Jason Marks, P.E.
Senior Engineer
City of Roseville
Environmental Utilities Department

CITY OF ROSEVILLE CALIFORNIA

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

February 12, 2021

Mr. Paul Helliker, General Manager
San Juan Water District
9935 Auburn-Folsom Road
Granite Bay, CA 95764

RE: City of Roseville 2020 Urban Water Management Plan

Dear Mr. Helliker:

The City of Roseville (City) water utility has begun preparing the 2020 Urban Water Management Plan, which must be completed by July 1, 2021. In accordance with California Water Code Section 10642, we are writing to notify you that preparation is underway and to encourage your active input and involvement in the process. Additionally, in accordance with California Water Code Section 10631, as we are a retail water supplier receiving water from your agency, we will provide you with projected water use for the next 20 years (up to the year 2040).

Prior to Board adoption of the plan a public hearing will be held, and we will notify you of the date, time, and location of the meeting. We will also make a draft of the 2020 Urban Water Management Plan available to your agency in advance of the public hearing.

If you wish to contact the City about its review process, you may do so by writing to the undersigned or by email to jtmarks@roseville.ca.us. Thank you.

Sincerely,

Jason Marks

Jason Marks, P.E.
Senior Engineer
City of Roseville
Environmental Utilities Department

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

February 12, 2021

Ansel Lundberg, Water and Power Contract Specialist
Sacramento Municipal Utility District
6201 S Street
Sacramento, CA 95817

RE: City of Roseville 2020 Urban Water Management Plan

Dear Ansel Lundberg:

The City of Roseville (City) water utility has begun preparing the 2020 Urban Water Management Plan, which must be completed by July 1, 2021. In accordance with California Water Code Section 10642, we are writing to notify you that preparation is underway and to encourage your active input and involvement in the process.

Prior to Board adoption of the plan a public hearing will be held, and we will notify you of the date, time, and location of the meeting. We will also make a draft of the 2020 Urban Water Management Plan available to your agency in advance of the public hearing.

If you wish to contact the City about its review process, you may do so by writing to the undersigned or by email to jtmarks@roseville.ca.us. Thank you.

Sincerely,

Jason Marks

Jason Marks, P.E.
Senior Engineer
City of Roseville
Environmental Utilities Department

CITY OF ROSEVILLE CALIFORNIA

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

February 12, 2021

Mr. Daniel York, General Manager
Sacramento Suburban Water District
3701 Marconi Avenue, Suite 100
Sacramento, CA 95821

RE: City of Roseville 2020 Urban Water Management Plan

Dear Mr. York:

The City of Roseville (City) water utility has begun preparing the 2020 Urban Water Management Plan, which must be completed by July 1, 2021. In accordance with California Water Code Section 10642, we are writing to notify you that preparation is underway and to encourage your active input and involvement in the process.

Prior to Board adoption of the plan a public hearing will be held, and we will notify you of the date, time, and location of the meeting. We will also make a draft of the 2020 Urban Water Management Plan available to your agency in advance of the public hearing.

If you wish to contact the City about its review process, you may do so by writing to the undersigned or by email to jtmarks@roseville.ca.us. Thank you.

Sincerely,

Jason Marks

Jason Marks, P.E.
Senior Engineer
City of Roseville
Environmental Utilities Department

CITY OF ROSEVILLE CALIFORNIA

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

February 12, 2021

Mr. Drew Lessard, Area Manager
Central California Area Office
7794 Folsom Dam Road
Folsom, CA 95630

RE: City of Roseville 2020 Urban Water Management Plan

Dear Mr. Lessard:

The City of Roseville (City) water utility has begun preparing the 2020 Urban Water Management Plan, which must be completed by July 1, 2021. In accordance with California Water Code Section 10642, we are writing to notify you that preparation is underway and to encourage your active input and involvement in the process. Additionally, in accordance with California Water Code Section 10631, as we are a retail water supplier receiving water from your agency, we will provide you with projected water use for the next 20 years (up to the year 2040).

Prior to Board adoption of the plan a public hearing will be held, and we will notify you of the date, time, and location of the meeting. We will also make a draft of the 2020 Urban Water Management Plan available to your agency in advance of the public hearing.

If you wish to contact the City about its review process, you may do so by writing to the undersigned or by email to jtmarks@roseville.ca.us. Thank you.

Sincerely,

Jason Marks

Jason Marks, P.E.
Senior Engineer
City of Roseville
Environmental Utilities Department

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

May 25, 2021

Mr. Dominick Casey, City Manager
City of Roseville
311 Vernon Street
Roseville, CA 95678

RE: City of Roseville 2020 Urban Water Management Plan Public Hearing

Dear Mr. Casey:

We sent notice earlier this year to inform you that the City of Roseville Water Utility (Water Utility) had begun preparation of the 2020 Urban Water Management Plan (UWMP). A draft of the UWMP, which is inclusive of the newly required Water Shortage Contingency Plan (WSCP), has been completed and can be accessed at www.roseville.ca.us/UWMP.

Prior to Board adoption, a public hearing of the UWMP and WSCP will be held on June 16th at 6pm. We encourage you to attend the public hearing which will be held through video conferencing. For information regarding broadcasting of the meeting and providing public comment please visit the City's website at https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=16870417.

If you wish to contact the Water Utility regarding either of the plans, you may do so by writing to the undersigned or by email to TJoseph@roseville.ca.us. Thank you.

Sincerely,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
City of Roseville
Environmental Utilities Department

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

May 25, 2021

S. Audie Foster, General Manager
California American Water
4701 Beloit Drive
Sacramento, CA 95838

RE: City of Roseville 2020 Urban Water Management Plan Public Hearing

Dear S. Audie Foster:

We sent notice earlier this year to inform you that the City of Roseville Water Utility (Water Utility) had begun preparation of the 2020 Urban Water Management Plan (UWMP). A draft of the UWMP, which is inclusive of the newly required Water Shortage Contingency Plan (WSCP), has been completed and can be accessed at www.roseville.ca.us/UWMP.

Prior to Board adoption, a public hearing of the UWMP and WSCP will be held on June 16th at 6pm. We encourage you to attend the public hearing which will be held through video conferencing. For information regarding broadcasting of the meeting and providing public comment please visit the City's website at https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=16870417.

If you wish to contact the Water Utility regarding either of the plans, you may do so by writing to the undersigned or by email to TJoseph@roseville.ca.us. Thank you.

Sincerely,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
City of Roseville
Environmental Utilities Department

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

May 25, 2021

Mr. Hilary Straus, General Manager
Citrus Heights Water District
6230 Sylvan Road
Citrus Heights, CA 95610

RE: City of Roseville 2020 Urban Water Management Plan Public Hearing

Dear Mr. Straus:

We sent notice earlier this year to inform you that the City of Roseville Water Utility (Water Utility) had begun preparation of the 2020 Urban Water Management Plan (UWMP). A draft of the UWMP, which is inclusive of the newly required Water Shortage Contingency Plan (WSCP), has been completed and can be accessed at www.roseville.ca.us/UWMP.

Prior to Board adoption, a public hearing of the UWMP and WSCP will be held on June 16th at 6pm. We encourage you to attend the public hearing which will be held through video conferencing. For information regarding broadcasting of the meeting and providing public comment please visit the City's website at https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=16870417.

If you wish to contact the Water Utility regarding either of the plans, you may do so by writing to the undersigned or by email to TJoseph@roseville.ca.us. Thank you.

Sincerely,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
City of Roseville
Environmental Utilities Department

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

May 25, 2021

Peter Kraatz, Assistant Director
Placer County Public Works Department
3901 County Center Drive, Suite 220
Auburn, CA 95603

RE: City of Roseville 2020 Urban Water Management Plan Public Hearing

Dear Mr. Kraatz:

We sent notice earlier this year to inform you that the City of Roseville Water Utility (Water Utility) had begun preparation of the 2020 Urban Water Management Plan (UWMP). A draft of the UWMP, which is inclusive of the newly required Water Shortage Contingency Plan (WSCP), has been completed and can be accessed at www.roseville.ca.us/UWMP.

Prior to Board adoption, a public hearing of the UWMP and WSCP will be held on June 16th at 6pm. We encourage you to attend the public hearing which will be held through video conferencing. For information regarding broadcasting of the meeting and providing public comment please visit the City's website at https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=16870417.

If you wish to contact the Water Utility regarding either of the plans, you may do so by writing to the undersigned or by email to TJoseph@roseville.ca.us. Thank you.

Sincerely,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
City of Roseville
Environmental Utilities Department

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

May 25, 2021

Lehigh Chavez, Environmental Coordinator
Placer County Community Development Resource Agency
3901 County Center Drive
Auburn, CA 95603

RE: City of Roseville 2020 Urban Water Management Plan Public Hearing

Dear Lehigh Chavez:

We sent notice earlier this year to inform you that the City of Roseville Water Utility (Water Utility) had begun preparation of the 2020 Urban Water Management Plan (UWMP). A draft of the UWMP, which is inclusive of the newly required Water Shortage Contingency Plan (WSCP), has been completed and can be accessed at www.roseville.ca.us/UWMP.

Prior to Board adoption, a public hearing of the UWMP and WSCP will be held on June 16th at 6pm. We encourage you to attend the public hearing which will be held through video conferencing. For information regarding broadcasting of the meeting and providing public comment please visit the City's website at https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=16870417.

If you wish to contact the Water Utility regarding either of the plans, you may do so by writing to the undersigned or by email to TJoseph@roseville.ca.us. Thank you.

Sincerely,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
City of Roseville
Environmental Utilities Department

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

May 25, 2021

Regional Water Authority
5620 Birdcage Street, Suite 180
Citrus Heights, CA 95610

RE: City of Roseville 2020 Urban Water Management Plan Public Hearing

Dear RWA Members:

We sent notice earlier this year to inform you that the City of Roseville Water Utility (Water Utility) had begun preparation of the 2020 Urban Water Management Plan (UWMP). A draft of the UWMP, which is inclusive of the newly required Water Shortage Contingency Plan (WSCP), has been completed and can be accessed at www.roseville.ca.us/UWMP.

Prior to Board adoption, a public hearing of the UWMP and WSCP will be held on June 16th at 6pm. We encourage you to attend the public hearing which will be held through video conferencing. For information regarding broadcasting of the meeting and providing public comment please visit the City's website at https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=16870417.

If you wish to contact the Water Utility regarding either of the plans, you may do so by writing to the undersigned or by email to TJoseph@roseville.ca.us. Thank you.

Sincerely,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
City of Roseville
Environmental Utilities Department

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

May 25, 2021

Ansel Lundberg, Water and Power Contract Specialist
Sacramento Municipal Utility District
6201 S Street
Sacramento, CA 95817

RE: City of Roseville 2020 Urban Water Management Plan Public Hearing

Dear Ansel Lundberg:

We sent notice earlier this year to inform you that the City of Roseville Water Utility (Water Utility) had begun preparation of the 2020 Urban Water Management Plan (UWMP). A draft of the UWMP, which is inclusive of the newly required Water Shortage Contingency Plan (WSCP), has been completed and can be accessed at www.roseville.ca.us/UWMP.

Prior to Board adoption, a public hearing of the UWMP and WSCP will be held on June 16th at 6pm. We encourage you to attend the public hearing which will be held through video conferencing. For information regarding broadcasting of the meeting and providing public comment please visit the City's website at https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=16870417.

If you wish to contact the Water Utility regarding either of the plans, you may do so by writing to the undersigned or by email to TJoseph@roseville.ca.us. Thank you.

Sincerely,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
City of Roseville
Environmental Utilities Department

Environmental Utilities
Water Division
2005 Hilltop Circle
Roseville, California 95747

May 25, 2021

Mr. Daniel York, General Manager
Sacramento Suburban Water District
3701 Marconi Avenue, Suite 100
Sacramento, CA 95821

RE: City of Roseville 2020 Urban Water Management Plan Public Hearing

Dear Mr. York:

We sent notice earlier this year to inform you that the City of Roseville Water Utility (Water Utility) had begun preparation of the 2020 Urban Water Management Plan (UWMP). A draft of the UWMP, which is inclusive of the newly required Water Shortage Contingency Plan (WSCP), has been completed and can be accessed at www.roseville.ca.us/UWMP.

Prior to Board adoption, a public hearing of the UWMP and WSCP will be held on June 16th at 6pm. We encourage you to attend the public hearing which will be held through video conferencing. For information regarding broadcasting of the meeting and providing public comment please visit the City's website at https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=16870417.

If you wish to contact the Water Utility regarding either of the plans, you may do so by writing to the undersigned or by email to TJoseph@roseville.ca.us. Thank you.

Sincerely,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
City of Roseville
Environmental Utilities Department

From:	Joseph, Trevor
To:	Foster, Stephen (American Water)
Cc:	Bigley, Sean; York, Linda
Subject:	City of Roseville 2020 Urban Water Management Plan Public Hearing
Date:	Tuesday, May 25, 2021 12:35:03 PM
Attachments:	Cal Am General Manager ldy.pdf image001.png

Hello Stephen

Please see the attached letter as part of the Urban Water Management Plan requirements informing Cal Am of a pending public hearing. They City's UWMP will be made available on our website shortly.

Regards,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
Environmental Utilities
c: (916) 517-2578

Corporation Yard | 2005 Hilltop Circle | Roseville, CA | 95747

From:	Joseph, Trevor
To:	York, Linda
Subject:	FW: City of Roseville 2020 Urban Water Management Plan Public Hearing
Date:	Tuesday, May 25, 2021 12:41:00 PM
Attachments:	CHWD_General Manager ldy.pdf image001.png

From: Joseph, Trevor
Sent: Tuesday, May 25, 2021 12:37 PM
To: Hilary Straus <hstraus@chwd.org>
Subject: City of Roseville 2020 Urban Water Management Plan Public Hearing

Hello Hilary

Please see the attached letter as part of the Urban Water Management Plan requirements informing CHWD of a pending public hearing. They City's UWMP will be made available on our website shortly.

Regards,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
Environmental Utilities
c: (916) 517-2578

Corporation Yard | 2005 Hilltop Circle | Roseville, CA | 95747



From:	Joseph, Trevor
To:	pkraatz@placer.ca.gov
Cc:	Bigley, Sean; York, Linda; Hanson, Christina (Placer County)
Subject:	City of Roseville 2020 Urban Water Management Plan Public Hearing
Date:	Tuesday, May 25, 2021 12:40:09 PM
Attachments:	Placer County Public Works_Assistant Director ldy.pdf image001.png

Hello Peter

Please see the attached letter as part of the Urban Water Management Plan requirements informing Placer County Public Works of a pending public hearing. They City's UWMP will be made available on our website shortly.

Regards,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
Environmental Utilities
c: (916) 517-2578

Corporation Yard | 2005 Hilltop Circle | Roseville, CA | 95747

From:	Joseph, Trevor
To:	cdraecs@placer.ca.gov
Cc:	Bigley, Sean; York, Linda; Hanson, Christina (Placer County)
Subject:	City of Roseville 2020 Urban Water Management Plan Public Hearing
Date:	Tuesday, May 25, 2021 12:43:10 PM
Attachments:	Placer County, Environmental Coordinator ldy.pdf image001.png

Hello Leigh

Please see the attached letter as part of the Urban Water Management Plan requirements informing Placer County Environmental Coordinator of a pending public hearing. They City's UWMP will be made available on our website shortly.

Regards,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
Environmental Utilities
c: (916) 517-2578

Corporation Yard | 2005 Hilltop Circle | Roseville, CA | 95747

From: Cecilia Partridge
Subject: City of Roseville 2020 Urban Water Management Plan Public Hearing Notification
Date: Tuesday, May 25, 2021 2:54:37 PM
Attachments: RWA_Membership Idy.pdf

EXTERNAL: This email originated from outside of the organization. Do not click on any links or open attachments unless you recognize the sender and know the content is safe.

Good afternoon RWA members,

Attached is a notice from the City of Roseville regarding an upcoming Public Hearing for their 2020 Urban Water Management Plan.

Any questions please feel free to contact me.

Cecilia Partridge
cpartridge@rwah2o.org
Executive Assistant
Regional Water Authority
5620 Birdcage Street, Suite 180
Citrus Heights, CA 95610
916-213-4631 cell

From:	Joseph, Trevor
To:	"Ansel Lundberg"
Cc:	Bigley, Sean; York, Linda
Subject:	City of Roseville 2020 Urban Water Management Plan Public Hearing
Date:	Tuesday, May 25, 2021 12:46:14 PM
Attachments:	SMUD_Water and Power Contract Specialist Idy.pdf image001.png

Hello Ansel

Please see the attached letter as part of the Urban Water Management Plan requirements informing SMUD of a pending public hearing. They City's UWMP will be made available on our website shortly.

Regards,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
Environmental Utilities
c: (916) 517-2578

Corporation Yard | 2005 Hilltop Circle | Roseville, CA | 95747

From:	Joseph, Trevor
To:	Dan York
Cc:	Bigley, Sean; York, Linda
Subject:	City of Roseville 2020 Urban Water Management Plan Public Hearing
Date:	Tuesday, May 25, 2021 12:45:17 PM
Attachments:	SSWD_General Manager ldy.pdf image001.png

Hello Dan

Please see the attached letter as part of the Urban Water Management Plan requirements informing Sacramento Suburban Water District of a pending public hearing. They City's UWMP will be made available on our website shortly.

Regards,

Trevor Joseph, P.G., C.Hg.
Hydrogeologist
Environmental Utilities
c: (916) 517-2578

Corporation Yard | 2005 Hilltop Circle | Roseville, CA | 95747

York, Linda

Subject: FW: Urban Water Management Plan and Water Shortage Contingency Update to Publish in the Press Tribune on May 28, 2021 and June 4, 2021 City of Roseville #1050
Attachments: NOTICE OF PUBLIC HEARING UWMP AND WSCP.docx

From: Rachel White <rachelw@goldcountrymedia.com> on behalf of legals@goldcountrymedia.com <legals@goldcountrymedia.com>
Sent: Friday, May 21, 2021 4:01:49 PM
To: Six, Katrina <KMSix@roseville.ca.us>
Subject: RE: Urban Water Management Plan and Water Shortage Contingency Update to Publish in the Press Tribune on May 28, 2021 and June 4, 2021 City of Roseville #1050

EXTERNAL: This email originated from outside of the organization. Do not click on any links or open attachments unless you recognize the sender and know the content is safe.

Hi, Katrina,

This order has been completed and scheduled as requested for The Roseville Press Tribune on May 28, June 4, 2021. The order is #77551.

If you have any questions on this order, please include the order number in your email to legals@goldcountrymedia.com.

Thank you for your business,

Rachel White
Legals Clerk
Gold Country Media
Direct: (916) 774-7911
Email: legals@goldcountrymedia.com

From: Six, Katrina via Legals [mailto:legals@goldcountrymedia.com]
Sent: Wednesday, May 19, 2021 12:28 PM
To: legals@goldcountrymedia.com
Subject: Urban Water Management Plan and Water Shortage Contingency Update to Publish in the Press Tribune on May 28, 2021 and June 4, 2021 City of Roseville #1050

Urban Water Management Plan and Water Shortage Contingency Update to Publish in the Press Tribune on May 28, 2021 and June 4, 2021 City of Roseville #1050

Katrina Six
Deputy City Clerk
City Clerk Department
o: (916) 774-5267
f: (916) 786-9175

Civic Center | 311 Vernon Street | Roseville, CA | 95678



NOTICE OF PUBLIC HEARING
2020 URBAN WATER MANAGEMENT PLAN
AND 2020 WATER SHORTAGE CONTINGENCY UPDATE
CITY OF ROSEVILLE, PLACER COUNTY, CALIFORNIA

NOTICE IS HEREBY GIVEN that the City of Roseville will hold a public hearing on Wednesday, June 16, 2021 at 6:00 p.m. in the City Council Chambers at 311 Vernon Street, Roseville, California, to consider adoption of the City of Roseville 2020 Urban Water Management Plan. The public hearing will also include consideration for adoption of the 2020 Water Shortage Contingency Plan. The Water Shortage Contingency Plan is included as Chapter 8 of the 2020 Urban Water Management Plan.

The Public Review Draft of these documents is available on the City's website at http://roseville.ca.us/UWMP .

Appendix C – Land Use Element

CITY OF ROSEVILLE CALIFORNIA

II. LAND USE



Table of Contents

II LAND USE ..... II-I
Purpose II-1
Guiding Principles II-2
Organization II-2
Planning Area II-4
Land Use Designations II-7
Development Forecast II-23
Community Form II-25
Community Design II-31
Growth Management II-33

Figures

Figure II-1 | Planning Areas II-5
Figure II-2 | Land Use Map II-9

Tables

Table II-1 | Residential Land Use Characteristics II-12
Table II-2 | Non-Residential Land Use Characteristics II-12
Table II-3 | Residential Land Use Designations II-14
Table II-4 | Non-Residential Land Use Designations: Commercial II-15
Table II-5 | Non-Residential Land Use Designations: Office II-16
Table II-6 | Non-Residential Land Use Designations: Industrial II-16
Table II-6 | Non-Residential Land Use Designations: Industrial (Cont.) II-17
Table II-7 | Special Land Use Designations II-19
Table II-7 | Special Land Use Designations (Cont.) II-20
Table II-8 | Combining Designations II-20
Table II-9 | Compatibility of Adjacent Land Use Designations as Applied on the General Plan Land Use Map II-21
Table II-10 | Land Use Designations, Special Areas, and Combining Designations and Implementing Zones II-22
Table II-11 | Existing and Future Development II-24



LAND USE

PURPOSE

The purpose of the Land Use Element is to set guidelines for managing land use change. Land use designations define allowable density and land uses. The Land Use Map illustrates the location of each of these uses. Goals and policies in this Element guide land use change to achieve many goals: maintaining and enhancing quality of life in neighborhoods; promoting revitalization and economic development; enhancing fiscal sustainability; and ensuring orderly and efficient long-term growth.

A community's ultimate land use distribution and development pattern are influenced by economic development and opportunities, the capacity and location of infrastructure and services, natural and environmental constraints, the periods of time when the community was founded and experienced growth, market opportunities and constraints, and social factors. The implementation of land policies interacts with these and other factors to improve social, economic, and environmental outcomes. Land

use patterns have complex relationships with other key planning considerations. For example, infrastructure capacity and placement can influence the distribution of land uses and the community's overall character. At the same time, the desired community character speaks to the distribution of land uses and the infrastructure necessary to serve these land uses.

It is the overall goal of the Land Use Element to promote a balanced land use pattern that supports innovative land use approaches and retains and enhances the distinct character and identity of Roseville.

GUIDING PRINCIPLES

The City has received input from residents and business owners through surveys, task forces, committee meetings, and other mechanisms. This input was used to develop guiding principles that create the foundation for the goals and policies of the Land Use Element. These guiding principles include:

- Promote and enhance Roseville's unique character and identity.
- Distinguish Roseville from adjacent communities through the quality of development and design and the level of public services and facilities provided.
- Protect and enhance Downtown and the City's established neighborhoods.
- Promote new development and ensure that development is an integrated and connected part of the City's land use pattern.
- Provide a variety of housing types and opportunities to serve the needs and incomes of all households.
- Create a balanced land use pattern with an appropriate mix of uses to accommodate residential, employment, service, and social needs within the community.
- Preserve open space in areas with sensitive environmental resources and provide high-quality, accessible recreational amenities.
- Ensure fiscal responsibility.
- Create a land use mix and development pattern that accommodates and promotes alternative transportation modes for ease of access and improved air quality and public health.
- Proactively manage and plan for growth.

ORGANIZATION

The Land Use Element consists of the Land Use Map and land use goals and policies. The Land Use Map visually illustrates the City's existing and planned land use mix and pattern.[1] Land use decision-making is guided by the goals and policies contained in the text of the Land Use Element, as well as the land use implementation measures outlined in the appendix to the General Plan. While the Land Use Map is an illustration of policy, it only reflects those policies that can be graphically shown. The Land Use Map and land use policies must be used in combination with each other, along with the policies from the other Elements.

[1] A copy of the Land Use Map is available through the Development Services Department - Planning Division at 311 Vernon Street or online at www.roseville.ca.us.

The Land Use Element is organized into the following six components:

1 ***Planning Area*** provides a description of the Planning Area, the Sphere of Influence, and planning subareas.

2 ***Land Use Designations*** identifies and defines the City's land use categories, incorporating general use, development, intensity, and siting and compatibility guidelines.

3 ***Development Forecast*** presents estimates of future development potential within the Planning Area.

4 ***Community Form*** provides goals and policies to define and direct the future form and development pattern of the City.

5 ***Community Design*** includes goals and policies that address aesthetics, integration of the built and natural environments, and community character.

6 ***Growth Management*** focuses on the proactive management of growth in the community, including performance standards to regulate growth and development, as well as policies addressing annexations and expansion of the City's Sphere of Influence.



It is the overall goal of the Land Use Element to promote a balanced land use pattern that supports innovative land use approaches and retains and enhances the distinct character and identity of Roseville.

PLANNING AREA

The focus of the General Plan's land use policy is on the City's "Planning Area" (see Figure II-1), which includes all planning subareas within the City limits, Sphere of Influence, and the City/County Memorandum of Understanding area, as described below.

Sphere of Influence

The City's Planning Area includes 796 acres of land that is within the City's Sphere of Influence, but outside the current City limits. The City does not have jurisdiction over projects proposed within the Sphere of Influence, but will monitor, receive notices, and provide official comments on such projects. The City will use policies of the Growth Management component of this Element to evaluate annexations to the City and expansions of the Sphere of Influence, which would be subject to approval by the Placer County Local Agency Formation Commission (LAFCO).

City/County Memorandum of Understanding Area

The City has an expanded cooperation agreement in place with Placer County, commonly referred to as the City/County Memorandum of Understanding (MOU), which provides guidelines for the City or County to follow to ensure that development within the MOU area is cooperatively planned with input from both agencies.

Planning Subareas

Within the City limits, there are 16 subareas that have been defined for planning purposes. These include the Infill Area, the North Industrial Area, and the City's 14 Specific Plan Areas:

- **Infill Area** – This area has vacant and underutilized properties where the City will encourage infill development, but overall, it is mostly built out. The Infill Area includes the historic core of the community but excludes the Downtown and Riverside Gateway Specific Plan Areas.

- **North Industrial Area** – While not subject to a specific plan, this is a recognized planning subarea of the City that provides a major opportunity for industrial and employment development serving the south Placer region. The North Industrial Area has adopted design guidelines, the North Roseville Design Guidelines, which applies to the majority of the planning area. Other portions of the North Industrial Area are regulated by the Hewlett Packard Master Plan or Campus Oaks Master Plan.

- **Southeast Roseville Specific Plan (1985)** – This mixed-use Specific Plan represents the City's first effort to use the specific plan process to master plan a new development area.

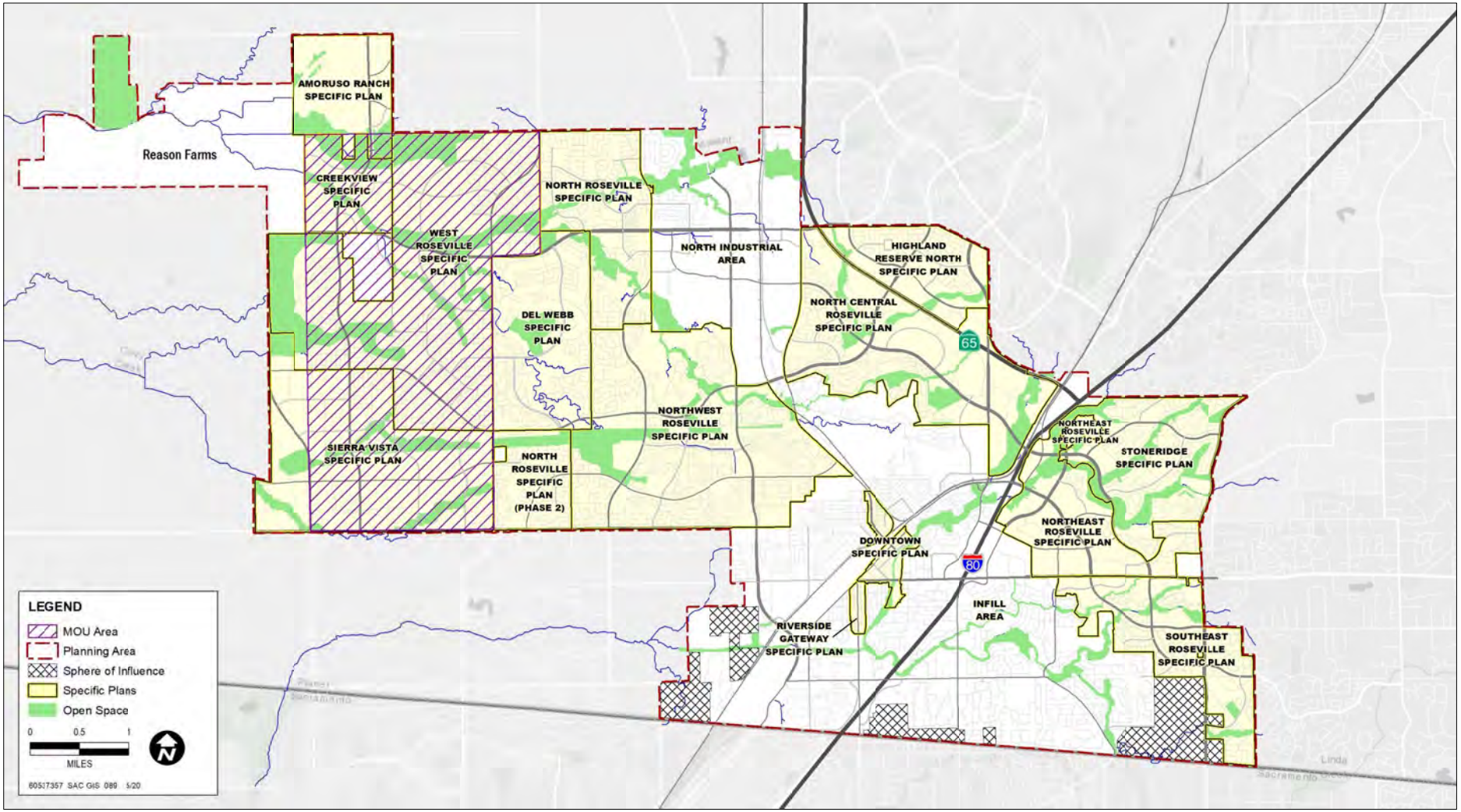
- **Northeast Roseville Specific Plan (1987)** – This Specific Plan is primarily intended for commercial and employment-generating uses but also has significant residential and open space components.

- **Northwest Roseville Specific Plan Area (1989)** – The predominant land uses in this Specific Plan Area are single- and multi-family development, but the Specific Plan also provides for commercial, office, open space, and public uses.

- **North Central Roseville Specific Plan (1990)** – This Specific Plan Area includes residential, commercial, and office uses, along with a large area for wetland preservation and creation.

- **Del Webb Specific Plan (1993)** – This Specific Plan Area is planned as an age-restricted community consisting of single-family homes focused around recreational facilities with supportive private and public uses.

Figure II-1 | Planning Areas



This page intentionally left blank

- **Highland Reserve North Specific Plan (1997)** – This Specific Plan accommodates single- and multi-family residential development, along with commercial and other supportive uses.
- **North Roseville Specific Plan (1997)** – This multi-phase Specific Plan includes single- and multi-family dwelling units, commercial uses, parks and other public facilities, and open space.
- **Stoneridge Specific Plan (1998)** – This Specific Plan accommodates single- and multi-family residential development, commercial and office uses, parks and other public facilities, and open space.
- **West Roseville Specific Plan (2004)** – This Specific Plan accommodates single- and multi-family dwelling units, including age-restricted units, commercial uses, industrial development, parks and other public facilities, and open space.
- **Riverside Gateway Specific Plan (2006)** – The Riverside Gateway Specific Plan is intended to guide public improvements and facilitate commercial and residential infill development between Douglas Boulevard and Darling Way.
- **Downtown Specific Plan (2009)** – This Specific Plan encourages mixed-use infill development throughout the Historic Old Town and the Vernon Street District. The associated Downtown Code implements the Plan, physically applying the Plan's guidance to properties within the Plan Area.
- **Sierra Vista Specific Plan (2010)** – This Specific Plan accommodates single- and multi-family units, including age-restricted units, commercial development, parks and other public facilities, and open space.
- **Creekview Specific Plan (2012)** – This Specific Plan accommodates single- and multi-family dwelling units, commercial and office development, parks and other public facilities, and open space.
- **Amoruso Ranch Specific Plan (2016)** – This Specific Plan accommodates single- and multi-family dwelling units, commercial development, parks and other public facilities, and open space.

Roseville's Specific Plans play an important role in guiding development and conservation. In many areas of the City, the Specific Plans are the primary mechanism for implementing the goals and policies of the General Plan. It is the City's policy to plan for new development and/or reinvestment efforts through the Specific Plan process.

The Specific Plans establish detailed policies and implementation programs for portions of the City, consistent with the goals and policies established in the General Plan. Specific Plan land use designations are reflected on the General Plan Land Use Map, although Specific Plans may also use new land use categories that are more specific or tailored to a particular situation. The City's Specific Plans are consistent with, and are hereby incorporated by this reference, as a component of the Land Use Element of the General Plan. Copies of all of the City's Specific Plans may be obtained through the Development Services Department in the Civic Center at 311 Vernon Street or online at: www.roseville.ca.us.

LAND USE DESIGNATIONS

The City's land use designations define allowable land use, and serve as a guide for zoning, Specific Plans, and other land use regulations. Each land use designation has density and intensity guidelines (Table II-3 and II-4), which are used for planning of facilities (e.g. roadway, utilities, schools, parks, etc.) that support the various land uses, as directed by goals and policies in other Elements. The Land Use Map (Figure II-2) illustrates the location of the City's land use designations. The City's land use designations include:

Residential

- Low-Density Residential (0.5 – 6.9 Dwelling Units/Acre)
- Medium-Density Residential (7.0 – 12.9 Dwelling Units/Acre)
- High-Density Residential (13.0 Dwelling Units/Acre or greater)

Commercial

- Neighborhood Commercial
- Community Commercial
- Regional Commercial

Office

- Business Professional

Industrial

- Light Industrial
- Tech/Business Park
- General Industrial
- Transfer Station

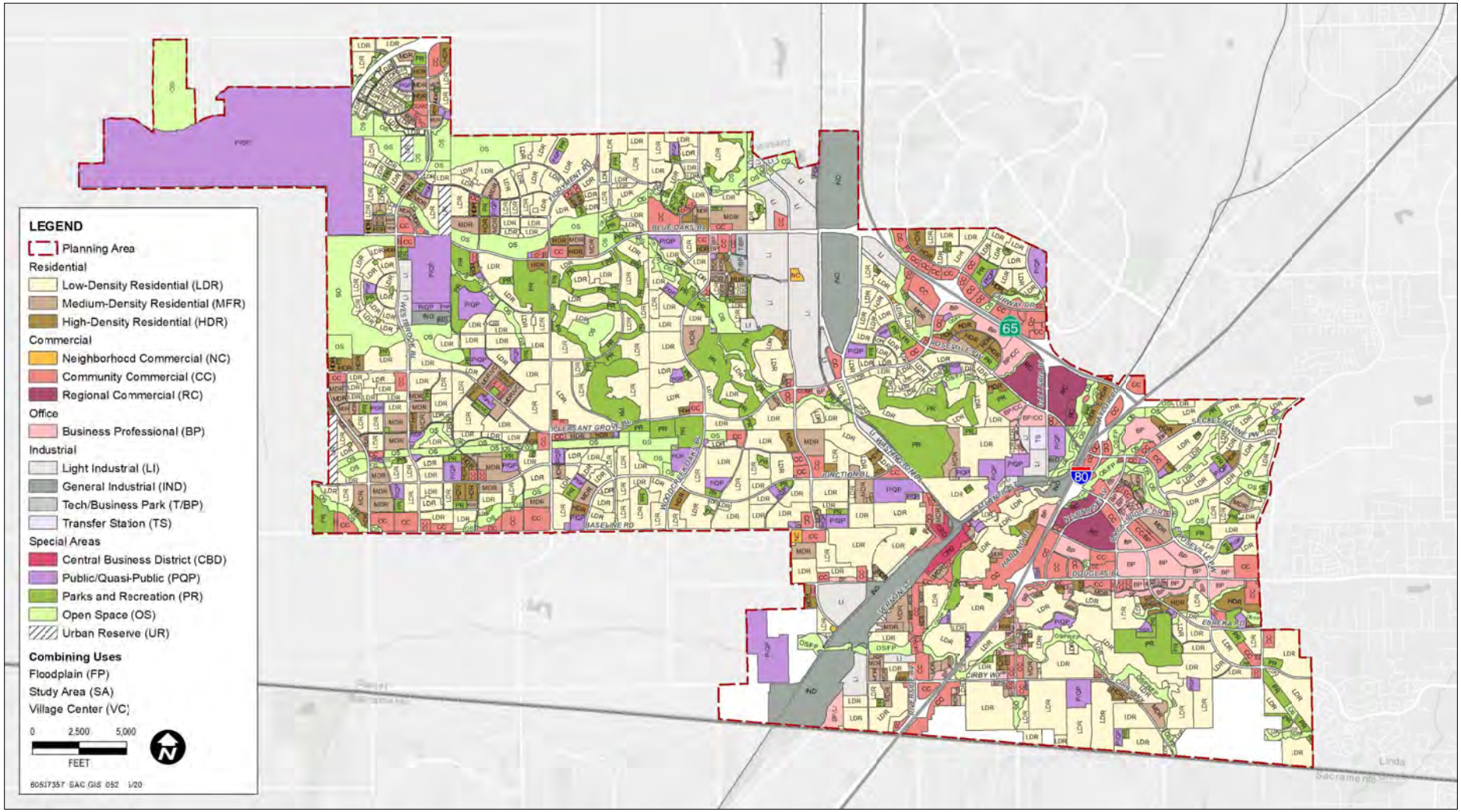
Special Areas

- Central Business District
- Public/Quasi-Public
- Parks and Recreation
- Open Space
- Urban Reserve

Combining Designations

- Floodplain
- Study Area
- Village Center

Figure II-2 | Land Use Map



This page intentionally left blank

Compared to zoning, the City's land use designations define allowable land use broadly, in part to provide the flexibility necessary to achieve the General Plan's policies related to pedestrian orientation and convenience and facilitate mixed-use, infill development. For example, in addition to primary uses, there are permitted secondary uses associated with each land use designation that allow for a more diverse land use mix. The Zoning Ordinance, Specific Plans, and Community Design Guidelines provide more specific standards to ensure compatibility among adjacent land uses. The extent of the secondary uses permitted and conditions related to their use will be as specified in the overlying zoning, Specific Plan, and/or other master plan.

Typically, a single land use designation is applied to a given area. However, to promote mixed-use development, the City may use two or more designations for certain areas that include complementary land uses. Because the Land Use Map provides a guide for future development, it is possible that more than one zoning district may be consistent with any one land use designation.



The City's land use designations define allowable land use broadly, in part to provide the flexibility necessary to achieve the General Plan's policies related to pedestrian orientation and convenience and facilitate mixed-use, infill development.

Use Types, Density, Intensity, and Compatibility

Land use designations contain development guidelines to be applied to each use. These include density guidelines for residential uses, intensity guidelines for non-residential uses, and, where appropriate, land use compatibility guidelines. Tables II-1 and II-2 summarize density and intensity guidelines. Tables II-3 through II-8 describe the purpose, allowable uses, and development guidelines for land use designations. Table II-9 is a compatibility matrix for all land use designations. Table II-10 illustrates the relationship between land use designations and implementing zoning districts.

Table II-1 | Residential Land Use Characteristics

Land Use Category	Dwelling Units Per Acre	Estimated Population Per Gross Acre[1]
Low-Density Residential	0.5 TO 6.9	1.45-20.01
Medium-Density Residential	7.0 TO 12.9	20.3-37.41
High-Density Residential	13.0 +	27.3+

[1] Assumes 2.1 persons per multi-family unit and 2.9 persons per single-family unit based on the American Community Survey (2013 - 2017). The estimated population per gross acre is only an estimate and does not represent City policy.

Table II-2 | Non-Residential Land Use Characteristics

Land Use Category	Floor Area Ratio*	Typical Acreage	Typical Square Footage
Neighborhood Commercial	20% TO 40%	Less than 5	< 50,000
Community Commercial	20% TO 40%	5 to 25	50,000 TO 250,000
Regional Commercial	20% TO 40%	>25	>250,000
Business Professional	20% TO 40%	Varies	Varies
Light Industrial	20% TO 50%	Varies	Varies
Tech/Business Park	20% TO 50%	Varies	Varies
General Industrial	20% TO 50%	Varies	Varies
Transfer Station	Varies	Varies	Varies
Central Business District	Up to 300%	Varies	Varies
Public/Quasi-Public	Varies	Varies	Varies

* Floor Area Ratios (FARs) are intended as guidelines and not as absolute restriction

RESIDENTIAL LAND USES

The residential designations include areas designated for a broad array of housing types with different densities. Each residential designation includes a purpose statement, primary and secondary uses, and development guidelines for each designation.

The Low-, Medium-, and High-Density land use designations are based on the number of allowable dwelling units per gross developable acre. A gross developable acre is defined as the land designated as residential use excluding overhead power lines and their easements, areas within the designated 100-year floodplain, and for the Low- and Medium-Density land use designations, any right-of-way and landscape corridors associated with collector and arterial roadways.

Each residential land use designation is indicated on the Land Use Map as an abbreviation (e.g., LDR) and will be followed by a number, indicating the number of dwelling units per gross developable area (e.g., LDR-6.0). Roseville generally uses the Specific Plan or master planning process to establish land use designations. Minimum and maximum densities for each residential land use designation are included within the development guidelines listed for each designation.

Each residential designation includes both primary and secondary land uses. As expected, the primary land uses are residential in each of these designations, but also include public parks, resource preservation and open space areas, and landscape corridors and other public utility easements. Secondary uses include those uses such as schools, places of worship, private recreation, limited office, and childcare facilities – uses that are normally associated with residential areas and are of such a limited size that a separate or distinct land use designation (e.g., public facility or commercial) is not always warranted.

Table II-3 outlines the purpose, allowable uses, and development guidelines for the residential land designations.

NON-RESIDENTIAL LAND USES

The non-residential designations include areas designated for commercial, office, industrial uses, special areas, and combining districts. Like the residential designations, each non-residential designation includes a purpose statement, primary and secondary uses, and development guidelines for each designation.

Intensity development guidelines for non-residential development are expressed as floor area ratios (FARs). This is a ratio of the total floor area (including all floors and not just the "footprint" of a building) divided by the total lot or parcel area. The City expresses this ratio as a percentage. Typical commercial FARs range from 20 to 50 percent, but may be as high as 300 percent (i.e. a three-story building covering 100 percent of the lot area) in locations such as downtown Roseville.

Intensity and compatibility guidelines for the commercial, office, and industrial land use designations are guidelines and not absolute restrictions. Factors such as General Plan policies, intensity of use, anticipated traffic levels, and availability of public facilities and infrastructure will be assessed as part of the development review or Specific Plan process to determine the appropriate level of floor area to land area ratio.

Unlike the specific secondary uses listed in the residential designations, which are intended to be subordinate and may be permitted only to support neighborhood convenience, the relationship of secondary uses in non-residential areas differ. It is the intention of the non-residential land use designations to permit secondary land uses that support and complement primary uses. These secondary land uses do not need to be subordinate. The size of these areas would typically be limited and would, therefore, not warrant a separate land use designation for the secondary land use. Tables II-4, II-5, and II-6 outline the purpose, allowable uses, and development guidelines for the non-residential land designations.

SPECIAL LAND USE DESIGNATIONS

In addition to the residential, commercial, office, and industrial land use designations, the City has also established Special Land Use Designations for Central Business Districts, Parks and Recreation, Open Space, public uses, and Urban Reserve Areas. Table II-7 outlines the purpose, allowable uses, and development guidelines for the Special Land Use Designations.

COMBINING DESIGNATIONS

These designations are only applied in combination with another land use designation and modify the uses and development guidelines of that designation. Table II-8 outlines the purpose, allowable uses, and development guidelines for the Special Land Use Designations.

Table II-3 | Residential Land Use Designations

Designation	Purpose	Primary Uses	Secondary Uses	Development Guidelines
Low-Density Residential (LDR)	Applies to lands where single-family dwelling units, which comprise the majority of Roseville's housing supply, are located. Assigned to lands with the flexibility to accommodate development constraints (e.g., slopes, trees, etc.). Typically, low-density residential lands should require minimal grading or disturbance of natural features. Avoidance of land use limitations (topography, vegetation, easements, etc.) can be achieved by designing larger or smaller lots or by clustering and attaching units.	Attached and detached single-family residences, public parks, resource preservation and open space areas, landscape corridors, and other public utility easements.	Secondary uses include accessory dwelling units, public and private schools, religious assembly, private recreation, and limited office, commercial childcare facilities, and neighborhood retail and services.	0.5 to 6.9 dwelling units per gross developable acre. Lot sizes average 6,000 to 7,500 square feet but may be larger or smaller.
Medium-Density Residential (MDR)	Applies to lands characterized by small-lot single-family detached dwelling units and attached patio homes, halfplexes, duplexes, townhouses, condominiums, and mobile home parks. Should accommodate a variety of housing types and designs. Often located as a transition between higher-intensity land uses and low-density residential uses.	Attached and detached single-family, halfplexes, duplexes and multi-family residences; and public parks, resource preservation and open space areas, landscape corridors and other public utility easements.	Secondary uses include accessory dwelling units, public and private schools, religious assembly, private recreation, and limited office, commercial childcare facilities, and neighborhood retail and services.	7.0 to 12.9 dwelling units per gross developable acre.
High-Density Residential (HDR)	Provides for apartments or condominiums with multiple-story structures containing multiple attached dwelling units. The broad range of densities in this category will yield a variety of design options. May be combined with commercial uses to form a mixed-use development where higher densities could be desirable and beneficial.	Multiple-family dwellings in attached units and public parks, resource preservation and open space areas, landscape corridors, and other public utility easements.	Secondary uses include public and private schools, religious assembly, private recreation, and limited office, commercial childcare facilities, and neighborhood retail and services.	13.0 and above dwelling units per gross developable acre. Should be applied to lands adjacent to bicycle and transit corridors, and in close proximity to services.

Table II-4 | Non-Residential Land Use Designations: Commercial

Designation	Purpose	Primary Uses	Secondary Uses	Development Guidelines
Neighborhood Commercial (NC)	Provides basic commercial retail and services for the convenience of surrounding neighborhoods within walking distance of major residential areas.	A limited range of goods and services intended for the convenience of the residents in the immediate neighborhood and compatible with adjacent land uses.	Medical offices, veterinary clinics, other professional offices and commercial child care facilities.	Goods and services may be provided in stand-alone buildings or in small centers, typically on parcels less than five (5) acres in size with a floor area ratio between 20% and 40%. Developments will have a pedestrian scale and orientation and provide convenient pedestrian and bicycle access to reduce the need for an automobile trip. Should be adjacent to collector and/or arterial streets, and residential neighborhoods.
Community Commercial (CC)	Provides a broader range of goods and services to an expanded service area.	Retail stores and businesses selling a full range of goods and services including auto sales and repair, and commercial child care facilities.	Professional offices uses, including medical offices and clinics.	Due to the larger service area, the acreages are larger than in the neighborhood commercial land use category. Typically, the acreages range from 5 to 25 acres, the square footage ranges from 50,000 to 250,000 square feet, and the floor area ratio ranges from 20% to 40%. Should be located at intersections of, or adjacent to arterials.
Regional Commercial (RC)	Accommodates the larger shopping centers and commercial activities where uses provide goods and services to a citywide and regional service area.	Major department and discount stores, auto malls, hotels and motels, and commercial recreation or entertainment.	Office and financial institutions.	Typically, Regional Commercial developments would encompass more than 25 acres. Should be located adjacent to and with immediate access to major transit linkages, arterials, regional roadways, and highways. Sites should possess good automobile and truck access. Shopping centers in the regional commercial land use would typically exceed 250,000 square feet with a floor area ratio between 20% and 40%.

Table II-5 | Non-Residential Land Use Designations: Office

Designation	Purpose	Primary Uses	Secondary Uses	Development Guidelines
Business Professional (BP)	Provides areas for small and large office uses, including uses supportive of offices.	Administrative, professional, government, and medical offices, and research and development (not including any manufacturing or assembly). Hospitals, clinics, and general medical may also be permitted.	Limited service commercial uses (e.g., banks, restaurants, commercial day care centers, travel agencies, florists, etc.) are encouraged where they would minimize the need for vehicle travel for convenience trips but only as secondary uses in proximity to large office parks and complexes. In association with clinics and hospitals, general medical, pharmacies and other medical related retail may be permitted.	Offices developed in stand-alone buildings or in a business park or campus setting. The business professional land use designation may be applied to lands that are adjacent to regional and community commercial designated lands. May also be used as a buffer between residential areas and arterials, community commercial, and light industrial. Floor area ratios should range between 20% and 40%.

Table II-6 | Non-Residential Land Use Designations: Industrial

Designation	Purpose	Primary Uses	Secondary Uses	Development Guidelines
Light Industrial (LI)	Applies to lands reserved for office, industrial, and research and development uses that generate very limited noise, vibration, odor, dust, smoke, light, or other pollutants, and are either integrated or compatible with surrounding uses.	Research and development (which may include manufacturing and assembly), electronics assembly, warehousing, intensive commercial uses (e.g., auto body repair, landscaping material sales, retail and wholesale lumberyards), and associated administrative offices.	Limited service commercial uses (e.g., banks, restaurants, commercial day care centers, travel agencies, florist, etc.) are encouraged where they would minimize the need for vehicle travel for convenience trips, but only as secondary uses. Service uses with large space requirements, such as health clubs, religious assembly, dance and gymnastic studios, and off-peak public assembly uses may also be permitted.	Floor area ratios range from 20% to 50%. Should be located adjacent to major roadways with convenient truck access to accommodate the needs of the businesses that require this land use.

Table II-6 | Non-Residential Land Use Designations: Industrial (Cont.)

Designation	Purpose	Primary Uses	Secondary Uses	Development Guidelines
Tech/Business Park (T/BP)	A variant of the LI designation and is envisioned as more of a campus type use. The land use designation provides for a mix of uses that are compatible with and act as a transition between the light industrial use types and commercial and residential uses.	Allowed use types include professional offices, light manufacturing, research services, and light wholesale and distribution.	Limited service commercial uses (e.g., banks, restaurants, commercial day care centers, travel agencies, florist, etc.) are encouraged where they would minimize the need for vehicle travel for convenience trips but only as secondary uses. Service uses with large space requirements such as health clubs, religious assembly, dance and gymnastic studios, and off-peak public assembly uses may also be permitted.	Floor area ratios range from 20% to 50%.
General Industrial (IND)	Provides areas for industrial uses that tend to generate noise, vibration, odor, dust, smoke, light, and an aesthetic appearance not compatible with residential and other sensitive receptors. The intent of this category is to provide a place for industrial uses within the City that is properly buffered from other uses.	A wide range of activities, including manufacturing, wholesale distribution, large storage areas and other industrial uses, are permitted.	Incidental retail and service commercial uses associated with large employment areas and industrial parks.	Areas developed under this designation should be located with direct access to a major or minor arterial or both, freeways, or rail lines. Floor area ratios range from 20% to 50%.

Table II-6 | Non-Residential Land Use Designations: Industrial (Cont.)

Designation	Purpose	Primary Uses	Secondary Uses	Development Guidelines
Transfer Station (TS)	Reserves and protects industrial areas that may be suitable for a solid waste transfer station.	Intermediate waste handling facilities where solid waste is transferred from hauling vehicles to a transfer vehicle where the waste or portion thereof undergoes processing, recycling, or further handling before transport to a disposal site, waste processing facility, or other facility.	None.	Only be applied where all of the following is satisfied: • All adjacent land use designations are General Industrial or Light Industrial; • All areas within 200 feet of the transfer station facility property shall be zoned such that the transfer station facility use is protected from incompatible adjacent uses; • The area has access from major arterials capable of providing access for transfer vehicles and the public; and • The use of the area as a transfer station facility is consistent with the existing or planned character of the area. Transfer stations shall be designed and maintained to, at a minimum, include enclosed processing areas, paved access, fenced and screened storage areas for recycled goods, dust mitigation, and be in compliance with other City, county, state, and federal standards.

Table II-7 | Special Land Use Designations

Designation	Purpose	Primary Uses	Secondary Uses	Development Guidelines
Central Business District (CBD)	Accommodates significantly greater intensities and traditional mixed retail, office, and apartment uses. Limited in its application to Downtown Roseville but may be applied to areas of greater urban intensity.	A mix of retail and office uses, including municipal offices, public assembly, theaters, and restaurants.	Medium-density and high-density residential uses.	Floor area ratios may be as high as 300% (three times the site area).
Park and Recreation (P/R)	Accommodates public parks and public and private recreation facilities.	Public park and recreation facilities, including ball diamonds and fields, golf courses, pools, bike trails and community buildings; and private recreation uses when they include outdoor facilities, such as golf course, tennis courts, and similar uses.	Libraries, child/elder care facilities, resource mitigation, and drainage detention.	For public recreation, the Parks and Recreation Element contains policies and standards that establish locational criteria, acreage requirements, and the types of improvements planned for each of the City parks.
Open Space (OS)	Preserves and protects public and private lands that are significant due to wildlife habitat, natural features, or flood hazard. Within new development areas, the 100-year floodplain will be designated as Open Space. Sensitive or unique natural features, including, but not limited to, wetlands, vernal pools, and oak woodlands are also to be designated as Open Space as part of specific plans and other major development review processes.	Preserved natural lands, passive recreation and minor recreation facilities (picnic tables, restrooms), walking and bike trails, and resource interpretive facilities.	Resource mitigation and drainage detention.	All permitted uses shall be compatible with the preservation and protection of open space values (habitat and visual) and shall comply with the policies and standards contained in the Open Space and Conservation Element.
Public/Quasi-Public (P/QP)	Establishes areas for education, religious assembly, governmental offices, municipal corporation yards, and water treatment plants.	Municipal, governmental or public facilities, places of worship, and related uses.	None.	This land use designation shall apply to all municipal facilities and may also be applied to quasi-public facilities where the size of such facilities warrants an individual land use designation.

Table II-7 | Special Land Use Designations (Cont.)

Designation	Purpose	Primary Uses	Secondary Uses	Development Guidelines
Urban Reserve (UR)	Applies to those lands that are anticipated to receive urban land entitlements, but at the present time, are constrained by growth management policies, availability of services or other limitations.	Agriculture, open space, passive recreation and resource protection.	Caretakers' residence.	A caretaker's residence may be established at a density of 1 unit per 300 acres. Prior to the allocation of any urban land use entitlements, the applicable constraints must be resolved, consistent with the policies contained in the Growth Management component of this Element.

Table II-8 | Combining Designations

Designation	Purpose	Permitted Uses and Guidelines
Floodplain (FP)	Identifies lands that are within the regulatory floodplain boundaries as defined in the Safety Element. Development is strictly regulated by the City. In areas with existing development, the floodplain designation is an overlay or a combining land use. As part of a specific plan, the land use designation may be combined with an open space or parks designation, if found consistent with the policies of the Safety Element.	Uses are limited to those that minimize flooding impacts on upstream and downstream areas and are consistent with both the policies of the Safety Element and the underlying land use designation.
Study Area (SA)	Identifies future General Plan or neighborhood study areas. This combining designation may be applied to any area, in which the City believes that additional land use analysis and amendment of the General Plan may be desirable to resolve specific neighborhood or land use issues.	Concurrent with a Land Use Map amendment to apply this combining designation, the City shall also adopt an ordinance regulating interim land use development. Such regulations shall relate to the land use issue that requires such regulations and shall include an expiration date.
Village Center (VC)	Allows for a mix and density of land uses common to a traditional downtown, urban setting. Allows for flexibility and deviation from the development guidelines and permitted uses contained in the primary land use designation for which it is combined.	Use of this combining designation requires comprehensive land use planning through approval of a Specific Plan. The permitted uses, development guidelines, and extent of deviation are to be defined in the Specific Plan.

Table II-9 | Compatibility of Adjacent Land Use Designations as Applied on the General Plan Land Use Map

	LDR	MDR	HDR	NC	CC	RC	BP	LI	IND	T/BP	CBD	P/QP	P/R	OS	UR	VC
LDR	■	■	▒	▒	▒	□	▒	▒	□	□	▒	▒	■	■	▒	▒
MDR	■	■	■	▒	▒	□	▒	▒	□	▒	▒	▒	■	■	▒	▒
HDR	▒	■	■	▒	▒	▒	▒	▒	□	■	■	▒	■	■	▒	▒
NC	▒	▒	▒	■	■	▒	■	■	▒	■	■	■	▒	▒	▒	▒
CC	▒	▒	▒	■	■	■	■	■	▒	■	■	■	▒	▒	▒	▒
RC	□	□	▒	▒	■	■	■	■	▒	■	▒	▒	▒	▒	▒	▒
BP	▒	▒	▒	■	■	■	■	■	▒	■	■	▒	■	■	▒	▒
LI	▒	▒	▒	■	■	■	■	■	■	■	▒	▒	▒	▒	▒	▒
IND	□	□	□	▒	▒	▒	▒	■	■	▒	□	▒	□	▒	▒	▒
T/BP	▒	▒	■	■	■	■	■	■	■	■	■	■	▒	▒	■	□
CBD	▒	▒	■	■	■	▒	■	▒	□	■	■	■	■	■	▒	▒
P/QP	▒	▒	▒	■	■	▒	▒	▒	▒	■	■	▒	■	■	▒	▒
P/R	■	■	■	▒	▒	▒	■	▒	□	■	■	▒	■	■	▒	▒
OS	■	■	■	▒	▒	▒	■	▒	▒	▒	▒	■	▒	■	▒	▒
UR	▒	▒	▒	▒	▒	▒	▒	▒	▒	■	▒	▒	▒	▒	■	■
VC	▒	▒	▒	▒	▒	▒	▒	▒	▒	■	▒	▒	▒	▒	■	■

■ Compatible
▒ Conditionally Compatible
□ Not Compatible

BP = Business Professional
CBD = Central Business District
CC = Community Commercial
HDR = High Density Residential
IND = General Industrial
LDR = Low Density Residential
LI = Light Industrial
MDR = Medium Density Residential
NC = Neighborhood Commercial
OS = Open Space
P/QP = Public/Quasi Public
P/R = Park and Recreation
RC = Regional Commercial
T/BP = Tech/Business Park
UR = Urban Reserve
VC = Village Center

Note: or purposes of this table, “adjacent” includes land uses separated by collectors and local streets but does not include land uses separated by major arterials or highways or by a buffer greater than 50 feet defined as open space, parks, paseos, or landscape setbacks, provided the adjacent use is not heavy industrial or manufacturing.

Table II-10 | Land Use Designations, Special Areas, and Combining Designations and Implementing Zones

LAND USE DESIGNATION	IMPLEMENTING ZONES
Low-Density Residential (LDR)	R1, R2, RS, RMU, PD
Medium-Density Residential (MDR)	R2, R3, RS, RMU, PD
High-Density Residential (HDR)	R3, RM, PD
Neighborhood Commercial (NC)	NC, PD
Community Commercial (CC)	NC, CC, PD, GC, HC, CMU
Regional Commercial (RC)	CC, RC, GC, PD
Business Professional (BP)	BP, PD
Light Industrial (LI)	M1, MP, MMU, PD, CMU
General Industrial (IND)	M1, M2, MMU, MP, PD, CMU
Central Business District (CBD)	HD, CBD, R3, RMU, P/QP, CMU, BP, NC, PR, OS, PD
Public/Quasi-Public (P/QP)	P/QP, PR, OS, UR, PD
Parks and Recreation (P/R)	PR, P/QP, OS, UR
Open Space (OS)	OS, P/QP, PR, UR
Urban Reserve (UR)	OS, P/QP, PD, UR, PR
Tech/Business Park (T/BP)	BP, MMU, CMU, MP, M1
Village Center (VC)	R1, R2, R3, RS, CC, CMU, PD, NC

Note: Land use designation implementation is not necessarily limited to these zones, especially when combined with an RS or PD zone. Additional zones may be consistent for transitional or interim land uses consistent with General Plan policies. Mixed land use designations may require a variety of land use designations, overlay and/or a PD zone.

Implementing Zones Legend
BP = Business Professional; CBD = Central Business District; CC = Community Commercial; CMU = Commercial Mixed Use; GC = General Commercial; HC = Highway Commercial; HD = Old Town Historic District; M1 = Light Industrial; M2 = General Industrial; MMU = Industrial Mixed Use; MP = Industrial/Business Park; NC = Neighborhood Commercial; OS = Open Space; P/QP = Public/Quasi-Public; PD = Planned Development; PR = Park and Recreation; R1 = Single-Family Residential; R2 = Two-Family Residential; R3 = Multi-Family Housing; RC = Regional Commercial; RMU = Residential Mixed Use; RS = Small Lot Residential; UR = Urban Reserve.

DEVELOPMENT FORECAST

The City can influence the pace of development and the number of dwelling units, building square footage, jobs, population, and other characteristics of development through General Plan policy and implementing actions. The pace and nature of buildout of the General Plan is also dependent on factors outside of the City's control, including, but not limited to:

- Global, national, state, and regional economic conditions
- Federal budget and regulatory actions
- State budget allocations, relevant policy direction, and regulatory actions
- Perceptions about the quality of life in the region
- Housing costs, demographic trends, and community character
- Job and educational opportunities
- Infrastructure, resource, and land availability and cost

While it is difficult to accurately predict the amount and pace of long-term development, it is important for long-range plans to provide such estimates. The location, timing, and financing for infrastructure and public facilities depend on these forecasts. They also allow communities to assess land availability for different housing types and inform updates to plans that are needed as demand and capacity for different housing types change over time. Estimates of development capacity also allow the City to assess whether it can accommodate existing and future needs for non-residential development.[2] Development forecasts are used in the City's environmental impact analysis and inform mitigation measures that are needed to reduce or avoid such impacts.

With buildout of the General Plan, the City is estimated to have a total population of approximately 198,000, with approximately 75,200 dwelling units, 60 million square feet of non-residential building square footage, and between 120,000 and 150,000 local jobs (Table II-11).

The estimates of future population, housing units, local jobs, and square footage of development are not City policy. These assumptions are derived strictly for the purposes of analysis. The General Plan does not specify a maximum growth rate. Certain areas designated for urban use may or may not be developed between the present and 2035. Some areas may be developed at the upper end of the density ranges, while other areas may develop at the lower end. It is likely that, over time, the underlying factors driving these development forecasts will change. The City may update land use change assumptions from time to time, either in the context of a General Plan amendment or update, or as a separate exercise for planning purposes.

The City may also update the General Plan, Specific Plans, or implementing documents for policy purposes based, in part, on development forecasts and changes to these development forecasts in the future. For example, the Land Use Element contains policies that are intended to promote a beneficial jobs/housing balance. The right balance is related to the number of residents that commute, the transportation mode used for that commute, and the commute distance and time required. The relationship between jobs and housing affects and is affected by local employment opportunities, household incomes, housing prices, and non-residential lease rates and land costs. The City could

[2] This includes an assessment of the capacity for both "basic" and "non-basic" activities and services. While there is some overlap, in general, basic activities serve an export market, and are the driver of economic growth, while non-basic activities serve the local market.

consider plan amendments to the General Plan or Specific Plans to ensure an adequate supply of land for housing and economic development purposes.

Table II-11 | Existing and Future Development

Development Factor	2016	2035
Dwelling Units	52,900	75,200
Population	135,800	198,000
Non-Residential Square Footage	33,000,000	60,000,000
Jobs	82,000	120,000 to 150,000
Jobs to Dwelling Units	1.55	1.6 to 2

Notes: The population estimate assumes 2.1 persons per multi-family unit and 2.9 persons per single-family unit based on the American Community Survey (2013 - 2017), 1.8 persons per household for age-restricted dwelling units based on the 2010 Census, and 350 square feet for each resident for congregate care/assisted living facilities. The 2016 jobs estimate is from the Sacramento Area Council of Governments (SACOG) 2020 Metropolitan Transportation Plan/Sustainable Communities Strategy Appendix C – Land Use Forecast. The future non-residential square footage was estimated by the City of Roseville in 2019 and does not include square footage devoted to fairgrounds, schools, or structures within golf courses, parks, or cemeteries. The estimate for local jobs in 2035 is derived using existing jobs-to-housing, jobs-to-population, and employment per square footage ratios applied to 2035 estimates for dwelling units, population, and non-residential square footage.

Achieving the City's planning objectives requires more than the right ratio between housing and local jobs. This is not just a mathematical exercise, but rather, requires both a quantitative and qualitative analysis of commute behavior, employment opportunities by occupation and wage, housing need and income type, and the rate of both job and housing growth in a regional context. Similarly, while the relationship between jobs and housing is important to monitor, Roseville also strives to be a complete community with neighborhoods and districts that offer a diverse array of housing, commercial and public services, recreational and cultural opportunities, and multiple transportation options to reach daily destinations.

COMMUNITY FORM

The Community Form component is intended to go a step beyond the identification of land uses and the rules and regulations for their development. Goals and policies related to community form address the physical characteristics that lend shape, appearance, and identity to a community. A community's character is tied to expressions of familiar physical characteristics - landmarks, streets, buildings, parks, and natural features that create a unique identity. Roseville's policies are intended to influence the shape, form, and appearance of both new development and reinvestment in existing districts and neighborhoods, so that development appropriately reflects the vision and goals of residents and decision makers.

Community form has been the focus of regional long-range planning efforts, particularly since the adoption of the Sacramento Region Blueprint by the Sacramento Area Council of Governments (SACOG) Board of Directors in 2004. The Blueprint Principles focus on high-quality design for compact development that provides walkable communities; compact development that helps preserve open space, allow multi-modal transportation access, and facilitate more efficient infrastructure provision; reinvestment to allow better use of existing infrastructure; mixed-use development that provides for more vibrant neighborhoods; and open space that is incorporated into development and conserved on the fringes of the developed region for agriculture and habitat. These Blueprint Principles are broad and are expected to be applied differently in different parts of the Sacramento region. In 2005, the City went through a process to identify how these Principles, including the following Roseville Blueprint Implementation Strategies, which are embodied in the Community Form and Community Design components of this Element, should be applied locally.[3]

- **Transportation Choices:** Provide a variety of transportation choices. Development should be designed to encourage people to walk, ride bicycles, ride the bus, ride transit and heavy rail, or carpool. Land use concepts are intended to encourage the use of these modes of travel and reduce congestion.

- **Mixed Land Use:** Provide a variety of services in proximity to residential uses to reduce the reliance on automobile travel and give residents transit options… A mix of land uses can be provided within the same building and/or project. There are many examples of this type of development: housing near employment centers; a building with ground-floor retail with housing such as apartments or condominiums above; etc.

- **Compact Development:** Take advantage of compact building design. Creating environments that are more compactly built and that use space in an efficient but aesthetic manner can encourage more walking, biking, and public transit use, and shorten auto trips.

- **Housing Choices:** Create a range of housing opportunities and choices. Providing a variety of places where people can live such as apartments, condominiums, townhouses, and single-family detached homes on varying lot sizes is important in serving all aspects of the community including families, singles, seniors, and people with special needs. This issue is of special concern for residents with very low-, low-, and moderate-incomes (often our teachers, entry-level public safety personnel, and other public employees and professionals) as well as retail employees, service workers, and others for whom finding housing close to work is challenging, especially as land values increase. By providing a mix of housing options, residents will have more choices.

- **Use Existing Assets:** Use of existing assets to strengthen and direct development toward existing development areas. Ongoing public and private investment in the Downtown and historic core is critical to maintaining and enhancing the economic vitality of Roseville. Development of infill or vacant lands, intensification of underutilized parcels, or redevelopment can make better use of existing public

[3] Please see *Smart Choices for Roseville's Future: Implementation Strategies to Achieve Blueprint Project Objectives* (May 2005) for more details.

infrastructure. This can include rehabilitation and reuse of buildings, introduction of mixed-use opportunities, and joint use of existing public facilities, such as parking garages.

- **Natural Resource Conservation:** Natural resource conservation of open space and agricultural land. Encourage the incorporation of public-use open space (such as parks, town squares, trails, greenbelts, paseos, and preserves) within development projects and protect wildlife and plant habitat through open space preservation, agricultural preservation, and promotion of environment-friendly practices, such as energy efficient design, water conservation, and stormwater management. In addition to conserving resources and protecting species, natural resource conservation improves the overall quality of life by providing places for everyone to enjoy the outdoors with family outings and by creating a sense of open space throughout the community.

- **Quality Design:** Foster distinctive, attractive communities with a strong sense of place and use land efficiently. The design details of any land use development, such as the relationship to the street, setbacks, placement of garages, sidewalks, landscaping, the aesthetics of building design, and the design of the public right-of-way (sidewalks, connected streets and paths, bike lanes, and the width of streets), are all factors that can influence the attractiveness of living in a compact development. Design also facilitates the ease of walking and biking to work or neighborhood services. Good site and architectural design are important factors in creating a sense of community and a sense of place.

The Community Form component addresses the following topics:

- ***General*** policies that identify the desired quality of design and public services, along with the connectedness of all neighborhoods and commercial districts of the City.

- ***Development Patterns, Transportation, and Air Quality/Greenhouse Gas Emissions*** provide guidance for land use patterns that allow residents a range of viable transportation options, including walking, bicycling, transit, and vehicular travel.

- ***Downtown and Neighborhoods*** indicates the City's priority in retaining, enhancing, and preserving its historic business district and existing neighborhoods and the development of new areas that provide neighborhood services.

- ***Relationship of New Development*** emphasizes the importance of ensuring that the forms of new development cohere with those of the existing community, and that all portions of the City are linked and compatible with one another.

- ***Jobs/Housing and Economic Development*** establishes policies that support the fiscal viability of the City, focusing on jobs and housing for residents and a prosperous business climate.

- ***Community Involvement and Inter-jurisdictional Cooperation*** addresses the need for community and regional involvement on major development applications, City studies, and regional issues such as air quality, solid waste and transportation. Community involvement will be broad and inclusive and continue to engage the Roseville Coalition of Neighborhood Associations.

GOALS AND POLICIES

COMMUNITY FORM: GENERAL

Goal LU1 **Define Roseville's overall identity and character by the following attributes:**

a. Distinction from other communities through the quality of development and the high level of services provided to citizens.

b. **A commitment to preserving its small-town attributes and cultural heritage and a dedication to promoting a strong sense of community, while preserving individual neighborhoods and promoting a prosperous business community.**

c. **Continuing to be a family-oriented community that offers opportunities to pursue various lifestyles.**

d. **Residential development that includes clusters of high to low densities balanced with large expanses of open space.**

e. **Ensuring high standards of public safety.**

Policy LU1.1 *Ensure high-quality development in new and existing development areas, as defined through specific plans, the development review process, and the Community Design Guidelines.*

Policy LU1.2 *Through both public and private efforts, develop clearly defined entries at major entrances into the City through the use of open space, landscaping, signage, and other distinctive elements as a way of defining the City's boundaries and identity.*

Policy LU1.3 *Continue to provide a full range of public services and maintain high levels of service for public facilities, services, transportation, open space, and parks and recreation.*

Policy LU1.4 *Promote a diversity of residential living options (e.g. density ranges, housing types, affordability ranges), while ensuring community compatibility and well-designed residential development.*

Policy LU1.5 *Promote land use patterns that result in the efficient use of urban lands and preservation of open space, as specified in the Open Space and Conservation Element.*

Policy LU1.6 *Through development approvals and City programs (e.g., revitalization, Capital Improvement Program, parks and recreation programs, etc.), ensure that all portions of the community are linked and integrated.*

Policy LU1.7 *Promote land use patterns that result in the dispersion of secondary or satellite services including libraries, schools, parks, public meeting places, and commercial uses throughout the community through the establishment of neighborhood centers.*

COMMUNITY FORM: DEVELOPMENT PATTERNS, TRANSPORTATION, AND AIR QUALITY/GREENHOUSE GAS EMISSIONS

Goal LU2 **Achieve a community form that supports convenient and safe pedestrian, bicycle, and transit access.**

Policy LU2.1 *Promote development patterns that support a variety of transportation modes and accommodate pedestrian mobility.*

Policy LU2.2 *Allow mixed-use development that integrates residential and non-residential land uses, so that residents may easily walk or bike to shopping, services, employment, and leisure activities.*

Policy LU2.3 *Concentrate higher-intensity uses and appropriate support uses in Pedestrian Districts and within close proximity of transit and bikeway corridors, as identified in the Transit Master Plans and Bicycle Master Plan. Public uses, such as parks, plazas, public buildings, community centers, schools, and/or libraries, should be easily accessible to the public.*

Policy LU2.4 *Promote and encourage the location of employee services, such as child care, restaurants, banking facilities, convenience markets, and other daily needs within major employment centers for the purpose of reducing mid-day vehicle trips.*

Policy LU2.5 *Where feasible, improve existing developed areas to create better pedestrian, bicycle, and transit accessibility.*

Policy LU2.6 *Require proposed neighborhood-serving uses (e.g. neighborhood commercial uses, day care, parks, schools, and other community facilities and services) to be physically linked with adjacent residential neighborhoods through multi-modal transportation connections.*

COMMUNITY FORM: DOWNTOWN AND REVITALIZATION

Goal LU3.1 In partnership with private interests, the City of Roseville will continue to promote a vibrant town center offering government services, social and cultural activities, and commercial opportunities in Downtown Roseville. Roseville will also encourage the creation of additional social, cultural and commercial satellite opportunities throughout the community.

Goal LU3.2 Through the designation of special study areas and revitalization efforts, the City of Roseville will preserve, revitalize, and enhance its business districts, existing neighborhoods, and mixed-use corridors.

Policy LU3.1 *Create and maintain a strong and identifiable Downtown that offers the surrounding community a cluster of municipal offices and services, commercial, retail, and office uses, higher education opportunities, and higher-density residential uses, consistent with the Downtown Specific Plan.*

Policy LU3.2 *Facilitate population and economic growth in areas having the potential for revitalization*

Policy LU3.3 *Direct resources to facilitate revitalization of Downtown, neighborhoods in the Infill Area, and mixed-use corridors.*

Policy LU3.4 *Encourage infill development and reinvestment that:*

- *Upgrades the quality and enhances the character of existing areas;*
- *Enhances the mix of land uses in proximity to one another so that more households can access services, recreation, and jobs without the use of a car;*
- *Facilitates pedestrian activity and public transit use;*
- *Efficiently utilizes and does not overburden existing services and infrastructure; and*

- *Results in land use patterns and densities that provide the opportunity for the construction of a variety of housing types that are affordable to all income groups.*

Policy LU3.5 *Promote active citizen involvement in defining, maintaining, and improving the character and identity of existing neighborhoods, including consideration of cultural and artistic enhancements.*

Policy LU3.6 *Support the maintenance and rehabilitation of existing residential units within established neighborhoods.*

Policy LU3.7 *Identify locations where special study is necessary to develop strategies for preserving, enhancing, and revitalizing existing developed areas.*

COMMUNITY FORM: NEW DEVELOPMENT

Goal LU4 Design new development to be integrated, connected, and related to existing development areas within the City.

Policy LU4.1 *Require new development areas and associated community-wide facilities (open space resources, parks, libraries, etc.) to be linked and oriented to existing developed areas of the community through road networks, public transit systems, open space systems, bikeway and pedestrian systems, and other physical connections.*

Policy LU4.2 *Encourage a development pattern that is contiguous with existing developed areas of the City.*

COMMUNITY FORM: JOBS/HOUSING AND ECONOMIC DEVELOPMENT

Goal LU5.1 Roseville will strive to be a complete community with a mix of land uses, housing types, and job opportunities that meet the diverse needs of its existing and future residents and businesses.

Goal LU5.2 Roseville will promote and encourage the availability of a variety of goods and services and retain a positive business climate in the City.

Policy LU5.1 *Implement a land use mix and pattern of development that provides linkages between residents' jobs and local employment-generating uses, facilitates a match between the number and type of local jobs and the local labor force, and maintains the fiscal viability of the City.*

Policy LU5.2 *Support density bonuses in the construction of affordable housing, in accordance with the Density Bonus Ordinance and the Housing Element, to promote affordable housing options in areas particularly in areas where with few such housing opportunities and where employment centers exist or are planned.*

Policy LU5.3 *Consider the fiscal impacts to the City from projects proposing a General Plan land use change.*

Policy LU5.4 *The City may approve a project that is identified as having a negative fiscal impact on the City if overriding findings are made that the project benefits outweigh its impacts. Such benefits may relate to the provision of affordable housing, significant open space or recreation facilities, job creation, infill development near transit service, or other public benefits.*

Policy LU5.5 *Uphold the City's Affordable Housing Goal by requiring an affordable housing target for projects seeking a General Plan Amendment, Specific Plan Amendment, and/or rezoning to a residential designation proposing 25 or more new dwelling units. For these projects, the target is for a minimum of 10% of all new housing units to cost no more than 30% of the total monthly income of very low-, low-income, and moderate-income households (the City also uses the term "middle" in certain Specific Plans to refer to moderate-income households earning no more than 100% of the Area Median Income- AMI). The breakdown of the affordable units will be, at a minimum, 40% for rental to very low- and 40% for rental to low-income households. The remaining 20% may be reserved for moderate-income purchase (which will be priced to be affordable to households earning 95% of the Area Median Income) or may be distributed equally among the rental obligations, as approved by the City. Variations in affordable housing ratios may be approved through a Development Agreement where the following criteria are met:*

- *A need has been identified for a specific affordable housing type (very low-, low- or moderate-income) and the project meets this need;*
- *The project does not rely on or obtain City subsidies; and*
- *Units proposed within these criteria would allow for individuals to stay within their units as their future income grows.*

Policy LU5.6 *Maintain land use patterns, intensities, and densities that ensure an adequate supply of land for office, commercial, industrial, and other employment-generating development.*

Policy LU5.7 *Support activities that attract employment uses to the City, as identified in the Economic Development Strategy.*

COMMUNITY FORM: COMMUNITY INVOLVEMENT AND INTER-JURISDICTIONAL COOPERATION

Goal LU6.1 Roseville recognizes its role within the Sacramento and Placer County region and is dedicated to exploring regional solutions to regional issues.

Goal LU6.2 Provide inclusive community engagement opportunities for individuals and community groups to produce timely and meaningful input leading to proactive, consensus-driven actions by the City and its partners.

Policy LU6.1 *Encourage active involvement by individuals and citizens in the planning process through ongoing public participation opportunities and informational programs.*

Policy LU6.2 *For major development proposals (e.g. major General Plan amendments, adoption of specific plans and amendments), encourage and provide public participation opportunities at early stages in the process.*

Policy LU6.3 *Coordinate and take a lead role, where feasible, with local, state, federal, and other agencies on regional issues of importance, including but not limited to air quality, climate change mitigation and resiliency, transportation, water supply, sewage treatment, solid waste disposal and recycling, flood control, hazardous waste management, resource protection, and transit.*

Policy LU6.4 *To the extent feasible, coordinate land use planning and public improvements with neighboring jurisdictions.*

Policy LU6.5 *Encourage early consultation with adjacent jurisdictions and refer development proposals that may have an impact to these jurisdictions to the respective agencies for their review and comment. Respond and comment on development proposals in other jurisdictions that may have an impact on Roseville to minimize such impacts and ensure consistency and compatibility with existing and planned development in the City.*

COMMUNITY DESIGN

Design influences the aesthetics, character, desirability, and function of a community. Roseville, through its development review process, promotes high-quality design that balances aesthetic and functional considerations; integrates the natural and built environments; and creates inviting, convenient, safe, and comfortable human-scale connections between different land uses.

The emphasis of the Community Design component of this Element is on presenting a design framework that reflects the City's goal of high-quality, community-wide design. To assist in achieving this goal, the City has developed policies that address aesthetics and function, the integration of the built and the natural environments, art in public places, and community character. The application of these design principles will help to establish an aesthetically pleasing city and a distinct community identity.

The goals and policies in this Element will be implemented through the application of the City's Community Design Guidelines. The Guidelines provide detailed standards that establish common design elements and concepts to be used in the design and review of new development proposals in Roseville. The intent of the Guidelines is to ensure consistent quality, while supporting flexibility and the ability to provide unique solutions that fulfill the intent of the Guidelines through alternative means. The City anticipates that the Community Design Guidelines will need to be updated periodically to implement the General Plan's direction in a dynamic regulatory and economic environment. The design concepts contained in this Element, and further refined by the Community Design Guidelines, indicate Roseville's desire to create a City that has a distinct character notable for its high-quality design.

GOALS AND POLICIES

COMMUNITY DESIGN

Goal LU7.1 **Achieve a consistent level of high-quality aesthetic and functional design through the development of, and adherence to superior design concepts and principles, as defined in the Community Design Guidelines.**

Goal LU7.2 **Encourage, promote, and support the maintenance and expansion of a wide range of programs that serve to increase public understanding, appreciation, and enjoyment of cultural and artistic forms, and the display of artistic expression in public spaces to contribute to the cultural experience and the sense of place and community.**

Goal LU7.3 **Encourage the planning and building of a city that sensitively integrates open space and natural resources, and promotes compatibility within and between the natural and the urban environments.**

Goal LU7.4 Emphasize the preservation and enhancement of historically and culturally significant buildings, native oak trees, woodlands, and other significant features, as a primary element in defining Roseville's community character.

Policy LU7.1 *Through the design review process, apply design standards that promote the use of high-quality building materials, architectural and site designs, landscaping signage, and amenities.*

Policy LU7.2 *Continue to develop and apply design standards that result in efficient site and building designs, pedestrian-friendly projects that stimulate the use of alternative modes of transportation, and compatibility between adjacent developments.*

Policy LU7.3 *Encourage designs that strike a balance between the incorporation of aesthetic and development requirements, and the economic considerations associated with development.*

Policy LU7.4 *Promote flexibility in the design review process to achieve design objectives, and encourage projects with innovative, unique, and creative architectural style and design.*

Policy LU7.5 *Encourage, promote, and support art in public spaces and programs to enhance the design of the City.*

Policy LU7.6 *Encourage project designs that place a high priority and value on open space, and the preservation, enhancement and incorporation of natural resources and other features including consideration of topography, vegetation, wetlands, and water courses.*

Policy LU7.7 *Encourage and promote the preservation of historic and/or unique, culturally and architecturally significant buildings, features, and important visual resources.*

Policy LU7.8. *The location and preservation of native oak trees and oak woodlands shall be a primary factor in determining site design, building location, grading, construction and landscaping, and in establishing the character of projects through their use as a unifying element in both new and existing development.*

Policy LU7.9 *Control artificial lighting to avoid spill-over lighting onto adjacent properties. Use anti-reflective architectural materials and coatings to prevent glare.*

GROWTH MANAGEMENT

In general, growth management can be defined as certain actions taken by local government to influence the location, composition, rate, or total amount of development in a community. The City manages growth to help coordinate development opportunities and constraints, as dictated by the physical, social, and economic characteristics of the areas planned for development, for the City as a whole.

The City recognizes two primary candidates for growth potential. The first is within existing developed parts of the City's corporate boundaries through reinvestment in the community. The second is either inside or outside City limits through new development of "greenfield" areas (non-urbanized or vacant land). "Greenfield" development has been the focus of the City's growth management efforts, but as the City matures and approaches buildout, infill development and reinvestment have an increasing role in meeting the City's needs for housing and economic development.

Inherent in the term "growth management" is the assumption that there will be growth. With growth, there are many potential tangible and intangible benefits, as well as impacts. The right type of growth can be beneficial to the community's economy and quality of life through additional employment opportunities, housing availability, improved delivery and variety of services, opportunity for greater access to destinations without the use of a car, enhanced efficiency of public service provision and fiscal sustainability, and increased commercial, social and cultural opportunities. At the same time, if growth is not well planned and managed, it can have negative impacts on the community. These may include increased reliance on the automobile for reaching destinations, public health effects related to air pollutant emissions, increased costs of construction and maintenance for public infrastructure, impacts to environmental resources, loss of community character, loss of the sense of safety and security, and other adverse effects.

Growth Management Principles

The challenge is to accommodate and manage growth that balances the positive and negative impacts in a fashion that results in an overall benefit to the community. This is best accomplished proactively. To this end, the overarching principles that guide the City's approach to managing growth include:

- Maintain quality of life through a balance of land uses;
- Maintain the City's fiscal health in the long term;
- Continue to add and enhance the value of the built environment;
- Maintain and further define the City's physical form through creation of an open space transition area along the western interface with County lands.

In the recent past, the City has used the Specific Plan process, with appropriate updates to the General Plan, to manage and direct growth in a way that is relatively more comprehensive, compared to a project-by-project approach. This approach allows the City to plan for and finance necessary infrastructure and facilities, address area-wide development opportunities and constraints, and identify key growth management issues that may not be apparent in the context of individual project analysis.

Growth Management Visioning Committee

In 2004, the City Council appointed a 20-member Growth Management Visioning Committee. The Committee was charged with reviewing growth management policies and developing a vision and policy recommendations to guide the City's long-range physical development. The Committee's Vision includes 11 characteristics that define the preferred future:

- A Distinct Community Identity;
- Well-Planned Neighborhoods and Communities;
- A Vibrant Downtown;
- A Balance Between New Growth and Revitalization;
- Abundant Parks and Open Space;
- A Diverse Range of Housing Types;
- Mobility and Transportation Choices;
- Economic Vitality;
- Convenient Access to Higher Education;
- Sustainable Environmental Resources and Infrastructure;
- Innovative Design and Land Use Planning; and,
- On-going Partnerships with Neighboring Communities.

The Committee recommended three additional policy concepts: Maintain Roseville's Identity and Character; Promote Stakeholder Involvement and Ensure Accountability; and Work Aggressively to Address Traffic Generated Outside of Roseville. Further, the Committee recommended that the following Policy Concepts be used to evaluate and influence potential growth that could affect the City within its current boundaries, within its Sphere of Influence, and in unincorporated land where the development will impact the City:

- Maintain an Open Space Transition Buffer;
- Ensure Fiscal Sustainability;
- Encourage High-Quality Infrastructure, Programs, and Services;
- Promote Comprehensive Large-Scale Planning;
- Use Performance-Based Standards to Manage Growth;
- Ensure Community Benefit;
- Maintain Roseville's Identify and Character;
- Promote Stakeholder Involvement and Ensure Accountability; and,
- Work Aggressively to Address Traffic Impacts Generated Outside of Roseville.

Guiding Principles for Growth

The City Council adopted a set of 13 Guiding Principles for new development areas in May of 2001. The intent of the Guiding Principles is to supplement General Plan policies by creating guidelines for new development proposals for areas located outside of City limits. They are intended to articulate the City's expectations relating to any potential development proposals and are to be applied as performance

measures for annexation proposals. These principles are contained as policies of this Growth Management component.

The Growth Management component focuses on the development of performance standards rather than artificial timelines or growth rates for future development. This approach has resulted in goals and policies that emphasize performance (e.g., maintaining levels of service, providing adequate park acreage, financing needed school facilities, etc.) rather than on specific dates, growth rates, or build-out of existing plans. The performance standards provide the criteria for planning and managing growth by requiring the mitigation of growth impacts and the provision of both tangible and intangible benefits to the community.

GOALS AND POLICIES

GROWTH MANAGEMENT - GENERAL

Goal LU8.1 **Proactively manage and plan for growth.**

Goal LU8.2 **Encourage a pattern of development that promotes the efficient and timely provision of urban infrastructure and services, and that preserves valuable natural and environmental resources.**

Goal LU8.3 **Growth shall mitigate its impacts through consistency with the General Plan goals and policies and shall provide a positive benefit to the community.**

Goal LU8.4 **Continue a comprehensive, logical planning process, rather than an incremental, piecemeal approach.**

Goal LU8.5 **Encourage public participation in the development and monitoring of growth management policies and programs.**

Goal LU8.6 **Manage and evaluate growth in a regional context, not in isolation.**

Goal LU8.7 **Potential population growth in Roseville must be based on the long-term carrying capacities and limits of the roadway system, sewer and water treatment facilities, and electrical utility service, as defined in the Circulation Element and the Public Facilities Element.**

Goal LU8.8 **Growth and development must occur at a rate corresponding to the availability of desired facilities' capacity.**

Goal LU8.9 **Growth should be managed to minimize negative impacts to existing businesses and residents within the City.**

Goal LU8.12 **Use growth management as a tool to maintain the City's identity, community form, reputation in the region, to maintain high levels of service for residents, and to influence projects outside the City's boundaries that have the potential to affect the quality of life and/or services that are provided to residents.**

Policy LU8.1 *Growth must provide a strong diversified economic base and a balance between employment and affordable housing.*

Policy LU8.2 *Growth should occur on the basis that projected revenue should be sufficient to meet public costs.*

Policy LU8.3 *Growth shall be managed to ensure that adequate public facilities and services, as defined in the Public Facilities Element, are planned and provided, and public health, safety, and welfare is protected.*

Policy LU8.4 *The City shall accommodate projected population and employment growth in areas where the appropriate level of public infrastructure and services are planned or will be made available concurrent with development.*

Policy LU8.5 *The City shall use the specific plan process to ensure a comprehensive, logical growth process for new development areas (e.g., annexations) or any areas where significant land use changes are considered.*

Policy LU8.6 *The City shall oppose urban density residential, commercial, or industrial development in unincorporated areas unless adequate public facilities and services can be provided and mechanisms to ensure their availability and provision are secured during the land use entitlement process. It is the City's preference that urban development occur within incorporated areas.*

Policy LU8.7 *The City will manage growth in such a way to ensure that significant open space areas will be preserved.*

Policy LU8.8 *Retain and enhance Roseville's identity and character to ensure that Roseville, even as it grows, remains consistent with the Growth Management Visioning Committee's Vision Statement.*

Policy LU8.9 *Work aggressively to address traffic generated outside of Roseville by working in collaboration with neighboring jurisdictions, regional, state, and federal entities to ensure that traffic through Roseville is mitigated by regional solutions. The City will encourage changes in land use mix and community design that promote walking, biking, and transit.*

Policy LU8.10 *In addition to being consistent with the other goals and policies of the General Plan, Specific Plans shall comply with the following:*

a. *Provide a public focal point, community, and/or theme feature. These features shall be specific to each area and be designed to promote and enhance community character. A special feature may include, but is not limited to, a community plaza, central park, or some other type of gathering area; outdoor amphitheater; community garden; regional park with special facilities; sports complex; or cultural facilities.*

b. *Provide entryways at entrances to the City in accordance with the Community Design Guidelines. Where possible, the entryways shall take advantage of and incorporate existing natural resources into the entry treatment. The Specific Plans shall identify the location and treatment of the entryways, and shall consider the use of open space, oak regeneration areas, signage, and/or special landscaping to create a visual edge or buffer that provides a strong definition to entryways into the City.*

c. *The Specific Plan areas shall be planned and oriented to be an integral part of the City consistent with the policies of the Community Form component of this Element.*

d. *Develop design guidelines, specifying screening and a transition between public utilities (e.g. substations, pump stations) and other uses, in conjunction with the public utility departments and agencies. In addition, development along power line and*

pipeline easements shall incorporate design treatment to ensure compatibility and safety. Design guidelines and treatment may include minimum setbacks, building and landscape design standards, and possible limitations on certain types of uses and activities.

e. *Preserve natural resource areas where they exist, and where feasible, along new roadways. Such roadways may create a public boundary between the resource area and other uses. The Specific Plans shall identify locations and standards for the preservation of natural resources along roadways, and shall identify sources of financing for such road segments.*

GROWTH MANAGEMENT – NEW GROWTH AREAS

Goal LU9.10 Growth should be planned in a way that addresses the appropriate interface between City and County lands.

Goal LU9.11 New growth should be designed to meet the Guiding Principles for Growth.

Goal LU9.13 New development shall be consistent with the City's desire to establish an edge along the western boundary of the City that fosters: a physical separation from County lands through a system of connected open space; a well-defined sense of entry to City from the west; opportunities for habitat preservation and recreation; and view preservation corridors that provide an aesthetic and recreational resource for residents.

Policy LU9.1 *The City may consider modification to the General Plan for new growth where adequate public services and facilities and preservation and conservation of natural resources can be provided in conjunction with the following:*

a. *Additional land to accommodate demand for housing or employment uses*

b. *Projects that will provide community benefits, including, but not limited to the provision of public transit services*

c. *Ensure that growth provides benefits to the community as a whole and weigh community benefits against public costs*

Policy LU9.2 *Prior to the consideration of any General Plan amendment to modify land use designations or expand the City's boundaries or Sphere of Influence, the City shall complete or cause to be completed the following City-wide studies/plans:*

a. *Long-range transit plan*

b. *Fiscal studies*

c. *Public facilities and services capacity study*

d. *Transportation system capacity study*

e. *Utility capacity and supply (i.e., water, sewer, drainage, and electric)*

The studies shall define overall holding capacities and identify additional performance standards that will need to be met to ensure the achievement of the goals and policies of the General Plan.

Policy LU9.3 *The City shall require the submittal of a specific plan for the consideration of new development areas or any areas where a significant modification to the General Plan land use allocation is proposed. The specific plan process shall, at a minimum, include the following:*

a. *General Plan Amendment*

b. *Development Agreement*

c. *Zoning Entitlements*

d. *Environmental Impact Report*

e. *Phasing, Financing, Capital Improvements Plan*

f. *Fiscal Impact Analysis*

Policy LU9.4 *Specific plans will be evaluated based on the following minimum criteria:*

a. *Government Code requirements for specific plans*

b. *Demonstrated consistency with General Plan goals and policies*

c. *Demonstrated consistency with the identified City-wide studies and holding capacity analyses*

d. *Justification for proposed specific plan boundaries*

e. *Community benefit (e.g., affordable housing, significant open space or recreation facilities, job creation, infill development near transit service).*

f. *Ability to substantially mitigate impacts*

g. *Impact on the City's growth pattern*

Each specific plan proposal shall include, with its initial submittal, a full analysis of how the plan complies with, and relates to the above factors.

Policy LU9.5 *Apply the City's adopted Guiding Principles for Growth to any new development proposed in and out of City's corporate boundaries that is not already part of an adopted Specific Plan or within the Infill Area:*

1. *Any new development proposal shall, on a stand-alone basis, have an overall net neutral or positive fiscal impact on the City's General Fund Services.*

2. *Any new development proposal shall include logical growth/plan boundaries.*

3. *Any new development proposal shall not create a direct or indirect conflict with the ongoing operations of the Pleasant Grove or Dry Creek Wastewater Treatment Plant operations or any City-owned power generation facilities.*

4. *Any new development proposal shall maintain the integrity of existing neighborhoods and create a sense of place in new neighborhoods.*

5. *Any new development proposal shall include a plan to ensure full funding and maintenance of improvements and services at no cost to existing residents (including increased utility rates). A proposal shall not burden, increase the cost of, or diminish the supply or reliability of public services.*

6. *Any new development proposal shall aid in regional transportation solutions and in right-of-way preservation.*

7. *Any new development proposal that does not have a sufficient supply of surface water shall secure additional supplies above what the City currently has available. New development proposals shall also provide the funding necessary to incorporate the new source of supply into the City's water supply portfolio (surface water, groundwater and recycled water); and new development proposals shall include measures to reduce water demand by implementing the use of conservation best management practices, recycled water, and other off-sets.*

8. *Any new development proposal shall consider development potential within the entire City/County Memorandum of Understanding Area in the design and sizing of infrastructure improvements.*

9. *Any new development proposal shall aid in resolution of regional storm water retention.*

10. *Any new development proposal shall incorporate mechanisms to ensure schools, and, if necessary, new schools, are available to serve residents anticipated for new development and that new development does not adversely affect existing schools.*

11. *Any new development proposal shall include a significant interconnected public open space component/conservation plan consistent with the City of Roseville/U.S. Fish and Wildlife Service Memorandum of Understanding.*

12. *Any new development proposal shall include a public participation component to keep the public informed and solicit feedback throughout the specific plan process.*

13. *Any new development proposal shall provide a community benefit to the City and residents.*

Policy LU9.6 *As new development is proposed in or outside the City's Sphere of Influence, project proponents shall provide a transitional area between City and County lands, through a system of managed interconnecting open space or other buffers, such as separation by arterial roadways.*

Policy LU9.7 *Monitor and participate in development proposals and/or General Plan updates in Placer County to ensure that potential impacts to City residents are minimized, with respect to traffic, service levels, and other quality of life matters.*

Policy LU9.8 *New development proposals to the north and west of the City limits shall meet the objectives and terms of the Memorandum of Understanding between the City of Roseville and the County of Placer.*

Policy LU9.9 *Development proposed on the western edge of the City shall provide a distinctive open space transition to create a physical and visual buffer between the City and County that ensures that the identity and uniqueness of the City and County will be maintained.*

Policy LU9.10 *Consistent with the County/City Memorandum of Understanding, the City shall continue to support and endorse the maintenance of the one-mile buffer zone around landfill operations, as set forth in Policy No. 4.G.11 of the Placer County General Plan. The buffer zone should, consistent with relevant performance criteria, be sufficient to maintain the long-term viability of the landfill, while at the same time protecting City residences from nuisances.*

Policy LU9.11 *Promote stakeholder involvement and ensure accountability between property owners, Placer County, and surrounding jurisdictions on defining and shaping the vision for growth to the west and north of the City.*

GROWTH MANAGEMENT - ANNEXATIONS AND SPHERE OF INFLUENCE

Goal LU10 Evaluate Sphere of Influence amendments and annexations that promote efficient use of land and public service provision and advance General Plan goals.

Policy LU10.1 *The City may initiate studies to investigate the potential of (1) annexing areas within its Sphere of Influence; and (2) expanding its Sphere of Influence boundaries. The studies should be focused on those areas that may affect General Plan goals and policies and would be logically served and planned by the City. The studies shall include the identification, availability, and funding of public services, as well as the costs and impacts to the City and other service providers. Issues to be analyzed include, but are not limited to present and planned land uses, water, sewer, electric, library, parks, schools, circulation, and affordable housing. Based on these studies and resident and property owner input, the City may take steps to annex or expand its Sphere of Influence.*

Policy LU10.2 *The City may consider annexations that:*

- *Are contiguous with City boundaries and provide for a logical expansion of the City;*
- *Create clear and reasonable boundaries;*
- *Are beneficial from a fiscal standpoint to the City and its residents;*
- *Are consistent with state law and Placer County Local Agency Formation Commission (LAFCO) standards and criteria;*
- *Ensure the preservation of open space and agriculture lands; and,*
- *Are consistent with the General Plan.*

Policy LU10.3 *The City may consider expanding its Sphere of Influence to incorporate areas that, in the future, should be logically planned and serviced by Roseville. The City shall consider the following factors, as identified by LAFCO, when making determinations involving Sphere of Influence boundaries:*

- *Present and planned land uses in the area;*
- *Present and probable need for public facilities and services in the area;*
- *Present capacity of public facilities and adequacy of public services;*
- *Existence of any social or economic communities of interest in the area; and,*
- *Open space and agricultural lands.*

Appendix D – AWWA Water Loss Audits

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0

American Water Works Association.
Copyright © 2014, All Rights Reserved.

? Click to access definition
+ Click to add a comment

Water Audit Report for: City of Roseville (3110008)
Reporting Year: 2019 1/2019 - 12/2019

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

Master Meter and Supply Error Adjustments

WATER SUPPLIED

<---------- Enter grading in column 'E' and 'J' ---------->

					Pcnt:	Value:	
Volume from own sources:	7	28,372.970	acre-ft/yr	7		3.744	acre-ft/yr
Water imported:	5	1,264.500	acre-ft/yr	2			acre-ft/yr
Water exported:	3	1,336.300	acre-ft/yr	1			acre-ft/yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: 28,297.426 acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

				Pcnt:	Value:	
Billed metered:	6	26,276.770	acre-ft/yr			
Billed unmetered:	10	132.020	acre-ft/yr			
Unbilled metered:	8	0.080	acre-ft/yr			
Unbilled unmetered:	8	23.320	acre-ft/yr		23.320	acre-ft/yr

Use buttons to select percentage of water supplied OR value

AUTHORIZED CONSUMPTION: ? 26,432.190 acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption) 1,865.236 acre-ft/yr

Apparent Losses

				Pcnt:	Value:	
Unauthorized consumption:		70.744	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	4	265.423	acre-ft/yr	1.00%		acre-ft/yr
Systematic data handling errors:	5	65.692	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: ? 401.858 acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: ? 1,463.378 acre-ft/yr

WATER LOSSES: 1,865.236 acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: ? 1,888.636 acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	9	633.4	miles
Number of active AND inactive service connections:	9	45,395	
Service connection density:		72	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure:	6	83.2	psi

COST DATA

Total annual cost of operating water system:	10	$14,408,821	$/Year	
Customer retail unit cost (applied to Apparent Losses):	9	$1.30	$/100 cubic feet (ccf)	
Variable production cost (applied to Real Losses):	5	$208.00	$/acre-ft	☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 70 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Customer metering inaccuracies
3: Billed metered

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0
American Water Works Association.
Copyright © 2014, All Rights Reserved.

? Click to access definition
+ Click to add a comment

Water Audit Report for: City of Roseville (3110008)
Reporting Year: 2018 1/2018 - 12/2018

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

<---------- Enter grading in column 'E' and 'J' ---------->

Master Meter and Supply Error Adjustments

WATER SUPPLIED

			Pcnt:	Value:	
Volume from own sources:	7	28,312.300 acre-ft/yr	8	1.810	acre-ft/yr
Water imported:	5	1,106.030 acre-ft/yr	1		acre-ft/yr
Water exported:	3	1,123.700 acre-ft/yr	1		acre-ft/yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: 28,292.820 acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

			Pcnt:	Value:	
Billed metered:	5	26,007.220 acre-ft/yr			
Billed unmetered:	10	74.700 acre-ft/yr			
Unbilled metered:	8	47.560 acre-ft/yr			
Unbilled unmetered:	8	22.394 acre-ft/yr		22.394	acre-ft/yr

Use buttons to select percentage of water supplied **OR** value

AUTHORIZED CONSUMPTION: 26,151.874 acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption) 2,140.946 acre-ft/yr

Apparent Losses

			Pcnt:	Value:	
Unauthorized consumption:		70.732 acre-ft/yr	0.25%		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	3	263.180 acre-ft/yr	1.00%		acre-ft/yr
Systematic data handling errors:	5	65.018 acre-ft/yr	0.25%		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: 398.930 acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: 1,742.016 acre-ft/yr

WATER LOSSES: 2,140.946 acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: 2,210.900 acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	9	627.5	miles
Number of active AND inactive service connections:	9	44,467	
Service connection density:		71	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: 6 82.1 psi

COST DATA

Total annual cost of operating water system:	10	$14,859,449	$/Year
Customer retail unit cost (applied to Apparent Losses):	9	$1.17	$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	5	$179.67	$/acre-ft

☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 68 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Customer metering inaccuracies
3: Billed metered

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0
American Water Works Association.
Copyright © 2014, All Rights Reserved.

? Click to access definition
+ Click to add a comment

Water Audit Report for: City of Roseville (3110008)
Reporting Year: 2017 1/2017 - 12/2017

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

<---------- Enter grading in column 'E' and 'J' ---------->

Master Meter and Supply Error Adjustments

WATER SUPPLIED

				Pcnt:	Value:	
Volume from own sources:	7	28,449.624	acre-ft/yr	8	-143.610	acre-ft/yr
Water imported:	5	964.400	acre-ft/yr	1		acre-ft/yr
Water exported:	3	1,207.900	acre-ft/yr	1		acre-ft/yr
WATER SUPPLIED:		**28,349.734**	acre-ft/yr			

Enter negative % or value for under-registration
Enter positive % or value for over-registration

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

				Pcnt:	Value:	
Billed metered:	5	25,483.030	acre-ft/yr			
Billed unmetered:	10	159.840	acre-ft/yr			
Unbilled metered:	n/a		acre-ft/yr			
Unbilled unmetered:	8	23.920	acre-ft/yr		23.920	acre-ft/yr
AUTHORIZED CONSUMPTION:		**25,666.790**	acre-ft/yr			

Use buttons to select percentage of water supplied **OR** value

WATER LOSSES (Water Supplied - Authorized Consumption)

2,682.944 acre-ft/yr

Apparent Losses

				Pcnt:	Value:	
Unauthorized consumption:		70.874	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	3	257.404	acre-ft/yr	1.00%		acre-ft/yr
Systematic data handling errors:	5	63.708	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: **391.986** acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: **2,290.957** acre-ft/yr

WATER LOSSES: **2,682.944** acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: **2,706.864** acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	9	615.0	miles
Number of active AND inactive service connections:	9	43,618	
Service connection density:		71	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure:	5	83.6	psi

COST DATA

Total annual cost of operating water system:	10	$14,825,646	$/Year	
Customer retail unit cost (applied to Apparent Losses):	9	$1.18	$/100 cubic feet (ccf)	
Variable production cost (applied to Real Losses):	5	$112.40	$/acre-ft	☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 67 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Customer metering inaccuracies
3: Billed metered

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0
American Water Works Association.
Copyright © 2014, All Rights Reserved.

? Click to access definition
+ Click to add a comment

Water Audit Report for: City of Roseville
Reporting Year: 2016 1/2016 - 12/2016

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

Master Meter and Supply Error Adjustments

WATER SUPPLIED

<---------- Enter grading in column 'E' and 'J' ---------->

					Pcnt:	Value:	
Volume from own sources:	7	25,813.000	acre-ft/yr	3			acre-ft/yr
Water imported:	3	915.250	acre-ft/yr	1			acre-ft/yr
Water exported:	3	911.700	acre-ft/yr	1			acre-ft/yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: 25,816.550 acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

			Pcnt:	Value:	
Billed metered:	5	22,956.000	acre-ft/yr			
Billed unmetered:	9	212.000	acre-ft/yr			
Unbilled metered:	8	296.200	acre-ft/yr			
Unbilled unmetered:	7	21.880	acre-ft/yr		21.880	acre-ft/yr

Use buttons to select percentage of water supplied OR value

AUTHORIZED CONSUMPTION: 23,486.080 acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption) 2,330.470 acre-ft/yr

Apparent Losses

			Pcnt:	Value:	
Unauthorized consumption:		64.541	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	3	234.871	acre-ft/yr	1.00%	acre-ft/yr
Systematic data handling errors:	5	57.390	acre-ft/yr	0.25%	acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: 356.802 acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: 1,973.668 acre-ft/yr

WATER LOSSES: 2,330.470 acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: 2,648.550 acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	10	600.0	miles
Number of active AND inactive service connections:	8	42,655	
Service connection density:		71	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: 6 86.2 psi

COST DATA

Total annual cost of operating water system:	10	$9,313,891	$/Year	
Customer retail unit cost (applied to Apparent Losses):	8	$1.54	$/100 cubic feet (ccf)	
Variable production cost (applied to Real Losses):	5	$109.00	$/acre-ft	☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 67 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Customer metering inaccuracies
3: Billed metered

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0

American Water Works Association.
Copyright © 2014, All Rights Reserved.

? Click to access definition
+ Click to add a comment

Water Audit Report for: City of Roseville
Reporting Year: 2015 1/2015 - 12/2015

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

<---------- Enter grading in column 'E' and 'J' ---------->

Master Meter and Supply Error Adjustments

WATER SUPPLIED

					Pcnt:	Value:	
Volume from own sources:	7	22,991.000	acre-ft/yr				acre-ft/yr
Water imported:	9	853.500	acre-ft/yr				acre-ft/yr
Water exported:	9	781.900	acre-ft/yr				acre-ft/yr
WATER SUPPLIED:		**23,062.600**	acre-ft/yr				

Enter negative % or value for under-registration
Enter positive % or value for over-registration

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

				Pcnt:	Value:	
Billed metered:	7	20,499.000	acre-ft/yr			
Billed unmetered:	9	222.000	acre-ft/yr			
Unbilled metered:	8	182.000	acre-ft/yr			
Unbilled unmetered:	7	32.080	acre-ft/yr	1.25%	32.080	acre-ft/yr
AUTHORIZED CONSUMPTION:		**20,935.080**	acre-ft/yr			

Use buttons to select percentage of water supplied OR value

				Pcnt:	Value:	
WATER LOSSES (Water Supplied - Authorized Consumption)		**2,127.520**	acre-ft/yr			
Apparent Losses						
Unauthorized consumption:		57.657	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	5	208.899	acre-ft/yr	1.00%		acre-ft/yr
Systematic data handling errors:	5	51.248	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses:		**317.803**	acre-ft/yr
Real Losses (Current Annual Real Losses or CARL)			
Real Losses = Water Losses - Apparent Losses:		**1,809.717**	acre-ft/yr
WATER LOSSES:		**2,127.520**	acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER:		**2,341.600**	acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	10	583.0	miles	
Number of active AND inactive service connections:	8	41,832		
Service connection density:		72	conn./mile main	
Are customer meters typically located at the curbstop or property line?		No		
Average length of customer service line:	10	1.5	ft	(length of service line, beyond the property boundary, that is the responsibility of the utility)
Average operating pressure:	8	78.0	psi	

COST DATA

Total annual cost of operating water system:	8	$5,579,612	$/Year	
Customer retail unit cost (applied to Apparent Losses):	8	$0.72	$/100 cubic feet (ccf)	
Variable production cost (applied to Real Losses):	8	$242.69	$/acre-ft	☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

*** YOUR SCORE IS: 72 out of 100 ***

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Customer metering inaccuracies
3: Billed metered

Appendix E – Proposed Water Loss Standards

Proposed Water Loss Performance Standards

Note: The State Water Board has proposed combined standards for water districts that generally report per other water use efficiency requirements in a combined manner for certain water systems.

Sample combination of standards for water systems reporting in different metrics:

Suppliers with all water systems reporting in gallons per connection per day: Standard in in gallons per connection per day

$$\frac{\text{Standard for system 1} \times \text{Number of connections for system 1} + \text{Standard for system 2} \times \text{Number of connections for system 2}}{\text{Sum total of number of connections for system 1 and system 2}}$$

Suppliers with all water systems reporting in gallons per mile per day: Standard in gallons per mile per day

$$\frac{\text{Standard for system 1} \times \text{Length of mains for system 1} + \text{Standard for system 2} \times \text{Length of mains for system 2}}{\text{Sum total of length of mains for system 1 and system 2}}$$

Suppliers with water systems reporting in a combination of gallons per mile per day and gallons per connection per day:

Standard in gallons per connection per day

$$\frac{\text{Standard for system 1} \times \text{Number of connections for system 1} + \text{Standard for system 2} \times \text{Length of mains for system 2}}{\text{Sum total of number of connections for system 1 and system 2}}$$

Calculated baseline and proposed water loss performance standards

Note: The standards that are combined for certain water districts are in orange text, while the individual system data informing the respective combined standard is in *italics* and grey text in the rows above the standard.

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Adelanto City Of	49.1	N/A	18.5	N/A
Alameda County Water District	21.5	N/A	17.7	N/A
Alco Water Service	15.1	N/A	15.1	N/A
Alhambra City Of	8.6	N/A	8.6	N/A
Amador Water Agency	66.3	N/A	21.0	N/A
American Canyon City Of	30.8	N/A	17.7	N/A
Anaheim City Of	23.5	N/A	19.5	N/A
Anderson City Of	53.4	N/A	16.5	N/A
Antioch City Of	11.9	N/A	11.9	N/A
Apple Valley Ranchos Water Company	23.3	N/A	23.3	N/A
Arcadia City Of	32.1	N/A	18.2	N/A
Arcata City Of	48.7	N/A	20.1	N/A
Arroyo Grande City Of	7.7	N/A	7.7	N/A
Arvin Community Service District	67.9	N/A	14.4	N/A
Atascadero Mutual Water Company	35.9	N/A	35.9	N/A
Atwater City Of	308.8	N/A	11.4	N/A
Azusa Lightand Water	78.5	N/A	13.8	N/A
Bakersfield City Of	19.3	N/A	19.3	N/A
Bakman Water Company	85.3	N/A	15.1	N/A
Banning City Of	63.1	N/A	31.4	N/A
Bear Valley Community Services District	N/A	191.7	N/A	191.7
Beaumont-Cherry Valley Water District	41.0	N/A	20.9	N/A
Bella Vista Water District	N/A	1710.6	N/A	670.4
Bellflower-Somerset Mutual Water Company	12.4	N/A	12.4	N/A
Benicia City Of	46.1	N/A	19.4	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Beverly Hills City Of	30.0	N/A	16.9	N/A
Big Bear Community Services District	12.8	N/A	12.8	N/A
Big Bear Lake City Of	9.5	N/A	9.5	N/A
Blythe City Of	80.3	N/A	15.0	N/A
Brawley City Of	54.8	N/A	12.7	N/A
Brea City Of	15.2	N/A	15.2	N/A
Brentwood City Of	30.5	N/A	14.7	N/A
Buena Park City Of	35.8	N/A	16.4	N/A
Burbank City Of	13.4	N/A	13.4	N/A
Burlingame City Of	19.5	N/A	19.5	N/A
Calaveras County Water District-Ebbetts Pass	*84.8*	*N/A*	*20.9*	*N/A*
Calaveras County Water District-Jenny Lind	*155.9*	*N/A*	*21.3*	*N/A*
Calaveras County Water District	112.6	N/A	21.1	N/A
Calexico City Of	4.2	N/A	4.2	N/A
California American Water Company-Los Angeles Division-Baldwin Hills	*24.6*	*N/A*	*17.5*	*N/A*
California American Water Company-Los Angeles Division-Duarte	*85.9*	*N/A*	*18.5*	*N/A*
California American Water Company-Los Angeles Division-San Marino	*27.4*	*N/A*	*18.1*	*N/A*
California American Water Company-Los Angeles Division	42.3		18.1	
California American Water Company-Monterey District	6.4	N/A	6.4	N/A
California American Water Company-Sacramento District-Antelope	*19.4*	*N/A*	*14.9*	*N/A*
California American Water Company-Sacramento District-Lincoln Oaks	*5.6*	*N/A*	*5.6*	*N/A*

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
California American Water Company-Sacramento District-Parkway	*25.3*	*N/A*	*14.2*	*N/A*
California American Water Company-Sacramento District-Rosemont	*29.4*	*N/A*	*17.8*	*N/A*
California American Water Company-Sacramento District	20.4		13.2	
California American Water Company-San Diego District	25.6	N/A	15.6	N/A
California American Water Company-Ventura District	33.5	N/A	24.5	N/A
California City	N/A	1641.2	N/A	460.4
California Water Service Company Bakersfield-Bakersfield	*74.6*	*N/A*	*17.2*	*N/A*
California Water Service Company Bakersfield-North Garden	*65.7*	*N/A*	*18.5*	*N/A*
California Water Service Company Bakersfield	73.7		17.3	
California Water Service Company Bear Gulch	13.9	N/A	13.9	N/A
California Water Service Company Chico District	28.6	N/A	18.7	N/A
California Water Service Company Dominguez	23.8	N/A	18.4	N/A
California Water Service Company East Los Angeles	4.0	N/A	4.0	N/A
California Water Service Company Hermosa-Redondo	12.4	N/A	12.4	N/A
California Water Service Company Livermore	17.2	N/A	17.2	N/A
California Water Service Company Los Altos-Suburban	24.5	N/A	17.8	N/A
California Water Service Company Marysville	40.6	N/A	15.2	N/A
California Water Service Company Mid Peninsula-San Carlos	*6.2*	*N/A*	*6.2*	*N/A*
California Water Service Company Mid Peninsula-San Mateo	*20.6*	*N/A*	*16.1*	*N/A*
California Water Service Company Mid Peninsula	16.6		13.4	

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
California Water Service Company Oroville	27.4	N/A	18.4	N/A
California Water Service Company Palos Verdes	32.6	N/A	24.0	N/A
California Water Service Company Salinas District	9.2	N/A	9.2	N/A
California Water Service Company Selma	35.1	N/A	14.0	N/A
California Water Service Company South San Francisco	0.6	N/A	0.6	N/A
California Water Service Company Stockton	20.6	N/A	13.5	N/A
California Water Service Company Visalia	10.1	N/A	10.1	N/A
California Water Service Company Westlake	31.7	N/A	24.6	N/A
Camarillo City Of	3.4	N/A	3.4	N/A
Cambria Community Service District	15.5	N/A	15.5	N/A
Camrosa Water District	35.9	N/A	18.8	N/A
Carlsbad Municipal Water District	21.5	N/A	21.5	N/A
Carmichael Water District	36.3	N/A	15.5	N/A
Carpinteria Valley Water District	23.0	N/A	23.0	N/A
Castaic Lake Water Agency Santa Clarita Water Division	47.0	N/A	25.5	N/A
Ceres City Of	14.6	N/A	11.3	N/A
Cerritos City Of	19.9	N/A	19.9	N/A
Chino City Of	37.3	N/A	17.8	N/A
Chino Hills City Of	6.2	N/A	6.2	N/A
Citrus Heights Water District	15.3	N/A	15.3	N/A
Cloverdale City of	30.9	N/A	12.6	N/A
Clovis City Of	7.4	N/A	7.4	N/A
Coachella City Of	31.9	N/A	18.7	N/A
Coachella Valley Water District	43.3	N/A	24.1	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Coalinga City Of	41.0	N/A	20.6	N/A
Coastside County Water District	18.5	N/A	18.5	N/A
Colton City Of	65.5	N/A	16.7	N/A
Contra Costa Water District	21.8	N/A	18.5	N/A
Corcoran City Of	N/A	2415.1	N/A	444.7
Corona City Of	16.1	N/A	16.1	N/A
Covina City Of	30.2	N/A	22.3	N/A
Covina Irrigating Company	37.7	N/A	22.2	N/A
Crescent City	80.2	N/A	21.6	N/A
Crescenta Valley Community Water District	22.4	N/A	22.4	N/A
Crestline Village Water District	4.3	N/A	4.3	N/A
Cucamonga Valley Water District	28.6	N/A	21.2	N/A
Cupertino City Of	25.6	N/A	25.6	N/A
Daly City	12.3	N/A	12.3	N/A
Davis City Of	37.3	N/A	11.1	N/A
Del Oro Water Company	22.0	N/A	22.0	N/A
Delano City Of	56.6	N/A	14.1	N/A
Desert Water Agency	87.1	N/A	21.2	N/A
Diablo Water District	15.5	N/A	15.5	N/A
Dinuba City Of	32.9	N/A	11.6	N/A
Discovery Bay Community Services District	14.0	N/A	14.0	N/A
Downey City Of	27.4	N/A	14.9	N/A
Dublin San Ramon Services District	7.3	N/A	7.3	N/A
East Bay Municipal Utility District	45.6	N/A	21.7	N/A
East Niles Community Services District	47.1	N/A	14.6	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
East Orange County Water District	25.8	N/A	25.8	N/A
East Palo Alto City Of	25.1	N/A	14.2	N/A
East Valley Water District	37.3	N/A	19.8	N/A
Eastern Municipal Water District	28.1	N/A	20.7	N/A
El Centro City Of	128.0	N/A	13.7	N/A
El Dorado Irrigation District	83.2	N/A	42.2	N/A
El Monte City Of	49.9	N/A	13.5	N/A
El Segundo City Of	37.6	N/A	15.4	N/A
El Toro Water District	24.2	N/A	24.2	N/A
Elk Grove Water District	15.9	N/A	15.9	N/A
Elsinore Valley Municipal Water District	20.1	N/A	20.1	N/A
Escondido City Of	22.2	N/A	22.2	N/A
Estero Municipal Improvement District	31.4	N/A	14.1	N/A
Eureka City Of	23.2	N/A	15.0	N/A
Exeter City Of	41.0	N/A	12.6	N/A
Fair Oaks Water District	23.3	N/A	19.6	N/A
Fairfield City Of	73.7	N/A	15.0	N/A
Fallbrook Public Utilities District	62.5	N/A	44.8	N/A
Folsom City Of	133.3	N/A	16.9	N/A
Fortuna City Of	45.4	N/A	26.1	N/A
Fountain Valley City Of	11.9	N/A	11.9	N/A
Fresno City Of	47.7	N/A	13.6	N/A
Fruitridge Vista Water Company	71.4	N/A	10.8	N/A
Fullerton City Of	18.4	N/A	18.4	N/A
Galt City Of	24.4	N/A	11.5	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Garden Grove City Of	22.9	N/A	11.9	N/A
Georgetown Divide Public Utility District	N/A	787.5	N/A	787.5
Gilroy City Of	33.4	N/A	17.0	N/A
Glendale City Of	18.2	N/A	18.2	N/A
Glendora City Of	68.5	N/A	19.8	N/A
Golden State Water Company-Artesia	23.3	N/A	13.3	N/A
Golden State Water Company-Barstow	51.0	N/A	26.0	N/A
Golden State Water Company-Bay Point	24.2	N/A	17.8	N/A
Golden State Water Company-Bell-Bell Gardens	21.7	N/A	13.5	N/A
Golden State Water Company-Claremont	46.9	N/A	23.5	N/A
Golden State Water Company-Cordova	67.3	N/A	12.1	N/A
Golden State Water Company-Culver City	15.2	N/A	15.2	N/A
Golden State Water Company-Florence Graham	25.2	N/A	13.1	N/A
Golden State Water Company-Norwalk	16.3	N/A	13.7	N/A
Golden State Water Company-Orcutt	49.5	N/A	16.7	N/A
Golden State Water Company-Placentia	27.3	N/A	22.5	N/A
Golden State Water Company-San Dimas	16.7	N/A	16.7	N/A
Golden State Water Company-Simi Valley	12.2	N/A	12.2	N/A
Golden State Water Company-South Arcadia	15.2	N/A	15.2	N/A
Golden State Water Company-South San Gabriel	41.7	N/A	13.3	N/A
Golden State Water Company-Southwest	14.7	N/A	14.7	N/A
Golden State Water Company-West Orange	19.5	N/A	19.5	N/A
Goleta Water District	24.3	N/A	24.3	N/A
Great Oaks Water Company Incorporated	22.5	N/A	14.4	N/A
Greenfield City Of	37.3	N/A	13.8	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Groveland Community Services District	14.5	N/A	14.5	N/A
Hawthorne City Of	14.1	N/A	14.1	N/A
Hayward City Of	20.5	N/A	20.5	N/A
Healdsburg City Of	10.4	N/A	10.4	N/A
Helix Water District	18.4	N/A	18.4	N/A
Hemet City Of	5.8	N/A	5.8	N/A
Hesperia Water District	19.2	N/A	19.2	N/A
Hi Desert Water District	23.5	N/A	23.5	N/A
Hillsborough Town Of	26.6	N/A	26.6	N/A
Hollister City Of	30.4	N/A	15.6	N/A
Humboldt Community Services District	59.1	N/A	14.0	N/A
Huntington Beach City Of	14.8	N/A	14.8	N/A
Huntington Park City Of	18.8	N/A	12.4	N/A
Imperial City Of	45.6	N/A	14.8	N/A
Indian Wells Valley Water District	38.7	N/A	16.5	N/A
Indio City Of	30.5	N/A	17.6	N/A
Inglewood City Of	12.6	N/A	12.6	N/A
Irvine Ranch Water District	14.9	N/A	14.9	N/A
Joshua Basin Water District	N/A	507.0	N/A	507.0
Jurupa Community Service District	33.0	N/A	24.8	N/A
Kerman City Of	32.4	N/A	11.2	N/A
Kingsburg City Of	505.3	N/A	12.1	N/A
La Habra City Of	28.0	N/A	20.1	N/A
La Palma City Of	37.2	N/A	15.0	N/A
La Verne City Of	34.2	N/A	18.9	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Laguna Beach County Water District	24.4	N/A	17.5	N/A
Lake Arrowhead Community Services District	20.7	N/A	20.7	N/A
Lake Hemet Municipal Water District	32.2	N/A	19.9	N/A
Lakeside Water District	19.8	N/A	19.8	N/A
Lakewood City Of	12.9	N/A	12.9	N/A
Lamont Public Utility District	79.7	N/A	12.9	N/A
Las Virgenes Municipal Water District	25.1	N/A	25.1	N/A
Lathrop City Of	18.6	N/A	13.3	N/A
Liberty Utilities(Park Water)Corp-Bell Norwalk	*5.8*	*N/A*	*5.8*	*N/A*
Liberty Utilities(Park Water)Corp-Compton Willow	*11.2*	*N/A*	*11.2*	*N/A*
Liberty Utilities(Park Water)Corp-Lynwood	*N/A*	*50.2*	*N/A*	*50.2*
Liberty Utilities (Park Water) Corp			6.5	
Lincoln Avenue Water Company	21.4	N/A	21.4	N/A
Lincoln City Of	35.2	N/A	23.6	N/A
Linda County Water District	88.1	N/A	14.0	N/A
Livermore City Of	27.8	N/A	16.8	N/A
Livingston City Of	67.4	N/A	11.4	N/A
Lodi City Of	10.6	N/A	10.6	N/A
Loma Linda City Of	62.3	N/A	16.8	N/A
Lomita City Of	17.7	N/A	12.8	N/A
Lompoc City Of	15.9	N/A	15.9	N/A
Long Beach City Of	7.0	N/A	7.0	N/A
Los Angeles City Department Of Water And Power	36.9	N/A	33.0	N/A
Los Angeles County Waterworks District29-Malibu&Marina Del Rey	26.7	N/A	26.7	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Los Angeles County Waterworks District40-Antelope Valley	23.3	N/A	20.5	N/A
Los Banos City Of	83.6	N/A	11.5	N/A
Lynwood City Of	22.3	N/A	12.3	N/A
Madera City Of	3.5	N/A	3.5	N/A
Mammoth Community Water District	26.6	N/A	26.6	N/A
Manhattan Beach City Of	3.6	N/A	3.6	N/A
Manteca City Of	22.3	N/A	12.6	N/A
Marin Municipal Water District	24.5	N/A	24.5	N/A
Marina Coast Water District	30.6	N/A	17.4	N/A
Martinez City Of	57.5	N/A	20.3	N/A
Mc Kinleyville Community Services District	19.5	N/A	15.5	N/A
Menlo Park City Of	59.2	N/A	19.3	N/A
Merced City Of	41.9	N/A	11.4	N/A
Mesa Water District	18.0	N/A	18.0	N/A
Mid-Peninsula Water District	14.8	N/A	14.8	N/A
Millbrae City Of	28.4	N/A	17.8	N/A
Milpitas City Of	35.0	N/A	23.5	N/A
Mission Springs Water District	48.1	N/A	19.2	N/A
Modesto City Of	80.9	N/A	14.7	N/A
Monrovia City Of	17.9	N/A	17.9	N/A
Monte Vista Water District	67.3	N/A	21.1	N/A
Montebello Land And Water Company	38.9	N/A	15.3	N/A
Montecito Water District	33.7	N/A	33.7	N/A
Monterey Park City Of	23.6	N/A	18.4	N/A
Morgan Hill City Of	30.4	N/A	17.7	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Morro Bay City Of	2.1	N/A	2.1	N/A
Moulton Niguel Water District	24.7	N/A	24.7	N/A
Mountain House Community Services District	44.9	N/A	14.8	N/A
Mountain View City Of	18.9	N/A	16.4	N/A
Myoma Dunes Mutual Water Company	47.6	N/A	19.8	N/A
Napa City Of	24.9	N/A	16.2	N/A
Nevada Irrigation District-E George	*58.7*	*N/A*	*28.4*	*N/A*
Nevada Irrigation District-Lake Wildwood	*13.5*	*N/A*	*13.5*	*N/A*
Nevada Irrigation District-Loma Rica	*28.1*	*N/A*	*28.1*	*N/A*
Nevada Irrigation District	37.8	N/A	24.9	N/A
Newhall County Water District	36.2	N/A	27.5	N/A
Newman Cityof	61.7	N/A	11.0	N/A
Newport Beach City Of	26.2	N/A	18.4	N/A
Nipomo Community Service District	N/A	755.7	N/A	755.7
Norco City Of	29.3	N/A	24.9	N/A
North Coast County Water District	13.0	N/A	13.0	N/A
North Marin Water District	8.5	N/A	8.5	N/A
North Tahoe Public Utilities District	64.5	N/A	26.9	N/A
Norwalk City Of	0.4	N/A	0.4	N/A
Oakdale City Of	34.6	N/A	11.0	N/A
Oceanside City Of	15.8	N/A	15.8	N/A
Oildale Mutual Water Company	12.2	N/A	12.2	N/A
Olivehurst Public Utilities District	*48.2*	*N/A*	*13.8*	*N/A*
Olivehurst Public Utilities District-Plumas Lake	*51.7*	*N/A*	*13.5*	*N/A*
Olivehurst Public Utilities District	49.4	N/A	13.7	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Olivenhain Municipal Water District	36.2	N/A	36.2	N/A
Ontario City Of	23.0	N/A	23.0	N/A
Orange City Of	31.1	N/A	21.6	N/A
Orangevale Water Company	29.6	N/A	16.4	N/A
Orchard Dale Water District	32.3	N/A	13.7	N/A
Otay Water District	15.9	N/A	15.9	N/A
Oxnard City Of	31.3	N/A	17.0	N/A
Padre Dam Municipal Water District	6.6	N/A	6.6	N/A
Palmdale Water District	44.7	N/A	19.8	N/A
Palo Alto City Of	13.4	N/A	13.4	N/A
Paradise Irrigation District	20.9	N/A	20.9	N/A
Paramount City Of	68.5	N/A	18.9	N/A
Pasadena City Of	31.8	N/A	19.0	N/A
Paso Robles City Of	11.0	N/A	11.0	N/A
Patterson City Of	69.4	N/A	12.6	N/A
Petaluma City Of	23.7	N/A	13.4	N/A
Phelan Pinon Hills Community Services District	N/A	819.7	N/A	819.7
Pico Rivera City Of	10.0	N/A	10.0	N/A
Pico Water District	10.3	N/A	10.3	N/A
Pismo Beach City Of	11.8	N/A	11.8	N/A
Pittsburg City Of	24.9	N/A	15.4	N/A
Placer County Water Agency-Auburn Bowman	*56.9*	*N/A*	*19.9*	*N/A*
Placer County Water Agency-Foothill	*47.0*	*N/A*	*20.2*	*N/A*
Placer County Water Agency	49.5	N/A	20.1	N/A
Pleasanton City Of	49.2	N/A	18.9	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Pomona City Of	25.6	N/A	21.2	N/A
Port Hueneme City Of	8.6	N/A	8.6	N/A
Porterville City Of	47.2	N/A	14.6	N/A
Poway City Of	37.4	N/A	31.8	N/A
Quartz Hill Water District	19.3	N/A	19.3	N/A
Rainbow Municipal Water District	N/A	718.5	N/A	718.5
Ramona Municipal Water District	18.4	N/A	18.4	N/A
Rancho California Water District	41.1	N/A	36.6	N/A
Red Bluff City Of	14.3	N/A	14.3	N/A
Redding City Of	57.1	N/A	23.0	N/A
Redlands City Of	46.8	N/A	24.7	N/A
Redwood City	23.6	N/A	14.5	N/A
Reedley City Of	155.1	N/A	11.9	N/A
Rialto City Of	21.2	N/A	21.2	N/A
Rincon Del Diablo Municipal Water District	31.7	N/A	31.7	N/A
Rio Linda-Elverta Community Water District	37.6	N/A	12.3	N/A
Rio Vista City Of	22.3	N/A	15.0	N/A
Riverbank City Of	19.3	N/A	12.9	N/A
Riverside City Of	54.8	N/A	24.0	N/A
Riverside Highland Water Company	10.5	N/A	10.5	N/A
Rohnert Park City Of	27.0	N/A	13.3	N/A
Rosamond Community Service District	27.2	N/A	22.1	N/A
Roseville City Of	41.0	N/A	22.3	N/A
Rowland Water District	18.6	N/A	18.6	N/A
Rubidoux Community Service District	55.8	N/A	20.5	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Rubio Canyon Land And Water Association	22.4	N/A	18.6	N/A
Sacramento City Of	38.2	N/A	12.0	N/A
Sacramento County Water Agency	54.2	N/A	15.6	N/A
Sacramento Suburban Water District	22.1	N/A	15.1	N/A
San Bernardino City Of	47.6	N/A	21.8	N/A
San Bernardino County Service Area64Spring Valley Lake	69.9	N/A	17.1	N/A
San Bernardino County Service Area70J Oak Hills	N/A	1040.5	N/A	767.2
San Bruno City Of	17.7	N/A	17.7	N/A
San Buenaventura City Of(Ventura)	19.9	N/A	19.9	N/A
San Clemente City Of	36.4	N/A	17.9	N/A
San Diego City Of	31.7	N/A	25.1	N/A
San Dieguito Water District	23.5	N/A	21.0	N/A
San Fernando City Of	28.7	N/A	17.2	N/A
San Francisco Public Utilities Commision	24.9	N/A	18.3	N/A
San Gabriel County Water District	24.5	N/A	18.0	N/A
San Gabriel Valley Water Company	21.2	N/A	18.5	N/A
San Gabriel Valley Water Company Fontana Division	40.4	N/A	21.1	N/A
San Jacinto City Of	39.7	N/A	20.1	N/A
San Jose City Of	38.0	N/A	23.0	N/A
San Jose Water Company	24.0	N/A	18.8	N/A
San Juan Capistrano City Of	13.1	N/A	13.1	N/A
San Juan Water District	77.1	N/A	19.4	N/A
San Lorenzo Valley Water District	49.2	N/A	23.6	N/A
San Luis Obispo City Of	27.3	N/A	17.6	N/A
Santa Ana City Of	13.8	N/A	13.8	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Santa Barbara City Of	27.4	N/A	27.4	N/A
Santa Clara City Of	25.6	N/A	15.4	N/A
Santa Cruz City Of	18.5	N/A	18.5	N/A
Santa Fe Irrigation District	53.2	N/A	22.9	N/A
Santa Fe Springs City Of	31.0	N/A	17.8	N/A
Santa Margarita Water District	16.2	N/A	16.2	N/A
Santa Maria City Of	11.2	N/A	11.2	N/A
Santa Monica City Of	2.2	N/A	2.2	N/A
Santa Paula City Of	10.8	N/A	10.8	N/A
Santa Rosa City Of	16.3	N/A	16.3	N/A
Scotts Valley Water District	19.9	N/A	19.9	N/A
Seal Beach City Of	26.3	N/A	15.4	N/A
Shafter City Of	62.2	N/A	14.8	N/A
Shasta Lake City Of	24.0	N/A	24.0	N/A
Sierra Madre City Of	76.3	N/A	27.2	N/A
Signal Hill City Of	18.6	N/A	18.6	N/A
Soledad City Of	17.6	N/A	10.7	N/A
Sonoma City Of	22.8	N/A	16.6	N/A
Soquel Creek Water District	13.3	N/A	13.3	N/A
South Coast Water District	8.1	N/A	8.1	N/A
South Feather Waterand Power	57.0	N/A	30.4	N/A
South Gate City Of	11.2	N/A	11.2	N/A
South Pasadena City Of	30.1	N/A	18.6	N/A
South Tahoe Public Utility District	71.5	N/A	23.0	N/A
Stockton City Of	35.5	N/A	14.7	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Suburban Water Systems-San Jose Hills	16.8	N/A	16.8	N/A
Suburban Water Systems-Whittier-La Mirada	22.7	N/A	18.4	N/A
Suisun-Solano Water Authority	47.1	N/A	12.3	N/A
Sunny Slope Water Company	27.2	N/A	16.2	N/A
Sunnyslope Community Water District	14.8	N/A	14.8	N/A
Sunnyvale City Of	20.6	N/A	17.1	N/A
Susanville City Of	59.5	N/A	19.5	N/A
Sweetwater Authority	15.4	N/A	15.4	N/A
Sweetwater Springs Water District	29.4	N/A	19.6	N/A
Tehachapi City Of	46.1	N/A	19.5	N/A
Thousand Oaks City Of	14.1	N/A	14.1	N/A
Torrance City Of	6.7	N/A	6.7	N/A
Trabuco Canyon Water District	20.2	N/A	20.2	N/A
Tracy City Of	39.3	N/A	15.4	N/A
Triunfo Sanitation District-Oak Park Water Service	1.6	N/A	1.6	N/A
Truckee-Donner Public Utilities District	63.1	N/A	23.1	N/A
Tulare City Of	18.8	N/A	11.2	N/A
Tuolumne Utilities District-Sonora Jamestown	*75.7*	*N/A*	*25.6*	*N/A*
Tuolumne Utilities District-Upper Basin	*31.6*	*N/A*	*21.7*	*N/A*
Tuolumne Utilties District	56.1	N/A	23.8	N/A
Turlock City Of	58.0	N/A	13.2	N/A
Tustin City Of	37.4	N/A	11.3	N/A
Twentynine Palms Water District	31.3	N/A	27.0	N/A
Ukiah City Of	38.3	N/A	21.2	N/A
Upland City Of	25.2	N/A	25.2	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Vacaville City Of	28.3	N/A	19.5	N/A
Valencia Water Company	30.2	N/A	26.6	N/A
Vallecitos Water District	35.1	N/A	35.1	N/A
Vallejo City Of	57.9	N/A	14.9	N/A
Valley Center Municipal Water District	N/A	834.6	N/A	834.6
Valley County Water District	12.8	N/A	12.8	N/A
Valley Of The Moon Water District	29.0	N/A	15.2	N/A
Valley Water Company	13.4	N/A	13.4	N/A
Vaughn Water Company	31.2	N/A	12.8	N/A
Ventura County Waterworks District No01-Moorpark	35.5	N/A	21.7	N/A
Ventura County Waterworks District No08-Simi Valley	13.4	N/A	13.4	N/A
Vernon City Of	N/A	5234.6	N/A	630.2
Victorville Water District	53.6	N/A	26.5	N/A
Vista Irrigation District	23.8	N/A	23.8	N/A
Walnut Valley Water District	28.3	N/A	28.3	N/A
Wasco City Of	15.3	N/A	12.4	N/A
Watsonville City Of	20.2	N/A	15.0	N/A
West Kern Water District	N/A	5110.3	N/A	506.2
West Sacramento City Of	236.0	N/A	12.8	N/A
West Valley Water District	62.5	N/A	18.1	N/A
Westborough Water District	8.1	N/A	8.1	N/A
Western Municipal Water District Of Riverside	64.6	N/A	32.5	N/A
Westminster City Of	14.5	N/A	14.5	N/A
Whittier City Of	20.0	N/A	15.1	N/A
Windsor Town Of	28.2	N/A	23.9	N/A

Urban water supplier (naming per water loss audit)	Baseline water loss (Averaged over 2017-2019) Gallons per connection per day	Baseline water loss (Averaged over 2017-2019) Gallons per mile per day	Water loss performance standards Gallons per connection per day	Water loss performance standards Gallons per mile per day
Woodland City Of	25.7	N/A	13.5	N/A
Yorba Linda Water District	40.5	N/A	20.9	N/A
Yreka City Of	68.6	N/A	28.3	N/A
Yuba City	35.8	N/A	13.6	N/A
Yucaipa Valley Water District	46.3	N/A	12.0	N/A

Baseline inputs from water loss audits to draft economic model

Note: The data for water systems that are combined into one standard are identified in *italics.*

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
Adelanto City Of	450.3	130.6	8194.3	903.9	73.0
Alameda County Water District	2046.7	920.8	85131.3	606.2	72.8
Alco Water Service	146.2	89.2	8638.3	219.8	67.4
Alhambra City Of	179.5	167.5	18588.0	478.9	60.0
Amador Water Agency	142.2	51.3	1914.0	108.7	70.0
American Canyon City Of	192.7	103.4	5584.0	705.7	68.0
Anaheim City Of	1677.7	799.1	63805.3	643.1	77.0
Anderson City Of	203.1	40.0	3396.0	66.1	70.9
Antioch City Of	431.5	370.7	32401.0	777.2	68.2
Apple Valley Ranchos Water Company	550.3	476.2	21051.0	112.9	93.4
Arcadia City Of	502.4	164.6	13978.7	104.3	77.0
Arcata City Of	349.6	90.6	6414.7	274.2	80.0

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
Arroyo Grande City Of	55.8	88.7	6453.3	1501.9	65.0
Arvin Community Service District	307.9	61.3	4046.3	393.5	60.0
Atascadero Mutual Water Company	430.8	246.0	10700.0	175.0	103.0
Atwater City Of	2592.7	97.6	7495.0	112.4	50.0
Azusa Lightand Water	2068.7	305.2	23526.0	301.8	59.7
Bakersfield City Of	1005.4	569.3	46460.7	176.6	70.0
Bakman Water Company	246.5	73.2	2578.5	318.2	52.5
Banning City Of	760.6	168.2	10756.0	190.8	109.3
Bear Valley Community Services District	38.6	180.0	3602.0	524.0	90.0
Beaumont-Cherry Valley Water District	828.9	376.7	18042.0	462.3	75.0
Bella Vista Water District	463.7	242.0	6328.7	176.3	72.0
Bellflower-Somerset Mutual Water Company	98.4	66.0	7053.0	56.1	56.7
Benicia City Of	504.6	114.6	9763.0	230.9	81.0
Beverly Hills City Of	374.5	171.0	11141.0	1205.8	68.2
Big Bear Community Services District	87.5	82.1	6102.0	377.4	85.0
Big Bear Lake City Of	160.7	165.4	15029.7	257.4	86.3
Blythe City Of	305.8	51.4	3400.0	91.6	62.0
Brawley City Of	459.7	100.0	7487.0	50.9	55.0
Brea City Of	231.7	222.1	13573.0	937.8	75.0
Brentwood City Of	810.2	326.7	23700.7	1130.7	62.2
Buena Park City Of	765.6	236.2	19107.0	619.8	70.0
Burbank City Of	401.2	286.0	26661.0	738.5	115.0
Burlingame City Of	201.0	115.8	9200.7	1745.8	85.0
Calaveras County Water District-Ebbetts Pass	*557.4*	*155.6*	*5869.0*	*238.8*	*70.0*
Calaveras County Water District-Jenny Lind	*656.6*	*103.6*	*3759.0*	*209.4*	*70.0*
Calexico City Of	39.9	55.2	8550.0	244.4	50.0

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
California American Water Company-Los Angeles Division-Baldwin Hills	*180.3*	*69.8*	*6556.3*	*806.3*	*75.8*
California American Water Company-Los Angeles Division-Duarte	*753.7*	*98.8*	*7832.0*	*315.6*	*76.8*
California American Water Company-Los Angeles Division-San Marino	*462.3*	*181.0*	*15085.3*	*366.8*	*76.2*
California American Water Company-Monterey District	279.8	561.4	39097.7	435.1	89.3
California American Water Company-Sacramento District-Antelope	*228.5*	*95.8*	*10496.5*	*277.0*	*68.0*
California American Water Company-Sacramento District-Lincoln Oaks	*91.3*	*143.5*	*14606.0*	*240.2*	*64.5*
California American Water Company-Sacramento District-Parkway	*423.3*	*167.3*	*14912.0*	*167.0*	*63.0*
California American Water Company-Sacramento District-Rosemont	*550.4*	*187.9*	*16725.0*	*169.9*	*76.3*
California American Water Company-San Diego District	629.0	180.8	21939.7	1810.3	71.8
California American Water Company-Ventura District	776.7	256.5	20706.3	1491.7	95.9
California City	576.9	313.8	4858.0	1387.4	65.0
California Water Service Company Bakersfield-Bakersfield	*5510.4*	*856.8*	*65962.7*	*288.6*	*68.3*
California Water Service Company Bakersfield-North Garden	*505.2*	*122.2*	*6859.7*	*288.6*	*71.0*
California Water Service Company Bear Gulch	300.7	347.2	19263.3	1683.7	81.0
California Water Service Company Chico District	934.9	406.0	29204.3	98.9	76.0
California Water Service Company Dominguez	918.6	389.6	34439.7	1380.6	78.0
California Water Service Company East Los Angeles	121.6	277.8	27131.0	574.2	79.0
California Water Service Company Hermosa-Redondo	377.1	217.7	27242.7	1234.7	68.0
California Water Service Company Livermore	365.2	230.4	18935.7	963.9	66.3

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
California Water Service Company Los Altos-Suburban	527.7	300.8	19236.3	1142.6	71.0
California Water Service Company Marysville	178.7	55.9	3929.3	77.2	63.7
California Water Service Company Mid Peninsula-San Carlos	*70.7*	*115.5*	*10139.0*	*1961.3*	*80.0*
California Water Service Company Mid Peninsula-San Mateo	*611.6*	*259.1*	*26497.7*	*1961.3*	*72.0*
California Water Service Company Oroville	117.6	62.4	3834.7	193.6	72.3
California Water Service Company Palos Verdes	887.3	347.3	24292.3	1404.7	91.7
California Water Service Company Salinas District	257.8	279.2	25083.7	138.2	76.0
California Water Service Company Selma	258.8	91.8	6591.3	115.4	59.4
California Water Service Company South San Francisco	11.0	169.0	17224.3	1608.5	76.0
California Water Service Company Stockton	1043.7	562.1	45194.3	684.0	55.0
California Water Service Company Visalia	500.9	588.9	44466.7	66.9	62.7
California Water Service Company Westlake	253.5	118.3	7141.0	1488.2	90.0
Camarillo City Of	51.8	203.0	13706.0	915.8	76.0
Cambria Community Service District	70.1	66.7	4032.0	583.8	85.0
Camrosa Water District	329.7	211.1	8204.7	898.0	65.0
Carlsbad Municipal Water District	777.3	453.7	32204.7	1214.4	81.0
Carmichael Water District	479.5	154.0	11789.7	257.1	66.0
Carpinteria Valley Water District	116.3	88.4	4504.7	386.7	89.0
Castaic Lake Water Agency Santa Clarita Water Division	1633.9	355.0	31054.3	553.3	100.6
Ceres City Of	202.0	154.0	12360.0	66.3	50.0
Cerritos City Of	349.2	186.4	15638.0	439.5	82.5
Chino City Of	843.9	267.0	20204.7	623.0	73.8
Chino Hills City Of	151.4	280.5	21946.3	913.9	80.0

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
Citrus Heights Water District	346.0	271.0	20232.3	250.4	88.3
Cloverdale Cityof	114.6	32.3	3314.3	218.0	57.8
Clovis City Of	289.5	518.0	34901.7	313.4	63.5
Coachella City Of	297.0	121.6	8319.0	117.4	75.0
Coachella Valley Water District	5049.6	1716.7	104047.7	234.8	83.3
Coalinga City Of	177.5	98.5	3861.7	416.0	70.0
Coastside County Water District	158.2	88.9	7624.7	1486.6	78.1
Colton City Of	748.2	165.9	10202.0	160.6	66.7
Contra Costa Water District	1526.0	818.1	62501.3	215.7	73.0
Corcoran City Of	351.7	130.0	3772.0	198.6	50.0
Corona City Of	795.4	802.6	44012.0	609.8	93.6
Covina City Of	292.7	112.7	8650.3	786.0	88.5
Covina Irrigating Company	365.6	111.0	8647.0	794.0	88.4
Crescent City	397.1	104.2	4420.3	89.3	74.2
Crescenta Valley Community Water District	210.7	170.9	8386.3	687.7	93.4
Crestline Village Water District	24.5	72.8	5076.0	1150.0	99.8
Cucamonga Valley Water District	1562.0	710.0	48694.7	487.7	80.0
Cupertino City Of	122.6	59.9	4279.3	1357.8	104.1
Daly City	319.8	198.0	23122.7	1675.7	70.7
Davis City Of	714.0	192.0	17101.7	248.4	50.0
Del Oro Water Company	118.7	64.8	4820.7	470.5	84.2
Delano City Of	595.0	131.0	9390.0	159.9	59.7
Desert Water Agency	2388.3	416.6	24469.0	235.9	79.9
Diablo Water District	207.2	190.0	11903.3	657.4	70.0
Dinuba City Of	221.5	72.5	6016.3	145.9	51.7
Discovery Bay Community Services District	93.4	48.0	5944.3	150.4	60.0

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
Downey City Of	717.1	276.0	23325.0	366.6	65.0
Dublin San Ramon Services District	195.3	319.0	23724.0	1420.3	80.9
East Bay Municipal Utility District	19584.5	4205.9	383229.0	78.2	82.6
East Niles Community Services District	423.5	127.6	8020.3	475.7	60.0
East Orange County Water District	35.2	23.7	1215.0	620.5	101.0
East Palo Alto City Of	115.3	38.6	4102.0	1786.1	65.0
East Valley Water District	974.7	316.6	23319.7	145.9	80.0
Eastern Municipal Water District	5037.5	2390.4	160146.7	871.1	74.7
El Centro City Of	1419.3	120.0	9899.0	76.5	60.0
El Dorado Irrigation District	3863.1	1185.2	41445.3	92.1	109.3
El Monte City Of	209.1	43.0	3738.3	168.9	60.0
El Segundo City Of	217.0	57.5	5152.0	1318.0	67.5
El Toro Water District	272.5	180.2	10044.3	946.0	86.9
Elk Grove Water District	141.9	102.9	7957.0	186.2	61.3
Elsinore Valley Municipal Water District	1019.4	722.7	45313.3	1048.0	84.0
Escondido City Of	665.1	430.7	26710.3	1288.3	96.1
Estero Municipal Improvement District	263.9	120.6	7512.7	1860.5	58.0
Eureka City Of	261.1	160.9	10028.7	1072.5	61.2
Exeter City Of	153.1	43.0	3331.0	537.6	55.0
Fair Oaks Water District	363.1	181.0	13938.7	234.4	80.0
Fairfield City Of	2549.9	370.7	30901.3	113.4	65.0
Fallbrook Public Utilities District	648.0	271.8	9251.3	1139.7	116.6
Folsom City Of	3155.1	335.2	21138.5	112.1	68.0
Fortuna City Of	231.2	65.4	4544.7	216.8	97.3
Fountain Valley City Of	228.0	217.0	17178.0	605.7	70.0
Fresno City Of	7775.7	1839.8	145578.7	168.5	51.1

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
Fruitridge Vista Water Company	386.4	52.0	4830.0	100.6	49.0
Fullerton City Of	656.5	431.3	31894.0	791.6	76.9
Galt City Of	206.6	100.7	7565.0	116.8	50.0
Garden Grove City Of	863.0	440.0	33702.0	656.3	52.0
Georgetown Divide Public Utility District	145.7	165.2	3883.7	93.3	93.0
Gilroy City Of	552.7	209.3	14768.7	626.8	70.0
Glendale City Of	696.4	400.0	34101.0	1212.2	94.3
Glendora City Of	1034.0	225.7	13485.0	383.6	76.0
Golden State Water Company-Artesia	282.4	101.2	10824.7	486.9	61.4
Golden State Water Company-Barstow	527.4	187.3	9232.3	124.0	89.0
Golden State Water Company-Bay Point	138.1	52.1	5105.7	1217.7	77.7
Golden State Water Company-Bell-Bell Gardens	181.3	75.0	7449.7	490.1	61.5
Golden State Water Company-Claremont	595.0	162.8	11328.7	868.6	89.9
Golden State Water Company-Cordova	1144.9	202.7	15185.7	98.4	52.4
Golden State Water Company-Culver City	165.0	109.9	9719.7	1363.8	76.1
Golden State Water Company-Florence Graham	275.7	94.1	9774.7	462.3	60.0
Golden State Water Company-Norwalk	174.0	91.0	9507.3	642.0	62.8
Golden State Water Company-Orcutt	639.7	145.3	11544.0	211.0	70.7
Golden State Water Company-Placentia	400.3	144.3	13075.7	689.2	92.0
Golden State Water Company-San Dimas	302.8	204.7	16219.7	866.5	82.0
Golden State Water Company-Simi Valley	184.7	146.1	13543.0	1289.8	74.6
Golden State Water Company-South Arcadia	127.7	66.3	7493.0	457.8	65.4
Golden State Water Company-South San Gabriel	232.8	40.0	4979.7	364.7	62.8
Golden State Water Company-Southwest	874.7	519.0	52959.0	1119.7	74.3
Golden State Water Company-West Orange	611.0	260.4	27917.3	585.1	79.0
Goleta Water District	457.9	254.7	16842.0	1078.3	83.1

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
Great Oaks Water Company Incorporated	537.1	211.4	21345.7	851.5	65.0
Greenfield City Of	155.8	35.3	3729.7	136.0	63.0
Groveland Community Services District	52.9	71.0	3262.0	887.3	110.0
Hawthorne City Of	102.2	60.8	6477.0	1046.2	58.3
Hayward City Of	838.8	387.0	36459.7	1823.2	94.1
Healdsburg City Of	54.6	59.5	4706.0	152.3	65.0
Helix Water District	1208.9	744.5	58661.3	1046.5	90.0
Hemet City Of	60.5	132.3	9304.0	240.9	80.0
Hesperia Water District	576.8	589.0	26813.0	645.6	85.0
Hi Desert Water District	280.1	308.9	10635.7	172.3	82.0
Hillsborough Town Of	127.8	100.1	4294.0	3069.4	85.0
Hollister City Of	223.8	93.5	6572.5	363.5	65.0
Humboldt Community Services District	525.5	105.6	7932.0	684.3	60.0
Huntington Beach City Of	902.1	607.2	54440.0	665.2	63.3
Huntington Park City Of	118.7	59.8	5649.7	791.1	56.0
Imperial City Of	282.5	63.0	5532.0	388.7	65.0
Indian Wells Valley Water District	534.8	263.9	12351.3	85.8	61.7
Indio City Of	790.0	344.7	23130.0	175.4	71.3
Inglewood City Of	223.9	156.0	15869.3	1441.9	85.0
Irvine Ranch Water District	1976.2	1886.1	118025.0	1330.3	84.1
Joshua Basin Water District	148.7	261.8	5831.0	1039.7	84.0
Jurupa Community Service District	1164.4	481.6	31509.3	838.5	92.5
Kerman City Of	134.8	59.6	3711.0	104.0	47.0
Kingsburg City Of	2082.3	61.0	3679.0	63.5	50.0
La Habra City Of	411.3	165.0	13121.0	676.1	82.0
La Palma City Of	183.6	39.4	4408.0	506.9	68.7

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
La Verne City Of	339.2	178.0	8854.5	1021.2	70.0
Laguna Beach County Water District	237.3	135.0	8670.0	984.7	70.0
Lake Arrowhead Community Services District	194.2	127.7	8356.7	501.5	88.0
Lake Hemet Municipal Water District	516.2	250.0	14332.0	991.5	75.7
Lakeside Water District	157.0	127.0	7080.7	1461.0	90.0
Lakewood City Of	290.1	180.0	20137.0	291.3	57.0
Lamont Public Utility District	281.3	28.5	3152.0	81.5	60.0
Las Virgenes Municipal Water District	599.0	402.9	21318.3	1001.2	121.8
Lathrop City Of	136.1	112.6	6524.0	95.0	54.0
Liberty Utilities(Park Water)Corp-Bell Norwalk	*109.8*	*205.2*	*16895.0*	*785.8*	*75.8*
Liberty Utilities(Park Water)Corp-Compton Willow	*87.6*	*148.8*	*6959.0*	*785.8*	*87.5*
Liberty Utilities(Park Water)Corp-Lynwood	*9.1*	*162.3*	*4520.0*	*785.8*	*68.4*
Lincoln Avenue Water Company	107.6	58.0	4483.3	439.3	92.0
Lincoln City Of	724.9	244.3	18384.0	904.3	92.0
Linda County Water District	454.2	61.3	4603.7	93.8	60.0
Livermore City Of	320.1	160.3	10285.3	1166.0	67.9
Livingston City Of	248.6	36.0	3293.3	128.2	51.7
Lodi City Of	277.5	243.0	23262.7	179.8	57.5
Loma Linda City Of	379.1	77.4	5435.3	642.3	69.3
Lomita City Of	85.5	43.2	4323.0	1129.8	58.3
Lompoc City Of	178.8	140.0	10016.7	369.6	110.0
Long Beach City Of	737.3	923.0	93928.3	1014.7	67.0
Los Angeles City Department Of Water And Power	30602.8	7384.8	740490.7	936.3	109.0
Los Angeles County Waterworks District29-Malibu&Marina Del Rey	229.0	218.1	7646.0	1401.8	79.3
Los Angeles County Waterworks District40-Antelope Valley	1498.7	1008.0	57449.4	385.5	71.3

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
Los Banos City Of	1137.8	175.0	12149.0	93.8	49.4
Lynwood City Of	227.7	95.0	9097.3	1222.2	56.0
Madera City Of	55.8	204.0	14232.0		54.0
Mammoth Community Water District	111.0	66.0	3730.0	129.2	110.0
Manhattan Beach City Of	55.4	106.1	13631.0	1432.6	65.0
Manteca City Of	553.5	285.5	22156.3	156.2	55.0
Marin Municipal Water District	1726.2	869.9	62958.3	335.5	109.3
Marina Coast Water District	255.9	203.0	7474.3	158.1	60.0
Martinez City Of	653.4	139.1	10139.7	195.8	81.2
Mc Kinleyville Community Services District	137.3	87.8	6300.3	710.4	65.0
Menlo Park City Of	299.7	57.7	4520.3	2069.3	79.3
Merced City Of	1011.8	280.0	21545.0	90.6	50.0
Mesa Water District	501.5	328.4	24919.0	728.2	80.0
Mid-Peninsula Water District	132.6	102.3	7988.3	1583.5	102.0
Millbrae City Of	208.8	76.0	6552.7	1970.6	75.8
Milpitas City Of	646.6	194.7	16511.3	695.3	93.8
Mission Springs Water District	708.1	354.1	13138.0	488.3	65.0
Modesto City Of	6525.6	868.0	72015.0	280.4	60.0
Monrovia City Of	194.2	108.6	9678.7	214.9	99.3
Monte Vista Water District	939.9	201.9	12476.3	878.6	80.8
Montebello Land And Water Company	173.8	46.0	3988.3	558.7	66.9
Montecito Water District	175.2	116.5	4643.7	814.9	111.2
Monterey Park City Of	357.2	134.0	13491.0	50.2	80.0
Morgan Hill City Of	478.9	197.2	14060.7	531.5	72.4
Morro Bay City Of	12.7	73.7	5486.0	2573.6	65.0
Moulton Niguel Water District	1483.5	676.3	53674.0	929.5	98.0

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
Mountain House Community Services District	256.2	57.2	5094.0	228.7	65.3
Mountain View City Of	390.3	185.3	18390.0	641.8	72.7
Myoma Dunes Mutual Water Company	134.8	33.8	2525.5	111.4	80.0
Napa City Of	717.4	360.2	25723.0	488.8	67.3
Nevada Irrigation District-E George	*411.8*	*150.7*	*6261.3*	*74.7*	*90.4*
Nevada Irrigation District-Lake Wildwood	*50.3*	*44.8*	*3327.7*	*79.5*	*84.9*
Nevada Irrigation District-Loma Rica	*164.6*	*118.8*	*5224.7*	*87.6*	*88.3*
Newhall County Water District	156.7	65.9	3866.0	273.7	97.1
Newman Cityof	242.6	28.0	3513.0	124.9	52.3
Newport Beach City Of	782.2	302.2	26638.7	1176.7	78.0
Nipomo Community Service District	156.6	185.0	4685.7	173.0	68.0
Norco City Of	249.4	104.7	7586.0	787.7	95.0
North Coast County Water District	175.5	132.6	12091.0	1739.3	83.0
North Marin Water District	196.9	316.6	20768.7	878.5	62.5
North Tahoe Public Utilities District	236.3	46.0	3270.3	157.6	100.0
Norwalk City Of	2.5	57.6	5371.5	955.0	67.5
Oakdale City Of	314.9	75.0	8114.3	123.4	51.0
Oceanside City Of	787.6	591.0	44425.0	1543.7	72.3
Oildale Mutual Water Company	154.3	148.4	11308.3	132.5	60.0
Olivehurst Public Utilities District	*242.8*	*56.5*	*4498.0*	*214.1*	*60.0*
Olivehurst Public Utilities District-Plumas Lake	*129.7*	*25.1*	*2238.5*	*164.9*	*60.0*
Olivenhain Municipal Water District	916.4	466.2	22617.3	1128.4	115.0
Ontario City Of	912.6	595.3	35480.7	346.3	85.0
Orange City Of	1266.2	462.0	36402.0	780.8	86.8
Orangevale Water Company	188.9	82.5	5705.0	167.5	67.5
Orchard Dale Water District	153.8	43.0	4257.0	603.4	62.0

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
Otay Water District	893.5	733.0	50287.7	1756.0	116.6
Oxnard City Of	1481.3	581.4	42312.0	1112.5	67.0
Padre Dam Municipal Water District	177.1	410.0	24072.7	1871.4	107.7
Palmdale Water District	1373.7	433.0	27439.0	278.6	77.2
Palo Alto City Of	395.3	238.5	26404.0	1810.8	71.0
Paradise Irrigation District	201.9	177.9	8640.5	53.1	91.0
Paramount City Of	567.1	161.7	7391.3	441.0	68.3
Pasadena City Of	1357.3	531.5	38048.3	1041.0	73.4
Paso Robles City Of	137.8	228.8	11174.0	569.4	74.2
Patterson City Of	506.2	49.0	6507.7	78.3	60.0
Petaluma City Of	536.6	245.5	20172.7	1056.9	59.0
Phelan Pinon Hills Community Services District	317.7	346.0	7010.0	647.6	100.4
Pico Rivera City Of	107.6	98.0	9562.5	292.7	70.0
Pico Water District	62.5	68.0	5428.7	339.9	66.0
Pismo Beach City Of	62.9	50.0	4759.7	1550.0	72.9
Pittsburg City Of	527.9	254.3	18891.0	806.3	65.0
Placer County Water Agency-Auburn Bowman	*598.1*	*156.1*	*9390.0*	*265.0*	*76.7*
Placer County Water Agency-Foothill	*1481.7*	*413.4*	*28147.0*	*265.0*	*79.7*
Pleasanton City Of	1220.4	329.0	22126.3	858.9	75.3
Pomona City Of	919.8	488.0	32110.0	986.7	82.2
Port Hueneme City Of	56.6	47.3	5838.7	783.2	45.0
Porterville City Of	862.9	260.8	16326.0	182.0	60.0
Poway City Of	584.1	285.5	13949.0	1482.0	102.7
Quartz Hill Water District	126.2	96.9	5824.3	410.3	73.8
Rainbow Municipal Water District	257.5	320.0	8040.0	1312.7	158.0
Ramona Municipal Water District	198.4	226.3	9612.3	1300.0	155.0

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
Rancho California Water District	2057.3	940.8	44734.7	1271.7	110.5
Red Bluff City Of	77.9	81.0	4865.0		63.0
Redding City Of	1872.8	558.5	29263.5	261.7	80.0
Redlands City Of	1100.8	406.2	21017.0	235.3	87.0
Redwood City	650.1	264.6	24605.7	1948.9	64.7
Reedley City Of	1099.4	92.2	6329.0	132.1	50.7
Rialto City Of	280.7	197.3	11833.3	141.1	71.7
Rincon Del Diablo Municipal Water District	255.9	119.0	7218.0	1870.9	106.7
Rio Linda-Elverta Community Water District	195.0	61.9	4631.7	122.7	53.3
Rio Vista City Of	117.6	46.0	4706.0	161.7	67.5
Riverbank City Of	158.6	66.0	7323.3	82.8	60.0
Riverside City Of	4327.2	985.9	70478.3	98.7	89.0
Riverside Highland Water Company	54.1	77.7	4584.3	112.2	72.0
Rohnert Park City Of	280.3	116.1	9283.7	458.2	58.0
Rosamond Community Service District	153.0	97.3	5030.0	958.2	80.0
Roseville City Of	2002.2	614.2	43580.0	133.7	84.0
Rowland Water District	287.6	207.0	13771.7	1037.3	85.5
Rubidoux Community Service District	393.1	71.6	6284.0	91.9	85.0
Rubio Canyon Land And Water Association	78.6	60.0	3129.3	378.1	70.0
Sacramento City Of	6465.0	1708.3	150898.0	100.7	45.0
Sacramento County Water Agency	2202.3	544.7	36264.3	176.5	60.7
Sacramento Suburban Water District	1168.4	706.9	47238.7	156.7	58.9
San Bernardino City Of	2556.1	755.8	47915.3	158.5	80.3
San Bernardino County Service Area64Spring Valley Lake	305.5	40.4	3901.3	156.7	75.0
San Bernardino County Service Area70J Oak Hills	181.8	156.0	3285.3	637.1	85.0

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
San Bruno City Of	231.8	120.3	11699.0	622.7	81.3
San Buenaventura City Of(Ventura)	671.0	394.5	30104.0	465.8	93.0
San Clemente City Of	709.5	212.6	17403.3	1063.1	75.3
San Diego City Of	10519.5	3370.2	296100.3	1289.7	93.4
San Dieguito Water District	314.4	176.4	11966.0	1323.6	82.0
San Fernando City Of	165.0	67.1	5132.7	164.3	72.0
San Francisco Public Utilities Commision	4970.3	1257.6	178166.0	90.3	76.1
San Gabriel County Water District	253.2	82.0	9215.7	84.9	80.0
San Gabriel Valley Water Company	1169.1	566.2	49312.3	880.8	75.0
San Gabriel Valley Water Company Fontana Division	2189.7	692.1	48373.3	812.5	80.0
San Jacinto City Of	186.6	126.7	4197.3	518.0	65.0
San Jose City Of	1157.9	343.0	27182.0	1579.6	91.0
San Jose Water Company	6292.5	2477.7	234386.3	1226.1	73.6
San Juan Capistrano City Of	172.6	207.3	11734.3	884.7	60.0
San Juan Water District	922.4	209.9	10687.3	266.6	72.0
San Lorenzo Valley Water District	441.6	185.0	8014.0	224.1	80.0
San Luis Obispo City Of	338.2	177.6	11043.0	270.4	70.0
Santa Ana City Of	670.9	505.3	43250.0	617.5	73.9
Santa Barbara City Of	832.4	323.0	27121.0	482.5	120.8
Santa Clara City Of	755.9	312.9	26406.0	1301.4	66.9
Santa Cruz City Of	507.5	271.2	24524.0	183.8	91.1
Santa Fe Irrigation District	447.5	160.0	7509.0	1223.9	80.0
Santa Fe Springs City Of	218.4	108.0	6283.5	812.5	69.5
Santa Margarita Water District	1012.1	625.1	55648.3	952.1	90.0
Santa Maria City Of	284.2	337.5	22709.3	232.5	79.3
Santa Monica City Of	43.6	206.8	18109.3	994.1	74.5

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
Santa Paula City Of	91.7	97.8	7572.3	216.4	66.4
Santa Rosa City Of	992.2	644.3	54388.3	851.6	69.0
Scotts Valley Water District	92.0	65.1	4132.0	426.2	100.0
Seal Beach City Of	162.4	74.8	5513.3	513.5	65.0
Shafter City Of	327.3	108.6	4699.3	136.9	55.0
Shasta Lake City Of	100.5	79.4	3740.3	158.8	83.0
Sierra Madre City Of	317.5	47.6	3715.5	160.0	103.0
Signal Hill City Of	69.6	50.0	3331.0	921.0	78.5
Soledad City Of	76.5	14.6	3884.0	155.5	55.3
Sonoma City Of	112.3	54.3	4404.7	866.6	70.7
Soquel Creek Water District	235.8	172.4	15863.7	176.6	76.4
South Coast Water District	119.4	163.3	13114.0	1012.9	87.5
South Feather Waterand Power	446.6	200.0	7000.0		90.0
South Gate City Of	180.9	169.0	14408.5	418.5	65.0
South Pasadena City Of	210.5	67.8	6239.0	1044.0	79.3
South Tahoe Public Utility District	1134.6	253.0	14173.7	164.2	84.0
Stockton City Of	1938.8	601.5	48791.3	564.5	60.0
Suburban Water Systems-San Jose Hills	805.4	483.9	42870.3	566.5	77.9
Suburban Water Systems-Whittier-La Mirada	861.9	376.7	33874.7	471.3	78.5
Suisun-Solano Water Authority	447.3	95.8	8475.0	108.2	55.0
Sunny Slope Water Company	192.1	60.2	6300.0	165.5	72.5
Sunnyslope Community Water District	98.2	80.2	5921.3	95.6	72.0
Sunnyvale City Of	667.0	347.7	28926.7	1560.4	72.7
Susanville City Of	253.8	43.5	3808.3	70.2	81.8
Sweetwater Authority	592.3	408.0	34363.0	1554.9	74.3
Sweetwater Springs Water District	125.2	65.0	3800.0	272.9	75.0

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
Tehachapi City Of	170.8	55.5	3307.0	142.5	75.2
Thousand Oaks City Of	269.2	229.9	17050.3	1525.8	80.5
Torrance City Of	201.6	320.0	27041.7	993.3	75.0
Trabuco Canyon Water District	90.5	66.5	3989.7	885.1	90.0
Tracy City Of	1062.6	458.3	24121.7	485.0	60.0
Triunfo Sanitation District-Oak Park Water Service	8.5	46.0	4700.0	1646.8	80.0
Truckee-Donner Public Utilities District	909.6	231.7	12871.0	294.4	84.3
Tulare City Of	417.1	227.0	19839.0	87.0	50.0
Tuolumne Utilities District-Sonora Jamestown	*422.7*	*102.4*	*4984.7*	*155.2*	*87.7*
Tuolumne Utilities District-Upper Basin	*141.4*	*105.6*	*3995.0*	*155.2*	*72.0*
Turlock City Of	1241.8	305.0	19100.3	57.2	54.7
Tustin City Of	593.1	172.0	14165.0	633.9	50.0
Twentynine Palms Water District	283.6	211.0	8087.3	185.7	85.0
Ukiah City Of	205.2	62.0	4779.0	108.5	85.0
Upland City Of	584.8	255.6	20733.0	805.0	100.0
Vacaville City Of	896.7	359.4	28254.7	644.0	80.0
Valencia Water Company	1101.2	367.2	32598.7	535.2	103.9
Vallecitos Water District	882.2	376.6	22469.7	2030.6	117.4
Vallejo City Of	2638.3	483.3	40646.0	227.0	65.0
Valley Center Municipal Water District	320.4	342.7	10066.7	1444.2	120.0
Valley County Water District	180.8	126.0	12649.3	492.0	63.0
Valley Of The Moon Water District	230.9	92.5	7108.0	1609.6	65.0
Valley Water Company	54.9	55.0	3657.0	1578.0	70.0
Vaughn Water Company	375.0	220.4	10727.7	0.5	50.0
Ventura County Waterworks District No01-Moorpark	434.1	171.0	10912.7	1289.3	83.0

Urban water supplier (naming per water loss audit)	Average real loss (acre-feet per year)	Length of mains (miles)	Number of service connections	Variable production cost (dollars per acre-foot)	Average operational pressure (psi)
Ventura County Waterworks District No08-Simi Valley	387.4	350.3	25762.0	1081.0	100.0
Vernon City Of	295.6	50.4	1022.0	589.4	75.0
Victorville Water District	2135.2	752.0	35561.0	424.0	86.8
Vista Irrigation District	765.4	467.4	28706.7	994.2	97.7
Walnut Valley Water District	869.4	482.0	27471.0	1032.0	103.0
Wasco City Of	86.0	79.0	5009.3	208.0	51.8
Watsonville City Of	335.0	178.0	14806.3	116.6	65.0
West Kern Water District	1820.3	318.0	7733.3	156.1	60.0
West Sacramento City Of	3797.5	200.0	14367.3	89.5	55.0
West Valley Water District	1502.0	375.1	21441.3	291.9	70.0
Westborough Water District	35.7	24.5	3928.7	1904.1	77.7
Western Municipal Water District Of Riverside	1507.1	493.4	20839.3	1048.8	100.0
Westminster City Of	335.8	251.0	20638.0	317.0	63.7
Whittier City Of	258.2	143.0	11516.0	433.6	65.0
Windsor Town Of	174.6	139.1	5524.0	428.3	78.6
Woodland City Of	462.6	277.1	16049.7	820.4	55.0
Yorba Linda Water District	1134.0	366.3	25013.0	725.8	82.0
Yreka City Of	234.3	90.8	3047.3	137.6	84.3
Yuba City	754.4	299.3	18813.7	86.2	56.1
Yucaipa Valley Water District	668.2	209.0	12893.0	202.7	50.0

Appendix F – 2015 SBX7-7 Verification Form

SB X7-7 Table 0: Units of Measure Used in UWMP* *(select one from the drop down list)*
Acre Feet
**The unit of measure must be consistent with Table 2-3*
NOTES:

SB X7-7 Table-1: Baseline Period Ranges

Baseline	Parameter	Value	Units
10- to 15-year baseline period	2008 total water deliveries	34,052	Acre Feet
	2008 total volume of delivered recycled water	2,985	Acre Feet
	2008 recycled water as a percent of total deliveries	8.77%	Percent
	Number of years in baseline period[1,2]	10	Years
	Year beginning baseline period range	1995	
	Year ending baseline period range[3]	2004	
5-year baseline period	Number of years in baseline period	5	Years
	Year beginning baseline period range	2003	
	Year ending baseline period range[4]	2007	

[1] If the 2008 recycled water percent is less than 10 percent, then the first baseline period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first baseline period is a continuous 10- to 15-year period. *[2] The Water Code requires that the baseline period is between 10 and 15 years. However, DWR recognizes that some water suppliers may not have the minimum 10 years of baseline data.*

[3] The ending year must be between December 31, 2004 and December 31, 2010.

[4] The ending year must be between December 31, 2007 and December 31, 2010.

NOTES:

SB X7-7 Table 2: Method for Population Estimates	
Method Used to Determine Population (may check more than one)	
☑	**1. Department of Finance** (DOF) DOF Table E-8 (1990 - 2000) and (2000-2010) and DOF Table E-5 (2011 - 2015) when available
☐	**2. Persons-per-Connection Method**
☐	**3. DWR Population Tool**
☐	**4. Other** DWR recommends pre-review
NOTES:	

SB X7-7 Table 3: Service Area Population		
Year		Population
10 to 15 Year Baseline Population		
Year 1	1995	54,602
Year 2	1996	58,424
Year 3	1997	62,619
Year 4	1998	66,761
Year 5	1999	71,824
Year 6	2000	74,562
Year 7	2001	78,420
Year 8	2002	83,167
Year 9	2003	89,289
Year 10	2004	94,561
5 Year Baseline Population		
Year 1	2003	89,289
Year 2	2004	94,561
Year 3	2005	99,295
Year 4	2006	101,641
Year 5	2007	103,693
2015 Compliance Year Population		
2015		123,572
NOTES: Does not include approximately 4,810 person living within City limits, but outside the water service area.		

SB X7-7 Table 4-A: Volume Entering the Distribution System(s)

Complete one table for each source.

Name of Source	All Sources
This water source is:	
☑	The supplier's own water source
☑	A purchased or imported source

Baseline Year *Fm SB X7-7 Table 3*		Volume Entering Distribution System	Meter Error Adjustment* *Optional (+/-)*	Corrected Volume Entering Distribution System
10 to 15 Year Baseline - Water into Distribution System				
Year 1	1995	18,841		18,841
Year 2	1996	21,254		21,254
Year 3	1997	23,001		23,001
Year 4	1998	20,462		20,462
Year 5	1999	24,179		24,179
Year 6	2000	25,646		25,646
Year 7	2001	28,100		28,100
Year 8	2002	29,853		29,853
Year 9	2003	29,714		29,714
Year 10	2004	32,468		32,468
5 Year Baseline - Water into Distribution System				
Year 1	2003	29,714		29,714
Year 2	2004	32,468		32,468
Year 3	2005	31,481		31,481
Year 4	2006	33,637		33,637
Year 5	2007	33,864		33,864
2015 Compliance Year - Water into Distribution System				
2015		22,881		22,881

** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 4: Annual Gross Water Use *

Baseline Year *Fm SB X7-7 Table 3*		Volume Into Distribution System *This column will remain blank until SB X7-7 Table 4-A is completed.*	Deductions					Annual Gross Water Use
			Exported Water	Change in Dist. System Storage (+/-)	Indirect Recycled Water *This column will remain blank until SB X7-7 Table 4-B is completed.*	Water Delivered for Agricultural Use	Process Water *This column will remain blank until SB X7-7 Table 4-D is completed.*	
10 to 15 Year Baseline - Gross Water Use								
Year 1	1995	18,841			-		-	18,841
Year 2	1996	21,254			-		-	21,254
Year 3	1997	23,001			-		-	23,001
Year 4	1998	20,462			-		-	20,462
Year 5	1999	24,179			-		-	24,179
Year 6	2000	25,646			-		-	25,646
Year 7	2001	28,100			-		-	28,100
Year 8	2002	29,853			-		-	29,853
Year 9	2003	29,714			-		-	29,714
Year 10	2004	32,468			-		-	32,468
10 - 15 year baseline average gross water use								**25,352**
5 Year Baseline - Gross Water Use								
Year 1	2003	29,714			-		-	29,714
Year 2	2004	32,468			-		-	32,468
Year 3	2005	31,481			-		-	31,481
Year 4	2006	33,637			-		-	33,637
Year 5	2007	33,864			-		-	33,864
5 year baseline average gross water use								**32,233**
2015 Compliance Year - Gross Water Use								
2015		22,881	-		-		-	**22,881**

* NOTE that the units of measure must remain consistent throughout the UWMP, as reported in Table 2-3

NOTES:

SB X7-7 Table 5: Gallons Per Capita Per Day (GPCD)				
Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Annual Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use (GPCD)
10 to 15 Year Baseline GPCD				
Year 1	1995	54,602	18,841	308
Year 2	1996	58,424	21,254	325
Year 3	1997	62,619	23,001	328
Year 4	1998	66,761	20,462	274
Year 5	1999	71,824	24,179	301
Year 6	2000	74,562	25,646	307
Year 7	2001	78,420	28,100	320
Year 8	2002	83,167	29,853	320
Year 9	2003	89,289	29,714	297
Year 10	2004	94,561	32,468	307
10-15 Year Average Baseline GPCD				**309**
5 Year Baseline GPCD				
Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use
Year 1	2003	89,289	29,714	297
Year 2	2004	94,561	32,468	307
Year 3	2005	99,295	31,481	283
Year 4	2006	101,641	33,637	295
Year 5	2007	103,693	33,864	292
5 Year Average Baseline GPCD				**295**
2015 Compliance Year GPCD				
2015		123,572	22,881	**165**
NOTES:				

SB X7-7 Table 6: Gallons per Capita per Day *Summary From Table SB X7-7 Table 5*	
10-15 Year Baseline GPCD	309
5 Year Baseline GPCD	295
2015 Compliance Year GPCD	165
NOTES:	

SB X7-7 Table 7: 2020 Target Method *Select Only One*		
Target Method		Supporting Documentation
☑	Method 1	SB X7-7 Table 7A
☐	Method 2	SB X7-7 Tables 7B, 7C, and 7D *Contact DWR for these tables*
☐	Method 3	SB X7-7 Table 7-E
☐	Method 4	Method 4 Calculator
NOTES:		

SB X7-7 Table 7-A: Target Method 1 20% Reduction	
10-15 Year Baseline GPCD	**2020 Target GPCD**
309	**247**
NOTES:	

SB X7-7 Table 7-F: Confirm Minimum Reduction for 2020 Target			
5 Year Baseline GPCD *From SB X7-7 Table 5*	Maximum 2020 Target[1]	Calculated 2020 Target[2]	**Confirmed 2020 Target**
295	280	247	**247**

[1] Maximum 2020 Target is 95% of the 5 Year Baseline GPCD *[2] 2020 Target is calculated based on the selected Target Method, see SB X7-7 Table 7 and corresponding tables for agency's calculated target.*

NOTES:

SB X7-7 Table 8: 2015 Interim Target GPCD		
Confirmed 2020 Target *Fm SB X7-7 Table 7-F*	10-15 year Baseline GPCD *Fm SB X7-7 Table 5*	**2015 Interim Target GPCD**
247	309	**278**

NOTES:

SB X7-7 Table 9: 2015 Compliance								
Actual 2015 GPCD	2015 Interim Target GPCD	Optional Adjustments *(In GPCD)* Enter "0" if Adjustment Not Used: Extraordinary Events	Weather Normalization	Economic Adjustment	TOTAL Adjustments	Adjusted 2015 GPCD	2015 GPCD *(Adjusted if applicable)*	**Did Supplier Achieve Targeted Reduction for 2015?**
165	278	*From Methodology 8 (Optional)*	*From Methodology 8 (Optional)*	*From Methodology 8 (Optional)*	-	165	165	**YES**

NOTES:

Appendix G – 2020 SBX7-7 Compliance Form

SB X7-7 Table 0: Units of Measure Used in 2020 UWMP* *(select one from the drop down list)*
Acre Feet
**The unit of measure must be consistent throughout the UWMP, as reported in Submittal Table 2-3.*
NOTES:

SB X7-7 Table 2: Method for 2020 Population Estimate	
Method Used to Determine 2020 Population (may check more than one)	
☑	**1. Department of Finance** (DOF) or **American Community Survey** (ACS)
☐	**2. Persons-per-Connection Method**
☐	**3. DWR Population Tool**
☑	**4. Other** DWR recommends pre-review
NOTES: The population for areas in the City of Roseville boundary not served by the City of Roseville Water Utility was subtracted from the total 2020 DOF population.	

SB X7-7 Table 3: 2020 Service Area Population	
2020 Compliance Year Population	
2020	140,187
NOTES:	

SB X7-7 Table 4: 2020 Gross Water Use							
		2020 Deductions					
Compliance Year 2020	2020 Volume Into Distribution System *This column will remain blank until SB X7-7 Table 4-A is completed.*	Exported Water *	Change in Dist. System Storage* (+/-)	Indirect Recycled Water *This column will remain blank until SB X7-7 Table 4-B is completed.*	Water Delivered for Agricultural Use*	Process Water *This column will remain blank until SB X7-7 Table 4-D is completed.*	2020 Gross Water Use
	33,263	1,451	-	-	-	-	**31,813**
* **Units of measure (AF, MG , or CCF)** must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.							
NOTES:							

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment

Complete one table for each source.

Name of Source	Folsom Lake
This water source is *(check one)* **:**	
☑	The supplier's own water source
☐	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
	31,711	-	31,711

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.*

[2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES: Total volume excludes raw water delivered to Linda Creek.

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s) Meter Error Adjustment

Complete one table for each source.

Name of Source	Ground Water
This water source is *(check one)* **:**	
☑	The supplier's own water source
☐	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
	201	0	201

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.*

[2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment

Complete one table for each source.

Name of Source	Total water delivered from other suppliers to Roseville
This water source is *(check one)* **:**	
☐	The supplier's own water source
☑	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
	1,352	0	1,352

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.*

[2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 5: 2020 Gallons Per Capita Per Day (GPCD)		
2020 Gross Water *Fm SB X7-7 Table 4*	**2020 Population** *Fm SB X7-7 Table 3*	**2020 GPCD**
31,813	140,187	**203**
NOTES:		

SB X7-7 Table 9: 2020 Compliance							
Actual 2020 GPCD[1]	Optional Adjustments to 2020 GPCD Enter "0" if Adjustment Not Used			TOTAL Adjustments[1]	Adjusted 2020 GPCD [1] *(Adjusted if applicable)*	2020 Confirmed Target GPCD [1, 2]	**Did Supplier Achieve Targeted Reduction for 2020?**
	Extraordinary Events[1]	Weather Normalization[1]	Economic Adjustment[1]				
203	-	-	-	-	203	247	**YES**
[1] *All values are reported in GPCD*							
[2] ***2020 Confirmed Target GPCD*** *is taken from the Supplier's SB X7-7 Verification Form Table SB X7-7, 7-F.*							
NOTES:							

Appendix H – Intent to Retain Control of Conserved Water

RESOLUTION NO. 09-64

DECLARING AN INTENT TO RETAIN CONTROL OF CONSERVED WATER

WHEREAS, the City has contractual entitlements to divert water from Folsom Reservoir, under which the City diverts and treats water for distribution to its residents and water users; and

WHEREAS, the City plans to implement a series of water conservation projects and programs for the purpose of eliminating losses of water within its water transmission and distribution system and for reducing consumption of water by its customers through on-site efficiency improvements and curtailment of water waste; and

WHEREAS, Water Code section 1011 provides that water is deemed conserved when less water is used to accomplish the same purposes of use allowed under a water right and that such cessation or reduction in use is deemed a beneficial use of a water right to the extent of such cessation or reduction in use; and

WHEREAS, Water Code section 1011 and the City's CVP water service contract authorizes the City to make water conserved as a result of such water conservation projects and programs available for use, sale, lease, exchange or short- or long-term transfers inside and outside of the City; and

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Roseville as follows:

1. The foregoing recitals are true and are incorporated into this Resolution by this reference.

2. The City Council finds and determines that: (a) making significant investments in infrastructure and administrative resources protects the City's water supplies for the benefit of all residents and water users in the City; (b) protecting all of the City's water supplies is of paramount importance to the health and welfare of the City's residents and water users; (c) conserving water through reductions in use is intended to promote statewide policies mandating and encouraging beneficial use of water; and (d) preserving conserved water supplies and making those supplies available for use, sale or transfer is in the best interests of the City and its residents and water users.

3. The City Council declares that, by instituting programs to conserve water, it abandons no right, title or interest in or to any City water rights, contractual entitlements or any appurtenant rights necessary to exercise such water rights or entitlements.

4. In accordance with Water Code section 1011 and any contractual rights, the City reserves the right to sell, lease, exchange, or otherwise transfer for use within or outside of the City's boundaries all water that has been conserved as a result of its water conservation projects and programs.

5. The Environmental Utilities Director and staff are directed to take all actions necessary to implement this Resolution, including the filing of annual reports of reductions in water use resulting from any water conservation projects and programs carried out under this Resolution with the State Water Resources Control Board.

PASSED AND ADOPTED by the City Council of the City of Roseville on the 18th day of February 2009, by the following vote:

AYES COUNCILMEMBERS: Allard, Gray, Garcia, Roccucci, Garbolino

NOES COUNCILMEMBERS: None

ABSENT COUNCILMEMBERS: None

MAYOR

Attest:

City Clerk

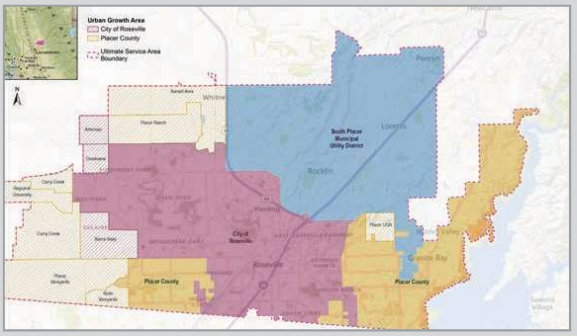
Appendix I – Regional 2020 Wastewater Systems Evaluation Report

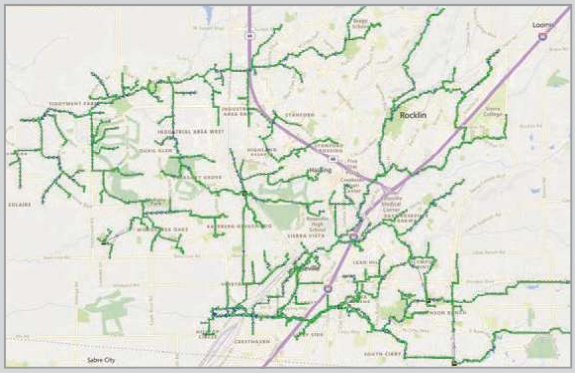
SOUTH PLACER WASTEWATER AUTHORITY

Partners: City of Roseville, Placer County, South Placer Municipal Utility District

South Placer Regional Wastewater 2020 Systems Evaluation Report









December 2020

Prepared by

WOODARD &CURRAN

SOUTH PLACER REGIONAL WASTEWATER 2020 SYSTEMS EVALUATION REPORT



WOODARD &CURRAN
2175 North California Blvd., Suite 315
Walnut Creek, CA 94596
925-627-4100

woodardcurran.com
COMMITMENT & INTEGRITY DRIVE RESULTS

0011183.00
South Placer Wastewater Authority
December 2020

TABLE OF CONTENTS

SECTION **PAGE NO.**

EXECUTIVE SUMMARY **ES-1**

1. INTRODUCTION **1-1**

1.1 Objectives of the Systems Evaluation 1-1
1.2 Project Scope 1-3
1.3 Report Organization 1-4

2. BASIS OF FLOW PROJECTIONS **2-1**

2.1 Introduction 2-1
2.2 Average Dry Weather Flow 2-2
2.2.1 Diurnal Base Wastewater Flow Curves 2-3
2.2.2 Groundwater Infiltration 2-4
2.2.3 Existing Base Wastewater Flows 2-5
2.2.3.1 City of Roseville 2-5
2.2.3.2 Placer County and SPMUD 2-7
2.2.3.3 Drought Rebound 2-7
2.2.4 Future Average Dry Weather Flow 2-7
2.2.4.1 City of Roseville 2-9
2.2.4.2 Placer County and SPMUD 2-10
2.2.4.3 Urban Growth Areas 2-10
2.2.5 Dry Weather Flow Summary 2-11
2.3 Rainfall-Dependent Infiltration and Inflow 2-12

3. TRUNK SEWER EVALUATION **3-1**

3.1 Introduction 3-1
3.2 Model Network Development 3-1
3.2.1 Modeling Terminology 3-1
3.2.2 Modeled System 3-2
3.2.3 Flow Monitoring Program 3-4
3.2.3.1 Radar Rainfall Data 3-8
3.2.4 Model Loading 3-8
3.2.5 Model Calibration 3-8
3.2.6 Dry Weather Calibration 3-9
3.3 Wet Weather Flow Projections 3-14
3.3.1 Wet Weather Calibration 3-14
3.4 Capacity Analysis 3-18
3.4.1 Design Flow Criteria 3-18
3.4.1.1 Summary of Flows Under Design Storm 3-19
3.4.2 Hydraulic Capacity Criteria 3-19
3.4.3 Capacity Analysis Results 3-19
3.5 Proposed Improvements 3-23
3.5.1 Design Criteria for New Sewer Facilities 3-23
3.5.1.1 Gravity Sewers 3-23
3.5.1.2 Pump Stations and Force Mains 3-24
3.5.2 Cost Criteria 3-24

3.5.3 Proposed Capacity Improvement Project Descriptions 3-25
3.5.3.1 Improvement Project 1 3-25
3.5.3.2 Improvement Project 2 3-25
3.5.3.3 Improvement Project 3 3-26
3.5.4 Timing of Proposed Improvement Projects 3-29

4. WASTEWATER TREATMENT PLANT EXPANSION EVALUATION 4-1

4.1 Introduction 4-1
4.1.1 Dry Creek Wastewater Treatment Plant 4-1
4.1.2 Pleasant Grove Wastewater Treatment Plant 4-2
4.2 Flows and Loadings 4-3
4.2.1 Current Flows and Peaking Factors 4-3
4.2.2 Projected Plant Influent Flows 4-4
4.2.3 Current BOD Loadings 4-5
4.2.4 Current and Projected Plant Influent Loadings 4-6
4.3 Plant Capacity Comparison and Expansion Phasing 4-7
4.3.1 Dry Creek Wastewater Treatment Plant 4-9
4.3.1.1 Hydraulic Capacity and Phasing 4-9
4.3.1.2 Biological Capacity and Phasing 4-9
4.3.2 Pleasant Grove Wastewater Treatment Plant 4-9
4.3.2.1 Hydraulic Capacity and Phasing 4-9
4.3.2.2 Biological Capacity and Phasing 4-10
4.4 Conceptual Capital Cost Estimates 4-15
4.4.1 Cost Estimation Approach 4-15
4.4.2 Dry Creek WWTP Cost Estimates 4-17
4.4.3 PGWWTP Cost Estimates 4-19

5. CAPACITY IMPROVEMENT PROJECT SUMMARY & NEXT STEPS 5-1

5.1 Next Steps 5-2

TABLES

Table ES-1: Estimated Dry Weather Flows[a] by Agency 7
Table ES-2: Modeled ADWF And Peak WW Flow Summary 7
Table ES-3: Sewer Capacity Results under Existing and Buildout Land Use Scenarios 8
Table ES-4: Proposed Capacity Improvement Projects 8
Table ES-5: Current and Projected Flows and Organic (BOD) Loadings 12
Table ES-6: DCWWTP Phase 1 and Phase 2 Capital Cost Estimates (ENR CCI: 12115)[a] 18
Table ES-7: PGWWTP Phase 1 and Phase 2 Capital Cost Estimates (ENR CCI: 12115)[a] 19
Table ES-8: Proposed Capacity Improvement Projects 20

Table 2-1: Average Dry Weather Flow Factors 2-9
Table 2-2: ADWF from UGAs 2-11
Table 2-3: Estimated Dry Weather Flows[a] by Agency 2-12
Table 3-1: Regional Pump Station Facilities 3-4
Table 3-2: Permanent Flow Meters 3-4
Table 3-3: Temporary Flow Meter Locations 3-5

Table 3-4: Dry Weather Flow Loading Parameters 3-10
Table 3-5: Calibration Rainfall Events 3-14
Table 3-6: Wet Weather Calibration Parameters 3-15
Table 3-7: Modeled ADWF and Peak Wet Weather Flow Summary 3-19
Table 3-8: Capacity Results under Existing and Buildout Land Use Scenarios 3-20
Table 3-9: Cost Estimate Classification Matrix (AACE International) 3-24
Table 3-10: Proposed Capacity Improvement Projects 3-27
Table 3-11: Timing of Proposed Capacity Improvement Projects 3-29
Table 4-1: Current Flows and Peaking Factors 4-4
Table 4-2: Projected FY 59/60 and Buildout EDUs and Flows at DCWWTP 4-4
Table 4-3: Projected FY 59/60 and Buildout EDUs and Flows at PGWWTP 4-5
Table 4-4: Current and Projected Influent Loading at DCWWTP 4-7
Table 4-5: Current and Projected Influent Loading at PGWWTP 4-7
Table 4-6: Current Hydraulic and Organic (BOD) Capacities at DCWWTP and PGWWTP 4-8
Table 4-7: Revised Current Hydraulic and Organic (BOD) Capacities at DCWWTP and PGWWTP 4-8
Table 4-8: Cost Estimate Classification Matrix (AACE International) 4-15
Table 4-9: Direct Construction Cost Allowances 4-16
Table 4-10: DCWWTP Phase 1 and Phase 2 Capital Cost Estimates (ENR CCI: 12115)[a] 4-18
Table 4-11: PGWWTP Phase 1 and Phase 2 Capital Cost Estimates (ENR CCI: 12115)[a] 4-20
Table 5-1: Proposed Capacity Improvement Projects 5-1

FIGURES

Figure ES-1: SPWA Service Area 2
Figure ES-2: Modeled Trunk System 3
Figure ES-3: Existing Connected Parcels 5
Figure ES-4: Future Developments and Urban Growth Areas 6
Figure ES-5: Model Results (Buildout and Buildout-Sensitivity PWWF) 9
Figure ES-6: Proposed Improvement Locations 10
Figure ES-7: DCWWTP Biological Capacity Comparison 14
Figure ES-8: PGWWTP Hydraulic Capacity Comparison 15
Figure ES-9: PGWWTP Biological Capacity Comparison 16

Figure 1-1: SPWA Service Area 1-2
Figure 2-1: Wastewater Flow Components 2-2
Figure 2-2: Residential Diurnal Curves 2-3
Figure 2-3: Non-Residential Diurnal Curves 2-4
Figure 2-4: Existing Connected Parcels 2-6
Figure 2-5: Future Developments and Urban Growth Areas 2-8
Figure 2-6: RDI/I Hydrograph Components 2-13
Figure 3-1: Modeled Trunk System 3-3
Figure 3-2: Flow Monitoring Locations 3-6
Figure 3-3: Flow Meter Schematic 3-7

Figure 3-4: Example DWF Model Calibration Graph (Site 155) 3-11
Figure 3-5: Calibrated Unit Flow Factors 3-12
Figure 3-6: Calibrated GWI Rates by Flow Meter Area 3-13
Figure 3-7: Example WWF Model Calibration Graph (Site 155) 3-16
Figure 3-8: Calibrated R Values by Flow Meter Area 3-17
Figure 3-9: SPWA 10-year Design Storm Event 3-18
Figure 3-10: Model Results (Existing PWWF) 3-21
Figure 3-11: Model Results (Buildout and Buildout-Sensitivity PWWF) 3-22
Figure 3-12: Proposed Improvement Locations 3-28
Figure 4-1: DCWWTP Treatment Schematic 4-2
Figure 4-2: PGWWTP Treatment Schematic 4-3
Figure 4-3: Influent BOD Concentrations at DCWWTP 4-5
Figure 4-4: Influent BOD Concentrations at PGWWTP 4-6
Figure 4-5: DCWWTP Hydraulic Capacity Comparison 4-11
Figure 4-6: DCWWTP Biological Capacity Comparison 4-12
Figure 4-7: PGWWTP Hydraulic Capacity Comparison 4-13
Figure 4-8: PGWWTP Biological Capacity Comparison 4-14

APPENDICES

Appendix A – Placer County General Plan Densities
Appendix B – Urban Growth Area Land use Summaries
Appendix C – Flow Monitoring Data
Appendix D – Calibration Graphs
Appendix E – Modeled Hydraulic Profiles
Appendix F – Proposed Capacity Improvement Project Details

Acknowledgements

This report represents a collaborative effort between Woodard & Curran, V&A Consulting Engineers, the South Placer Wastewater Authority, the City of Roseville, the South Placer Municipal Utility District, and Placer County. We would like to take an opportunity to thank the following key individuals:

Ken Glotzbach	City of Roseville
Todd Jordan	City of Roseville
Chris Bracco	City of Roseville
Kevin Bell	Placer County
Robin Mahoney	Placer County
Jared Deck	Placer County
Eric Nielsen	South Placer Municipal Utility District
Carie Huff	South Placer Municipal Utility District
Herb Niederberger	South Placer Municipal Utility District
Dave Richardson	Woodard & Curran
Chris van Lienden	Woodard & Curran
Jim Graydon	Woodard & Curran
Gisa Ju	Woodard & Curran
Ian Jaffe	Woodard & Curran
Athena Pervissian	Woodard & Curran
James Kohne	Woodard & Curran
Kevin Krajewski	V&A Consulting Engineers

List of Abbreviations

AA	average annual
ac	acres
ADWF	average dry weather flow
AFY	acre feet per year
APN	assessor parcel number
BOD	biochemical oxygen demand
BSF	base sanitary flow
CIP	Capital Improvement Program
DC	Dry Creek
DCWWTP	Dry Creek Wastewater Treatment Plant
du, DU	dwelling unit
DWF	dry weather flow
ea	each
EDU	Equivalent Dwelling Unit
ENR-CCI	Engineering News Record Construction Cost Index
ft	feet
FY	fiscal year
GIS	Geographical Information System
gpd	gallons per day
gpm	gallons per minute
GWI	groundwater infiltration
I/I	inflow and infiltration
in	inches
lb/day	pounds per day
MCRT	mean cell residence time
MG	million gallons
mgd	million gallons per day
MM	maximum month
NPDES	National Pollutant Discharge Elimination System
PDWWF	peak day wet weather flow
PG	Pleasant Grove
PGWWTP	Pleasant Grove Wastewater Treatment Plant
PHWWF	peak hour wet weather flow
PMF	peak month flow
PS	pump station
PWWF	peak wet weather flow
RAS	return activated sludge
RDI/I	rainfall dependent infiltration/inflow

RWQCB	Regional Water Quality Control Board
SMD-2	Placer County Sewer Maintenance District 2
SMD-3	Placer County Sewer Maintenance District 3
SPMUD	South Placer Municipal Utility District
SPWA	South Placer Wastewater Authority
SWRCB	State Water Resources Control Board
Systems Evaluation	Regional Wastewater and Recycled Water Systems Evaluation
TM	technical memorandum
TSS	total suspended solids
UGA	Urban Growth Area
UV	ultraviolet
WAS	waste activated sludge
WWF	wet weather flow
WWTP	wastewater treatment plant

EXECUTIVE SUMMARY

This report summarizes the results and recommendations of the Systems Evaluation prepared for the South Placer Wastewater Authority (SPWA), which is a Joint Powers Authority comprised of the City of Roseville (City), South Placer Municipal Utility District (SPMUD), and the County of Placer (Placer County). The Systems Evaluation was prepared by Woodard & Curran in close coordination with City, County and District staff. The Systems Evaluation will be used to guide improvements to the regional wastewater collection system and wastewater treatment plants to accommodate current and future development and ensure that SPWA's customers continue to receive a high level of service.

Background and Purpose of the Systems Evaluation

The South Placer Wastewater Authority (SPWA) was created under a Joint Powers Agreement in October 2000 and comprises the City of Roseville (City), South Placer Municipal Utility District (SPMUD), and the County of Placer (Placer County). Flow from SPMUD and portions of Placer County discharge into the City's sewer collection system. The City of Roseville, on behalf of the regional partners, owns and operates two regional wastewater treatment facilities: the Pleasant Grove Wastewater Treatment Plant (PGWWTP), and the older Dry Creek Wastewater Treatment Plant (DCWWTP). Additionally, the City of Roseville owns and operates the network of gravity sewers, pump stations, and force mains that serve customers within the City's limits, including the joint (regional) facilities that convey flow from the SPWA partners. SPMUD owns and operates gravity sewers, pump stations, and force mains in Rocklin, Loomis, and portions of southern Placer County. Placer County owns and operates gravity sewers, pump stations, and force mains in unincorporated areas of Placer County that are not served by other agencies.

The South Placer Regional Wastewater and Recycled Water Systems Evaluation prepared in 2009 (2009 Systems Evaluation), defined the SPWA service area boundary; evaluated the wastewater collection, wastewater treatment, and recycled water distribution systems; and identified existing and potential future improvement needs. Since that study was completed, the recycled water distribution system has been "removed" from the SPWA system (reallocated as an asset) and is now wholly managed by the City of Roseville. SPWA is now updating the Systems Evaluation to better evaluate future wastewater collection and treatment capacity needs that may have changed since 2009. This report documents the evaluation of the wastewater collection system capacity and the capacity of the wastewater treatment plants versus projected flows and loads.

This South Placer Regional Wastewater Systems Evaluation (Systems Evaluation) has been conducted to accomplish the following:

- Document the existing (2020) capacity and the flows and loadings on regional trunk sewer and wastewater treatment infrastructure and facilities present in 2020;
- Project buildout conditions based upon regional planning documents and planned regional developments in southwestern Placer County; and,
- Present a Regional Systems evaluation, with system deficiencies identified, and capital projects forecasted, which will inform the SPWA partners in identifying their ability to provide service for planned and proposed development both presently and for buildout conditions.

The service area is shown in **Figure 1-1**, and the regional collection system is shown in **Figure ES-2**. Figure 1-1 also indicates the location of the Urban Growth Areas (UGAs) within the service area, which are included in this study. Note that Creekview has been incorporated into the City of Roseville service area as of January 2019, while Amoruso and Sierra Vista are anticipated to be incorporated into the City's service area in early 2021.

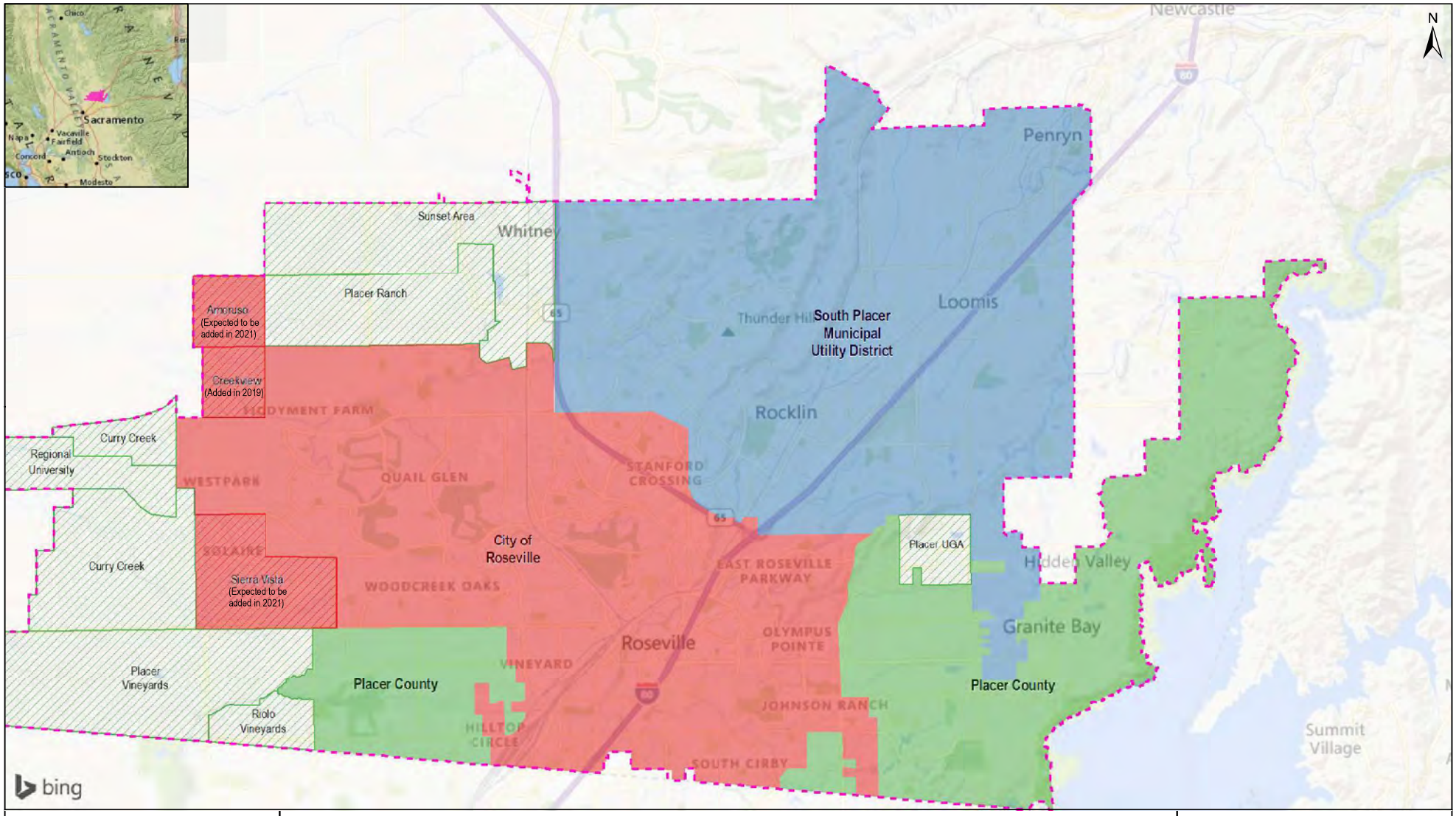


Figure ES-1
2021 Service Area Boundary

South Placer Wastewater Authority
2020 Systems Evaluation

0 ½ 1 2 Miles

2021 Partner Agency Service Area
- City of Roseville
- Placer County
- SPMUD

Urban Growth Area
- City of Roseville UGA
- Placer County UGA

Ultimate Service Area Boundary

Project #: 0011183.00
Map Created: December 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources:** SPWA Agencies, ESRI, W&C

Figure Exported: 12/21/2020 By: evanjlander Using: \\woodardcurran.net\shared\Projects\RMC\WCR\0091 Roseville, City of\0011183.00 SPWA Systems Evaluation\G. GIS\3 MXDs\Report Figures\1-1_SPWA_Service_Area.mxd

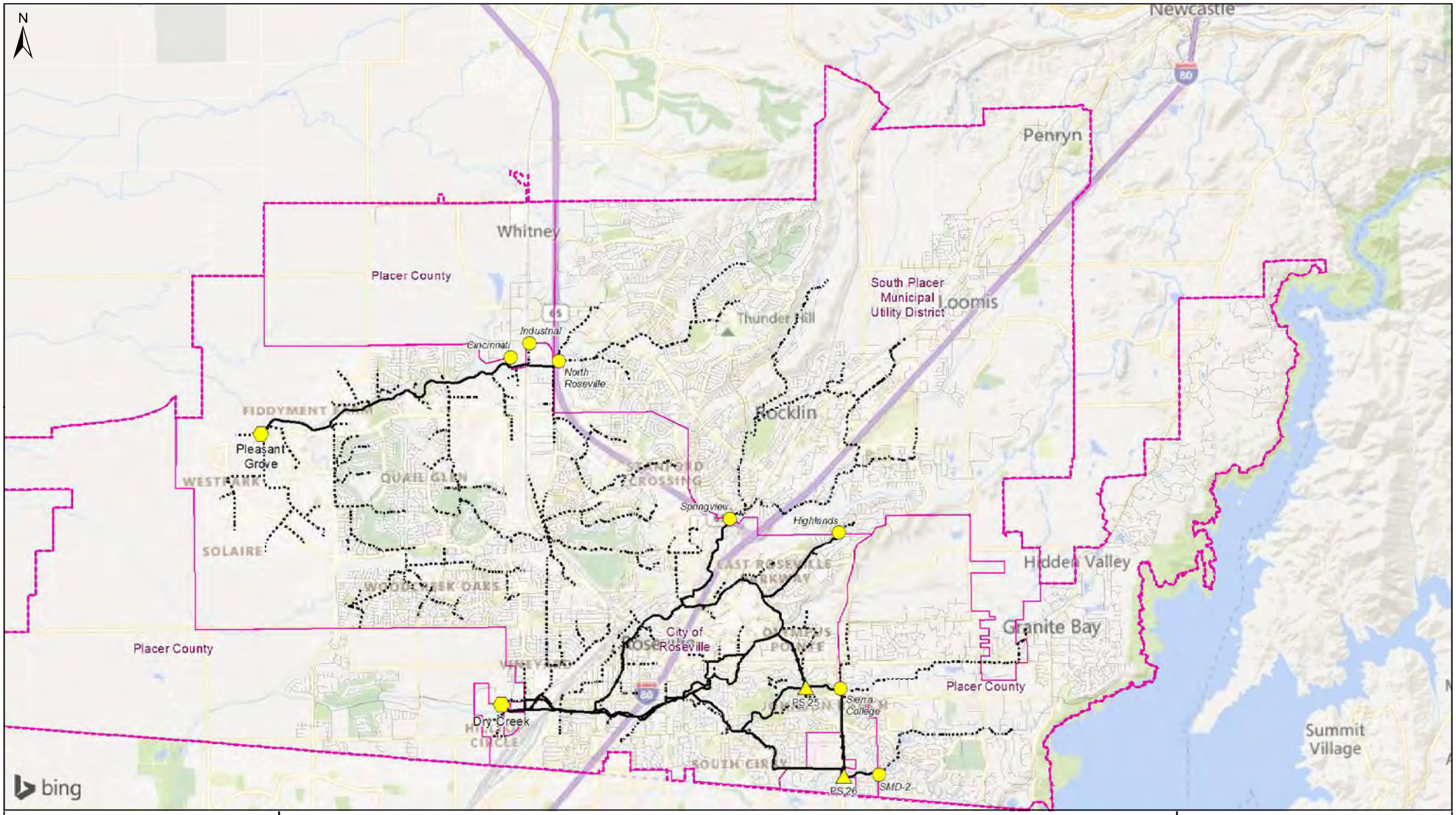


Figure ES-2
Modeled Trunk System

South Placer Wastewater Authority
2020 Systems Evaluation

0 ½ 1 2 Miles

- Regional Gravity Sewer
- Regional Force Main
- Non-Regional Modeled Sewer
- Non-Modeled Sewer
- Wastewater Treatment Plant
- Pump Station
- Permanent Flow Meters
- Partner Agency Boundary
- Ultimate Service Area Boundary

Project #: 0011183.00
Map Created: December 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources:** SPWA Agencies, ESRI, W&C

Figure Exported: 12/21/2020 By: evanlienden Using: \\woodardcurran.net\shared\Projects\RMC\WCR\0091 Roseville, City of\0011183.00 SPWA Systems Evaluation\G. GIS\3 MXDs\Report Figures\ES-2_Modeled_Trunk_System.mxd

Modeled Flow Projections

The flow projections developed for this Systems Evaluation were based on the information collected for the system's hydraulic model updates, including the updates performed for the current study. In 2007, a hydraulic model of the City's sewer collection system was developed using the H2OMap Sewer modeling platform (2007 Model Development Project), in parallel with a trunk sewer model for the combined Roseville, SPMUD, and Placer County systems. The models were later updated as part of the 2009 Systems Evaluation. Subsequently, the City's sewer model was updated in 2017 to reflect existing and future demands within the City, and to upgrade the modeling platform to the fully dynamic InfoWorks ICM software. For the current Systems Evaluation Update, the City's model was updated to reflect existing and future projected flows from Placer County and SPMUD.

Existing base wastewater flows were developed based on the assumptions summarized below; currently connected parcels are indicated in **Figure ES-3**. Note that flow projections (referred herein as loads) are intended to represent the level of development present during the flow monitoring periods used to calibrate the hydraulic model. Buildout loads were based on projected development within the service area. Two buildout scenarios were developed: (1) Buildout scenario representing the currently anticipated development density, and (2) Buildout-Sensitivity scenario, representing higher density development and some potential redevelopment areas.

For the City of Roseville, existing loads were developed based on water consumption data, and calibrated during the 2017 model update. A 15% rebound to reflect drought conditions was assumed for existing sewer loads. A buildout scenario was developed based on infill of currently vacant parcels using land use information from the City's General Plan or provided by the City's planning department, and development of UGAs within the City. The Buildout-Sensitivity scenario considers potential intensification and redevelopment in the downtown Roseville area.

Placer County provided spreadsheets summarizing existing equivalent dwelling units (EDUs) for each APN[1], which formed the basis of the existing model loads. (Note: an EDU is defined as the flow equivalent of one single-family residence.) For the Buildout scenario, flows were based on a spreadsheet provided by Placer County that summarized the anticipated EDUs for all entitled projects in Placer County[2], development of other currently vacant parcels (based on general plan data[2]), and development of the Placer County UGAs. For the Buildout scenario, an average development density for vacant parcels was assumed within the General Plan limits. For the Buildout-Sensitivity scenario, the development density was assumed to be at the maximum range allowed by the General Plan. A Base Wastewater Flowrate (BWF) of 180 gpd per EDU was assumed for Placer County and SPMUD.

SPMUD provided a shapefile[3] which provided EDUs for the year 2020 (which was identified as "existing" land use by SPMUD staff), and 2060 (which was identified as "Buildout" by SPMUD staff). This shapefile formed the basis of the Existing and Buildout scenarios.

For the UGAs, land use and flow projections were based on the most recent wastewater master plans for each UGA.

The locations of future developments, including urban growth areas, are indicated in **Figure ES-4.**

[1] Spreadsheets included: Existing dry creek EDU-7-24-19.xls, Existing SMD 2- EDU-2018-12-12.xlsx, Existing SMD 3- EDU-2018-12-12.xlsx, Existing Sunset EDU-7-24-19.xls

[2] 2018-12-18-Entitled-Planned Project.xlsx (provided December, 2018) and GeneralPlans_CommPlans.shp (downloaded from Placer County website, dated October 20, 2019)

[3] SPMUD_SewerLoading_AddressPoints, provided August 7, 2019.

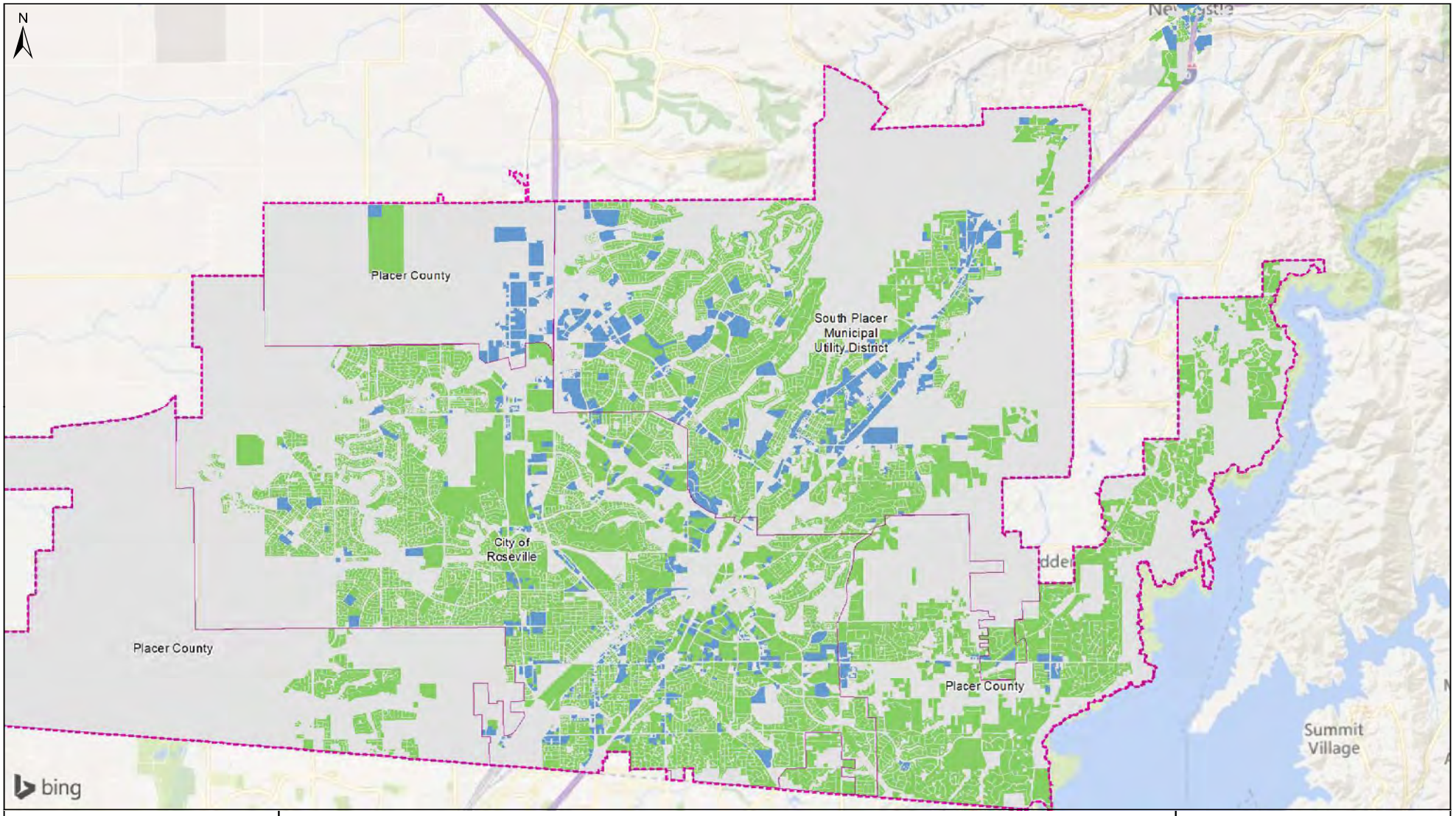


Figure ES-3

Existing Connected Parcels

South Placer Wastewater Authority
2020 Systems Evaluation

0 ½ 1 2 Miles

Parcel Land Use

- Commercial/Industrial
- Residential
- Unconnected

- Service Area Boundary
- Partner Agency Boundary

Project #: 0011183.00
Map Created: December 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources:** SPWA Agencies, ESRI, W&C

Figure Exported: 12/21/2020 By: cvanlaenden Using: \\woodardcurran.net\shared\Projects\RMC\WCR\0091 Roseville, City of\0011183.00 SPWA Systems Evaluation\G. GIS\3 MXDs\Report Figures\ES-3_Existing_Connected_Parcels.mxd

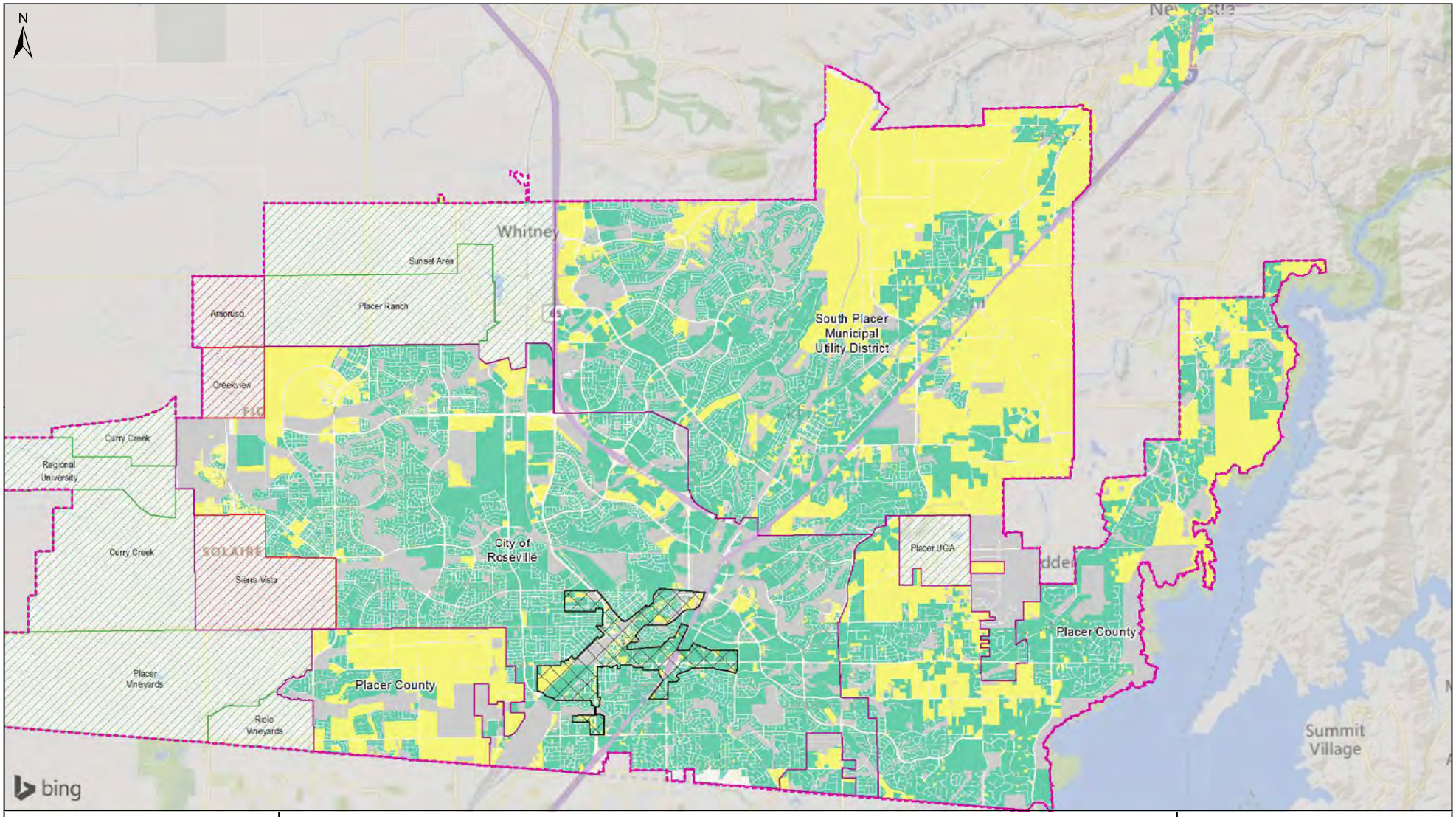


Figure ES-4

Future Development and Urban Growth Areas

South Placer Wastewater Authority
2020 Systems Evaluation

0 ½ 1 2 Miles

Buildout Status
- Existing
- Future Connection
- Unconnected
- Redevelopment Area

Urban Growth Area
- City of Roseville UGA
- Placer County UGA

Service Area Boundary

Partner Agency Boundary

Project #: 0011183.00
Map Created: December 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources:** SPWA Agencies, ESRI, W&C

Figure Exported: 12/21/2020 By: evanlienden Using: \\woodardcurran.net\shared\Projects\RMC\WCR\0091 Roseville, City of\0011183.00 SPWA Systems Evaluation\G. GIS\3 MXD\Report Figures\ES-4 Future Developments and Urban Growth Areas.mxd

Model loads were calibrated based on temporary monitoring programs for the 2015/2016 wet weather season (30 meters for the City's 2017 Model Update) and 12 meters during the 2018/2019 wet weather season (for SPMUD and Placer County). V&A Consulting Engineers, under subcontract to Woodard & Curran, conducted the monitoring. As part of the calibration process, rates of wet season groundwater infiltration (GWI, observed as a constant additional flow throughout the monitoring period), and rainfall-dependent inflow and infiltration (RDI/I) were calculated. Existing and projected flows predicted by the model are summarized in **Table ES-1** and **Table ES-2**.

Table ES-1: Estimated Dry Weather Flows[a] by Agency

WWTP	Agency	Existing Calibration ADWF (mgd)	Existing ADWF with Drought Rebound	Buildout ADWF (mgd)	Buildout-Sensitivity[b] ADWF (mgd)
Pleasant Grove	Roseville	5.87	6.70	13.01	13.04
	Placer County	0.18	0.20	9.85	9.85
	SPMUD	2.25	2.97	3.63	3.63
	Total	**8.30**	**9.87**	**26.49**	**26.52**
Dry Creek	Roseville	5.60	6.27	6.89	8.23
	Placer County	2.57	2.81	7.19	7.42
	SPMUD	2.90	3.64	5.16	5.16
	Total	**11.06**	**12.72**	**19.24**	**20.81**

Notes:
a. Includes wet season GWI.
b. For the Buildout-Sensitivity scenario, the development density was assumed to be at the maximum range allowed by the General Plan. A Base Wastewater Flowrate (BWF) of 180 gpd per EDU was assumed for Placer County and SPMUD

Table ES-2: Modeled ADWF And Peak WW Flow Summary

	Existing (Rebound)			Buildout			Buildout-Sensitivity		
WWTP	BWF[a] (mgd)	ADWF (mgd)	PWWF[b] (mgd)	BWF[a] (mgd)	ADWF (mgd)	PWWF[b] (mgd)	BWF[a]	ADWF (mgd)	PWWF[b] (mgd)
Pleasant Grove	9.5	9.9	27.4	26.1	26.5	55.8	26.2	26.5	56.0
Dry Creek	10.1	12.7	41.9	16.7	19.2	59.2	18.2	20.8	60.6

Notes:
a. Does not include wet season groundwater infiltration (GWI).
b. Modeled PWWF assumes improvements have been implemented to eliminate overflows and significant surcharging.

Trunk Sewer Evaluation

The calibrated model was run for Existing, Buildout, and Buildout-Sensitive land use scenarios under the design event described above. Several deficiencies were identified in non-regional facilities which resulted in model-predicted overflows for one or more of the scenarios; to ensure flows were conveyed to regional sewers, pipes were upsized in this analysis to eliminate any overflows. As the current model is a calibrated fully-dynamic model, the design condition represents a relatively infrequent storm event, and many of SPWA's sewers are relatively deep, surcharging up to within 5 feet of the manhole rims (ground surface) was considered acceptable under 10-year design storm PWWF, as long as the surcharge (flow height in the manhole) does not exceed 4 feet from the top of pipe up the manhole.

Model results under Existing and Buildout conditions are summarized in **Table ES-3** and results for the Buildout scenario are shown in **Figure ES-5**. Within the regional system, seven deficiency areas have been identified as indicated in **Figure ES-5**. There was no significant difference in modeled surcharge between the Buildout and Buildout-Sensitivity scenarios.

Table ES-3: Sewer Capacity Results under Existing and Buildout Land Use Scenarios[a]

Area	Existing (with Rebound)			Buildout and Buildout-Sensitivity		
	Length of Throttle Surcharge (ft)	Maximum Surcharge Depth (ft)	Minimum Freeboard (ft)	Length of Throttle Surcharge (ft)	Maximum Surcharge Depth (ft)	Minimum Freeboard (ft)
A	5,530	7.3	0.0	5,530	7.8	0.0
B	3,369	1.9	2.0	3,948	7.7	0.0
C	522	1.0	7.4	6,009	6.4	2.8
D	700	1.1	8.6	4,220	3.3	6.4
E	--	--	--	2,223	3.1	5.6
F	--	0.9	12.2	1,716	7.3	2.2
G	--	--	--	0	2.3	6.3

Notes:

a. Areas that exceed the hydraulic capacity criteria but do not have modeled overflows are highlighted yellow, while areas with modeled overflows are highlighted orange.

Based on these model results, improvement projects have been identified to relieve the capacity deficiencies. Improvement Project 1 would relieve existing deficiencies, while Improvement Project 2 and 3 would relieve deficiencies identified in the Buildout system. Improvement Project 2 and 3 would largely be triggered by additional growth in Placer County's SMD2 and SMD3 service areas. Subsequent model runs were performed to estimate the number of EDUs that would trigger the need for these additional projects; based on this analysis, the projects would be needed after approximately 1,800 additional EDUs (compared to 2018 development). Based on the EDU projections provided by Placer County, this additional growth is not anticipated until after Fiscal Year (FY) 2059/2060. Note that this estimate is based on dry weather flows and rainfall response estimated as part of the model update; changes in these projected flows may occur (in the future with additional flow monitoring and model updates) which would trigger the need for the projects earlier, or delay or eliminate the need for the projects.

The proposed capacity improvement projects are summarized in **Table ES-4** and the locations are shown in **Figure ES-6**.

Table ES-4: Proposed Capacity Improvement Projects

Project	Description	Estimated Capital Improvement Cost	Approximate Additional EDUs in SMD2/SMD3 to Trigger Project[a]
1	Increased Capacity of PS 26 and sewers on Sierra College Blvd directly downstream of PS 26 to relieve Old Auburn Trunk sewer (Area A)	$1,606,000	Existing
2	Redirect flows from PS 26 and Sierra College Blvd down Eureka Road to relieve Area E.	$1,831,000	~1,800[b]
3	Increased Firm capacity of PS 25 to meet Buildout PWWF. New weir structure or adjustments to existing structure at PS 25 to convey the maximum potential flow through PS 25 without any dry weather flows.	$758,000	~1,800[c]

Notes:

a. Based on a percentage of buildout factor applied to future model loads. Represents approximately 60% of buildout.

b. There are approximately 8,400 Existing EDUs upstream of the deficiency triggering Improvement Project 2, and approximately 10,200 EDUs would trigger the need for improvement. Represents approximately 60% of buildout.

c. There are approximately 11,900 Existing EDUs upstream of the deficiency triggering Improvement Project 3, including 7,600 in Placer County, 4,200 in Roseville, and less than 100 in SPMUD. Approximately 13,700 EDUs would trigger the need for the improvement.

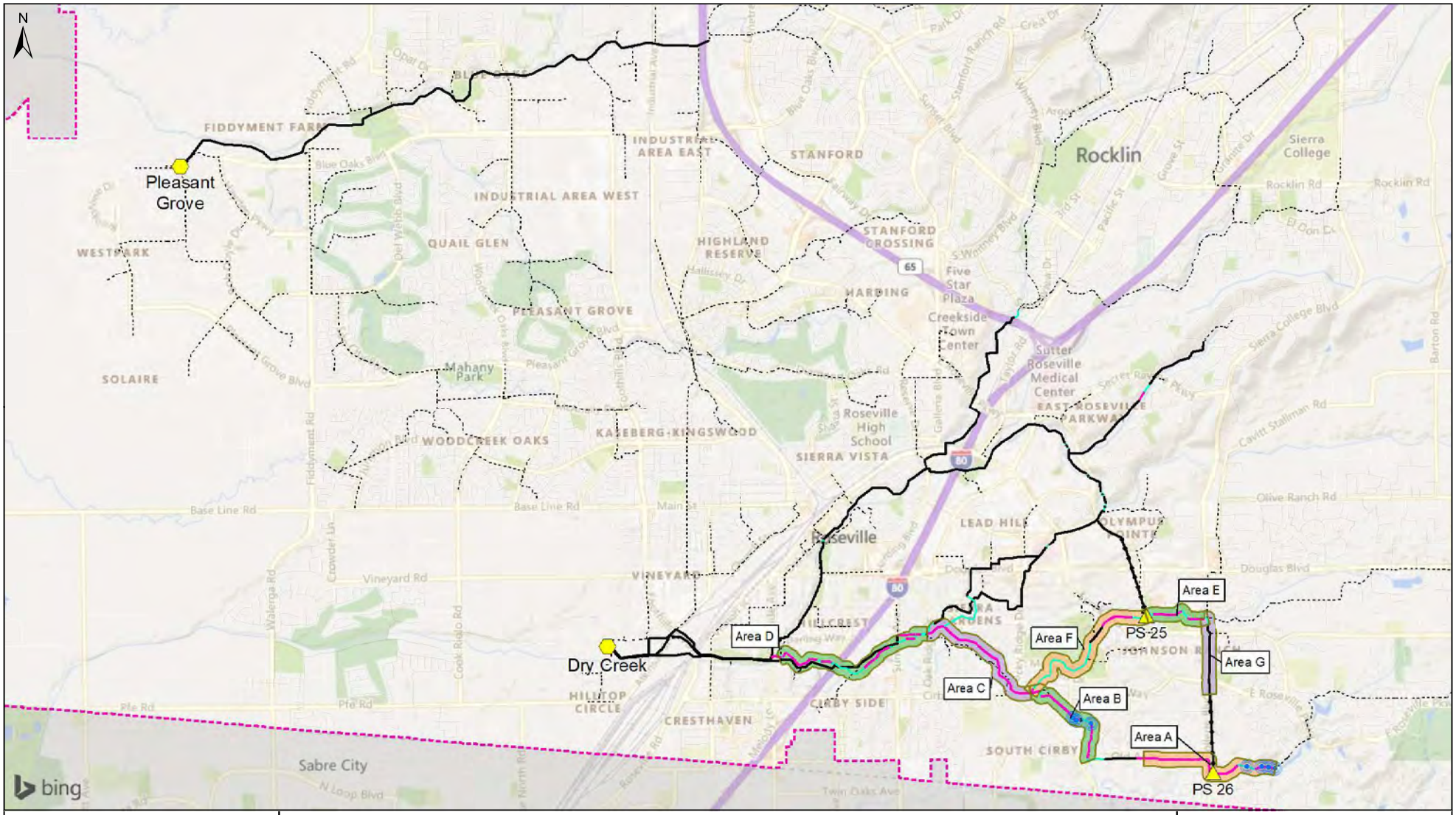


Figure ES-5

Model Results (Buildout and Buildout Sensitivity PWWF)

South Placer Wastewater Authority
2020 Systems Evaluation

0 ¼ ½ 1 Miles

- Regional Gravity Sewer
- Force Main
- Non-Regional Modeled Sewer
- Backwater Surcharge
- Throttle Surcharge
- Modeled Sewer Overflow
- Deficiency Area
- Ultimate Service Area Boundary

Project #: 0011183.00
Map Created: December 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources:** SPWA Agencies, ESRI, W&C

Figure Exported: 12/21/2020 By: cvanlaenden Using: \\woodardcurran.net\shared\Projects\RMC\WCR\0091 Roseville, City of\0011183.00 SPWA Systems Evaluation\G. GIS\3 MXD\eReport Figures\ES-5 Model Results Buildout and Buildout Sensitivity PWWF.mxd

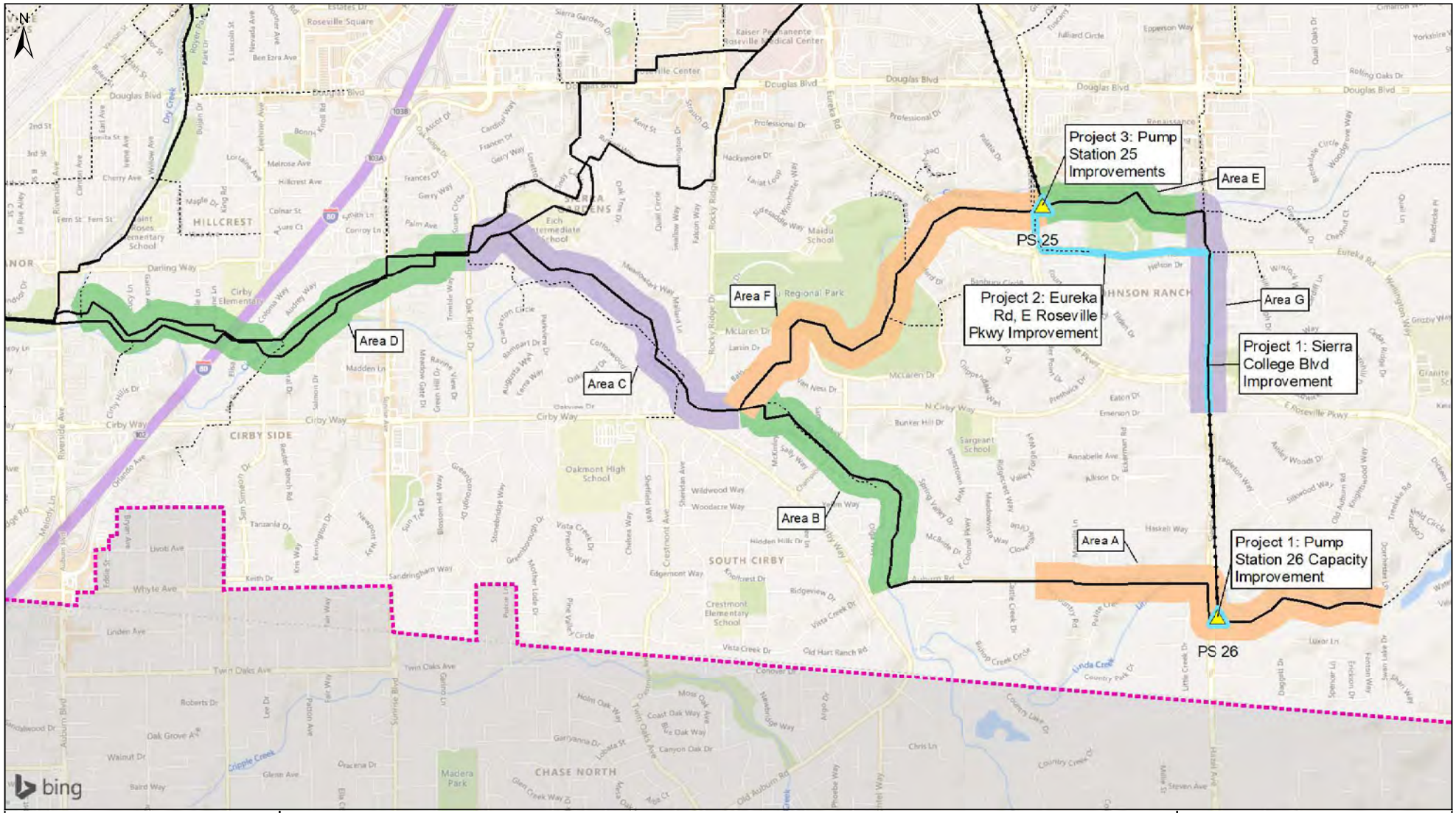


Figure ES-6
Proposed Improvement Locations

South Placer Wastewater Authority
2020 Systems Evaluation

0 0.125 0.25 0.5 Miles

- Regional Gravity Sewer
- Force Main
- Non-Regional Modeled Sewer
- Pump Station
- Preliminary Capacity Improvement Area
- Deficiency Area
- Service Area Boundary

Project #: 0011183.00
Map Created: December 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources:** SPWA Agencies, ESRI, W&C

Figure Exported: 12/21/2020 By: cvanlaenden Using: \\woodardcurran.net\shared\Projects\RMC\WCR\0091 Roseville, City of\0011183.00 SPWA Systems Evaluation\G. GIS\3 MXDs\Report Figures\ES-6 Proposed Improvement Projects.mxd

Wastewater Treatment Plant Expansion Evaluation

Based on the updated growth projections provided by the SPWA partners, wastewater flow and loading (organic loading as measured by Biochemical Oxygen Demand, or BOD, and solids loading as measured by Total Suspended Solids, or TSS) projections were developed for the Dry Creek Wastewater Treatment Plant (DCWWTP) and Pleasant Grove Wastewater Treatment Plant (PGWWTP). The flow and loading projections were compared to the most recent evaluations of treatment plant capacity from 2009 for DCWWTP and from 2016 for PGWWTP. Projected shortfalls in hydraulic capacity or biological treatment capacity were identified and preliminary recommendations for expansion and upgrade projects were proposed. The recommendations address phasing, timing, and preliminary conceptual costs of the expansions required through buildout to address both flows and loads, as well as identifying next steps for confirming current plant capacity and refining expansion and upgrade projects.

Wastewater Flow and Loading Evaluation

Current influent flows and loadings for both plants were established by analyzing daily plant influent data provided by the City of Roseville for the period from January 1, 2016 through September 19, 2019 for influent flow and from January 1, 2013 through September 19, 2019 for wastewater loadings. Notably, the waste loadings for biochemical oxygen demand (BOD) over the past 6 years have been significantly higher than documented for prior studies and design projects. In previous studies, average BOD concentrations of 248 mg/L at DCWWTP and 285 mg/L at PGWWTP were documented. The 2013-2019 data set shows an average influent BOD concentration of 425 mg/L at DCWWTP and 358 mg/L at PGWWTP. These higher concentrations may be a result of water conservation efforts over the past decade combined with the drought conditions that were experienced throughout California from 2011-2016, but should be confirmed through additional testing. While TSS and nutrient loadings were also calculated, now that the Roseville WWTPs are addressing nutrient removal in their water quality strategies, the focus herein is on organic loading, as measured by BOD, because that is where the capacity constraints present themselves.

Projected flows were calculated based on population and non-residential growth, normalized to account for diversity in land uses by establishing equivalent dwelling units (EDUs). EDU projection data were provided by each of the SPWA partners. Flow projections were developed by multiplying the projected EDUs by an ADWF contribution of 190 gallons per day (gpd) per EDU, in accordance with the estimate developed in the 2009 Systems Evaluation (a conservative value used for regional treatment capacity planning).

The plant data show that current BOD loadings are higher than the BOD treatment capacities estimated in the prior reference documents for both plants. However, according to City staff, the plants have consistently been in compliance with their NPDES discharge permits. This suggests that the **actual** plant capacities are beyond their **nomina**l design capacity with respect to BOD. Additionally, it is unclear to what extent interim improvements such as the Nitrate Reduction Improvements project at DCWWTP have affected the plant capacity. For the purposes of this Systems Evaluation, it is assumed that the annual average BOD removal capacity at each plant is, at minimum, the same as the current BOD loadings. It is recommended that process-specific sampling, process modeling, and, if needed, stress testing be performed to determine the actual plant capacity, the limiting processes, and corresponding process improvements needed at each plant. While this evaluation will be immediately helpful at Pleasant Grove, it is immediately essential at Dry Creek because of the large discrepancy between current loading and nominal capacity.

The current and projected flows and loadings to the treatment plants are summarized in **Table ES-5** along with the treatment capacities based on current operating conditions. This comparison of current plant capacity and projected future flows and loads accounts for only hydraulic and carbonaceous BOD treatment capacity because these parameters have driven capacity expansion timing in the past (vs. TSS and nutrient treatment capacity). Potential nutrient removal requirements have not been considered in expansion timing and phasing. Evaluation of plant capacity with respect to TSS and nutrient removal should be incorporated into the subsequent analysis of plant capacity.

Table ES-5: Current and Projected Flows and Organic (BOD) Loadings

Parameter	Condition	Unit	Capacity			
				Current	FY59/60	Buildout
Dry Creek Wastewater Treatment Plant						
EDU		#		57,747	87,772	96,000
Flow	Average Dry Weather Flow	mgd	18	8.6	16.7	18.2
BOD	Annual Average Loading	lbs/day	33,900[1]	33,900	52,000	56,000
Pleasant Grove Wastewater Treatment Plant						
EDU		#		54,907	92,864	145,000
Flow	Average Dry Weather Flow	mgd	12[2]	7.6	17.6	27.6
BOD	Annual Average Loading	lbs/day	22,400[1]	22,400	38,000	60,000

Notes:

1. Current BOD loadings based on plant data from January 2013 through September 2019.
2. Plant improvements that expand treatment capacity at PGWWTP are currently under construction and are expected to be in service by FY 22-23.

Recommended Expansion Phasing

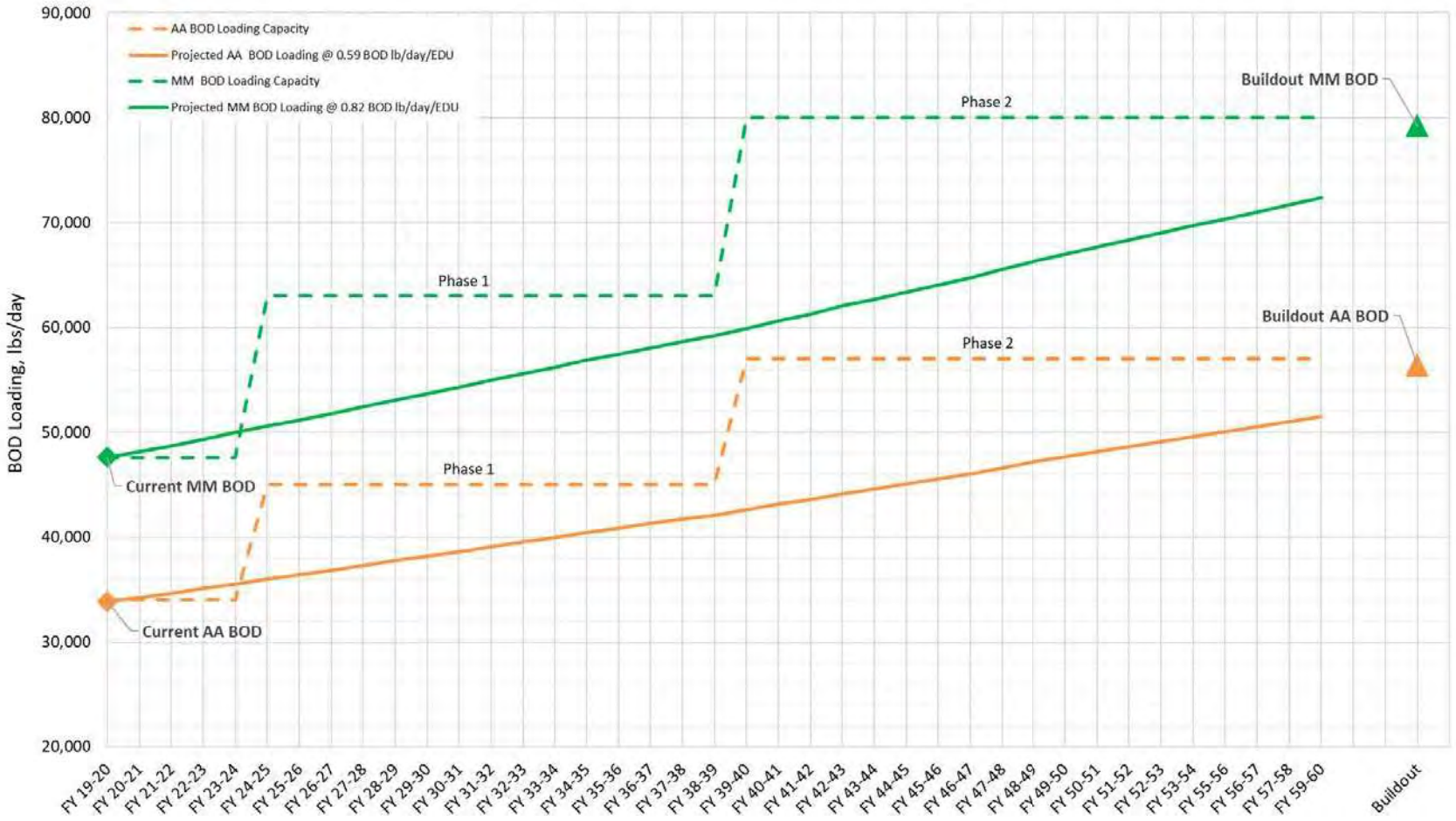
Prior to implementing any further improvements, it is recommended that process-specific sampling, process modeling, and if needed, stress testing be performed to determine the actual plant capacity, the limiting process, and corresponding process improvements needed at each plant.

Dry Creek Wastewater Treatment Plant. Based on the projected ADWF of 16.7 for FY 59/60 and 18.2 mgd for buildout, the current ADWF hydraulic capacity of 18 mgd is effectively sufficient through buildout. As shown in **Table ES-5**, DCWWTP appears to be currently running at or beyond its nominal design capacity with respect to BOD loading. **Figure ES-7** shows annual average (AA) and maximum monthly (MM) biological treatment capacities plotted against the loadings projected over the planning period and the anticipated expansion phasing. Depending on the results of the capacity testing, a Phase 1 expansion project may be necessary in approximately FY 24/25, which is the earliest practical time frame considering planning, design, and construction duration. The plant will reach 94% of the expanded Phase 1 AA and MM BOD loading capacity in FY 39/40. Therefore, it is recommended to implement Phase 2 biological improvements at this time. Phase 2 improvements in FY 39/40 are recommended to bring the plant BOD loading capacity to its buildout AA and MM projections of 56,000 and 79,000 lbs/day, respectively. The timing and magnitude of the recommended projects should be refined after additional capacity analysis and facility planning is completed, as described in the 3rd paragraph in the Wastewater Flow and Loading Evaluation section above.

Pleasant Grove Wastewater Treatment Plant. The improvements currently under construction will expand PGWWTP's treatment capacity to 12 mgd by FY 22-23. Based on the ADWF projections, this capacity expansion should be sufficient to handle flows through FY 28-29, though timing would depend on whether any rebound in sewer flows occurs.. Based on current estimates of capacity, Phase 1 hydraulic expansion at PGWWTP may be needed by approximately FY 28-29 to expand the plant ADWF to 15 mgd. Phase 1 expansion would carry the PGWWTP through FY 40-41. At that point, Phase 2 improvements may be needed to increase the plant ADWF capacity to the FY 59/60 flow projections of 17.6 mgd. Figure ES-8 shows ADWF plotted against the flow projected over the planning period and the anticipated phasing for improvements.

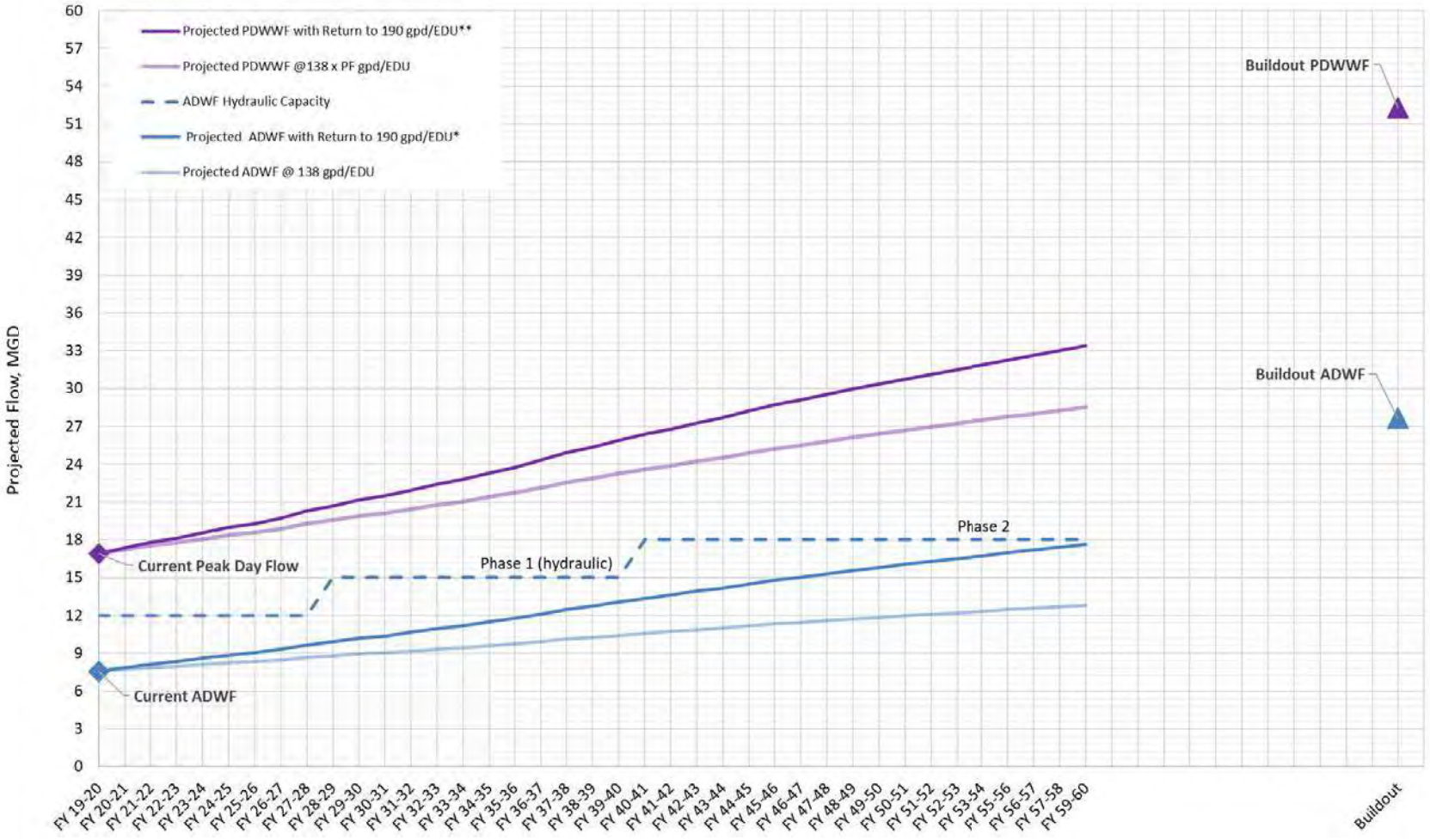
As shown in **Table ES-5**, PGWWTP is currently running at or beyond its nominal design capacity with respect to BOD loading. **Figure ES-9** shows AA and MM biological treatment capacities plotted against the loadings projected over the planning period and the anticipated expansion phasing. The improvements currently under construction will expand the plant's AA and MM BOD loading capacities to 34,500 lbs/day and 40,100 lbs/day, respectively. These improvements should be sufficient to meet projected BOD loadings through FY 40/41 when Phase 2 hydraulic capacity improvements are recommended at PGWWTP. During Phase 2 expansion, it is recommended that plant capacity be increased to accommodate projected FY59/60 AA and MM BOD loadings of 38,000 lbs/day and 48,000 lbs/day, respectively. The timing and magnitude of the recommended projects should be refined after additional capacity analysis and facility planning is completed, as described in the Wastewater Flow and Loading Evaluation section above.

Figure ES-7: DCWWTP Biological Capacity Comparison



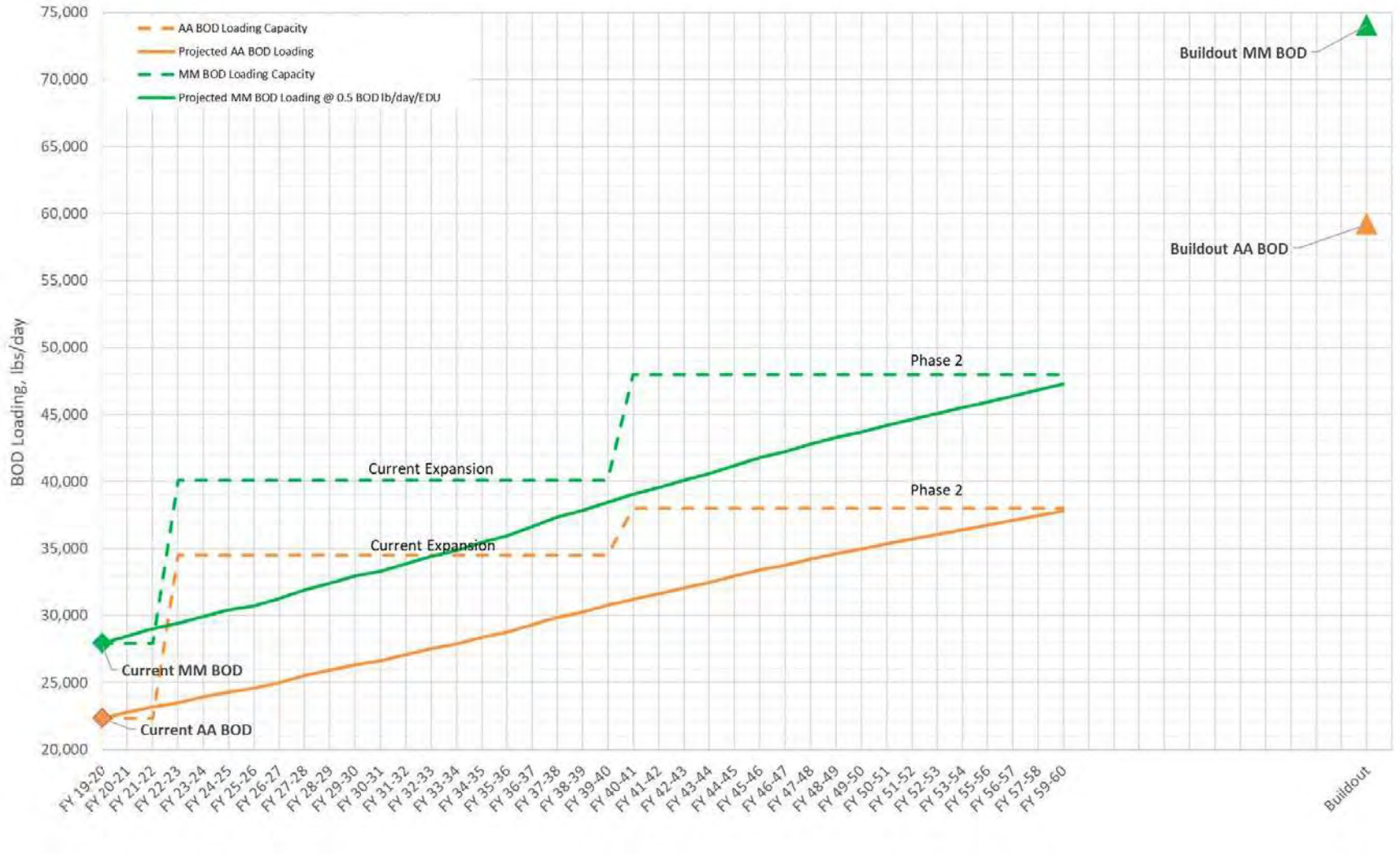
* Buildout date is currently unknown and is shown for graphical purposes only.

Figure ES-8: PGWWTP Hydraulic Capacity Comparison



* ADWF GPD/EDU factor is assumed to reach 190 gpd/EDU by FY 59/60, with a linear increase from 138 gpd/EDU at FY 19/20
**PDWWF is assumed to be ADWF flow plus 170 gpd/EDU of wet weather flow, based on current wet weather flowrates
*** Buildout date is currently unknown and is shown for graphical purposes only.

Figure ES-9: PGWWTP Biological Capacity Comparison



* Buildout date is currently unknown and is shown for graphical purposes only.

Conceptual Level Capital Cost Estimates

Preliminary opinions of probable cost at the conceptual level were developed for the recommended expansion phases. Estimates were developed by extrapolating from process unit cost estimates found in prior plant studies and applying appropriate escalation factors, allowances, and contingencies. Improvements that may be required after the FY 59/60 planning horizon have not been estimated.

Dry Creek Wastewater Treatment Plant. The preliminary phased improvements on a process basis are provided in **Table ES-6.** The listed improvements in Phase 1 (FY 24/25) will increase the AA BOD treatment capacity from 34,000 to 45,000 lbs/day (an equivalent increase in plant ADWF capacity from 11.5 mgd to 14.5 mgd). In Phase 2 (FY 39/40), the improvements will increase the AA BOD treatment capacity from 45,000 to 57,000 lbs/day (an equivalent increase in plant ADWF capacity from 14.5 mgd to 18 mgd). It should be emphasized that the cost estimates provided below are conceptual level costs for capacity expansion projects and do not include rehabilitation and replacement projects or discretionary projects. More detailed cost estimating should be developed when the plant capacity is determined and phased improvement projects are updated accordingly.

Pleasant Grove Wastewater Treatment Plant. The preliminary phased improvements on a process basis are provided in **Table ES-7.** The recommended phased improvements in Phase 1 (FY 28-29) increase the plant ADWF capacity from 12 mgd to 15 mgd. Phase 2 improvements will increase the ADWF capacity from 15 mgd to 18 mgd and the AA BOD treatment capacity from 35,000 to 38,000 lbs per day. It should be emphasized that the cost estimates provided below are conceptual level costs for capacity expansion projects and do not include rehabilitation and replacement projects or discretionary projects. More detailed cost estimating should be developed when the plant capacity is determined, and phased improvement projects are updated accordingly.

Table ES-6: DCWWTP Phase 1 and Phase 2 Capital Cost Estimates (ENR CCI: 12115)[a]

Process	Process Unit Cost	Phase 1 FY 24/25	Phase 2 FY 39/40
		# of units	# of units
Coarse Screens	$280,000	-	1
Influent Pump Station	$2,000,000	-	1
Fine Screens	$170,000	2	1
Odor Control	$210,000	1	1
Grit Basins	$290,000	-	1
Primary Sedimentation	$3,400,000	-	2
Aeration Basins	$2,600,000	4	6
Blowers	$290,000	1	-
Mixed Liquor Return Pumps	$150,000	4	6
Rehab Existing Anoxic Zones	$290,000	1	
Secondary Clarifiers	$4,100,000	4	2
RAS/WAS Pump Station	$860,000	1	1
Tertiary Filtration	$730,000		2
Waste Backwash Pumps	$100,000		1
UV Disinfection	$2,100,000		1
Anaerobic Digesters	$3,300,000	1	1
Centrifuges	$650,000	2	
Cooling Units	$290,000		2
Total Unit Process Costs		$34,000,000	$43,000,000
Site Yard Piping & Mechanical (5%)		$1,700,000	$2,200,000
Site Electrical / I&C/SCADA (15%)		$5,100,000	$6,500,000
Site Civil (5%)		$1,700,000	$2,200,000
Subtotal of Direct Construction Costs		$43,000,000	$54,000,000
Mobilization/Demobilization (5%)		$2,200,000	$2,700,000
Contractor Overhead & Profit (20%)		$8,600,000	$10,800,000
Subtotal of Direct and Indirect Costs		$54,000,000	$68,000,000
Contingency (30%)		$16,000,000	$20,000,000
Total Estimated Construction Cost		$70,000,000	$88,000,000
Engineering, Permitting, CM, ESDC (25%)		$18,000,000	$22,000,000
Total Estimated Capital Cost		**$88,000,000**	**$110,000,000**

Notes:

a. Costs based on Average of SF and "20 Cities" ENR for April 2020: 12115

Table ES-7: PGWWTP Phase 1 and Phase 2 Capital Cost Estimates (ENR CCI: 12115)[a]

Process	Process Unit Cost	Phase 1 FY 24/25	Phase 2 FY 39/40
		# of units	# of units
Influent Pumps	$120,000	1	-
Grit Basins	$290,000	1	-
Fine Screens	$170,000	2	-
Primary Sedimentation	$3,400,000	-	1
Oxidation Ditches	$7,100,000	-	1
Secondary Clarifiers	$4,100,000	1	1
RAS/WAS Pump Station	$860,000	1	-
Tertiary Filtration	$730,000	2	1
UV Disinfection	$2,100,000	3	-
Thickeners Building Modification	$490,000	-	1
Digesters Building Modification	$490,000	-	1
Total		**$13,000,000**	**$16,000,000**
Site Yard Piping & Mechanical (5%)		$650,000	$800,000
Site Electrical / I&C/SCADA (15%)		$2,000,000	$2,400,000
Site Civil (5%)		$650,000	$800,000
Subtotal of Direct Costs		**$16,000,000**	**$20,000,000**
Mobilization/Demobilization (5%)		$800,000	$1,000,000
Contractor Overhead & Profit (20%)		$3,200,000	$4,000,000
Subtotal of Direct and Indirect Costs		$20,000,000	$25,000,000
Contingency (30%)		$6,000,000	$7,500,000
Total Estimated Construction Cost		$26,000,000	$33,000,000
Engineering, Permitting, CM, ESDC (25%)		$6,500,000	$8,300,000
Total Estimated Capital Cost		**$33,000,000**	**$41,000,000**

Notes:

a. Costs based on Average of SF and "20 Cities" ENR for April 2020: 12115

Capacity Improvement Project Summary

Table ES-8 summarizes the capacity improvements identified in this systems evaluation. Note that the improvement needs projected for Dry Creek and Pleasant Grove WWTPs are significantly larger and more expensive than the improvement projects projected for the collection system, but are based on limited available data. The estimated costs for Dry Creek WWTP are especially high because of the size and age of that plant; when it was designed, the organic loading in Roseville was far lower than when Pleasant Grove was designed; since the mid 2000's organic loading to both plants has continued to increase. Further studies, as described in the Wastewater Flow and Loadings Section should be undertaken for both treatment plants, and the capacity improvement projects should be refined based on those findings.

Table ES-8: Proposed Capacity Improvement Projects

		Existing	FY 24/25 or FY 28/29	FY 39/40	After FY 59/60
Collection System	**Description**	Improvement Project 1 (Increased Capacity of PS 26 and sewers on Sierra College Blvd)	None	None	Improvement Project 2 (Redirect flows from PS 26 and Sierra College Blvd down Eureka Road) Improvement Project 3 (Increased Firm capacity of PS 25 with diversion structure improvements)
	Estimated Capital Cost	$1,610,000	-	-	$2,590,000
Dry Creek WWTP	**Description**	Plant Capacity, Condition Assessment, and Facilities Plan	Phase 1 (Increase AA BOD Capacity to ~45,000 lbs/day)	Phase 2 (Increase AA BOD Capacity to ~57,000 lbs/day)	Phase 3: Increase BOD Capacity and Hydraulic Capacity (not estimated)
	Estimated Capital Cost	$550,000	$88,000,000	$110,000,000	Not Estimated
Pleasant Grove WWTP	**Description**	Plant Capacity, Condition Assessment, and Facilities Plan	Increase ADWF hydraulic capacity to 15 mgd	Increase ADWF hydraulic capacity to 18 mgd. Increase AA BOD Loading Capacity to 38,000 lbs/day	Phase 3: Increase BOD Capacity and Hydraulic Capacity (not estimated)
	Estimated Capital Cost	$450,000	$33,000,000	$41,000,000	Not Estimated

Next Steps

Based on the findings of this preliminary evaluation, and discussions with the project team the following next steps are recommended for consideration by SPWA:

- Conduct an analysis of process performance and current biological treatment and hydraulic capacity at both DCWWTP and PGWWTP. This will likely require process-specific sampling and development of calibrated process models. Biological treatment capacity should consider both BOD and nitrate plus nitrite permit limitations set forth within each plant's respective NPDES permit. Results of this study should determine a capacity rating for each unit process at the plant and the limiting processes. This analysis will provide a sound basis for the planning of new facilities and is integral to determining required future capital improvement projects during phased expansions. It is recommended that DCWWTP capacity analysis take precedence over PGWWTP considering DCWWTP appears to be currently operating beyond its nominal BOD removal capacity.

- Review previous condition assessment work conducted on the plant assets and perform additional assessment needed to identify and prioritize repair and replacement (R&R) projects. This effort would include a risk assessment to identify likelihood of failure and criticality of each asset. Results of this study would identify R&R projects which may need to be implemented prior to or concurrent with phased expansions.

- Based on the capacity analysis and R&R project planning, develop Facilities Plans for DCWWTP and PGWWTP. Considering both plants could be running at or above their nominal design capacities, it is recommended that facilities planning begin immediately after the capacity analysis. This effort would evaluate various process optimization steps and upgrade alternatives and provide recommended improvements for phased expansions. The Facilities Plans would include review of the 190 gpd/EDU flow factor that is critical to the timing and magnitude of any hydraulic capacity improvements.

- Develop Class 4 cost estimates for recommended improvements at the WWTPs under each expansion phase and for R&R projects to assist SPWA partners in assessing capital needs in the future.

- For the collection system, periodically update the model network based on any configuration changes, perform re-calibration to confirm the actual and anticipated flows, and to update future loads into the model network. An update frequency of every 5-10 years is recommended, depending on changes in development planning and/or system configuration.

We also recommend that SPWA evaluate funding and financing options to support implementation of the recommended capital improvements, especially Phase 1 at Dry Creek given its size and relative immediacy. With the implementation of the steps above, and the ongoing high level performance of the SPWA Regional System, SPWA will be able to continue its excellent level of service to the Regional Partners.

1. INTRODUCTION

The South Placer Wastewater Authority (SPWA) was created under a Joint Powers Agreement in October 2000 and comprises the City of Roseville (City), South Placer Municipal Utility District (SPMUD), and the County of Placer (Placer County). Flow from SPMUD and portions of Placer County discharge into the City's sewer collection system. The City of Roseville, on behalf of the regional partners, owns and operates two regional wastewater treatment facilities: the Pleasant Grove Wastewater Treatment Plant (PGWWTP), and the older Dry Creek Wastewater Treatment Plant (DCWWTP). Additionally, the City of Roseville owns and operates the network of gravity sewers, pump stations, and force mains that serve customers within the City's limits, including the joint (regional) facilities that convey flow from the SPWA partners. SPMUD owns and operates gravity sewers, pump stations, and force mains in Rocklin, Loomis, and portions of southern Placer County. Placer County owns and operates gravity sewers, pump stations, and force mains in unincorporated areas of Placer County that are not served by other agencies.

Figure 1-1 shows the service area boundaries of the SPWA partner agencies and the overall SPWA service area. **Figure 1-1** also indicates the location of several Urban Growth Areas (UGAs), both inside and outside the City, which have significant development plans under varying stages of progress.

The South Placer Regional Wastewater and Recycled Water Systems Evaluation prepared in 2009 (2009 Systems Evaluation), defined the SPWA service area boundary; evaluated the wastewater collection, wastewater treatment, and recycled water distribution systems; and identified existing and potential future improvement needs. Since that study was completed, the recycled water distribution system has been removed from the SPWA system (reallocated as an asset) and is now wholly managed by the City of Roseville. SPWA is now updating the Systems Evaluation to better evaluate future wastewater collection and treatment capacity needs that may have changed since 2009. This report documents the evaluation of the regional wastewater collection system capacity and the capacity of the wastewater treatment plants versus projected flows and loads.

1.1 Objectives of the Systems Evaluation

The specific need for this Systems Evaluation was precipitated by several factors, including:

- Recent annexations of land by SPWA partner agencies;
- Changes in water consumption rates and associated dry weather flow rates;
- Planned development and redevelopment within the 2005 SPWA service area;
- Revisions in the planning for proposed Urban Growth Areas (UGAs) in the vicinity of the 2005 SPWA service area;
- Wastewater characteristics (i.e., flow and strength) that have changed since the 2009 Systems Evaluation.

This South Placer Regional Wastewater Systems Evaluation (Systems Evaluation) has been conducted to accomplish the following:

- Document the existing (2020) capacity and the flows and loadings on regional trunk sewer and wastewater treatment infrastructure and facilities present in 2020;
- Project buildout conditions based upon regional planning documents and planned regional developments in southwestern Placer County; and,
- Present a Regional Systems evaluation, with system deficiencies identified, and capital projects forecasted, which will inform the SPWA partners in identifying their ability to provide service for planned and proposed development, both presently and for buildout conditions.

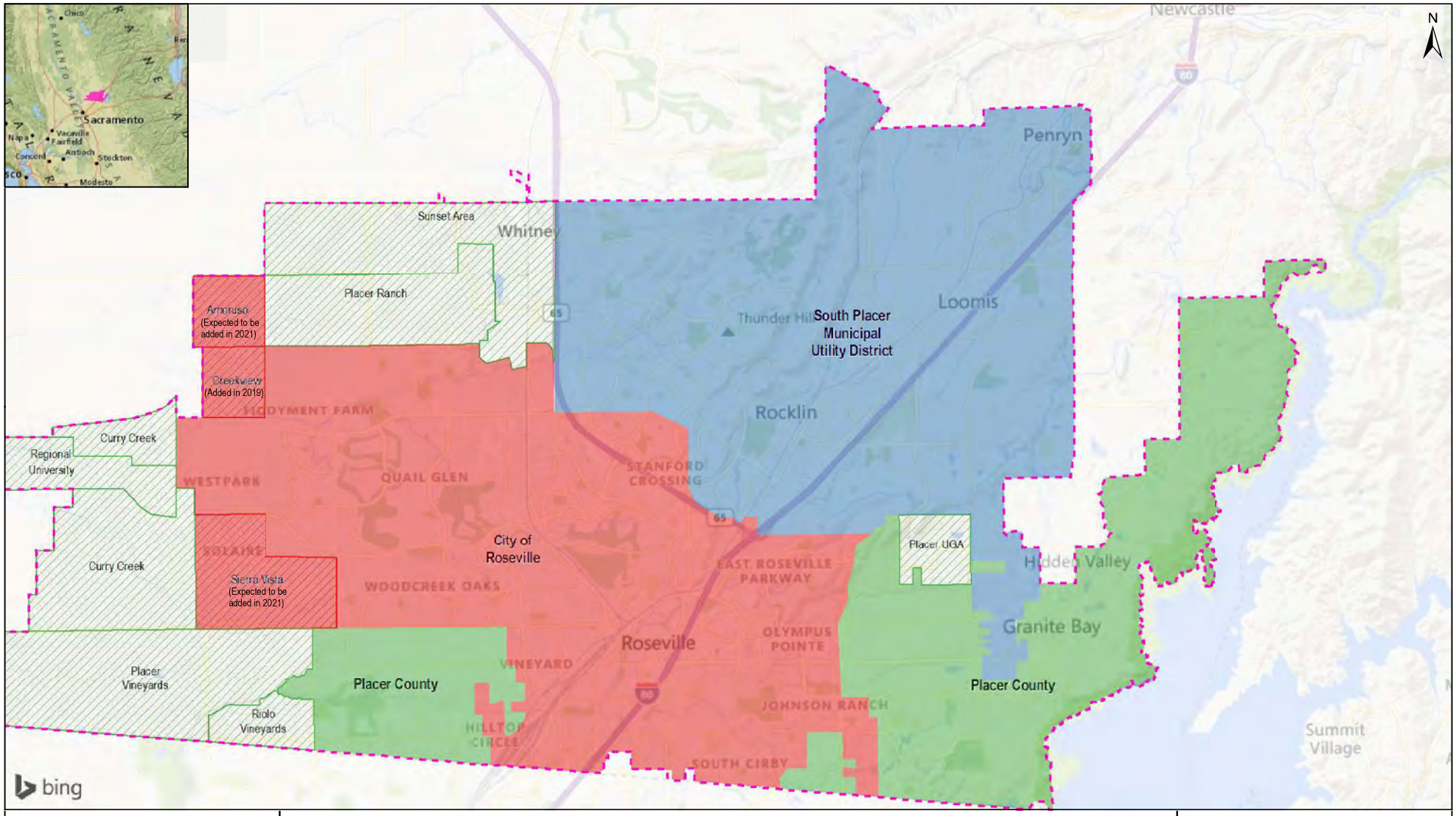


Figure 1-1
2021 Service Area Boundary

South Placer Wastewater Authority
2020 Systems Evaluation

0 ½ 1 2 Miles

2021 Partner Agency Service Area
- City of Roseville
- Placer County
- SPMUD

Urban Growth Area
- City of Roseville UGA
- Placer County UGA

Ultimate Service Area Boundary

Project #: 0011183.00
Map Created: December 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. Data Sources: SPWA Agencies, ESRI, W&C

Figure Exported: 12/21/2020 By: evanjlanden Using: \\woodardcurran.net\shared\Projects\RMC\WCR\0091 Roseville, City of\0011183.00 SPWA Systems Evaluation\G. GIS\3 MXDs\Report Figures\1-1_SPWA_Service_Area.mxd

1.2 Project Scope

The scope of the Systems Evaluation, as well as a brief discussion of work conducted under each task, is described below.

- **Task 1 – Project Management.**

  Periodic progress meetings were held with City staff to review project status and discuss project issues, and monthly status reports were prepared to document the work completed.

- **Task 2 – Data Collection and Review.**

  This task involved assembling, organizing, and reviewing information and data related to the sewer system, including previous reports; maps and drawings of sewer system facilities and recent sewer improvement projects; water use and customer account data; the City's General Plan and other relevant planning information; and sewer design standards and specifications. This task also included meetings with City Planning staff, Placer County and SPMUD to confirm growth and future land use assumptions within the City of Roseville as well as from the SPWA partners outside the City.

- **Task 3 – Flow Monitoring.**

  A plan for flow and rainfall monitoring in the collection system during the 2015/16 wet weather season was developed. The program included 30 temporary flow meters (including 5 meters authorized by Task 5) and two rain gauges installed for a period of approximately two months (mid-January through mid-March). Gauge adjusted radar rainfall (GARR) data was also obtained for the rainfall periods. The monitoring was conducted by Woodard & Curran's subconsultant, V&A Consulting Engineers, and the GARR data was provided by OneRain, Inc.

- **Task 4 – Model Update and Calibration.**

  A hydraulic model of the City's trunk sewer system was developed using InfoWorks™ ICM software. The model network was developed using as-builts, the City's GIS data, and information from the 2005 Model Development Project. Flow loads to the model were compiled using water use and land use data and flow factors representing unit base wastewater flow (BWF) rates, diurnal BWF patterns, and infiltration/inflow (I/I). The model was calibrated for dry and wet weather conditions using the flow monitoring data collected under Task 2.

- **Task 5 – Update Flow Projections.**

  Based on data collected under Task 2 and discussions with SPWA and partner agencies' staff, existing and projected flows were developed. As part of this task, the best available planning information was collected and documented, including plans for Urban Growth Areas and parcel based data within the agencies' current service areas. A database of parcel-based projections within the SPMUD and Placer County Service areas was also prepared in this task. This information was used to estimate future flows and potential capacity needs.

- **Task 6 – Trunk Sewer Evaluation**

  In this task, the existing trunk sewers were evaluated against hydraulic performance criteria under the design storm conditions identified for the 2009 System Evaluation. Using the calibrated model and the selected design storm, existing and future model runs were performed to identify capacity deficiencies in the trunk sewer system. For those deficiencies, capacity improvement projects were developed.

- **Task 7 – Wastewater Treatment Plant Expansion Evaluations**

Based on the flow projections developed in Task 5 and buildout timeline information provided by City of Roseville, Placer County, and SPMUD, design flows and biological loading for both the Dry Creek and Pleasant Grove Wastewater Treatment Plants were developed. Based on these design flows and work completed by the City of Roseville, phased WWTP capacity expansions were identified considering current and future changes in regulatory requirements, and preliminary cost estimates were developed.

- **Task 8 – Prepare Systems Evaluation**

  This report was prepared to summarize and present the results and recommendations of the study.

1.3 Report Organization

This report includes five chapters, which are described below

- **Chapter 1, Introduction,** presents the background, objectives, and scope of the System Evaluation.
- **Chapter 2, Modeled Flow Projections,** discusses the service area land use projections, the basis for developing estimates for each component of wastewater flows, and the base wastewater flow projections for the service area.
- **Chapter 3, Trunk Sewer Evaluation,** describes the modeled trunk sewer system, development of the model network and model loads, flow monitoring program, and model calibration. This chapter also identifies the results of the capacity analysis, including preliminary solutions for the identified capacity deficiencies.
- **Chapter 4, Wastewater Treatment System Evaluation,** summarizes the wastewater treatment upgrade and expansion analyses performed for the Systems Evaluation, including the development of flow and loading peaking factors, facility expansion recommendations to handle projected flows and loadings at buildout, and a timeline for phasing the construction of the improvements.
- **Chapter 5, Capacity Improvement Summary,** summarizes the recommended capacity improvements, including project costs, phasing, and implementation recommendations.

2. BASIS OF FLOW PROJECTIONS

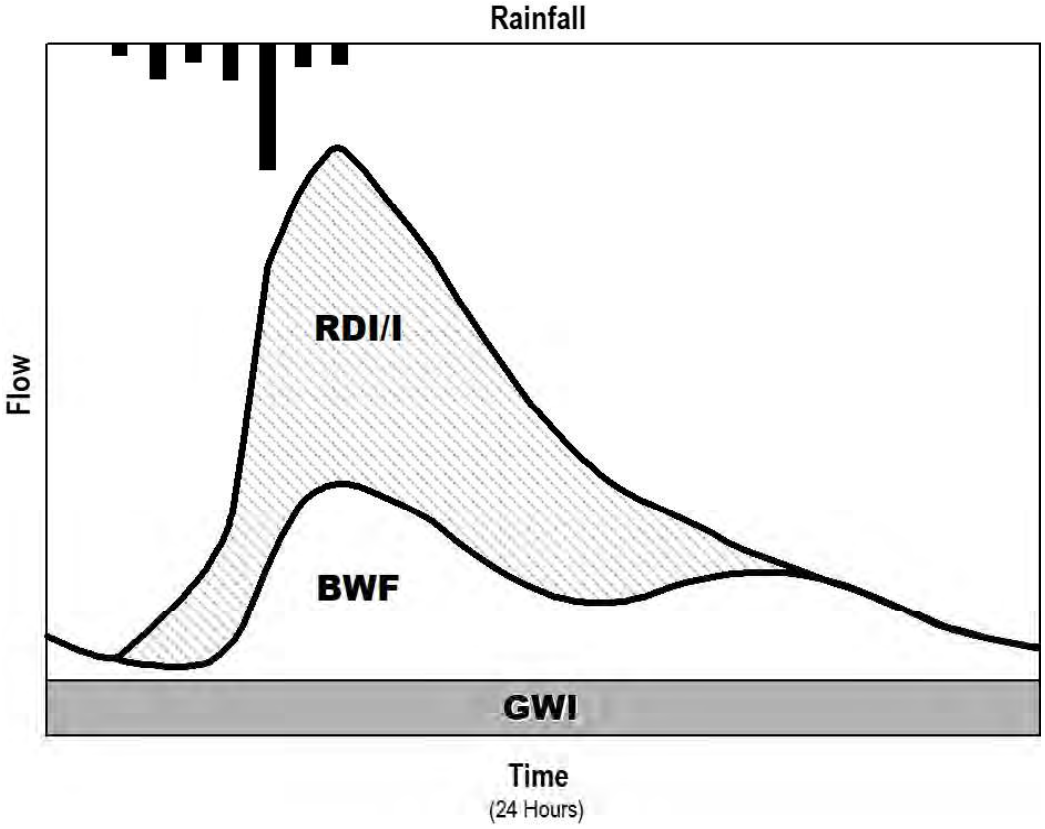
2.1 Introduction

The flow projections developed for this Systems Evaluation were based on the information collected for the system's hydraulic model updates, including the updates performed for the current study. In 2007, a hydraulic model of the City's sewer collection system was developed using the H2OMap Sewer modeling platform (2007 Model Development Project), in parallel with a trunk sewer model for the combined Roseville, SPMUD, and Placer County systems. The models were later updated as part of the 2009 Systems Evaluation. Subsequently, the City's sewer model was updated in 2017 to reflect existing and future demands within the City, and to upgrade the modeling platform to the fully dynamic InfoWorks ICM software. For the current Systems Evaluation Update, the City's model was updated to reflect existing and future projected flows from Placer County and SPMUD.

This section describes the flow components used in the hydraulic model and the existing and projected future land uses for the service area, which form the basis for generating base wastewater flows, in the current hydraulic model. Note that flow projections (referred herein as loads) are intended to represent the level of development present during the flow monitoring periods used to calibrate the hydraulic model. Design flow estimates were developed based on criteria developed for each component of wastewater flows: base wastewater flow (BWF), groundwater infiltration (GWI), and rainfall-dependent infiltration and inflow (RDI/I), and confirmed through model calibration, as described in Chapter 3. Average dry weather flow (ADWF) projections for each treatment plant area discussed in the Wastewater Treatment Plant Expansion Evaluations TM.

The three components of wastewater flows are illustrated conceptually in **Figure 2-1**. BWF represents the sanitary and process flow contributions from residential, commercial, institutional, and industrial users of the system. GWI is groundwater that infiltrates into defects in sewer pipes and manholes, particularly in winter and springtime in low-lying areas. GWI is typically seasonal in nature and remains relatively constant during specific periods of the year. ADWF represents the average flows at each WWTP from July to September. The source of these flows is a combination of BWF and GWI. RDI/I is storm water inflow and infiltration that enter the system in direct response to rainfall events, through direct connections such as holes in manhole covers or illegally connected roof leaders or area drains, or, more commonly, through defects in sewer pipes, manholes, and service laterals. RDI/I typically results in short term peak flows that recede quickly after the rainfall ends.

Figure 2-1: Wastewater Flow Components
(Not to scale)



2.2 Average Dry Weather Flow

ADWF has been estimated for four development scenarios: (1) Existing loads for model calibration; (2) Existing loads for capacity analysis; (3) Buildout; and (4) Buildout Sensitivity, which includes some additional densification and redevelopment assumptions based on feedback from the SPWA partners. As part of this Systems Evaluation, a database of existing and future loads for each parcel in Placer County and SPMUD service areas has been developed and provided to the City. As noted above, ADWF includes two components: GWI and BWF.

In 2007, a hydraulic model of the City's sewer collection system was developed using the H2OMap Sewer modeling platform (2007 Model Development Project), in parallel with a trunk sewer model for the combined Roseville, SPMUD, and Placer County systems. The models were later updated as part of the 2009 Systems Evaluation. Subsequently, the City's sewer model was updated in 2017 to reflect existing and future demands within the City, and to upgrade the modeling platform to the fully dynamic InfoWorks ICM software. For the current Systems Evaluation Update, the City's model was updated to reflect existing and future projected flows from Placer County and SPMUD.

This section describes the flow projections and model development process used to evaluate the SPWA collection system (sewers conveying flows from more than one partner agency), as well as findings from that effort.

2.2.1 Diurnal Base Wastewater Flow Curves

BWF varies throughout the day in a typical way, generally peaking early in the morning in upstream sewers and later and less sharply in larger downstream sewers. Typical hourly peak flows from small residential areas tend to be about twice the average flow (or even higher for very small areas), whereas peak flows further downstream may be less than 1.5 times average flows due to flow attenuation in the collection system. Higher peaks can occur on atypical days of the year (e.g., on major holidays such as Thanksgiving or at halftime on Super Bowl Sunday).

For the current Systems Evaluation Update, typical diurnal profiles were developed for residential and commercial/industrial (non-residential) wastewater flow, for both weekend and weekday conditions. These hydraulic profiles are shown in **Figure 2-2** and **Figure 2-3.** The residential profiles were developed based on monitored flows for smaller, primarily residential meter areas and refined during calibration. Two non-residential profiles were developed to represent flow patterns from two different types of uses: commercial/retail pattern, and an industrial/professional pattern. For parcels inside the City, each non-residential parcel was assigned a non-residential diurnal profile according to the land use code in the parcel database; a summary of the diurnal profile assigned to each land use code is provided in Appendix A. For non-residential parcels in Placer County and SPMUD, the commercial/retail pattern was used.

For UGAs, the residential profile was used for all residential uses, and the retail/commercial diurnal profile was used for all non-residential and mixed use land uses.

Figure 2-2: Residential Diurnal Curves

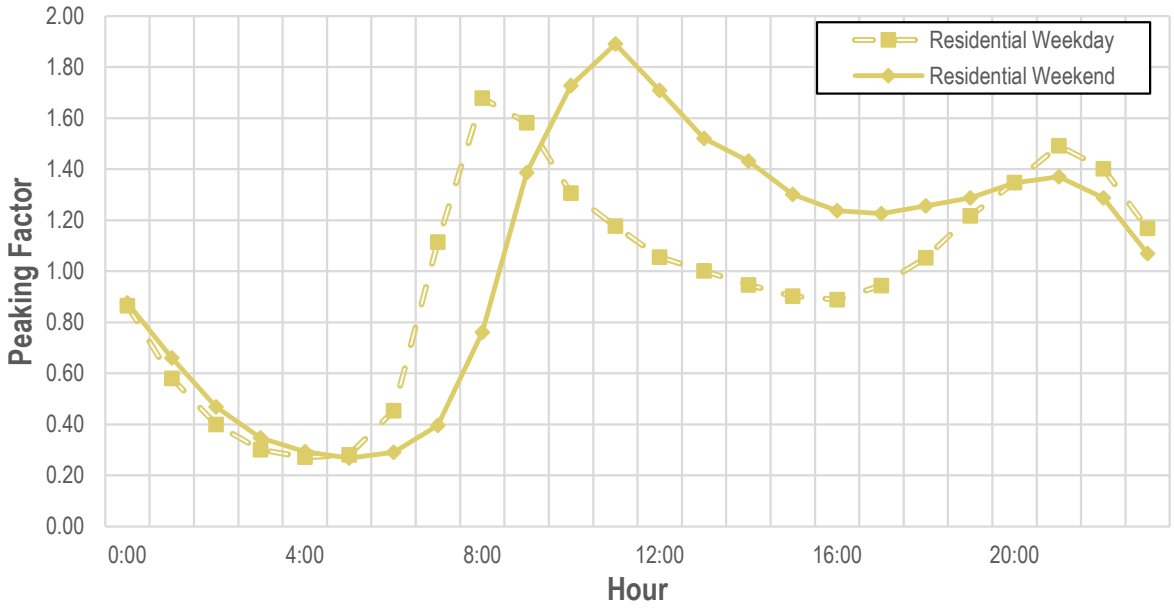
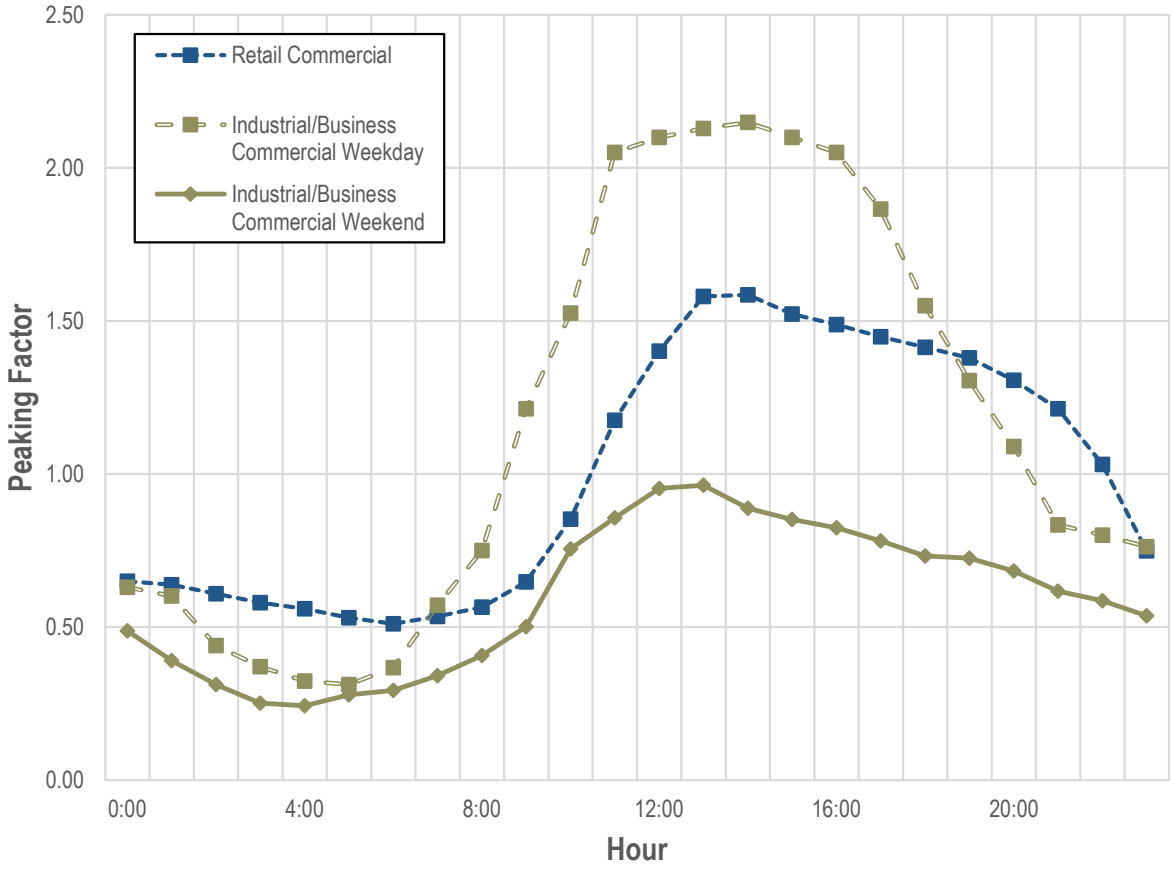


Figure 2-3: Non-Residential Diurnal Curves



2.2.2 Groundwater Infiltration

Groundwater infiltration is generally quantified based on actual flow monitoring data, since it is difficult to predict GWI rates based on physical system data alone. In the context of design flow criteria, GWI represents the incremental groundwater infiltration that occurs during the wet weather season above the "baseline" infiltration level during the driest months of the year.

GWI can be estimated based on minimum flows during non-rainfall periods within a wet weather flow monitoring period. Minimum flows typical occur during the nighttime or early morning hours when base wastewater flows are at a low. Alternatively, GWI can be estimated as the difference between average metered flow during non-rainfall periods and computed average BWF. In either case, the resulting GWI, is expressed on a unit basis (gpd/acre or gpad) by dividing by the sewered acreage of the monitored area. Typical GWI rates may range from 100 to over 1,000 gpad.

GWI flows for existing connected parcels were estimated through the model calibration process (see Chapter 3) by comparing model-simulated BWF to actual flow measurements from the temporary flow monitoring program. Cases where model-predicted BWF was noticeably lower than monitored flow indicated the possible occurrence of GWI.

2.2.3 Existing Base Wastewater Flows

Existing base wastewater flows were developed based on the assumptions summarized below; currently connected parcels are indicated in **Figure 2-4**. Note that loads are intended to represent the level of development present during the flow monitoring periods used to calibrate the hydraulic model.

2.2.3.1 City of Roseville

As noted previously, flows within City limits were estimated as part of the 2017 Sewer Model Update. As part of that study, existing residential and non-residential BWF within the City was determined based on water billing data provided by the City. The City has relatively complete water use records for all parcels within the City; billing data from December 2013 through April 2016 was provided for use in developing BWF estimates for the model. Metered water use during the winter months is assumed to most closely approximate wastewater generation, since outdoor water use is at a minimum. As data for the City of Roseville came from work done in 2016, existing BWF estimates for the City of Roseville represents 2016 land use.

December 2015 through March 2016 data was selected to represent winter water use, as it was generally wetter than prior years and therefore less irrigation was employed. This data also coincides with the flow monitoring period for the 2017 Sewer Model Update and should therefore correlate better with the recorded data during model calibration. It was assumed that all water use during these months was returned to the sewer; this assumption was validated during calibration. Note that the 2015/2016 wet season occurred after several years of drought. Therefore, water use levels may be lower than non-drought years due to conservation.

Where water use data was not available (limited portions of the City), sewer generation rates were estimated based on existing dwelling units indicated in the parcel database. For purposes of calibration, a single family rate of 160 gpd per DU and a multi-family rate of 120 gpd per DU were assumed, based on average rates from the December 2015 through March 2016 billing data. Using GIS processes, BWF loads from each parcel were then allocated to the nearest City sewer.

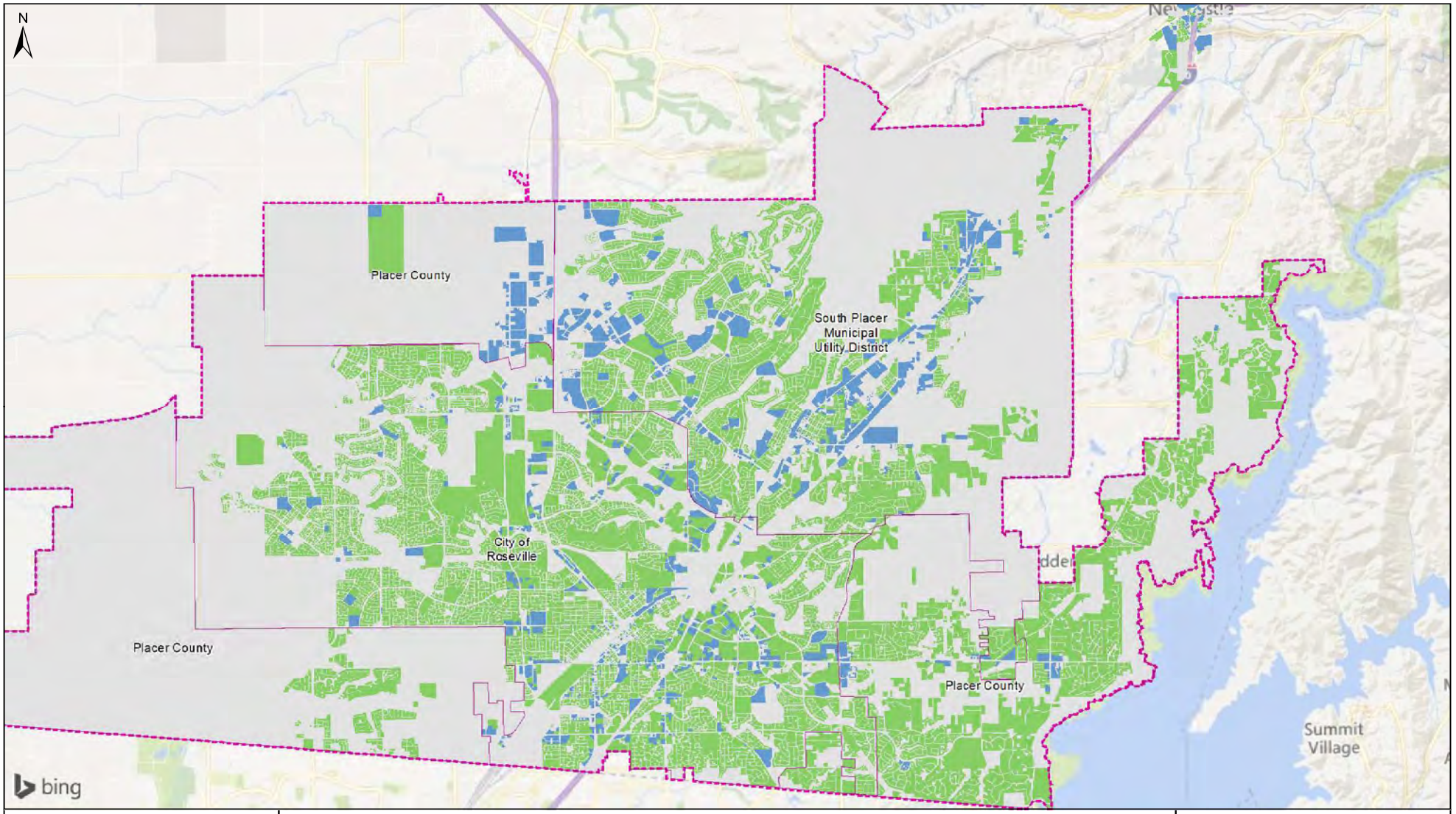


Figure 2-4

Existing[1] Connected Parcels

South Placer Wastewater Authority
2020 Systems Evaluation

0 ½ 1 2 Miles

Parcel Land Use

- Commercial/Industrial
- Residential
- Unconnected

- Service Area Boundary
- Partner Agency Boundary

1. "Existing" represents 2015/2016 connections within the City of Roseville and 2019 connections for Placer County and SPMUD.

Project #: 0011183.00
Map Created: December 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources:** SPWA Agencies, ESRI, W&C

Figure Exported: 12/21/2020 By: cvanlaenden Using: \\woodardcurran.net\shared\Projects\RMC\WCR\0091 Roseville, City of\0011183.00 SPWA Systems Evaluation\G. GIS\3 MXDs\Report Figures\2-4 Existing Connected Parcels.mxd

2.2.3.2 Placer County and SPMUD

Placer County provided spreadsheets summarizing equivalent dwelling units (EDUs) for each APN[1]. (Note: an EDU is defined as the flow equivalent of one single-family residence.) This dataset was then joined to a parcel dataset downloaded from the County website (downloaded March 20th, 2019), and then allocated to the nearest Placer County sewer. Since not all Placer County sewers are included in the model, GIS processes were used to identify the modeled manhole downstream of the parcel. All of the EDUs included in the spreadsheets were assigned to parcels and allocated to modeled manholes in this way. Each parcel was assigned either a residential or commercial loading pattern based on its general plan category as summarized in Appendix A.

SPMUD provided a shapefile[2] which provided EDUs for the year 2020 (which was identified as "existing" land use by SPMUD staff), an associated SPMUD manhole, and a type of use (residential or commercial) for each parcel. As for Placer County, GIS processes were used to identify the modeled manhole downstream of the parcel.

During calibration, a base wastewater flowrate of 160 gpd per EDU was typically applied, but this factor was adjusted down in some cases by 15 or 20 percent based on data from wastewater flow meters in the collection system.

2.2.3.3 Drought Rebound

The calibration period occurred during the third year of an ongoing drought. Billing data and flow records indicate a general decline in water use, likely due to the drought-induced conservation primarily limiting irrigation water use but also reducing indoor water use. Analysis of billing data indicates that on a per dwelling unit basis, water use was reduced by approximately 15 percent between 2014 and 2016. Therefore, for capacity analysis purposes of the existing system and for all future scenarios, it has been assumed that base wastewater flows within the City would increase by 15 percent.

For Placer County and SPMUD, BWF was increased to 180 gpd per EDU, which is consistent with the BWF assumptions used in the 2009 Systems Evaluation and is approximately a 15 percent increase compared to calibrated flow factors overall, though specific flow meter basins assume a higher rebound percentage (wherever the flowrate per EDU was decreased during calibration).

2.2.4 Future Average Dry Weather Flow

Future BWF from the City, SPMUD, and Placer County have been estimated for a Buildout scenario (representing likely future land use based on current data) as well as a Buildout-Sensitivity scenario (representing higher potential growth) using the factors summarized in **Table 2-1**. For consistency with WWTP flow projections, ADWF flow factors are used, which includes some dry season GWI.

The locations of future developments, including urban growth areas, are indicated in **Figure 2-5**, and discussed further in the next sections.

[1] Spreadsheets included: Existing dry creek EDU-7-24-19.xls, Existing SMD 2- EDU-2018-12-12.xlsx, Existing SMD 3- EDU-2018-12-12.xlsx, Existing Sunset EDU-7-24-19.xls

[2] SPMUD_SewerLoading_AddressPoints, provided August 7, 2019.

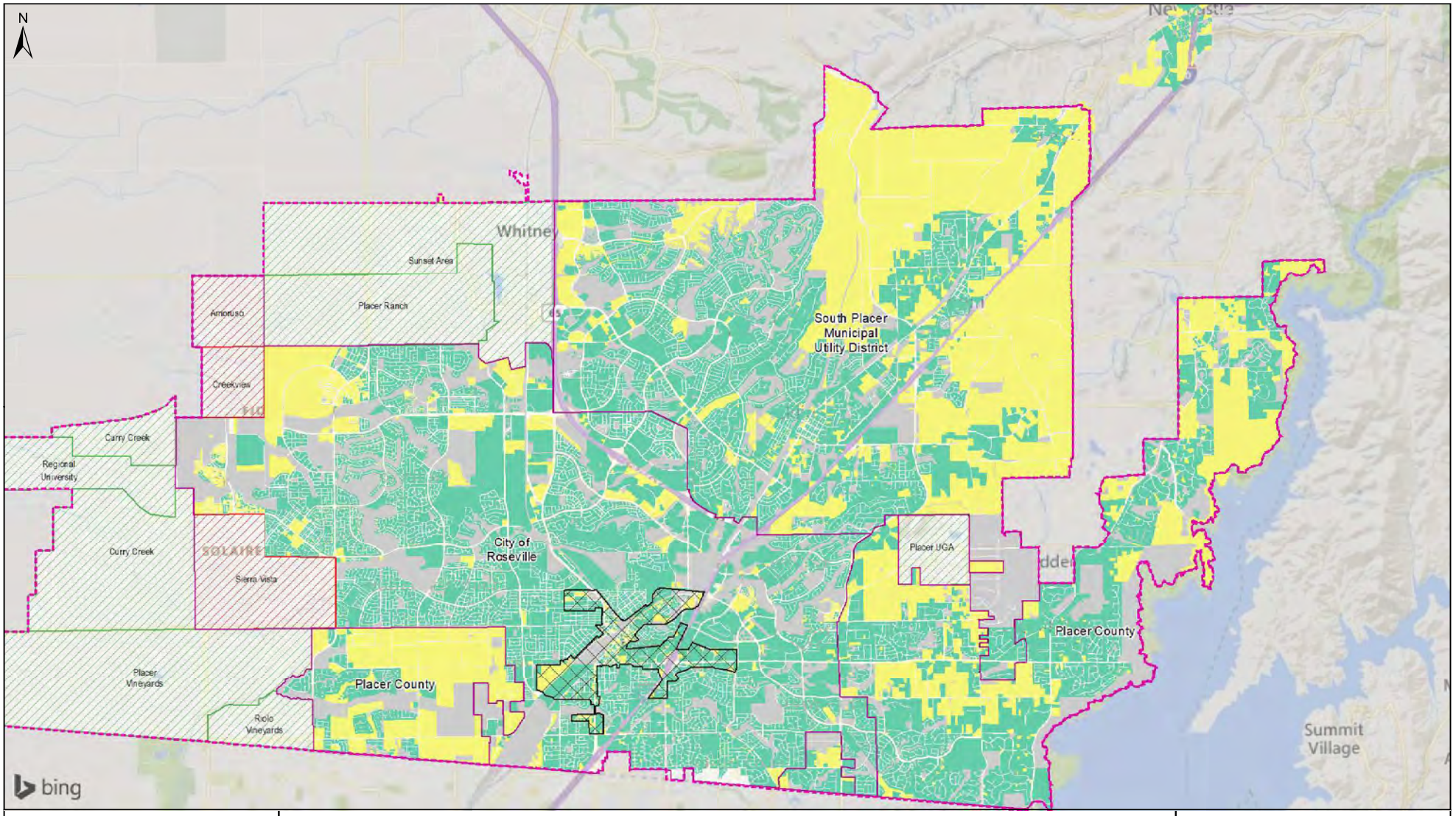


Figure 2-5
Future Development and Urban Growth Areas

South Placer Wastewater Authority
2020 Systems Evaluation

0 ½ 1 2 Miles

Buildout Status
- Existing
- Future Connection
- Unconnected
- Redevelopment Area

Urban Growth Area
- City of Roseville UGA
- Placer County UGA

Service Area Boundary

Partner Agency Boundary

Project #: 0011183.00
Map Created: December 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources:** SPWA Agencies, ESRI, W&C

Figure Exported: 12/21/2020 By: evanjlanden Using: \\woodardcurran.net\shared\Projects\RMC\WCR\0091 Roseville, City of\0011183.00 SPWA Systems Evaluation\G. GIS\3 MXD\Report Figures\2-5 Future Developments and Urban Growth Areas.mxd

Table 2-1: Average Dry Weather Flow Factors

Land Use Designation	Units	Unit Flow Factors [a]
Commercial	gpd per acre	850
Heavy Industrial	gpd per acre	850
Light Industrial	gpd per acre	850
Mixed Use	gpd per acre	2,300
Public/Quasi-Public	gpd per acre	660
Schools	gpd per acre	170
Residential Single DU (or EDU)	gpd per du	190
Residential Mult. DU [b]	gpd per acre	2,040
Parks > 10 Acres	gpd per acre	10
Vacant/Open Space	gpd per acre	0

Notes:
a. Includes allowance for GWI.
b. The Residential Multiple DU unit flow factor can also be represented as 130 gpd per du

2.2.4.1 City of Roseville

For the City of Roseville, the Buildout scenario is based on infill of currently vacant parcels, using land use information from the City's General Plan or provided by the City's planning department, and development of the Sierra Vista, Creekview, and Amoruso UGAs. Sources of data included the following:

- Parcel data downloaded from the City's website (download dated 8/25/2016). The parcel data has the following fields that were used for to estimate future demands:
    - PotUnits: The total number of units allocated to the parcel, prior to any development. Once development beings, potential units is reduced to zero.
    - Undevunits: Once development commences, undeveloped units are the number of vacant lots in the subdivision that do not have a single family unit
    - PotArea: the total developable square footage of the parcel upon its creation. Once development begins, the area is reduced to zero.
    - UndevArea: Once development commences, if the parcel is not fully developed, the number refers to the remaining available square footage of land available to be developed
- The West Roseville Specific Plan (*West Roseville Specific Plan*, EIP Associates, dated February 4, 2004) was used to confirm future units within the West Roseville Specific Plan area.
- Land use data for several specific developments was provided by City Planning, where that data was likely to be more current and more detailed than available in the current GIS.

Infill locations are indicated in **Figure 2-5**.

2.2.4.1.1 Redevelopment (Buildout-Sensitivity Scenario)

The Buildout-Sensitivity scenario includes redevelopment of a portion of the City, as indicated in **Figure 2-5**. Redevelopment occurs where existing land uses are removed and replaced with new, typically more intensive land

uses (and associated sewer flows). Redevelopment land uses are based on parcel-based classifications developed for the 2009 Systems Evaluation. It was assumed that existing land uses for the parcels in the redevelopment area would be replaced by the land uses in the redevelopment plan. Overall, redevelopment results in an increase in ADWF of about 1.5 mgd from the Buildout Scenario. More detailed information on the redevelopment land uses inside the City is included in TM 9C of the 2009 Systems Evaluation.

2.2.4.2 Placer County and SPMUD

Placer County provided a spreadsheet that summarized the anticipated EDUs for all entitled projects in Placer County[1]. EDUs for other currently vacant parcels were estimated using general plan data[1]. Specifically, the general plan shapefile indicated a minimum and maximum density for each category; the categories used for this study, and the associated density and diurnal curve used are summarized in Appendix A. For the Buildout-Sensitivity scenario, Placer County staff suggested an assumption that 60 percent of parcels zoned for residential development would densify to 30 percent higher than the maximum density allowed in the general plan. GIS processes were used to allocate each parcel to the nearest Placer County sewer, and then associated with the modeled manhole downstream of the parcel.

The shapefile provided by SPMUD specified the EDUs in 2060 for each parcel, as well as an associated SPMUD manhole. As for assignment of existing loads, GIS processes were used to identify the modeled manhole downstream of the parcel.

Locations of future development in Placer County and SPMUD are indicated on **Figure 2-5.**

2.2.4.3 Urban Growth Areas

Several UGAs were identified in the 2009 Systems Evaluation and have been included in this evaluation. Locations of the UGAs are shown in **Figure 2-5**. Placer County UGAs include Placer Ranch, Sunset Area, Placer Vineyards, Regional University, Riolo Vineyards, and Curry Creek; the SMD-3 UGA has been incorporated into the current Service Area Boundary. UGAs within the City identified for included Sierra Vista, Creekview, and Amoruso; these UGAs either have already been added to the current Service Area Boundary or are expected to be added in early 2021 (as shown in Figure 1-1) but are included here for consistency with the City's 2017 Model Update. Land use and flow projections were based on the most recent wastewater master plans for each UGA, as indicated below. Flows associated with each UGA are summarized in **Table 2-2**. A more detailed summary of land uses for each UGA broken out by sewershed is included in Appendix B.

- Sierra Vista (*Sierra Vista Specific Plan Sanitary Sewer Master Plan*, Mackay & Somps Civil Engineers, July 2009)
- Creekview (*Creekview Specific Plan Sanitary Sewer Master Plan*, Mackay & Somps Civil Engineers, November 2010)
- Amoruso (*Amoruso Ranch Specific Plan Area Wastewater Master Plan*, Kimley Horn, September 2015)
- Placer Ranch (*Placer Ranch Sewer Master Plan,* Mackay & Somps, July 2017*)*

[1] 2018-12-18-Entitled-Planned Project.xlsx (provided December, 2018) and GeneralPlans_CommPlans.shp (downloaded from Placer County website, dated October 20, 2019)

- Sunset Area (*Sunset Area Water, Wastewater, and Recycled Water Technical Report,* Psomas, October 2017)
- Placer Vineyards (*Placer Vineyards Specific Plan; Sanitary Sewer Master Plan Addendum 1,* Mackay & Somps, May 2019)
- Regional University (*Regional University Specific Plan, Sanitary Sewer Demand*, Mackay & Somps, September 1, 2017)
- Riolo Vineyards (*Riolo Vineyards Sanitary Sewer Master Plan Update*, Unico Engineering, April 2016)
- Curry Creek (*2009 SPWA Systems Evaluation*, RMC Water & Environment, 2009). No current planning information is available for Curry Creek. Preliminary land use estimates were developed for the 2009 Systems Evaluation and used again for this evaluation.
- Placer UGA (*Hawk Homestead Sewer Analysis – Supplementary Information Requested by Placer County Environmental Engineering,* Derrick Whitehead, Municipal Consulting Group, January 29, 2016)

Table 2-2: ADWF from UGAs

UGA	Agency	WWTP	Total Area (ac)	Buildout ADWF (mgd)
Sierra Vista	Roseville	Pleasant Grove	2,064	1.83
Creekview	Roseville	Pleasant Grove	501	0.43
Amoruso[a]	Roseville	Pleasant Grove	694	0.61
Placer Ranch	Placer County	Pleasant Grove	2,213	2.15
Sunset Area[b]	Placer County	Pleasant Grove	2,888	3.80
Placer Vineyards	Placer County	Dry Creek	5,230	2.89
Regional University	Placer County	Pleasant Grove	1,159	1.17
Riolo Vineyards	Placer County	Pleasant Grove	879	0.23
Curry Creek	Placer County	Pleasant Grove	3,212	2.74
Placer UGA	Placer County	Pleasant Grove	617	0.04

Notes:
a. Includes 274 units north of Amoruso that would contribute flow through sewers in Amoruso (Toad Hill)
b. Does not include the Placer Ranch subset of the Sunset Area Plan

2.2.5 Dry Weather Flow Summary

Existing and Projected Future Dry Weather Flows are summarized in **Table 2-3**. Note that these estimates include wet season GWI, which may be higher than dry season GWI.

Table 2-3: Estimated Dry Weather Flows[a] by Agency

WWTP	Agency	Existing Calibration ADWF (mgd)	Existing ADWF with Drought Rebound	Buildout ADWF (mgd)	Buildout-Sensitivity[b] ADWF (mgd)
Pleasant Grove	Roseville	5.87	6.70	13.01	13.04
	Placer County	0.18	0.20	9.85	9.85
	SPMUD	2.25	2.97	3.63	3.63
	Total	**8.30**	**9.87**	**26.49**	**26.52**
Dry Creek	Roseville	5.60	6.27	6.89	8.23
	Placer County	2.57	2.81	7.19	7.42
	SPMUD	2.90	3.64	5.16	5.16
	Total	**11.06**	**12.72**	**19.24**	**20.81**

Notes:

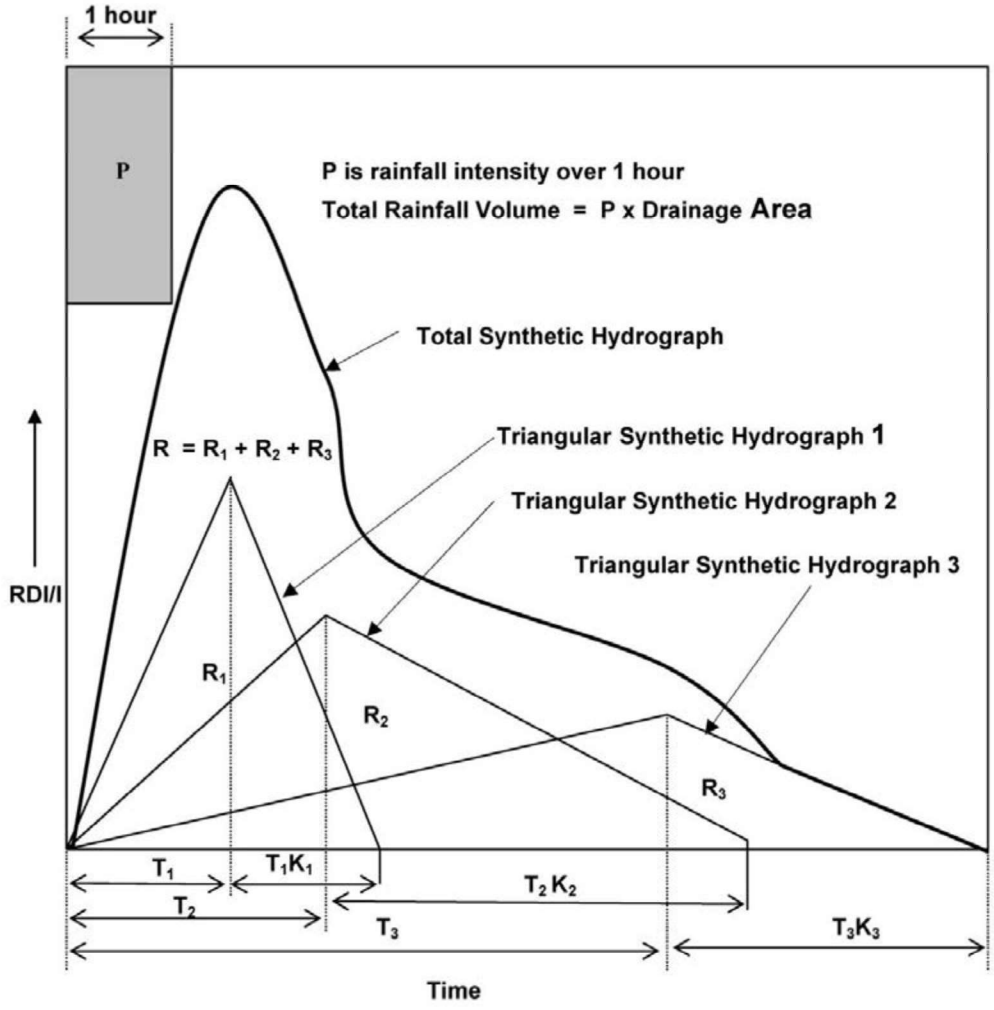
a. Includes wet season GWI.

b. For the Buildout-Sensitivity scenario, the development density was assumed to be at the maximum range allowed by the General Plan. A Base Wastewater Flowrate (BWF) of 180 gpd per EDU was assumed for Placer County and SPMUD.

2.3 Rainfall-Dependent Infiltration and Inflow

RDI/I flows result from rainfall events that produce infiltration and inflow of storm water runoff into the sewer system. RDI/I flows are defined by the magnitude, shape, and timing of the RDI/I response. RDI/I varies depending on many factors, including the magnitude and intensity of the storm event, area topography, type of soil, and the condition of the sewers, manholes, and sewer service laterals. In a dynamic model, RDI/I is typically computed as a percentage of the rainfall (sometimes referred to as the "R value") falling on the contributing area of a subcatchment for each of three or more hydrograph components, representing different response times to rainfall, e.g., fast, medium, and slow, as illustrated in **Figure 2-6**. The contributing area is assumed to be the sum of the area of all developed parcels, except for large open areas such as parks and parking lots. Summing all of the component hydrographs for the entire duration of the rainfall event results in the total RDI/I hydrograph for the event for that subcatchment. Note that although the "slow" RDI/I component can contribute significantly to the total RDI/I volume, the "fast" component has the biggest impact on the magnitude of the peak wet weather flow.

Figure 2-6: RDI/I Hydrograph Components



3. TRUNK SEWER EVALUATION

3.1 Introduction

This section describes the hydraulic analysis and design criteria used to evaluate system performance and size capacity relief projects in the trunk sewer system and identifies the capacity deficiencies based on the results of model runs.

3.2 Model Network Development

This section describes the development of the hydraulic model used for the capacity assessment of the SPWA trunk sewers. The modeling software used for this study was InfoWorks ICM by Innovyze, a fully dynamic hydraulic modeling program that has been used for many other collection systems in California, including Sacramento Area Sewer District, Regional San, and the City of Folsom. This section provides an overview of the model development process, including description of the modeled sewer network, the flow monitoring program, and the calibration of the model.

3.2.1 Modeling Terminology

Key modeling terms are defined below.

- **Network** refers to the representation of the physical facilities being modeled. Modeled network components include pipes, manholes, and pump stations.
- **Nodes** are primarily manholes, but also include pump station wet wells and outfalls (discharge points from the modeled system). Key data associated with nodes include manhole ground elevations and pump station wet well elevations and cross-sectional areas.
- **Pipes** or **conduits** are connections (links) between nodes, and include both gravity sewers, force mains and conduits. Key data associated with pipes are upstream and downstream node IDs, pipe length, diameter, roughness factor, and upstream and downstream invert elevations.
- **Pumps, gates, and overflow weirs** are represented in the model as links between nodes. Data associated with these facilities depend on the structure type. For example, data for weirs include width, elevation, and weir discharge coefficient.
- **Subcatchments** are areas that contribute flow to the modeled sewer network. They may represent parcels, or an area comprised of multiple parcels that are collected by unmodeled sewers in the collection system (sewershed). Data associated with subcatchments include BWF (computed based on population, water use, or other available data), type of diurnal BWF profile (which is a function of land use), I/I parameters, and the node at which the flow from the subcatchment enters the modeled system.
- **Model loads** are the flows entering the modeled sewer system from each subcatchment. Model loads include residential and commercial sanitary or BWF, GWI, and RDI/I. As a sum, they represent the total wastewater flow applied to the model.
- **Models** are the combination of a modeled network, its associated subcatchments and loads, and other data (e.g., rainfall, diurnal profiles, inflows from other areas, etc.) that comprise a specific model scenario.

3.2.2 Modeled System

The model network for this Systems Evaluation included trunk sewers from the City's model, as well as selected pipe reaches in SPMUD and Placer County. The extent of the modeled sewers in SPMUD and Placer County is consistent with the extent used in the 2009 Systems Evaluation, and generally includes 15-inch and larger trunk sewers. The existing modeled network is shown in **Figure 3-1**. **Figure 3-1** also highlights the trunk sewers within Roseville that convey flow from multiple SPWA partners and are the focus of the capacity analysis.

As noted previously, the model network was based on the model developed for the City's 2017 Sewer Model Update. For the trunk sewers in that model update, the City's GIS data was updated with rim and invert elevation data extracted from record drawings or, in some cases, ground elevation data from other datasets. In a few cases (e.g. at all flow splits) additional data was collected through survey or field inspection by City staff.

For the current Systems Evaluation Update, that model was extended into Placer County and SPMUD service areas to provide a more complete analysis of the regional trunk sewer system. GIS data provided by Placer County and SPMUD was used as the basis for extending the network into their respective systems. The model extent was limited to the extent used for the 2009 Systems Evaluation, but generally includes most 15-inch and larger sewers, as well as selected smaller diameter sewers. A model validation process was undertaken, similar to the process used in the City's 2017 Sewer Model Update.

Model validation generally includes the following:

- **Connectivity checks.** The modeled networks were checked for connectivity, which includes verifying that correct upstream/downstream manholes were identified for each pipe, with no missing links or nodes in the network. A connected network means that all pipes and manholes will be selected when the network is traced upstream from the model outfalls.
- **Missing data checks.** Key data required for modeling were reviewed to identify missing values. Missing data were inferred where reasonable (e.g., where one or two invert elevations were missing between populated values, the data could be interpolated), or populated based on data from the 2009 Systems Evaluation.
- **Profile review.** Profiles were plotted for each series of pipe segments in the modeled network to visually check for suspect data. Examples of suspect data include negative pipe slopes, abrupt steps up or down in pipe inverts, and pipe diameters that conflict with surrounding pipes. Where appropriate, corrections to suspect data were inferred. Otherwise, verification in the form of as-built drawings or field investigations were requested.
- **Special structures.** Flow splits (manholes with more than one outlet pipe) were identified for further verification of outlet pipe elevations and/or the existence of weir overflows or other control structures. Field verification and/or as-built drawings were requested as needed.

In all, the model includes approximately 83 miles of gravity trunk sewers, of which about 32 miles are considered SPWA facilities. All gravity pipelines are modeled assuming a Manning's n of 0.013.

The modeled system includes two pump stations that can convey regional flows as summarized in **Table 3-1**. PS 25 and PS 26 were designed to operate during high wet weather conditions by transferring flow between trunk sewers, thereby alleviating downstream capacity issues. Flow enters the pump station wet well when surcharge conditions in the adjacent gravity sewer overtops an associated weir. PS 25 is designed to limit surcharging in the trunk sewer on Old Auburn Road and conveys flows (mostly originating in Placer County) north towards the 21-inch trunk sewer downstream of Placer County's Sierra College Meter. PS 26 is designed to limit surcharging in that 21-inch easement sewer by conveying flows further north on East Roseville Parkway. City operations staff note that PS 26 is used regularly during wet weather conditions, but PS 25 has not been used in a number of years.

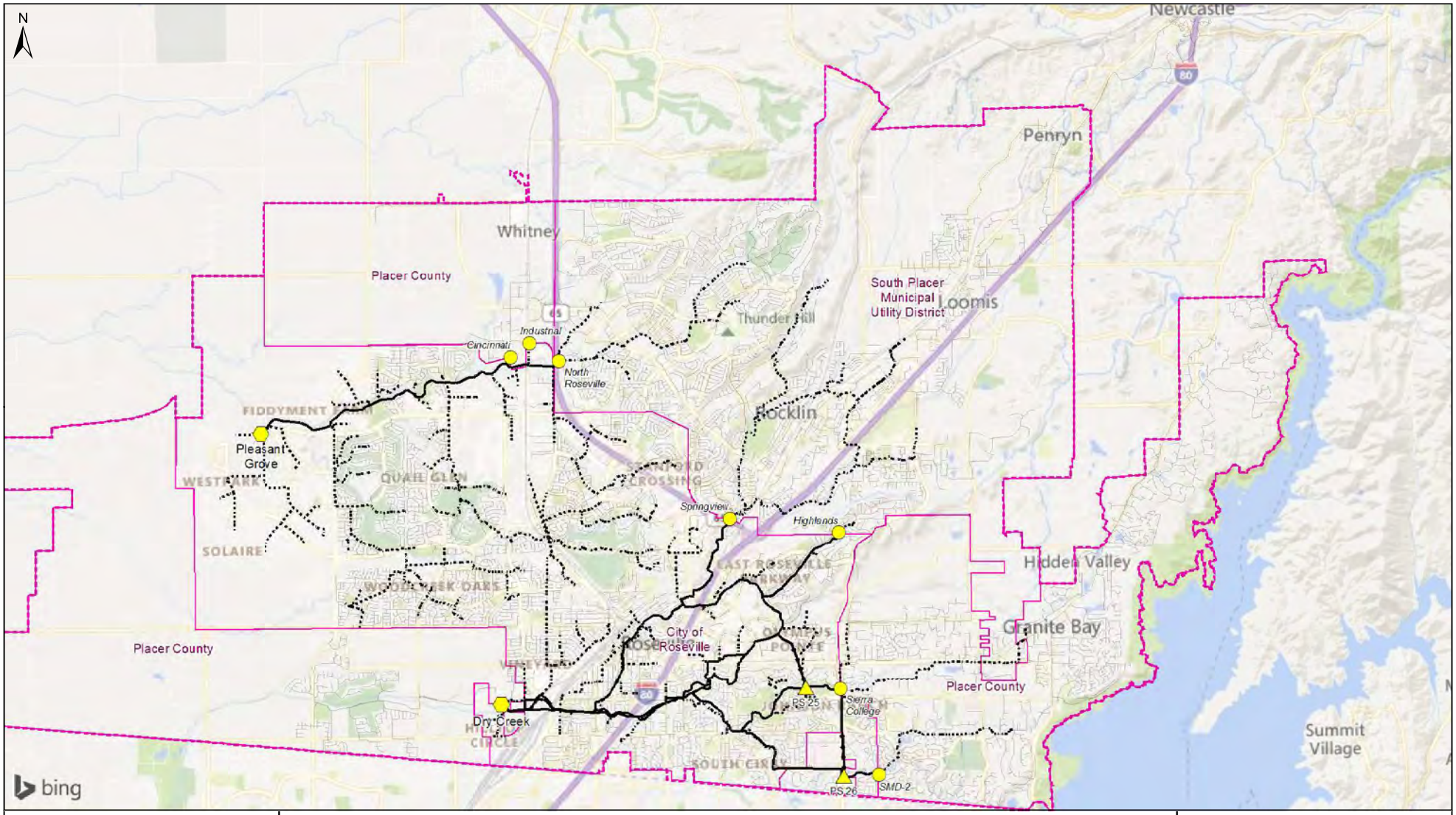


Figure 3-1
Modeled Trunk System

South Placer Wastewater Authority
2020 Systems Evaluation

0 ½ 1 2 Miles

- Regional Gravity Sewer
- Regional Force Main
- Non-Regional Modeled Sewer
- Non-Modeled Sewer
- Wastewater Treatment Plant
- Pump Station
- Permanent Flow Meters
- Partner Agency Boundary
- Ultimate Service Area Boundary

Project #: 0011183.00
Map Created: December 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources:** SPWA Agencies, ESRI, W&C

Placer ROSEVILLE

Figure Exported: 12/21/2020 By: evanlienden Using: \\woodardcurran.net\shared\Projects\RMC\WCR\0091 Roseville, City of\0011183.00 SPWA Systems Evaluation\G. GIS\3 MXDs\Report Figures\3-1 Modeled Trunk System.mxd

Table 3-1: Regional Pump Station Facilities

Pump Station	No. of Pumps	Firm Capacity[a] (mgd)	Total Capacity (mgd)	Force Main Dia. (in.)
PS 25[b] (Johnson Ranch)	2	2.02	3.20	12
PS 26 (Old Auburn)	2	0.43	0.68	8

Notes:

a. Capacity with one pump out of service.
b. Capacity of PS 25 is based on information collected as part of the 2009 Systems Evaluation. Capacity has not been evaluated for this study. Based on reports from City operations, PS 26 has not been used in several years.

3.2.3 Flow Monitoring Program

To support the development of the hydraulic model and flow projections for the Systems Evaluation Update, a temporary flow monitoring program was conducted as part of this study, including 30 meters during the 2015/2016 wet weather season (for the City's 2017 Model Update) and 12 meters during the 2018/2019 wet weather season (for SPMUD and Placer County). V&A Consulting Engineers, under subcontract to Woodard & Curran, conducted the monitoring. The meters and rain gauges were installed for a 2-month period from early January through early March for each wet weather season to capture the flow from the tributary areas. In addition, two recording rain gauges were also installed during both seasons and used for calibration of gauge-adjusted radar rainfall data. The locations of the flow monitoring sites are shown in **Figure 3-2.** The figure also shows the associated tributary area (basin) for each flow meter.

The locations of the flow meters relative to each other and to flow splits within the collection system are shown schematically in **Figure 3-3**. Note that many of the meters were located downstream of other meters; therefore, the tributary areas shown for each of these meters in **Figure 3-2** are the "incremental" areas between the flow meter and tributary basins of the upstream flow meters. Flow meter locations, pipe diameters, and upstream meters are listed in **Table 3-2** and **Table 3-3** for the permanent meters and temporary meters, respectively. Data for all meters during both flow monitoring periods are included in Appendix C.

The purpose of the flow monitoring program was to quantify the flows in the system to provide data with which to calibrate the hydraulic model (discussed later in this section), and to quantify the I/I response to storm events in various areas of the system.

Table 3-2: Permanent Flow Meters

Flow Meter ID (FM ID)	Agency	Downstream Meters	Upstream Meters
Cincinnati	Placer County	22	
Industrial	Placer County	22	
SMD-2	Placer County	11	161
Sierra College	Placer County	18	159, 160
Highlands	SPMUD	19	
North Roseville	SPMUD	22	151, 152, 153, 154, 155
Springview	SPMUD	14	156, 157, 158

Table 3-3: Temporary Flow Meter Locations

Flow Meter ID (FM ID)	Manhole ID	Diameter (in)[a]	Downstream Meters	Upstream Meters
1	E04-042	18	25	
2	E01-180	15	23	
3	D02-280	15	21	
4	B06-195	15	16, 17	
5	B04-003	12	15	
5A	B04-225	21	15	
6	C06-161	18	14	
7	D02-354	23.5	21	7A
7A	D03-115	12	7	
8	D04-201	24	24	
9	D02-068	18	21	
10	B06-341	18	16	
11[b]	A08-034	14.5	PS 26, 16, 17	SMD-2
12	B03-029	21	DC WWTP	
13[c]	B03-042	42	DC WWTP	16
14	B03-024	66	DC WWTP	6, 19, Springview
15	B03-053	36	DC WWTP	5, 5A, 15A, 17
15A	B04-082	12	15	
16	B04-151	30	13	4, 10, 11, 16A, 18
16A	B06-161	15	16, 17	
17	B05-258	21	15	4,1 6A, 11
18	B07-242	22.5	16	11, Sierra College
19	C06-024	35.5	14	20, Highlands
20	C07-003	24	19	
21	E01-149	33	23	3, 7, 9
22	F01-136	72	PG WWTP	24, 25, Cincinnati, Industrial, North Roseville
23	F01-147	36	PG WWTP	2, 21
24	F02-074	41.5	22	8
25	G04-041	21	22	1
26	F99-035	42	PG WWTP	
151	L02-001	24	North Roseville	
152	K02-005	18	North Roseville	
153	L03-014	18	North Roseville	
154	M06-004	18	North Roseville	
155	M06-003	21	North Roseville	
156	J07-058	15	Springview	
157	J07-060	18	Springview	
158	I10-037	18	Springview	
159	C9-02	17.4	Sierra College	161
160	C9-04	14.4	Sierra College	
161	B12-03	14.4	SMD-2	
162	D14-03	14.4	159	

Notes:

a. Actual measured diameter used for meter flow calculations (may be slightly different than pipe nominal diameter).
b. Meter located directly downstream of SMD-2 meter to confirm SMD-2 flows and for consistency with 2005 Flow Monitoring Program. Meter confirmed accuracy of flows at SMD-2 meter.
c. Meter placed for consistency with 2005 Flow Monitoring Program and to confirm measured flows to DC WWTP.

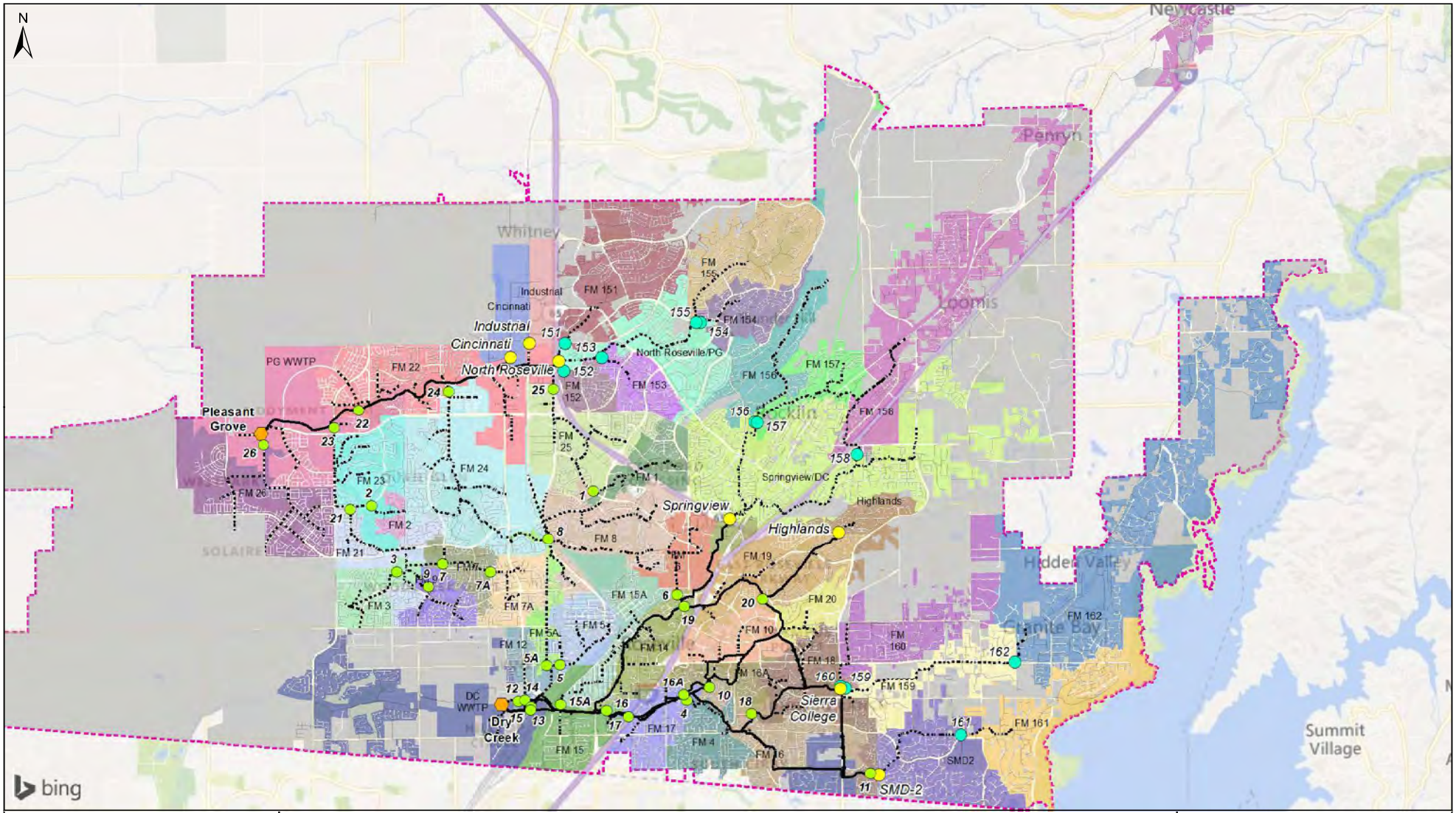


Figure 3-2

Flow Monitoring Locations

South Placer Wastewater Authority
2020 Systems Evaluation

0 ½ 1 2 Miles

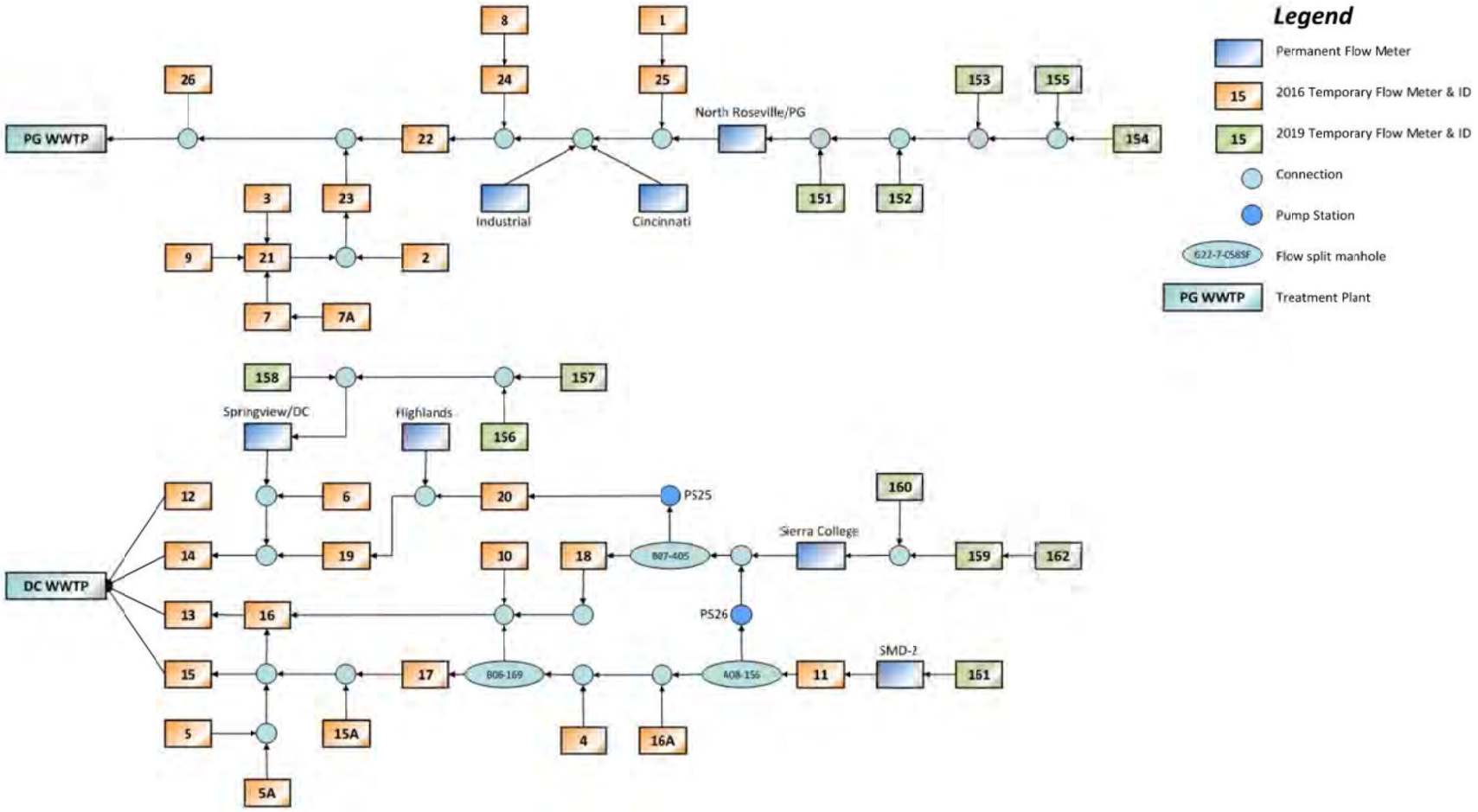
- Regional Gravity Sewer
- Regional Force Main
- Non-Regional Modeled Sewer
- Non-Modeled Sewer
- Permanent Flow Meters
- 152 2018/2019 Temporary Flow Meter
- 5 2015/2016 Temporary Flow Meter
- Wastewater Treatment Plant
- FM 152 Flow Meter Basin
- Ultimate Service Area Boundary

Project #: 0011183.00
Map Created: December 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources:** SPWA Agencies, ESRI, W&C

Figure Exported: 12/21/2020 By: cvanlaenden Using: \\woodardcurran.net\shared\Projects\RMC\WCR\0091 Roseville, City of\0011183.00 SPWA Systems Evaluation\G. GIS\3 MXDs\Report Figures\3-2 Flow Monitoring Locations v2.mxd

Figure 3-3: Flow Meter Schematic



3.2.3.1 Radar Rainfall Data

To obtain the most accurate spatial rainfall data for use in model calibration, gauge-adjusted radar rainfall (GARR) data was obtained for the rainfall events that occurred during both monitoring periods. GARR data combines the use of spatial rainfall estimates from radar data with point rainfall measurements from rain gauges located on the ground. The radar measures the reflected signals from falling raindrops in the atmosphere, which can then be translated into estimates of rainfall rates using mathematical and empirical relationships. However, the conversion of the reflected signals to rainfall rates is not sufficiently accurate to consistently estimate actual rainfall amounts at a given location, but does provide good information about the relative rainfall amounts at different locations (i.e., the spatial variation of rainfall). Therefore, the radar rainfall estimates are calibrated to (i.e., adjusted to match) more accurate rainfall measurements from rain gauges located on the ground in the area of study.

The process of converting radar images to GARR estimates is complex and must be conducted by trained and experienced radar rainfall specialists. There are several providers of GARR data throughout U.S. Each uses its own data processing techniques and proprietary algorithms to generate the gauge-adjusted radar rainfall estimates. For this study, Woodard & Curran contracted with OneRain, Inc. to provide the GARR data. The rainfall collected by the two V&A temporary rain gauges was provided to OneRain for use in their GARR calibration to supplement data available from permanent rain gauges owned by the City for its Flood Alert System.

OneRain developed the GARR data for the flow monitoring period in 5-minute time increments for 1 kilometer by 1 kilometer pixels (each approximately 250 acres in size) covering the entire SPWA service area (including SPMUD and Placer County). Approximately 200 pixels cover the sewered portions of the service area. The data was aggregated to 15-minute intervals for use in the model. The pixel containing the centroid of each model subcatchment defines the rainfall for that subcatchment for each rainfall event.

3.2.4 Model Loading

Section 4.4 described how BWF model loads were developed from water use and land use and growth projections. GWI and RDI/I flows were also loaded to the model by parcel by associating each parcel with a flow meter area. For each parcel, a sewershed ("contributing") area (i.e., area that potentially contributes I/I) was determined based on land use. Contributing areas for non-open space land uses, including residential, commercial, industrial, and institutional uses, were based on the full parcel area. Contributing areas for parks and other land uses that may contribute sewer flows but are likely to have significant open space were limited to 1 acre. Parcels comprised of open space, drainage channels, and large roadways such as freeways not likely to contribute sewer flows were assigned zero contributing area. I/I flows for each parcel were computed in the model by applying the appropriate meter area GWI and RDI/I parameters (determined during the model calibration process described below) to the contributing area of the parcel.

Parcels loading to the same modeled manhole are grouped into subcatchments. All BWF loads associated with each parcel in the subcatchment are then summed to calculate the overall BWF loading from the subcatchment. The contributing areas are also summed, and the appropriate meter area GWI and RDI/I parameters are assigned to calculate I/I flows for each subcatchment.

3.2.5 Model Calibration

Model calibration is the process of comparing model-computed flows to observed (monitored) flows to verify that the model is accurately simulating flows in the sewer system. The model is calibrated for both dry and wet weather conditions.

As described above, temporary flow monitoring programs were conducted during the late January through mid-March 2016 and 2018 wet weather periods. The data collected during these flow monitoring programs, as well as data from the permanent meters, were used for model calibration.

3.2.6 Dry Weather Calibration

The dry period in early to mid-February 2016 (for flow meters in the City) and late January 2019 (for flow meters in SPMUD and Placer County) were used as the dry weather calibration periods for the model. The dry weather calibration process was used to verify BWF loads and diurnal curves, and to quantify GWI (as indicated by monitored flows that were higher than estimated BWF). The dry period immediately prior to the wet weather calibration period in early March was also used to confirm the calibration.

Figure 3-4 shows an example plot of model vs. metered flow for one meter location (Site 155). In this graph, the green line represents the monitored (observed) flow, and the red line is the model-simulated flow. Calibration graphs for all meters throughout the monitoring program are included in Appendix D. Note that the Sierra College permanent meter was not operational during much of the 2019 season; however, nearly all tributary flows to this meter were measured as part of the temporary metering program. While most meters calibrated well for both 2016 and 2019 data, there were a few meters with discrepancies. The discrepancies are mostly due to differences in GWI observed in the temporary meters upstream of the Springview and Sierra College meters during the 2019 flow monitoring program versus the 2016 program. As 2016 had significantly less rainfall preceding the flow monitoring program, this GWI was likely not present during the 2016 flow monitoring program.

Table 3-4 summarizes the dry weather loading parameters determined for each flowmeter area during calibration. Calibrated unit flow factors are indicated on **Figure 3-5**, while estimated GWI rates for each flowmeter area are indicated on **Figure 3-6.**

The model calibration resulted in a reasonably good match of modeled to metered flow at most locations, but some differences at others. These differences may be due to inaccuracies in the meter data, inaccuracies in the water consumption data, or in the configuration of the system (e.g., upstream flow splits). The calibration process also resulted in further investigation and adjustments at the major flow split locations in the model (manholes SMH B06-169, SMH A08-156, SMH B07-405 and SMH D04-442). To ensure accuracy during calibration, sewers in the City's trunk model were updated based on survey, field investigation and City drawings to capture the physical structures of the flow splits and then adjusted as needed to better calibrate to the flow meter data.

For a few of the meters (FM 6, 10, and 16A), the water consumption data was not sufficient to account for all of the apparent flow observed by the flowmeter. This could be due to water use not in the water consumption database (e.g. water from another source, or error in the water consumption database), or an error in the flow meter data. To be conservative, some residential flow (less than 0.1 mgd) was distributed in each of the meter areas across all parcels to improve calibration.

Table 3-4: Dry Weather Flow Loading Parameters

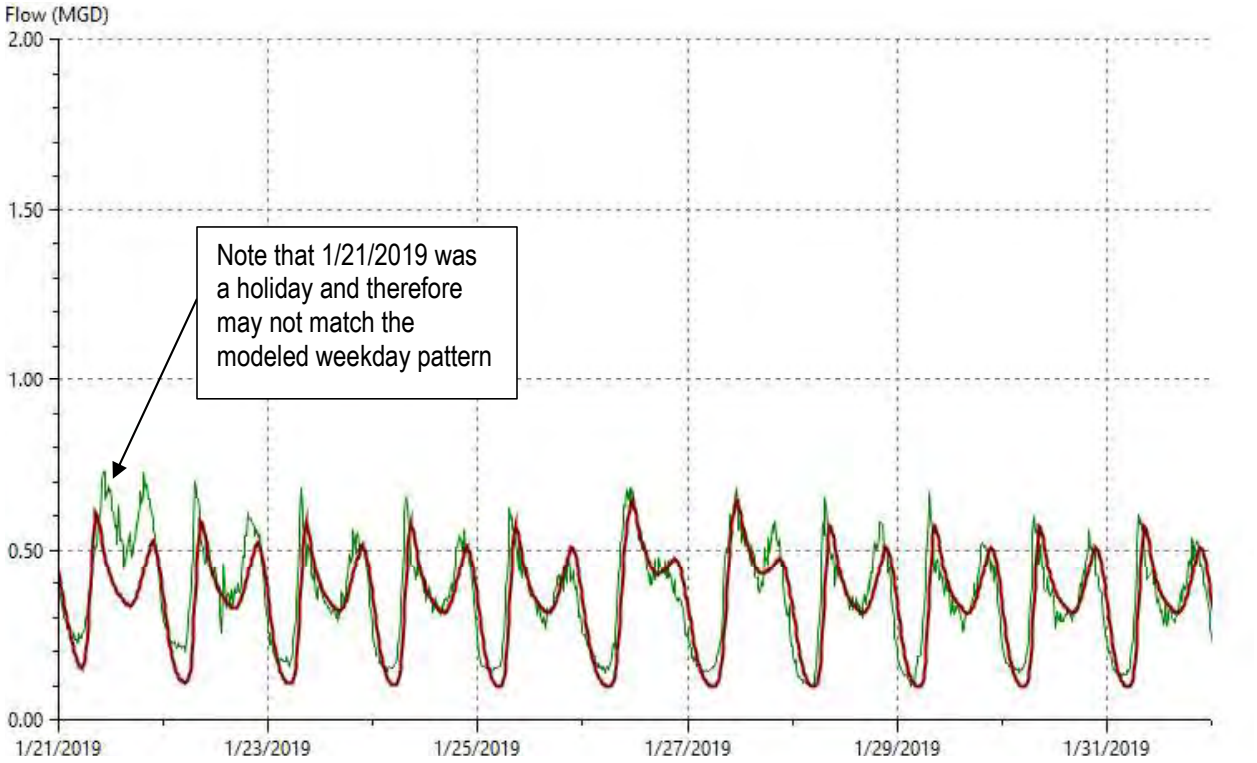
Flow Meter ID (FM ID)	Contributing Area[a] (acres)	Incremental Calibrated ABWF[a] (mgd)	Calibration ABWF Reduction Factor[b]	GWI (gpd/ac.)	GWI[a] (mgd)	Incremental Calibrated ADWF[a] (mgd)
1	297	0.28	0%	--	--	0.28
2	174	0.14	0%	--	--	0.14
3	270	0.29	0%	--	--	0.29
4	397	0.30	0%	--	--	0.30
5	241	0.30	0%	373	0.09	0.39
5A	181	0.14	0%	441	0.08	0.22
6	209	0.23	0%	192	0.04	0.27
7	181	0.19	0%	--	--	0.19
7A	349	0.42	0%	--	--	0.42
8	588	0.51	0%	425	0.25	0.76
9	209	0.22	0%	--	--	0.22
10	363	0.32	0%	--	--	0.32
11	0[b]	0.00	0%	--	--	0.00
12	157	0.15	0%	--	--	0.15
13	0[c]	0.00	0%	--	--	0.00
14	428	0.43	0%	--	--	0.43
15	328	0.31	0%	--	--	0.31
15A	326	0.30	0%	--	--	0.30
16	470	0.41	0%	1064	0.50	0.91
16A	219	0.27	0%	593	0.13	0.40
17	352	0.31	0%	--	--	0.31
18	364	0.34	0%	302	0.11	0.45
19	374	0.51	0%	561	0.21	0.72
20	172	0.18	0%	--	--	0.18
21	327	0.26	0%	--	--	0.26
22	857	0.58	0%	--	--	0.58
23	283	0.20	0%	--	--	0.20
24	932	1.38	0%	--	--	1.38
25	589	0.53	0%	170	0.10	0.53
26	423	0.34	0%	--	--	0.34
151	757	0.64	15%	--	--	0.64
152	218	0.25	0%	--	--	0.25
153	280	0.23	20%	--	--	0.23
154	384	0.23	20%	--	--	0.23
155	521	0.35	15%	--	--	0.35
156	562	0.21	15%	302	0.17	0.38
157	314	0.16	0%	96	0.03	0.19
158	1766	0.74	15%	130	0.23	0.97
159	497	0.11	0%	80	0.04	0.15
160	570	0.17	20%	175	0.1	0.27
161	818	0.21	0%	342	0.28	0.49
162	2124	0.44	0%	311	0.66	1.10
Cincinnati[d]	204	0.09	0%	--	--	0.09
Industrial[d]	121	0.06	0%	--	--	0.06
SMD-2	783	0.28	0%	--	--	0.28
Sierra College	14	0.01	0%	--	--	0.01
Highlands	344	0.11	0%	--	--	0.11

Flow Meter ID (FM ID)	Contributing Area[a] (acres)	Incremental Calibrated ABWF[a] (mgd)	Calibration ABWF Reduction Factor[b]	GWI (gpd/ac.)	GWI[a] (mgd)	Incremental Calibrated ADWF[a] (mgd)
North Roseville (Pleasant Grove)	1997	1.25	15%	--	--	1.25
Springview (Dry Creek)	605	0.55	15%	--	--	0.55

Notes:

a. For meters with upstream basins, represents the incremental meter basin area or flow, as shown on Figure 3-2.
b. Meter located directly downstream of SMD-2 meter to confirm SMD-2 flows and for consistency with 2005 Flow Monitoring Program
c. Meter placed for consistency with 2005 Flow Monitoring Program and to confirm measured flows to DC WWTP.
d. Due to highly variable and relatively small industrial flows, calibration of Cincinnati and Industrial meters was limited.

Figure 3-4: Example DWF Model Calibration Graph (Site 155)



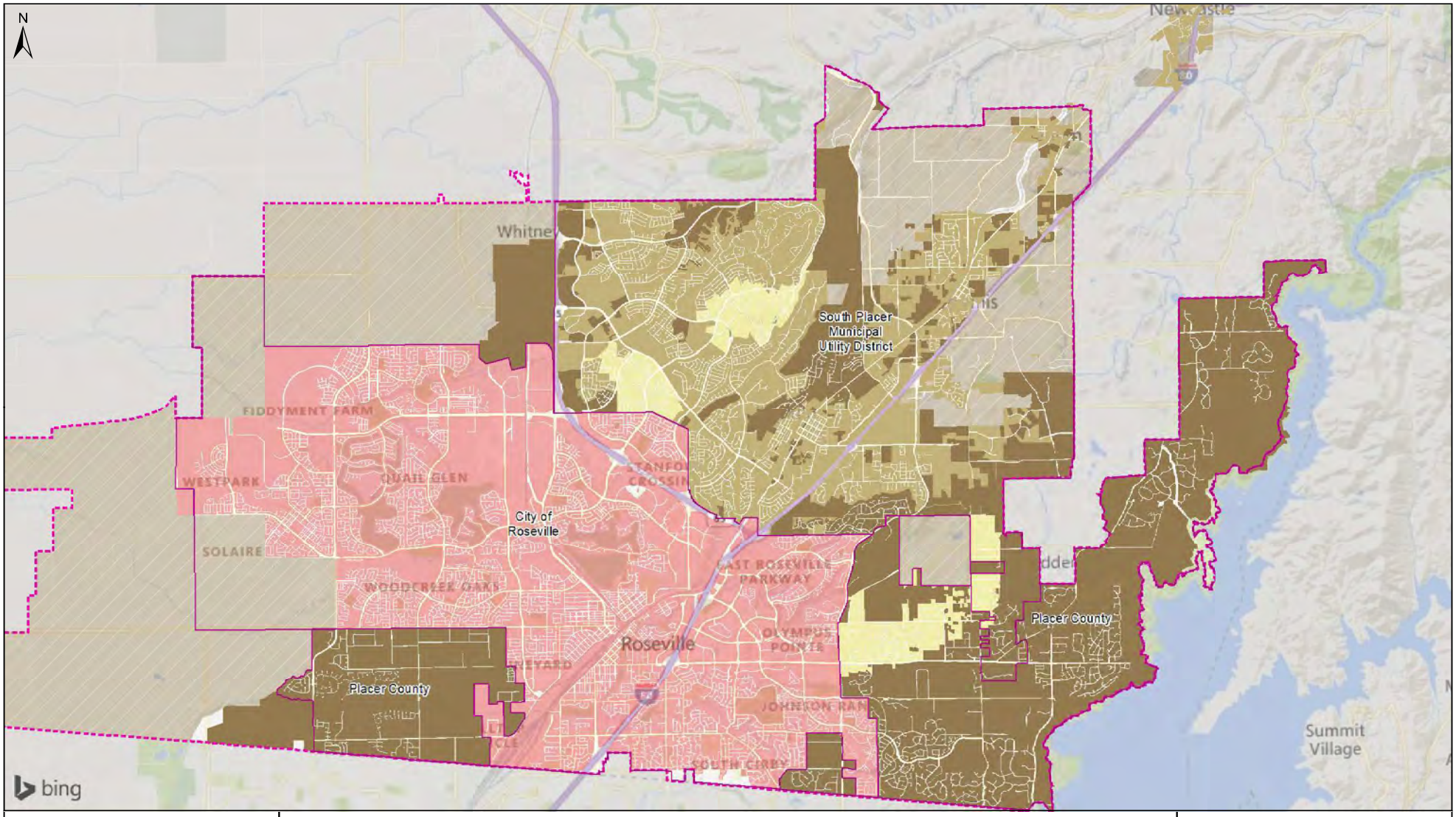


Figure 3-5

Calibrated Unit Flow Factors

South Placer Wastewater Authority
2020 Systems Evaluation

0 ½ 1 2 Miles

Flow Factor (gpd/EDU)

- 128
- 136
- 160

- City of Roseville (Water Billing Data)
- Future Connection
- Ultimate Service Area Boundary
- Partner Agency Boundary

Project #: 0011183.00
Map Created: December 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources:** SPWA Agencies, ESRI, W&C

Figure Exported: 12/21/2020 By: cvanlaenden Using: \\woodardcurran.net\shared\Projects\RMC\WCR\0091 Roseville, City of\0011183.00 SPWA Systems Evaluation\G. GIS\3 MXDs\Report Figures\3-5 Unit Flow Factors.mxd

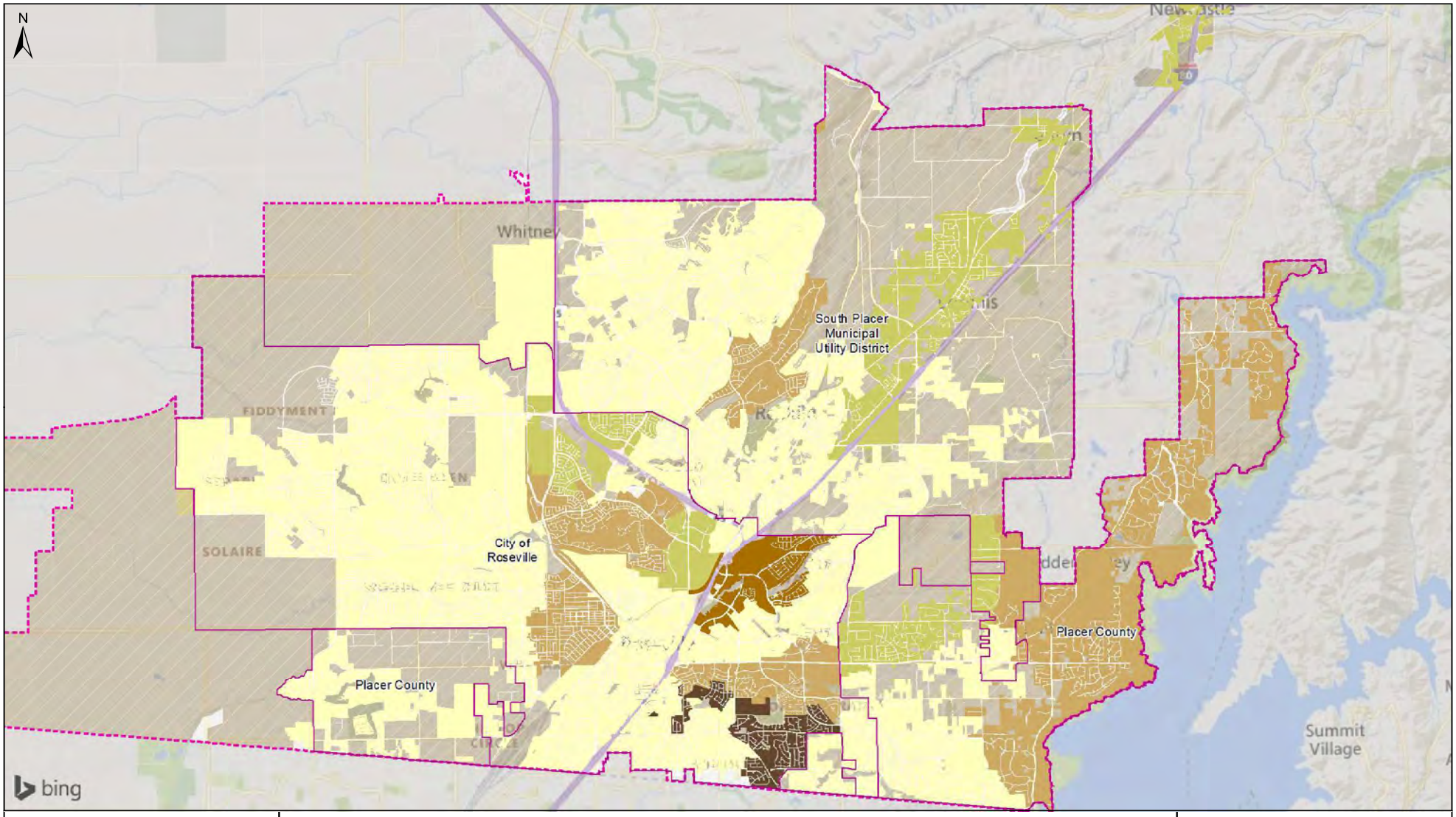


Figure 3-6

Calibrated GWI Rates

South Placer Wastewater Authority
2020 Systems Evaluation

0 ½ 1 2 Miles

Partner Agency Boundary

Ultimate Service Area Boundary

GWI (gpd/acre)

- < 100
- 100 - 200
- 200 - 500
- 500 - 1,000
- > 1,000
- Unconnected

Project #: 0011183.00
Map Created: December 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources:** SPWA Agencies, ESRI, W&C

Figure Exported: 12/21/2020 By: cvanlaenden Using: \\woodardcurran.net\shared\Projects\RMC\WCR\0091 Roseville, City of\0011183.00 SPWA Systems Evaluation\G. GIS\3 MXDs\Report Figures\3-6 Calibrated GWI Rates.mxd

3.3 Wet Weather Flow Projections

3.3.1 Wet Weather Calibration

During wet weather calibration, parameters are adjusted to simulate the volume and timing of RDI/I for monitored storm events. Rainfall was assigned to each parcel or subcatchment using data from the GARR pixel at the centroid of the parcel or subcatchment. Through the wet weather calibration process, RDI/I hydrograph parameters were developed for each metered area. For calibration of the City's meters, the rainfall period from March 4th through March 15th, 2016 was used to determine RDI/I parameters. This period had two storms: the first storm occurring around March 5th-6th generally had the highest rainfall totals; the second storm on March 12th-13th generally had the highest peak flows. The soils for the second storm were more saturated, and generated a larger response. For a conservative calibration, RDI/I parameters were selected to best match the response to the March 12th-13th storm. These conservative calibration conditions should be considered when using this model to evaluate capacity.

For meters in Placer County and SPMUD, two storms were used for wet weather calibration: one event occurring January 15th through January 17th, and another event February 25th through 27th, 2019. The January event was generally higher peak intensity but lower total volume, while the February event was less intense but had more total rain. Both events had similar (generally wet) antecedent conditions. Some meters had higher peak flows during the January event, while others had higher peak flows during the February event; in general, an attempt was made to calibrate for both events. Storm information for the calibration events are summarized in **Table 3-5**.

Table 3-5: Calibration Rainfall Events

Start Date/Time	Storm Duration (hours)	Total Storm Rainfall (in.)			Peak Hour (in.)		
		DC WWTP	Rocklin (Site 157)	Granite Bay (Site 162)	DC WWTP	Rocklin (Site 157)	Granite Bay (Site 162)
2016 Calibration Events							
3/5/2016 13:00	69	2.68	3.16	2.84	0.15	0.21	0.22
3/12/2016 14:00	86	2.29	2.52	2.70	0.21	0.22	0.25
2019 Calibration Events							
1/16/2019 12:00	12	1.55	1.71	1.83	0.36	0.34	0.44
2/24/2019 17:00	44	3.59	3.78	3.49	0.23	0.19	0.19

Table 3-6 summarizes the results of the wet weather calibration in terms of the R values assigned to each flow meter basin. An example wet weather calibration graph is presented in **Figure 3-7**. Calibration graphs for all meters are included in Appendix D.

Overall, most meters had relatively low R values, indicative of a tight system with newer pipes (see **Figure 3-8)**. The FM 5 and FM 7 areas exhibited more significant peak flow response. Further investigations, such as smoke tests or CCTV, may be appropriate in these area or others with higher R factors to identify potential sources of I/I (such as unauthorized stormwater discharge or leaking pipes or manholes) and any capacity concerns.

A few areas did not exhibit enough response to rainfall to develop calibration parameters; a minimum R volume response of 0.6 percent was assumed, distributed evenly between the fast, medium, and slow response R factors. For future growth areas, a minimum R volume response of 0.6 percent was also assumed, which results in a peak RDI/I under the design storm of approximately 700 gallons per acre per day (consistent with criteria for new development documented in TM 3A of the 2009 Systems Evaluation).

Table 3-6: Wet Weather Calibration Parameters

Flow Meter ID (FM ID)	R1 RDI/I Vol (%)	R2 RDI/I Vol (%)	R3 RDI/I Vol (%)	Rtot RDI/I Vol (%)
1	0.2	0.4	4.0	4.6
2	1.2	1.0	3.0	5.2
3	0.2	0.2	2.0	2.4
4	0.8	0.5	2.0	3.3
5	3.0	6.0	8.0	17.0
5A	0.2	2.0	3.5	5.7
6	0.5	1.5	1.0	3.0
7	2.5	2.0	12.0	16.5
7A	1.0	0.7	3.0	4.7
8	0.2	2.0	6.0	8.2
9	0.5	3.0	5.0	8.5
10	0.2	0.4	0.5	1.1
11	0.8	2.0	2.2	5.0
12	0.2	0.2	4.0	4.4
13	0.5	1.0	3.0	4.5
14	0.3	1.3	3.8	5.4
15	3.0	2.5	0.3	5.8
15A	0.8	0.3	0.3	1.4
16	0.5	1.0	3.0	4.5
16A	1.5	1.0	6.0	8.5
17[a]	0.2	0.2	0.2	0.8
18	0.3	2.0	5.0	7.3
19	0.3	1.3	3.8	5.4
20	0.2	0.6	3.0	3.8
21	0.2	2.0	2.0	4.2
22	0.2	0.4	4.0	4.6
23[a]	0.2	0.2	0.2	0.6
24	0.2	1.0	0.5	1.7
25	0.2	1.5	6.0	7.7
26[a]	0.2	0.2	0.2	0.6
151	0.6	0.7	0.2	1.5
152	0.7	0.3	0.1	1.1
153	1.0	0.5	0.2	1.7
154	0.4	0.5	0.1	1.0
155	1.3	1.0	1.0	3.3
156	1.0	1.3	2.0	4.3
157	0.7	0.4	0.4	1.5

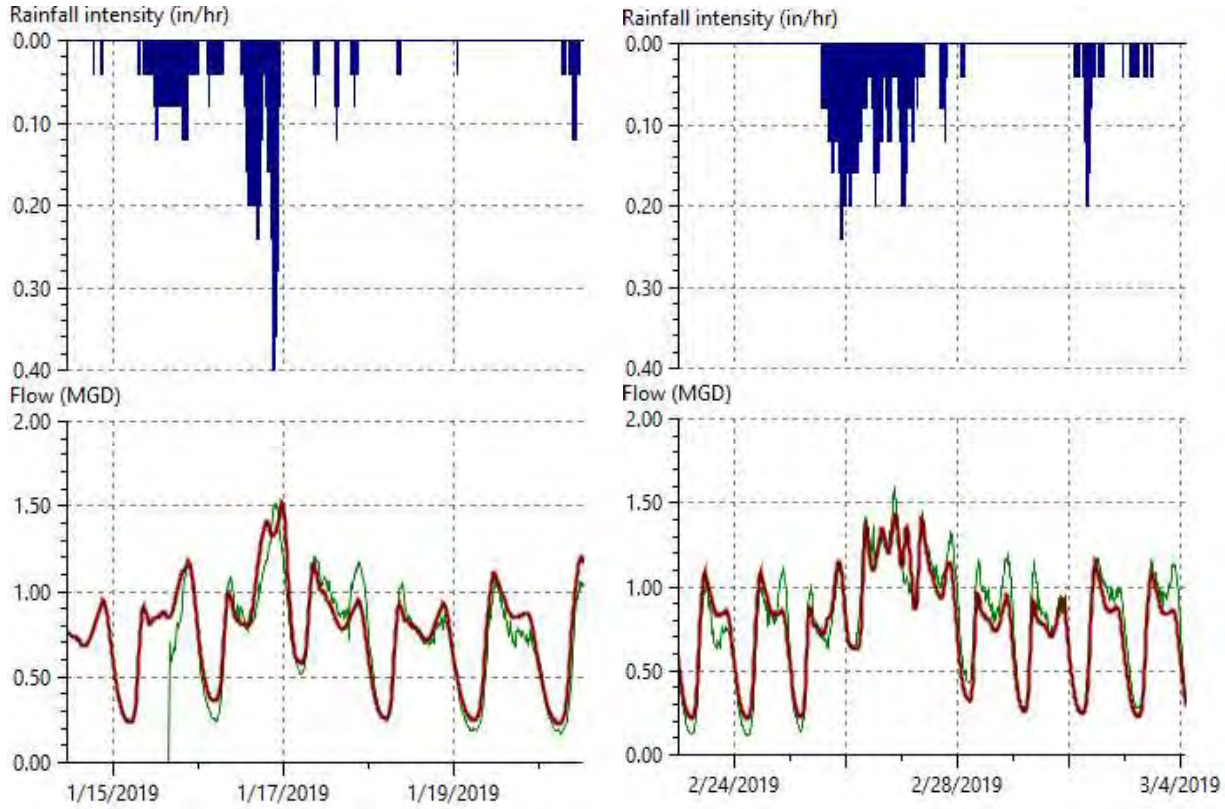
Flow Meter ID (FM ID)	R1 RDI/I Vol (%)	R2 RDI/I Vol (%)	R3 RDI/I Vol (%)	Rtot RDI/I Vol (%)
158	0.3	1.1	3.0	4.4
159	0.2	0.5	1.3	2.0
160	0.9	1.3	2.5	4.7
161	0.6	1.0	2.0	3.6
162	0.2	0.5	1.3	2.0
Cincinnati[b]	0.1	0.1	1.3	1.5
Industrial[b]	0.1	0.1	0.3	0.5
SMD-2	0.6	1.0	2.0	3.6
Sierra College	0.5	0.9	1.9	3.3
Highlands	0.7	1.0	0.4	2.1
North Roseville (Pleasant Grove)	1.3	1.3	0.3	2.9
Springview (Dry Creek)	0.7	2.0	10.0	12.7

Notes:

a. Where flowmeters did not indicate a significant response to rainfall, a minimum response of 0.6% was assumed, disbributed evenly between R1, R2, and R3. A minimum response of 0.6% was also assumed for areas of future growth.

b. Due to highly variable and relatively low industrial flows, calibration of Cincinnati and Industrial meters was limited.

Figure 3-7: Example WWF Model Calibration Graph (Site 155)



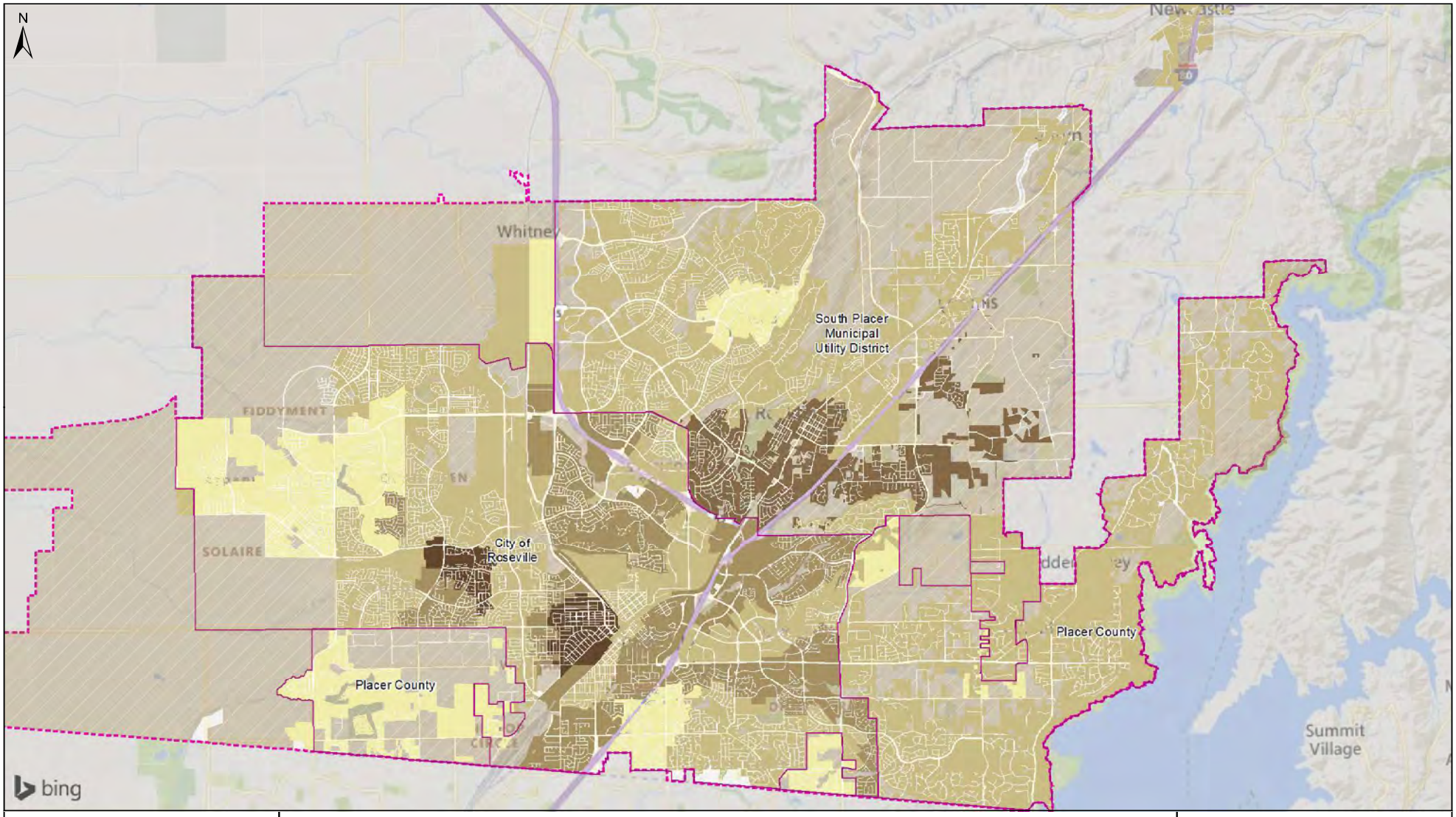


Figure 3-8

Calibrated R Values

South Placer Wastewater Authority
2020 Systems Evaluation

0 ½ 1 2 Miles

Unconnected

Partner Agency Boundary

Ultimate Service Area Boundary

Total R

0.3% - 1%

1% - 5%

5% - 10%

11% - 15%

> 15%

Project #: 0011183.00
Map Created: December 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources:** SPWA Agencies, ESRI, W&C

Placer ROSEVILLE CALIFORNIA

Figure Exported: 12/21/2020 By: evanjlanden Using: \\woodardcurran.net\shared\Projects\RMC\WCR\0091 Roseville, City of\0011183.00 SPWA Systems Evaluation\G. GIS\3 MXDs\Report Figures\3-8 Calibrated R Values.mxd

3.4 Capacity Analysis

This section describes the hydraulic analysis and capacity criteria used to evaluate system performance and size capacity relief projects in the trunk sewer system, and identifies the capacity deficiencies based on the results of model runs.

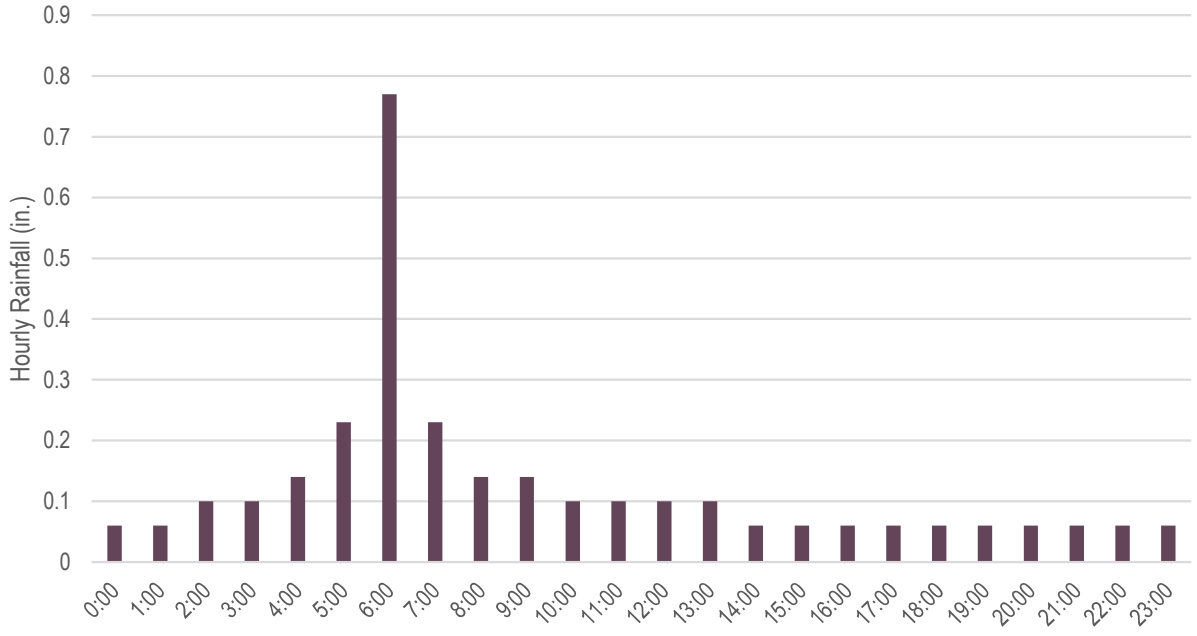
3.4.1 Design Flow Criteria

Design flows for sewer systems consist of BWF, GWI, and RDI/I. Criteria for computing existing BWF, GWI, and RDI/I (developed as part of model calibration), and flow assumptions for future development were discussed in the previous chapters. Note that for capacity analysis purposes, base wastewater flows assume rebound of approximately 15 percent from current flows.

For this Systems Evaluation Update, design RDI/I is based on a 10-year 24-hour synthetic rainfall pattern that occurs uniformly across the entire service area. The event used is the same event as used for the previous 2009 Systems Evaluation. The design storm hyetograph was developed utilizing Table 5-A-1 (elevation (h) = 150 feet) from the 1990 Placer County Flood Control and Water Conservation District Stormwater Management Manual (1990 Placer County Stormwater Management Manual). This event has a 1 hour peak intensity of 0.77 inches and a 24-hour rainfall depth of 2.97 inches. The peak rainfall hour was set at 6 a.m. so that the peak RDI/I response (which would normally occur about 1-2 hours after the rainfall for a typical basin) roughly coincides with the peak hour of the dry weather profiles to give a conservative flow response in the collection system. The intensity and timing of the design storm is presented in **Figure 3-9**.

It should be noted that current NOAA statistics (NOAA Atlas 14, updated in 2014) have a somewhat lower peak hour rainfall intensity, though slightly higher 24-hour rainfall depth (1 hour peak intensity of 0.65 and 24-hour depth of 3.35 inches). As the design event developed from the 1990 Placer County Stormwater Management Manual was likely to result in higher peak flows, and therefore more conservative estimate of system capacity, that design event was selected for this evaluation. NOAA Atlas 14 data confirms that design rainfall intensity does not vary significantly across the SPWA service area.

Figure 3-9: SPWA 10-year Design Storm Event



3.4.1.1 Summary of Flows Under Design Storm

A summary of modeled flows based on the design flow criteria is included in **Table 3-7.**

Table 3-7: Modeled ADWF and Peak Wet Weather Flow Summary

	Existing (Rebound)			Buildout			Buildout-Sensitivity		
WWTP	BWF[a] (mgd)	ADWF (mgd)	PWWF[b] (mgd)	BWF[a] (mgd)	ADWF (mgd)	PWWF[b] (mgd)	BWF[a]	ADWF (mgd)	PWWF[b] (mgd)
Pleasant Grove	9.5	9.9	27.4	26.1	26.5	55.8	26.2	26.5	56.0
Dry Creek	10.1	12.7	41.9	16.7	19.2	59.2	18.2	20.8	60.6

Notes:
a. Does not include wet season groundwater infiltration (GWI).
b. Modeled PWWF assumes improvements have been implemented to eliminate overflows and significant surcharging.

3.4.2 Hydraulic Capacity Criteria

Capacity deficiency or performance criteria are used to determine when the capacity of a sewer pipeline is exceeded to the extent that a capacity improvement project (e.g., a relief sewer or larger replacement sewer) is required. Capacity deficiency criteria are sometimes called "trigger" criteria in that they trigger the need for a capacity improvement project. These criteria may differ from "design criteria" that are applied to determine the size of a new facility, which may be more conservative than the performance criteria. The 2009 Systems Evaluation identified several hydraulic capacity criteria:

- No surcharging in SPWA sewers, though exceptions were made where limited surcharging may occur in relatively deep pipes. Note that surcharging due to downstream conditions (i.e. backwater conditions) may not be considered a deficiency.
- Pump stations are considered capacity deficient if the design storm PWWF exceeds the pump station capacity with the largest pumping unit out of service (i.e. firm capacity).
- Force mains with velocities exceeding 7 feet per second under PWWF may require further investigation, though would not trigger a project unless the pump station required additional capacity.

As the current model is a calibrated fully-dynamic model, the design condition represents a relatively infrequent storm event, and many of SPWA's sewers are relatively deep, a less conservative surcharge criteria was applied, with surcharging up to within 5 feet of the manhole rims (ground surface) considered acceptable under 10-year design storm PWWF, as long as the surcharge (flow height in the manhole) does not exceed 4 feet from the top of pipe up the manhole. The pump station and force main criteria from the 2009 Systems Evaluation were unchanged.

3.4.3 Capacity Analysis Results

The calibrated model was run for Existing, Buildout, and Buildout-Sensitive land use scenarios under the design event described above. Several deficiencies were identified in non-regional facilities which resulted in model-predicted overflows for one or more of the scenarios; to ensure flows were conveyed to regional sewers, pipes were upsized in this analysis to eliminate any overflows.

Within the regional system, seven areas have been identified that either have deficiencies or could be impacted when upstream deficiencies are relieved. Note that not all areas have been identified as having capacity deficiencies.

- **Area A** includes the sewers on Old Auburn Road immediately downstream and upstream of PS 26. This area is designed to divert flows above the springline of the sewer into PS 26. However, since PS 26 has insufficient firm capacity during peak wet weather flows, the sewers back up into the upstream sewers and results in a modeled overflow. This is an area of known capacity concerns. If flows through PS 26 were increased, the capacity issues in this area would be relieved.

- **Area B** includes the trunk sewer downstream of Area A from Old Auburn Road to SMH A06-257, which is where flow from PS 26 rejoins this trunk sewer. Note that there are two shallow manholes in this area that have less than 5 feet of cover (SMH A07-234 and SMH A07-091). Sewer depths should be investigated, and, if depths are confirmed, bolting manhole covers should be considered.

- **Area C** includes the trunk sewer downstream of Area B (from SMH A06-257) to the junction structure at Oak Ridge Drive. The junction structure at Oak Ridge Drive connects a 15-inch trunk (modeled, but not part of the regional system) to the main 33-inch trunk, but allows high flows to overtop a weir into a parallel 15-inch trunk sewer.

- **Area D** includes the 30-inch and 33-inch trunk sewer downstream of the Area C (from Oak Ridge Drive), to the 42-inch sewer near Riverside Age.

- **Area E** includes the 15 and 21-inch sewers from the Sierra College permanent meter to the weir structure adjacent to PS 25.

- **Area F** includes the area downstream of Area E, extending from PS 25 to the upstream manhole of Area C (SMH A06-257).

- **Area G** includes the gravity sewer downstream of PS 26, extending to the intersection with Area E.

Model results under Existing and Buildout conditions are summarized in **Table 3-8** and shown in **Figure 3-10** and **Figure 3-11**, respectively. The figures indicate existing trunk sewers that were predicted by the model to be surcharged (water levels in manholes above the crowns of the pipes) due to "throttle" conditions (peak flow exceeding full pipe capacity) or due to backwater from a downstream throttle condition, and locations of model-predicted overflows. Note that **Figure 3-11** shows the results for both the Buildout and Buildout-Sensitivity scenarios (i.e. there is no difference in surcharge locations between the scenarios). In **Table 3-8**, areas that exceed the hydraulic capacity criteria but do not have modeled overflows are highlighted yellow, while areas with modeled overflows are highlighted orange. Hydraulic profiles for each area under existing and Buildout land use conditions are included in Appendix E.

Table 3-8: Capacity Results under Existing and Buildout Land Use Scenarios[a]

Area	Existing (with Rebound)			Buildout and Buildout-Sensitivity		
	Length of Throttle Surcharge (ft)	Maximum Surcharge Depth (ft)	Minimum Freeboard (ft)	Length of Throttle Surcharge (ft)	Maximum Surcharge Depth (ft)	Minimum Freeboard (ft)
A	5,530	7.3	0.0	5,530	7.8	0.0
B	3,369	1.9	2.0	3,948	7.7	0.0
C	522	1.0	7.4	6,009	6.4	2.8
D	700	1.1	8.6	4,220	3.3	6.4
E	--	--	--	2,223	3.1	5.6
F	--	0.9	12.2	1,716	7.3	2.2
G	--	--	--	0	2.3	3.3

a. Areas that exceed the hydraulic capacity criteria but do not have modeled overflows are highlighted yellow, while areas with modeled overflows are highlighted orange.

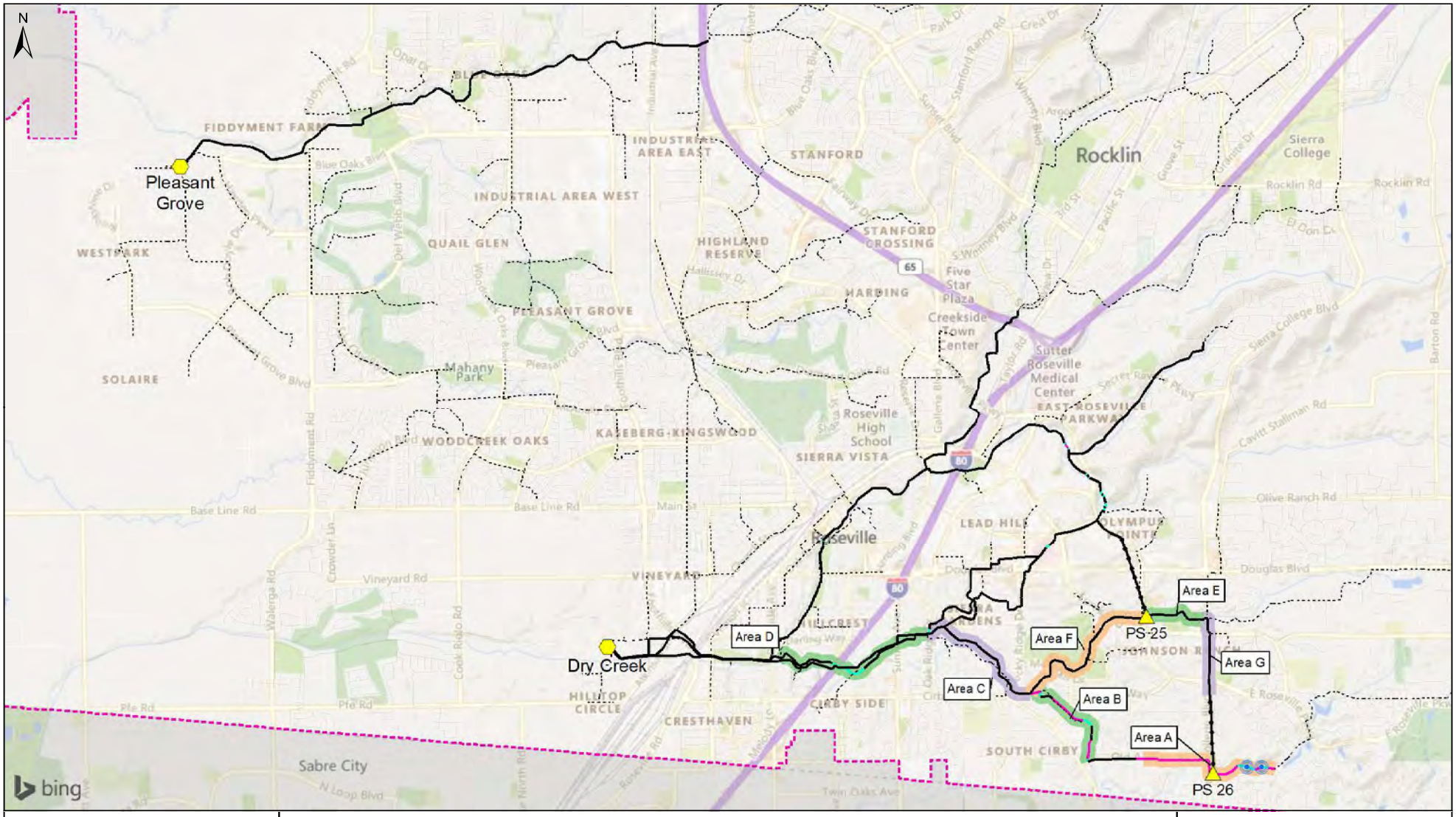


Figure 3-10
Model Results (Existing PWWF)

South Placer Wastewater Authority
2020 Systems Evaluation

0 ¼ ½ 1 Miles

- Regional Gravity Sewer
- Force Main
- Non-Regional Modeled Sewer
- Backwater Surcharge
- Throttle Surcharge
- Modeled Sewer Overflow
- Deficiency Area
- Ultimate Service Area Boundary

Project #: 0011183.00
Map Created: December 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources:** SPWA Agencies, ESRI, W&C

Figure Exported: 12/21/2020 By: evanljenden Using: \\woodardcurran.net\shared\Projects\RMC\WCR\0091 Roseville, City of\0011183.00 SPWA Systems Evaluation\G. GIS\3 MXD\ReportFigures\3-10_Model_Results_Existing_PWWF.mxd

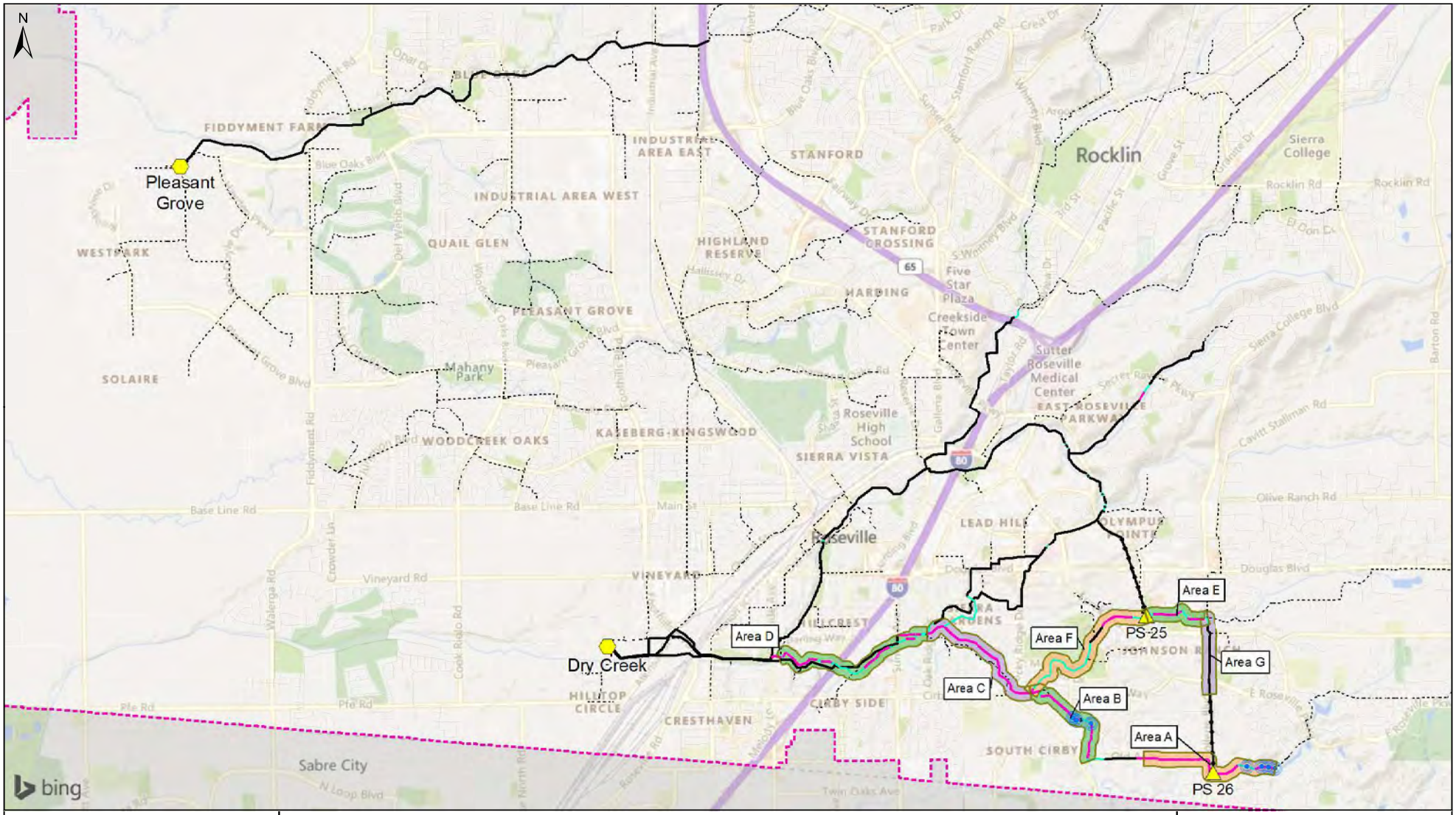


Figure 3-11

Model Results (Buildout and Buildout Sensitivity PWWF)

South Placer Wastewater Authority
2020 Systems Evaluation

0 ¼ ½ 1 Miles

- Regional Gravity Sewer
- Force Main
- Non-Regional Modeled Sewer
- Backwater Surcharge
- Throttle Surcharge
- Modeled Sewer Overflow
- Deficiency Area
- Ultimate Service Area Boundary

Project #: 0011183.00
Map Created: December 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources:** SPWA Agencies, ESRI, W&C

3.5 Proposed Improvements

Proposed improvement projects have been developed, and verified using the hydraulic model, to alleviate surcharge in the areas described in the previous section. Each proposed project was reviewed on aerial mapping to identify potential design and constructability issues. Preliminary estimates of probable construction costs were prepared.

This section discusses these proposed improvements as well as the criteria used to develop them and estimate costs. The projects are considered planning level, and further pre-design of each project is recommended prior to implementation.

3.5.1 Design Criteria for New Sewer Facilities

Section 9 of the City of Roseville Design Standards (January 2019) details criteria for Sanitary Sewer Design. These criteria are used during the development of new standards and applied to any new infrastructure.

3.5.1.1 Gravity Sewers

Below is a list of select City design standards for gravity sewers. See Section 9 of the Design Standards for a full listing of criteria.

- Minimum slopes and flow capacities summarized below

Pipe Diameter (in)	Slope (ft/ft)	Capacity (at 0.7 Depth)	Capacity Flowing Full
6	0.0050	0.22 MGD	
8	0.0035	0.38 MGD	
10	0.0025	0.58 MGD	
12	0.0020	0.85 MGD	1.00 MGD
15	0.0015	1.32 MGD	1.60 MGD
18	0.0012	1.95 MGD	2.35 MGD

- Maximum allowable depth-to-diameter ratio (d/D) of 0.7 at design flow for laterals 10 inches or less. Pipes 12" or greater may be designed to flow full unless connections are planned, in which case the 0.7 depth-to-diameter ratio governs.
- Flow velocities must be between 2 feet per second and 10 feet per second.
- Maximum bury depth of main with lateral connection shall be 15 feet. Minimum slope of lateral connection shall be ¼ inch per foot with a minimum bury depth of 12 inches at any buildable location within the properties to be served.
- Maximum spacing of manholes shall be 500 feet for all straight lines of 10 inches in diameter or less. Manhole spacing for mains 12 inches and larger shall be considered on a case by case basis.
- The invert elevation for pipe of the same diameter entering a manhole shall have a 0.10-foot drop between the entering and exiting pipe and invert elevations for pipe of different diameters shall match crown of exiting pipe. The crown of the entering pipe shall be at the same elevation or higher than the exit pipe.
- Drop connections shall be permitted under special conditions and with the approval of the Environmental Utilities Director

3.5.1.2 Pump Stations and Force Mains

Below is a list of select City design standards for pump stations and force mains. See Section 9 of the Design Standards for a full listing of criteria.

- A sufficient number of centrifugal pumping units shall be installed such that station capacity can be maintained with any one unit out of service.
- Provisions for 4 hour storage capacity shall be provided.
- Planning level criteria as follows:

Pump Stations	
Capacity	PWWF (hydraulic modeling required for pipes 18 inches and larger)
Storage	4 hours
Operation	Lead/lag for duty pump(s), plus 1 standby pump
Maximum Pump Cycles	6 cycles/hour (3 cycles per pump)
Force Mains	
Headloss	Hazen-Williams roughness coefficient (C-factor) of 120
Maximum Velocity	7-10 feet per second
Minimum Velocity	3.0 feet per second

3.5.2 Cost Criteria

Opinions of probable costs for proposed capacity improvement projects were developed based on Woodard & Curran's experience with similar projects and discussions with product vendors. The estimated construction costs are based on a Class 4 estimate as defined by the Association for the Advancement of Cost Engineering (AACE) International cost estimate classification system. **Table 3-9** provides a summary of the estimate classes and expected accuracy range. For Class 4 estimates, the expected accuracy range is -15% to -30% on the low end and +20% to +50% on the high end.

Table 3-9: Cost Estimate Classification Matrix (AACE International)

Estimate Class	Level of Project Definition	Purpose of Estimate	Methodology	Expected Accuracy Range
Class 5	0% to 2%	Concept screening	Capacity factored, parametric models, judgement, or analogy	Low: -20% to -50% High: +30% to +100%
Class 4	1% to 15%	Study or feasibility	Equipment factored or parametric models	Low: -15% to -30% High: +20% to +50%
Class 3	10% to 40%	Budget authorization or control	Semi-detailed unit costs with assembly level line items	Low: -10% to -20% High: +10% to +30%
Class 2	30% to 75%	Control or bid/tender	Detailed unit cost with forced detailed take-off	Low: -5% to -15% High: +5% to +20%
Class 1	65% to 100%	Check estimate or bid/tender	Detailed unit cost with detailed take-cost	Low: -3% to -10% High: +3% to +15%

Source: AACE International Recommended Practice No. 18R-97

These estimates are suitable for use for budget forecasting, CIP development, and project evaluations, with the understanding that refinements to the project details and costs would be necessary as projects proceed into the design and construction phases. All costs have been adjusted to an Engineering News Record Construction Cost Index (ENR CCI) of approximately 12,115, which represents the average of the April 2020 ENR CCI for "20 Cities Average" and "San Francisco" indices.

Cost criteria include baseline unit construction costs for gravity sewers using open-cut methods. Pipe bursting is sometimes a more cost-effective option for projects that involve upsizing existing sewers to 15-inch diameter or smaller; this construction method could be considered during design. Costs for gravity trunk sewers vary with pipe diameter and depth (in the case of open-cut construction). Allowances added to the baseline construction cost include mobilization/demobilization and project-specific for remove and replace construction and traffic control for work in roadways. A 30 percent allowance for contingencies for unknown conditions was also included for all projects, as well as an allowance of 25 percent of construction cost for engineering, administration, and legal costs. For pump stations, costs include site work, mechanical and electrical equipment specific to each station.

3.5.3 Proposed Capacity Improvement Project Descriptions

Improvement projects were developed as a series of improvements that sequentially decrease surcharging in downstream sewers. These improvement projects, including estimated capital improvement costs, are discussed below and summarized in **Table 3-10** and shown in **Figure 3-12**. Individual improvement project cost estimate details as well as detailed project figures are provided in Appendix F.

3.5.3.1 Improvement Project 1

Improvement Project 1 would increase the capacity of PS 26 (Sierra College Boulevard PS) as needed to limit surcharging in the Old Auburn Trunk sewer (Area A and Area B). The weir leading to PS 26 would be unchanged and would divert flows when depth in the sewer exceeds half the sewer diameter. Because this project would substantially increase flows through the sewer on Sierra College Boulevard (Area G), this project also includes upsizing those pipelines to 10, 12, and 15-inch sewers to eliminate surcharging in that line.

PS 26 will need to be modified to meet the increased firm capacity, from 0.43 mgd to 1.6mgd. If the existing wet well is large enough, it could be retrofitted with new, higher flow pumps. The existing wet well at PS 26 is 8 feet in internal diameter. Updated design criteria were provided to a Flygt pump representative and, based on the minimum wet well sizing for their recommended pump selection, the existing wet well is sufficiently large to be reused with a larger pump.

The pump selection provided should be considered preliminary. Given the high total pump station head and large motor of the resulting pump selection, an evaluation of alternatives to reduce the pump size, via upsizing the discharge force main for example, should be considered during pre-design. A life cycle cost analysis may be appropriate to compare the difference between the additional headloss and resulting pumping costs versus the cost to upsize the force main.

3.5.3.2 Improvement Project 2

Improvement Project 2 would re-route the sewer on Sierra College Boulevard east on Eureka and reconnect to the regional trunk at East Roseville Parkway (Area F). This would relieve surcharge in Area E. Excess flows resulting in surcharge in Area F would be diverted through PS 25 to the northern sewershed, which does not have capacity concerns. The preliminary project would upsize existing 8 and 10-inch sewer on Eureka Road and E Roseville Parkway. Since the connection is about 100 feet downstream of the PS 25 diversion structure, this improvement project may increase flows (and associated surcharge) in Area F (unless adjustments are made to the PS 25 diversion structure, as discussed in Improvement Project 3).

3.5.3.3 Improvement Project 3

Improvement Project 3 would alter the piping and diversion structure in the vicinity of PS 25 (Rollingwood PS) to convey additional flow away from Area C, Area D, and Area F, and increase the capacity of PS 25 as needed to accommodate the additional flow. For this improvement project, the diversion structure would be converted to divert any flows exceeding peak dry weather flow (up to approximately 2.6 mgd with buildout land uses under peak wet weather conditions),. It should be noted that the 2009 Systems Evaluation assumed diversion of 3.2 mgd through PS 25 with buildout land uses under peak wet weather conditions.

A new junction structure would need to be installed at E Roseville Parkway (or the existing junction structure would need to be relocated) in order to capture the additional flows.

PS 25 would need to be modified to meet the increased firm capacity. If the existing wet well is large enough, it could be retrofitted with new, higher flow pumps. The existing wet well at PS 25 is 10 feet in internal diameter. Updated design criteria were provided to a Flygt pump representative and, based on the minimum wet well sizing for their recommended pump selection, the existing wet well could be reused.

Table 3-10: Proposed Capacity Improvement Projects

Project	Location	Existing Sizes	Improved Sizes[a]	Description	Estimated Capital Improvement Cost
1	PS 26	0.43 mgd firm capacity	1.6 mgd PWWF at Buildout	Increased Capacity of PS 26 and sewers on Sierra College Blvd directly downstream of PS 26 to relieve Old Auburn Trunk sewer (Area A)	$1,606,000
	Sierra College Blvd (Area G)	500 ft of 8-inch 1,900 ft of 10-inch	500 ft of 10-inch (upsized from 8-inch) 900 ft of 12-inch (upsized from 10-inch) 1,000 ft of 15-inch (upsized from 10-inch)		
2	Eureka Road and E. Roseville Parkway	800 ft of 8-inch 1,400 ft of 10-inch	2,200 of 15-inch (upsized from 8 or 10-inch) 1,200 ft of new 15-inch.	Redirect flows from PS 26 and Sierra College Blvd down Eureka Road to relieve Area E.	$1,831,000
3	PS 25 (pumps)	2.02 mgd firm capacity	2.6 mgd PWWF at Buildout	Increased Firm capacity of PS 25 to meet Buildout PWWF (depends on alternative). New weir structure or adjustments to existing structure at PS 25 to convey the maximum potential flow through PS 25 without any dry weather flows.	$758,000
	PS 25 diversion structure	N/A	New diversion structure and related piping		

Notes:

a. Note that pipeline capacity increases could be accomplished through parallel pipes, rather than upsizes.

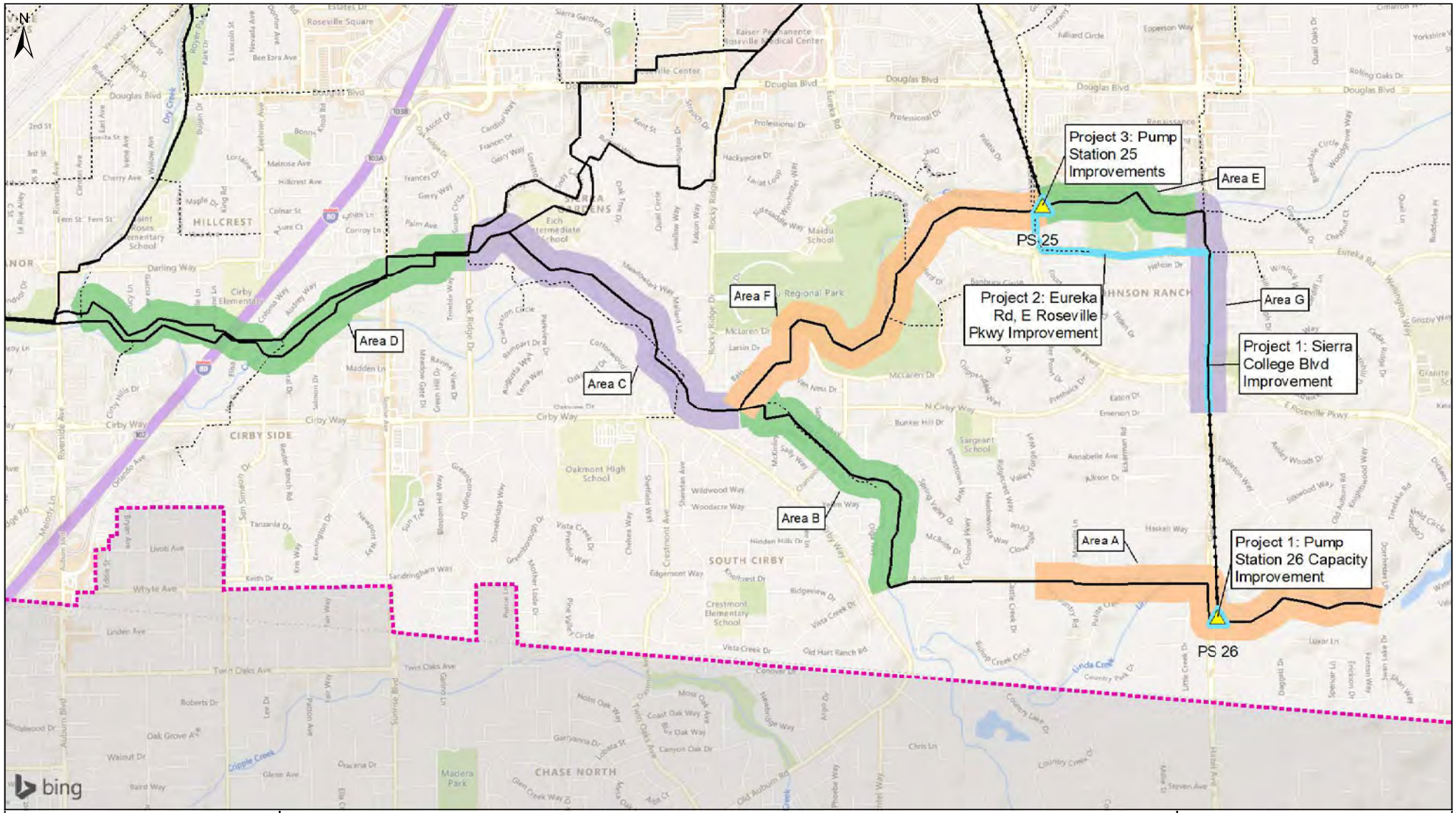


Figure 3-12
Proposed Improvement Locations

South Placer Wastewater Authority
2020 Systems Evaluation

0 0.125 0.25 0.5 Miles

- Regional Gravity Sewer
- Force Main
- Non-Regional Modeled Sewer
- Pump Station
- Preliminary Capacity Improvement Area
- Deficiency Area
- Service Area Boundary

Project #: 0011183.00
Map Created: December 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources:** SPWA Agencies, ESRI, W&C

Figure Exported: 12/21/2020 By: evanlienden Using: \\woodardcurran.net\shared\Projects\RMC\WCR\0091 Roseville, City of\0011183.00 SPWA Systems Evaluation\G. GIS\3 MXDs\Report Figures\3-12 Proposed Improvement Projects.mxd

3.5.4 Timing of Proposed Improvement Projects

While Project 1 is needed for current demands, Project 2 and Project 3 are expected to be triggered by future development. For the purpose of this Systems Evaluation, an approximate number of equivalent dwelling units upstream of the capacity deficiency that would trigger the need for a project has been estimated by applying a reduction factor to future flows to represent percentage of buildout. Nearly all of the future growth that would trigger the projects would occur in SMD-2 and SMD-3 (with less than 100 EDUs of future growth anticipated for SPMUD and Roseville). Based on the SMD2 and SMD3 growth projections provided by Placer County, this would occur beyond the 2060 planning horizon provided.

The timing estimated here is subject to change, and could be impacted by the following assumptions:

- Inflow and Infiltration rates for existing sewers are assumed to remain approximately the same. These rates could change based on pipe condition and maintenance activities (such as rehabilitation and repair) in the collection system.
- Inflow and Infiltration rates for new sewers are assumed based on typical values. Actual I/I rates could be higher or lower than assumed.
- The estimates are based on an assumed rebound of dry weather flows to 190 gpd per EDU. If dry weather flows do not rebound, the timing for Project 2 and Project 3 could be somewhat delayed.

Future studies should monitor the I/I rates and update these estimates as needed. The number of EDUs in SMD2/SMD3 that would trigger the proposed project are summarized in **Table 3-11**.

Table 3-11: Timing of Proposed Capacity Improvement Projects

Project	Description	Estimated Capital Improvement Cost	Approximate Additional EDUs in SMD2/SMD3 to Trigger Project[a]
1	Increased Capacity of PS 26 and sewers on Sierra College Blvd directly downstream of PS 26 to relieve Old Auburn Trunk sewer (Area A)	$1,606,000	Existing
2	Redirect flows from PS 26 and Sierra College Blvd down Eureka Road to relieve Area E.	$1,831,000	~1,800[b]
3	Increased Firm capacity of PS 25 to meet Buildout PWWF (depends on alternative). New weir structure or adjustments to existing structure at PS 25 to convey the maximum potential flow through PS 25 without any dry weather flows.	$758,000	~1,800[c]

Notes:

a. Based on a percentage of buildout factor applied to future model loads.
b. Represents approximately 60% of buildout. There are approximately 8,400 Existing EDUs upstream of the deficiency triggering Improvement Project 2, and approximately 10,200 EDUs would trigger the need for improvement.
c. Represents approximately 60% of buildout. There are approximately 11,900 Existing EDUs upstream of the deficiency triggering Improvement Project 3, including 7,600 in Placer County, 4,200 in Roseville, and less than 100 in SPMUD. Approximately 13,700 EDUs would trigger the need for the improvement.

4. WASTEWATER TREATMENT PLANT EXPANSION EVALUATION

4.1 Introduction

Based on the updated growth projections provided by the SPWA partners through fiscal year 2059-2060 and at buildout, this section provides facility expansion recommendations for Dry Creek Wastewater Treatment Plant (DCWWTP) and Pleasant Grove Wastewater Treatment Plant (PGWWTP), which treat the entirety of flows from the SPWA service area. The recommendations address timing, phasing, and preliminary conceptual costs of the expansions required through buildout to address both flows and loads, as well as identifying next steps for confirming current plant capacity to accurately reflect recent and ongoing capital improvements.

The analysis provides updates to the following flow and loading parameters for DCWWTP and PGWWTP:

- Flows: existing and projected influent flow through buildout:
    - Average Dry Weather Flow (ADWF)
    - Average Annual flow (AA)
    - Peak Month Flow (PMF)
    - Peak Day Wet Weather Flow (PDWWF)
    - Peak Hour Wet Weather Flow (PHWWF)
- Loads: existing and projected influent loads through buildout:
    - Biochemical Oxygen Demand (BOD), Annual Average (AA) and Maximum Month (MM)
    - Total Suspended Solids (TSS), AA and MM
    - Ammonia (NH_3), AA and MM

4.1.1 Dry Creek Wastewater Treatment Plant

Much of the DCWWTP was constructed in 1974 and was expanded in 1991 to treat an ADWF of 18 mgd. In June of 2004, a portion of the influent flow was diverted to the newly constructed PGWWTP, freeing up some treatment capacity at the time. Recently, nutrient removal upgrades were completed at DCWWTP to ensure reliable compliance with the NPDES permit limits (including the 10 mg/L average monthly limit for nitrate plus nitrite).[1] Currently, the flow meter on the discharge of the Influent Pump Station is being modified to increase the PHWWF hydraulic capacity to 36 mgd.

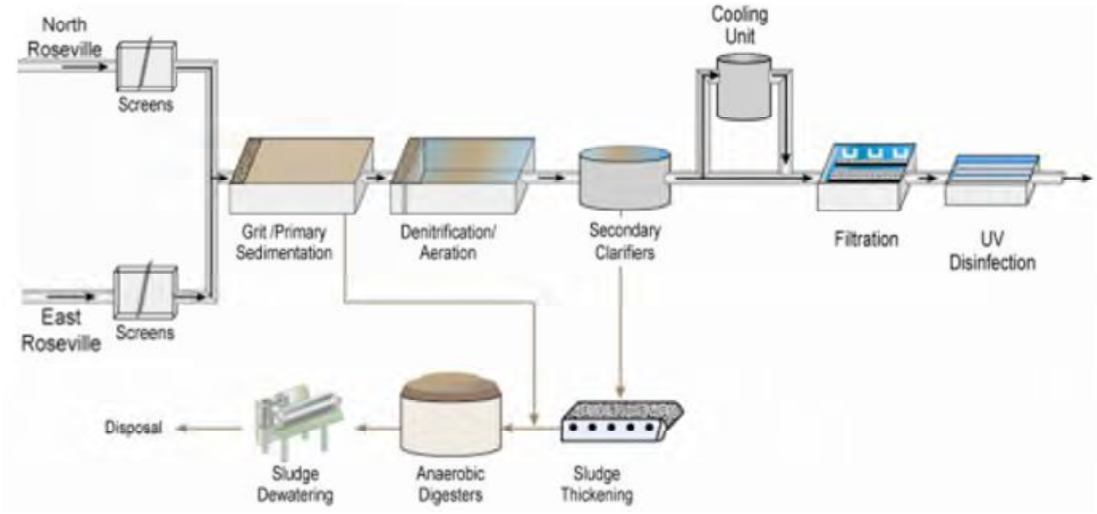
Population in the SPWA service area has continued to grow steadily, with loadings increasing substantially while ADWF decreased. The ADWF at DWWTP has decreased from 10.5 mgd in 2009to approximately 8.6 mgd as of 2019.

Equally as important as the hydraulic capacity of a plant is its biological treatment capacity. Design of the 1991 expansion of the plant was based on an influent BOD concentration of 160 mg/L, and the corresponding AA and MM loadings of 24,000 lbs/day and 36,000 lbs/day. Since 1991, the influent BOD concentration has increased to 425 mg/L, resulting in much higher BOD loadings than in previous projections. The impact of higher influent BOD concentration and loadings is discussed in Section 4.3.1.

A schematic of the DCWWTP liquid and solids treatment train is shown in **Figure 4-1**.

[1] Source: City of Roseville, DCWWTP Nitrate Reduction Improvements Project, Basis of Design Report (May 2017).

Figure 4-1: DCWWTP Treatment Schematic



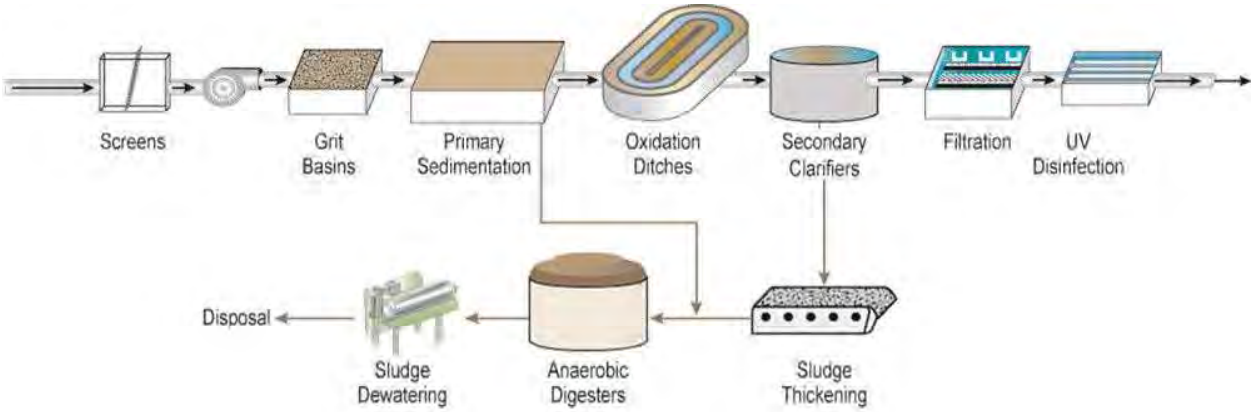
4.1.2 Pleasant Grove Wastewater Treatment Plant

Construction of the PGWWTP was completed in 2004. It was designed for an ADWF of 12 mgd, assuming historical domestic strength wastewater, similar to the Dry Creek Plant. Subsequent study of the plant's treatment processes and influent loading resulted in PGWWTP's capacity being lowered to an equivalent flow of 9.5 mgd. Like the DCWWTP, this was partially a result of influent BOD concentrations trending much higher over time than anticipated in the initial design. Current ADWF is approximately 7.6 mgd with an average influent BOD concentration of 358 mg/L.

To ensure the plant can reliably treat 12 mgd ADWF at the current higher loadings, an expansion project is currently underway, with anticipated completion/commissioning by fiscal year (FY) 22/23.[1] The expansion will add a primary sedimentation process to the liquid treatment train, which currently includes influent screening and grit removal, secondary treatment/denitrification in oxidation ditches, secondary clarification, filtration, and disinfection. The solids treatment process is being upgraded with sludge thickening using rotary drum thickeners and anaerobic digestion of the combined thickened secondary sludge and primary sludge, upstream of the existing dewatering centrifuges (which currently dewater only the secondary sludge). These upgrades will provide additional solids treatment capacity as well as biological treatment capacity. **Figure 4-2** shows a schematic of the PGWWTP treatment train reflecting the upgrades currently under construction.

[1] Source: City of Roseville, PGWWTP Expansion Basis of Design Report (March 2016).

Figure 4-2: PGWWTP Treatment Schematic



4.2 Flows and Loadings

Influent flows and loading (organic loading as measured by BOD and solids loading as measured by TSS) for both the DCWWTP and PGWWTP were established by analyzing daily plant influent data provided by the City of Roseville for the period from January 1, 2016 through September 19, 2019 for influent flow and from January 1, 2013 through September 19, 2019 for loadings. In addition, hourly flow data from December 1, 2016 to September 17, 2019 (which incorporated high winter flow periods) was used to establish peak hour flows.

Projected flows for both the DCWWTP and PGWWTP were calculated based on population and non-residential growth, normalized to account for diversity in land uses by establishing equivalent dwelling units (EDUs). EDU projection data were provided by each of the SPWA JPA Partners (City of Roseville, Placer County, and South Placer Municipal Utility District)[1]. Flow projections were developed by multiplying the projected EDUs by an ADWF contribution of 190 gallons per day (gpd) per EDU, in accordance with the estimate developed in the 2009 Systems Evaluation.

4.2.1 Current Flows and Peaking Factors

Current ADWF was established by averaging flows observed at each plant for the period of July through September. While the ADWF is usually thought of as the rated capacity of a treatment plant, the design of treatment systems must also accommodate significant seasonal and diurnal variations in influent flow. A treatment plant must be designed to prevent hydraulic overloads and wash out of solids during peak day and peak hour events. Generally, preliminary and primary treatment systems are sized for peak day or peak hour flow, while secondary treatment systems must meet maximum month organic loading peaks. Sizing treatment processes appropriately aids treatment plants in meeting discharge limits during the higher flows and loading periods that can otherwise stress or overwhelm the plant processes.

Current flow conditions and the associated peaking factors for both plants are summarized in **Table 4-1**.

[1] Data provided on July 2019 for Placer County, August 2019 for SPMUD, and November 2016 for the City of Roseville

Table 4-1: Current Flows and Peaking Factors

Flow Condition	DCWWTP		PGWWTP	
	Current Flow, mgd	Peaking Factor	Current Flow, mgd	Peaking Factor
ADWF	8.6	1.0	7.6	1.0
AA	10.8	1.2	8.1	1.07
PMF	18.4	2.12	10.3	1.36
PDWWF	27.9	3.22	16.9	2.23
PHWWF	36.0	4.19	20.4	2.69

It should be noted that the current plant data reflect a significantly lower flow contribution per EDU than the previously established unit flow factor of 190 gpd/EDU. Approximately 57,747 EDUs are tributary to DCWWTP for FY 19/20. Based on the current ADWF, the equivalent unit flow contribution is approximately 150 gpd/EDU. At PGWWTP, there are approximately 54,907 EDU tributary to the plant for FY19/20, which reflects a flow contribution of 138 gpd/EDU. This is likely the result of several factors, including water conservation efforts over the past decade, drought conditions that were experienced throughout California from 2011-2016, and lower levels of development than previously anticipated prior to the impacts of the recession in 2008-2009.

These flow contributions per EDU may rebound back to historical levels and, to provide a safety factor, the 190 gpd/EDU will continue to be used for this analysis. This unit flow factor should be tracked closely and, if warranted, the per EDU value adjusted accordingly over time.

4.2.2 Projected Plant Influent Flows

Future plant flows were projected over the planning horizon to fiscal year 2059-2060 (FY 59/60)[1] and to ultimate buildout conditions, based on the information provided in Chapter 2. ADWF projections at FY 59/60 and buildout are calculated by multiplying the EDU projection by the flow contribution per EDU. Peaking factors from **Table 4-1** were then applied to established ADWF per EDU based on current flows (138 gpd/EDU at PGWWTP and 150 gpd/EDU at DCWWTP) and added to ADWFs difference calculated from 190 gpd/EDU and current ADWF/EDU to project the additional flow conditions. This approach avoids using peaking factors on projected ADWF calculated from 190 gpd/EDU for a more realistic flow estimate. These flows are summarized in **Table 4-2** and **Table 4-3**.

Table 4-2: Projected FY 59/60 and Buildout EDUs and Flows at DCWWTP

Condition	DCWWTP			
	FY 59/60 EDU	FY 59/60 Flow, mgd	Buildout EDU	Buildout Flow, mgd
ADWF	87,772	16.7	96,000	18.2
AA	---	19.9	---	21.8
PMF	---	31.5	---	34.4
PDWWF	---	45.9	---	50.2
PHWWF	---	58.6	---	64.1

[1]SPWA's fiscal year runs from July 1 to June 30.

Table 4-3: Projected FY 59/60 and Buildout EDUs and Flows at PGWWTP

Condition	PGWWTP			
	FY 59/60 EDU	FY 59/60 Flow, mgd	Buildout EDU	Buildout Flow, mgd
ADWF	92,864	17.6	145,000	27.6
AA	---	18.6	---	29.0
PMF	---	22.2	---	34.8
PDWWF	---	33.4	---	52.3
PHWWF	---	39.3	---	61.5

4.2.3 Current BOD Loadings

In previous studies, design parameters were established based on much lower influent BOD concentrations, ranging from 248 mg/L at DCWWTP to 285 mg/L at PGWWTP. The plant data set provided for this TM (which is an extended data set from 2013-2019) indicates an average influent BOD concentration of 425 mg/L at DCWWTP, and 358 mg/L at PGWWTP. The range in influent BOD concentrations at both plants are shown in **Figure 4-3** and **Figure 4-4**.

Figure 4-3: Influent BOD Concentrations at DCWWTP

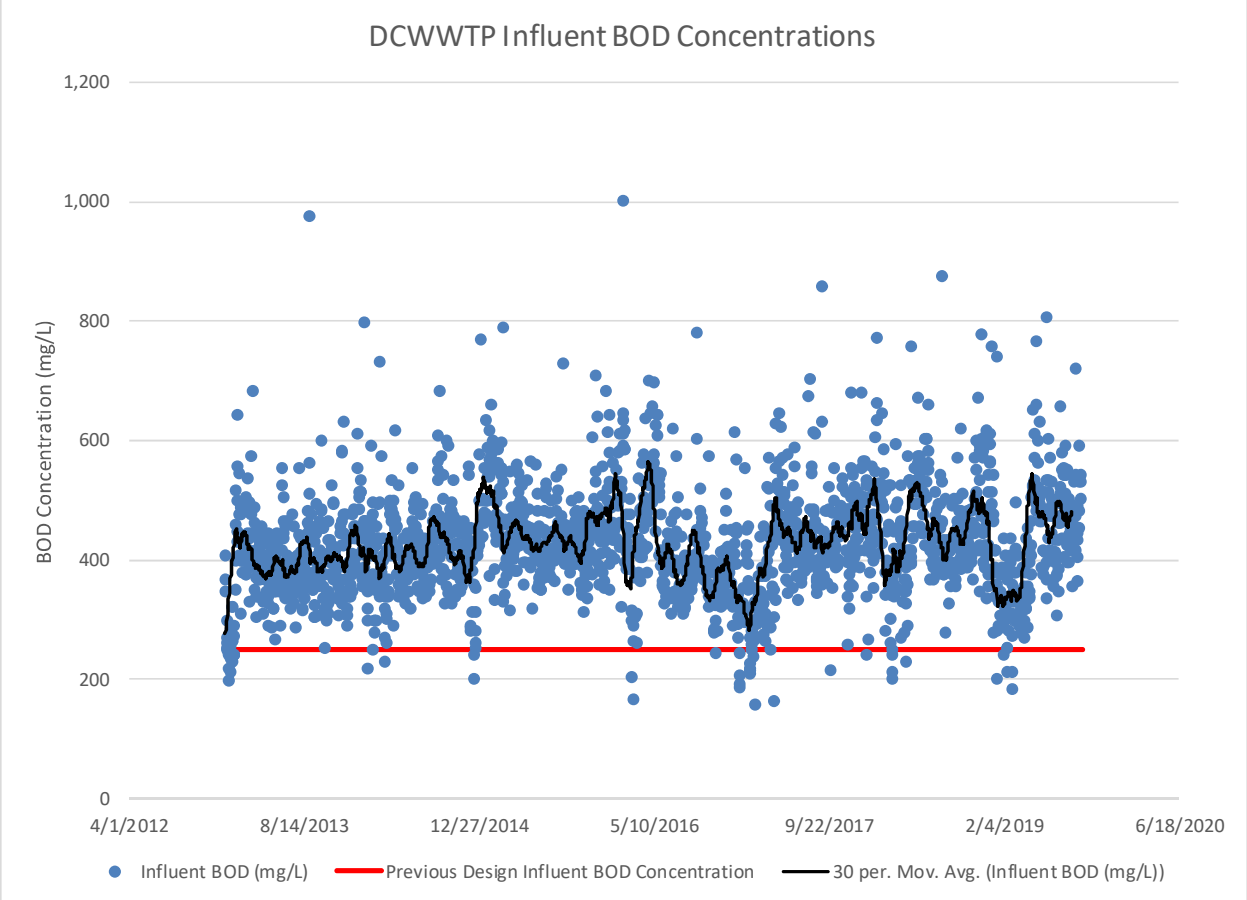
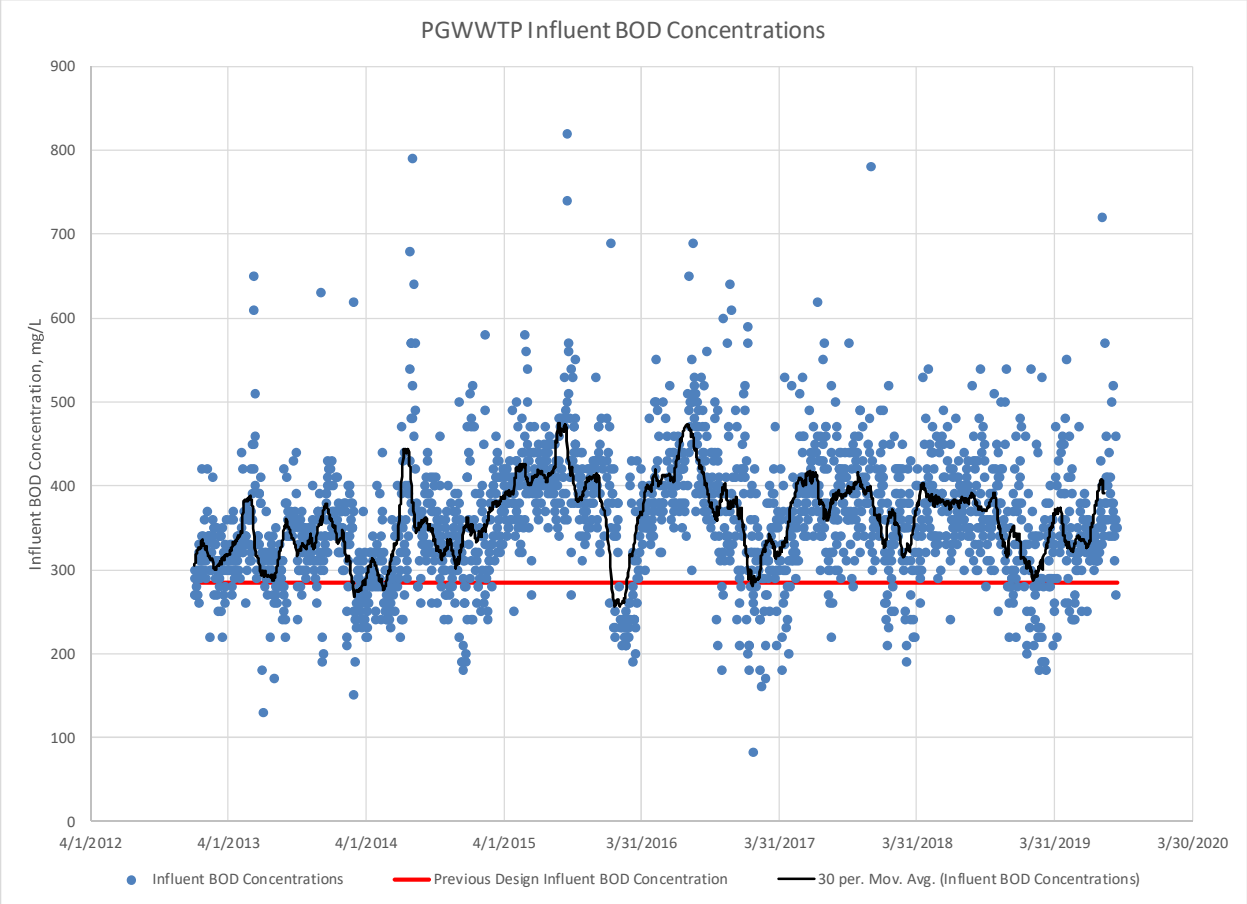


Figure 4-4: Influent BOD Concentrations at PGWWTP



These higher concentrations are likely a result of water conservation efforts over the past decade, combined with the drought conditions that were experienced throughout California from 2011-2016, though the relatively high concentrations at DCWWTP should be confirmed. The effect of conservation is on top of the demographic changes in the SPWA service area since the treatment plants were designed that brought much more commercial flows and loadings along with changing development patterns, such that the strength of the wastewater at both plants evolved from low strength domestic wastewater to moderate strength commercial wastewater, influenced by more food service, restaurant, brewery and other contributions.

A 30-day moving average of influent BOD concentrations is also shown on these figures. This moving average shows that current influent concentrations are now holding relatively constant, though they are higher than previous designs accounted for. This is an indication that influent BOD concentrations have now leveled off, however we recommend the SPWA monitor this parameter in the long term. When the State experiences another drought or there are changes to land use within the service area such as densification, influent loading concentrations may increase further.

4.2.4 Current and Projected Plant Influent Loadings

The January 1, 2013 through September 19, 2019 data set also included daily influent plant loadings for BOD, TSS, and NH_3. These data were analyzed to establish current annual average (AA) and maximum month (MM) pollutant loadings. Current MM loadings were established by taking the maximum value of a 30-day running average of the daily influent data provided. The peaking factors for each parameter were established by dividing the MM loading by the AA loading.

Projected loads, shown in **Table 4-4** and **Table 4-5,** were calculated by using the average loadings from the data set provided and establishing AA loading per EDU. Peaking factors were then applied to establish the FY 59/60 and buildout MM loads.

Table 4-4: Current and Projected Influent Loading at DCWWTP

Parameter	Condition	Unit	DCWWTP			
			Current	FY59/60	Buildout	Peaking Factor
BOD	Average Concentration	mg/L	425	---	---	---
	AA Loading	lbs/day	33,900	52,000	56,000	---
	MM Loading	lbs/day	47,600	73,000	79,000	1.41
TSS	Average Concentration	mg/L	540	---	---	---
	AA Loading	lbs/day	42,800	65,000	71,000	---
	MM Loading	lbs/day	60,800	92,000	101,000	1.42
NH_3	Average Concentration	mg/L	23	---	---	---
	AA Loading	lbs/day	1,800	2,800	3,100	---
	MM Loading	lbs/day	2,500	4,000	4,200	1.35

Table 4-5: Current and Projected Influent Loading at PGWWTP

Parameter	Condition	Unit	PGWWTP			
			Current	FY59/60	Buildout	Peaking Factor
BOD	Average Concentration	mg/L	358	---	---	---
	AA Loading	lbs/day	22,400	38,000	60,000	---
	MM Loading	lbs/day	28,000	48,000	75,000	1.25
TSS	Average Concentration	mg/L	291	---	---	---
	AA Loading	lbs/day	18,100	31,000	48,000	---
	MM Loading	lbs/day	26,400	45,000	70,000	1.46
NH_3	Average Concentration	mg/L	40	---	---	---
	AA Loading	lbs/day	2,400	4,100	6,400	---
	MM Loading	lbs/day	2,700	4,600	7,100	1.11

4.3 Plant Capacity Comparison and Expansion Phasing

This comparison of current plant capacity and projected future flows and loads accounts for only hydraulic and carbonaceous BOD treatment capacity because these parameters have driven capacity expansion timing in the past. Potential nutrient removal requirements have not been considered in expansion timing and phasing. Evaluation of plant capacity with respect to TSS and ammonia removal should be incorporated into a subsequent analysis of plant capacity. Existing plant capacity was provided in the following documents:

- South Placer Regional Wastewater and Recycled Water Systems Evaluation, RMC Water and Environment, December, 2009
- Technical Memorandum 4b: Wastewater Treatment Plants Expansion Requirements (TM 4b), RMC Water and Environment, March 28, 2006
- DCWWTP Initial Assessment Final Report, CH2M Hill, Inc, August 2008
- Final Pleasant Grove Wastewater Treatment Expansion Basis of Design Report, Kennedy/Jenks Consultants, March 2016
    - Executive Summary
    - Technical Memorandum No. 1: Influent Flow and Load Characteristics and Projections, Pleasant Grove Wastewater Treatment Plant

- City of Roseville, Dry Creek Wastewater Treatment Plant, Influent Pump Station Hydraulic Analysis, Waterworks Engineers, March 2018.

Current loading capacities at each plant based on these documents are summarized in **Table 4-6.**

Table 4-6: Current Hydraulic and Organic (BOD) Capacities at DCWWTP and PGWWTP

Plant	DCWWTP Existing	PGWWTP Existing	PGWWTP FY 22-23[a]
ADWF Hydraulic Treatment Capacity, mgd	18[b]	12[b]	12[a,c]
Biological Treatment Capacity, AA BOD Loading, lbs/day	26,200[d]	22,000[b]	34,500[c]
Biological Treatment Capacity, MM BOD loading, lbs/day	32,500[d]	N/A	40,100[c]

Notes:

a. Plant improvements that expand treatment capacity at PGWWTP are currently under construction and are expected to be in service by FY 22-23. Capacity comparisons in this TM take this into consideration.
b. Permitted plant capacity and capacity documented in the South Placer Regional Wastewater and Recycled Water Systems Evaluation, RMC Water and Environment, December 2009.
c. Source: Table 1.1, Technical Memorandum No. 1: Influent Flow and Load Characteristics and Projections. Final Pleasant Grove Wastewater Treatment Expansion Basis of Design Report, Kennedy/Jenks Consultants, March 2016
d. Source: Table 5-1, DCWWTP Initial Assessment Final Report, CH2M Hill, Inc, August 2008

The plant data show that current BOD loadings are higher than the BOD treatment capacities estimated in the reference documents at both plants (marginally higher at Pleasant Grove). However, according to City staff, the plants have consistently been in compliance with their NPDES discharge permits. This suggests that the **actual** plant capacities are beyond their nominal design capacity with respect to BOD. Additionally, it is unclear to what extent interim improvements such as the Nitrate Reduction Improvements project at DCWWTP have affected the plant capacity. For the purposes of this TM, it is assumed that the AA and MM BOD removal capacity at each plant are, at minimum, the same as their current BOD loadings. **Table 4-7** shows the revised treatment capacities based on current AA and MM BOD loadings. It is recommended that process-specific sampling, process modeling, and, if needed, stress testing be performed to determine the actual plant capacity, the limiting processes, and corresponding process improvements needed at each plant. While this evaluation will be immediately helpful at Pleasant Grove, it is essential at Dry Creek because of the large discrepancy between current loading and nominal capacity.

Table 4-7: Revised Current Hydraulic and Organic (BOD) Capacities at DCWWTP and PGWWTP

Plant	DCWWTP	PGWWTP Existing	PGWWTP FY 22-23[a]
ADWF Hydraulic Treatment Capacity, mgd	18[b]	12[b]	12[a,c]
Biological Treatment Capacity AA BOD Loading, lbs/day	33,900[d]	22,400[d]	34,500[c]
Biological Treatment Capacity, MM BOD Loading, lbs/day	48,000[d]	28,000[d]	40,100[c]

Notes:

a. Plant improvements that expand treatment capacity at PGWWTP are currently under construction and are expected to be in service by FY 22-23. Capacity comparisons in this TM take this into consideration.
b. Permitted plant capacity and capacity documented in the South Placer Regional Wastewater and Recycled Water Systems Evaluation, RMC Water and Environment, December, 2009.
c. Source: Table 1.1, Technical Memorandum No. 1: Influent Flow and Load Characteristics and Projections. Final Pleasant Grove Wastewater Treatment Expansion Basis of Design Report, Kennedy/Jenks Consultants, March 2016
d. Current BOD loadings based on plant data from January 2013 through September 2019.

4.3.1 Dry Creek Wastewater Treatment Plant

This section discusses the hydraulic and biological capacity of the DCWWTP and preliminary phasing of future improvements. Based on the estimated plant capacity and projected flow and loading requirements, two phases of improvements are recommended.

4.3.1.1 Hydraulic Capacity and Phasing

Based on the projected ADWF of 16.7 for FY 59/60 and 18.2 mgd for buildout, the current DCWWTP ADWF hydraulic capacity of 18 mgd is effectively sufficient through buildout. **Figure 4-5** shows ADWF capacity plotted against the flow projected over the planning period. **Figure 4-5** also presents graphs for ADWF and PDWWF rebound based on a linear interpolation from 150 gpd/EDU calculated based on current flows in FY 19/20 to a potential flow factor of 190 gpd/EDU in FY 59/60. This is not to say that all unit processes are sufficient to handle future peak flows associated with wet weather; assuming peaking factors hold steady over time, or increase, unit processes based upon flow criteria (as opposed to loading) will need to be expanded as presented below.

4.3.1.2 Biological Capacity and Phasing

Preliminary biological capacity improvements for DCWWTP have been identified, which should be confirmed and refined when additional capacity testing has been completed. Based on **Table 4-7**, DCWWTP is currently running at or beyond its nominal design capacity with respect to BOD loading. It is recommended that SPWA implement Phase 1 expansion in approximately FY 24/25 which is the earliest practical time frame it could be implemented considering planning, design, and construction duration. The plant will reach 94% of the expanded Phase 1 AA and MM BOD loading capacity in FY 39/40. Therefore, it is recommended to implement Phase 2 biological improvements at this time concurrent with necessary wet weather hydraulic improvements. Phase 2 improvements in FY 39/40 are recommended to bring the plant BOD loading capacity to its buildout AA and MM projections of 56,000 and 79,000 lbs/day, respectively. Figure 4-6 shows AA and MM biological treatment capacities plotted against the loadings projected over the planning period and the anticipated phasing. As discussed in Chapter 5, the timing and size of the recommended projects should be reviewed after additional capacity analysis and facility planning is completed.

4.3.2 Pleasant Grove Wastewater Treatment Plant

This section discusses the hydraulic and biological capacity of the PGWWTP and the recommended phasing of future improvements. This phasing includes improvements that are currently under design and are expected to be in service by FY 22-23. Based on the estimated plant capacity and projected flow and loading requirements, two phases of improvements beyond the FY 22-23 project are recommended.

4.3.2.1 Hydraulic Capacity and Phasing

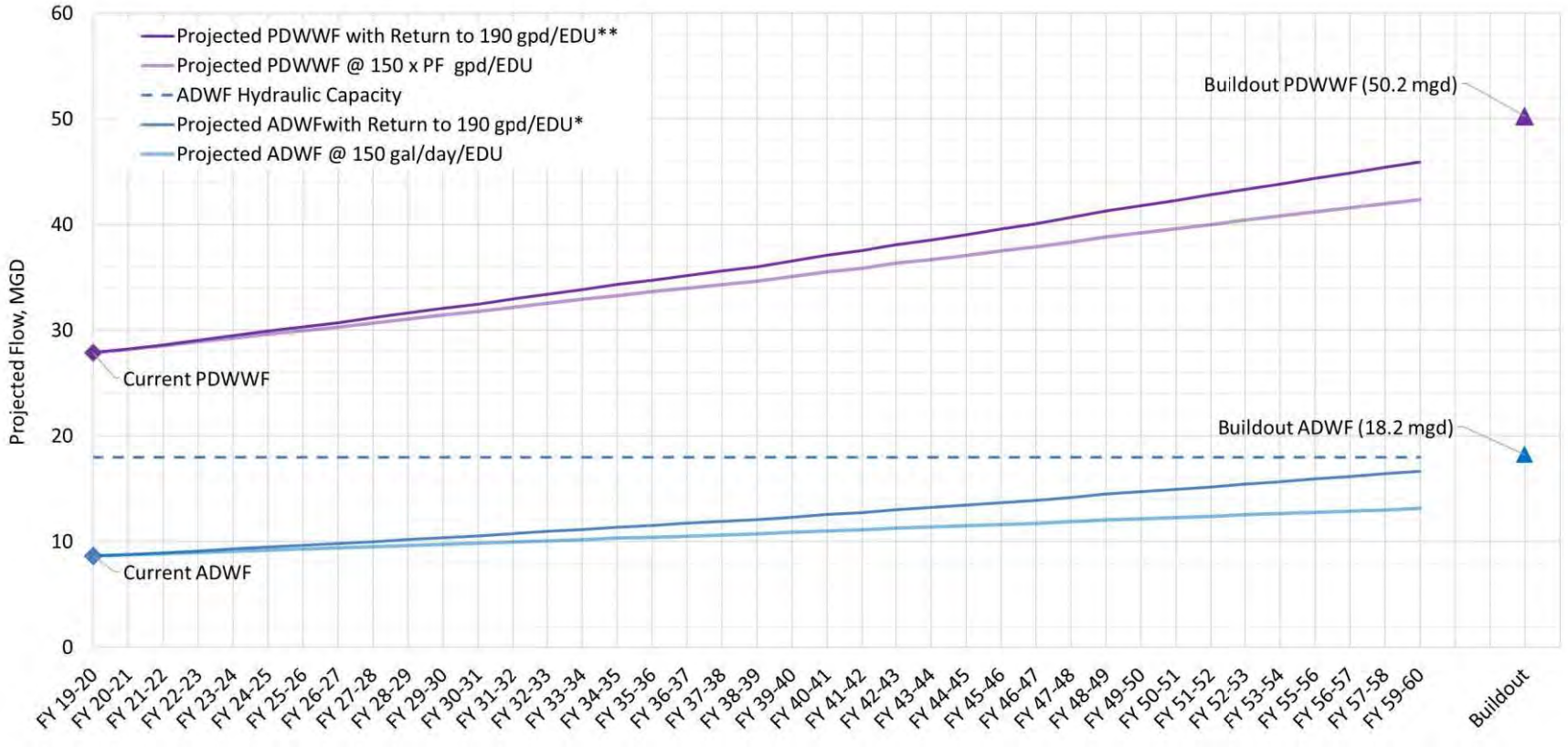
Although the PGWWTP hydraulic capacity is 12 mgd, based on the references above, the current ADWF treatment capacity at the PGWWTP is rated at 9.5 mgd. The improvements currently under construction will expand PGWWTP's treatment capacity to its hydraulic capacity rating of 12 mgd. Based on the ADWF projections calculated from a linear interpolation between current flow of 138 gpd/EDU and historic 190 gpd/EDU flow contribution, this capacity expansion should be sufficient to handle flows through approximately FY 28-29, though timing would depend on the rate of any rebound in sewer flows. It is currently recommended that Phase 1 hydraulic expansion be implemented in FY 28-29 to expand the plant ADWF to 15 mgd. Phase 1 expansion would carry the PGWWTP through FY 40-41. At that point, Phase 2 improvements may be needed to increase the plant ADWF capacity to FY 59/60 flow projections of 18 mgd. **Figure 4-7** shows ADWF plotted against the flow projected over the planning period and the anticipated phasing for improvements. **Figure 4-7** presents graphs for ADWF and PDWWF rebound based on linear interpolation from 138 gpd/EDU calculated based on current flows in FY 19/20 to a potential flow factor of 190 gpd/EDU in FY 59/60. As discussed in Chapter 5, the timing and size of the recommended projects should be reviewed after additional facility planning is completed and the gpd/EDU assumption is confirmed.

4.3.2.2 Biological Capacity and Phasing

Based on Table 4-7, PGWWTP is currently running at or beyond its nominal design capacity with respect to BOD loading. The improvements currently under design will expand the plant's AA and MM BOD loading capacities to 34,500 lbs/day and 40,100 lbs/day. These improvements should be sufficient to meet projected BOD loadings through FY 40/41 when Phase 2 hydraulic capacity improvements are recommended. During Phase 2 expansion, it is recommended that plant capacity be increased to accommodate projected FY59/60 AA and MM BOD loadings of 38,000 lbs/day and 48,000 lbs/day, respectively. The timing and magnitude of additional expansion to accommodate buildout will be determined in subsequent planning documents.

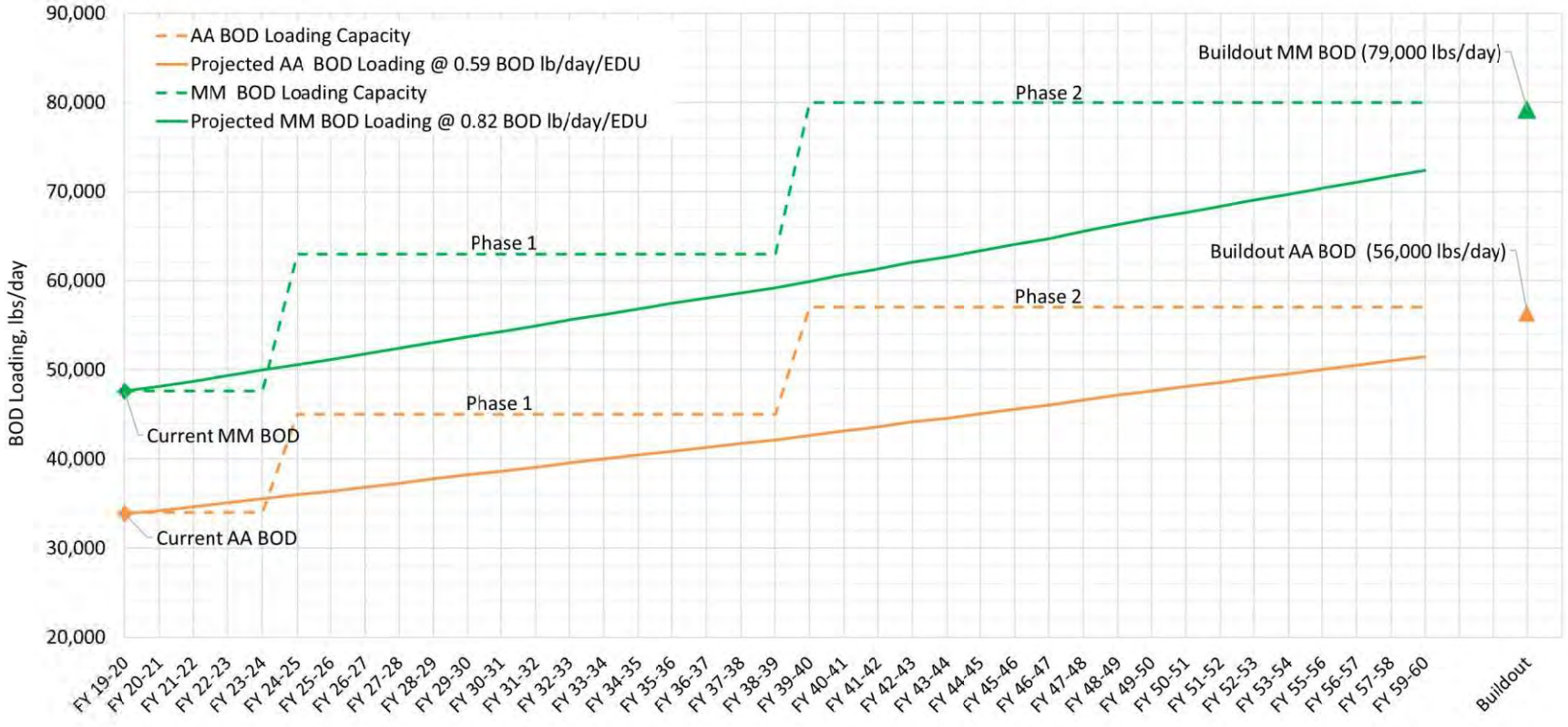
Figure 4-8 shows AA and MM biological treatment capacities plotted against the loadings projected over the planning period and the anticipated phasing.

Figure 4-5: DCWWTP Hydraulic Capacity Comparison



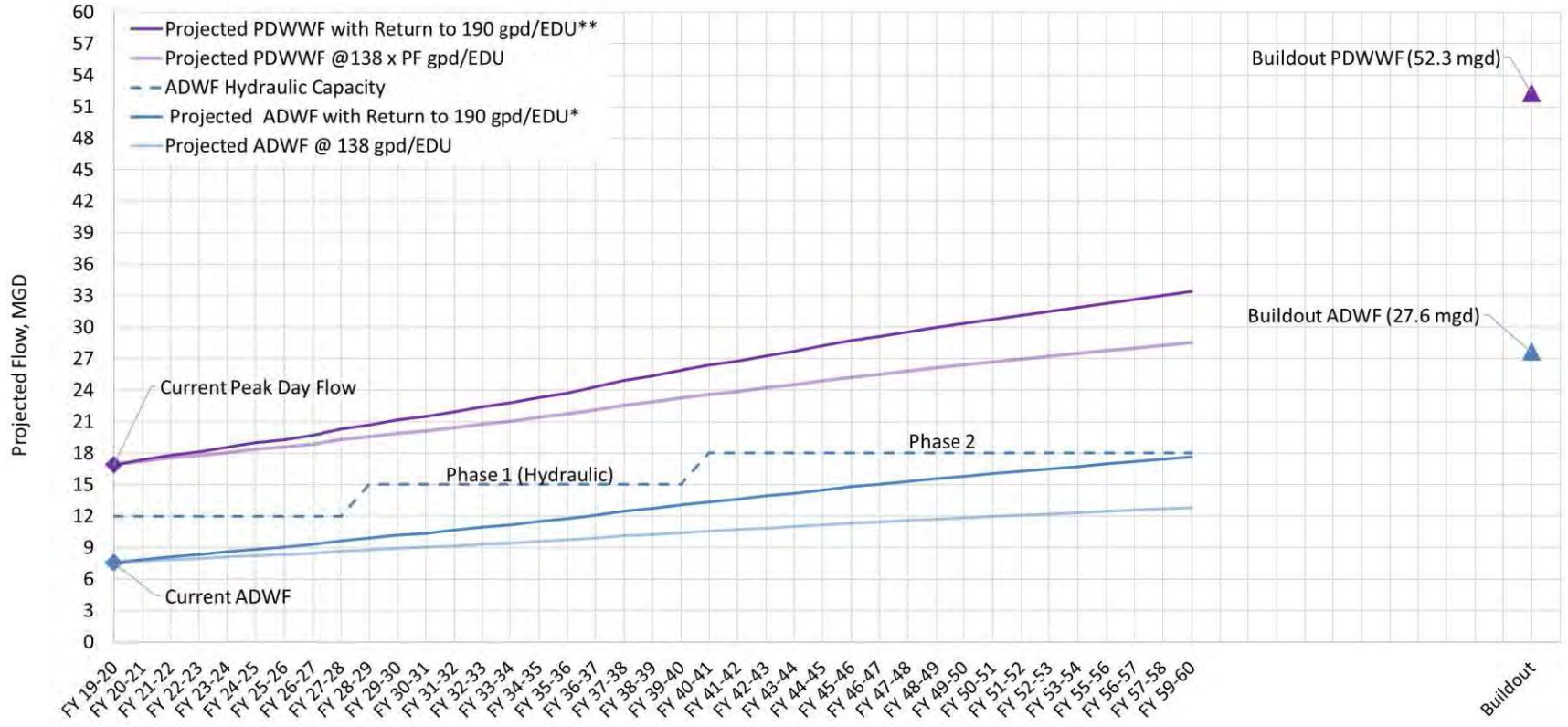
* ADWF gpd/EDU flow factor is assumed to reach 190 gpd/EDU by FY 59/60, with a linear increase from 150 gpd/EDU at FY 19/20
**PDWWF is assumed to be ADWF flow plus 330 gpd/EDU of wet weather flow, based on current wet weather flowrates
*** Buildout date is currently unknown and is shown for graphical purposes only.

Figure 4-6: DCWWTP Biological Capacity Comparison



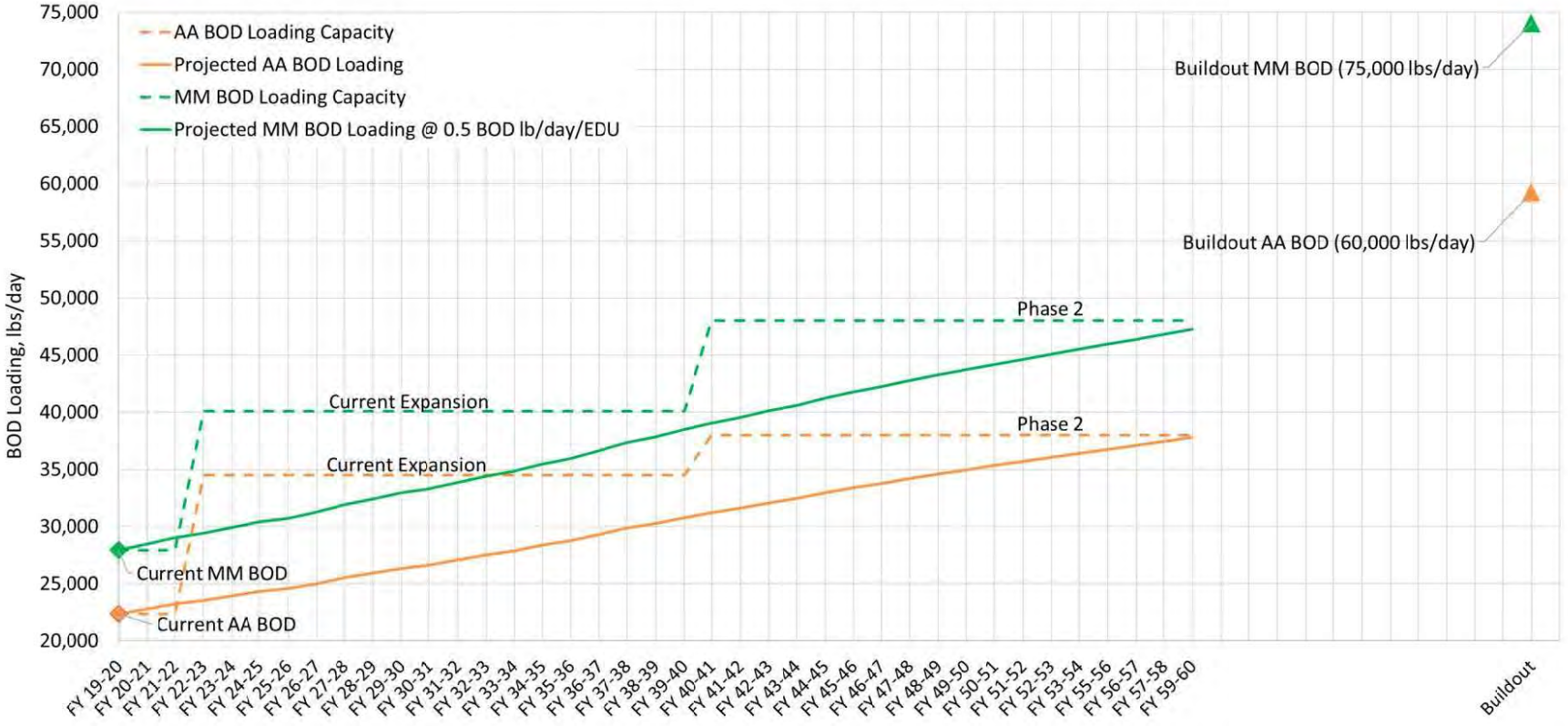
* Buildout date is currently unknown and is shown for graphical purposes only.

Figure 4-7: PGWWTP Hydraulic Capacity Comparison



* ADWF GPD/EDU factor is assumed to reach 190 gpd/EDU by FY 59/60, with a linear increase from 138 gpd/EDU at FY 19/20
**PDWWF is assumed to be ADWF flow plus 170 gpd/EDU of wet weather flow, based on current wet weather flowrates
*** Buildout date is currently unknown and is shown for graphical purposes only.

Figure 4-8: PGWWTP Biological Capacity Comparison



* Buildout date is currently unknown and is shown for graphical purposes only.

4.4 Conceptual Capital Cost Estimates

Opinions of probable cost were developed for the recommendations of this TM and are presented in this section. This section also provides the procedures and methodology used for developing planning-level capital cost estimates for PGWWTP and DCWWTP phased improvement projects. Note that improvements that would be required after the FY 59/60 planning horizon have not been estimated.

4.4.1 Cost Estimation Approach

This section describes the assumptions and procedures used to develop cost estimates for phased improvements at PGWWTP and DCWWTP. The cost estimates provided in this TM include improvements that would increase the plant capacity to treat the projected flows and loadings but does not include repair and replacement (R&R) projects or discretionary projects such as resource recovery improvements.

The estimated construction costs are based on a Class 5 estimate as defined by the Association for the Advancement of Cost Engineering (AACE) International cost estimate classification system. **Table 4-8** provides a summary of the estimate classes and expected accuracy range. For Class 5 estimates, the expected accuracy range is -20% to -50% on the low end and +30% to +100% on the high end.

Table 4-8: Cost Estimate Classification Matrix (AACE International)

Estimate Class	Level of Project Definition	Purpose of Estimate	Methodology	Expected Accuracy Range
Class 5	0% to 2%	Concept screening	Capacity factored, parametric models, judgement, or analogy	Low: -20% to -50% High: +30% to +100%
Class 4	1% to 15%	Study or feasibility	Equipment factored or parametric models	Low: -15% to -30% High: +20% to +50%
Class 3	10% to 40%	Budget authorization or control	Semi-detailed unit costs with assembly level line items	Low: -10% to -20% High: +10% to +30%
Class 2	30% to 75%	Control or bid/tender	Detailed unit cost with forced detailed take-off	Low: -5% to -15% High: +5% to +20%
Class 1	65% to 100%	Check estimate or bid/tender	Detailed unit cost with detailed take-cost	Low: -3% to -10% High: +3% to +15%

Source: AACE International Recommended Practice No. 18R-97

Construction costs were developed based on the improvements and unit costs provided in the prior planning documents listed below:

- Technical Memorandum 4b: Wastewater Treatment Plants Expansion Requirements, RMC Water and Environment, March 28, 2006 (TM 4b).
- DCWWTP Initial Assessment Final Report, CH2M Hill, Inc, August 2008 (CH2M Hill, 2008)
- Final Pleasant Grove Wastewater Treatment Expansion Basis of Design Report, Kennedy/Jenks Consultants, March 2016

Raw construction costs are estimated for each component based on estimated unit costs multiplied by quantity.

Construction cost factors were used to develop and escalate unit costs to reflect the current bid environment, industry trends, and project location as well as plant capacity increase. These factors are incorporated into the unit costs and are represented in two categories:

- **Engineering News Record's (ENR) Construction Cost Index (CCI) –** All project construction cost estimates are indexed to an ENR CCI of 12115 which represents the average of the April 2020 indices for San Francisco (SF) ENR and the "20-Cities" ENR, to account for the greater Sacramento area construction market.
- **Capacity Adjustment Factor –** The number of units listed in TM 4b were associated with different capacity increases than required in proposed improvement phasing in this Systems Evaluation. Proportional adjustment factors were used to account for these capacity increase differences. Further discussion is provided below.

Based on the level of detail available for Class 5 estimates, allowances are used for some of the direct construction elements including the site electrical, and instrumentation and control (I&C), site yard piping and mechanical, and site civil work estimates (i.e. direct construction costs). Allowance estimates are made using the percentages listed in **Table 4-9.**

Table 4-9: Direct Construction Cost Allowances

Construction Cost Allowance Types	Percent
Site Yard Piping & Mechanical	5%
Site Electrical / I&C/SCADA	15%
Site Civil	5%

From the direct construction cost subtotal, indirect construction cost factors are applied to develop an estimated total construction cost. These construction cost markups include the following:

- **Overhead and Profit –** Contractor overhead and profit (O&P) represents the general contractor's operating costs and estimated profit levels. The O&P factor typically varies between 10% and 25% of the direct construction cost subtotal, depending on the size of the project and market conditions, with larger projects typically having lower O&P factors. For this Systems Evaluation, an O&P factor of 20% was used.
- **Estimating Contingency –** The estimating contingency is defined as unknown costs due to lack of detailed engineering during the planning phase that are estimated as a percentage of defined project costs (i.e. direct and indirect construction cost subtotal). For this Systems Evaluation, a contingency factor of 30% was used since the projects are at conceptual planning level.

The estimated total construction cost is then multiplied by an allowance of 25% for Engineering, Permitting, Construction Management, and Engineering Services during Construction.

4.4.2 Dry Creek WWTP Cost Estimates

The proposed Phase 1 and 2 improvements and process unit cost estimates in TM 4b were used as the basis of the cost estimate. Several revisions and updates were made to the TM 4b improvements to develop the new phased improvements list and cost estimates in this Systems Evaluation, including the following:

- **Influent Pump Station –**Several improvements have been completed at East Roseville influent pump station including installation of new pumps and emergency generator, demolition of the old East Roseville Pump Station and Pump Station Annex, and replacement of PLCs. Therefore, TM 4b Phase 1 improvements were updated to remove the influent pump installation.
- **Influent Coarse Screen –** The existing two coarse screens have a PHWWF capacity of 30 mgd each. The existing screens provide sufficient capacity through buildout with project PHWWF of 54.7 mgd with two screens in service and using the existing bypass channel in the event that one of the screens is out of service. Therefore, it is recommended that a third screen be installed in Phase 2.
- **Aeration Tanks –** TM 4b proposed installation of ten new aeration tanks including replacement of four of the exiting smaller size aeration tanks constructed in 1974 with larger tanks (same size as tanks constructed in 1991) in Phase 1. The CH2M Hill, 2008 report evaluation indicated existing aeration basin volumes were sufficient for Phase 1 improvements which assumed a projected AA BOD loading capacity about the same as the current plant loading and recommended providing additional aeration and mixed liquor recycle (MLR) pumping capacity. New MLR pumps were installed at the plant per the Nitrate Removal Project Basis of Design Report (B&C, 2017). A rough evaluation of the aeration tank sizes indicated that replacement of two aeration tanks and construction of two new ones (total of four) in Phase 1 and replacement of the remaining 2 aeration tanks and construction of 4 new ones in Phase 2 (total of six) would provide sufficient capacity at each of the 2 phases.
- **Capacity Increase Adjustment Factor –** Biological treatment capacity increases for AA BOD loading were used to calculate the DCWWTP adjustment factor. The Adjustment Factor was obtained from the ratio between incremental capacity increases proposed in TM 4b and in this TM.

  BOD loading increase in Phase 1 based on TM 4b was 10,500 lb/day and the required capacity increase per this TM is 11,100. An adjustment factor of 1.06 was calculated and applied to the number of units.

  BOD loading increase in Phase 2 based on TM 4b was 13,700 lb/day and the required capacity increase per this TM is 12,000 lb/day. An adjustment factor of 0.88 was calculated and applied to the number of units.

The preliminary phased improvements are provided in **Table 4-10.** The listed improvements increase the plant ADWF capacity based on AA BOD loading from 11.5 mgd to 14.5 mgd in Phase 1 and to 18 mgd in Phase 2. It should be emphasized that the cost estimates provided below are conceptual level costs for capacity expansion projects and do not include rehabilitation and replacement projects or discretionary projects. More detailed cost estimating should be developed when the plant capacity is determined, and phased improvement projects are updated accordingly.

Table 4-10: DCWWTP Phase 1 and Phase 2 Capital Cost Estimates (ENR CCI: 12115)[a]

Process	Process Unit Cost	Phase 1 FY 24/25	Phase 2 FY 39/40
		# of units	# of units
Coarse Screens	$280,000	-	1
Influent Pump Station	$2,000,000	-	1
Fine Screens	$170,000	2	1
Odor Control	$210,000	1	1
Grit Basins	$290,000	-	1
Primary Sedimentation	$3,400,000	-	2
Aeration Basins	$2,600,000	4	6
Blower	$290,000	1	-
Mixed Liquor Return Pumps	$150,000	4	6
Rehab Existing Anoxic Zones	$290,000	1	
Secondary Clarifiers	$4,100,000	4	2
RAS/WAS Pump Station	$860,000	1	1
Tertiary Filtration	$730,000		2
Waste Backwash Pumps	$100,000		1
UV Disinfection	$2,100,000		1
Anaerobic Digesters	$3,300,000	1	1
Centrifuges	$650,000	2	
Cooling Units	$290,000		2
Total Unit Process Costs		**$34,000,000**	**$43,000,000**
Site Yard Piping & Mechanical (5%)		$1,700,000	$2,200,000
Site Electrical / I&C/SCADA (15%)		$5,100,000	$6,500,000
Site Civil (5%)		$1,700,000	$2,200,000
Subtotal of Direct Construction Costs		**$43,000,000**	**$54,000,000**
Mobilization/Demobilization (5%)		$2,200,000	$2,700,000
Contractor Overhead & Profit (20%)		$8,600,000	$10,800,000
Subtotal of Direct and Indirect Costs		**$54,000,000**	**$68,000,000**
Contingency (30%)		$16,000,000	$20,000,000
Total Estimated Construction Cost		**$70,000,000**	**$88,000,000**
Engineering, Permitting, CM, ESDC (25%)		$18,000,000	$22,000,000
Total Estimated Capital Cost		**$88,000,000**	**$110,000,000**

Notes:

a. Costs based on Average of SF and "20 Cities" ENR for April 2020: 12115

4.4.3 PGWWTP Cost Estimates

The proposed Phase 1 and 2 improvements and cost estimates in TM 4b were used as the basis of the cost estimate. Several revisions and updates were implemented on these proposed improvements for Phase 1 and Phase 2 to develop the new phased improvements cost estimates, including the following:

- **Current Expansion –** As described in 1.2, several improvements are currently being constructed at PGWWTP per the Pleasant Grove Wastewater Treatment Plant Expansion BODR (Kennedy/Jenks, 2016). Therefore, TM 4b Phase 1 improvements were updated by removing the current expansion projects from Phase 1 scope, including the following:
    - Installation of four new primary sedimentation basins
    - Installation of 1 odor control system
    - Installation of 2 new solid thickening systems and building
    - Installation of 2 new digesters and building
    - Installation of 1 new co-generation system
- **Hydraulic Capacity Increase –** Proposed Phase 1 improvements in this TM are to increase PGWWTP peak day hydraulic capacity. Therefore, proposed projects in Phase 1 improvements in TM 4b were revised to include only improvements to unit process that increase the plant hydraulic capacity and the remaining projects associated with BOD removal capacity including installation of one digester and one oxidation ditch, and construction of associated buildings were moved to Phase 2 improvements .
- **Capacity Increase Adjustment Factor –** For Phase 1, since only hydraulic capacity increase is required, an Adjustment Factor was obtained from the ratio between the hydraulic capacity increase in TM 4b and in this TM. Both TMs propose 3 mgd hydraulic capacity increases in Phase 1, therefore the adjustment factor of 1 was multiplied by the number of units proposed in TM 4b.

  For Phase 2, biological treatment capacity increases for AA BOD loading were used. The Phase 2 BOD loading capacity increase in TM 4b was 21,000 lb/day and the proposed capacity increase in this TM is 3,500 lb/day. An adjustment Factor of 0.17 was calculated from TM 4b and proposed capacity increase ratio and was multiplied by the number of units proposed in TM 4b.

  An adjustment factor was not applied to building modifications.

The updated opinion of probable cost for the phased improvements is provided in **Table 4-11**. The recommended phased improvements increase the plant ADWF capacity from 12 mgd to 15 mgd in Phase 1 and from 15 mgd to 18 mgd in Phase 2. It should be emphasized that the cost estimates provided below are conceptual level costs for capacity expansion projects and do not include rehabilitation and replacement projects or discretionary projects. More detailed cost estimating should be developed when the plant capacity is determined, and phased improvement projects are updated accordingly.

Table 4-11: PGWWTP Phase 1 and Phase 2 Capital Cost Estimates (ENR CCI: 12115)[a]

Process	Process Unit Cost	Phase 1 FY 28/29	Phase 2 FY 39/40
		# of units	# of units
Influent Pumps	$120,000	1	-
Grit Basins	$290,000	1	-
Fine Screens	$170,000	2	-
Primary Sedimentation	$3,400,000	-	1
Oxidation Ditches	$7,100,000	-	1
Secondary Clarifiers	$4,100,000	1	1
RAS/WAS Pump Station	$860,000	1	-
Tertiary Filtration	$730,000	2	1
UV Disinfection	$2,100,000	3	-
Thickeners Building Modification	$490,000	-	1
Digesters Building Modification	$490,000	-	1
Total		**$13,000,000**	**$16,000,000**
Site Yard Piping & Mechanical (5%)		$650,000	$800,000
Site Electrical / I&C/SCADA (15%)		$2,000,000	$2,400,000
Site Civil (5%)		$650,000	$800,000
Subtotal of Direct Costs		**$16,000,000**	**$20,000,000**
Mobilization/Demobilization (5%)		$800,000	$1,000,000
Contractor Overhead & Profit (20%)		$3,200,000	$4,000,000
Subtotal of Direct and Indirect Costs		**$20,000,000**	**$25,000,000**
Contingency (30%)		$6,000,000	$7,500,000
Total Estimated Construction Cost		**$26,000,000**	**$33,000,000**
Engineering, Permitting, CM, ESDC (25%)		$6,500,000	$8,300,000
Total Estimated Capital Cost		**$33,000,000**	**$41,000,000**

Notes:

a. Costs based on Average of SF and "20 Cities" ENR for April 2020: 12115

5. CAPACITY IMPROVEMENT PROJECT SUMMARY & NEXT STEPS

Table 5-1 summarizes the capacity improvements identified in this systems evaluation. Note that the improvement needs projected for Dry Creek and Pleasant Grove WWTPs are significantly larger and more expensive than the improvement projects projected for the collection system, but are based on limited available data. The estimated costs for Dry Creek WWTP are especially high because of the size and age of that plant; when it was designed, the organic loading in Roseville was far lower than when Pleasant Grove was designed; since the mid 2000's organic loading to both plants has continued to increase. Further studies, as described in Chapter 4, should be undertaken for both treatment plants, and the capacity improvement projects should be refined based on those findings.

Note that only capacity improvement projects have been identified; condition and reliability related improvement needs have not been evaluated in this study.

Table 5-1: Proposed Capacity Improvement Projects

		Existing	FY 24/25	FY 39/40	After FY 59/60
Collection System	**Description**	Improvement Project 1 (Increased Capacity of PS 26 and sewers on Sierra College Blvd)	None	None	Improvement Project 2 (Redirect flows from PS 26 and Sierra College Blvd down Eureka Road) Improvement Project 3 (Increased Firm capacity of PS 25 with diversion structure improvements)
	Estimated Capital Cost	$1,610,000	-	-	$2,590,000
Dry Creek WWTP	**Description**	Plant Capacity Analysis, Condition Assessment, and Facilities Plan	Phase 1 (Increase AA BOD Capacity to ~45,000 lbs/day)	Phase 2 (Increase AA BOD Capacity to ~57,000 lbs/day)	Phase 3: Increase BOD Capacity and Hydraulic Capacity (not estimated)
	Estimated Capital Cost	$550,000	$88,000,000	$110,000,000	Not Estimated
Pleasant Grove WWTP	**Description**	Plant Capacity Analysis, Condition Assessment, and Facilities Plan	Increase ADWF hydraulic capacity to 15 mgd	Increase ADWF hydraulic capacity to 18 mgd. Increase AA BOD Loading Capacity to 38,000 lbs/day	Phase 3: Increase BOD Capacity and Hydraulic Capacity (not estimated)
	Estimated Capital Cost	$450,000	$33,000,000	$41,000,000	Not Estimated

5.1 Next Steps

Based on the findings of this preliminary evaluation, and discussions with the project team, the following next steps are recommended for consideration by SPWA:

- Conduct an analysis of process performance and current biological treatment and hydraulic capacity at both DCWWTP and PGWWTP. This will likely require process-specific sampling and development of calibrated process models. Biological treatment capacity should consider both BOD and nitrate plus nitrite permit limitations set forth within each plant's respective NPDES permit. Results of this study should determine a capacity rating for each unit process at the plant and the limiting processes. This analysis will provide a sound basis for the planning of new facilities and is integral to determining required future capital improvement projects during phased expansions. It is recommended that DCWWTP capacity analysis take precedence over PGWWTP considering DCWWTP is currently operating well beyond its nominal BOD removal capacity.

- Review previous condition assessment work conducted on the plant assets and perform additional assessment needed to identify and prioritize repair and replacement (R&R) projects. This effort would include a risk assessment to identify likelihood of failure and criticality of each asset. Results of this study would identify R&R projects which may need to be implemented prior to or concurrent with phased expansions.

- Based on the capacity analysis and R&R project planning, develop Facilities Plans for DCWWTP and PGWWTP. Considering both plants are running at or above their nominal design capacities, it is recommended that facilities planning begin immediately after the capacity analysis. This effort would evaluate various process optimization steps and upgrade alternatives and provide recommended improvements for phased expansions. The Facilities Plans would include review of the 190 gpd/EDU flow factor that is critical to the timing and magnitude of any hydraulic capacity improvements.

- Develop Class 4 cost estimates for recommended improvements at the WWTPs under each expansion phase and for R&R projects to assist SPWA partners in assessing capital needs in the future.

- For the collection system, periodically update the model network based on any configuration changes, perform re-calibration to confirm the actual and anticipated flows, and to update future loads into the model network. An update frequency of every 5-10 years is recommended, depending on changes in development planning and/or system configuration.

We also recommend that SPWA evaluate funding and financing options to support implementation of the recommended capital improvements, especially Phase 1 at Dry Creek, given its size and relative immediacy. With the implementation of the steps above, and the ongoing high level performance of the SPWA Regional System, SPWA will be able to continue its excellent level of service to the Regional Partners.

APPENDIX A – PLACER COUNTY GENERAL PLAN DENSITIES

General Plan Designation	Maximum Density (EDU/Acre)	Diurnal Profile
Commercial	21	Commercial
Greenbelt & Open Space	0	Residential
High Density Residential 4 - 10 DU/Ac.	10	Residential
Industrial	4.356	Commercial
Low Density Residential 0.4 - 0.9 Ac. M	2.5	Residential
Low Density Residential 1 - 2 DU./Ac.	2	Residential
Low Density Residential Density Transf	2.5	Residential
Low Density Residential Development	2	Residential
Medium Density Residential 2 - 4 DU/A	4	Residential
Open Space	0	Residential
Professional Office	4.356	Commercial
Public Facility	0	Commercial
Rural Estate 4.6 - 20 Ac. Min.	0.21739	Residential
Rural Low Density Residential 0.9 - 2.3	1.11	Residential
Rural Low Density Residential 0.9 - 2.3	1.11	Residential
Rural Low Density Residential 0.9 - 2.3	1.11	Residential
Rural Low Density Residential 0.9 - 2.3	1.39	Residential
Rural Low Density Residential 1 - 2.3 A	1	Residential
Rural Residential 2.3 - 4.6 Ac. Min.	0.43478	Residential
Public Facility/Agricultural 80 Ac. Min.	0	Residential
Low Density Residential 0.4 - 2.3 Ac. M	1.11	Residential
Riparian Drainage	0	Residential
Agriculture/Timberland - 20 Ac. Min.	0	Residential
Rural Residential 1 - 10 Ac. Min.	1	Residential

APPENDIX B – URBAN GROWTH AREA LAND USE SUMMARIES

PLACER COUNTY URBAN GROWTH AREAS

Placer Ranch UGA[a]

Land Use	Flow Factor	Land Use Quantities		
		Western Shed	Central Shed	Eastern Shed
Single Family Residential (Units)	190 gpd/DU	2,244	1,254	320
Multi Family Residential (Units)	130 gpd/DU	397	782	831
Mixed Use (acres)	2,300 gpd/ac	-	33.8	15.1
Commercial (acres)	850 gpd/ac	73.2	309.9	38.0
Parks > 10 acres (acres)	10 gpd/ac	37.8	17.1	-
Public/Quasi-Public (acres)	660 gpd/ac	0.8	0.8	3.9
Schools (acres)	170 gpd/ac	32.0	-	-
Total ADWF (mgd)		**0.55**	**1.95**	**0.24**

Footnotes:

a. See Exhibit D of the Placer Ranch Sewer Master Plan (Mackay & Somps, 2017). Approximately 1,300 acres in the Sunset Industrial Area outside of Placer Ranch are anticipated to drain through Placer Ranch sewers, when fully developed.

Sunset Industrial Area[a]

Land Use	Flow Factor	Land Use Quantities			
		PR-POC 1	PR-POC 2	Existing POC 1	Existing POC 2
Single Family Residential (Units)	190 gpd/DU	2,361	297	0	0
Multi Family Residential (Units)	130 gpd/DU	0	0	0	0
Mixed Use (acres)	2,300 gpd/ac	257	161	0	0
Commercial/ Industrial (acres)	850 gpd/ac	1,287	85	531	277
Parks > 10 acres (acres)	10 gpd/ac	0	0	0	0
Public/Quasi-Public (acres)	660 gpd/ac	0	0	0	0
Schools (acres)	170 gpd/ac	0	0	0	0
Point Sources[d]	gpd	480,000	0	0	0
Total ADWF (mgd)		**2.61**	**0.50**	**0.45**	**0.24**

Footnotes:

a. Sunset Area Water, Wastewater, and Recycled Water Technical Report (Psomas, October 2017)
b. Includes low density residential and medium density residential units.
c. Approximately 1,300 acres in the Sunset Industrial Area outside of Placer Ranch are anticipated to drain through Placer Ranch sewers, when fully developed.
d. Includes Thunder Valley Casino and Area L270 (County area east of the Sunset Area proposed to drain through the Sunset Area)

Placer Vineyards[a]

Land Use	Flow Factor	Land Use Quantities		
		Shed A1	Shed A2	Shed B
Single Family Residential (Units)	190 gpd/DU	1,723	7,051	1,951
Multi Family Residential (Units)	130 gpd/DU	0	2,822	270
Mixed Use (acres)	2,300 gpd/ac	0	50.5	0
Commercial/ Industrial (acres)	850 gpd/ac	0	234.2	25.0
Parks > 10 acres (acres)	10 gpd/ac	0	30	12.0
Public/Quasi-Public (acres)	660 gpd/ac	0	113	27.2
Schools (acres)	170 gpd/ac	12	155	0
Total ADWF (mgd)		**0.33**	**2.12**	**0.45**

Footnotes:

a. Placer Vineyards Specific Plan; Sanitary Sewer Master Plan Addendum 1 (Mackay & Somps, May 20, 2019)

Table 0-1: Regional University[a]

Land Use	Flow Factor	Land Use Quantities
Single Family Residential (Units)	190 gpd/DU	1,845
Multi Family Residential (Units)	130 gpd/DU	349
Mixed Use (acres)	2,300 gpd/ac	10.98
Commercial/ Industrial (acres)	850 gpd/ac	25
Parks > 10 acres (acres)	10 gpd/ac	27.3
Public/Quasi-Public (acres)	660 gpd/ac	5.0
Schools (acres)	170 gpd/ac	32.6
University	mgd	0.725
Total ADWF (mgd)		**1.18**

Footnotes:

a. Regional University Specific Plan, Sanitary Sewer Demand (Mackay & Somps, September 1, 2017)

Riolo Vineyards[a]

Land Use	Flow Factor	Land Use Quantities		
		Lift Station Shed	Gravity Shed 1	Gravity Shed 2
Single Family Residential (Units)	190 gpd/DU	673[b]	172	153
Multi Family Residential (Units)	130 gpd/DU	0	0	0
Mixed Use (acres)	2,300 gpd/ac	0	0	0
Commercial/ Industrial (acres)	850 gpd/ac	26.5[b]	0	10
Parks > 10 acres (acres)	10 gpd/ac	0	0	0
Public/Quasi-Public (acres)	660 gpd/ac	0	0	11
Schools (acres)	170 gpd/ac	0	16	0
Total ADWF (mgd)		**0.15**	**0.035**	**0.045**

Footnotes:

a. Riolo Vineyards Sanitary Sewer Master Plan Update (Unico Engineering, April 2016)
b. Includes flows from offsite draining through these sheds

Placer UGA[a]

Land Use	Flow Factor	Land Use Quantities	
		North Shed	South Shed
Single Family Residential (Units)	190 gpd/DU	147	41.7
Multi Family Residential (Units)	130 gpd/DU	0	0
Mixed Use (acres)	2,300 gpd/ac	0	0
Commercial/ Industrial (acres)	850 gpd/ac	0	0
Parks > 10 acres (acres)	10 gpd/ac	0	0
Public/Quasi-Public (acres)	660 gpd/ac	0	0
Schools (acres)	170 gpd/ac	0	0
Total ADWF (mgd)		**0.028**	**0.008**

Footnotes:

a. *Hawk Homestead Sewer Analysis – Supplementary Information Requested by Placer County Environmental Engineering,* Derrick Whitehead, Municipal Consulting Group, January 29, 2016

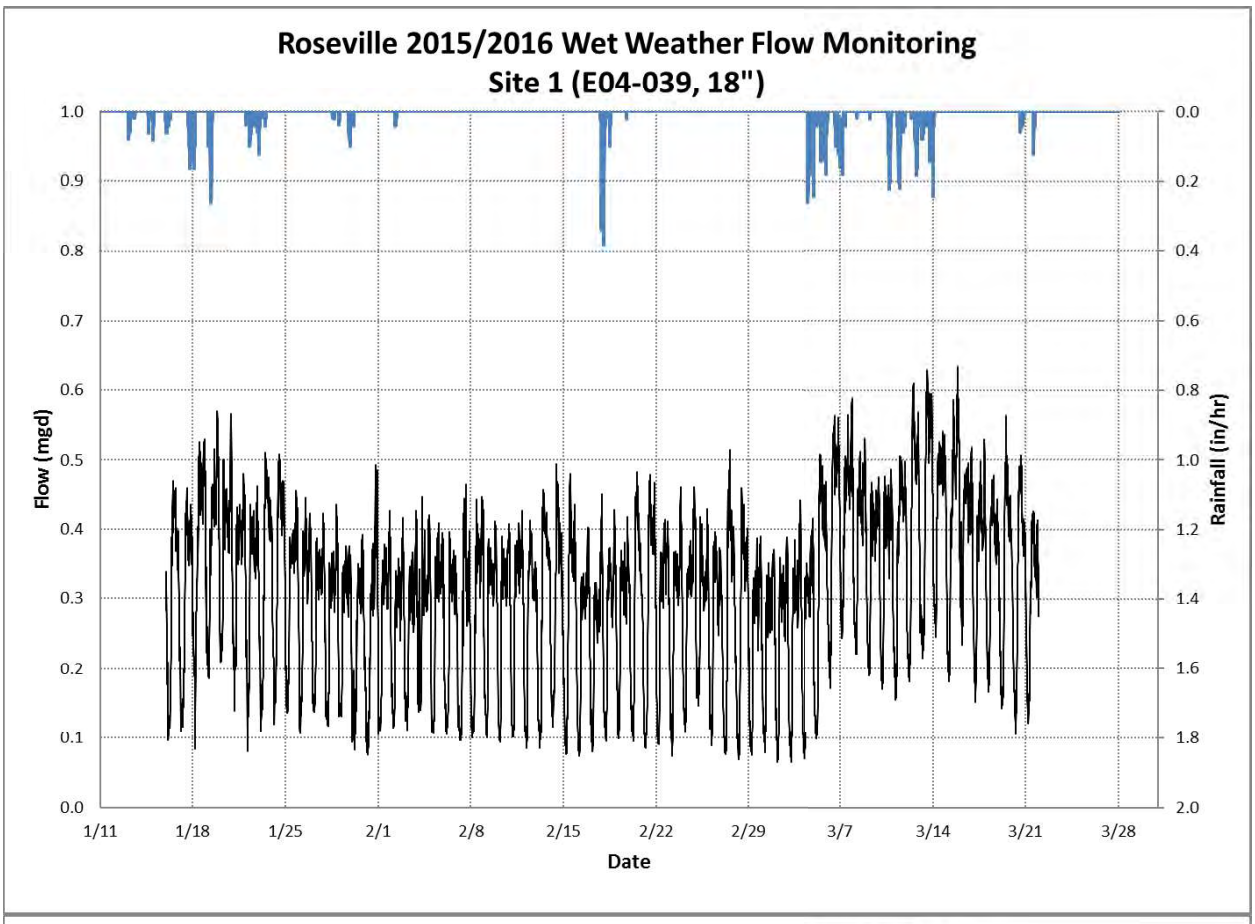
CITY OF ROSEVILLE URBAN GROWTH AREAS

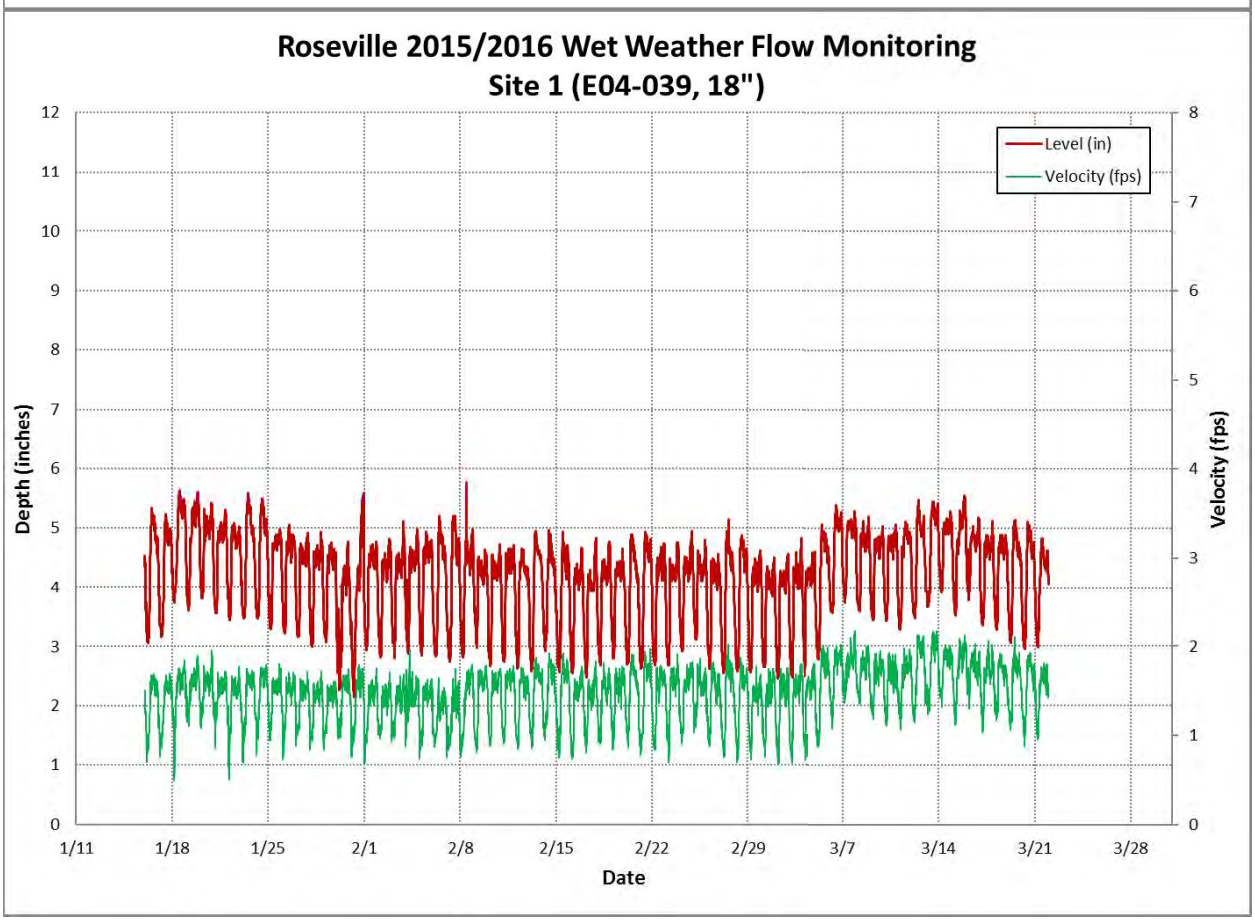
Land Use	Flow Factor	Creekview[a]	Amoruso[b]	Sierra Vista[c]	
				North Shed[d]	South Shed
Single Family Residential (Units)	190 gpd/DU	2,019	4,239[e]	1,658	2,118
Multi Family Residential (Units)	130 gpd/DU	758	873	1,058	1,478
Mixed Use (acres)	2,300 gpd/ac	0.0	27.3	13.3	34.9
Commercial (acres)	850 gpd/ac	15.5	23.9	37.7	181.0
Parks > 10 acres (acres)	10 gpd/ac	0.0	0.0	10.0	39.9
Public/Quasi-Public (acres)	660 gpd/ac	2.6	7.6	10.1	6.6
Schools (acres)	170 gpd/ac	7.0	9.6	10.0	45.6
Total ADWF (mgd)		**0.43**	**0.61**	**0.59**	**1.24**

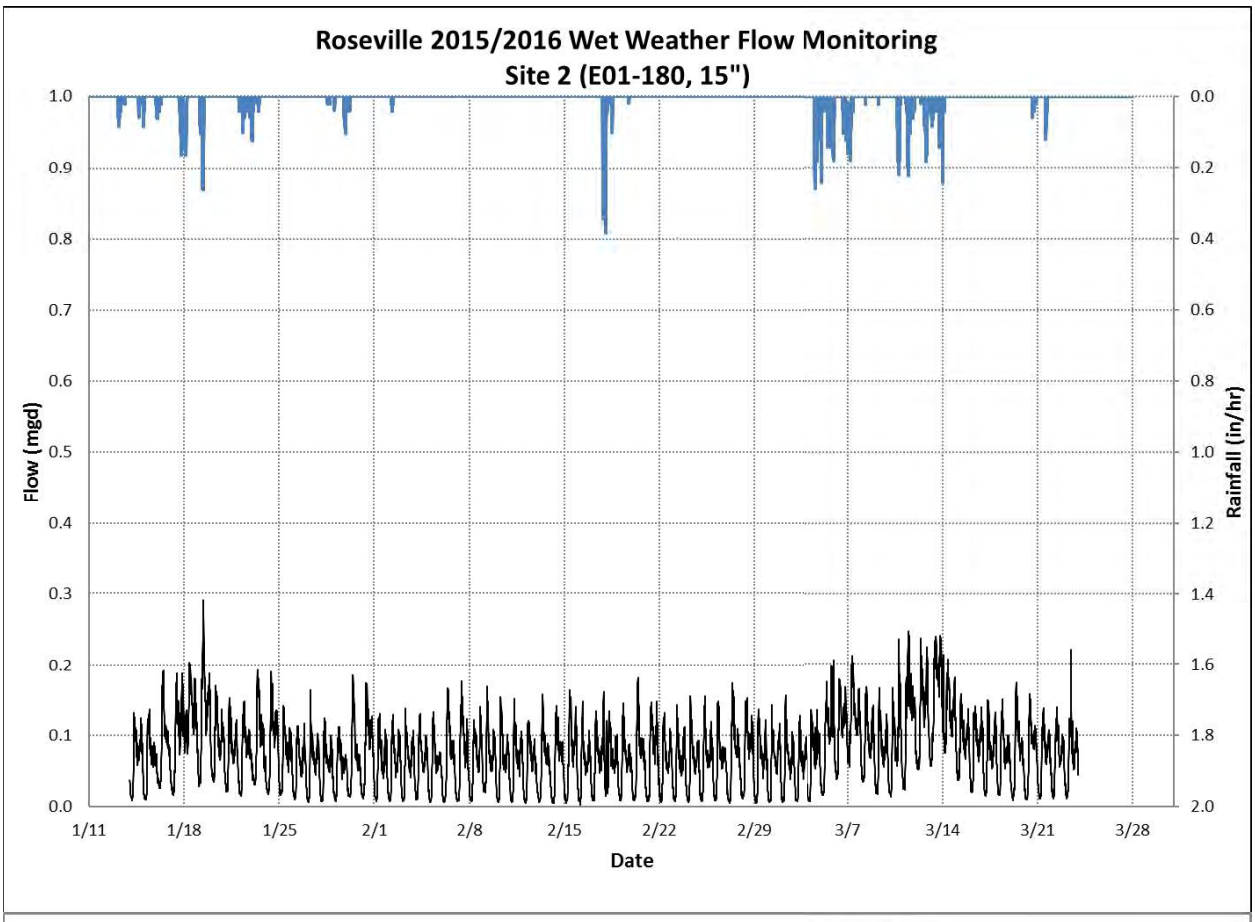
Footnotes:

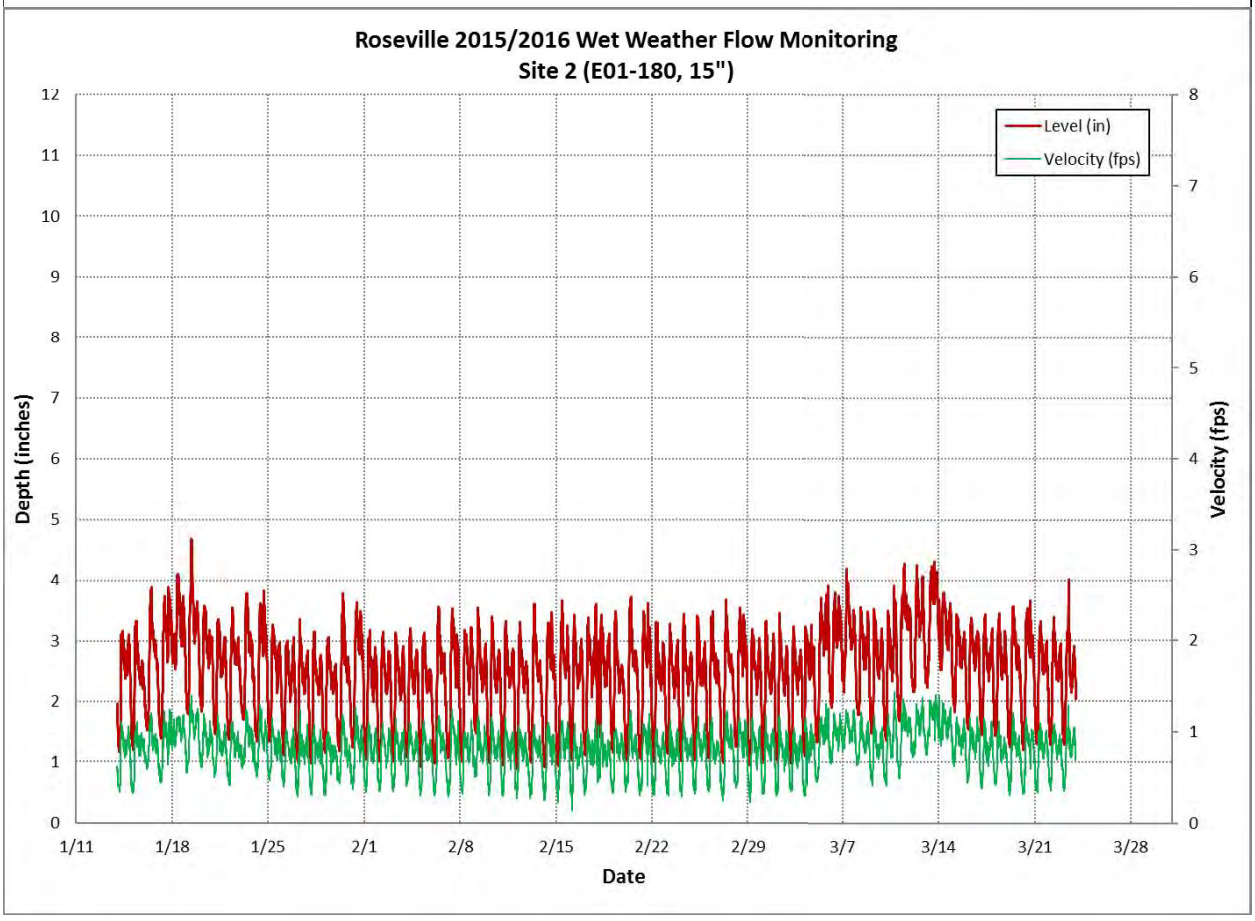
a. *Creekview Specific Plan Sanitary Sewer Master Plan*, Mackay & Somps Civil Engineers, November 2010
b. *Amoruso Ranch Specific Plan Area Wastewater Master Plan*, Kimley Horn, September 2015
c. *Sierra Vista Specific Plan Sanitary Sewer Master Plan*, Mackay & Somps Civil Engineers, July 2009
d. Includes the Westbrook portion of Sierra Vista
e. Includes 274 units north of Amoruso that would contribute flow through sewers in Amoruso (Toad Hill)

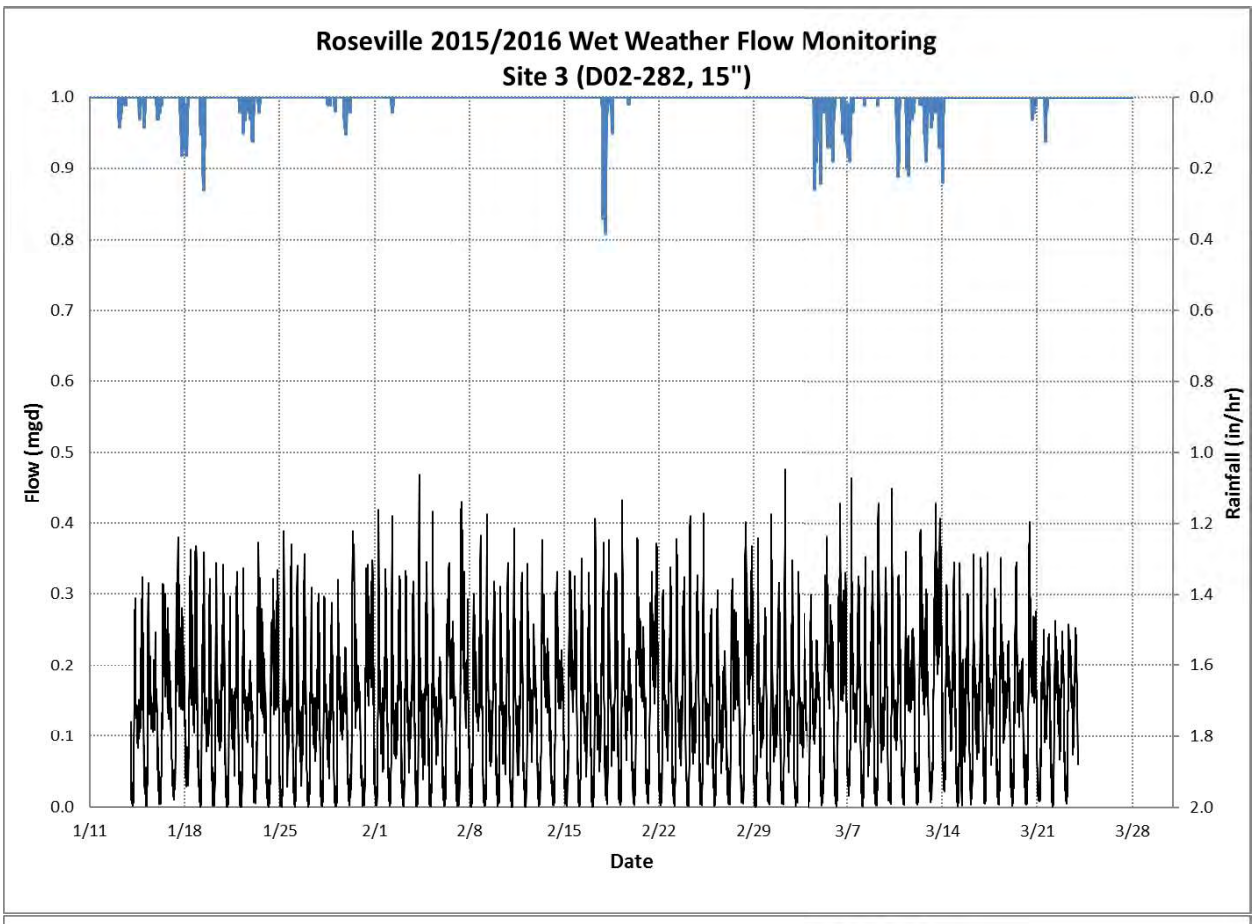
APPENDIX C – FLOW MONITORING DATA

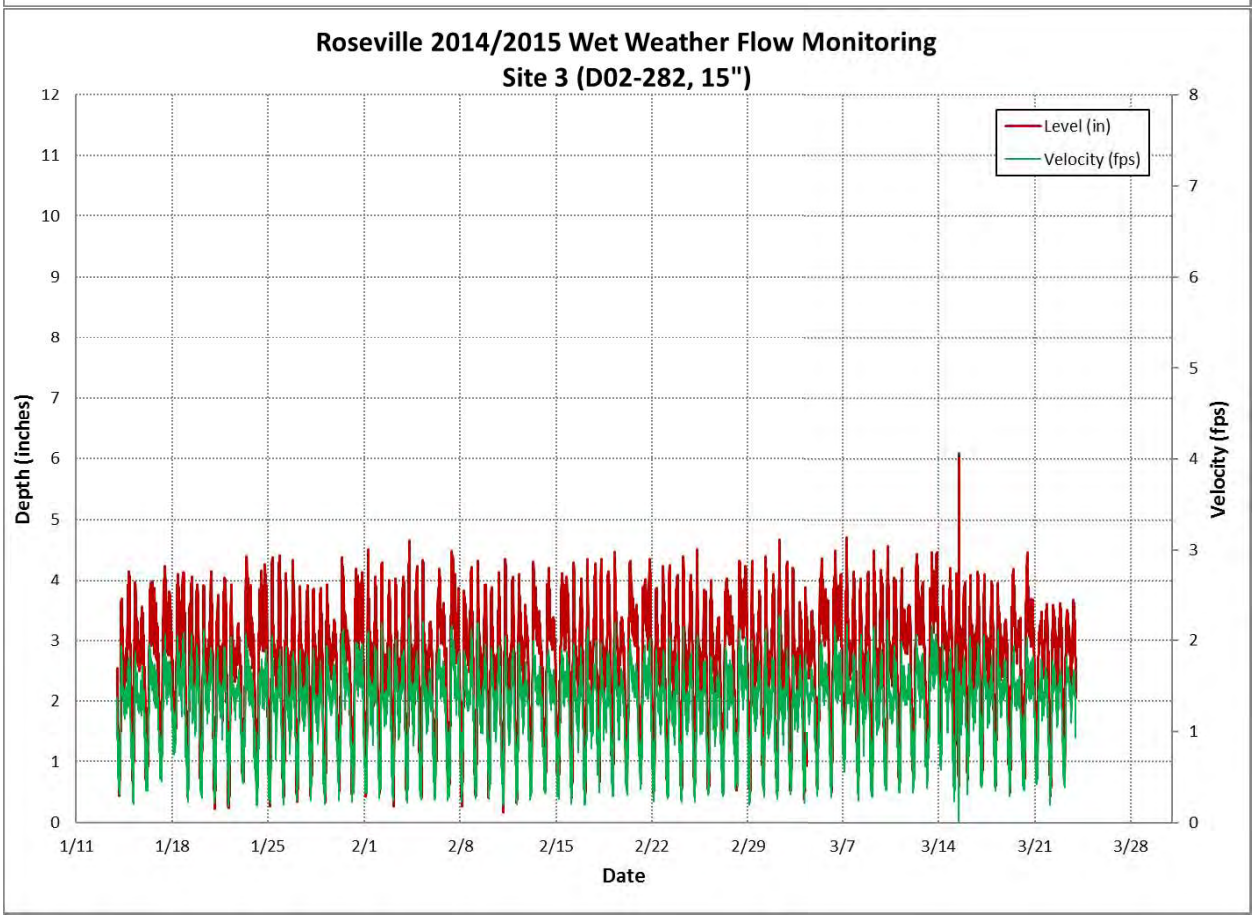

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 1 (E04-039, 18")
Flow (mgd)
Rainfall (in/hr)
Date
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

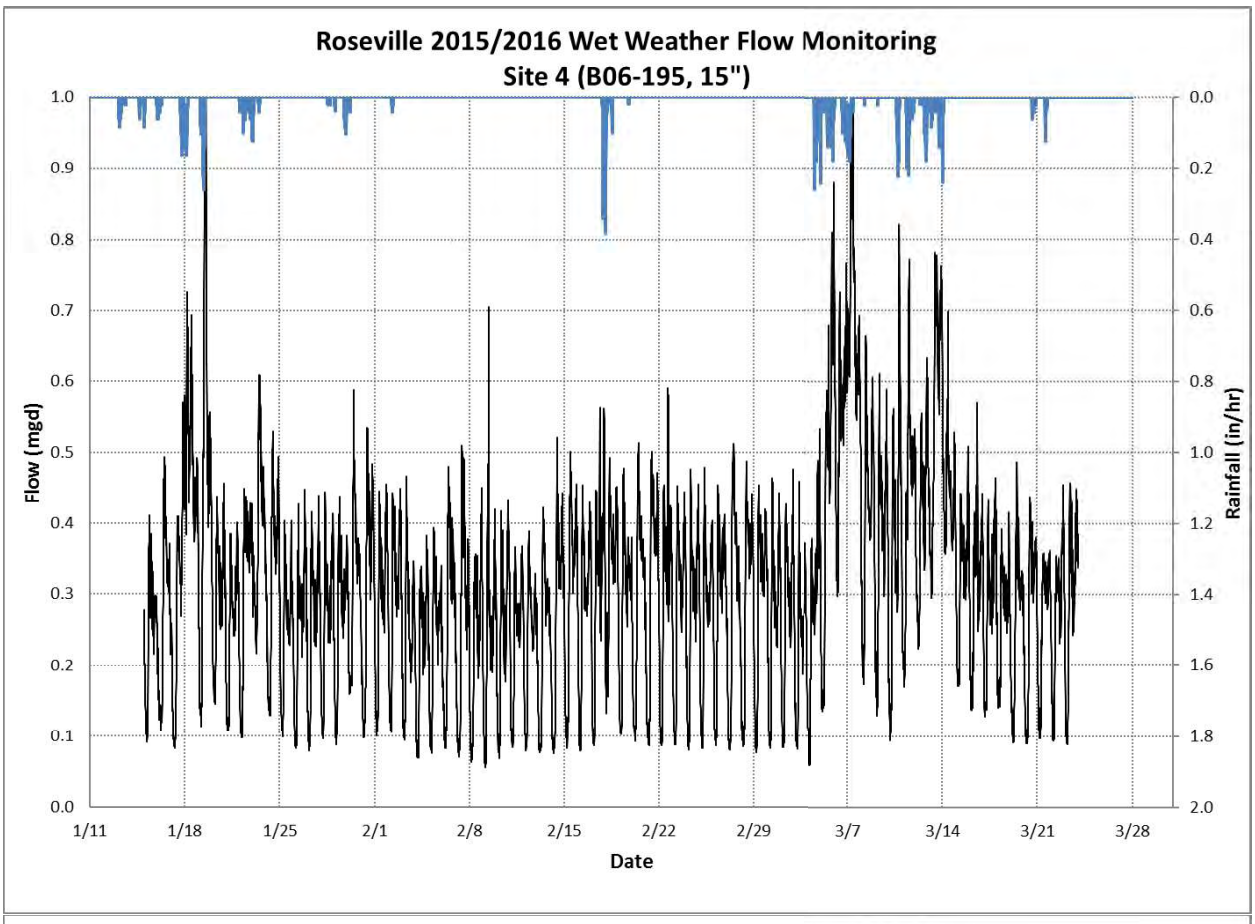

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 1 (E04-039, 18")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
12
11
10
9
8
7
6
5
4
3
2
1
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

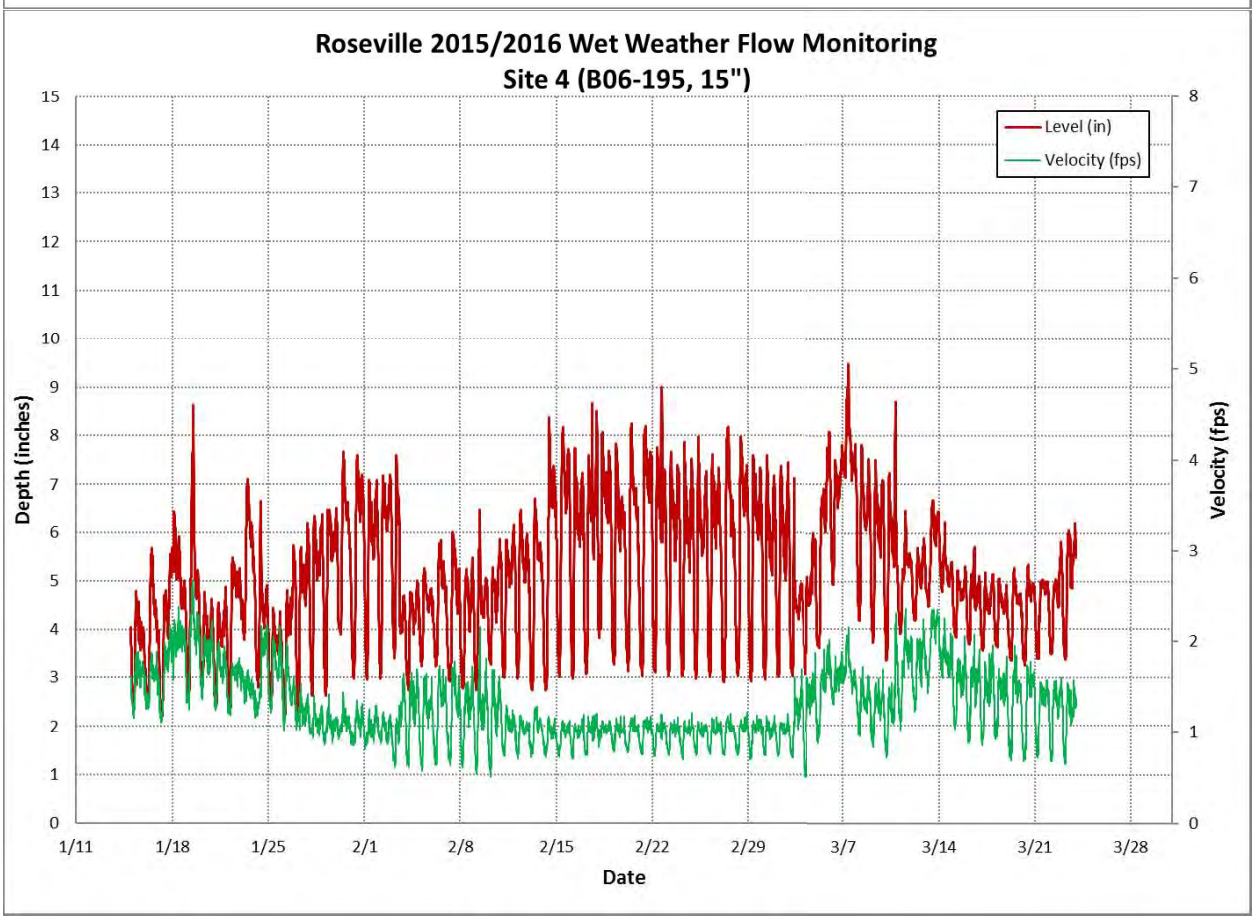

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 2 (E01-180, 15")
Flow (mgd)
Rainfall (in/hr)
Date
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

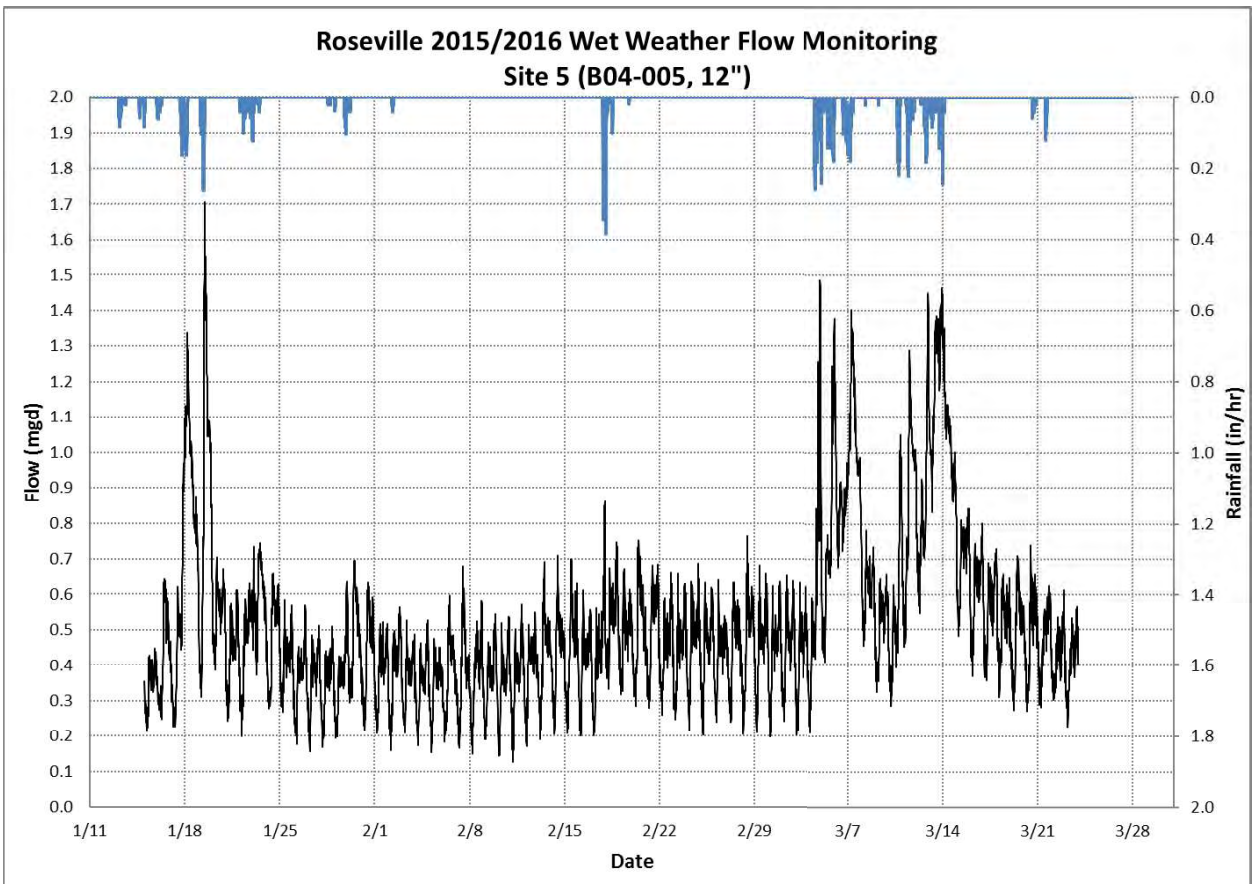

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 2 (E01-180, 15")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
12
11
10
9
8
7
6
5
4
3
2
1
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

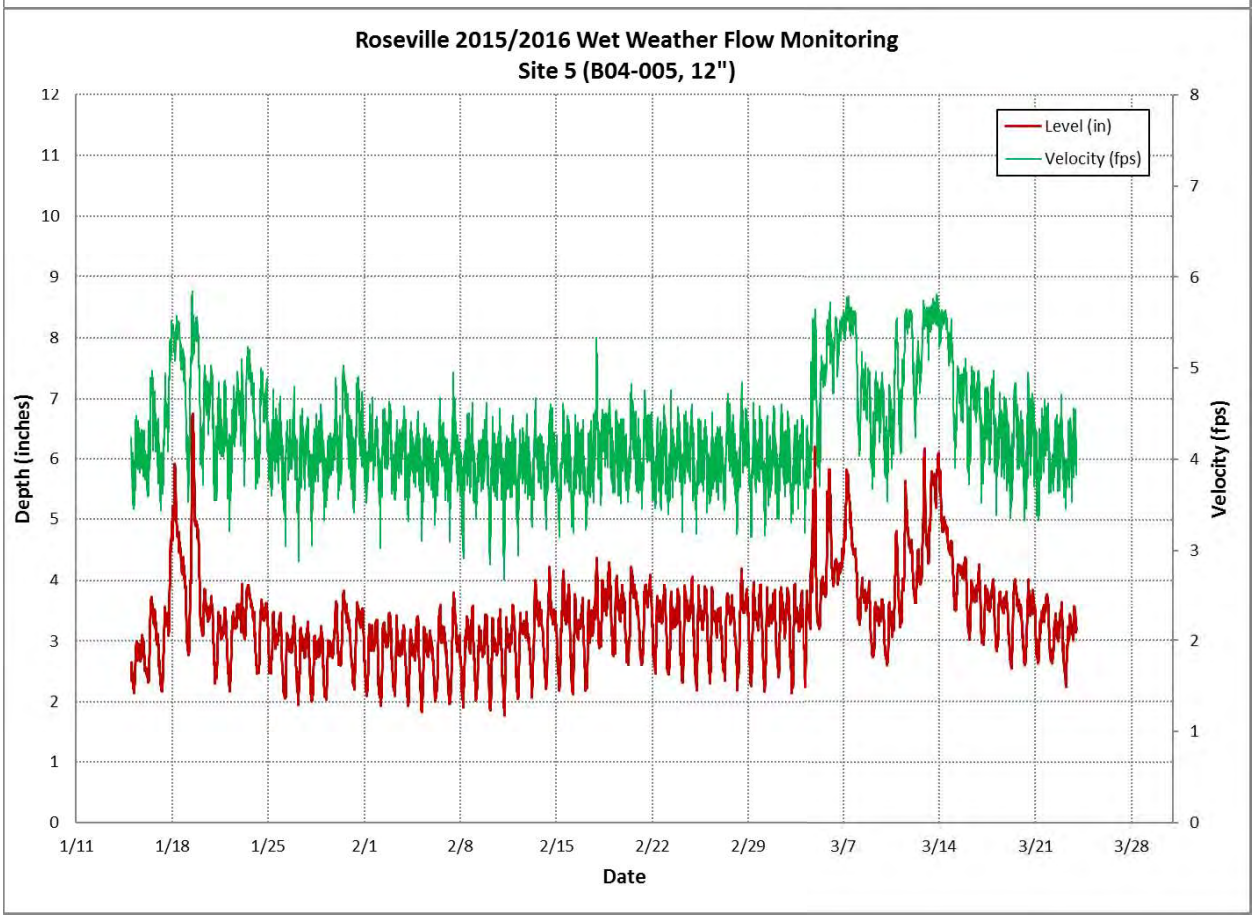

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 3 (D02-282, 15")
Flow (mgd)
Rainfall (in/hr)
Date
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

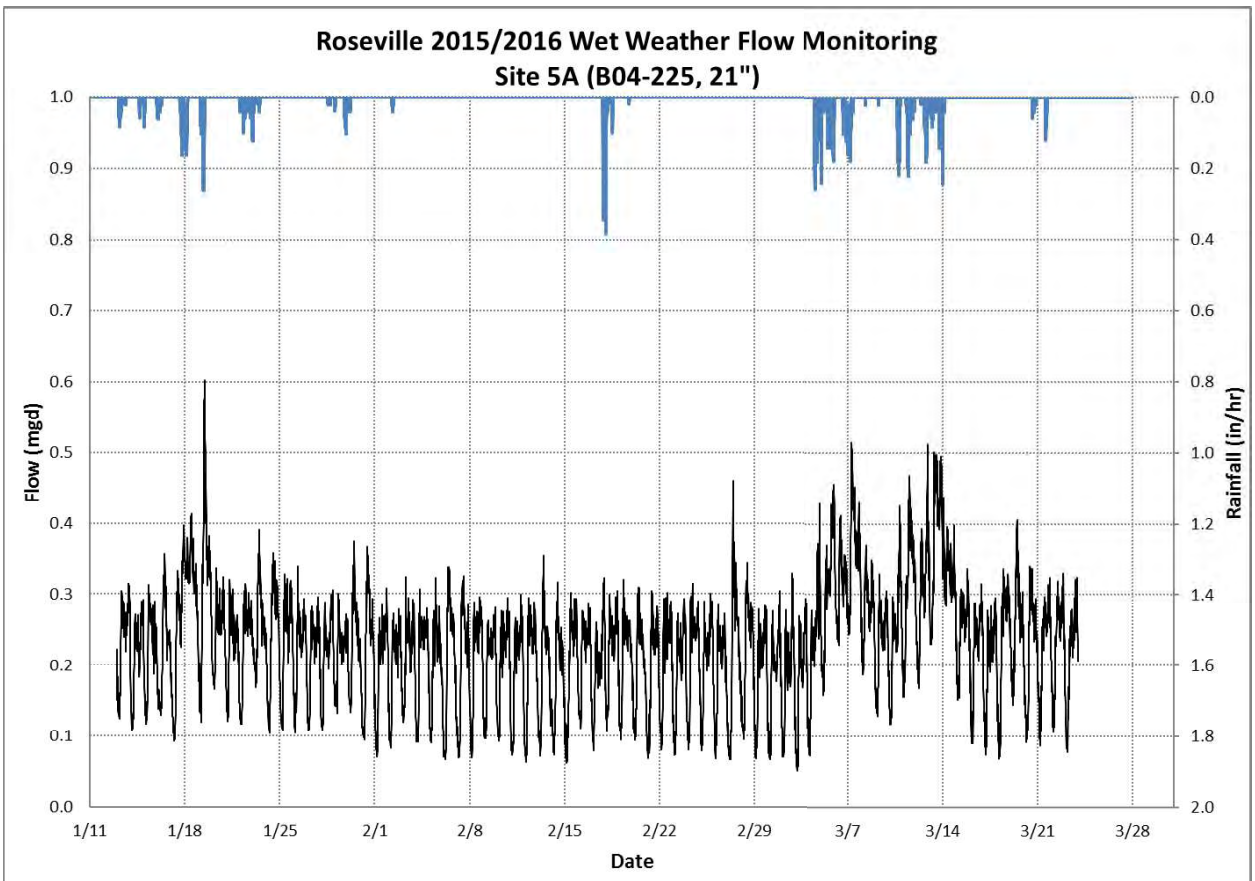

Roseville 2014/2015 Wet Weather Flow Monitoring
Site 3 (D02-282, 15")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
12
11
10
9
8
7
6
5
4
3
2
1
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

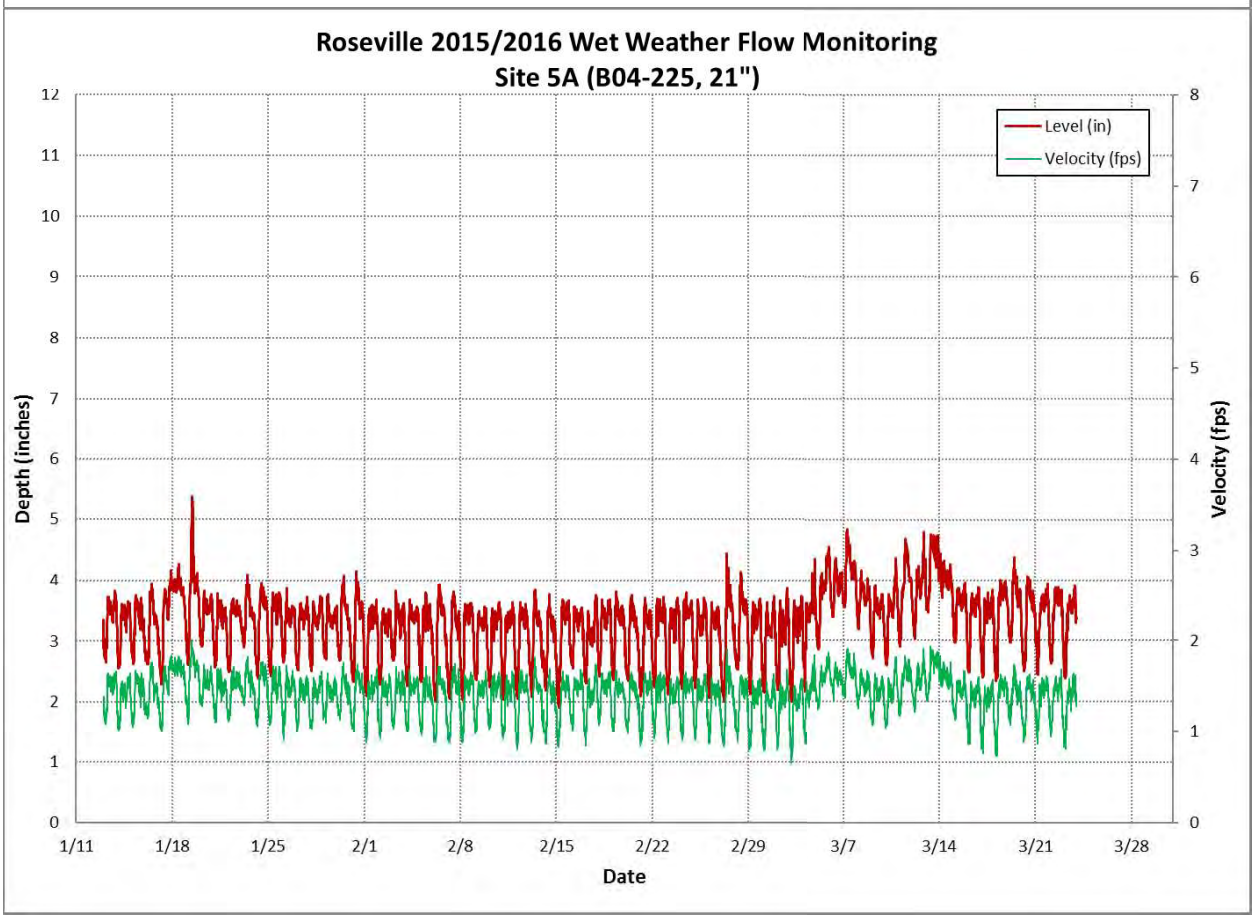

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 4 (B06-195, 15")
Flow (mgd)
Rainfall (in/hr)
Date
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

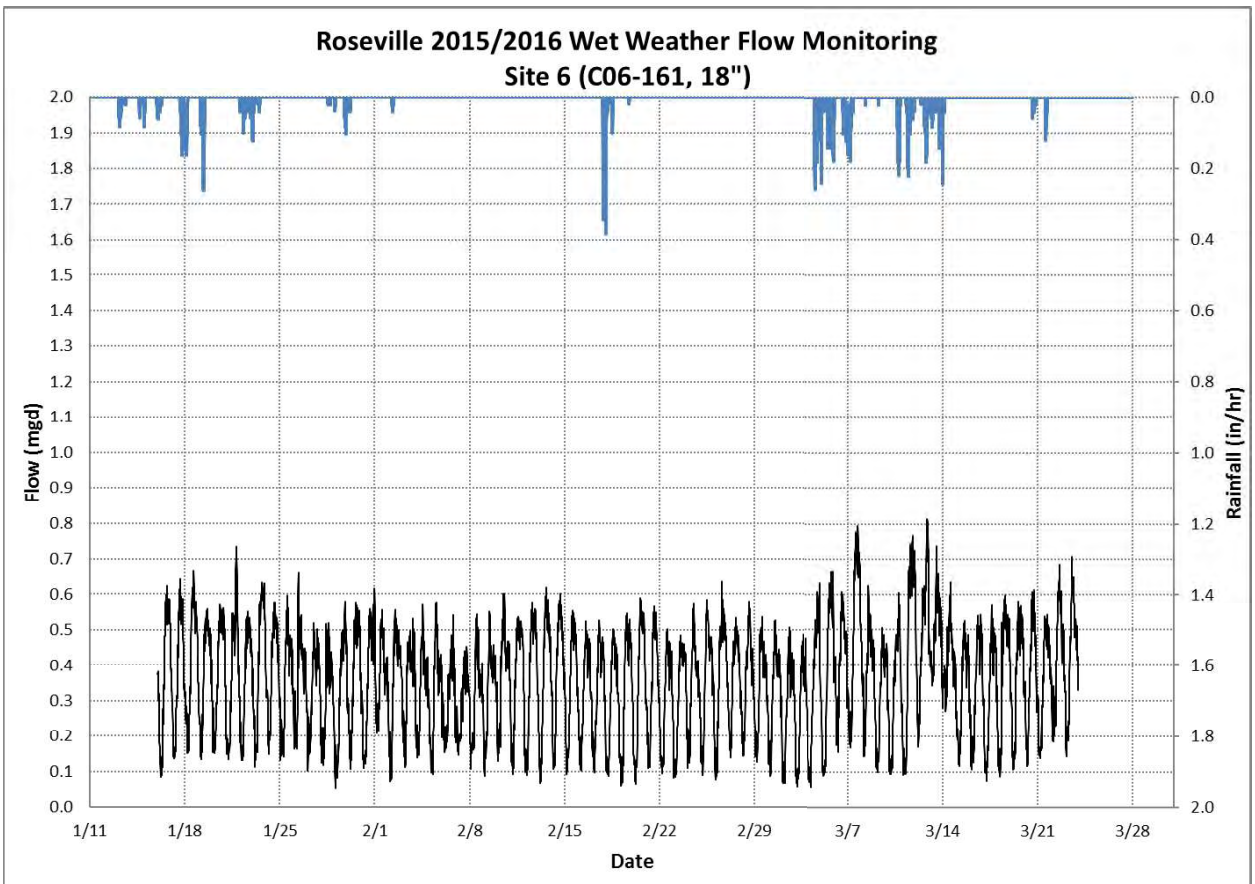

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 4 (B06-195, 15")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

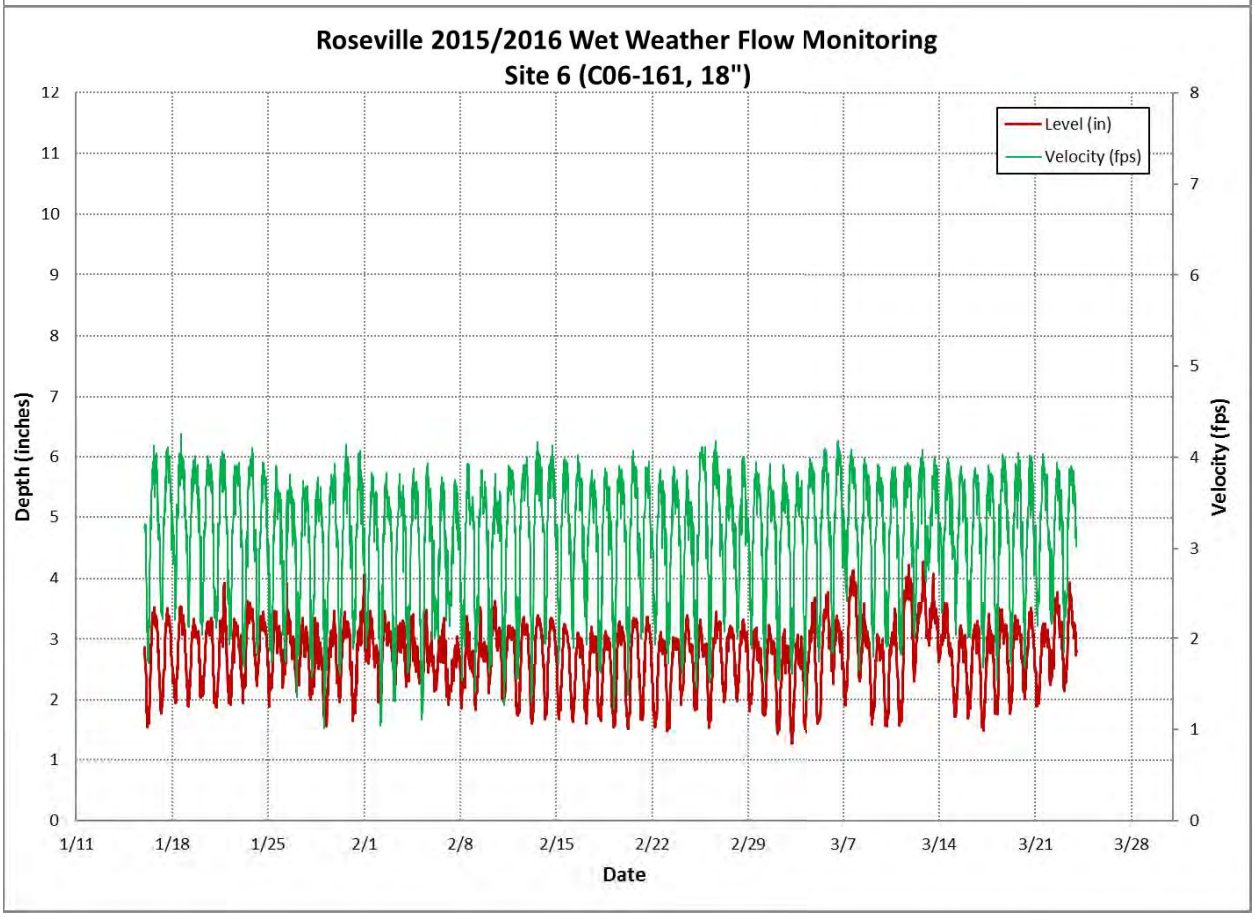

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 5 (B04-005, 12")
Flow (mgd)
Rainfall (in/hr)
Date
2.0
1.9
1.8
1.7
1.6
1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

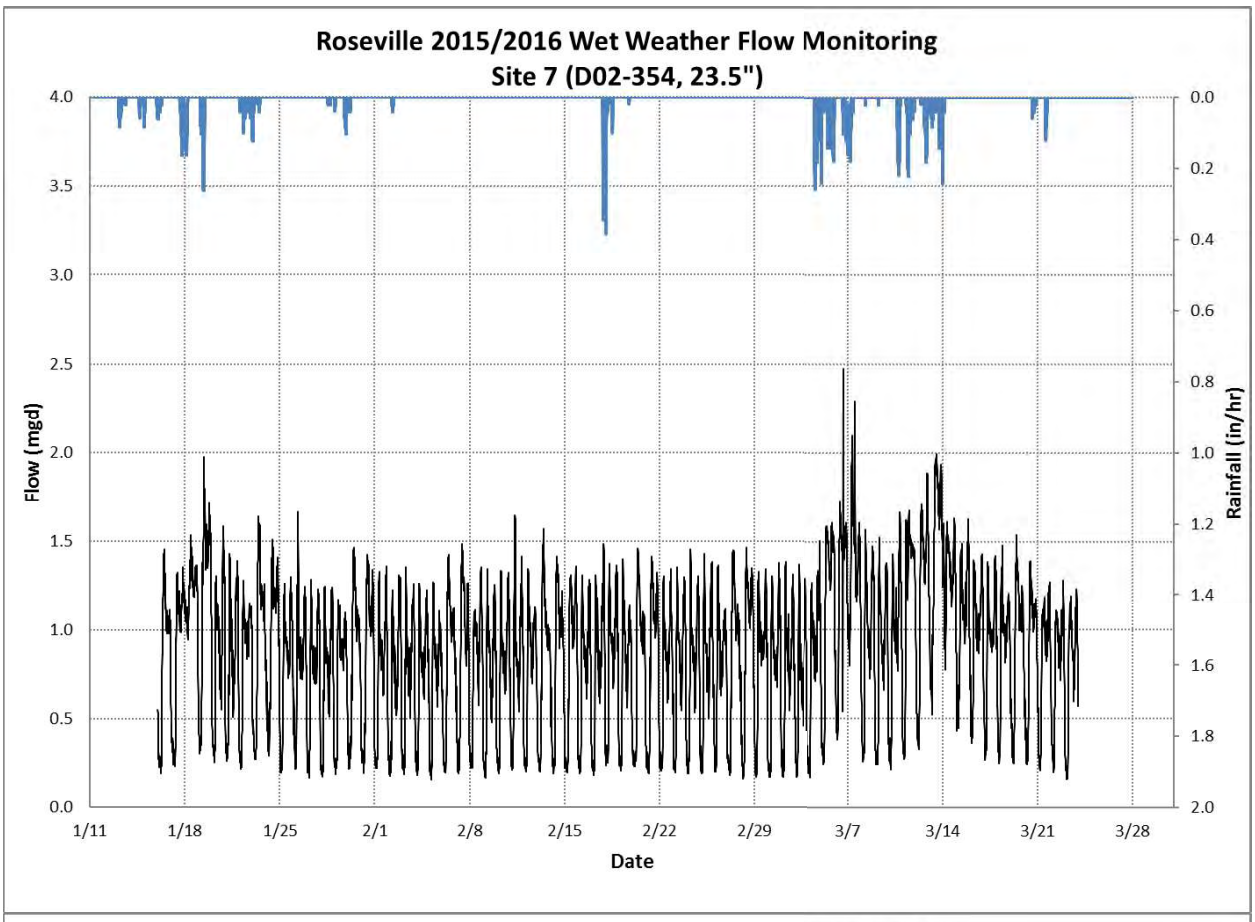

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 5 (B04-005, 12")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
12
11
10
9
8
7
6
5
4
3
2
1
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

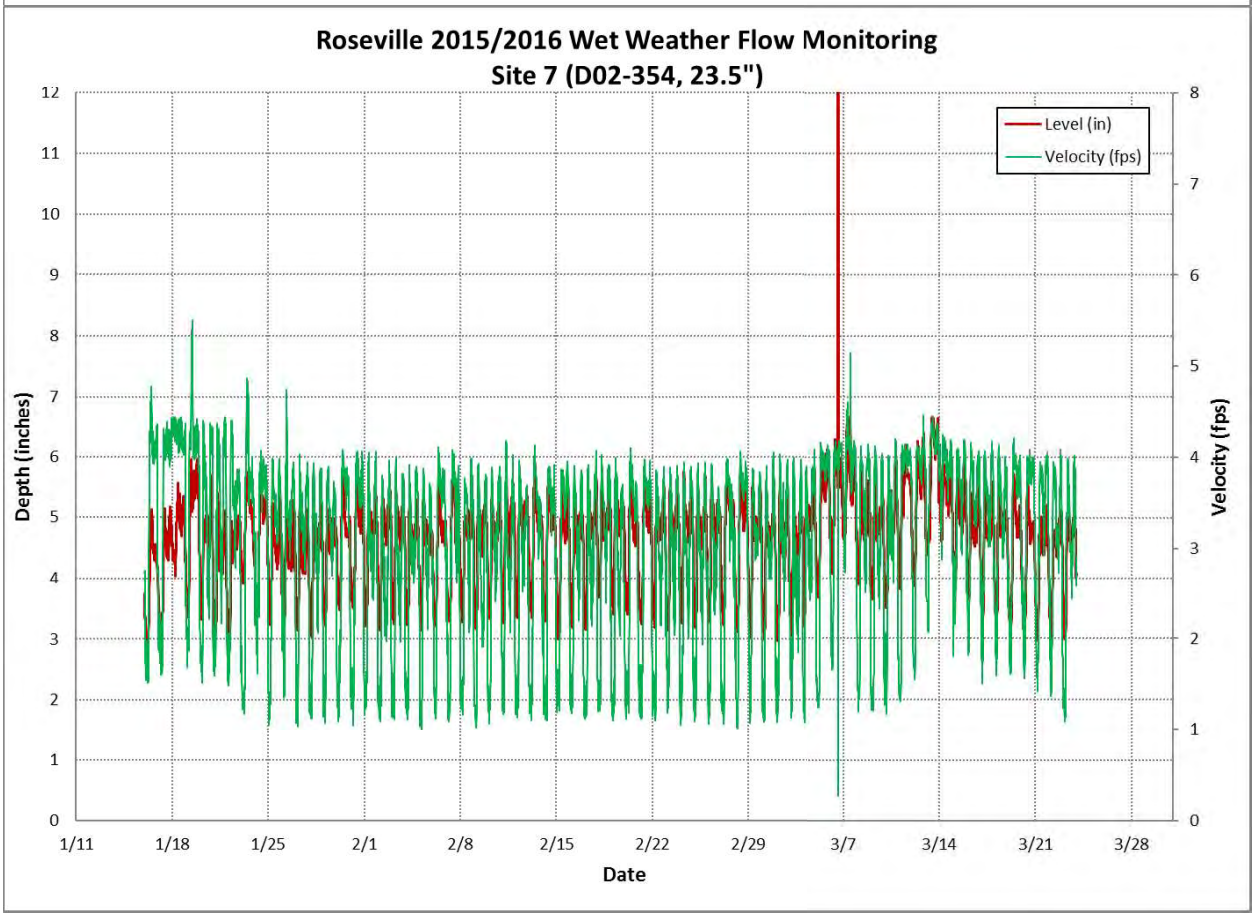

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 5A (B04-225, 21")
Flow (mgd)
Rainfall (in/hr)
Date
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

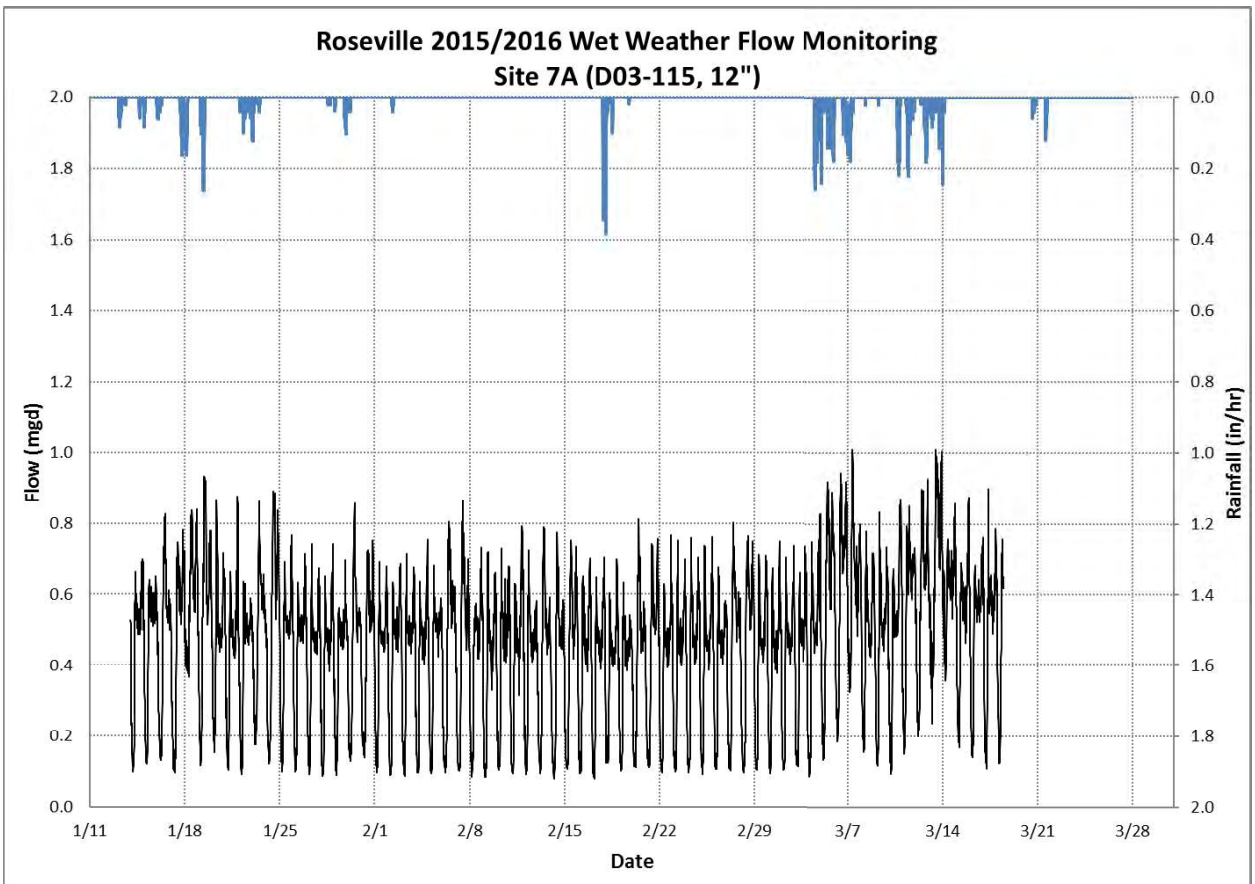

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 5A (B04-225, 21")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
12
11
10
9
8
7
6
5
4
3
2
1
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

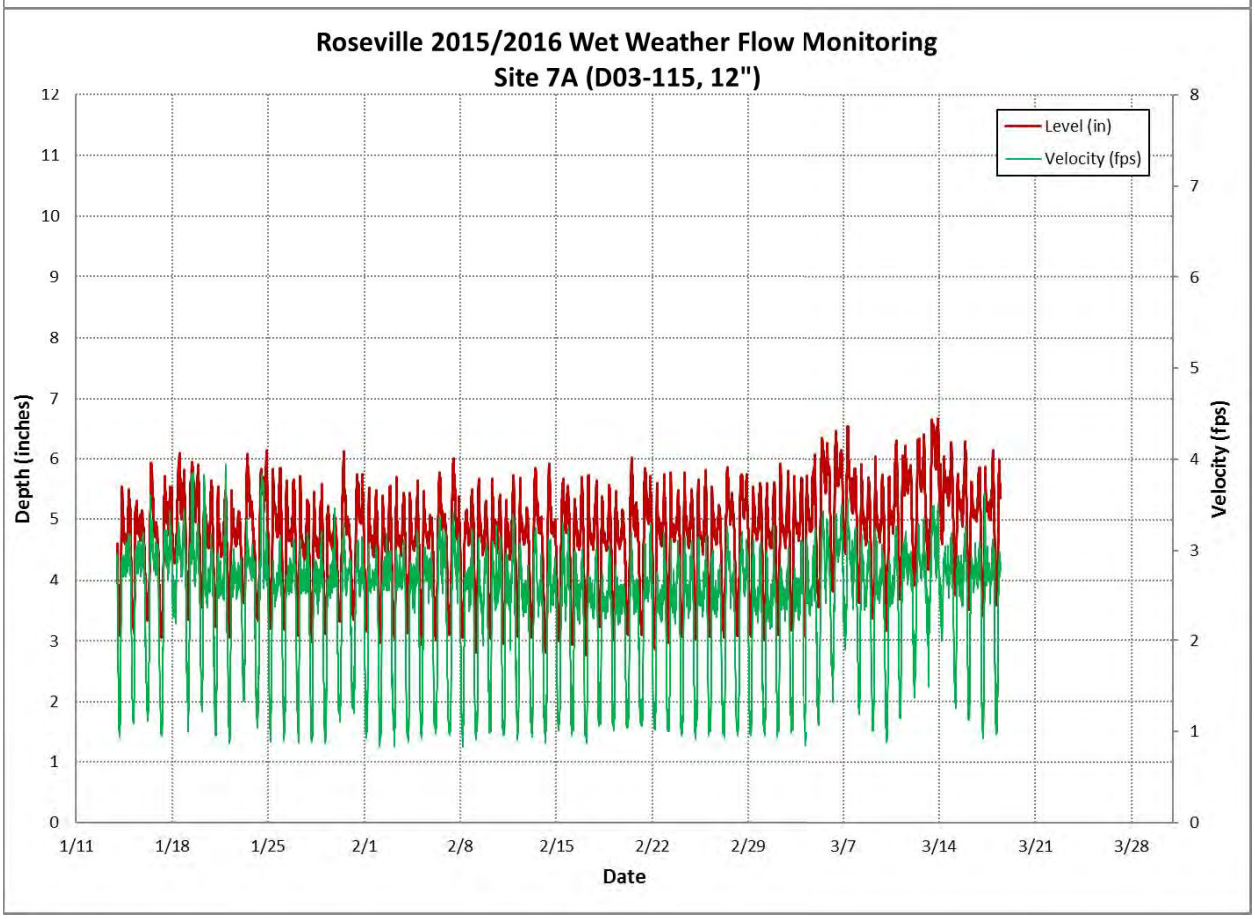

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 6 (C06-161, 18")
Flow (mgd)
Rainfall (in/hr)
Date
2.0
1.9
1.8
1.7
1.6
1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

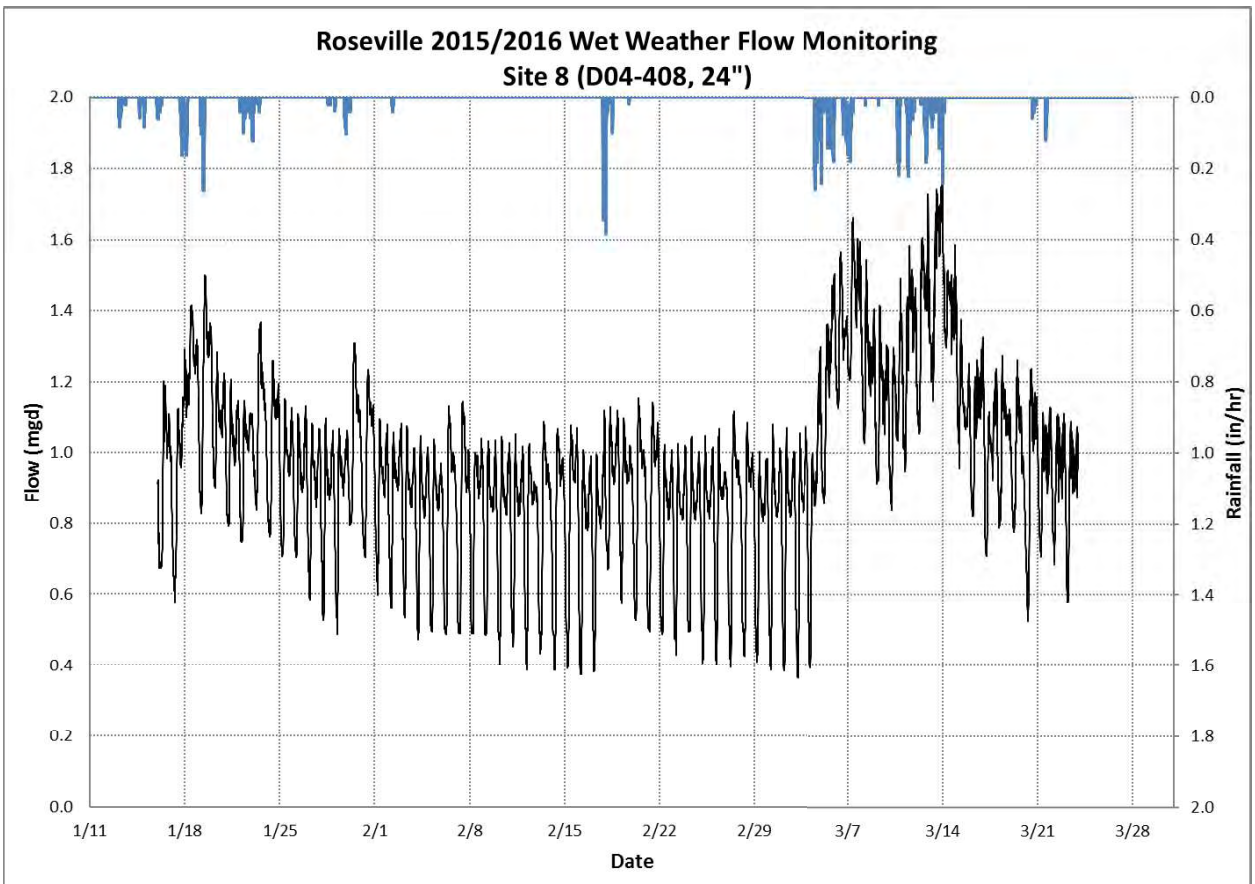

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 6 (C06-161, 18")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
12
11
10
9
8
7
6
5
4
3
2
1
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

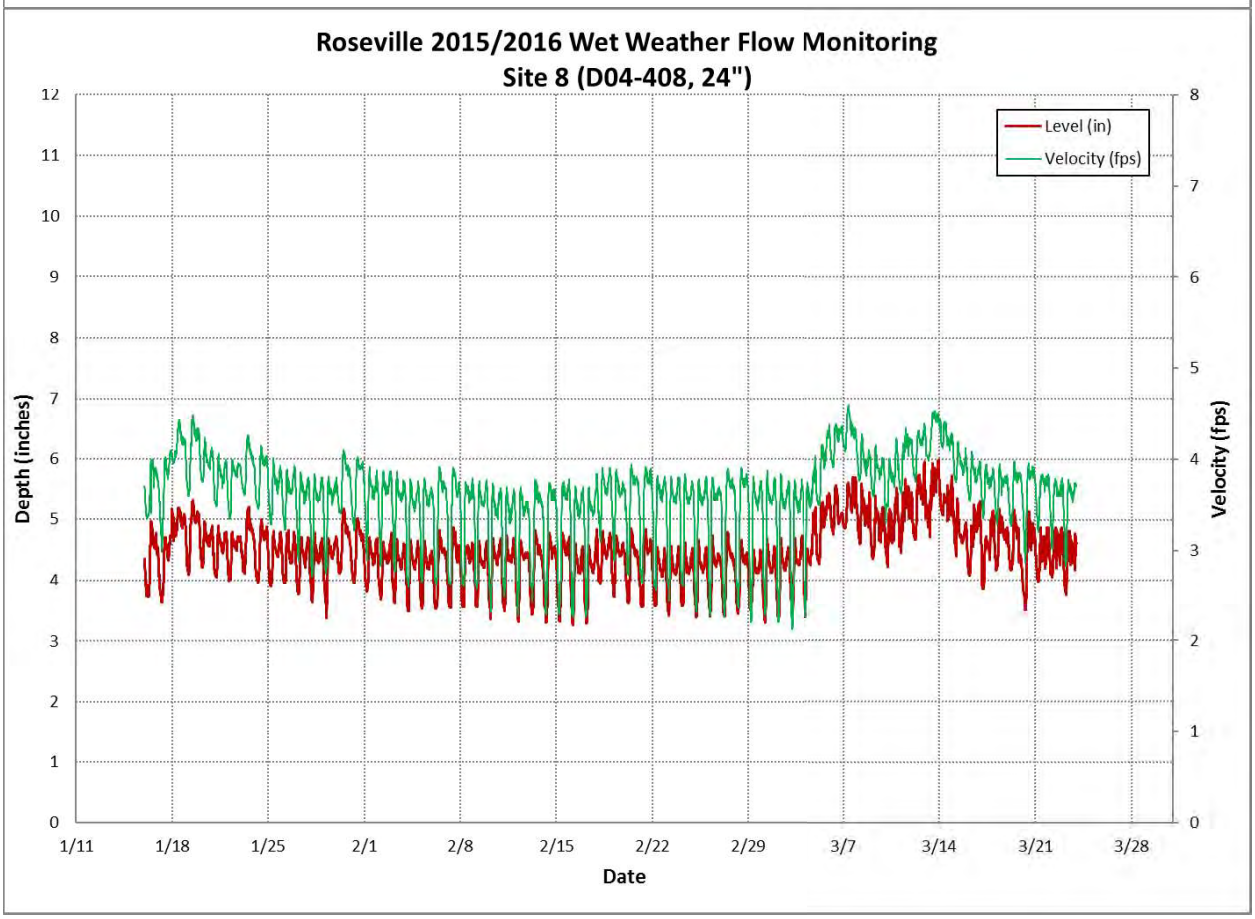

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 7 (D02-354, 23.5")
Flow (mgd)
Rainfall (in/hr)
Date
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

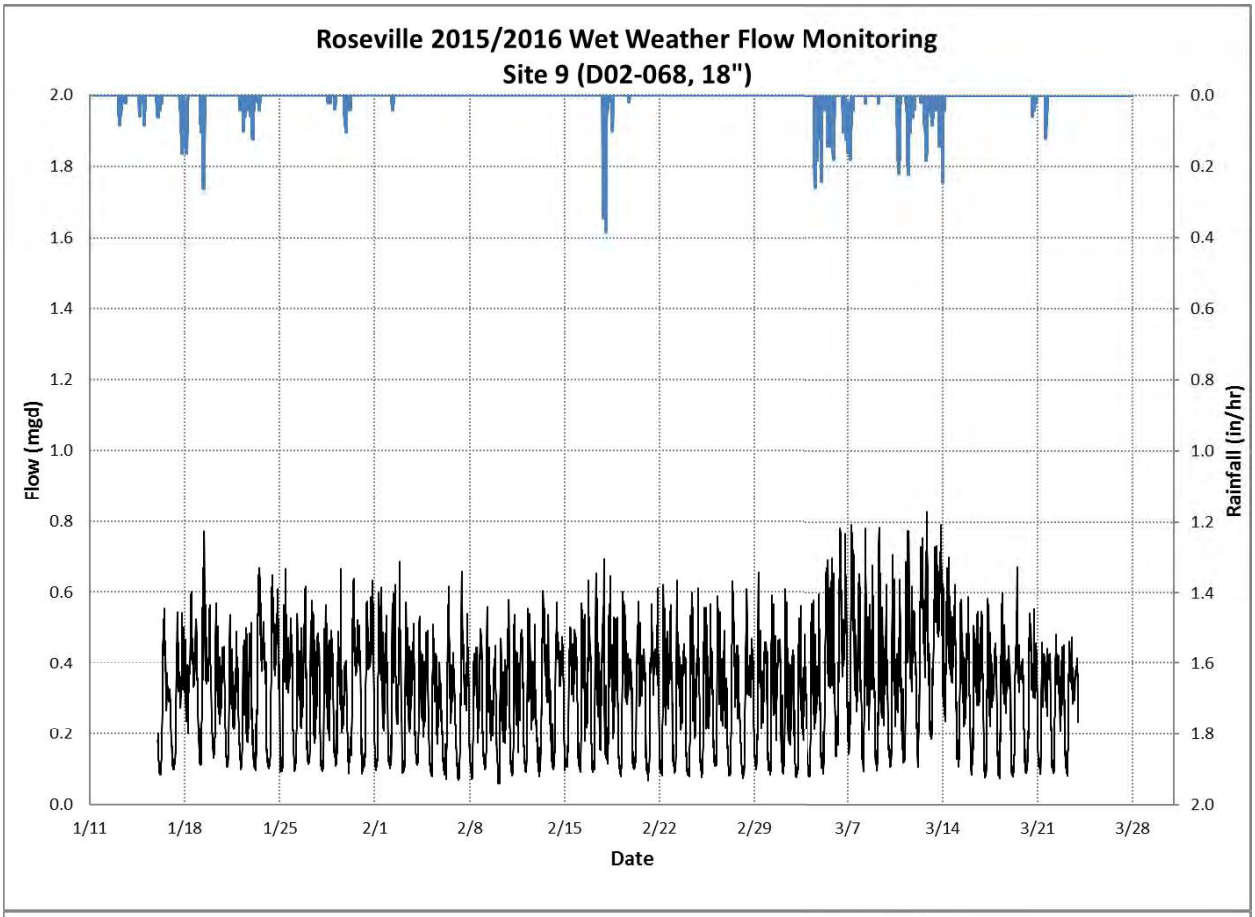

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 7 (D02-354, 23.5")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
12
11
10
9
8
7
6
5
4
3
2
1
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

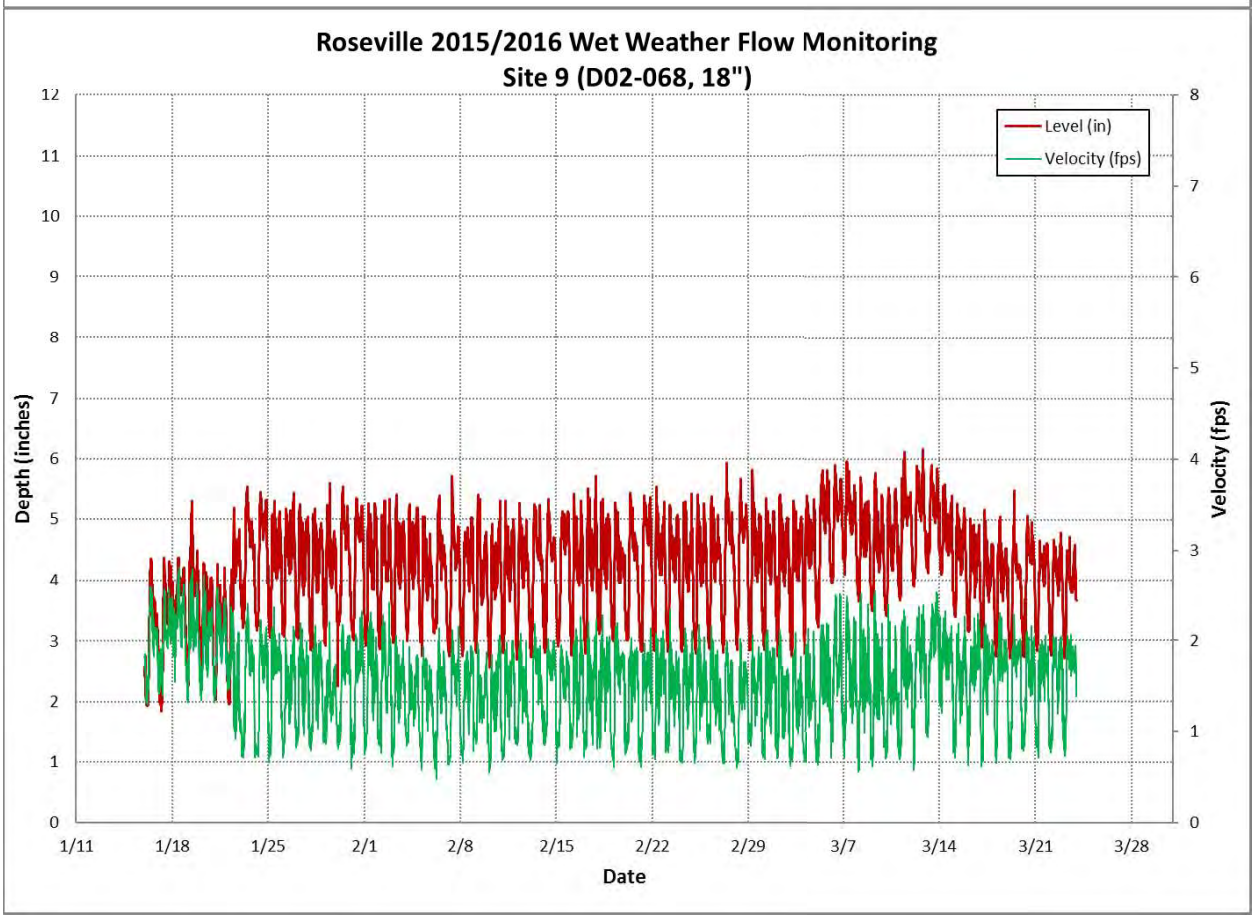

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 7A (D03-115, 12")
Flow (mgd)
Rainfall (in/hr)
Date
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

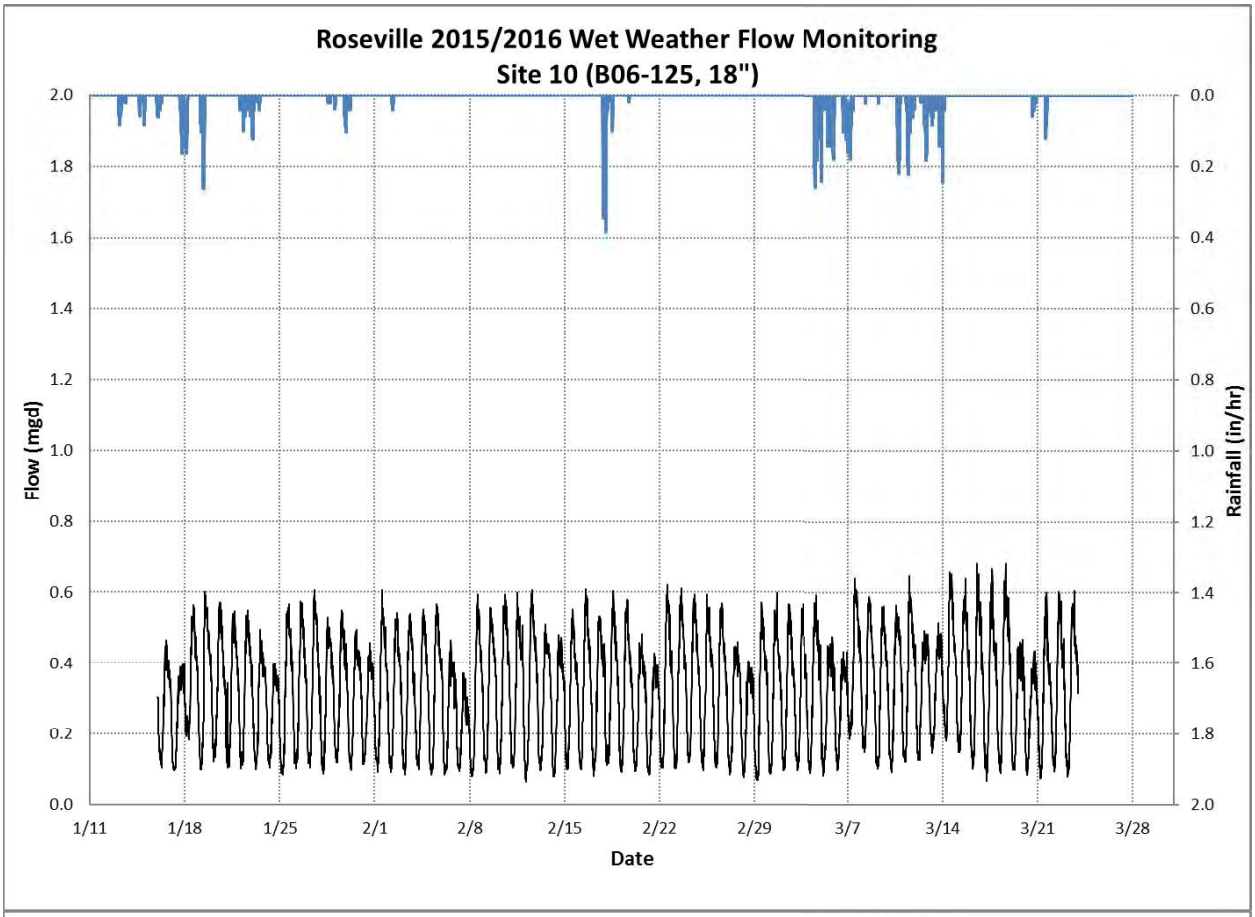

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 7A (D03-115, 12")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
12
11
10
9
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

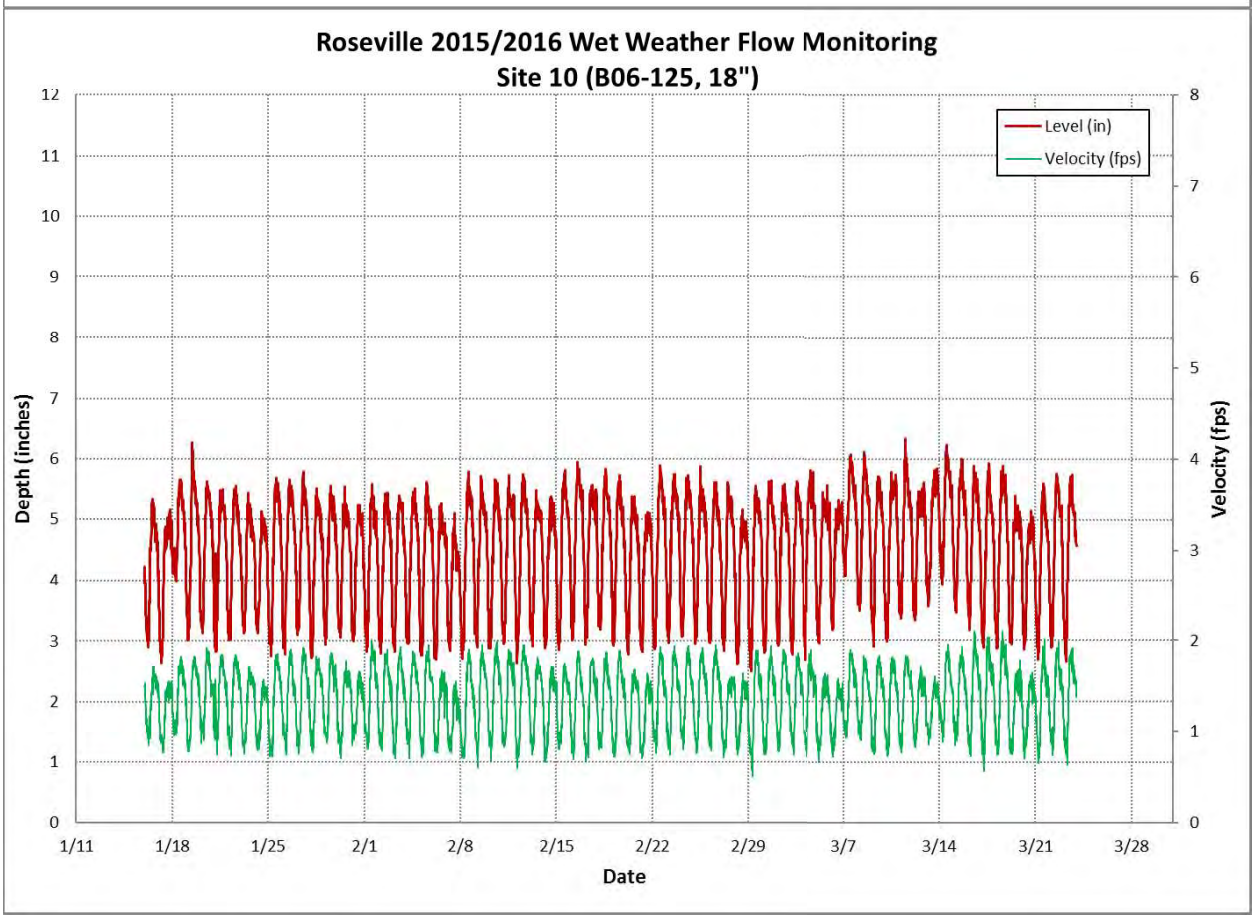

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 8 (D04-408, 24")
Flow (mgd)
Rainfall (in/hr)
Date
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

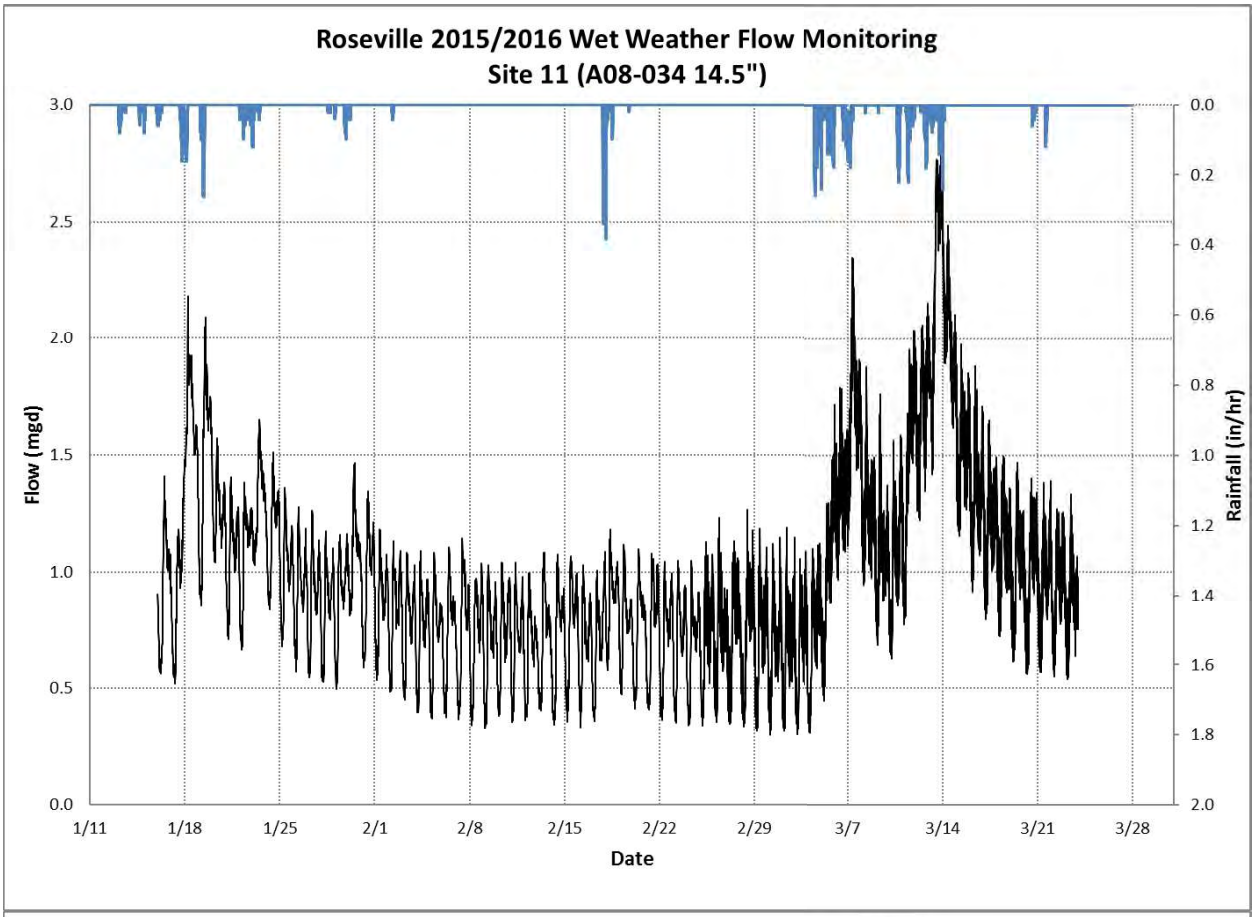

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 8 (D04-408, 24")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
12
11
10
9
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

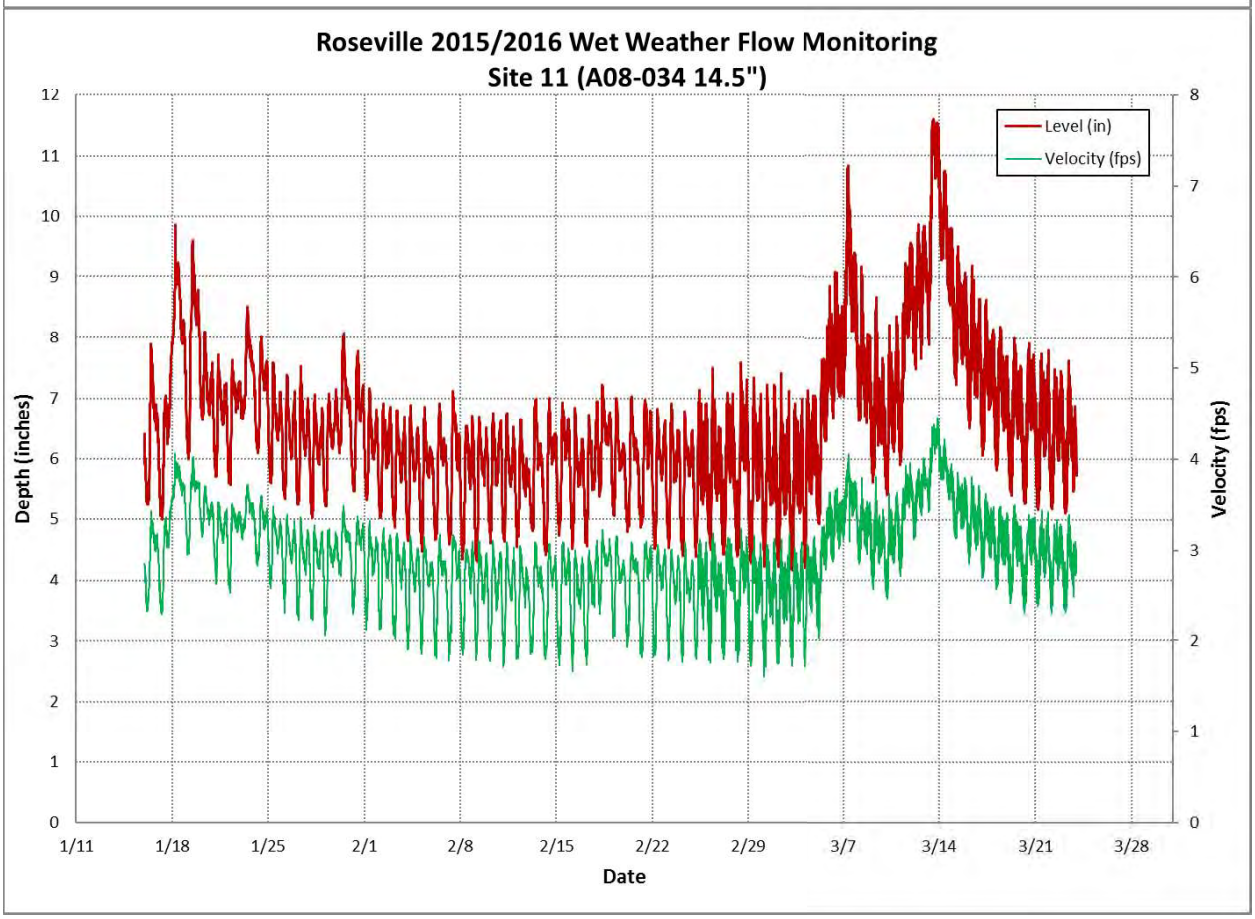

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 9 (D02-068, 18")
Flow (mgd)
Rainfall (in/hr)
Date
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

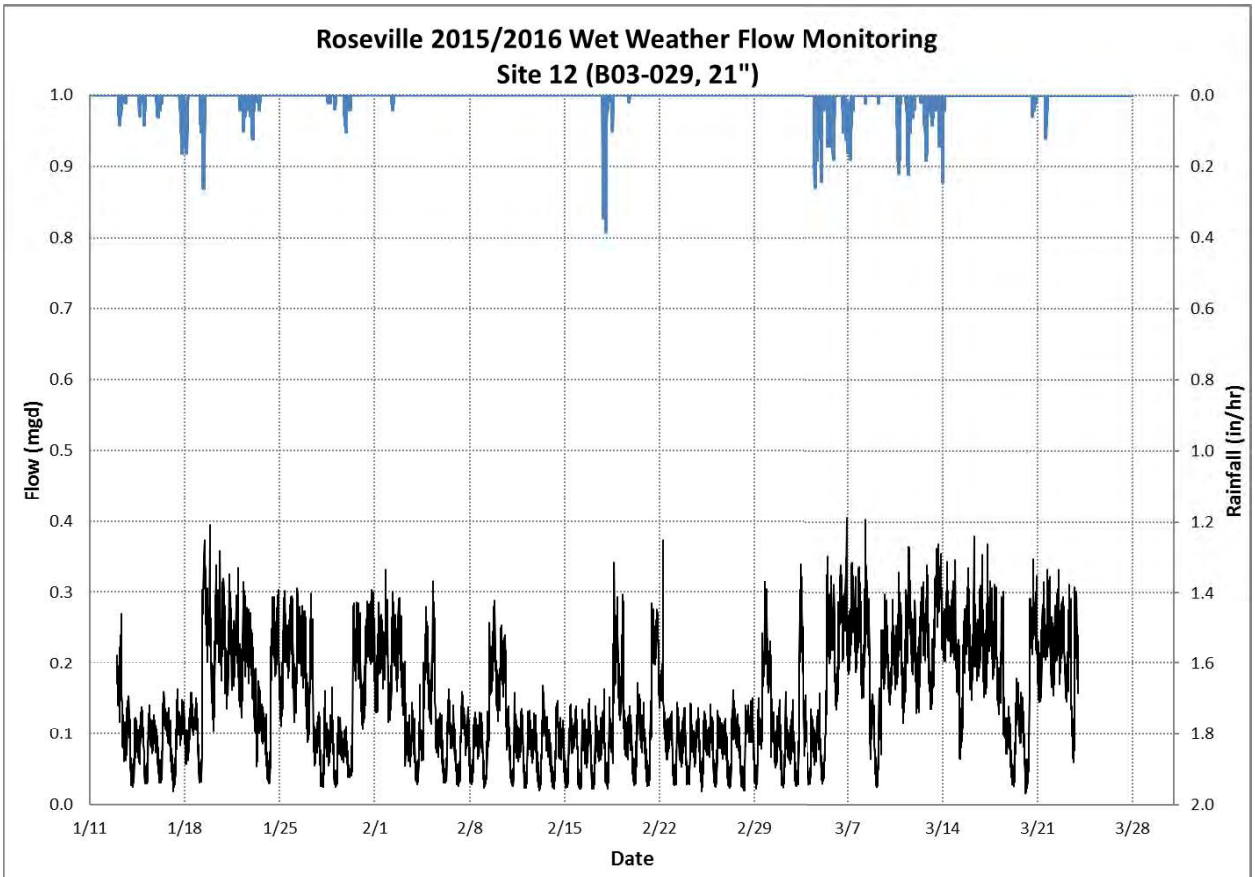

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 9 (D02-068, 18")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
12
11
10
9
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

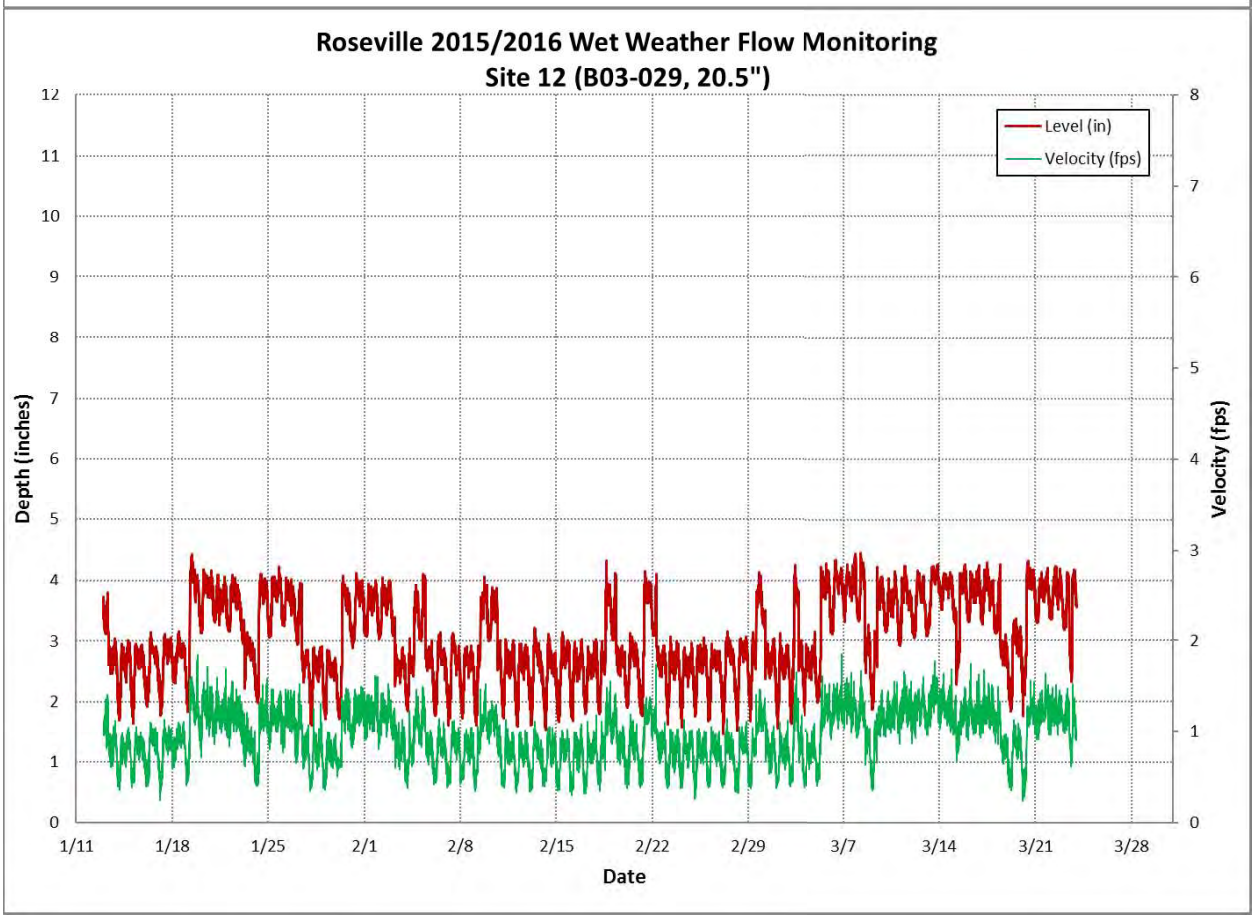

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 10 (B06-125, 18")
Flow (mgd)
Rainfall (in/hr)
Date
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

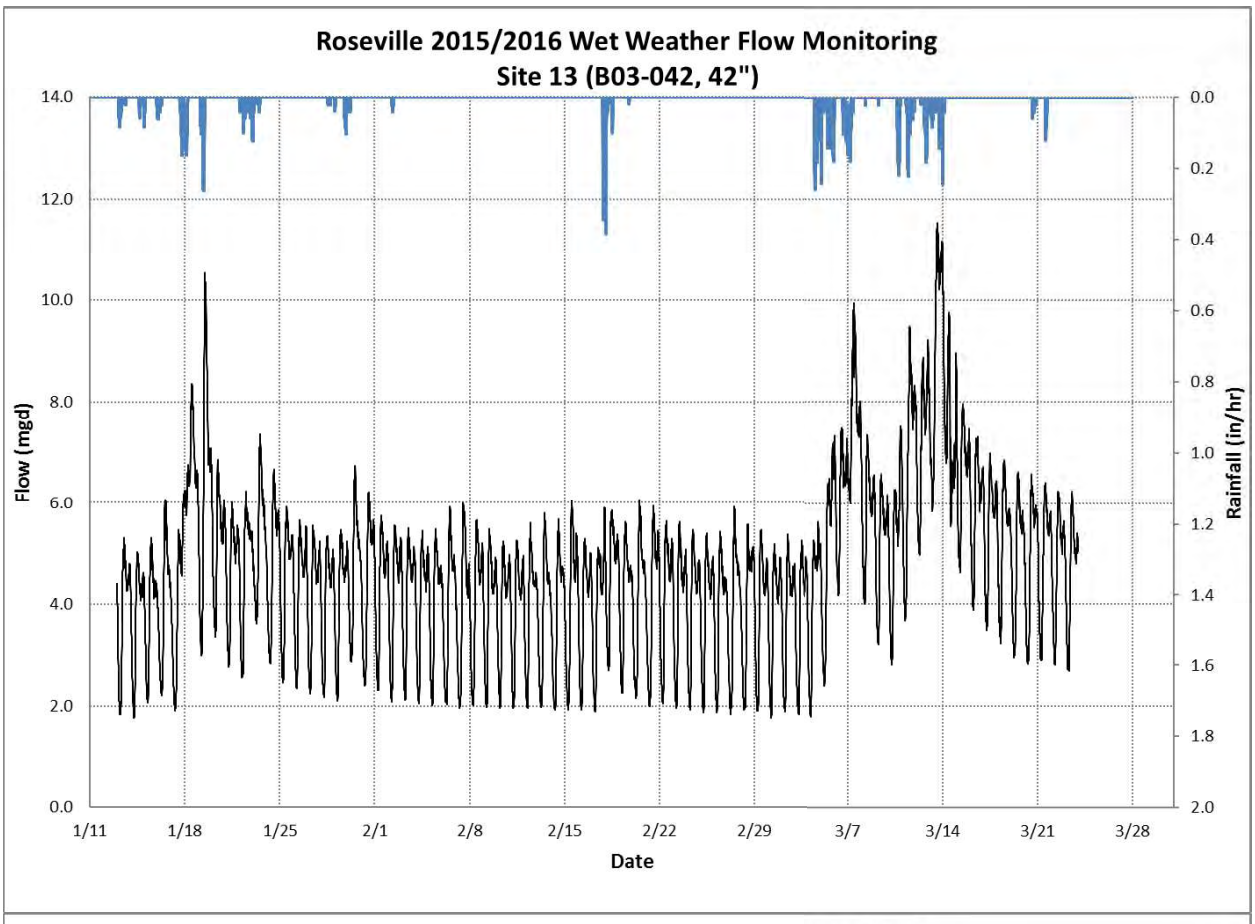

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 10 (B06-125, 18")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
12
11
10
9
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

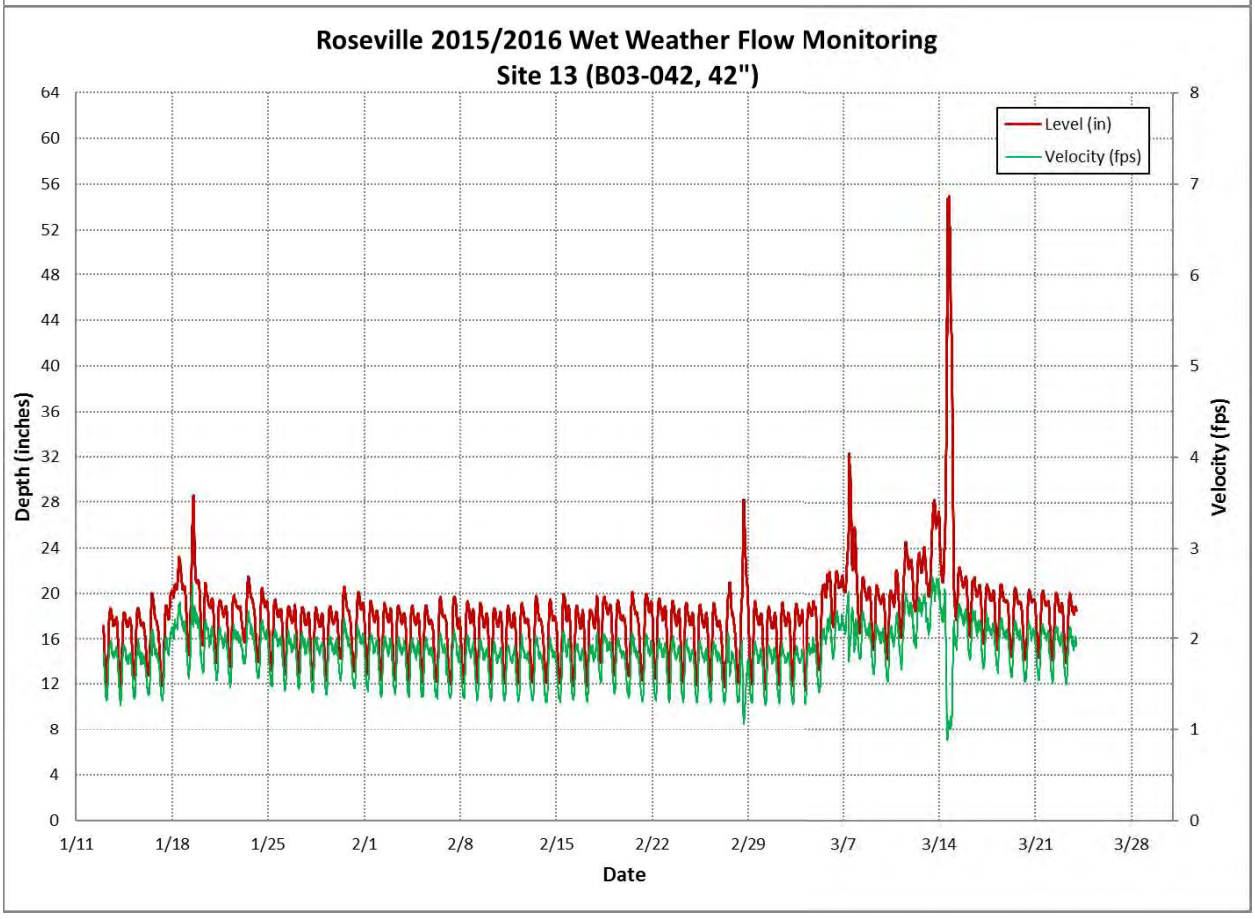

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 11 (A08-034 14.5")
Flow (mgd)
Rainfall (in/hr)
Date
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

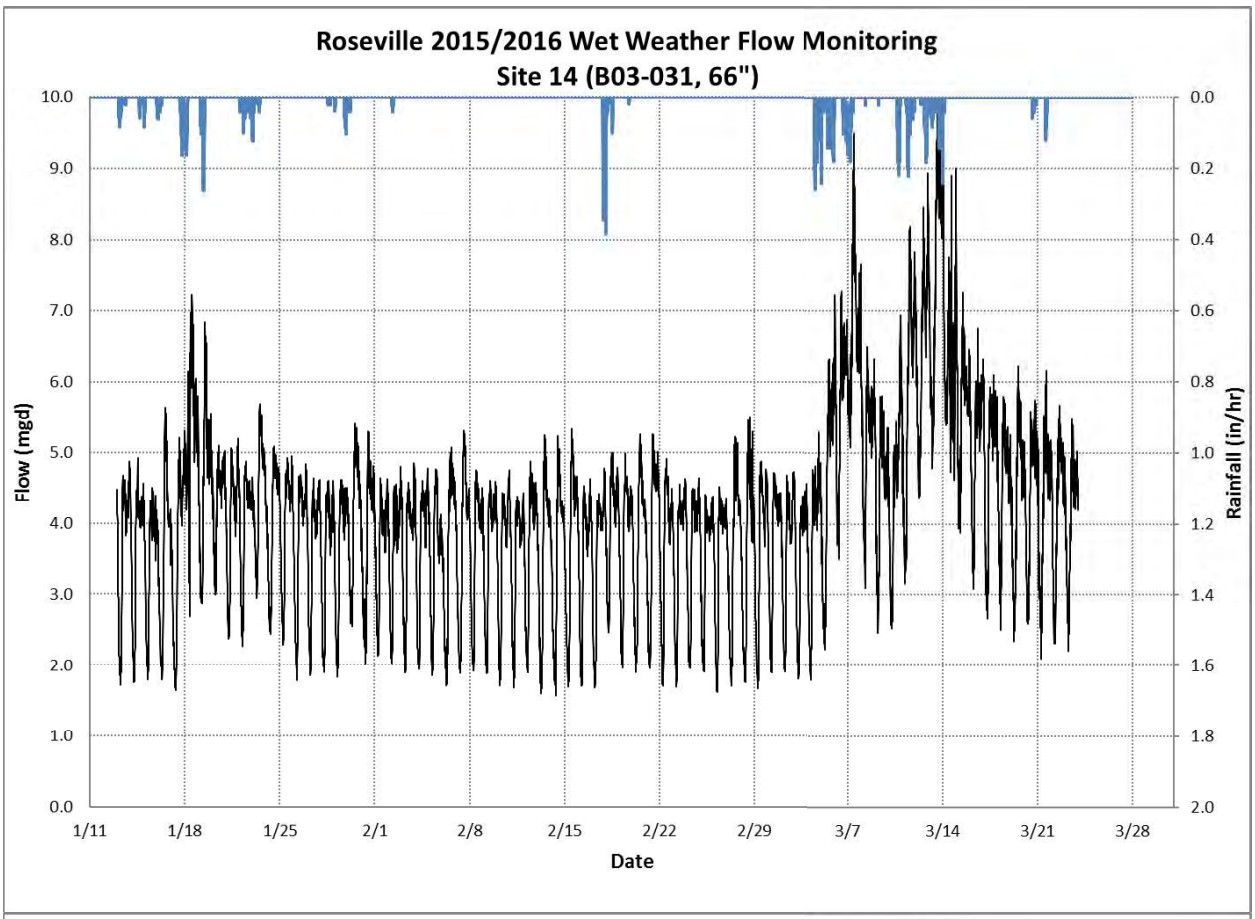

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 11 (A08-034 14.5")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
12
11
10
9
8
7
6
5
4
3
2
1
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

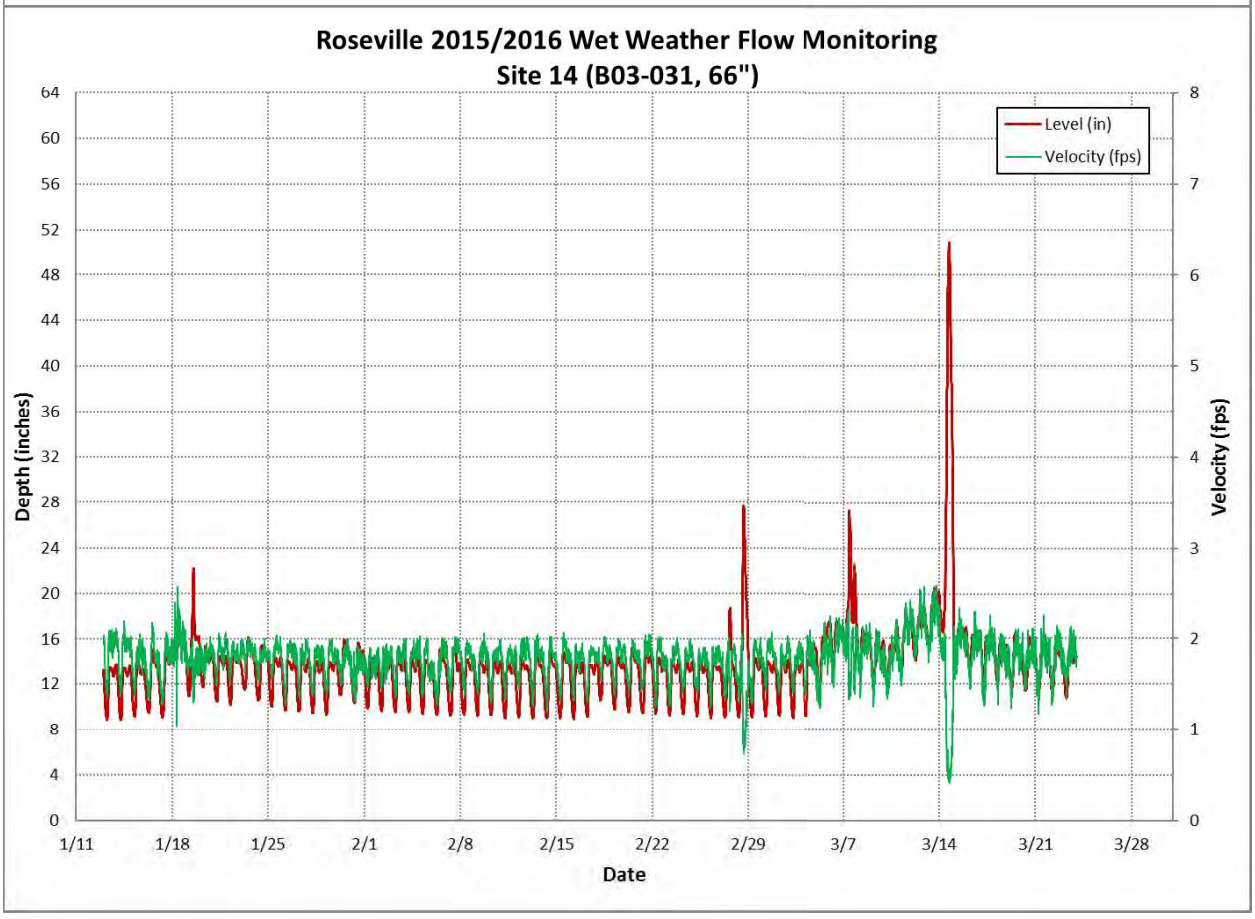

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 12 (B03-029, 21")
Flow (mgd)
Rainfall (in/hr)
Date
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

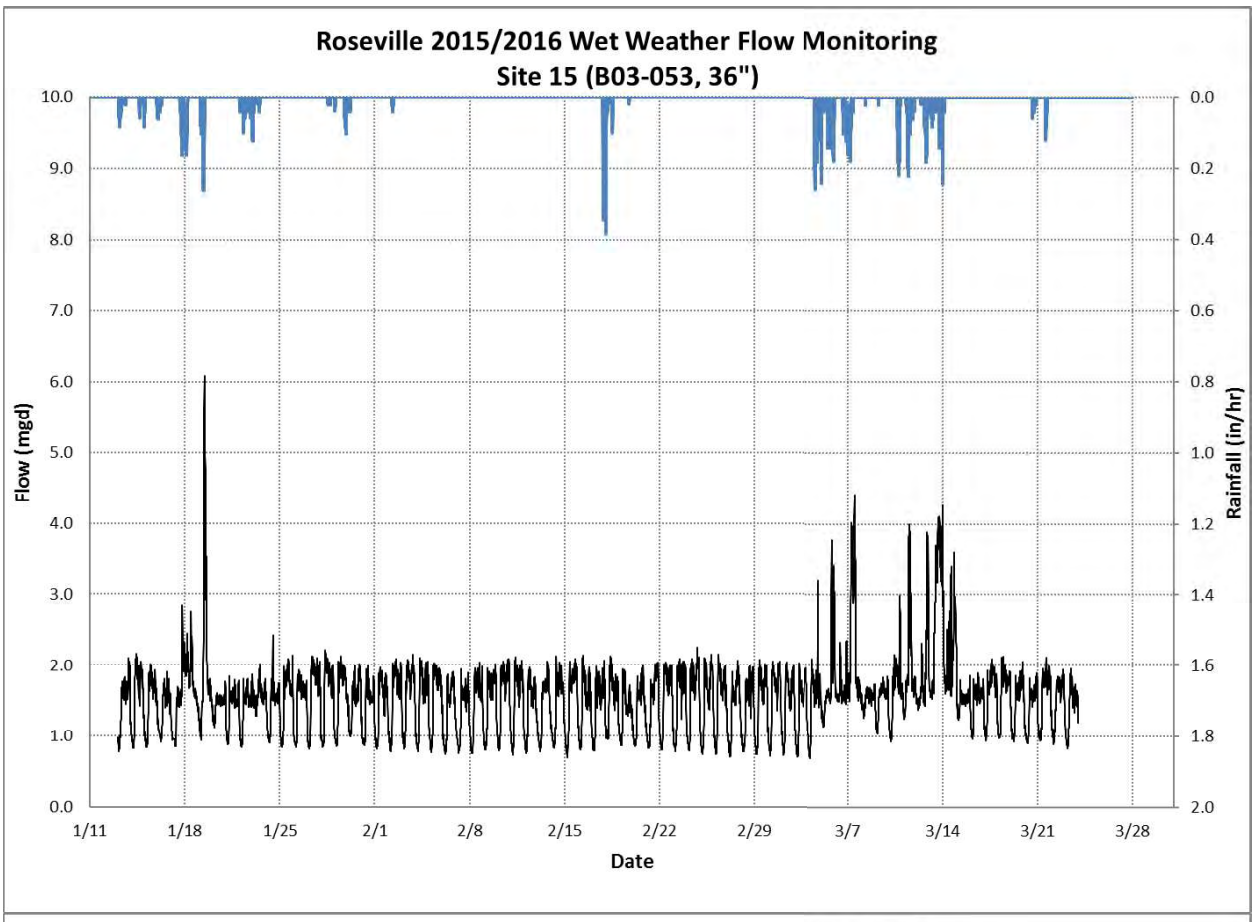

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 12 (B03-029, 20.5")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
12
11
10
9
8
7
6
5
4
3
2
1
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

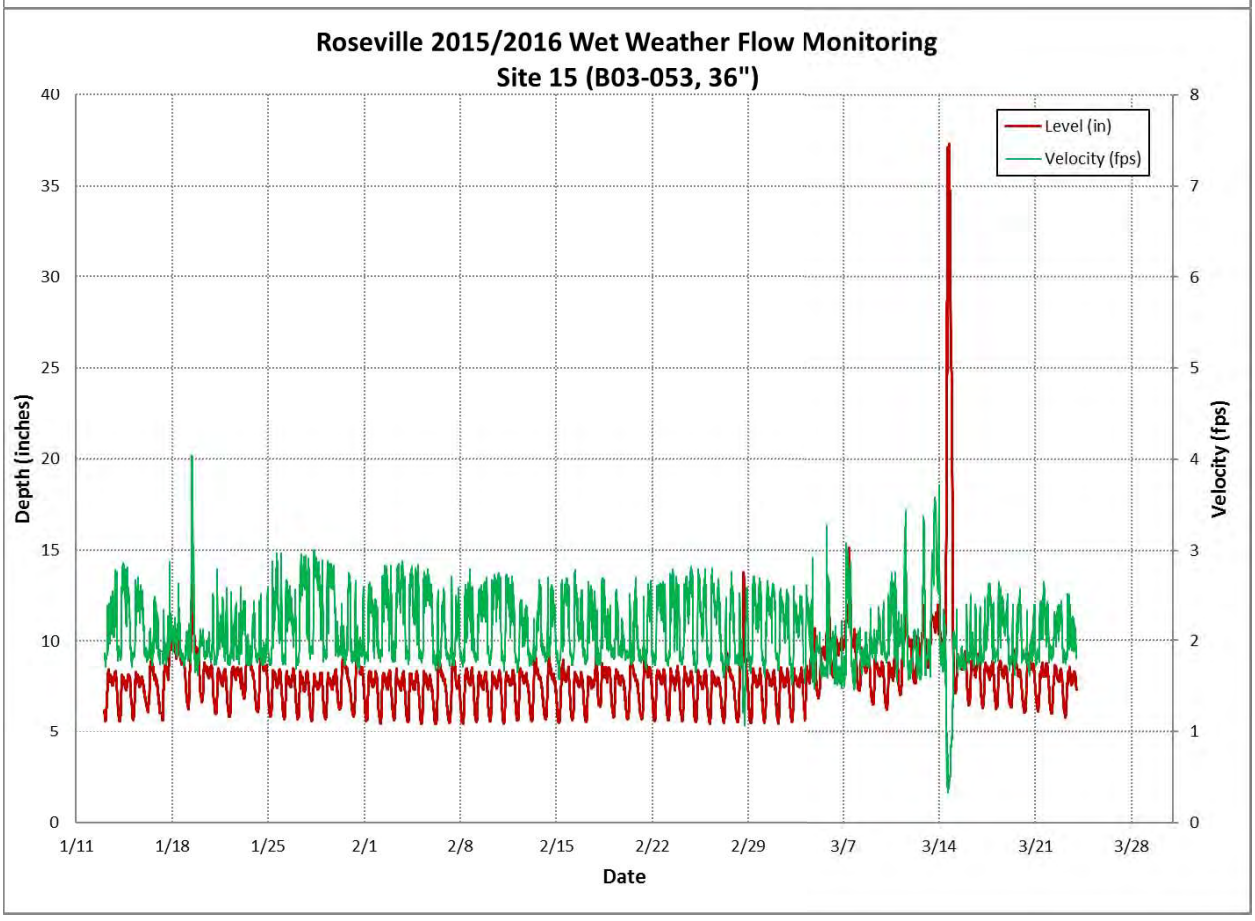

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 13 (B03-042, 42")
Flow (mgd)
Rainfall (in/hr)
Date
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

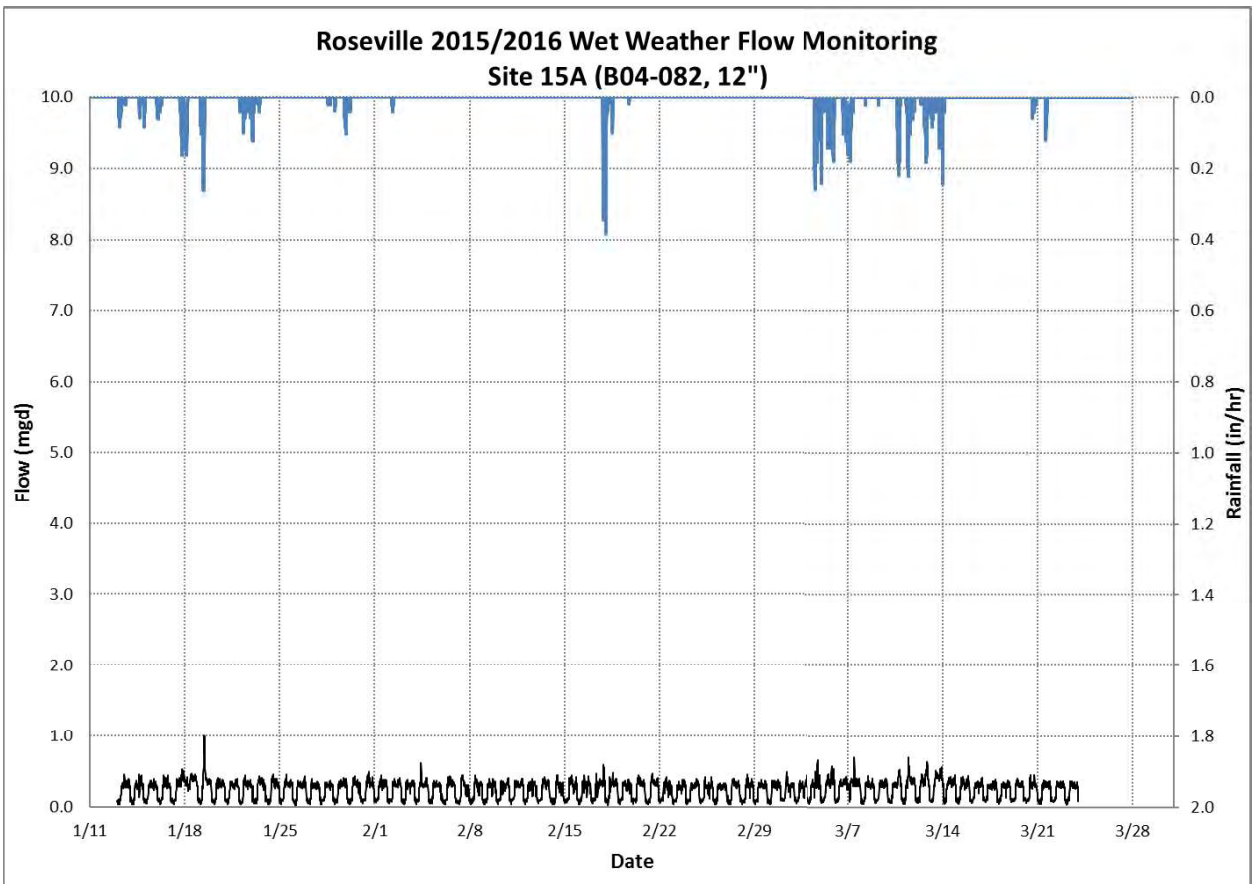

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 13 (B03-042, 42")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
64
60
56
52
48
44
40
36
32
28
24
20
16
12
8
4
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

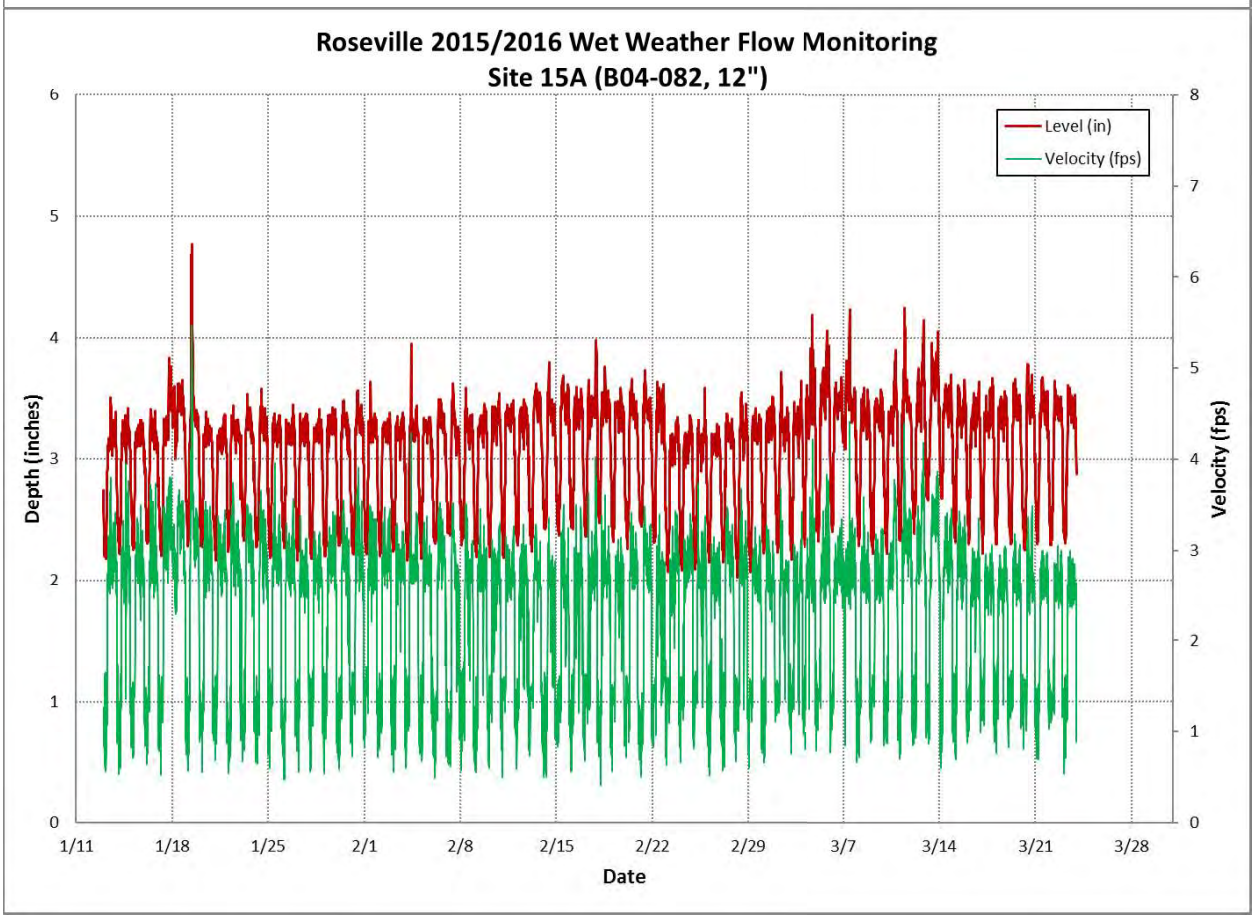

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 14 (B03-031, 66")
Flow (mgd)
Rainfall (in/hr)
Date
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

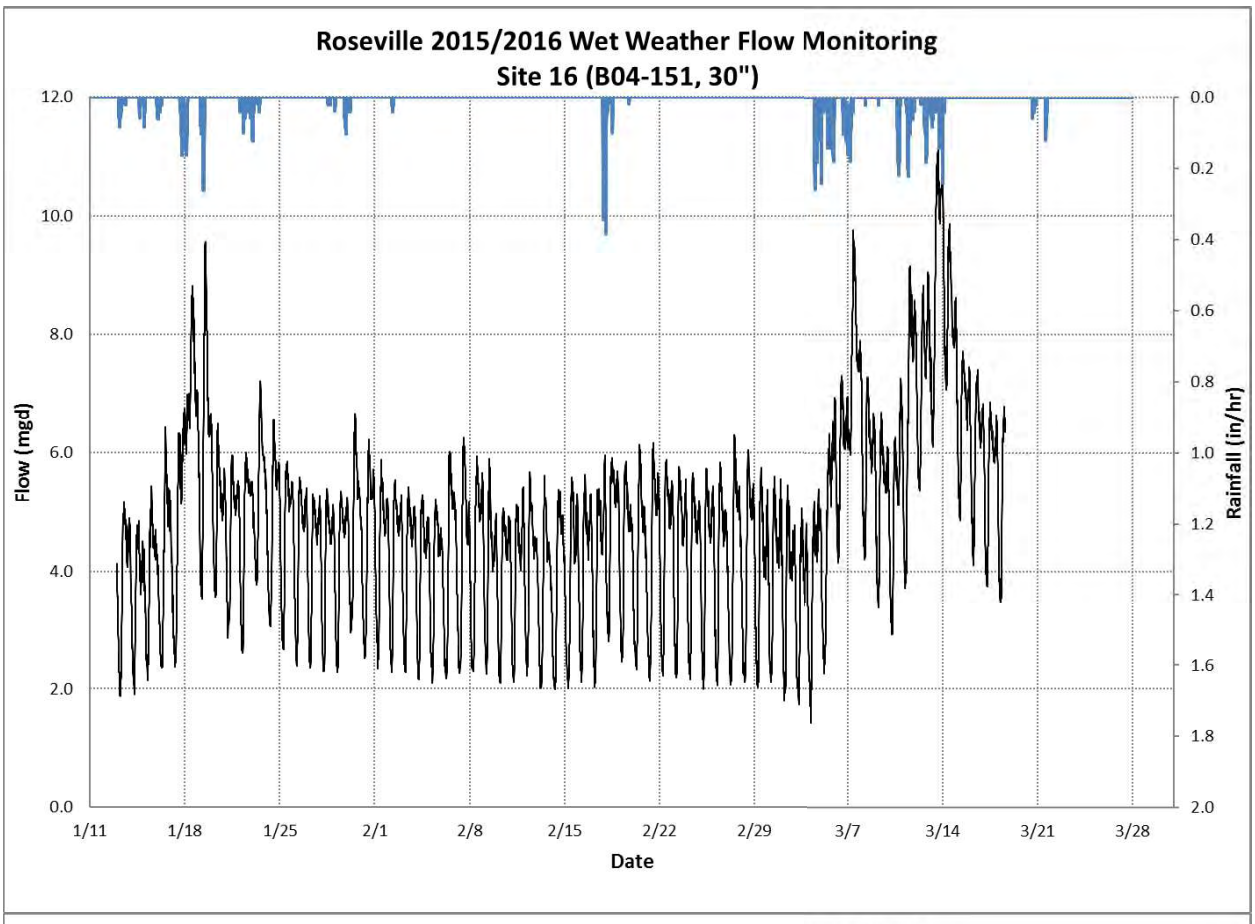

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 14 (B03-031, 66")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
64
60
56
52
48
44
40
36
32
28
24
20
16
12
8
4
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

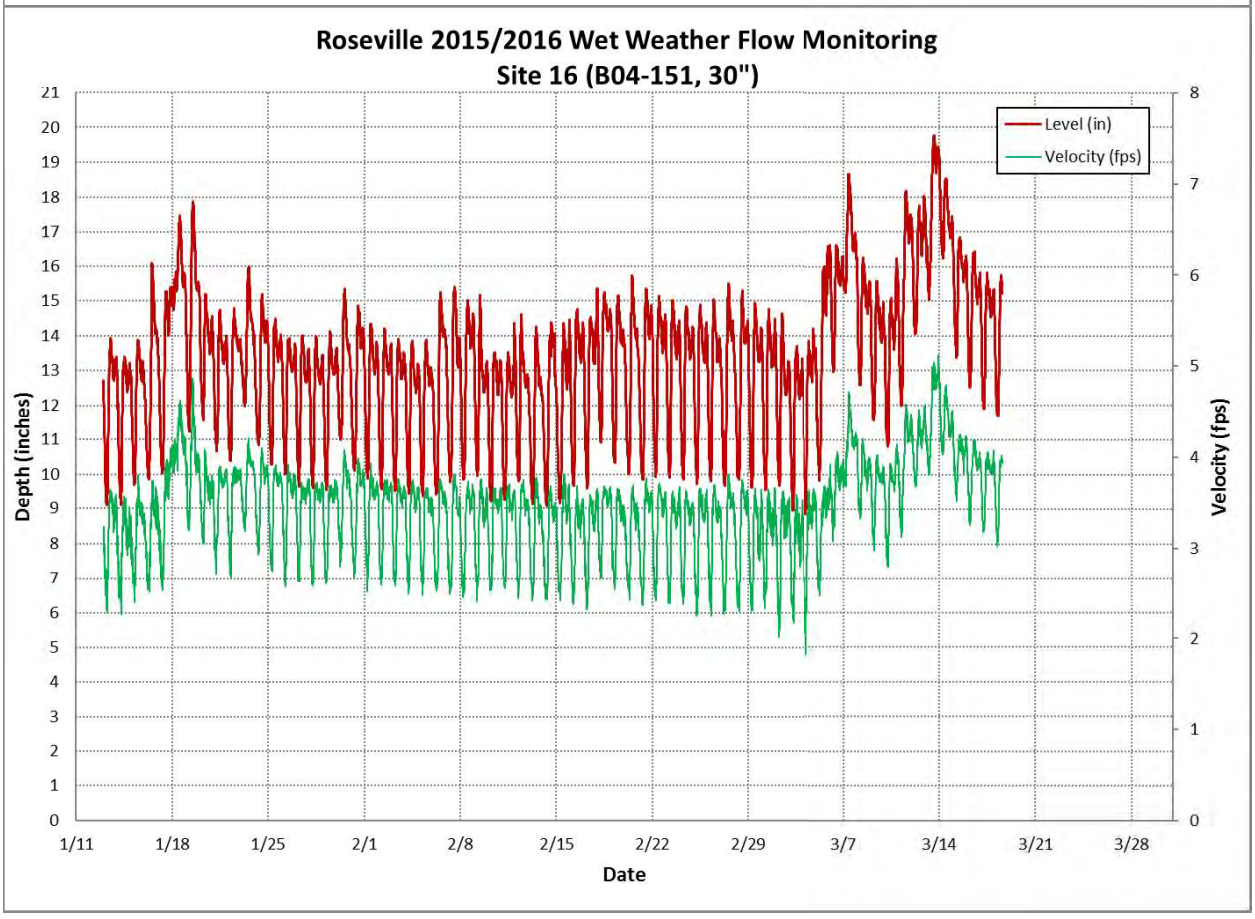

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 15 (B03-053, 36")
Flow (mgd)
Rainfall (in/hr)
Date
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

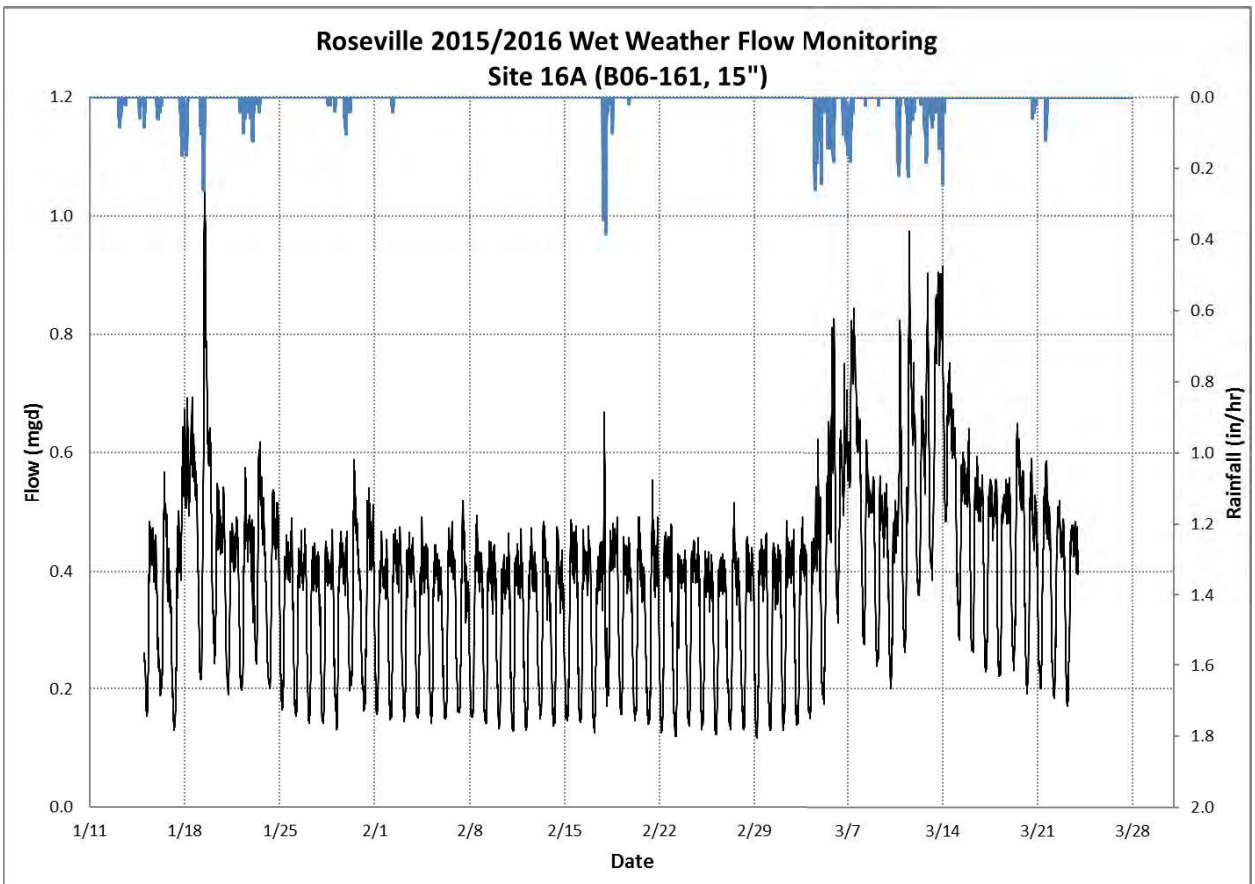

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 15 (B03-053, 36")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
40
35
30
25
20
15
10
5
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

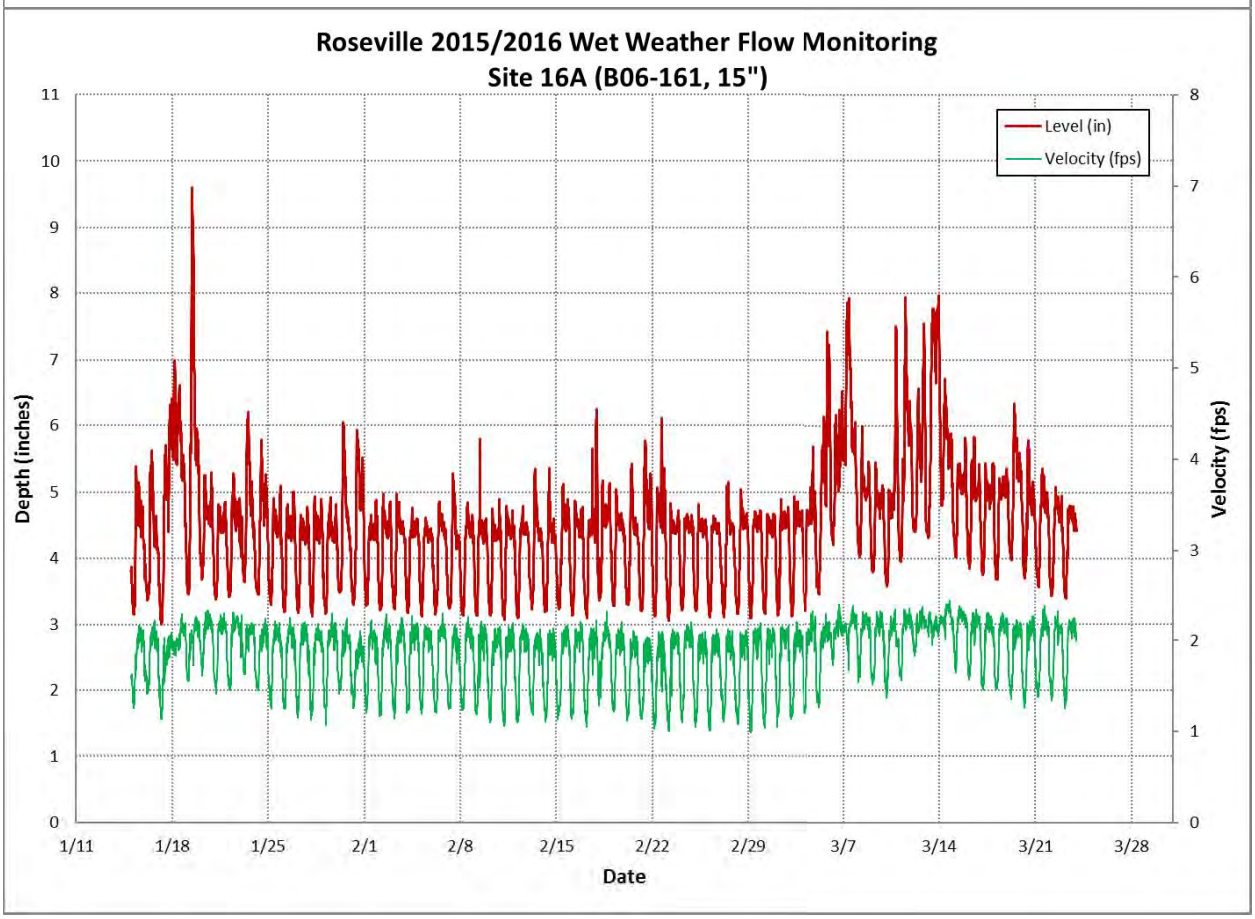

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 15A (B04-082, 12")
Flow (mgd)
Rainfall (in/hr)
Date
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

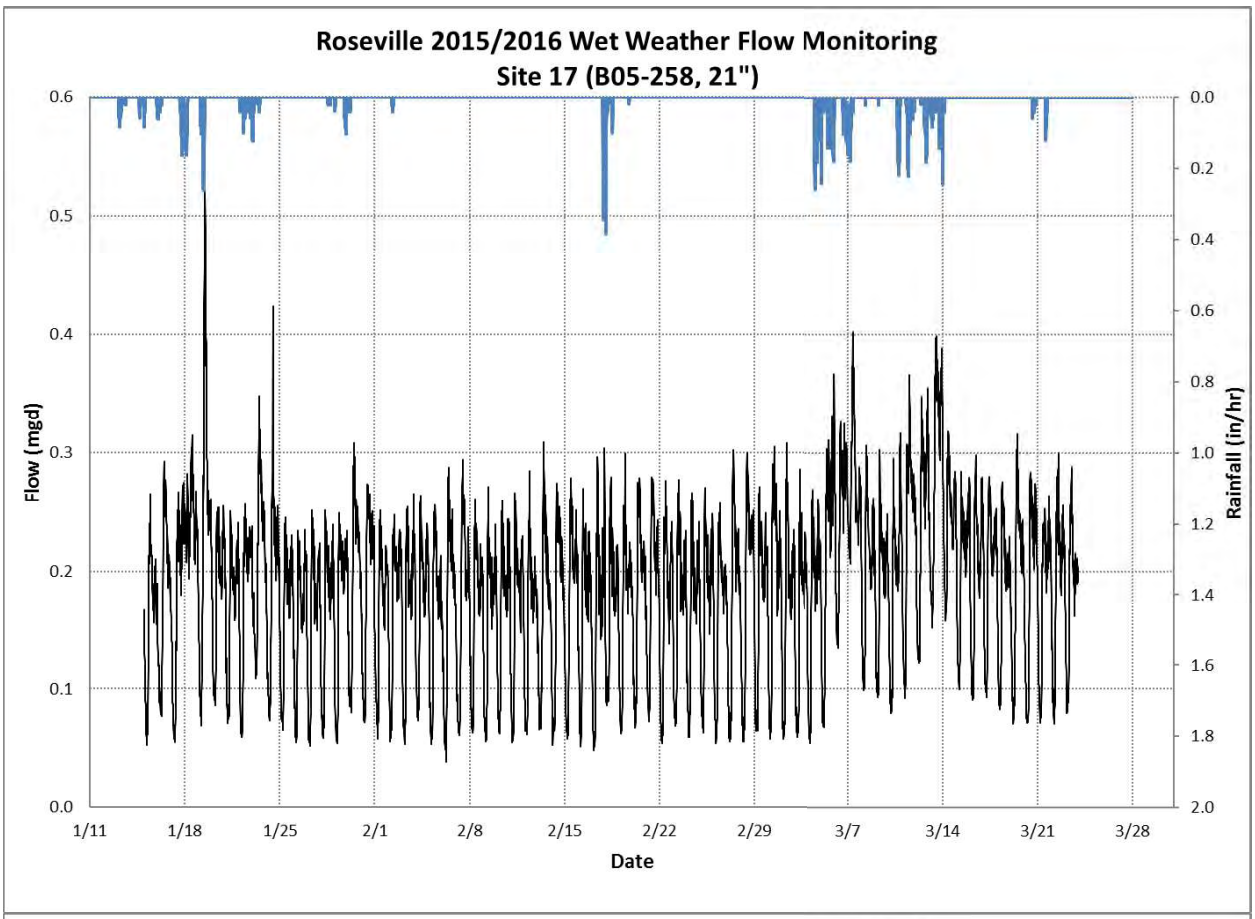

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 15A (B04-082, 12")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
6
5
4
3
2
1
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

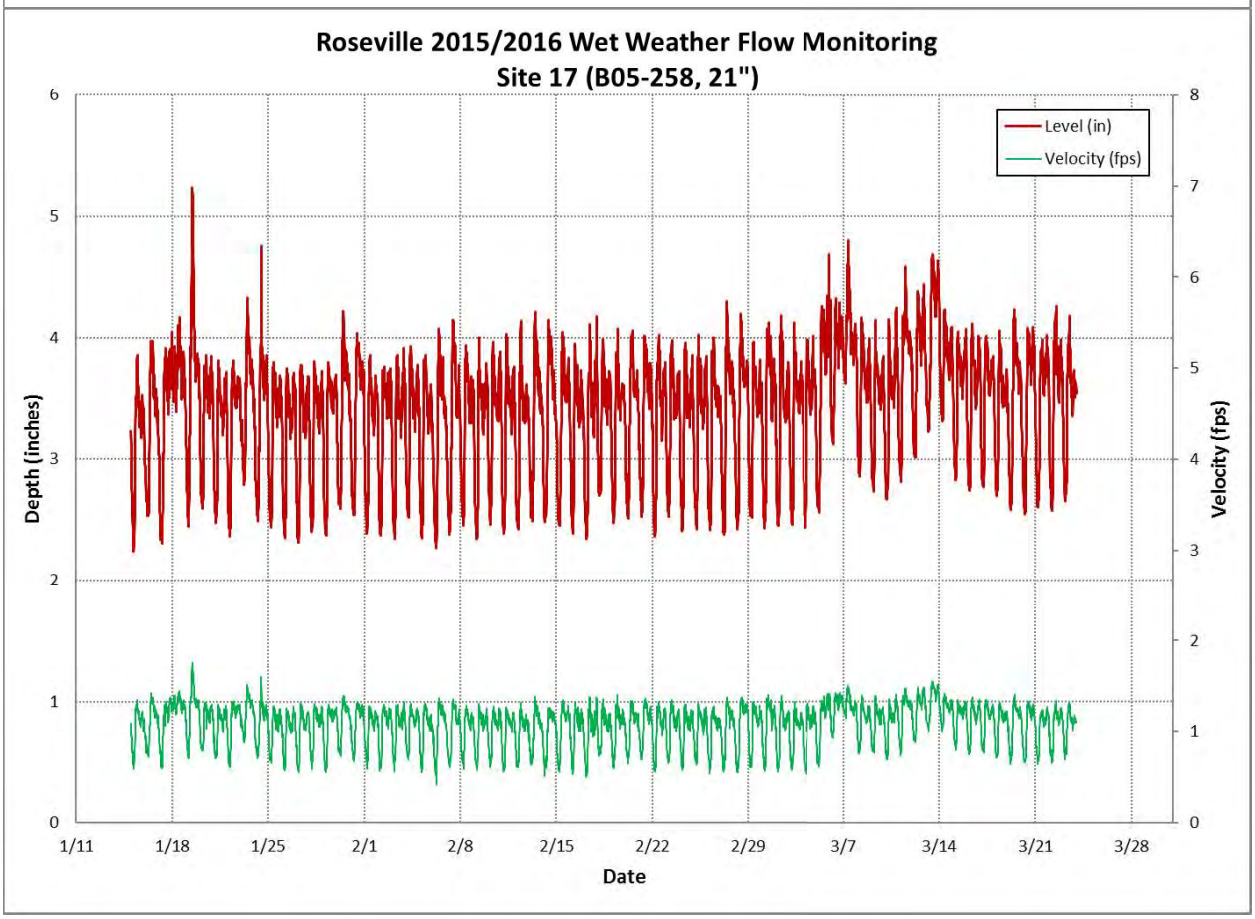

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 16 (B04-151, 30")
Flow (mgd)
Rainfall (in/hr)
Date
12.0
10.0
8.0
6.0
4.0
2.0
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

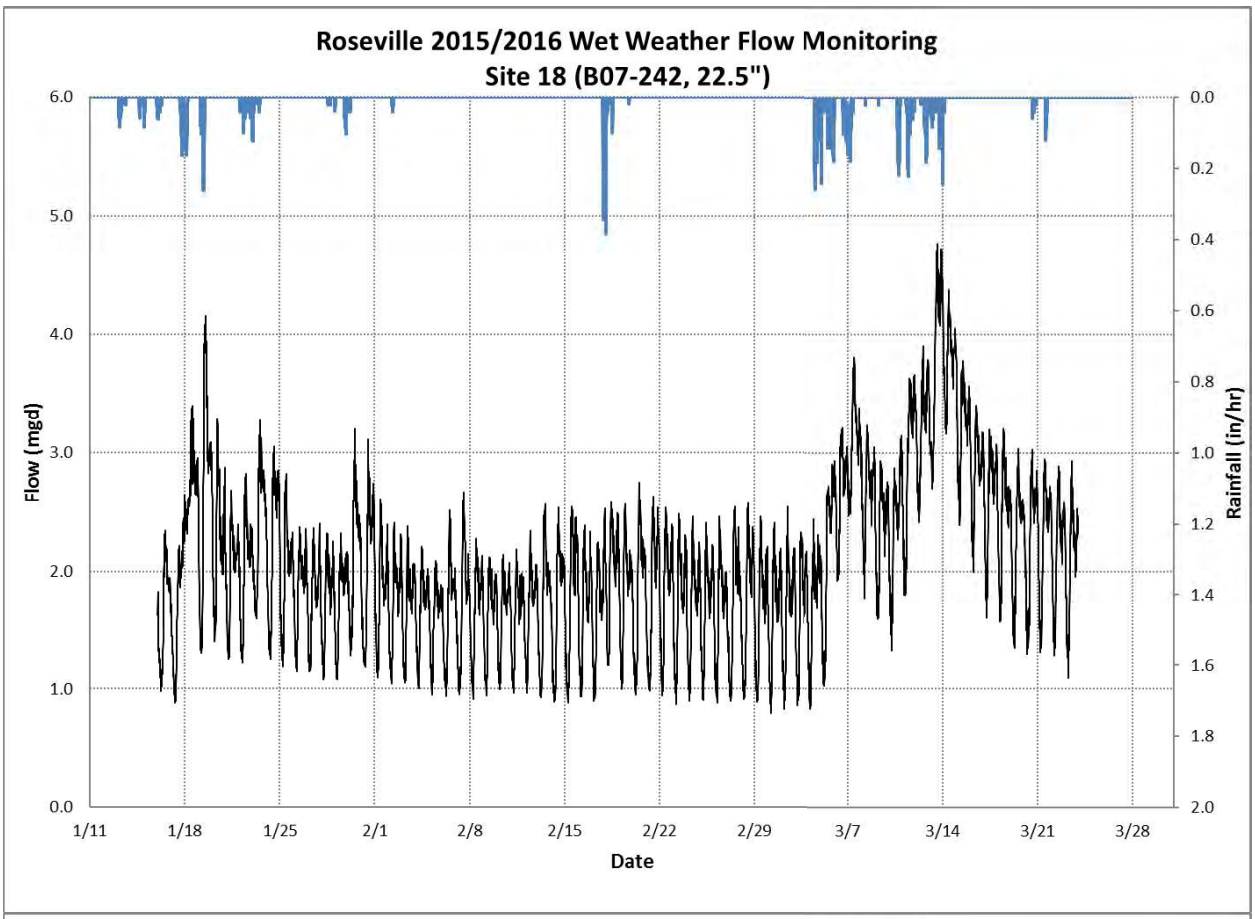

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 16 (B04-151, 30")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

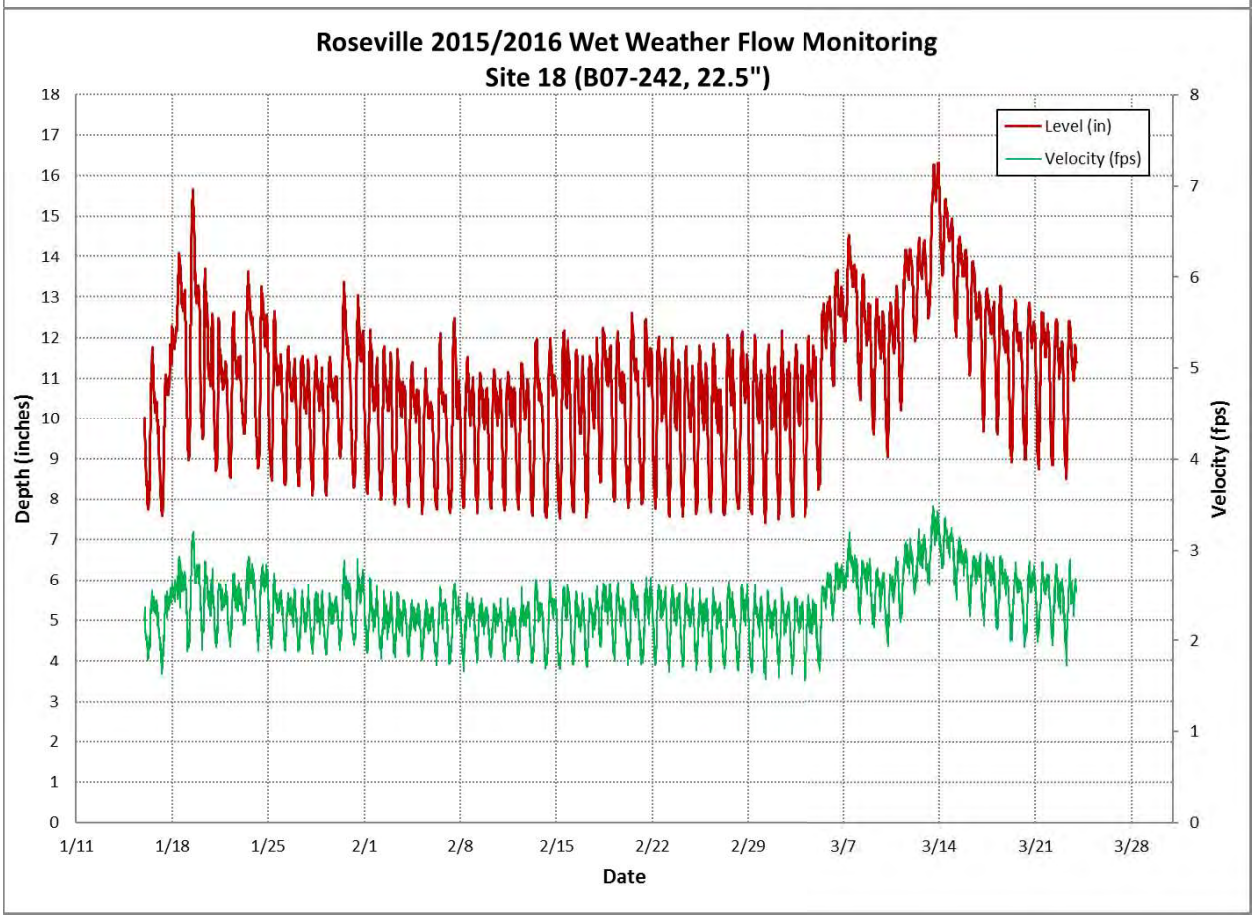

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 16A (B06-161, 15")
Flow (mgd)
Rainfall (in/hr)
Date
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

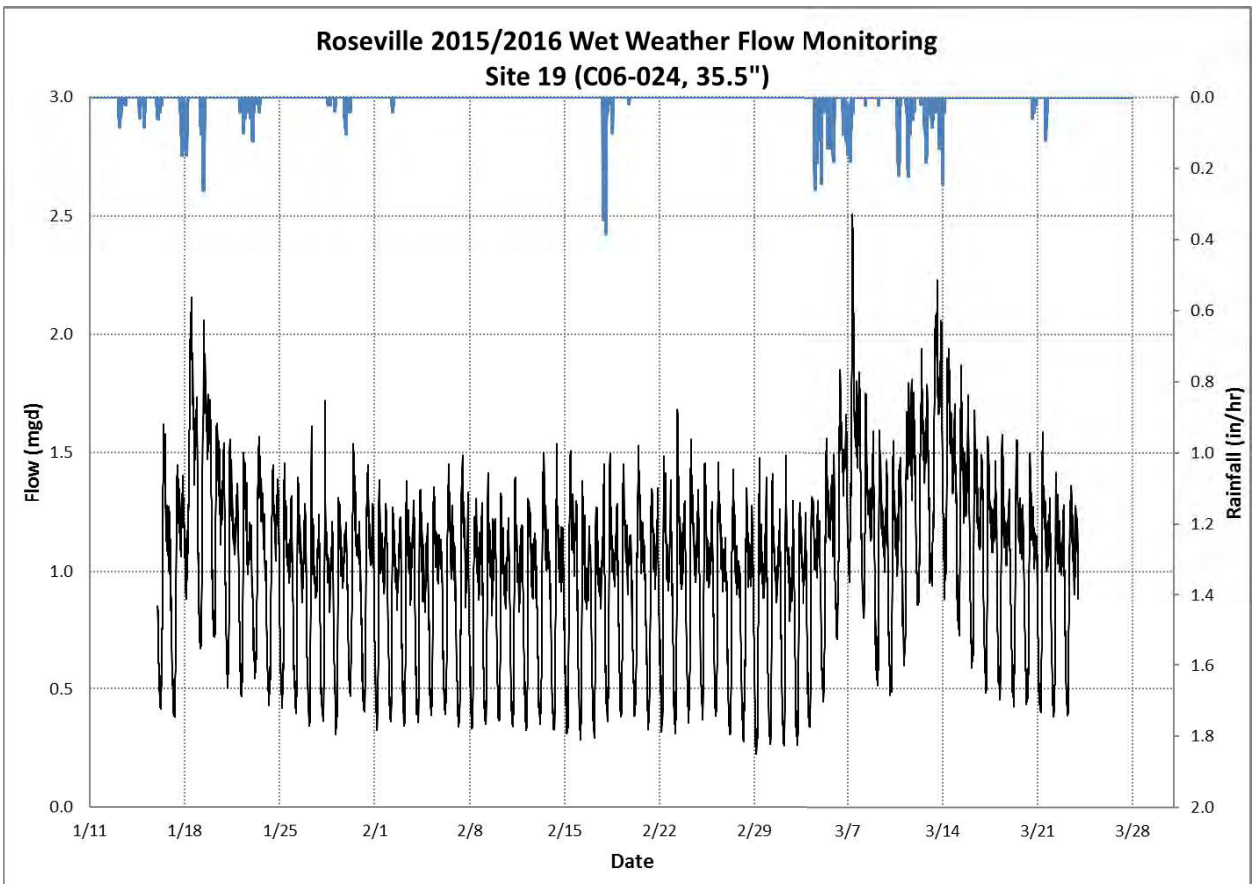

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 16A (B06-161, 15")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
11
10
9
8
7
6
5
4
3
2
1
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

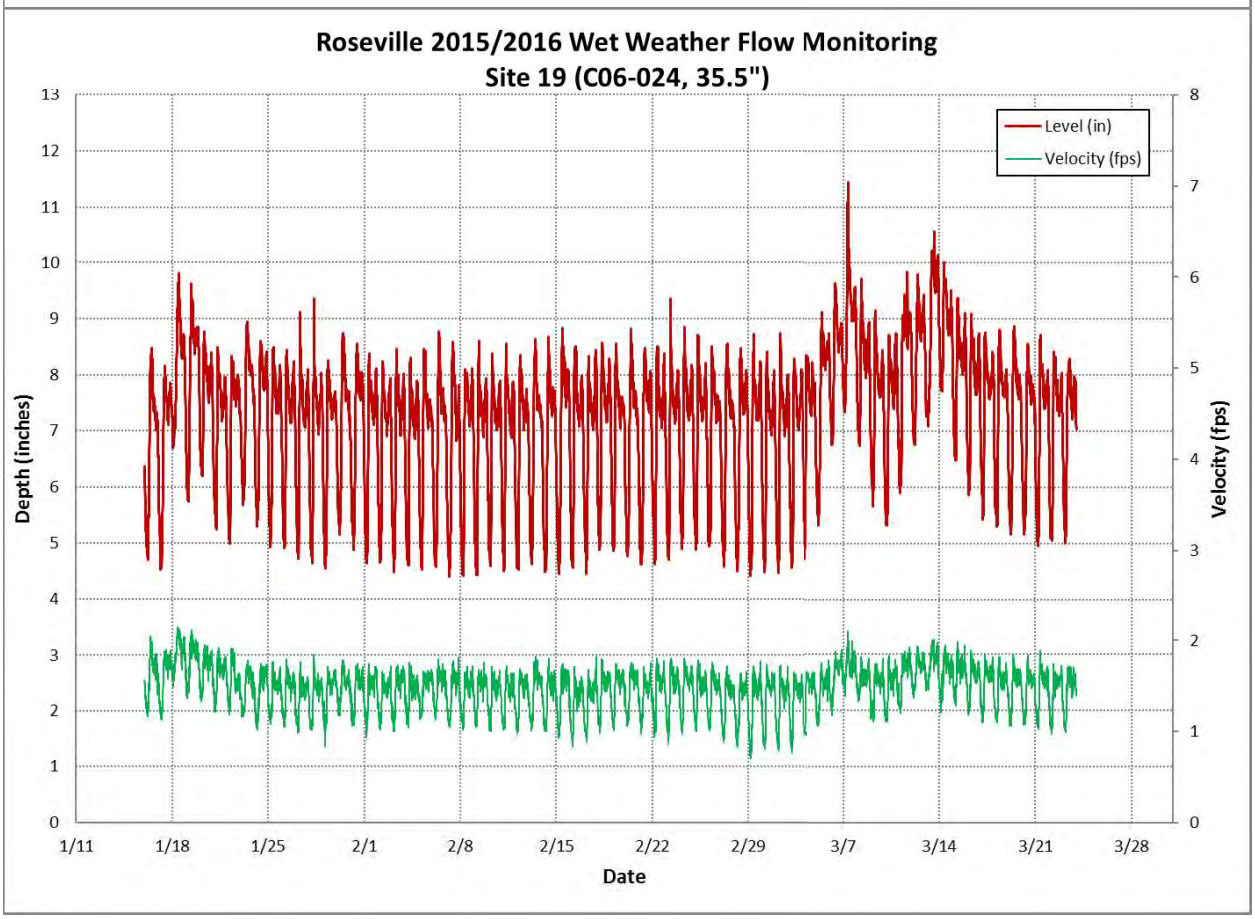

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 17 (B05-258, 21")
Flow (mgd)
Rainfall (in/hr)
Date
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

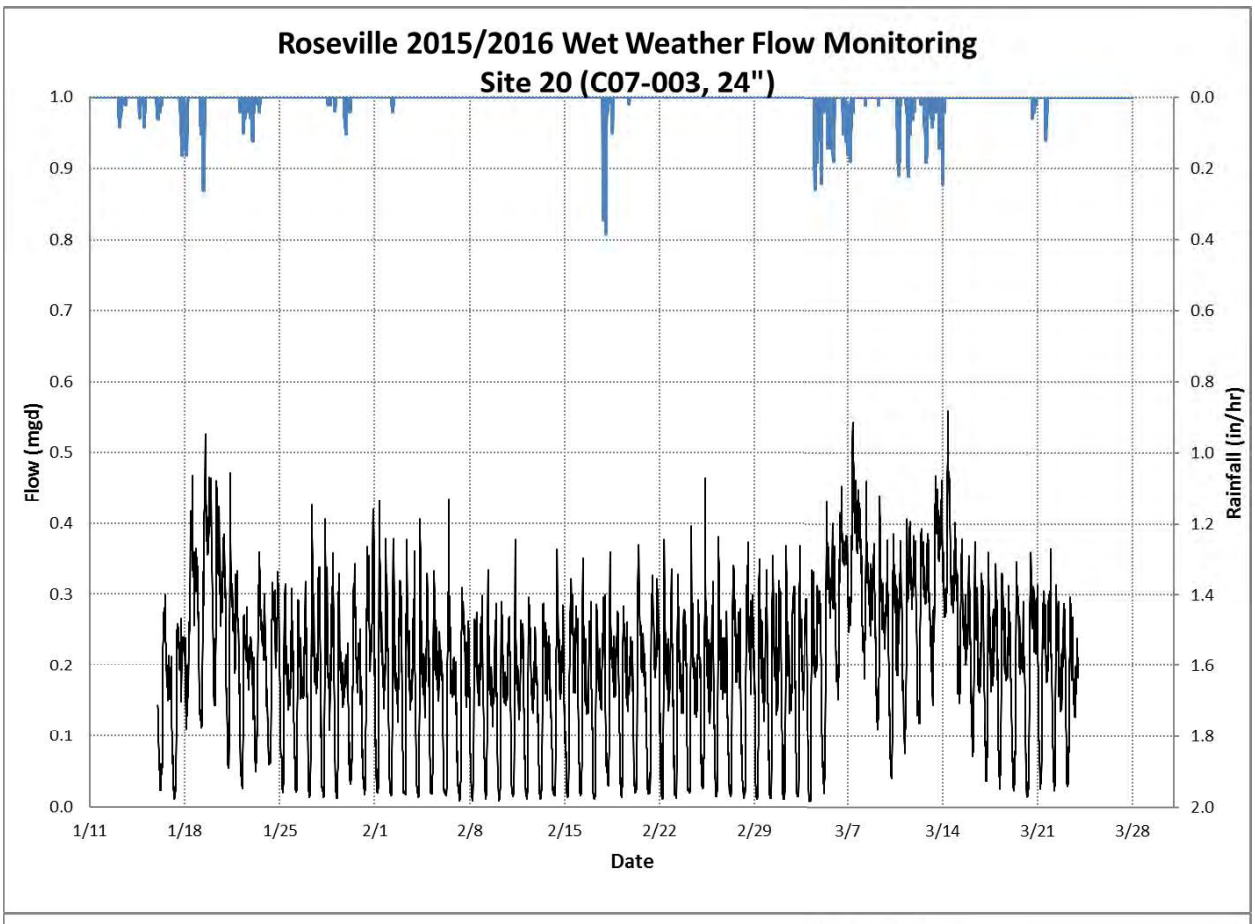

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 17 (B05-258, 21")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
6
5
4
3
2
1
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

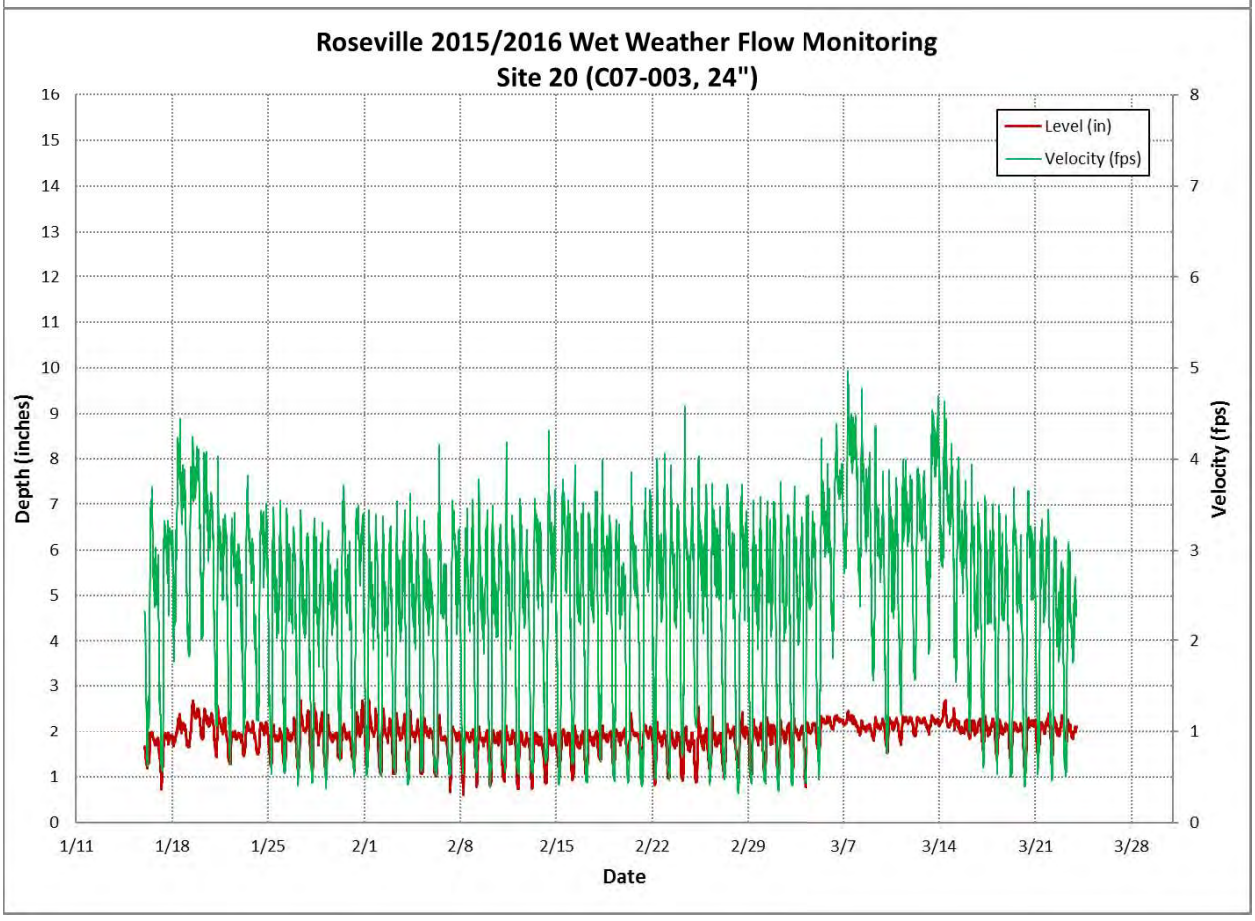

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 18 (B07-242, 22.5")
Flow (mgd)
Rainfall (in/hr)
Date
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

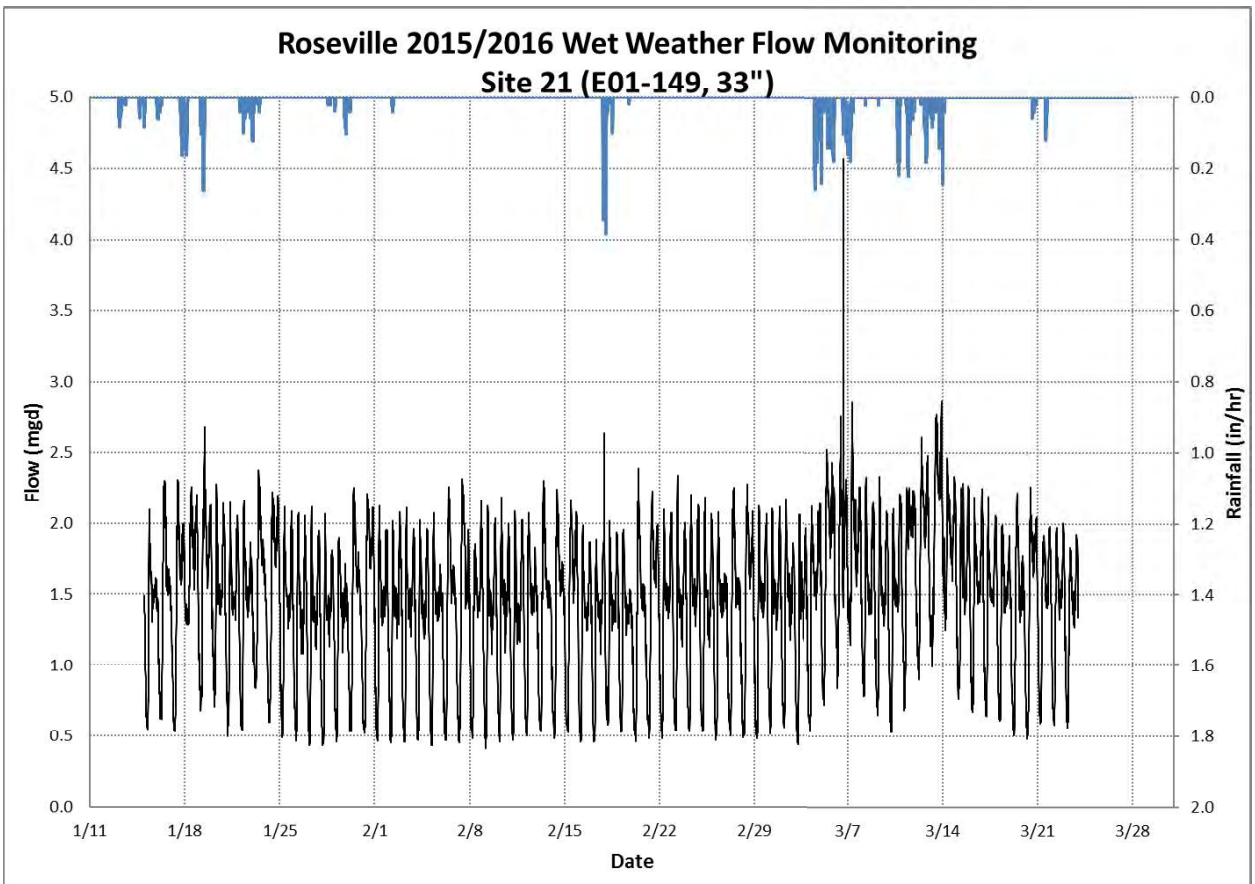

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 18 (B07-242, 22.5")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

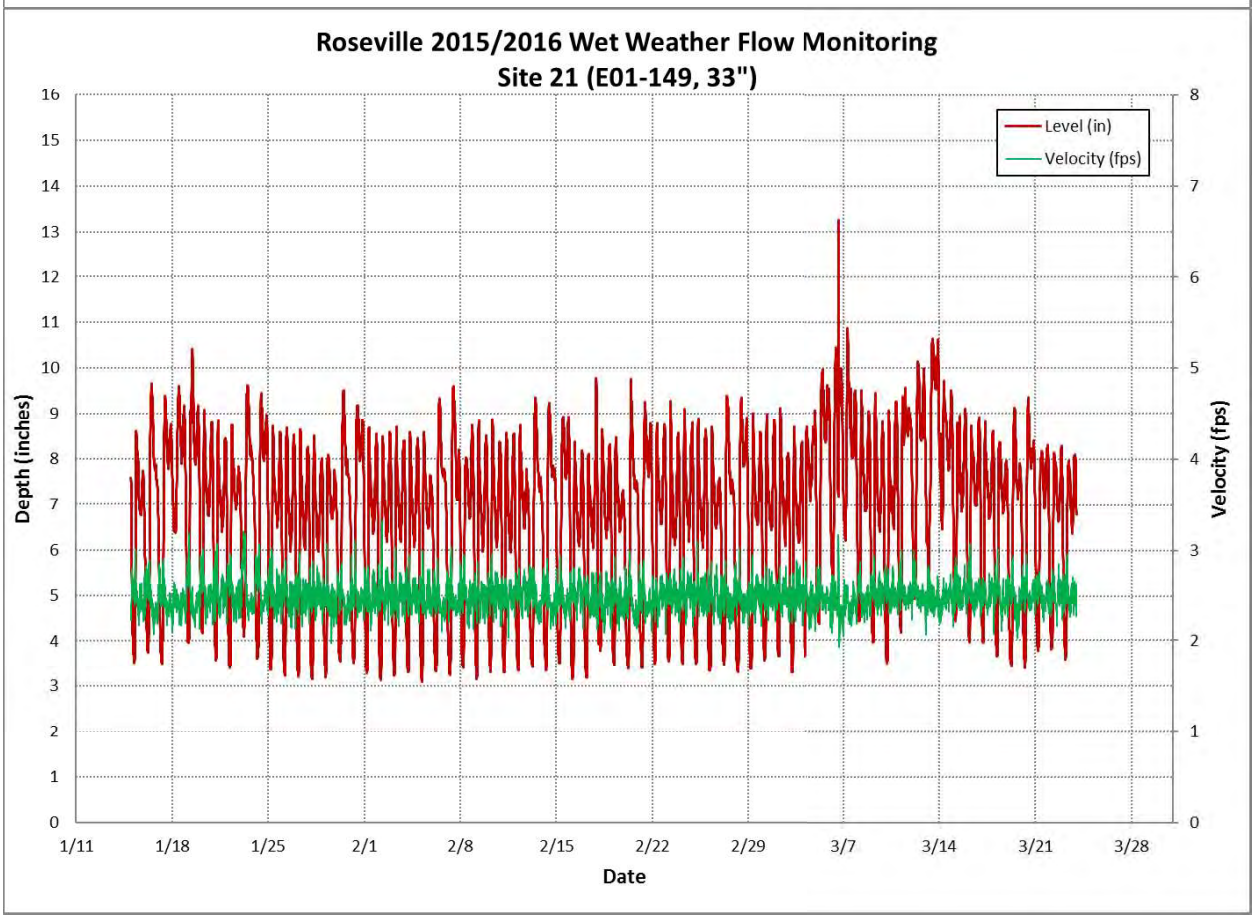

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 19 (C06-024, 35.5")
Flow (mgd)
Rainfall (in/hr)
Date
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

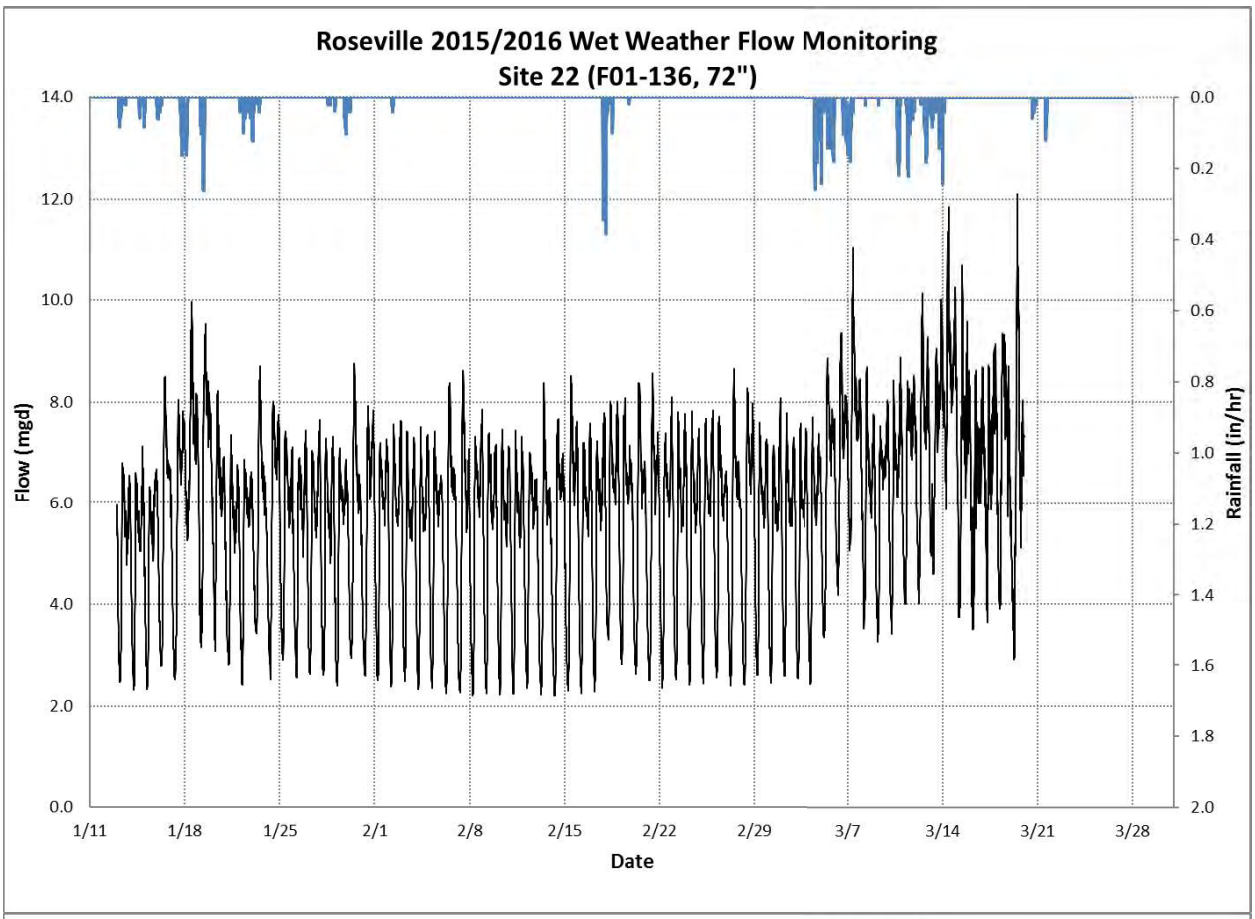

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 19 (C06-024, 35.5")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
13
12
11
10
9
8
7
6
5
4
3
2
1
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

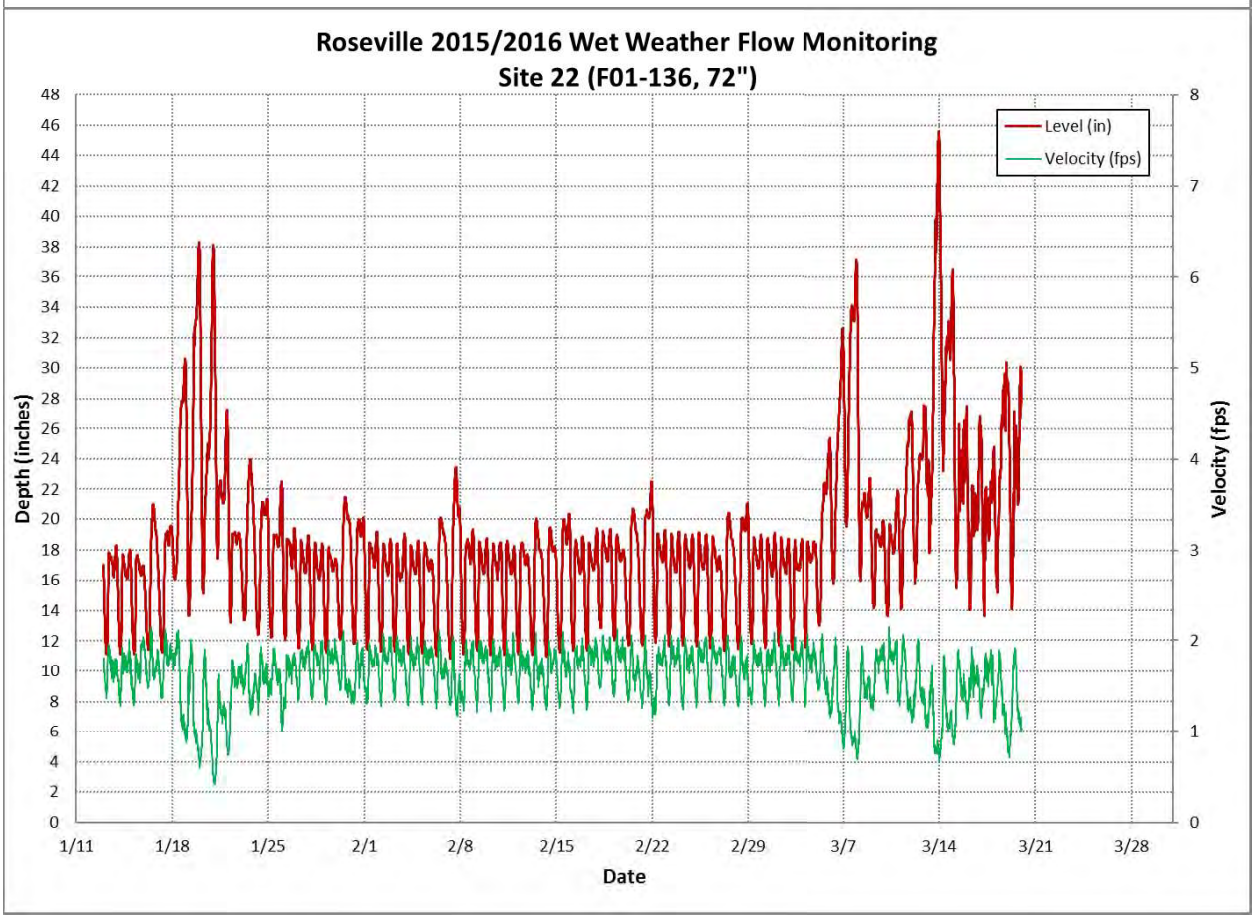

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 20 (C07-003, 24")
Flow (mgd)
Rainfall (in/hr)
Date
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

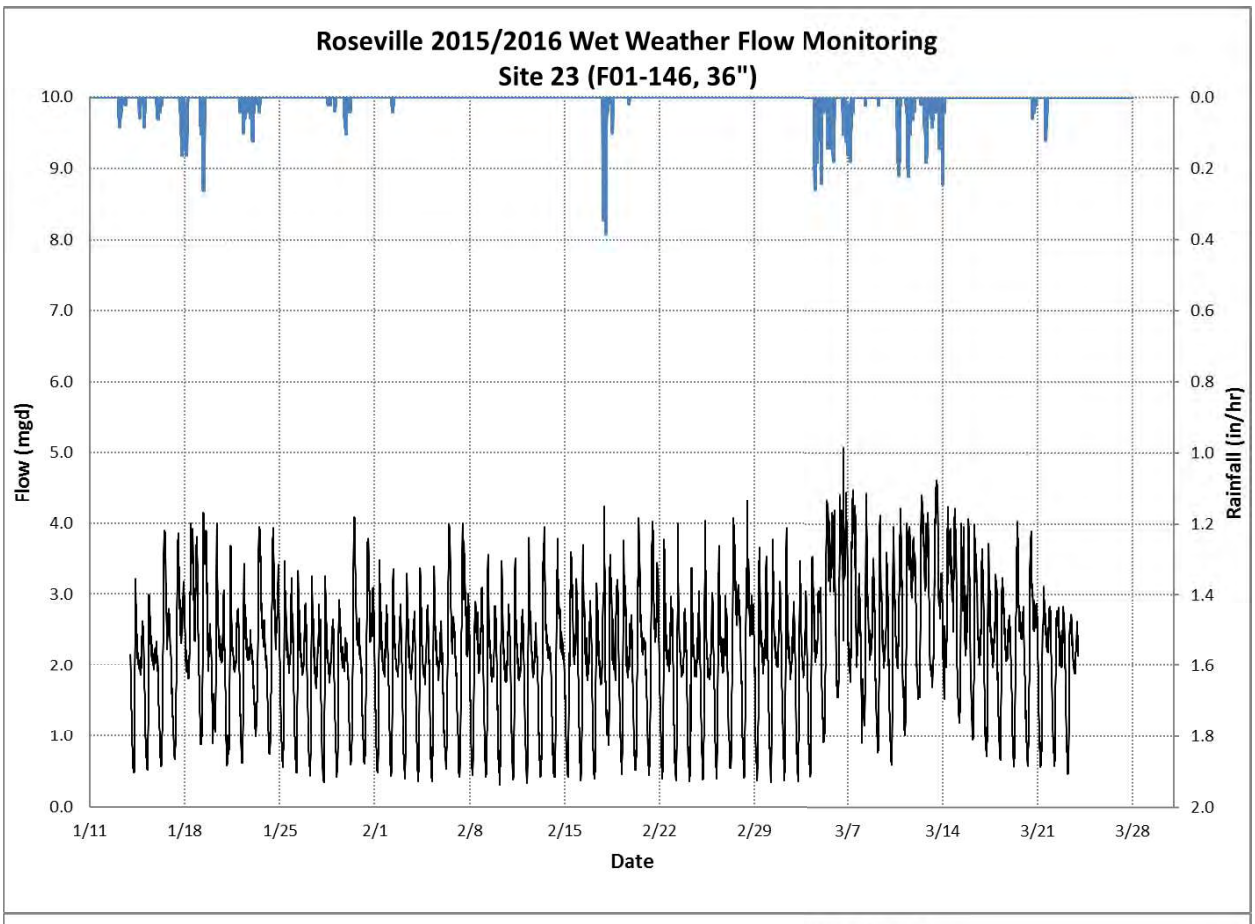

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 20 (C07-003, 24")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

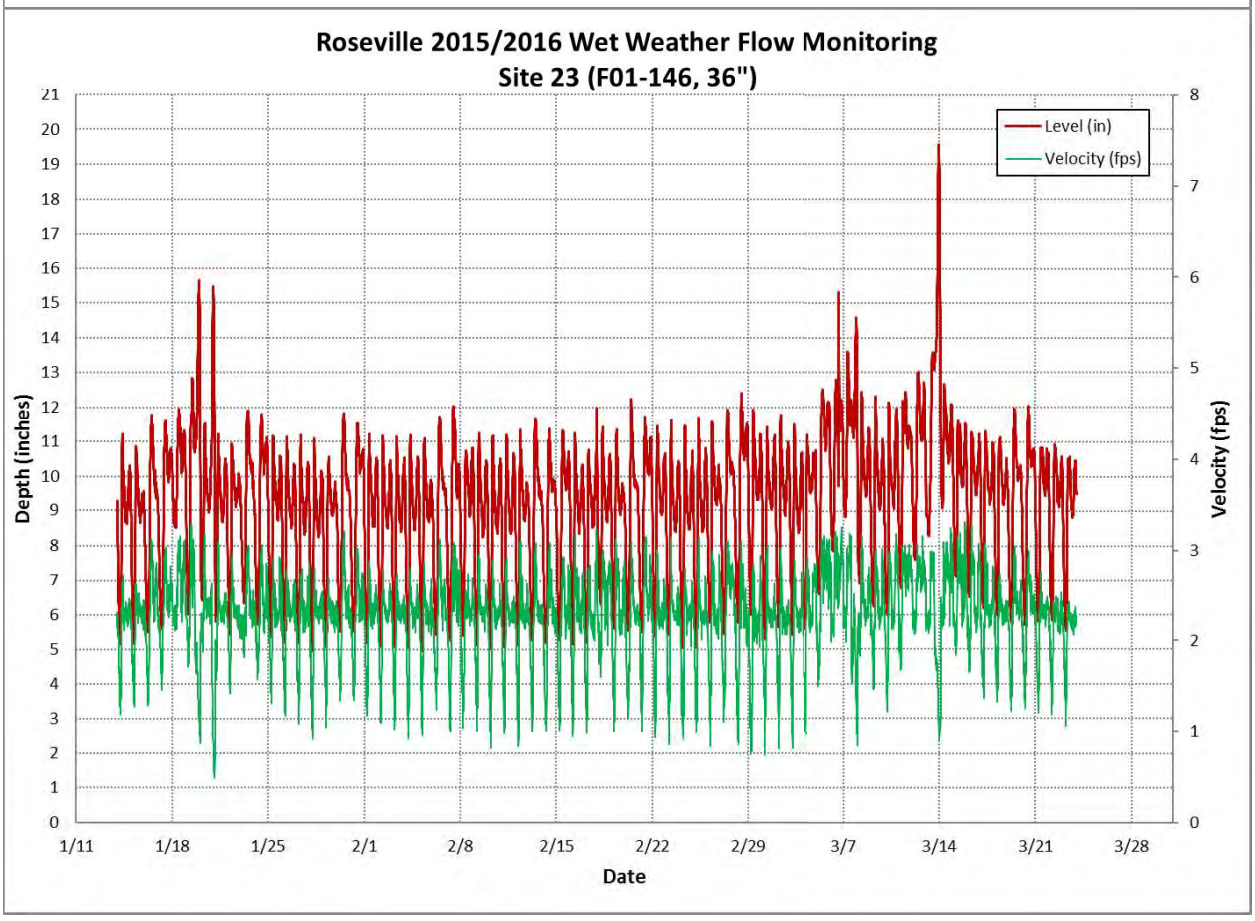

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 21 (E01-149, 33")
Flow (mgd)
Rainfall (in/hr)
Date
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

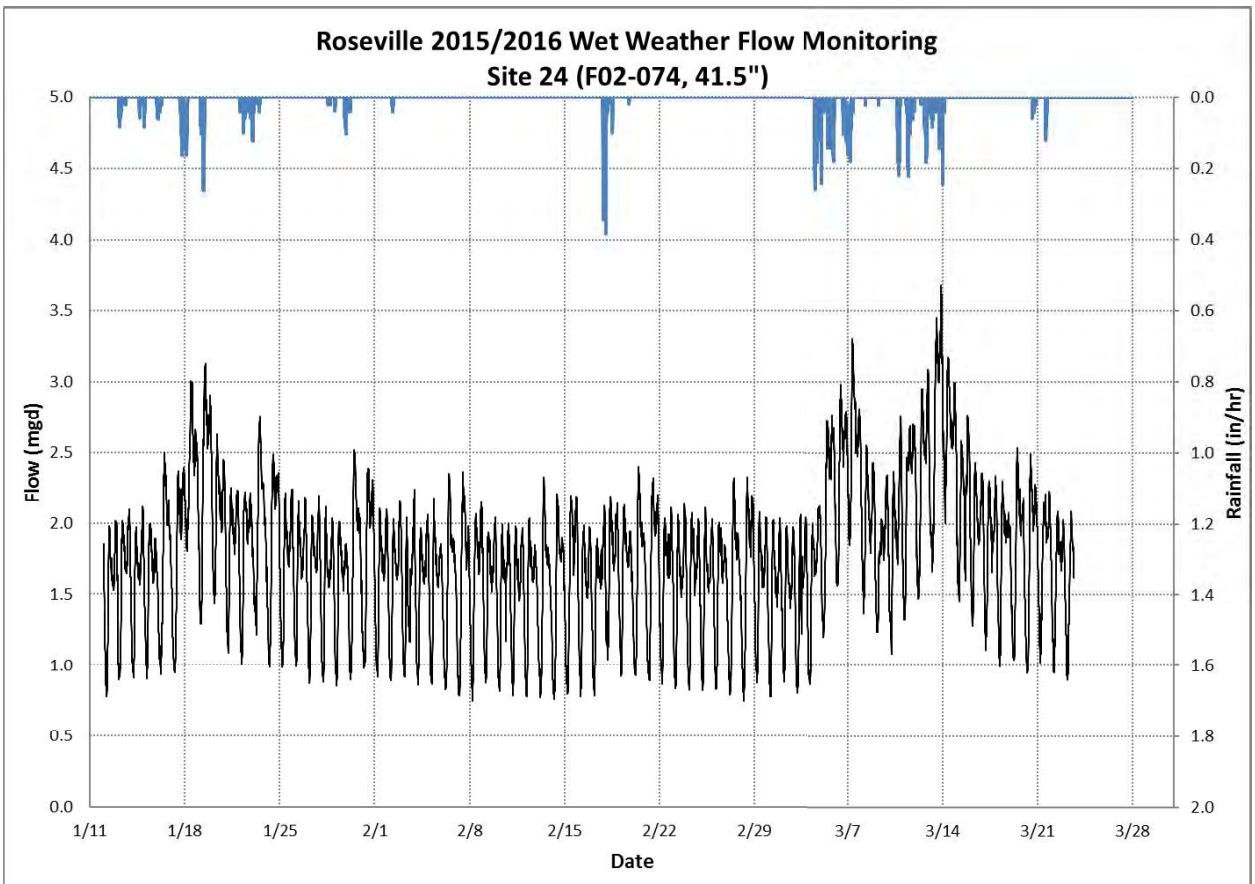

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 21 (E01-149, 33")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

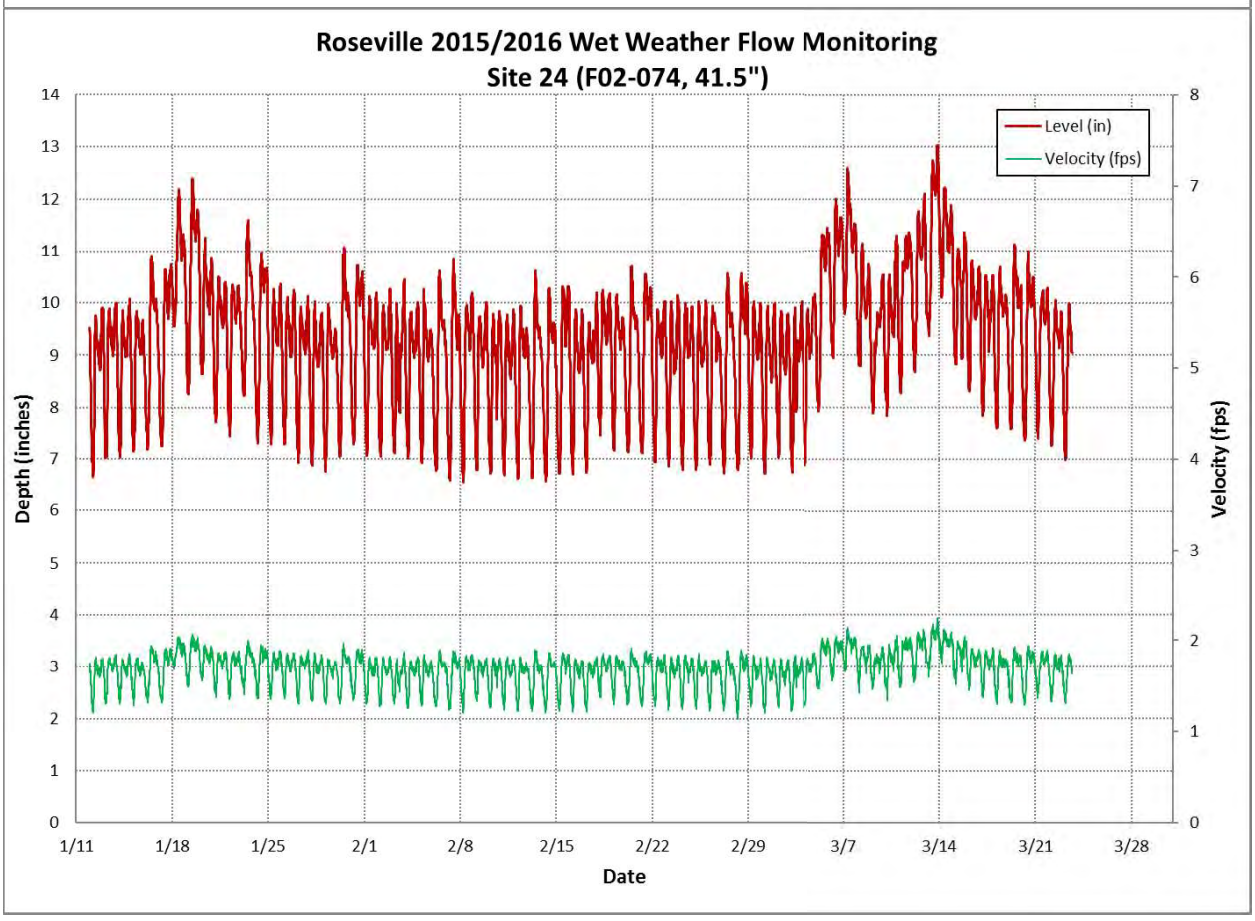

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 22 (F01-136, 72")
Flow (mgd)
Rainfall (in/hr)
Date
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

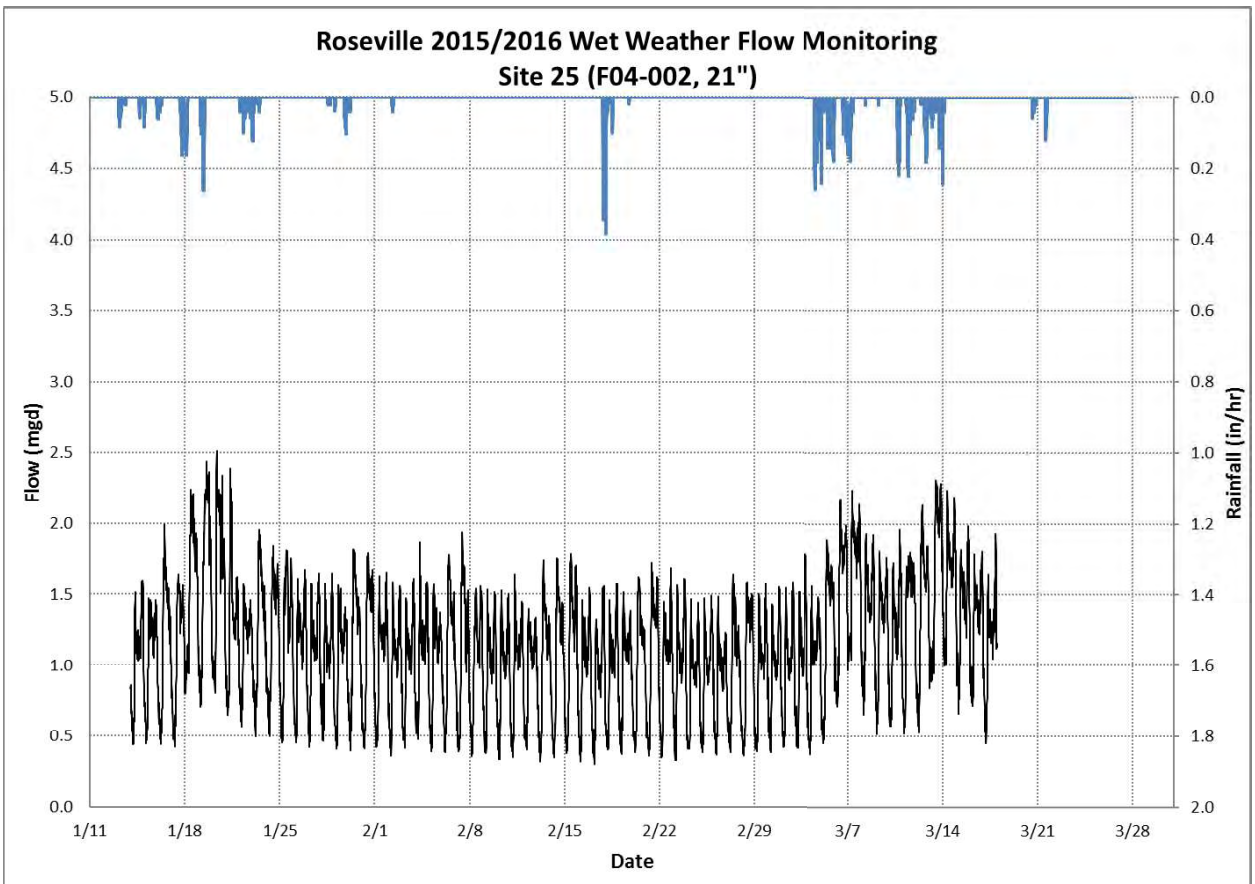

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 22 (F01-136, 72")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
48
46
44
42
40
38
36
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

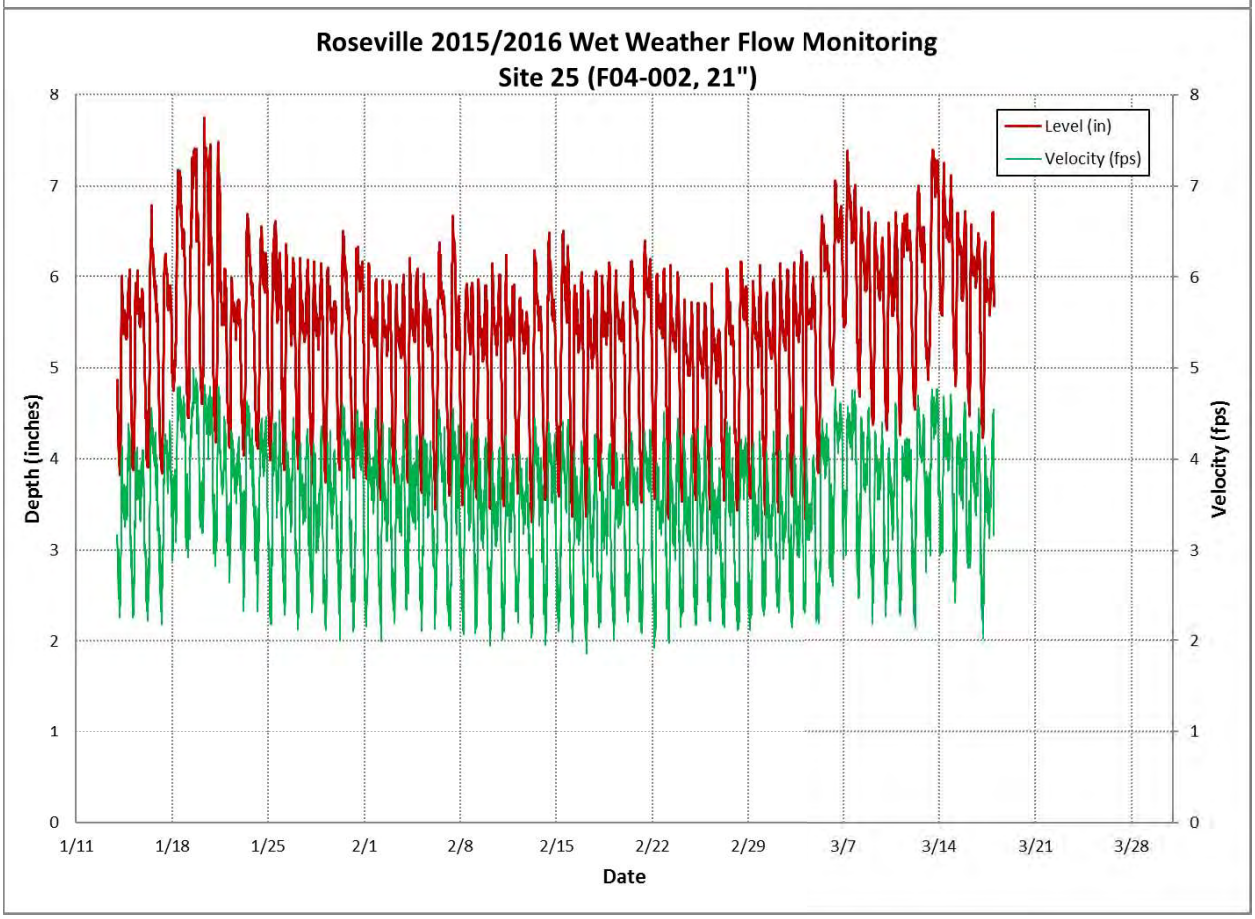

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 23 (F01-146, 36")
Flow (mgd)
Rainfall (in/hr)
Date
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

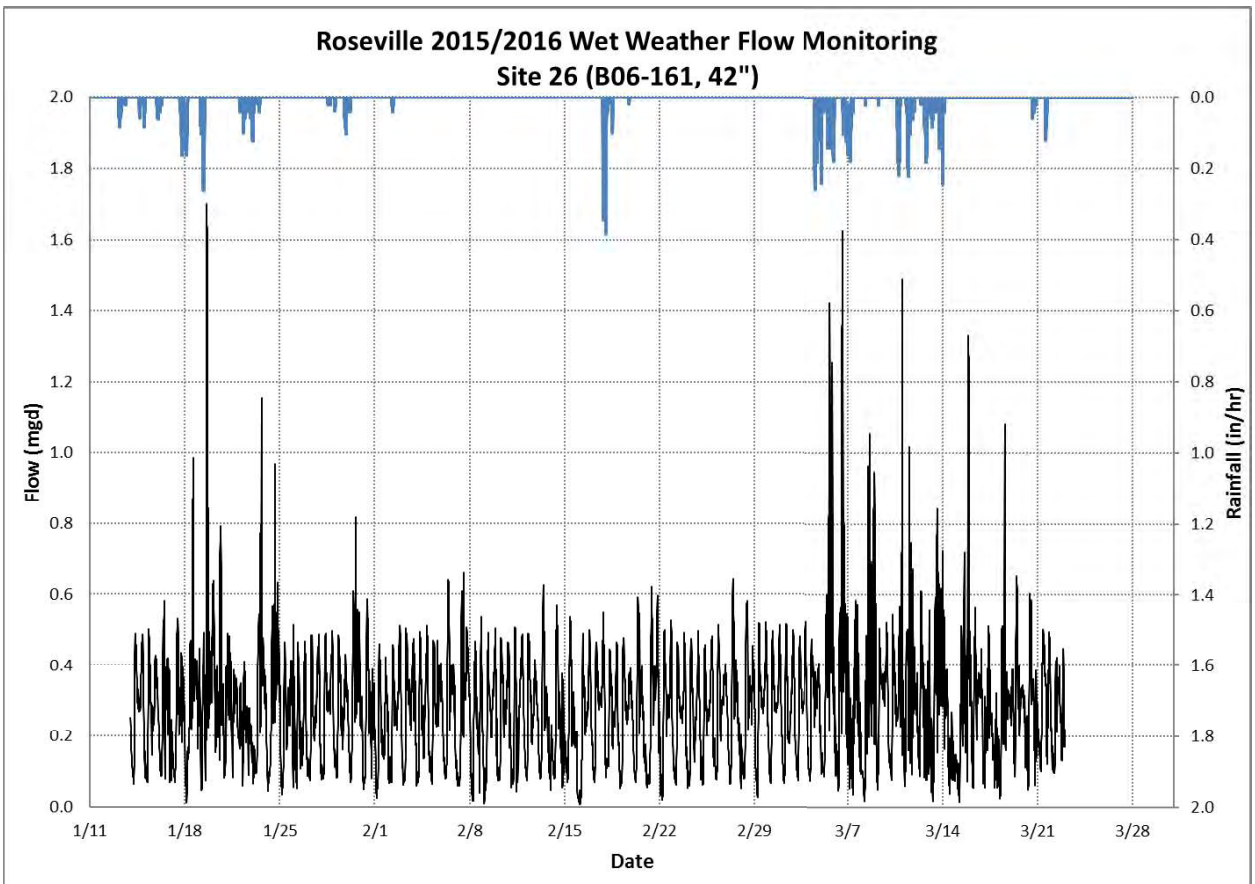

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 23 (F01-146, 36")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

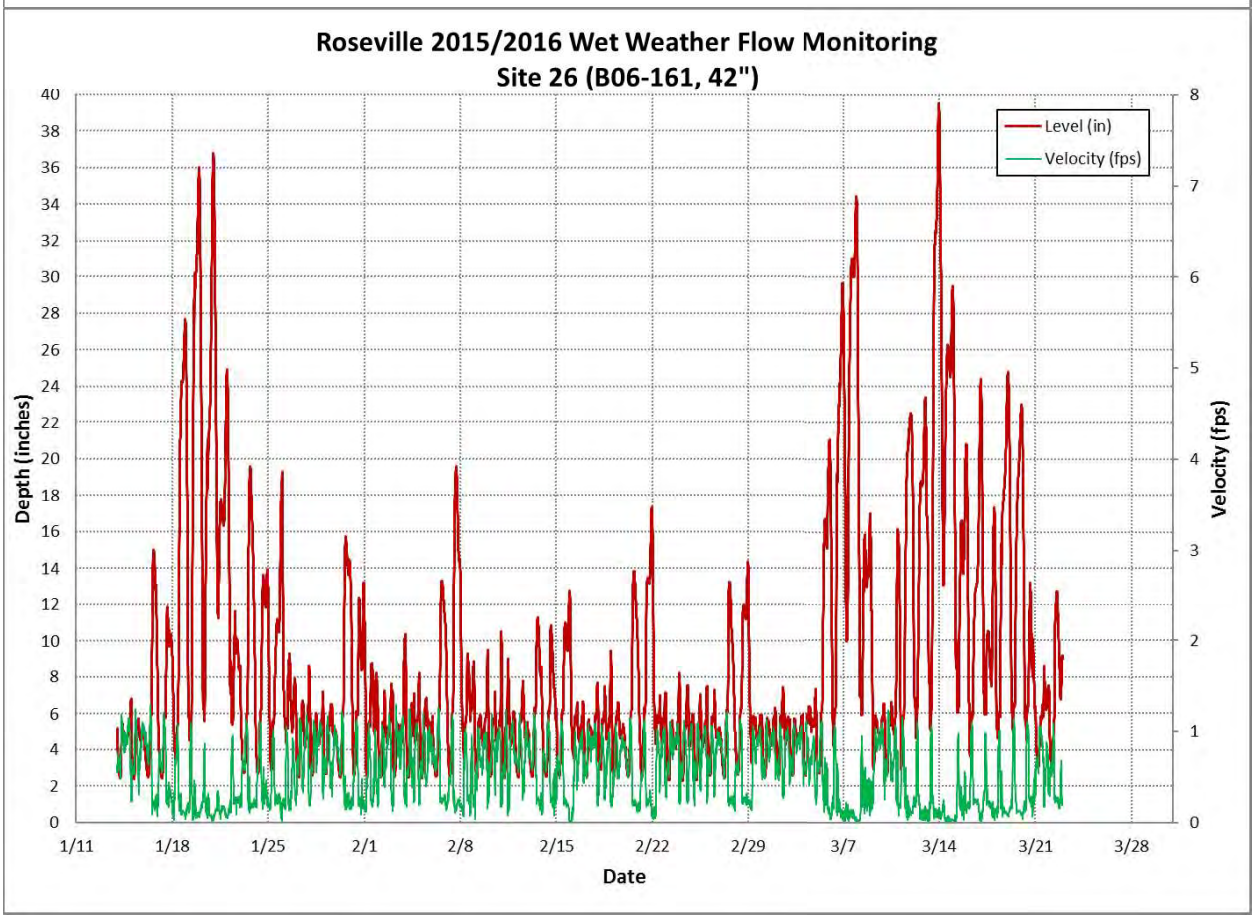

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 24 (F02-074, 41.5")
Flow (mgd)
Rainfall (in/hr)
Date
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

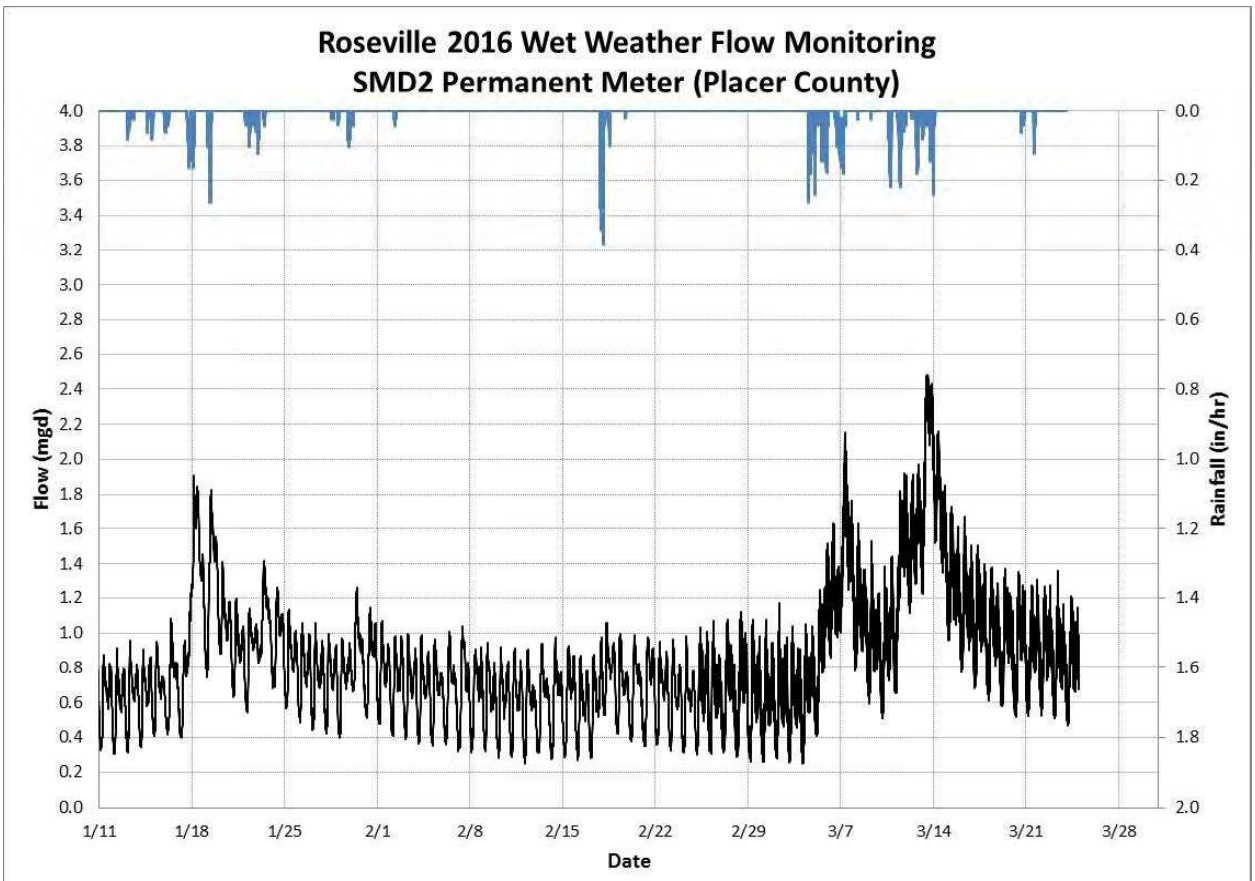

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 24 (F02-074, 41.5")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

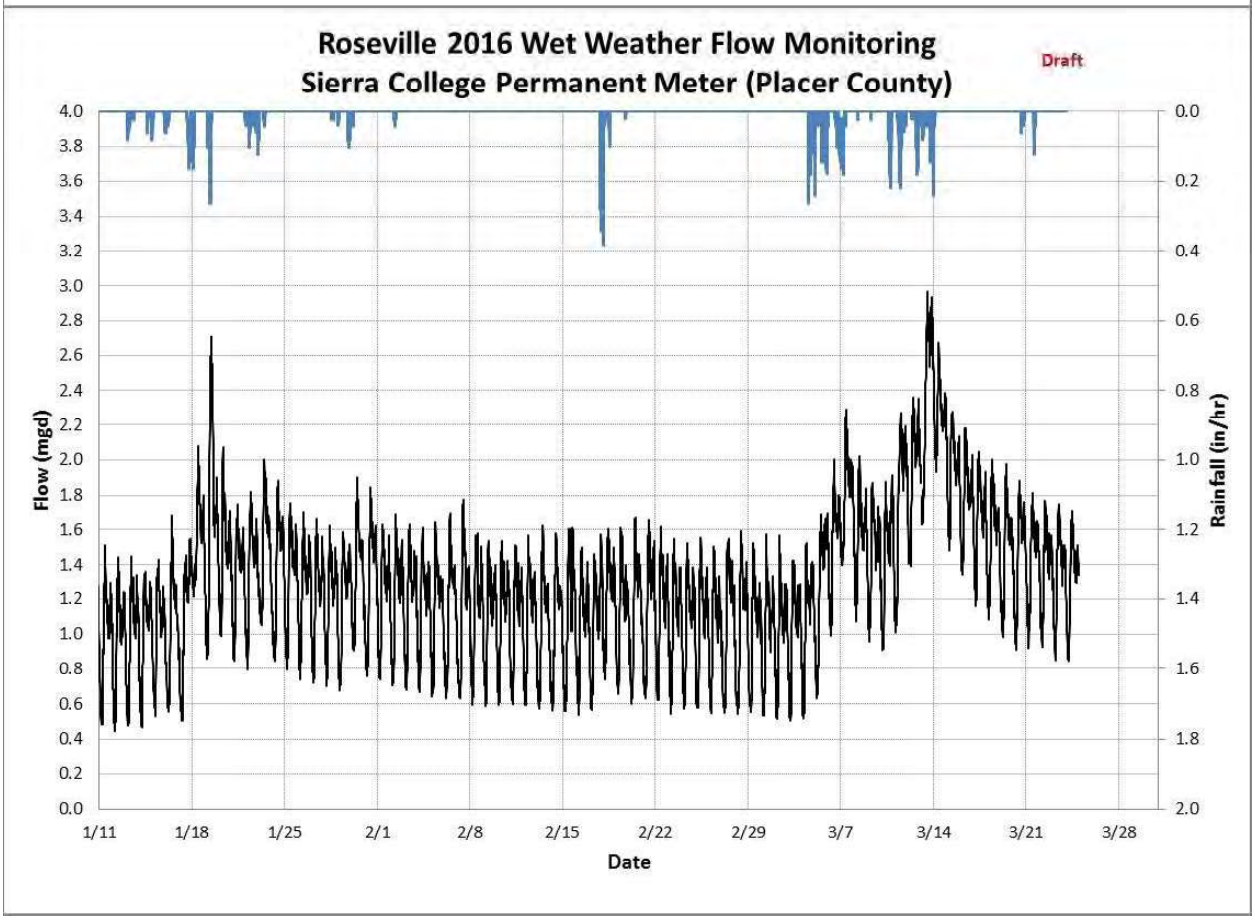

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 25 (F04-002, 21")
Flow (mgd)
Rainfall (in/hr)
Date
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

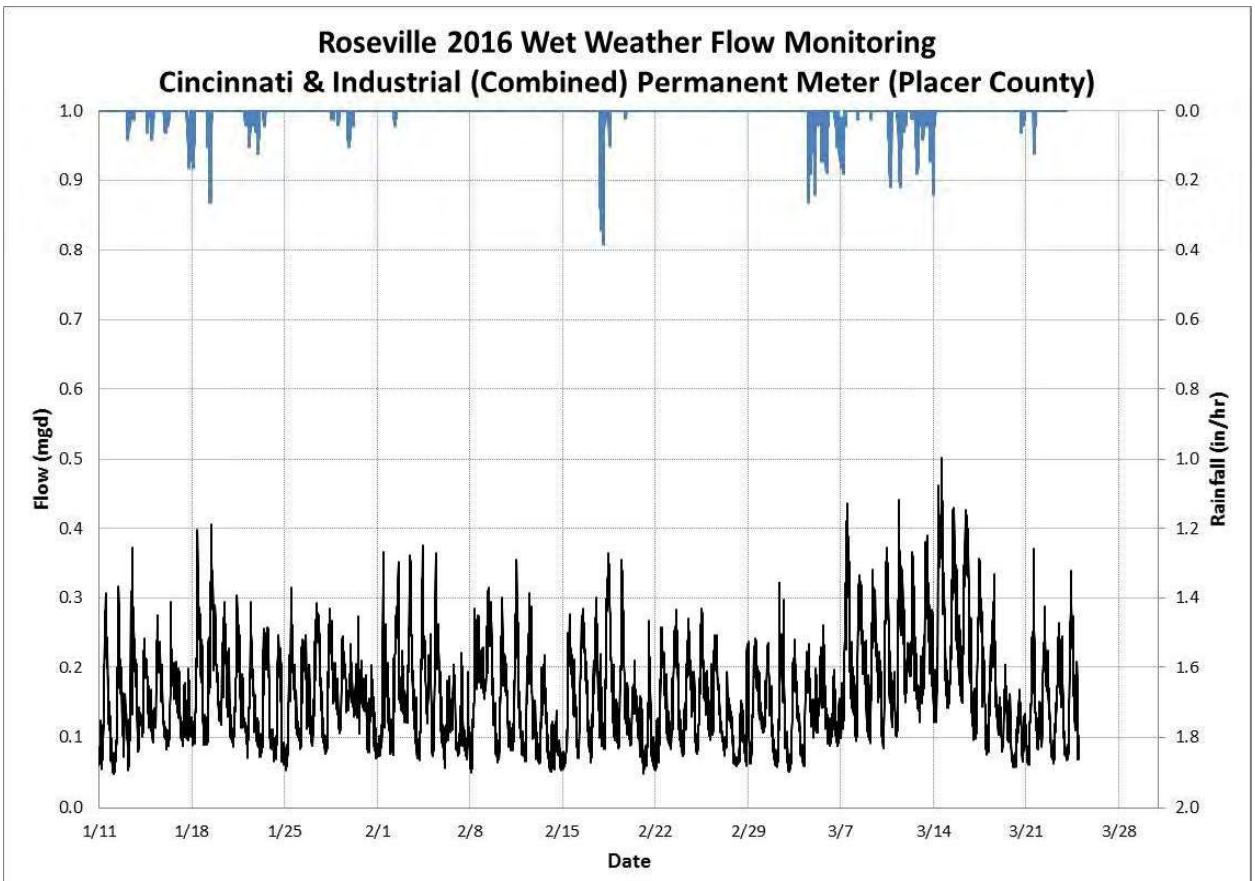

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 25 (F04-002, 21")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

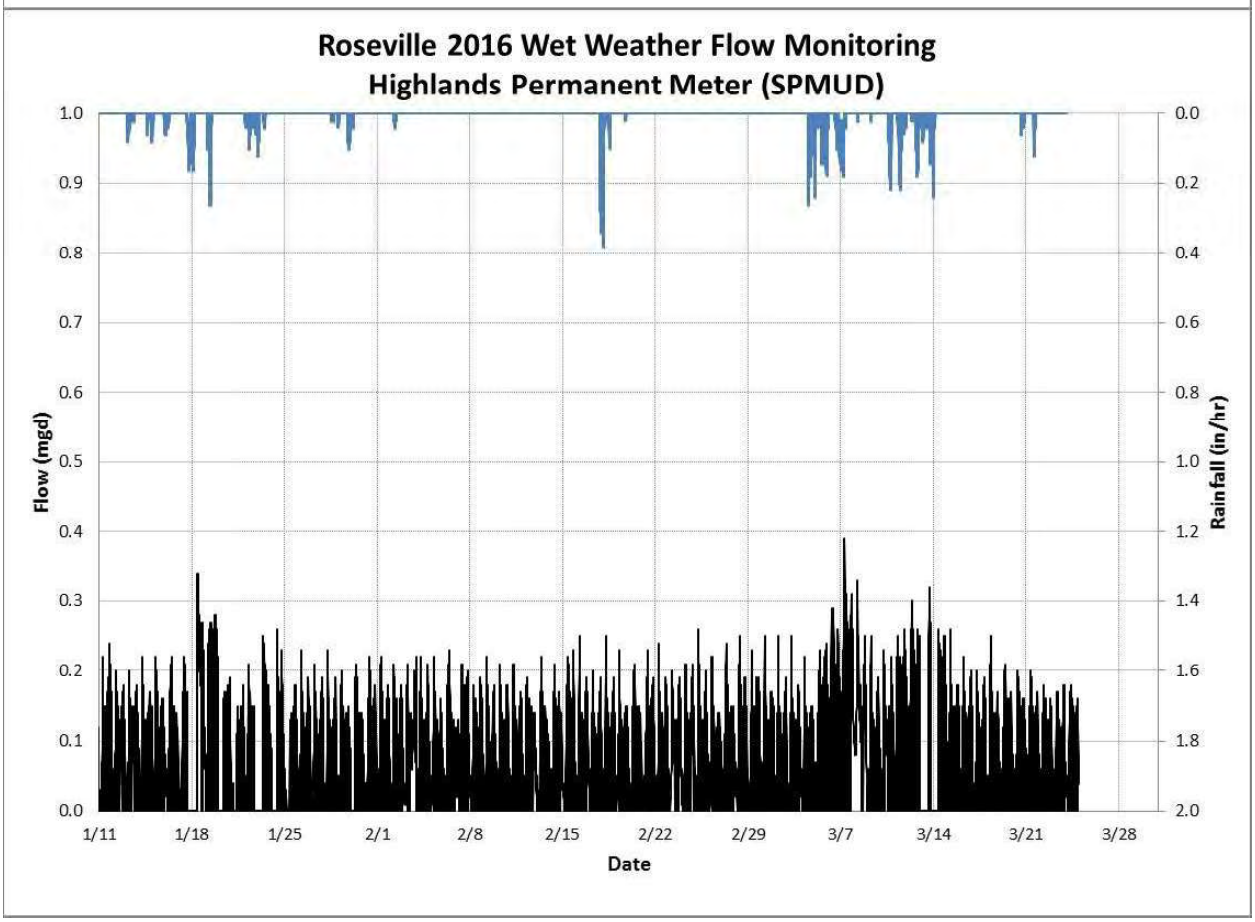

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 26 (B06-161, 42")
Flow (mgd)
Rainfall (in/hr)
Date
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

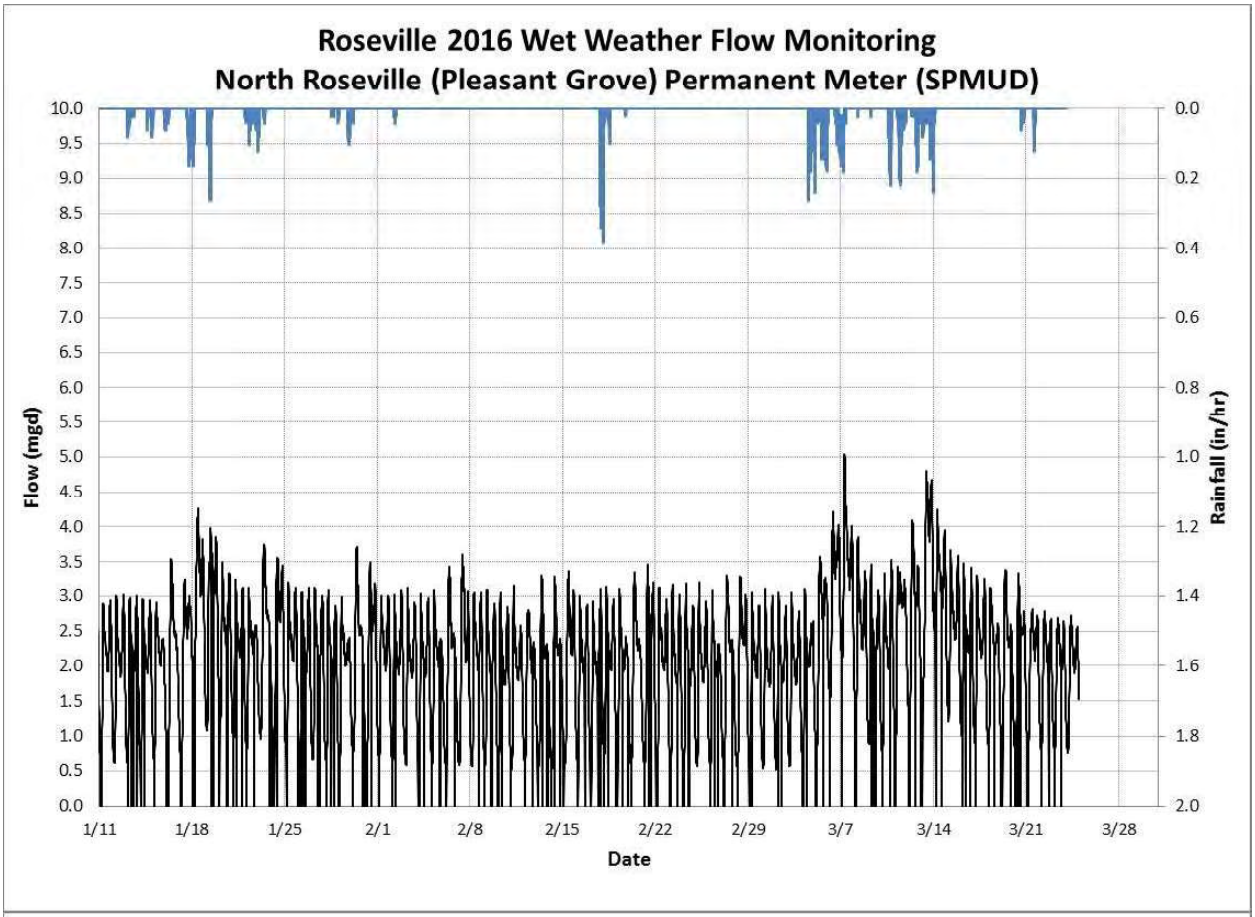

Roseville 2015/2016 Wet Weather Flow Monitoring
Site 26 (B06-161, 42")
Level (in)
Velocity (fps)
Depth (inches)
Velocity (fps)
Date
40
38
36
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
8
7
6
5
4
3
2
1
0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

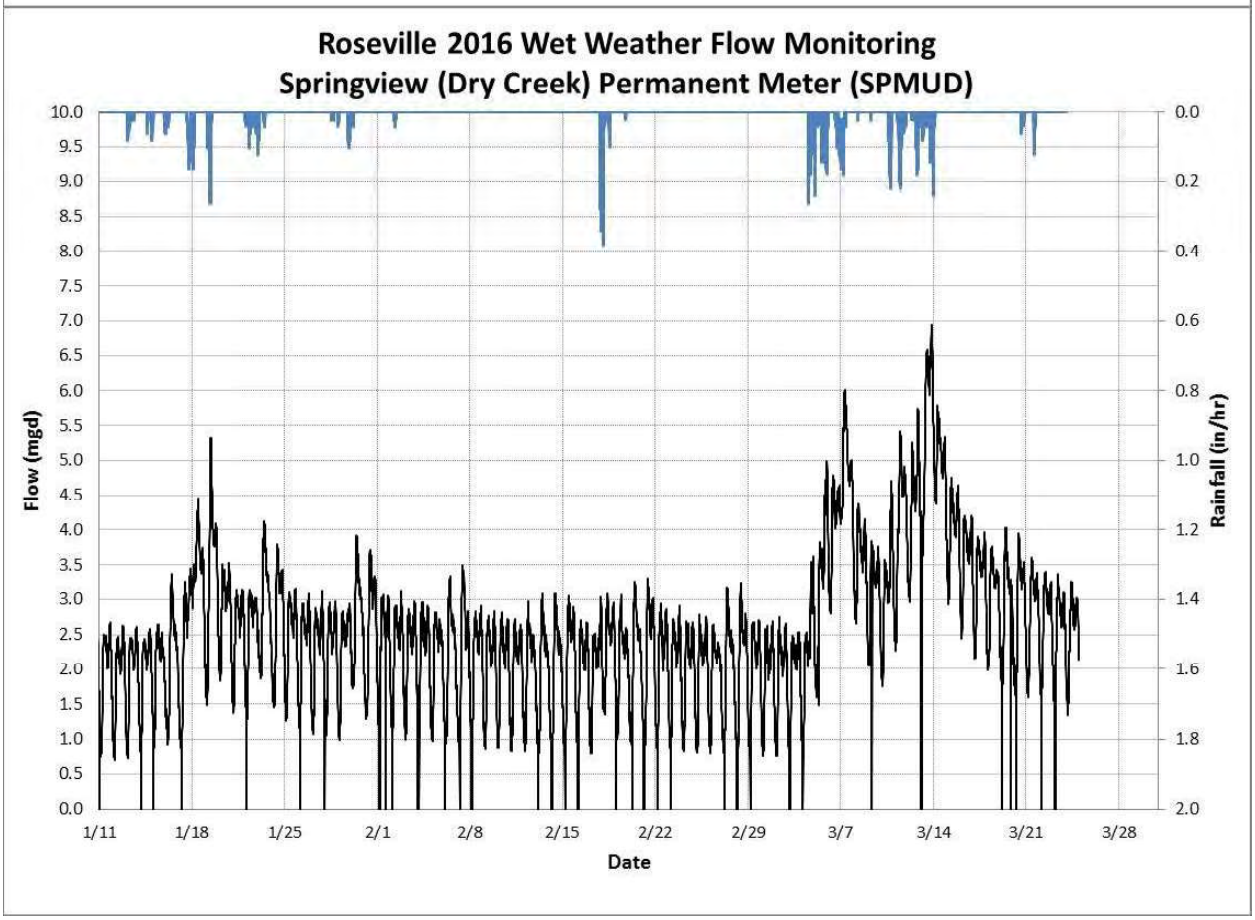

Roseville 2016 Wet Weather Flow Monitoring
SMD2 Permanent Meter (Placer County)
Flow (mgd)
Rainfall (in/hr)
Date
4.0
3.8
3.6
3.4
3.2
3.0
2.8
2.6
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

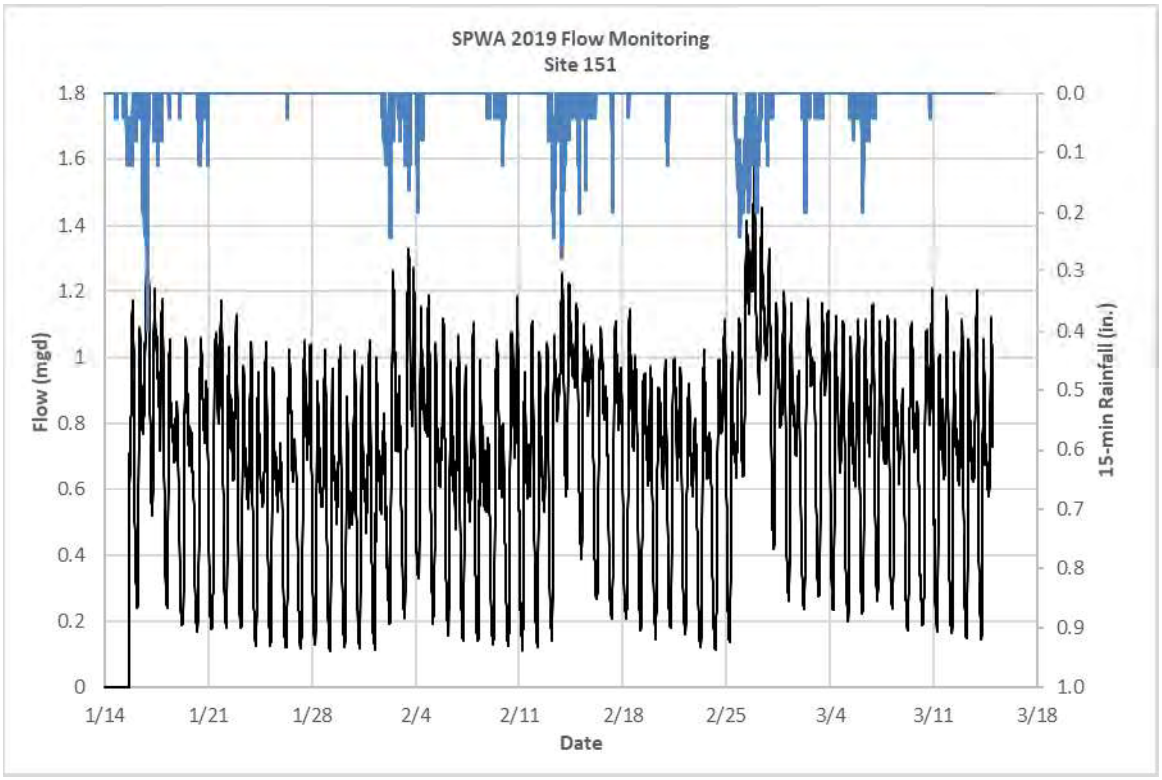

Roseville 2016 Wet Weather Flow Monitoring
Sierra College Permanent Meter (Placer County)
Draft
Flow (mgd)
Rainfall (in/hr)
Date
4.0
3.8
3.6
3.4
3.2
3.0
2.8
2.6
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

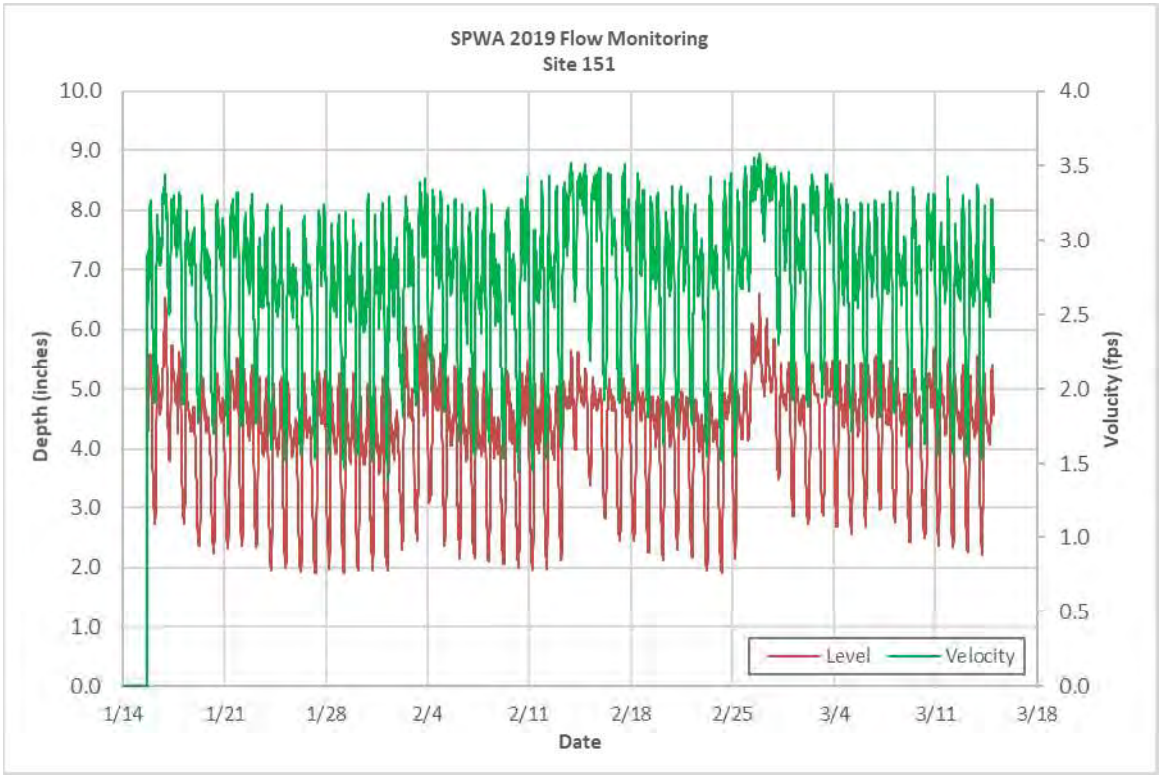

Roseville 2016 Wet Weather Flow Monitoring
Cincinnati & Industrial (Combined) Permanent Meter (Placer County)
Flow (mgd)
Rainfall (in/hr)
Date
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

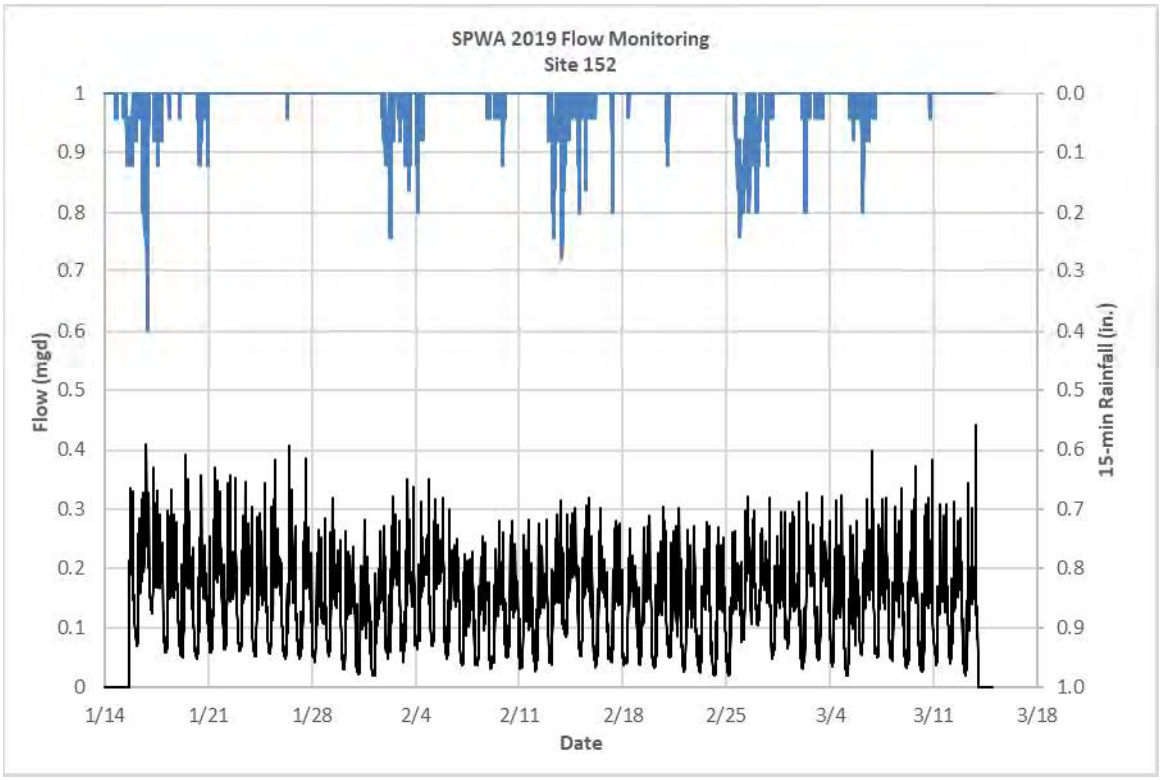

Roseville 2016 Wet Weather Flow Monitoring
Highlands Permanent Meter (SPMUD)
Flow (mgd)
Rainfall (in/hr)
Date
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

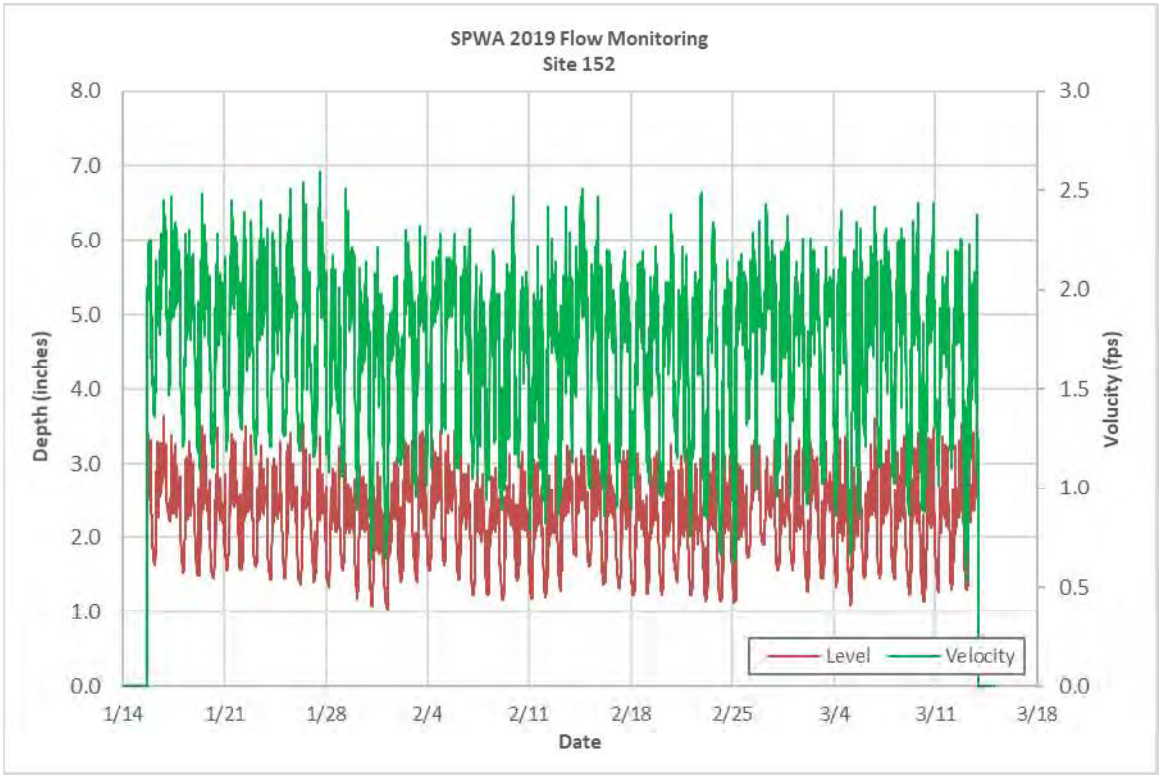

Roseville 2016 Wet Weather Flow Monitoring
North Roseville (Pleasant Grove) Permanent Meter (SPMUD)
Flow (mgd)
Rainfall (in/hr)
Date
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

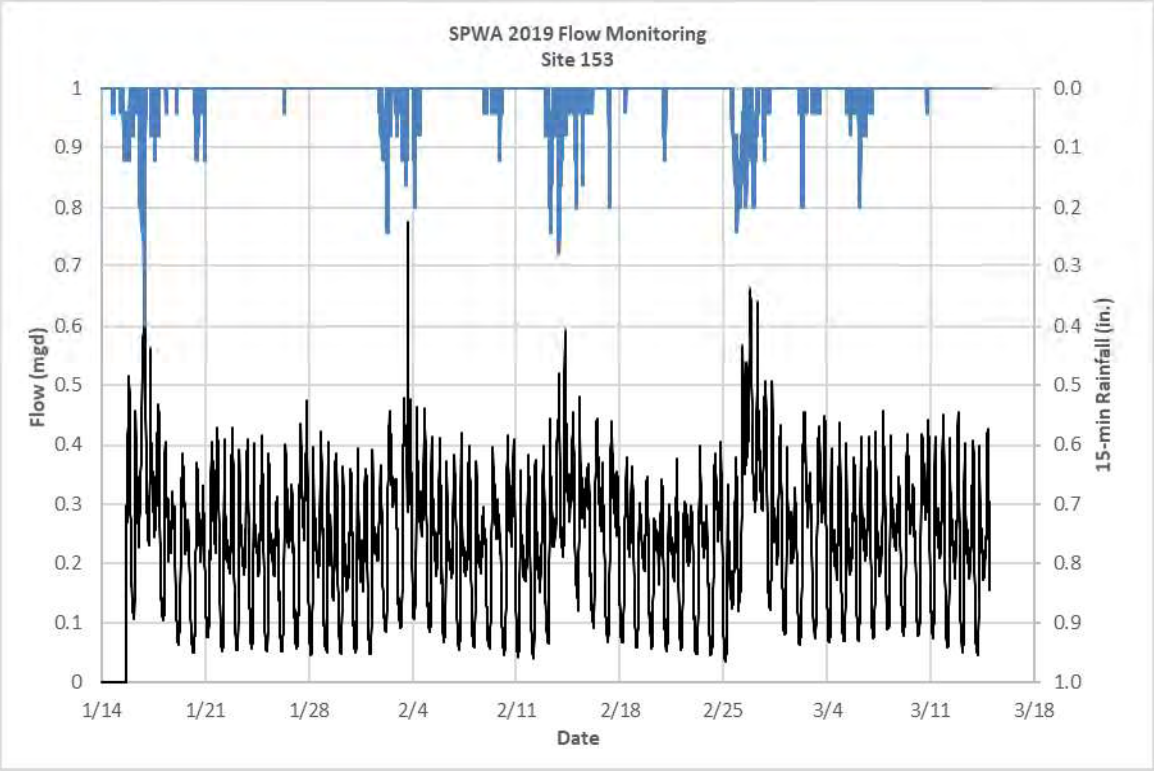

Roseville 2016 Wet Weather Flow Monitoring
Springview (Dry Creek) Permanent Meter (SPMUD)
Flow (mgd)
Rainfall (in/hr)
Date
1/11
1/18
1/25
2/1
2/8
2/15
2/22
2/29
3/7
3/14
3/21
3/28

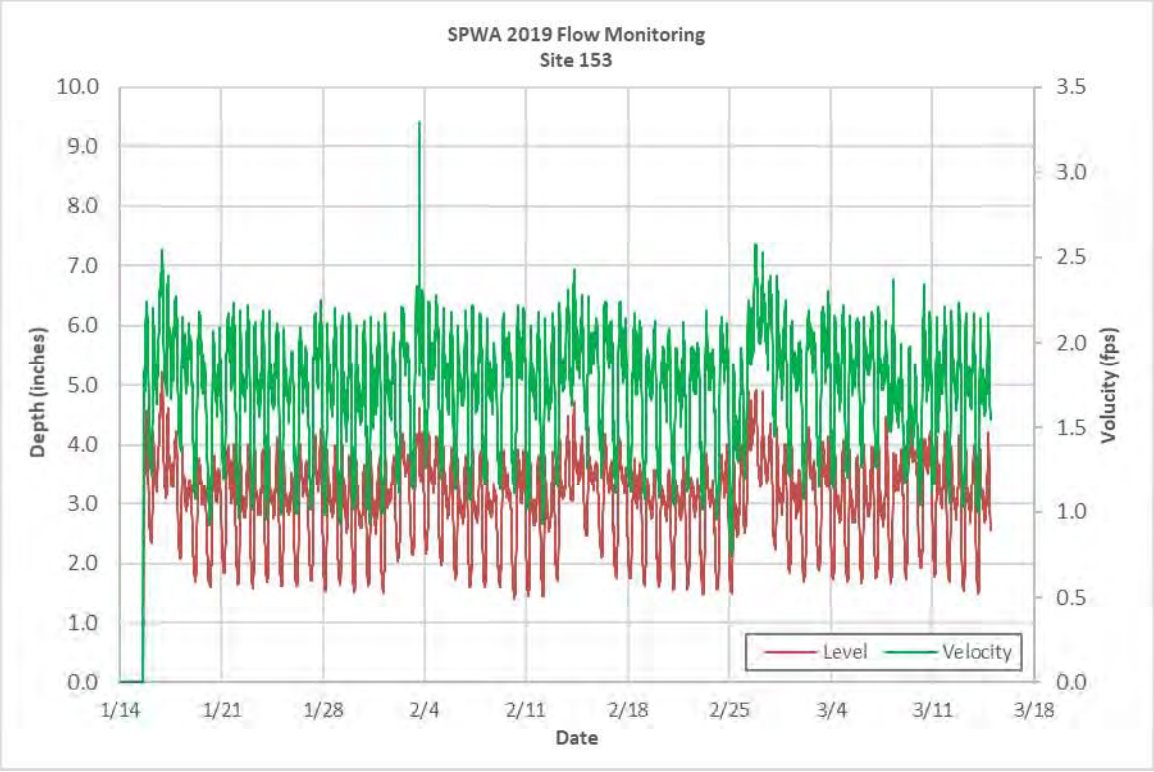

SPWA 2019 Flow Monitoring
Site 151
Flow (mgd)
15-min Rainfall (in.)
Date
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

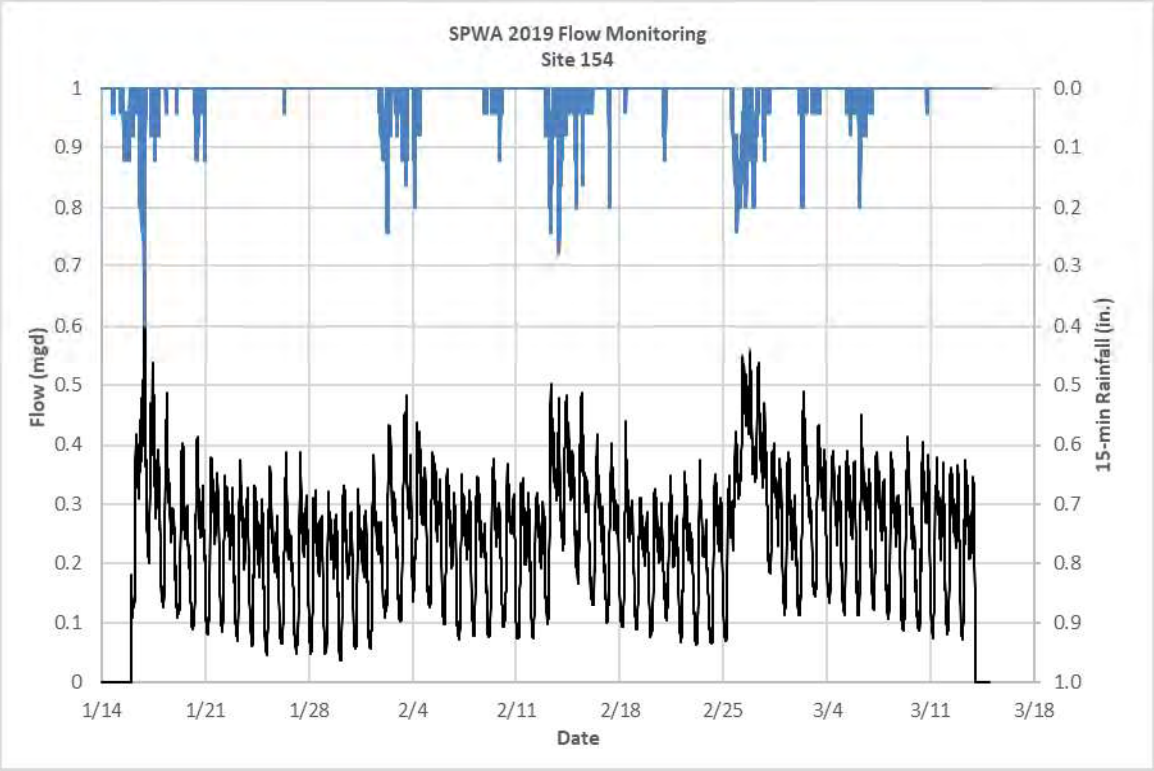

SPWA 2019 Flow Monitoring
Site 151
Depth (inches)
Volucity (fps)
Date
Level
Velocity
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

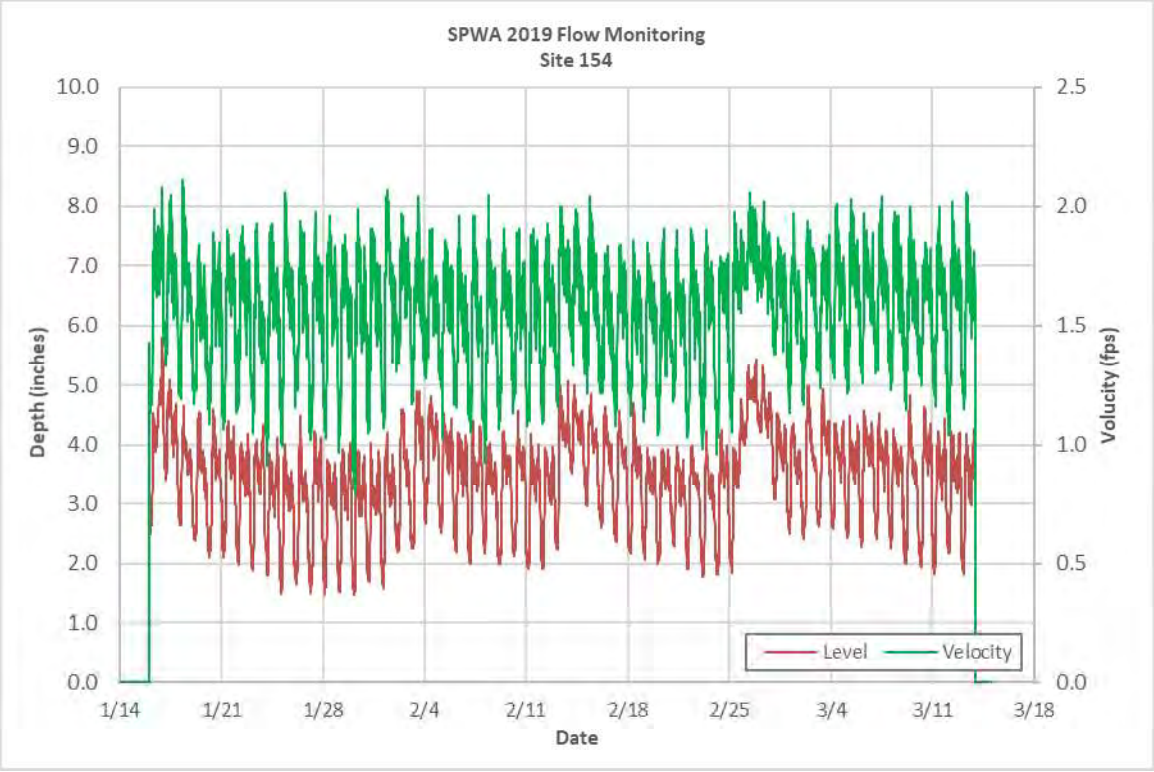

SPWA 2019 Flow Monitoring
Site 152
Flow (mgd)
15-min Rainfall (in.)
Date
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

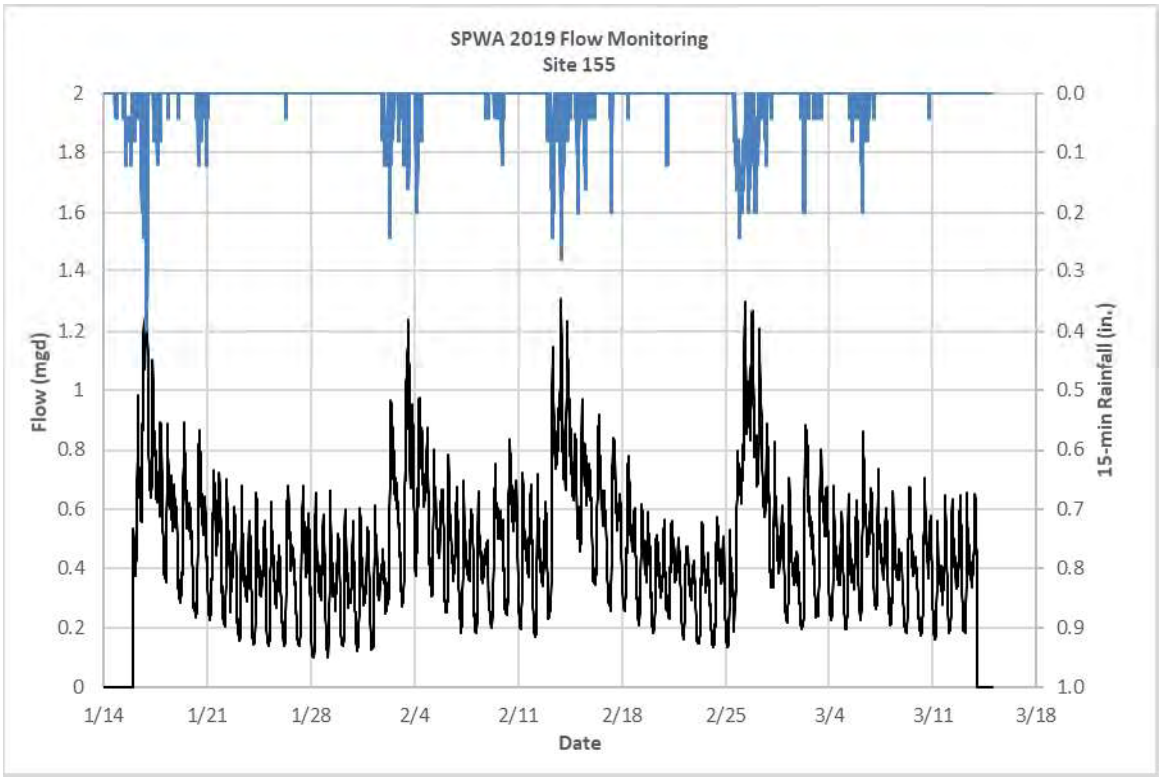

SPWA 2019 Flow Monitoring
Site 152
Depth (inches)
Volucity (fps)
Date
Level
Velocity
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18


SPWA 2019 Flow Monitoring
Site 153
Flow (mgd)
15-min Rainfall (in.)
Date
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

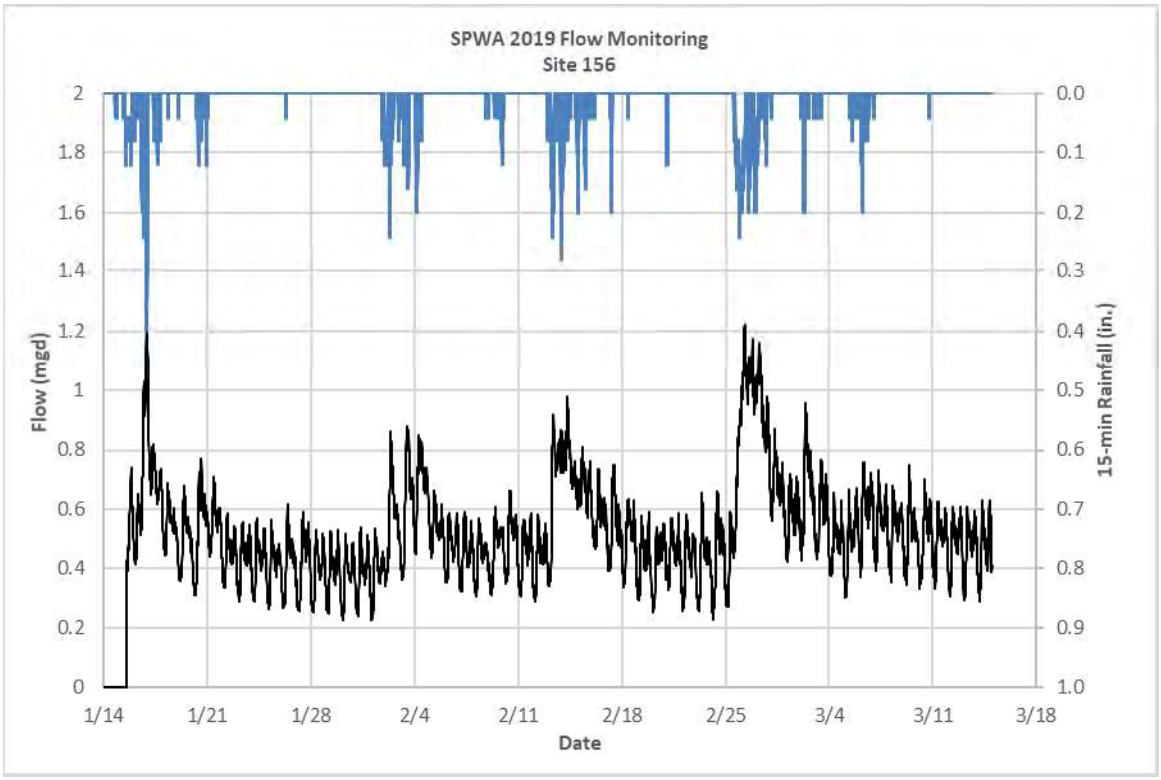

SPWA 2019 Flow Monitoring
Site 153
Depth (inches)
Volucity (fps)
Date
Level
Velocity
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18


SPWA 2019 Flow Monitoring
Site 154
Flow (mgd)
15-min Rainfall (in.)
Date
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

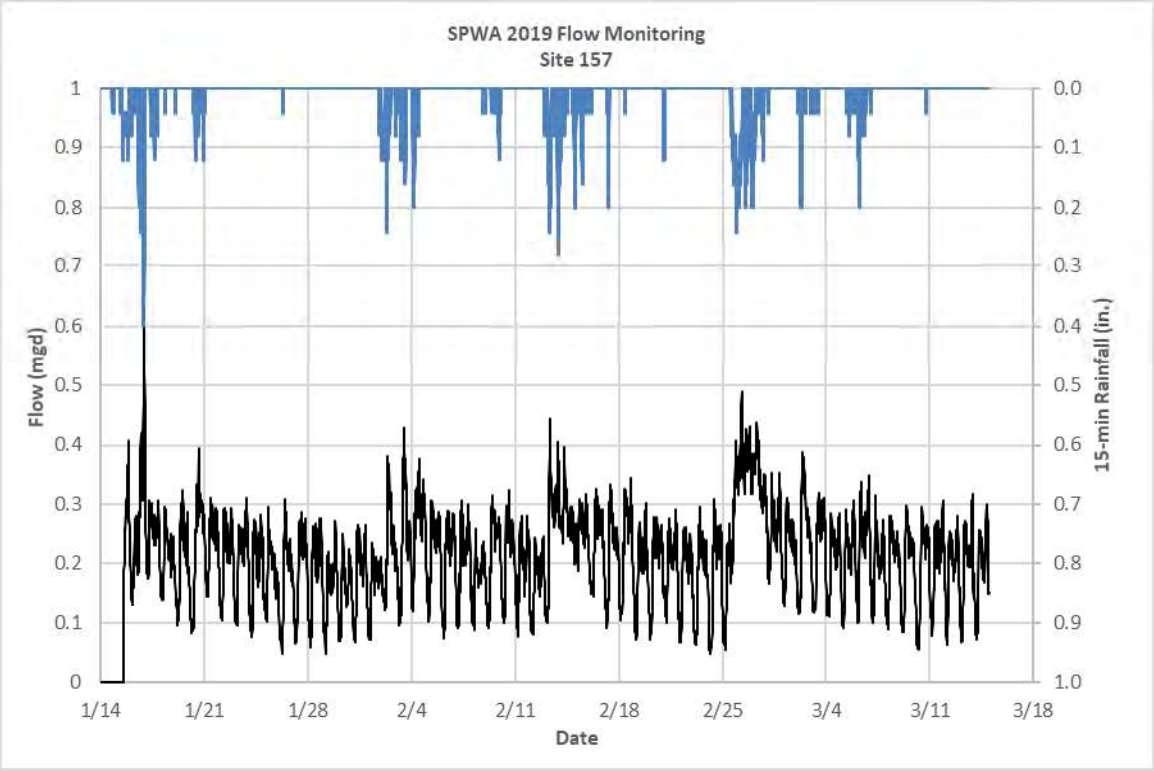

SPWA 2019 Flow Monitoring
Site 154
Depth (inches)
Volucity (fps)
Date
Level
Velocity
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2.5
2.0
1.5
1.0
0.5
0.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

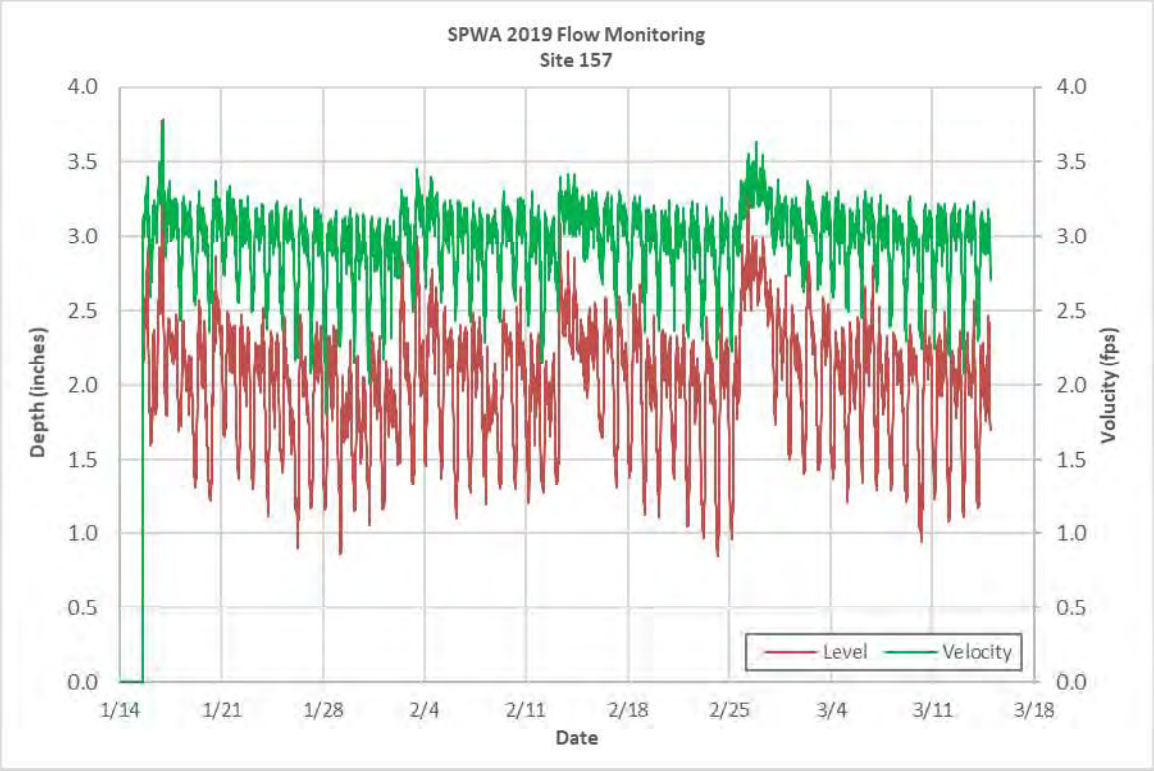

SPWA 2019 Flow Monitoring
Site 155
Flow (mgd)
15-min Rainfall (in.)
Date
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

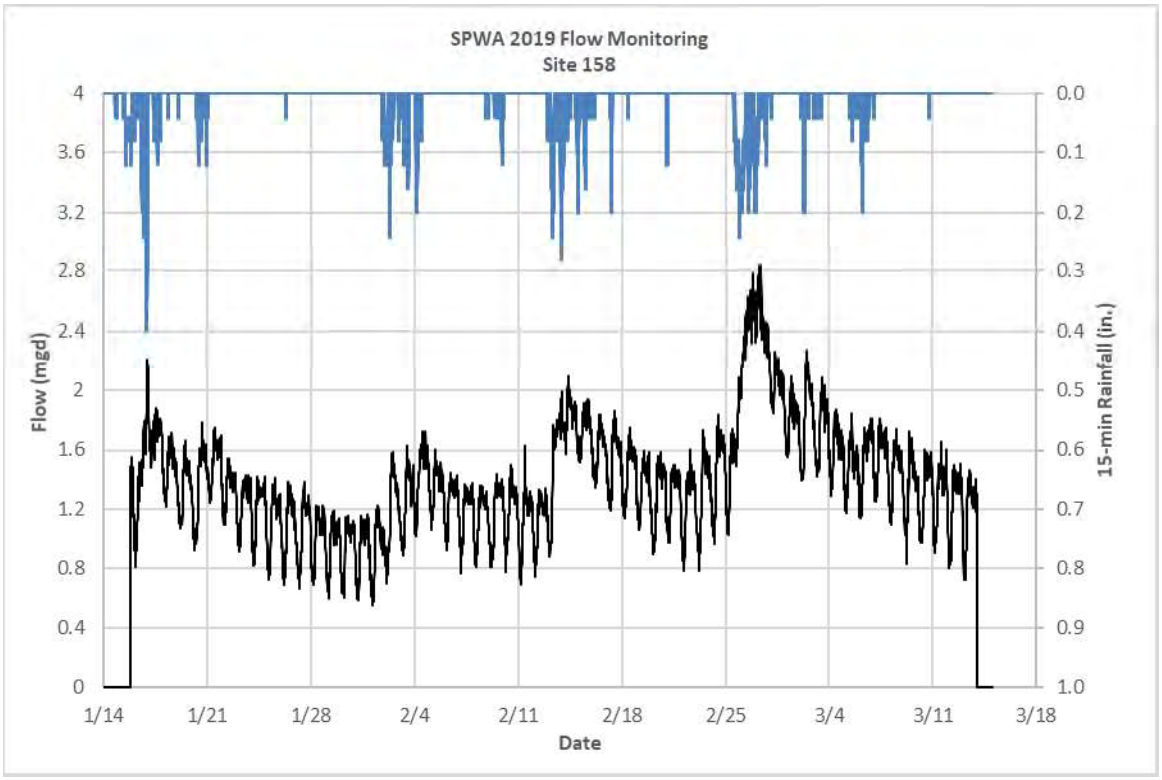

SPWA 2019 Flow Monitoring
Site 155
Depth (inches)
Volucity (fps)
Date
Level
Velocity
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

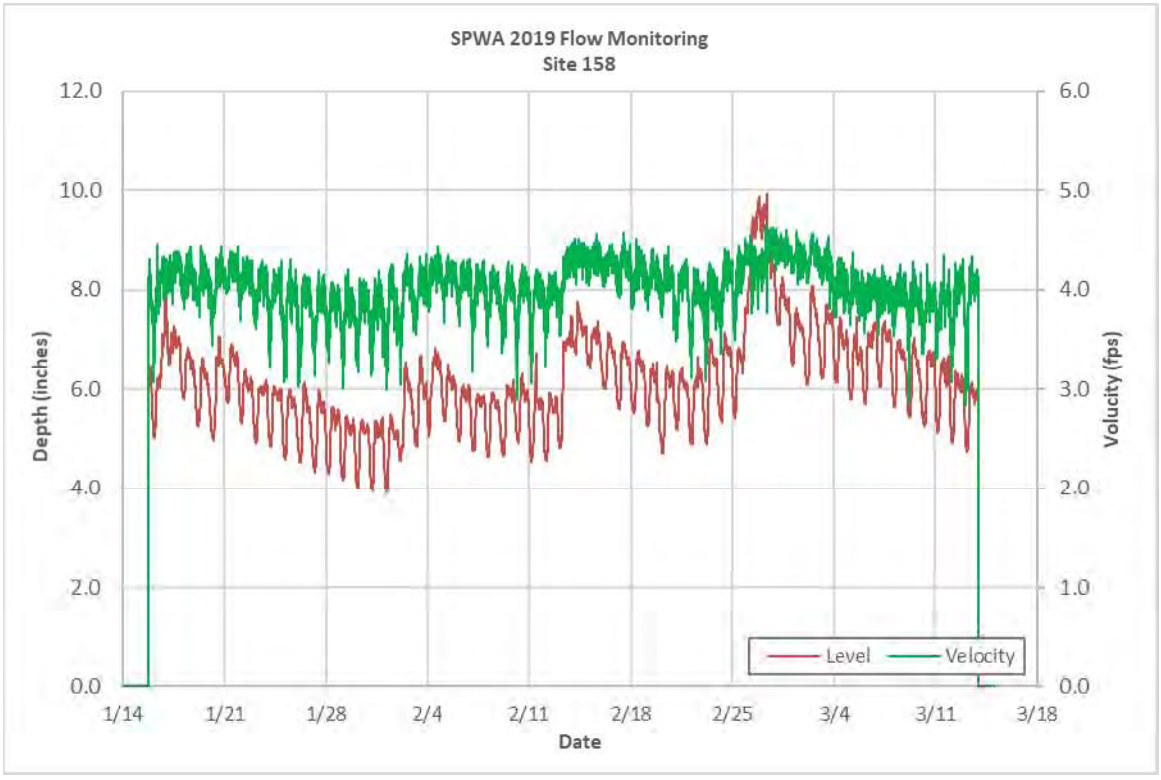

SPWA 2019 Flow Monitoring
Site 156
Flow (mgd)
15-min Rainfall (in.)
Date
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

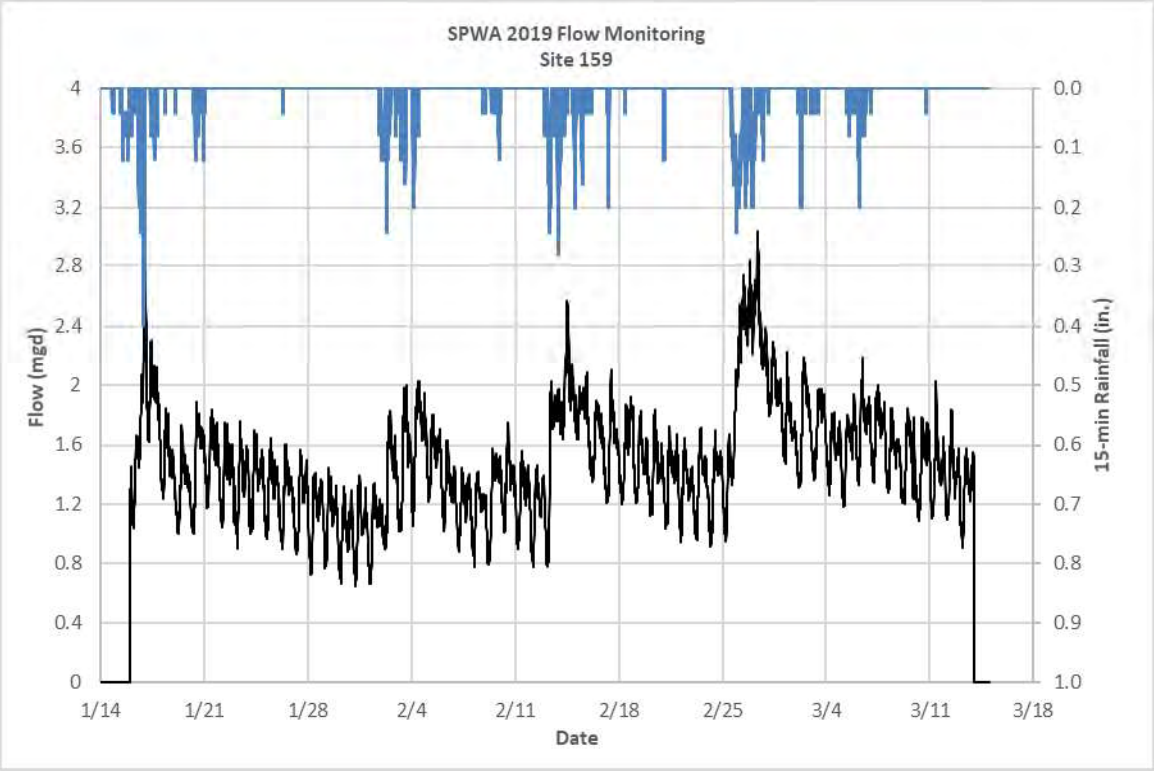

SPWA 2019 Flow Monitoring
Site 156
Depth (inches)
Volucity (fps)
Date
15.0
12.5
10.0
7.5
5.0
2.5
0.0
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Level
Velocity
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

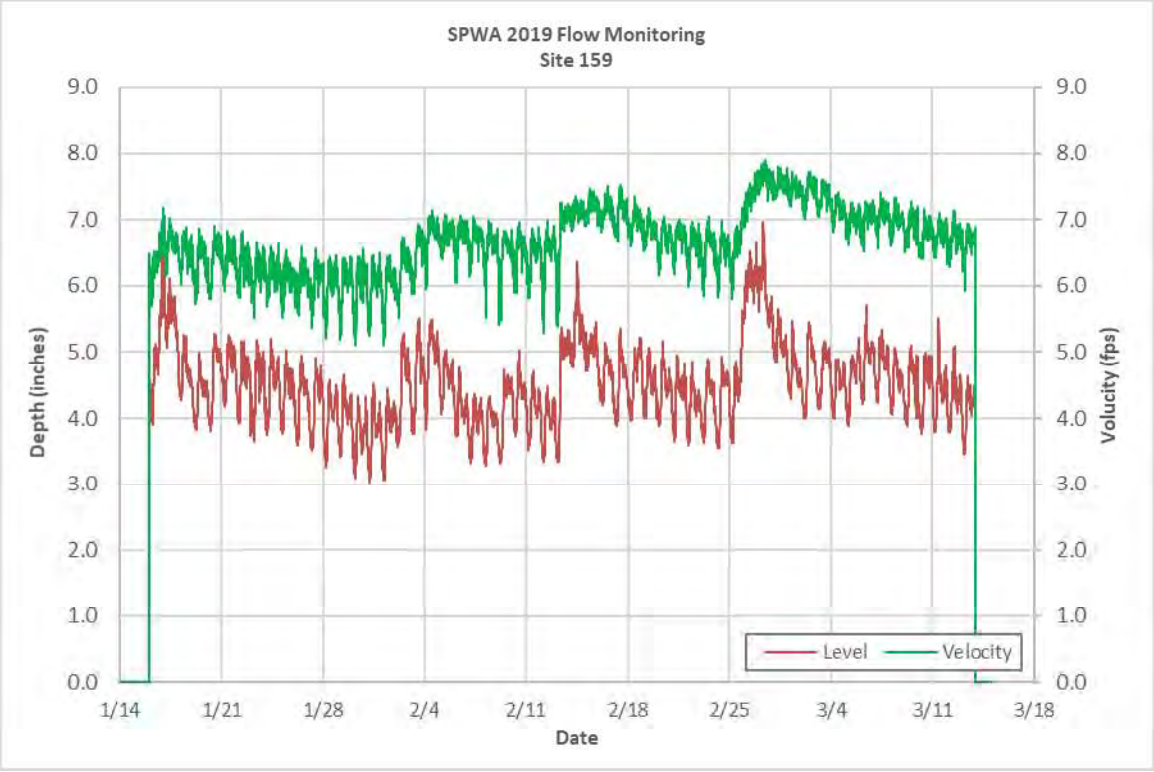

SPWA 2019 Flow Monitoring
Site 157
Flow (mgd)
15-min Rainfall (in.)
Date
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

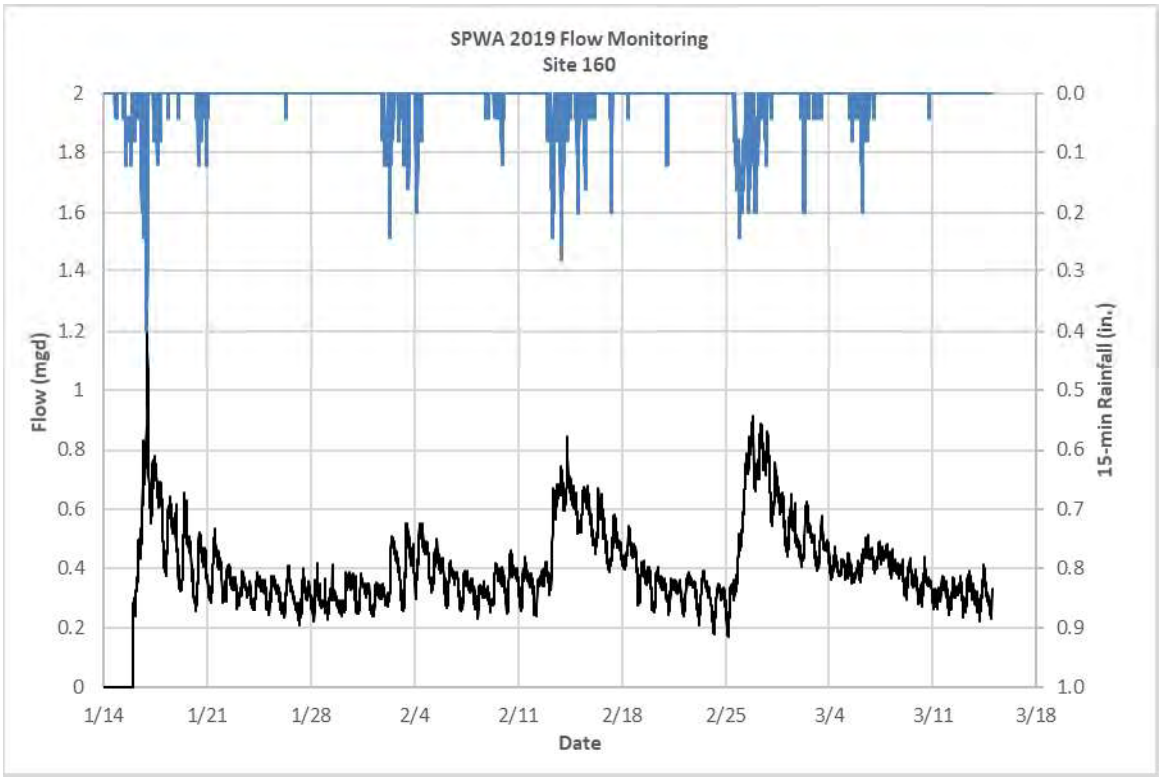

SPWA 2019 Flow Monitoring
Site 157
Depth (inches)
Volucity (fps)
Date
Level
Velocity
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

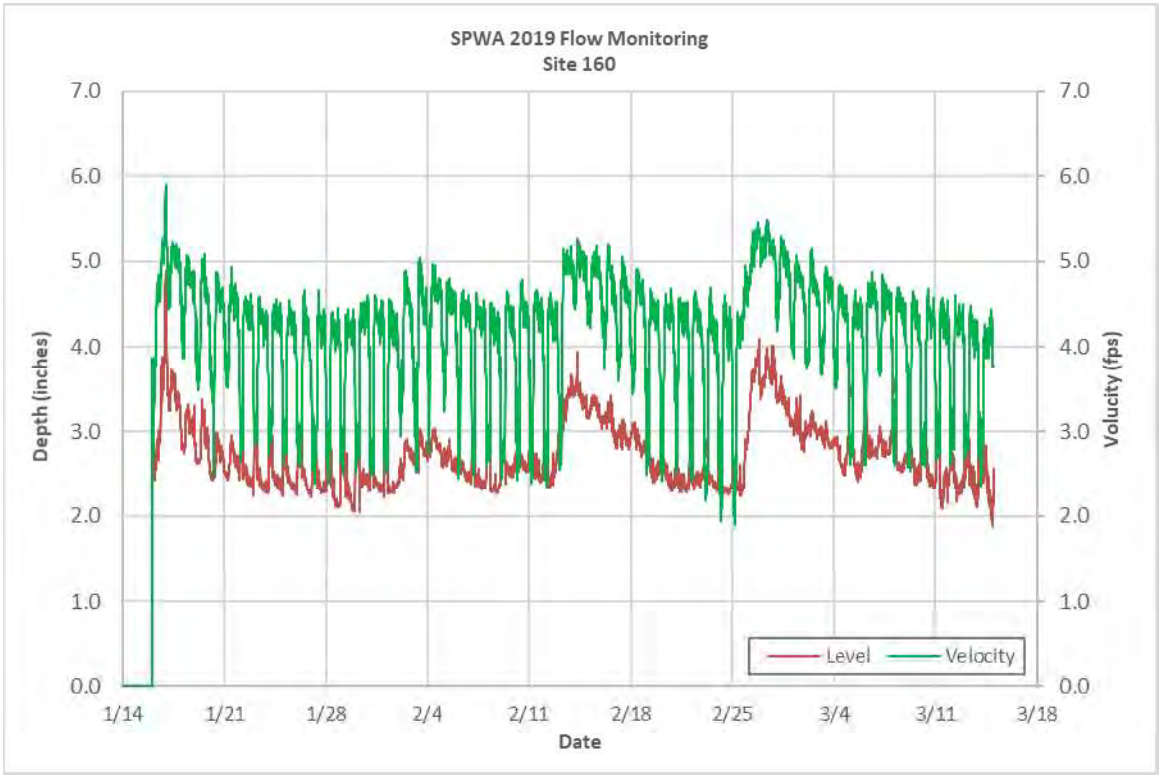

SPWA 2019 Flow Monitoring
Site 158
Flow (mgd)
15-min Rainfall (in.)
Date
4
3.6
3.2
2.8
2.4
2
1.6
1.2
0.8
0.4
0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

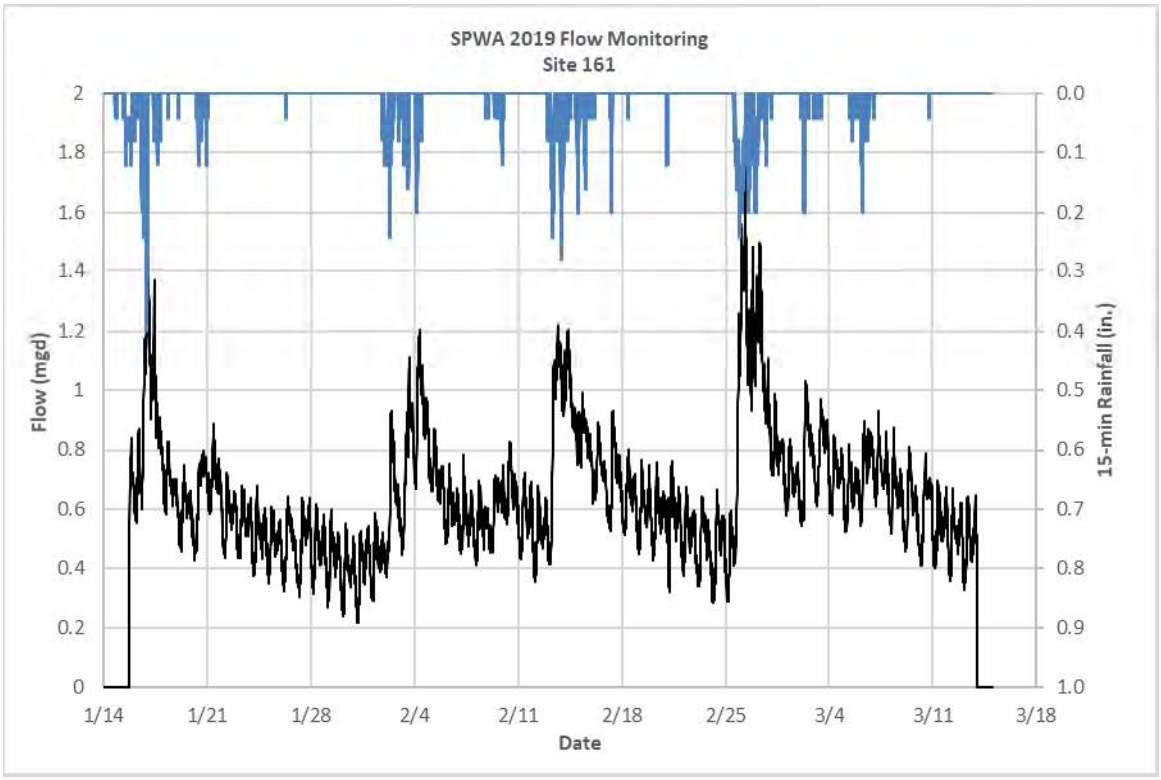

SPWA 2019 Flow Monitoring
Site 158
Depth (inches)
Volucity (fps)
Date
Level
Velocity
12.0
10.0
8.0
6.0
4.0
2.0
0.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18


SPWA 2019 Flow Monitoring
Site 159
Flow (mgd)
15-min Rainfall (in.)
Date
4
3.6
3.2
2.8
2.4
2
1.6
1.2
0.8
0.4
0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

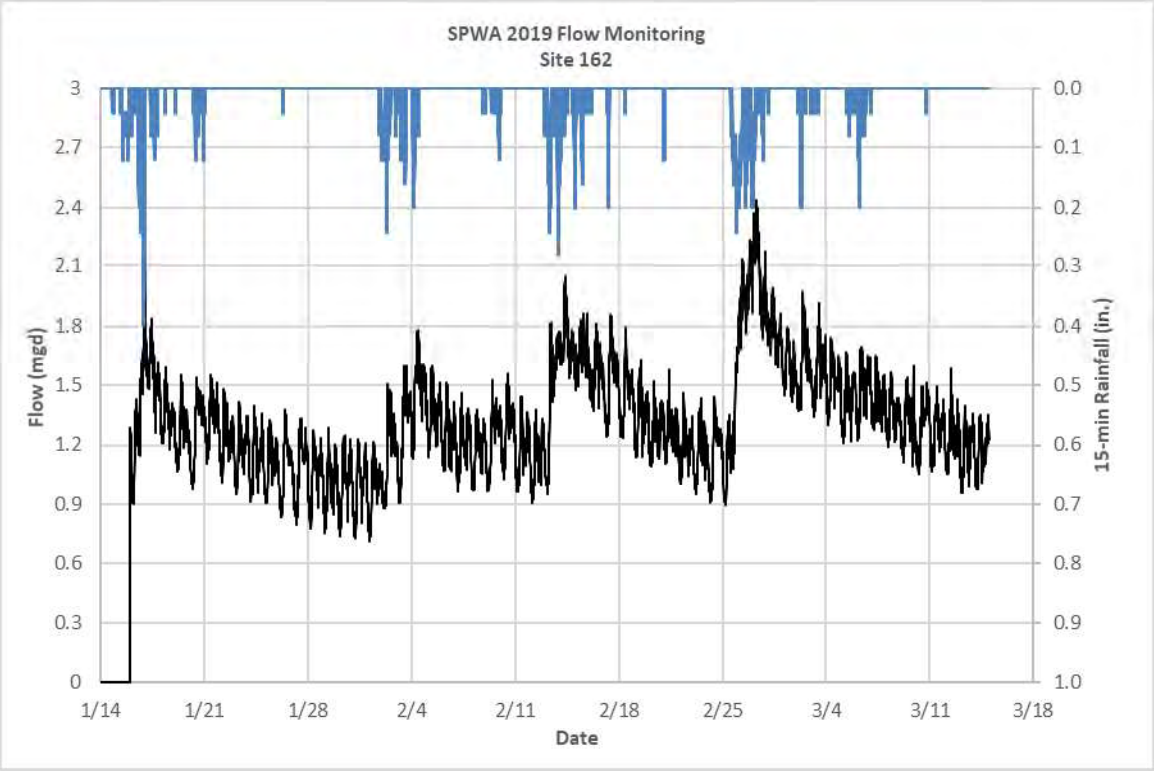

SPWA 2019 Flow Monitoring
Site 159
Depth (inches)
Volucity (fps)
Date
Level
Velocity
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

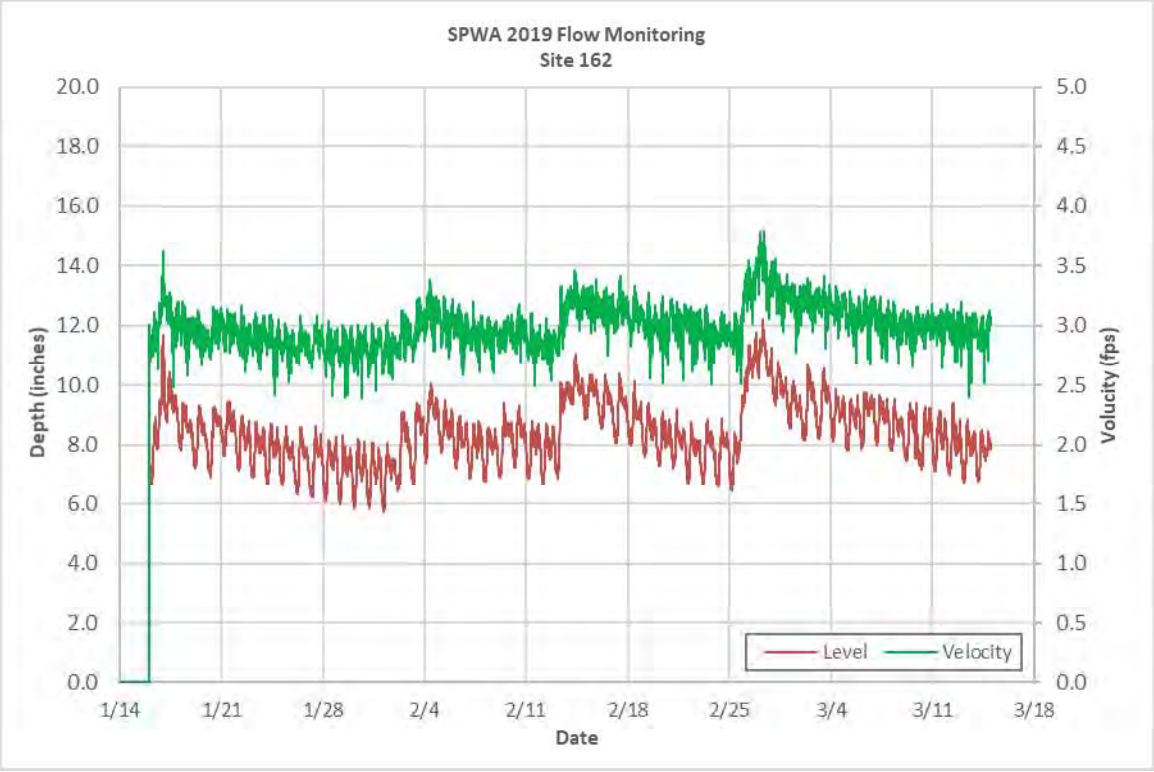

SPWA 2019 Flow Monitoring
Site 160
Flow (mgd)
15-min Rainfall (in.)
Date
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

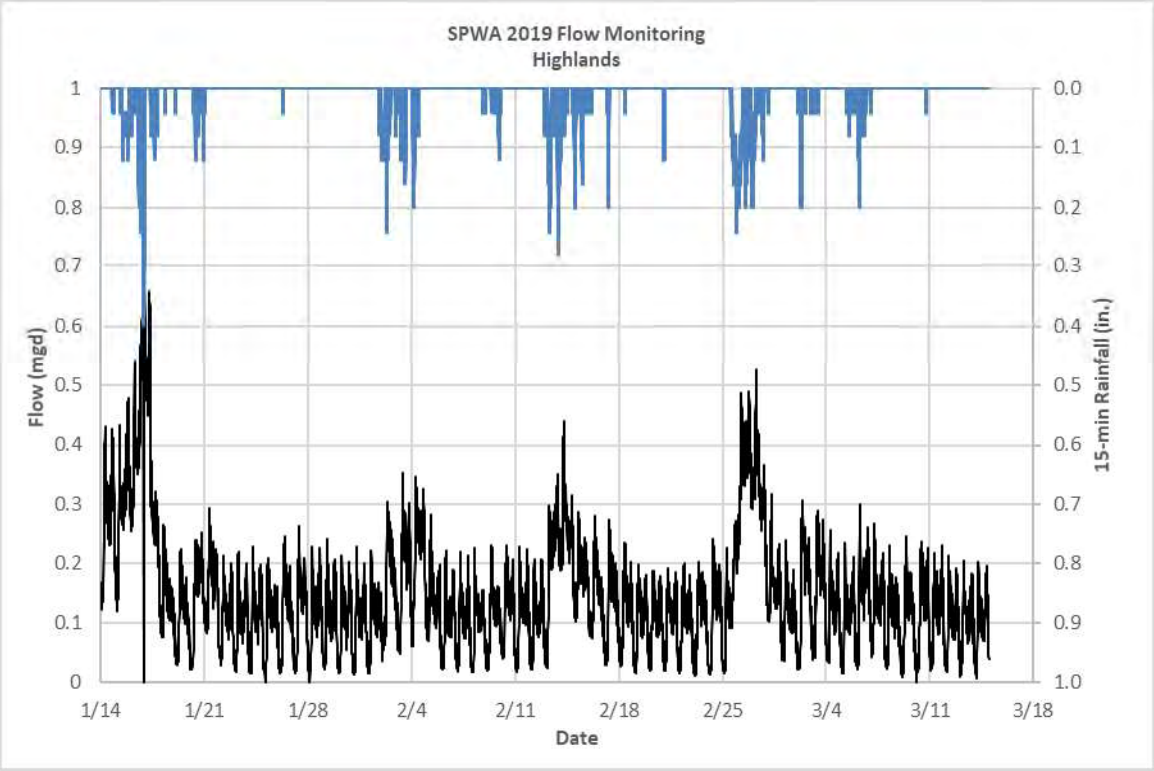

SPWA 2019 Flow Monitoring
Site 160
Depth (inches)
Volucity (fps)
Date
Level
Velocity
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

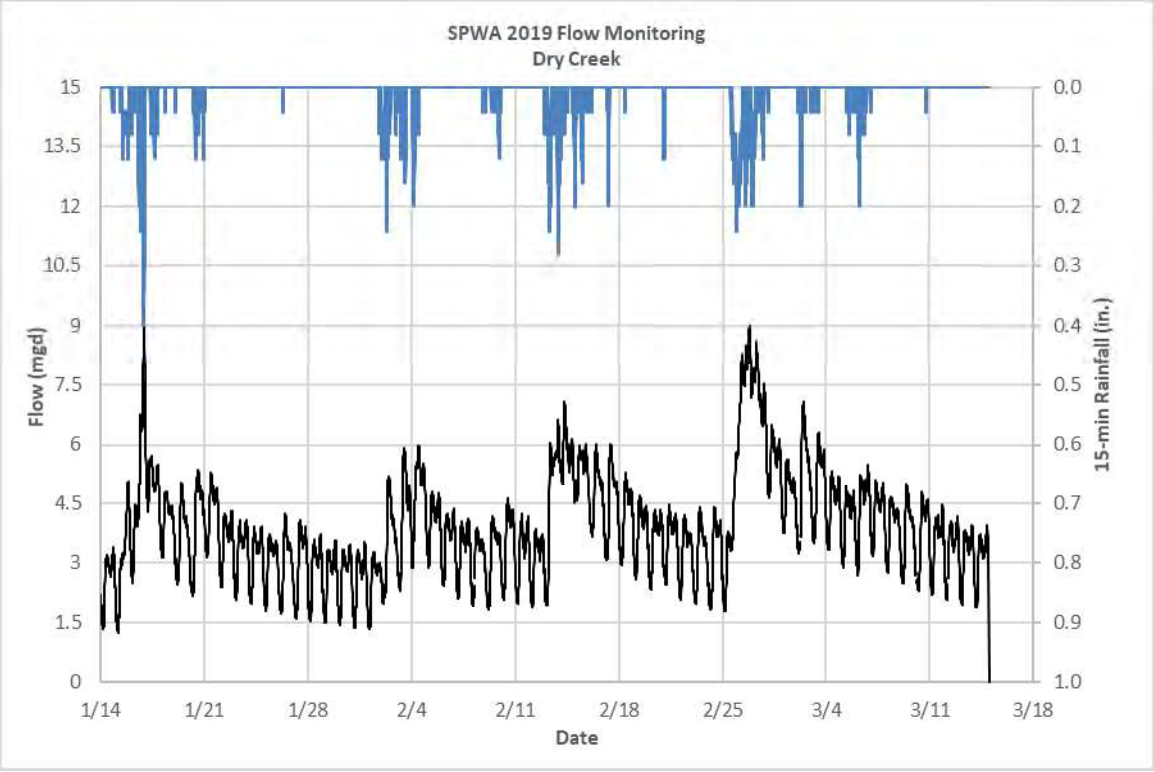

SPWA 2019 Flow Monitoring
Site 161
Flow (mgd)
15-min Rainfall (in.)
Date
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

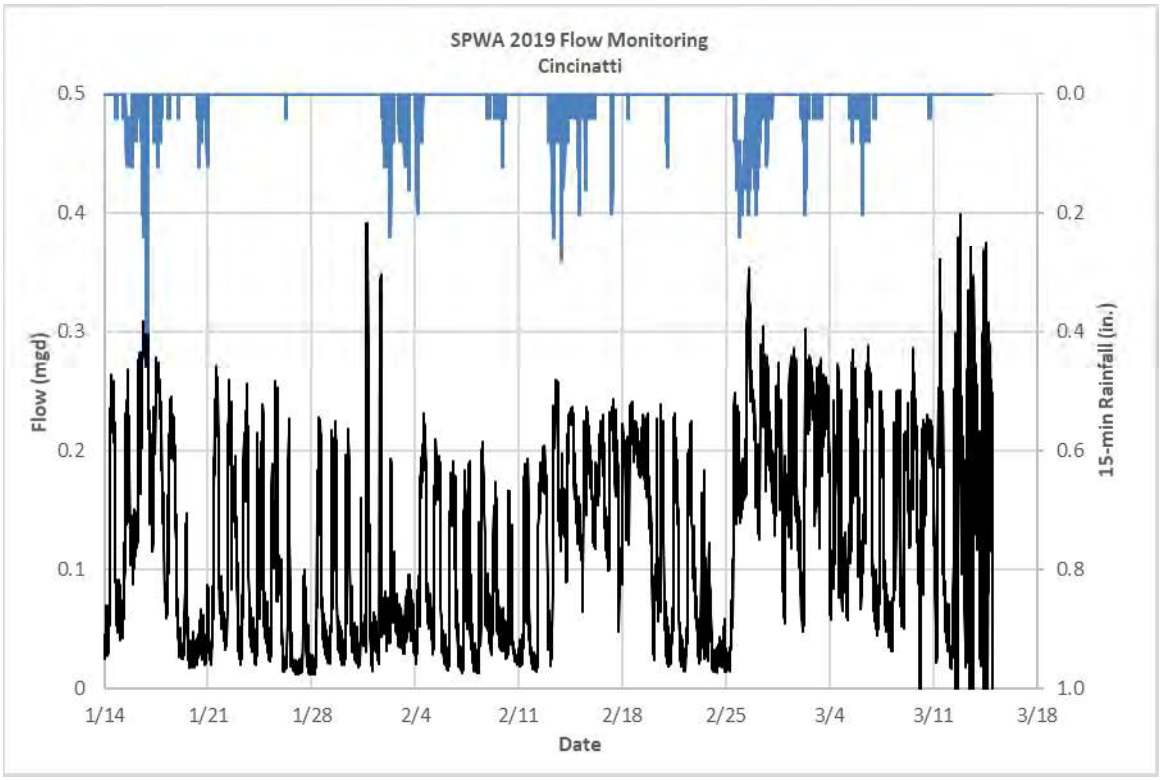

SPWA 2019 Flow Monitoring
Site 161
Depth (inches)
Volucity (fps)
Date
Level
Velocity
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

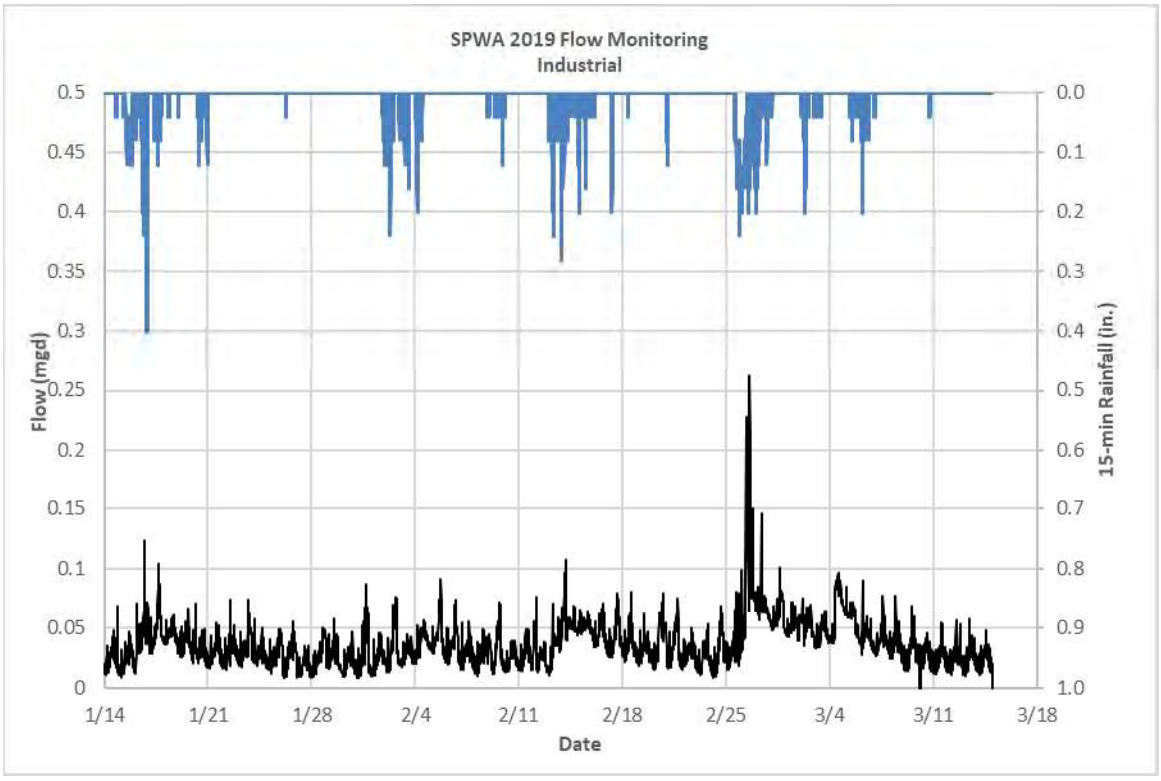

SPWA 2019 Flow Monitoring
Site 162
Flow (mgd)
15-min Rainfall (in.)
Date
3
2.7
2.4
2.1
1.8
1.5
1.2
0.9
0.6
0.3
0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

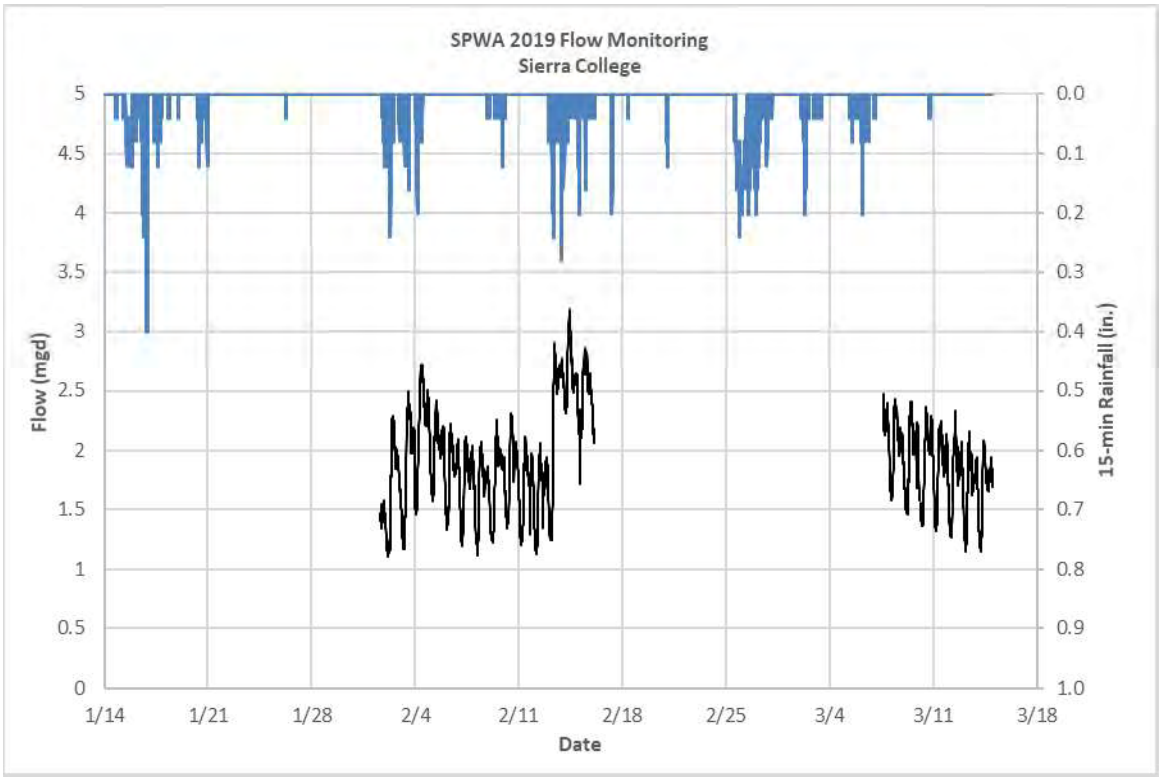

SPWA 2019 Flow Monitoring
Site 162
Depth (inches)
Volucity (fps)
Date
Level
Velocity
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

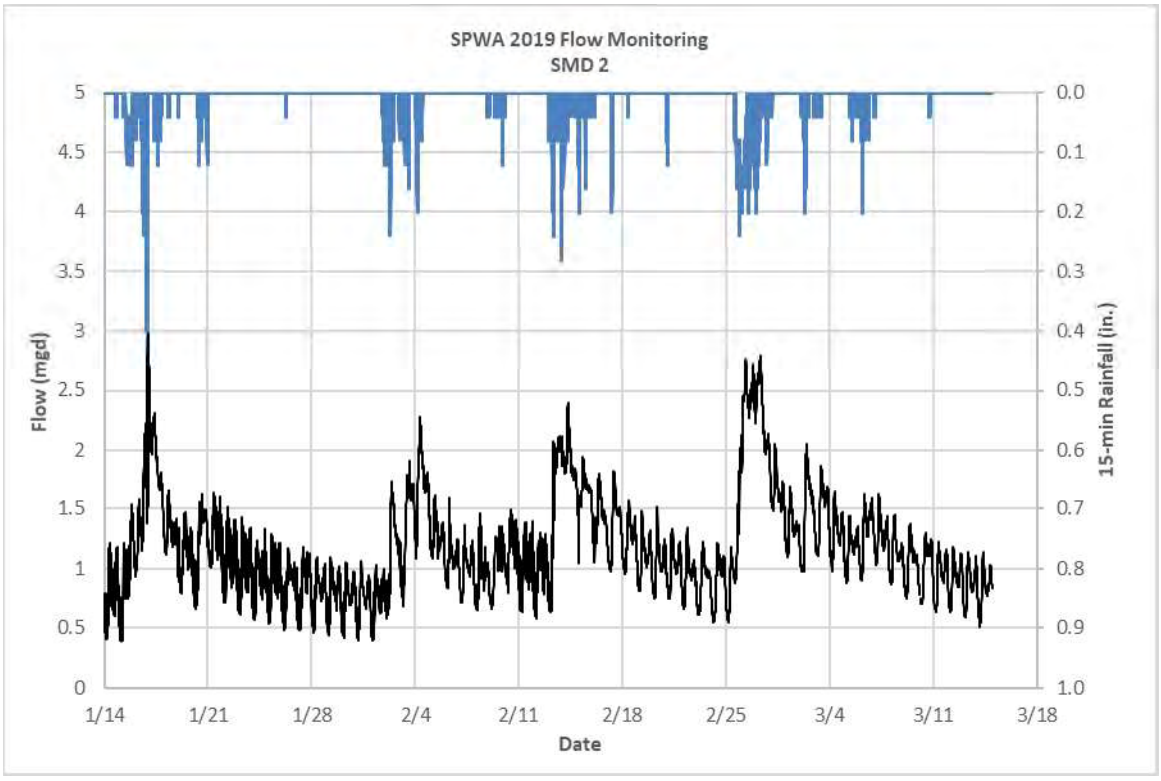

SPWA 2019 Flow Monitoring
Highlands
Flow (mgd)
15-min Rainfall (in.)
Date
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18


SPWA 2019 Flow Monitoring
Dry Creek
Flow (mgd)
15-min Rainfall (in.)
Date
15
13.5
12
10.5
9
7.5
6
4.5
3
1.5
0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18


SPWA 2019 Flow Monitoring
Cincinatti
Flow (mgd)
15-min Rainfall (in.)
Date
0.5
0.4
0.3
0.2
0.1
0
0.0
0.2
0.4
0.6
0.8
1.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18


SPWA 2019 Flow Monitoring
Industrial
Flow (mgd)
15-min Rainfall (in.)
Date
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

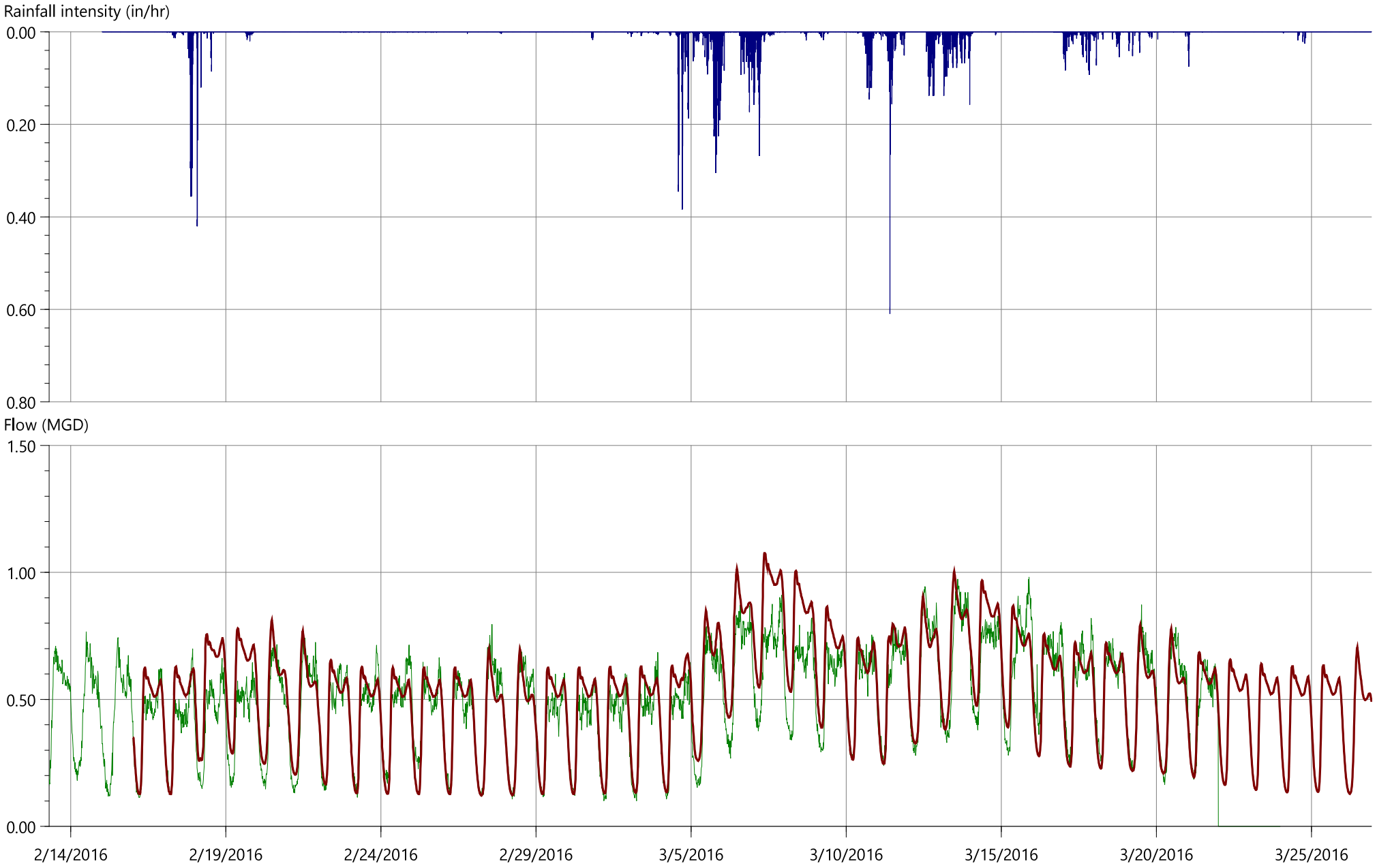

SPWA 2019 Flow Monitoring
Sierra College
Flow (mgd)
15-min Rainfall (in.)
Date
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18


SPWA 2019 Flow Monitoring
SMD 2
Flow (mgd)
15-min Rainfall (in.)
Date
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1/14
1/21
1/28
2/4
2/11
2/18
2/25
3/4
3/11
3/18

APPENDIX D – CALIBRATION GRAPHS

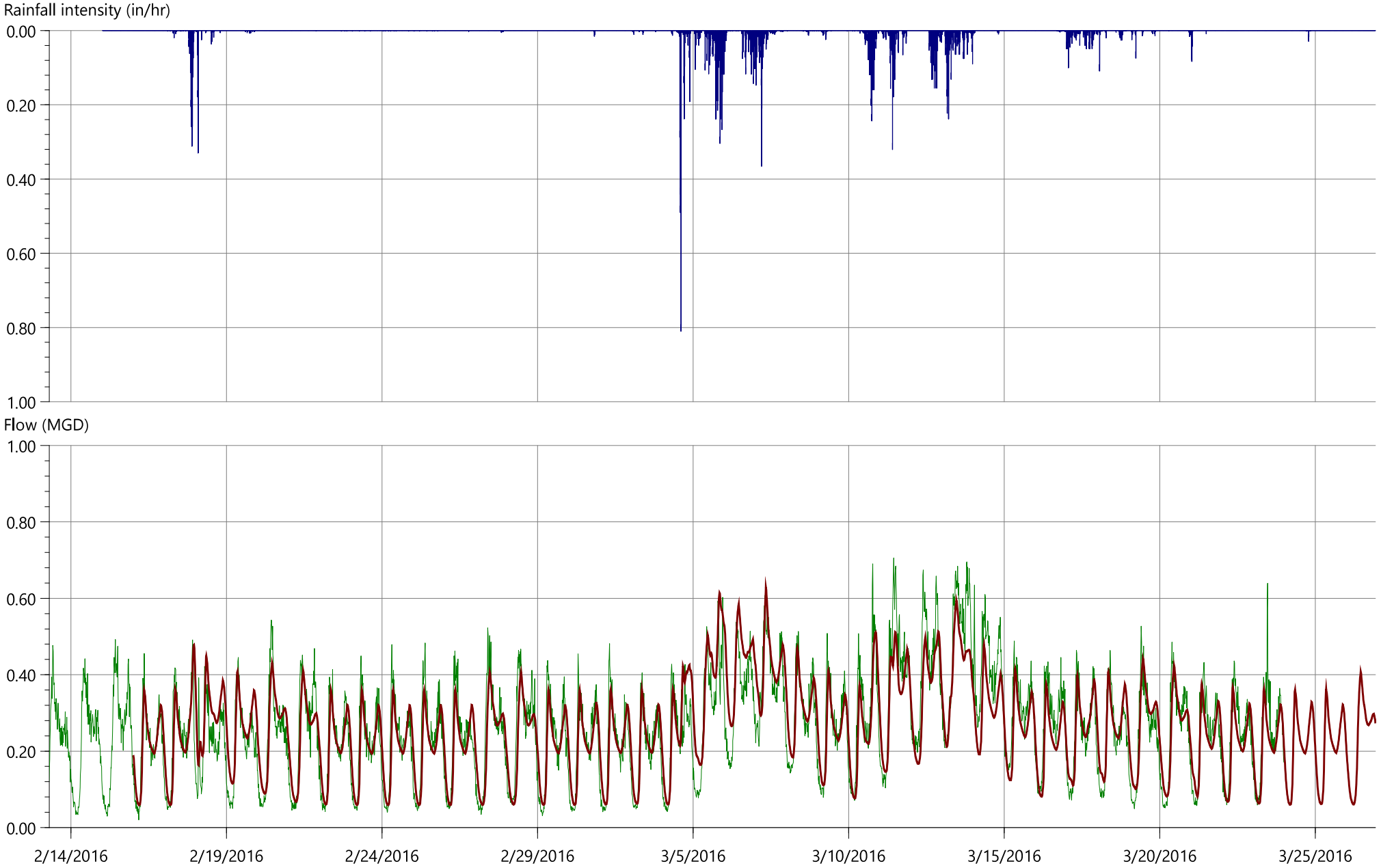
Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)

Flow Survey Location (Obs.) FM 1, Model Location (Pred.) D/S SMH E04-043.1, Rainfall Profile: 311



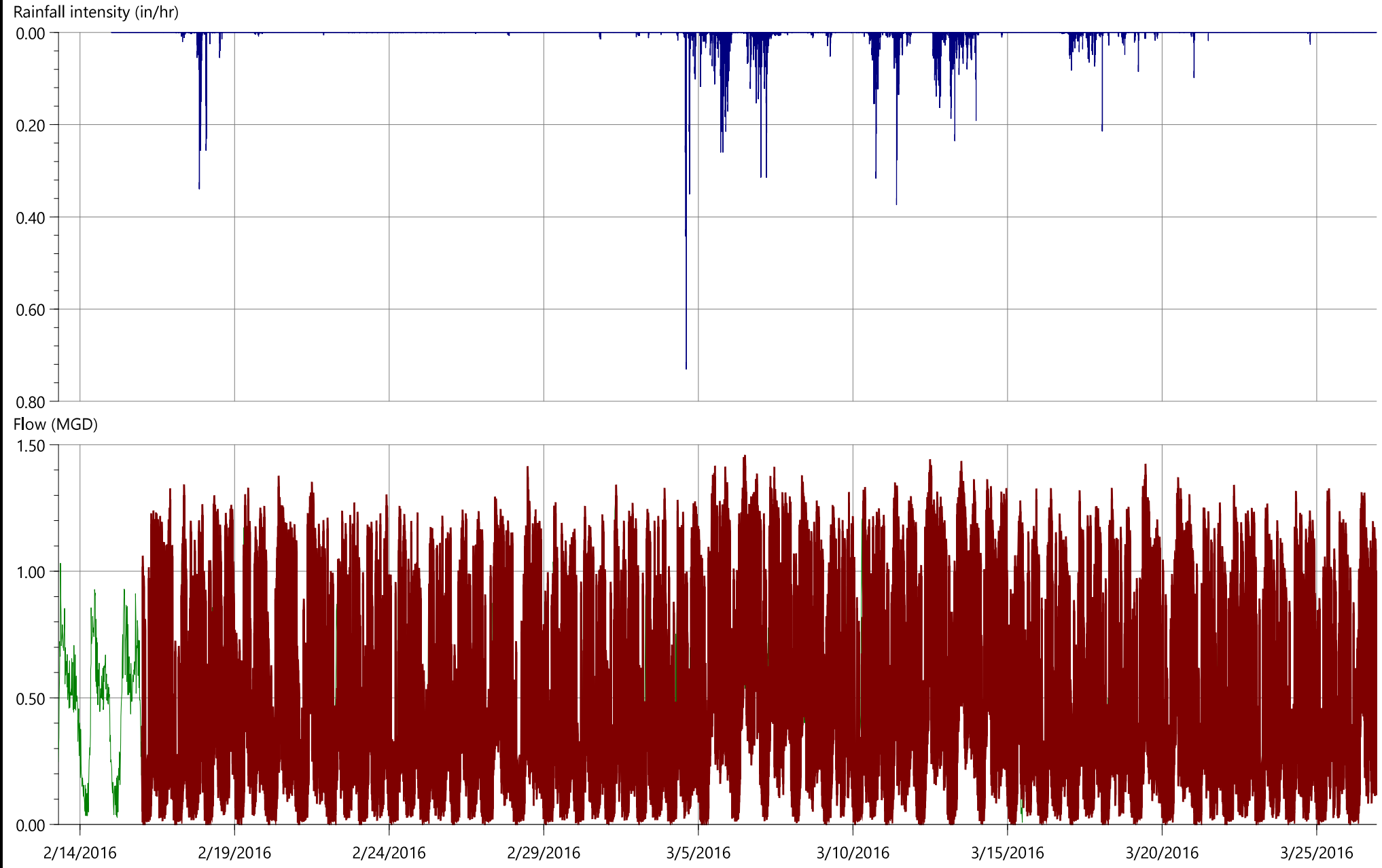
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.950	0.609	0.007			
Observed				0.000	0.981	1628041.595
...ta20160215_20160315				0.121	1.076	1849194.017

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 2, Model Location (Pred.) D/S SMH E01-166.1, Rainfall Profile: 305



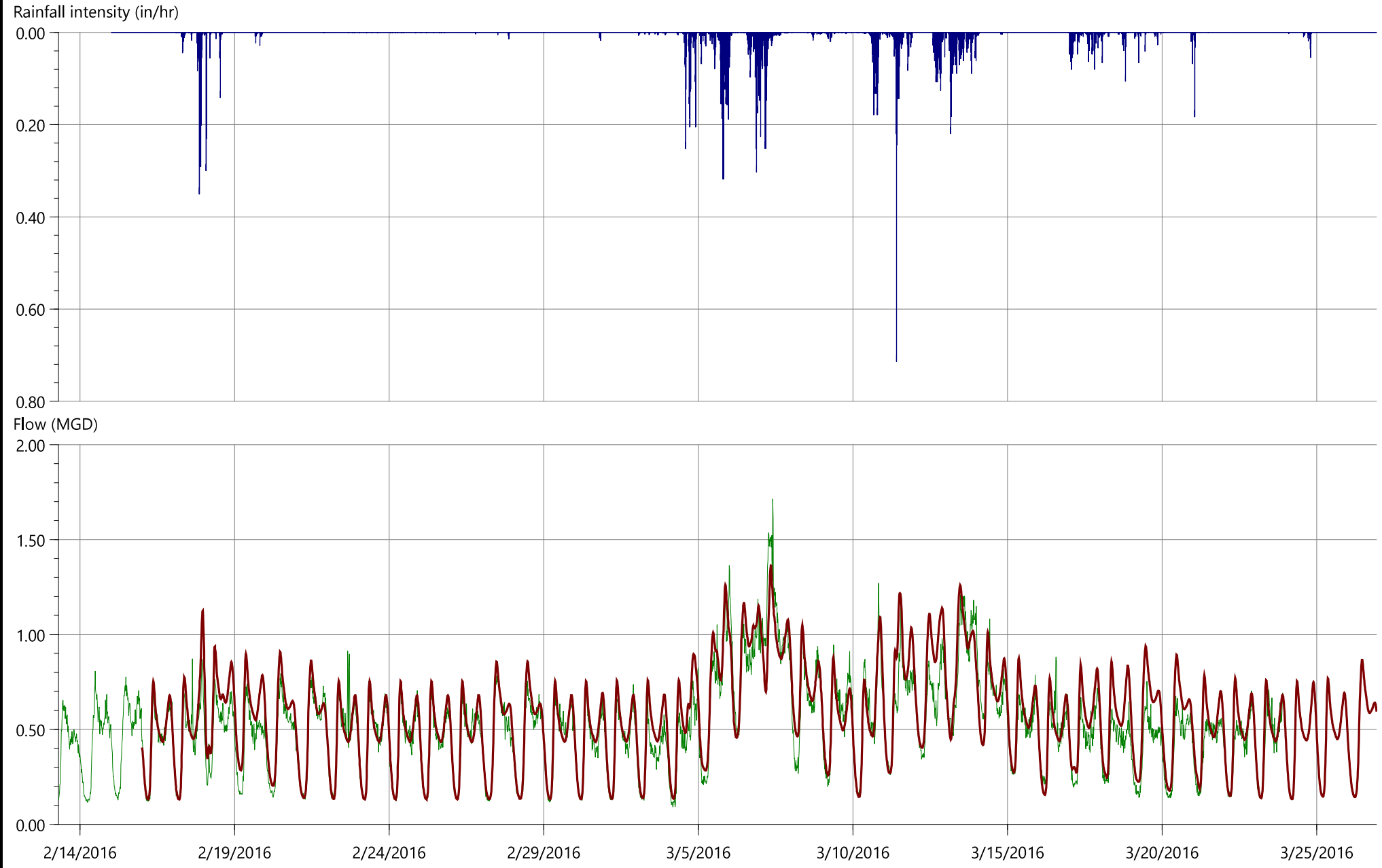
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.168	0.810	0.007			
Observed				0.020	0.706	914240.023
...ta20160215_20160315				0.059	0.629	906202.549

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 3, Model Location (Pred.) D/S SMH D01-090.1, Rainfall Profile: 273



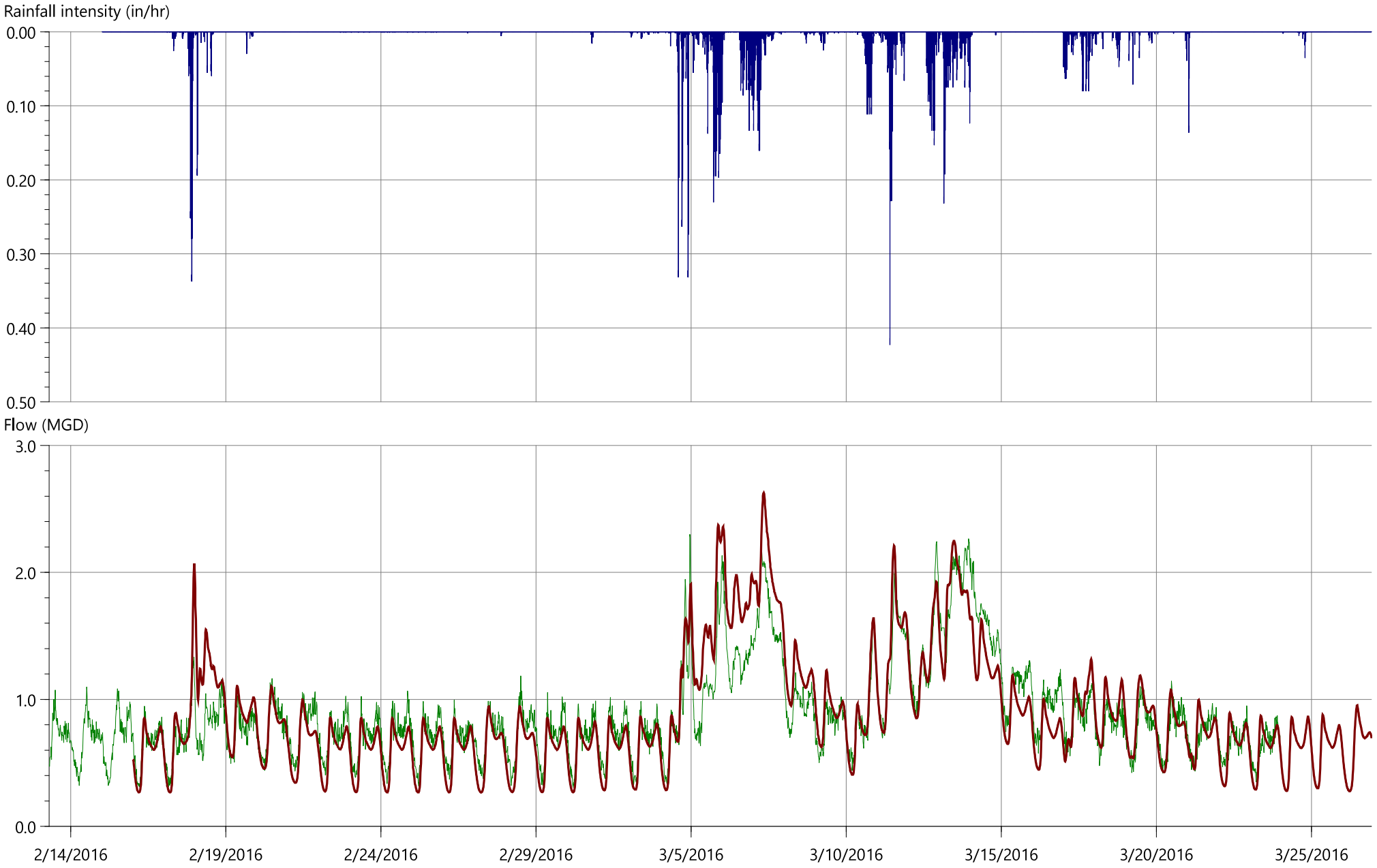
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.131	0.730	0.007			
Observed				0.007	1.272	1577879.095
...ta20160215_20160315				0.014	1.417	1694134.628

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 4, Model Location (Pred.) D/S SMH B06-185.1, Rainfall Profile: 182



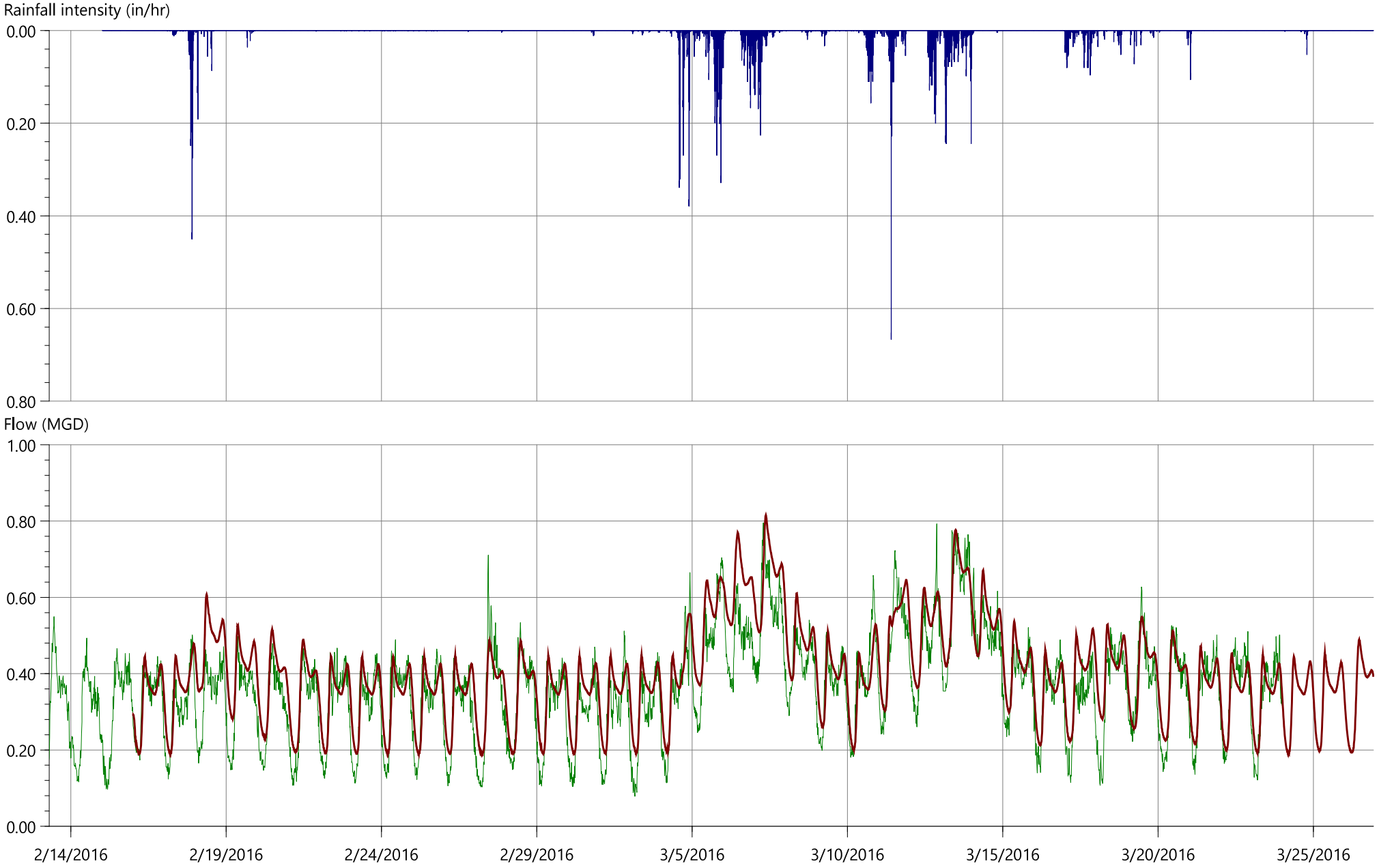
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.006	0.714	0.007			
Observed				0.092	1.713	1767988.571
...ta20160215_20160315				0.132	1.364	1962773.049

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 5, Model Location (Pred.) D/S SMH B04-006.1, Rainfall Profile: 179



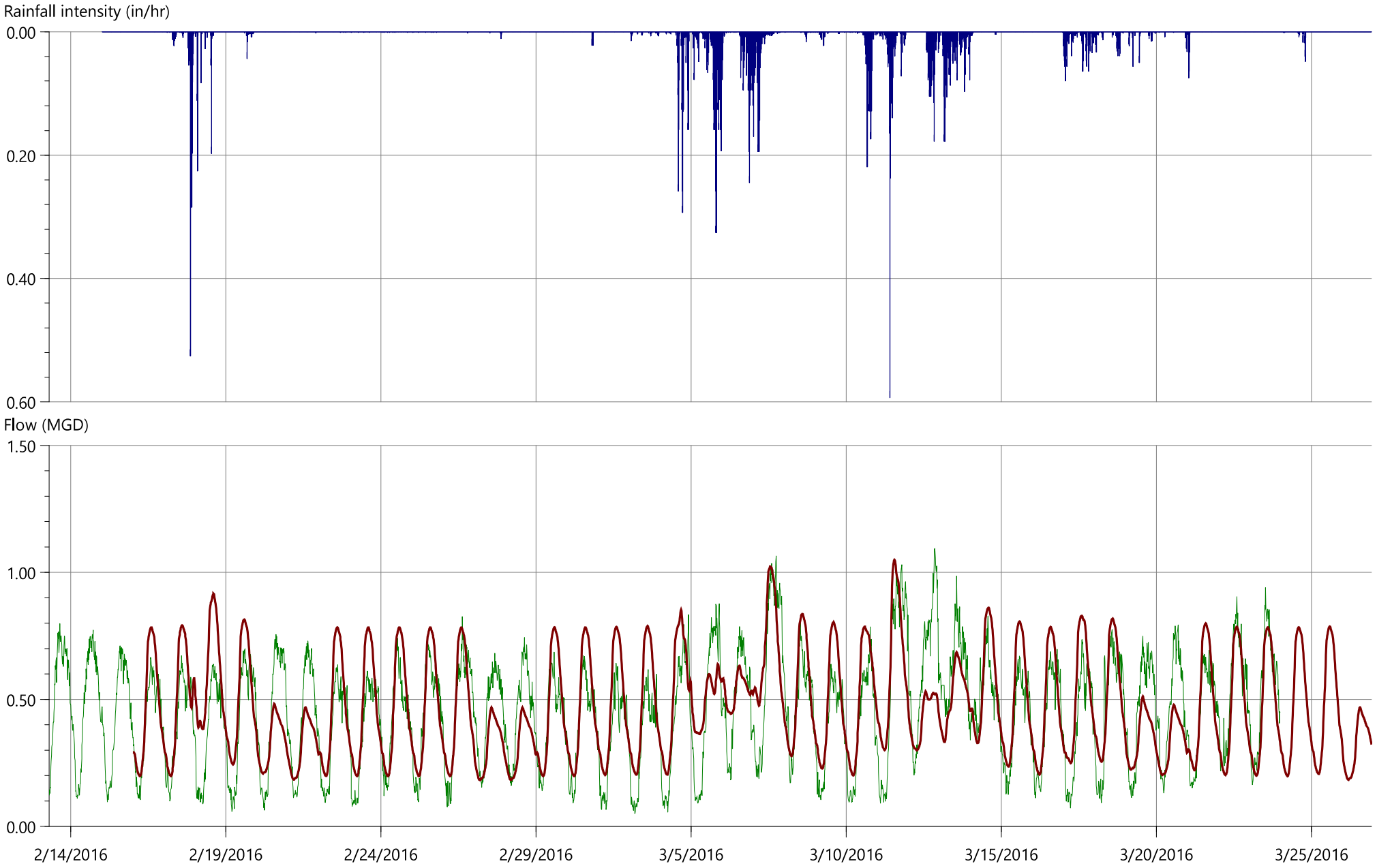
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.524	0.423	0.007			
Observed				0.308	2.299	3030867.347
...ta20160215_20160315				0.267	2.627	3046741.062

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 5A, Model Location (Pred.) D/S SMH B04-001.1, Rainfall Profile: 178



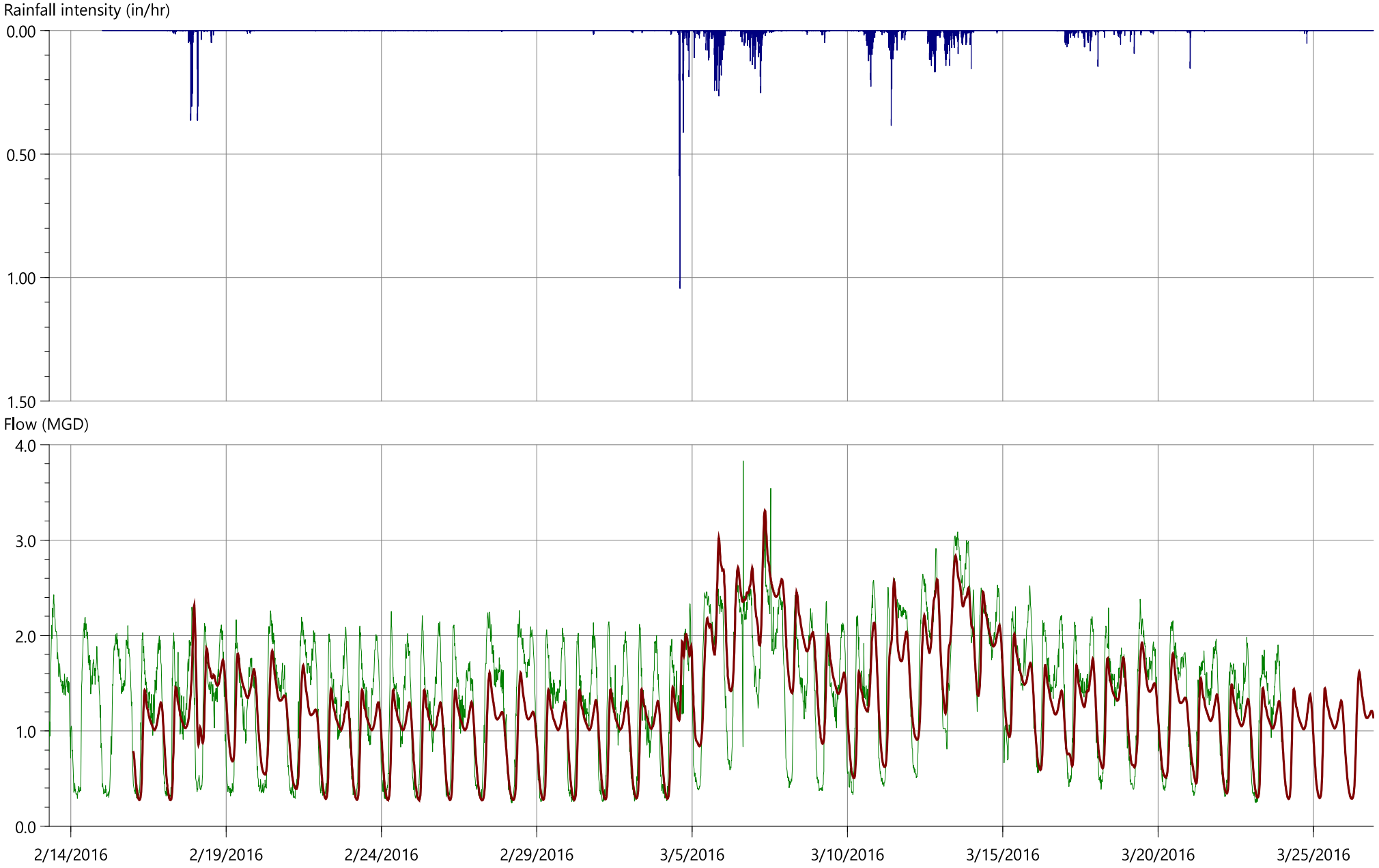
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.650	0.666	0.007			
Observed				0.078	0.796	1250814.058
...ta20160215_20160315				0.189	0.815	1385997.841

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 6, Model Location (Pred.) D/S SMH C06-160.1, Rainfall Profile: 248



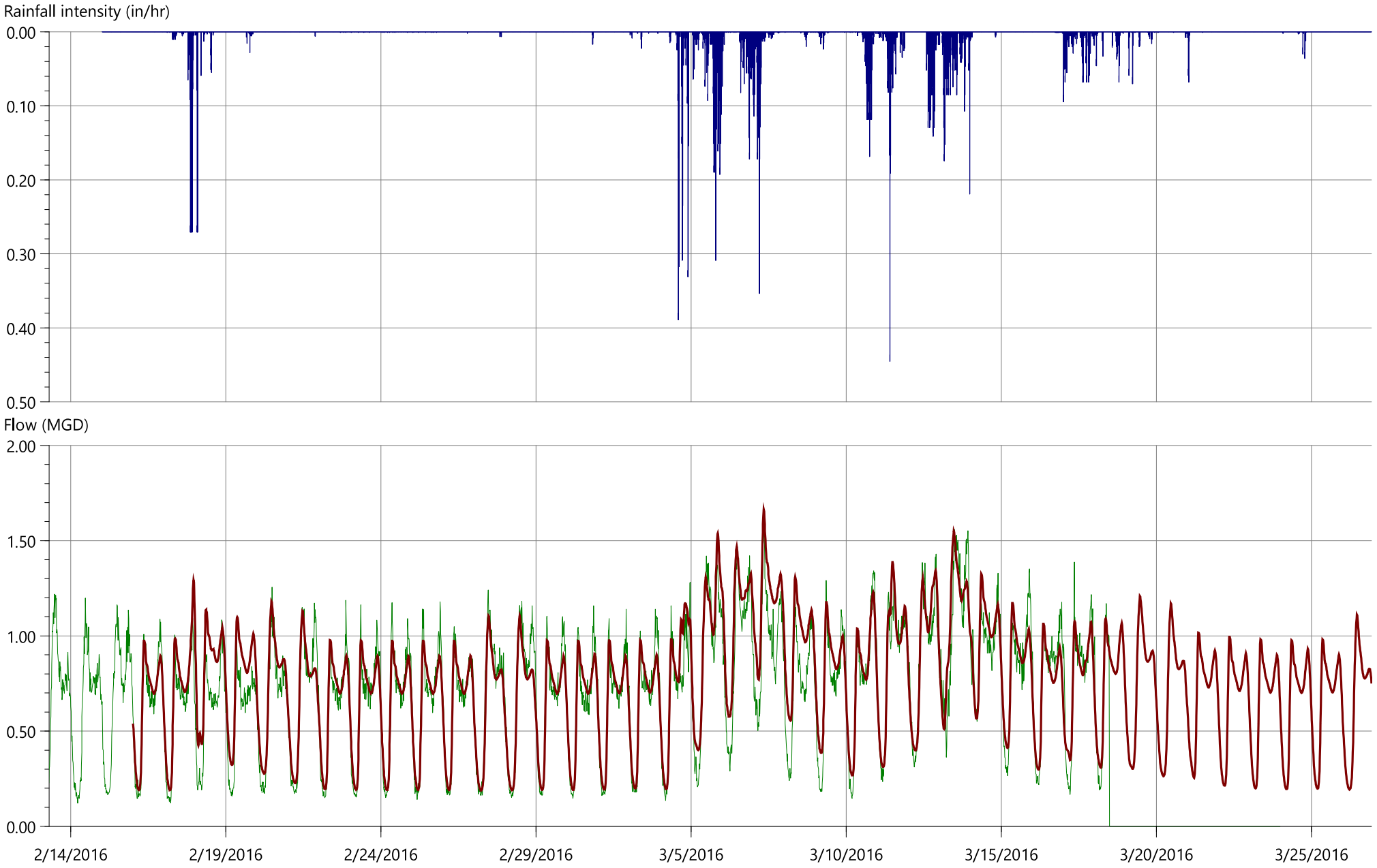
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.748	0.593	0.007			
Observed				0.050	1.095	1561247.890
...ta20160215_20160315				0.182	1.050	1627844.217

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 7, Model Location (Pred.) D/S SMH D02-353.1, Rainfall Profile: 274



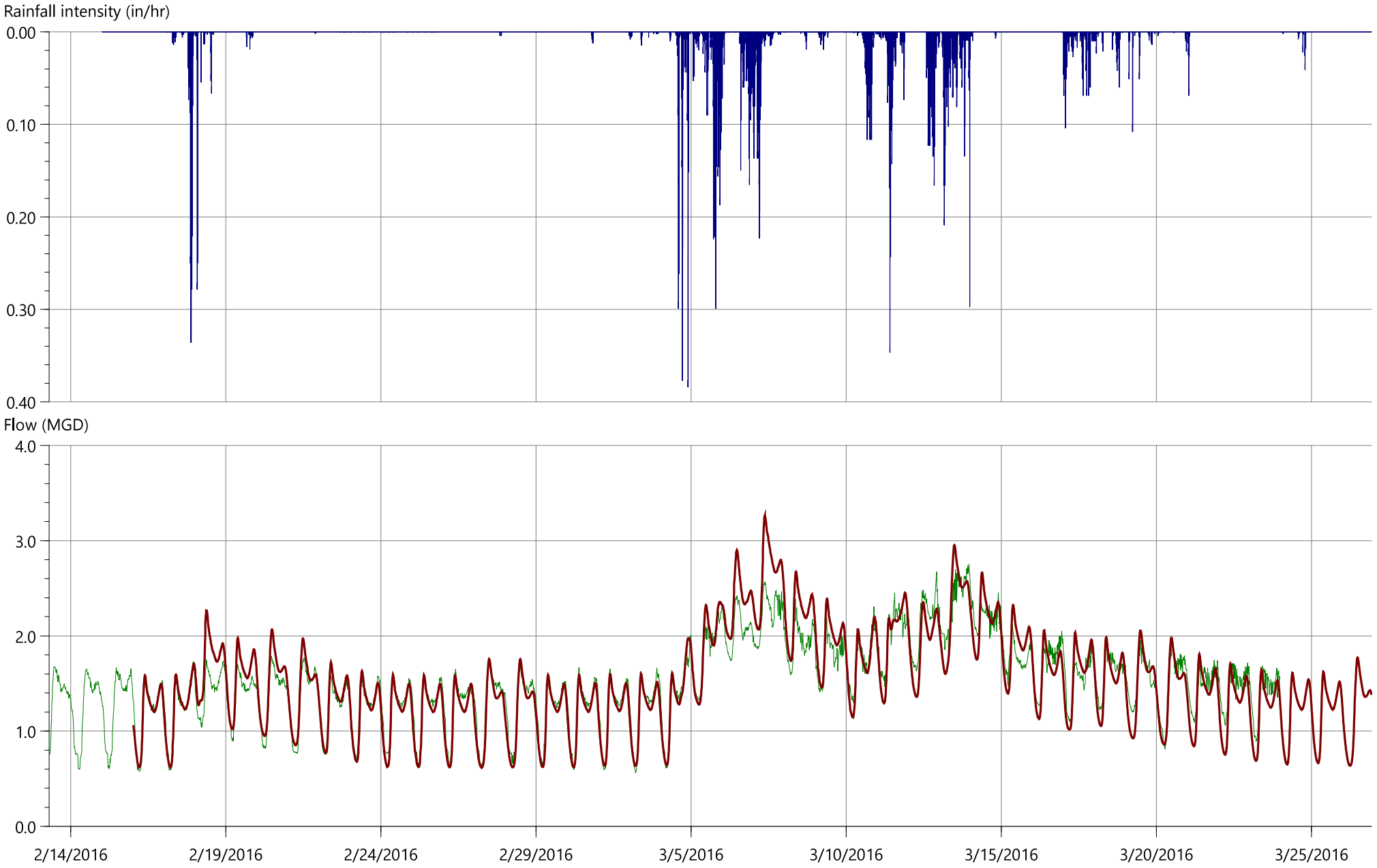
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.005	1.043	0.007			
Observed				0.243	3.830	4848161.759
...ta20160215_20160315				0.272	3.309	4389105.386

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 7A, Model Location (Pred.) D/S SMH D03-116.1, Rainfall Profile: 276



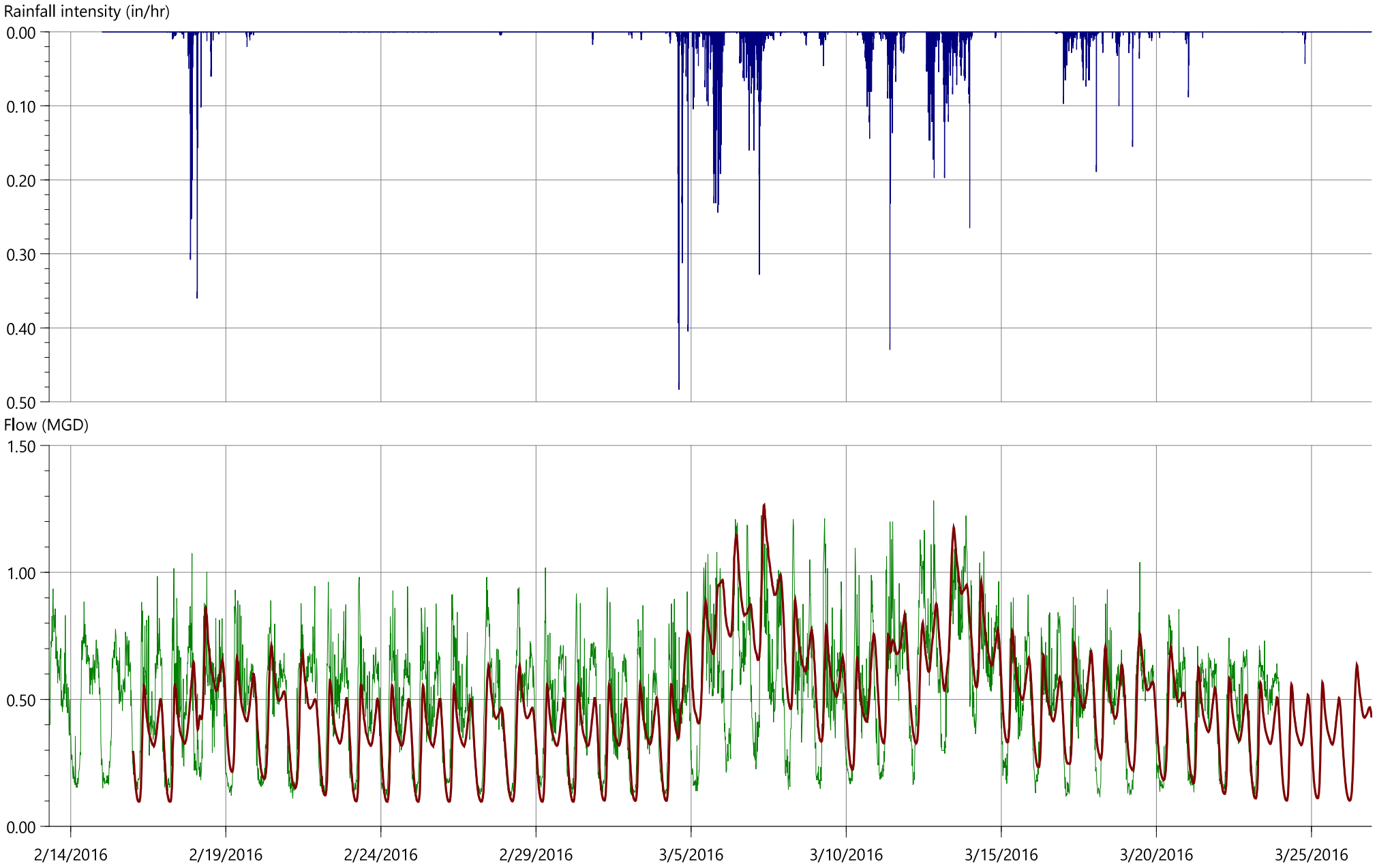
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.644	0.445	0.007			
Observed				0.000	1.560	2175152.424
...ta20160215_20160315				0.188	1.664	2640259.610

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 8, Model Location (Pred.) D/S SMH D04-201.1, Rainfall Profile: 277



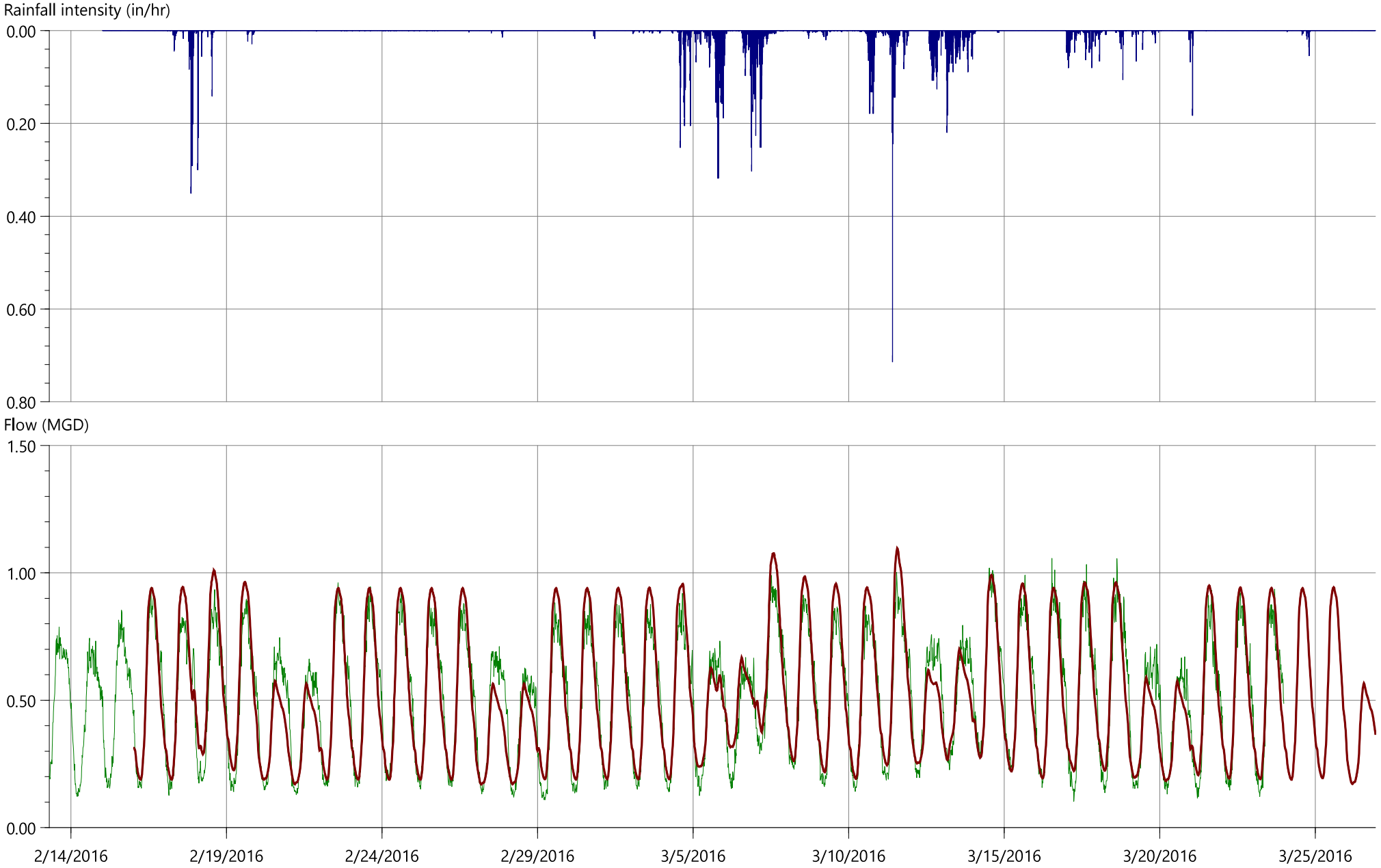
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.750	0.384	0.007			
Observed				0.563	2.756	5257075.125
...ta20160215_20160315				0.617	3.265	5297174.358

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 9, Model Location (Pred.) D/S SMH D02-069.1, Rainfall Profile: 241



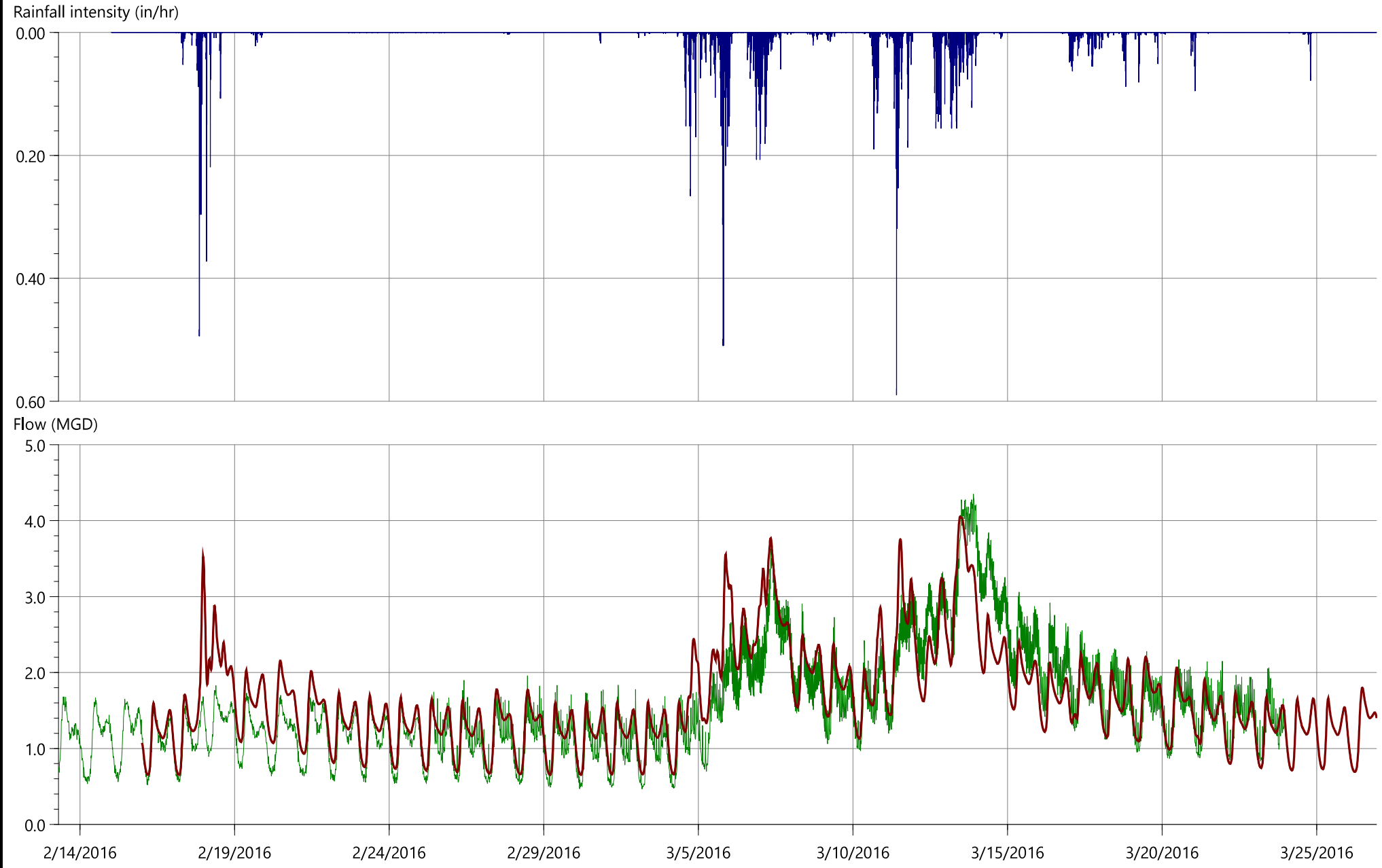
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.982	0.483	0.007			
Observed				0.110	1.283	1753822.349
...ta20160215_20160315				0.097	1.266	1626219.910

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 10, Model Location (Pred.) D/S SMH B06-340.1, Rainfall Profile: 182



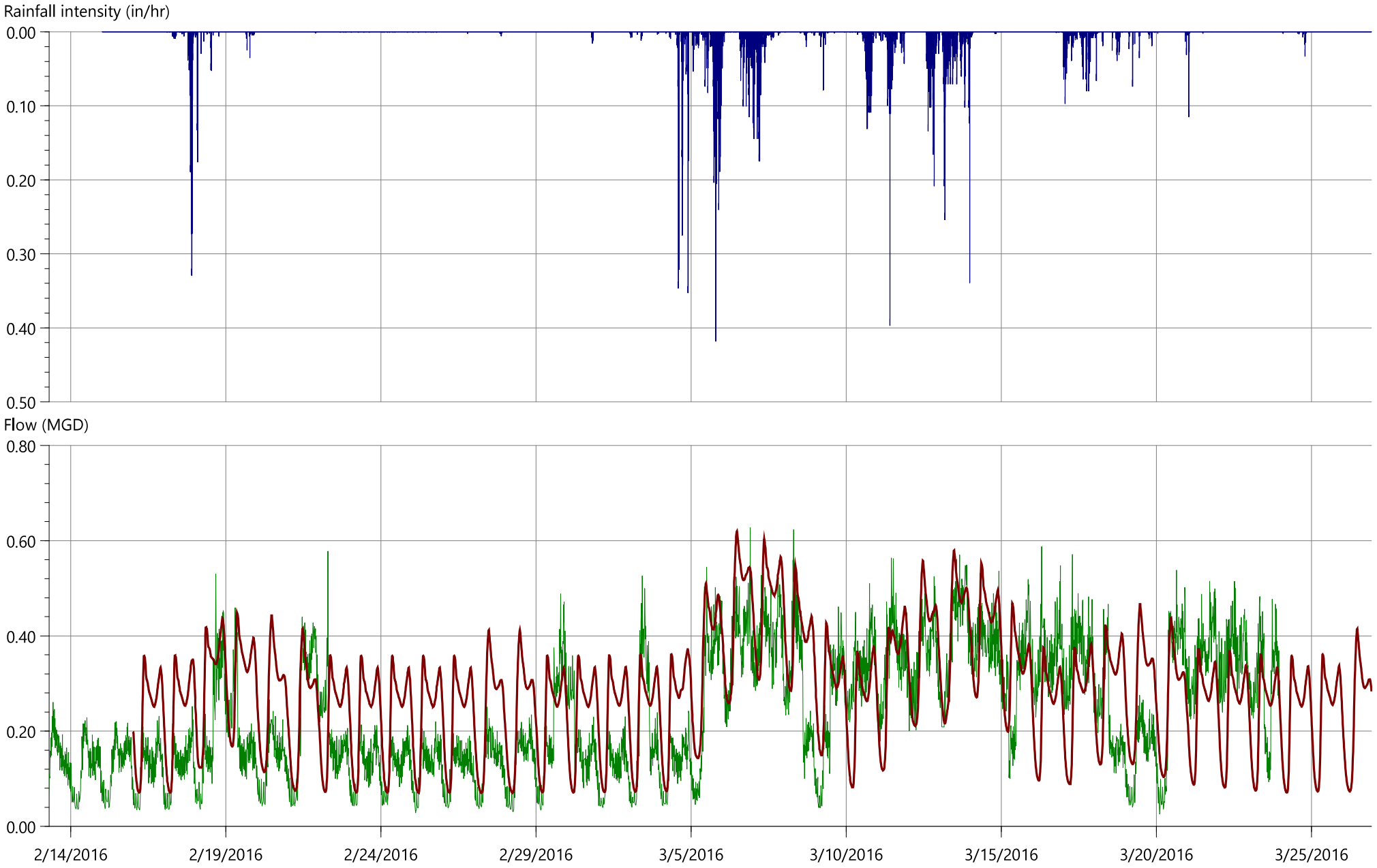
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.006	0.714	0.007			
Observed				0.103	1.057	1756657.949
...ta20160215_20160315				0.169	1.096	1787262.390

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 11, Model Location (Pred.) D/S SMH A08-019.1, Rainfall Profile: 121



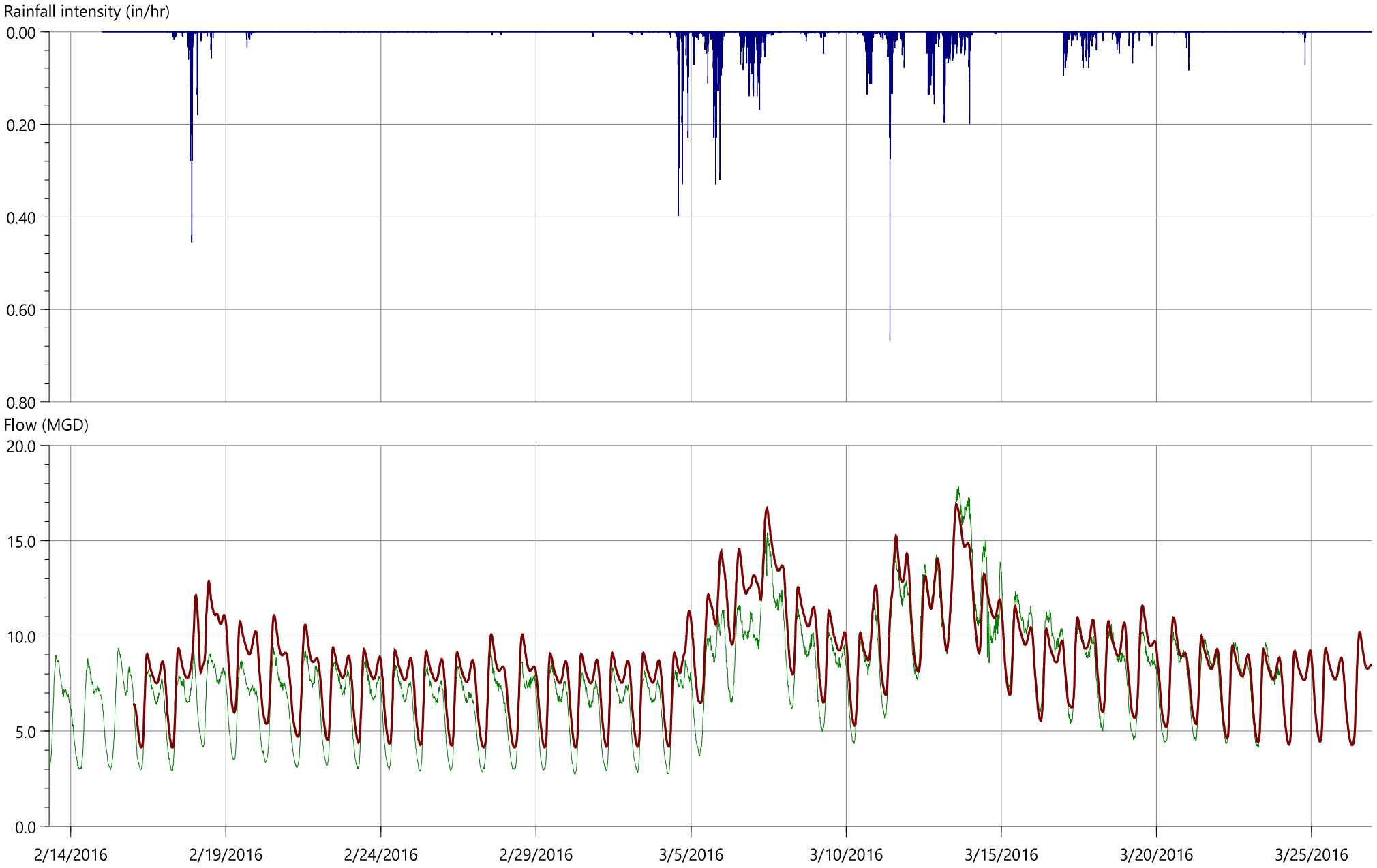
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.634	0.590	0.008			
Observed				0.468	4.351	5269869.468
...ta20160215_20160315				0.651	4.054	5683303.761

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 12, Model Location (Pred.) D/S SMH B03-030.1, Rainfall Profile: 177



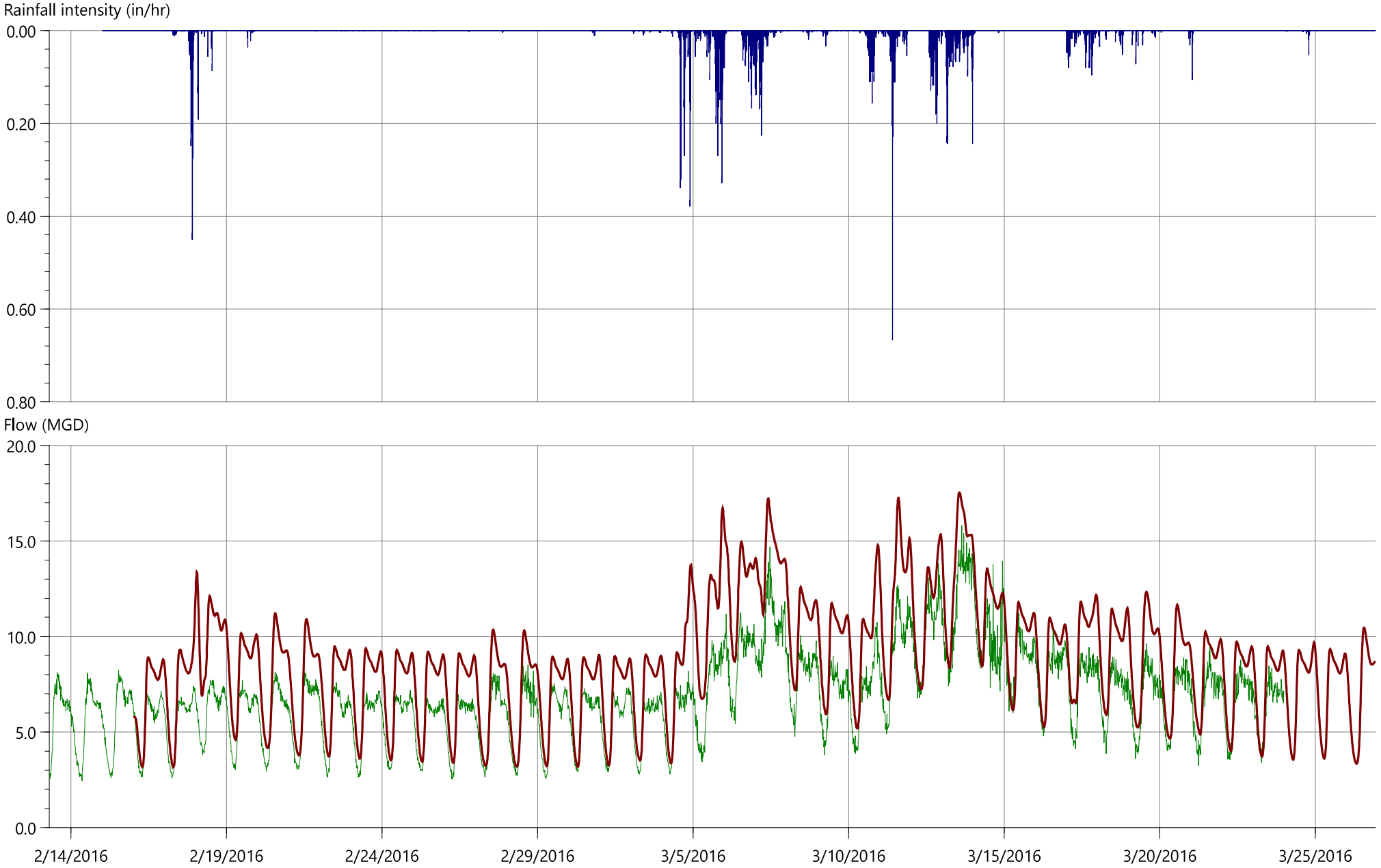
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.394	0.418	0.007			
Observed				0.025	0.627	798653.119
...ta20160215_20160315				0.070	0.620	991725.521

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 13, Model Location (Pred.) D/S SMH B03-043.1, Rainfall Profile: 145



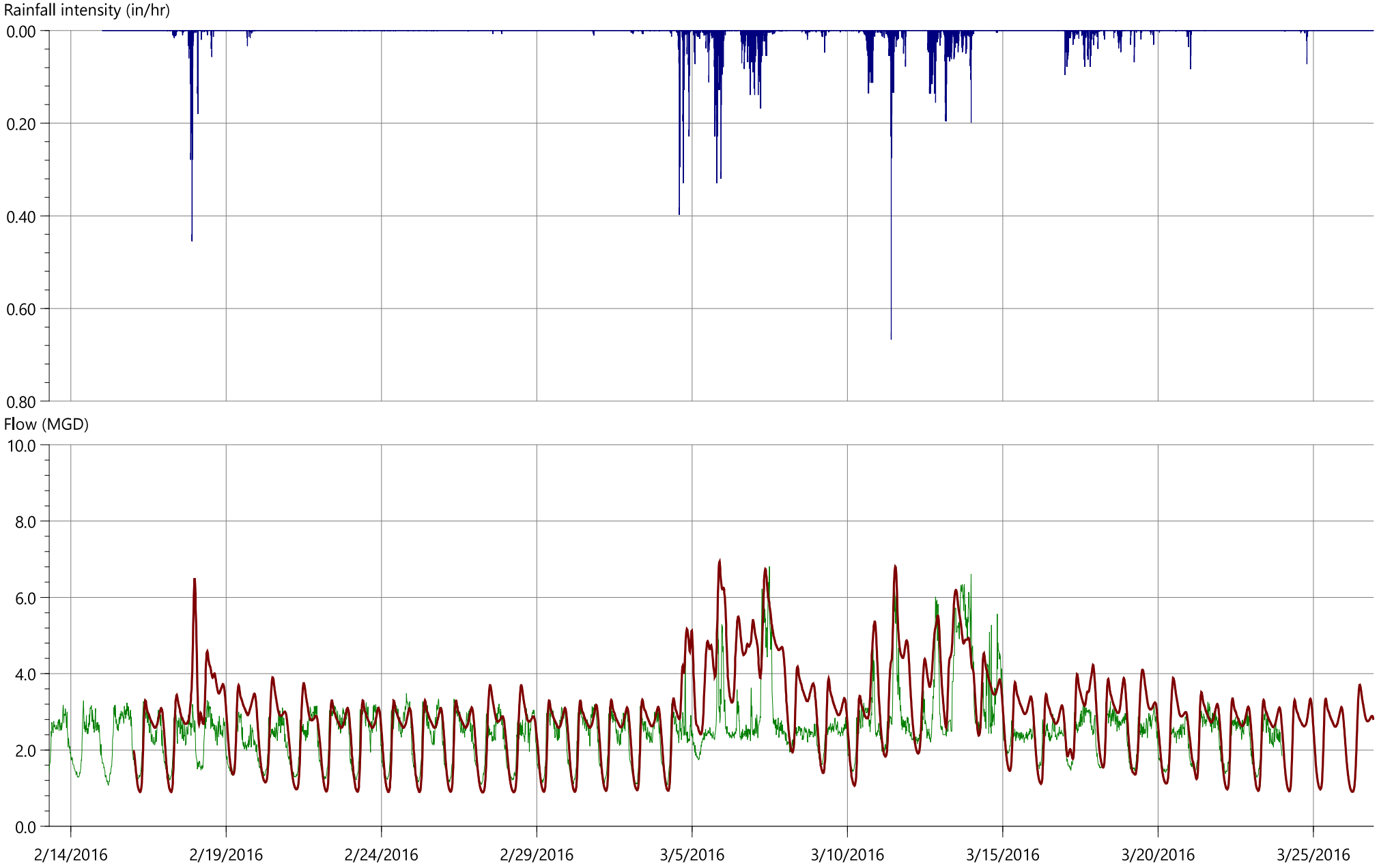
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.618	0.666	0.007			
Observed				2.731	17.837	26538612.826
...ta20160215_20160315				4.129	16.903	30158188.130

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 14, Model Location (Pred.) D/S SMH B03-024.1, Rainfall Profile: 178



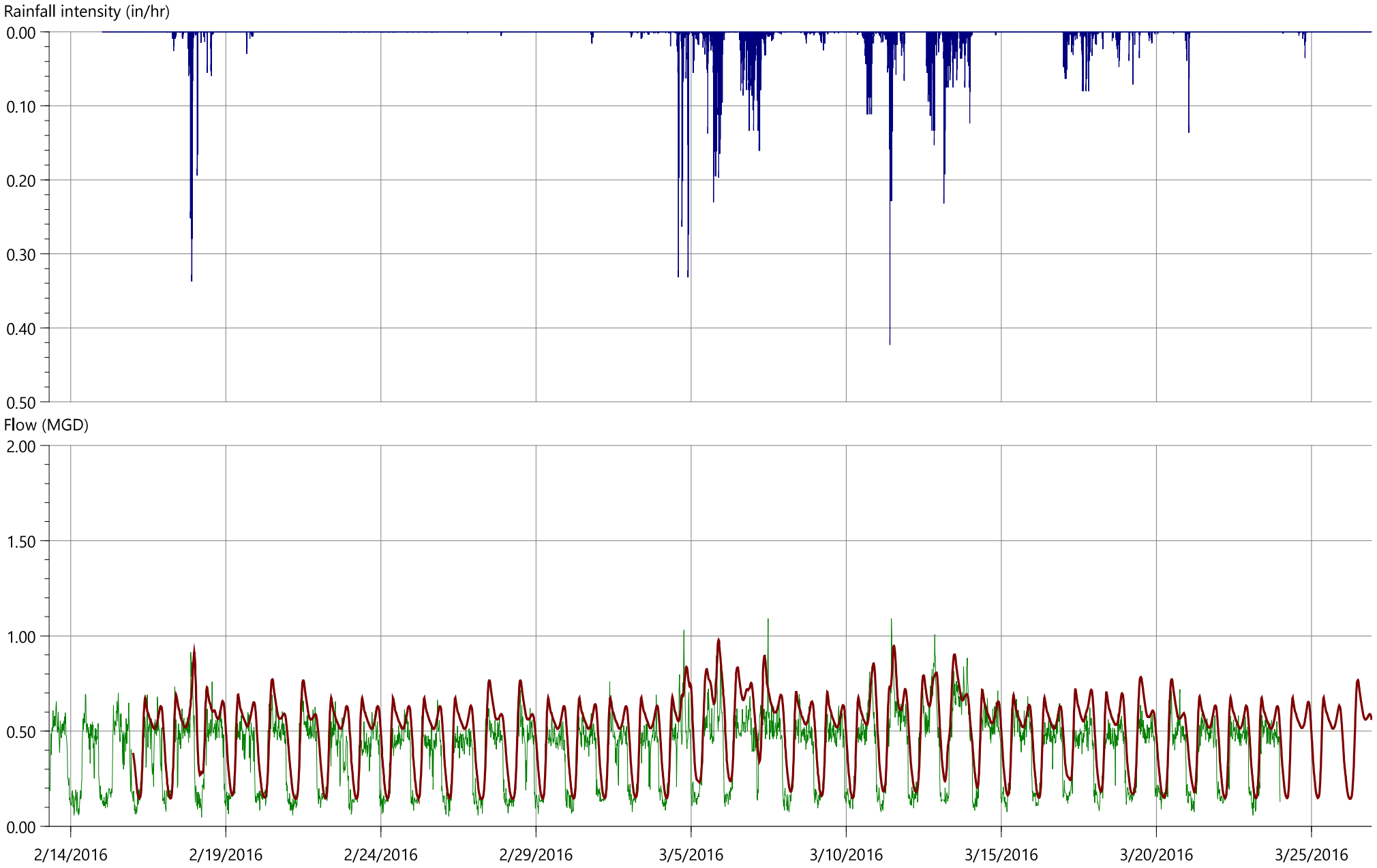
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.650	0.666	0.007			
Observed				2.435	15.807	23553734.551
...ta20160215_20160315				3.164	17.544	30549718.631

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 15, Model Location (Pred.) D/S SMH B03-053.1, Rainfall Profile: 145



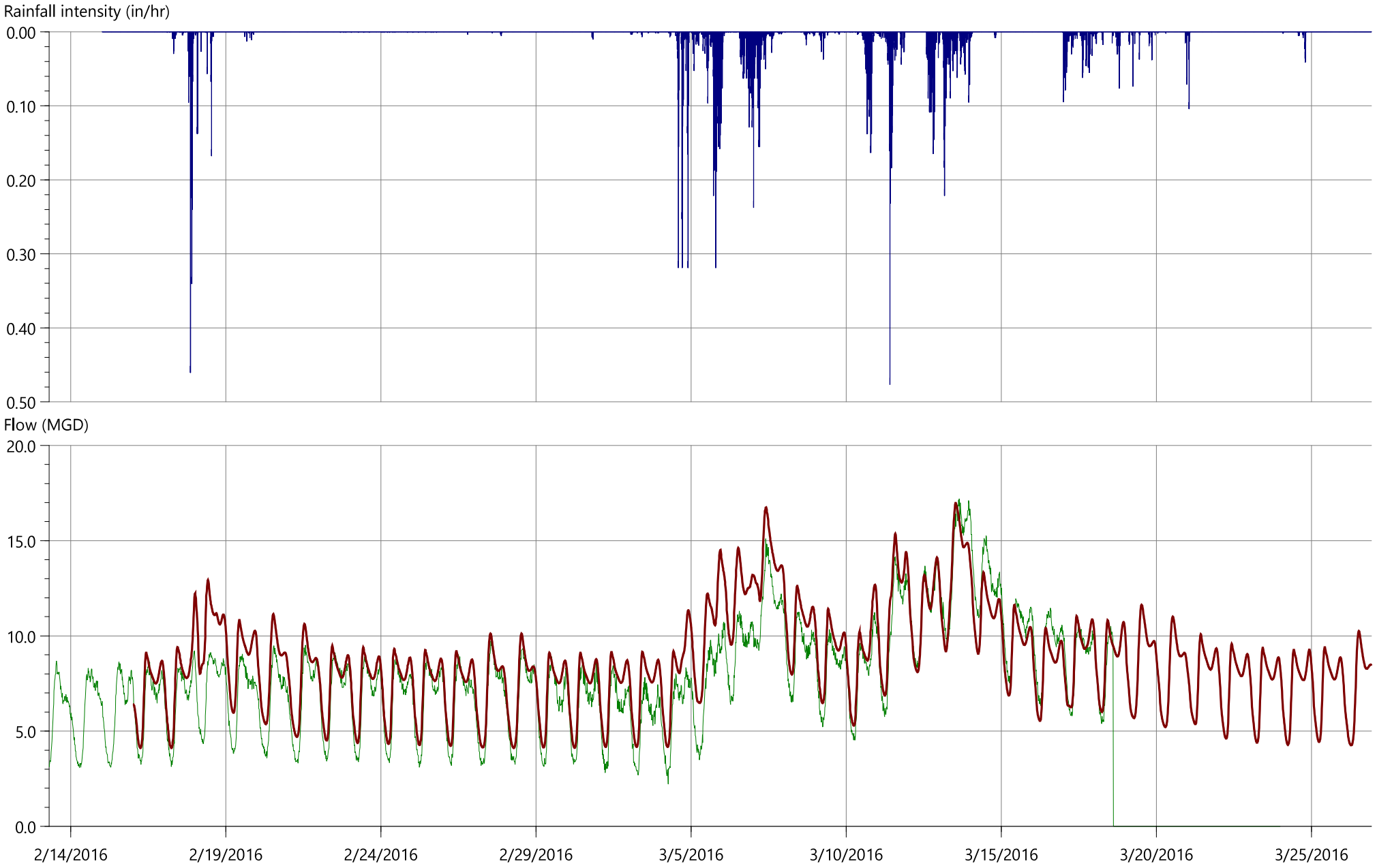
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.618	0.666	0.007			
Observed				1.071	6.810	8508039.397
...ta20160215_20160315				0.886	6.940	9988758.893

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 15A, Model Location (Pred.) D/S SMH B04-061.1, Rainfall Profile: 179



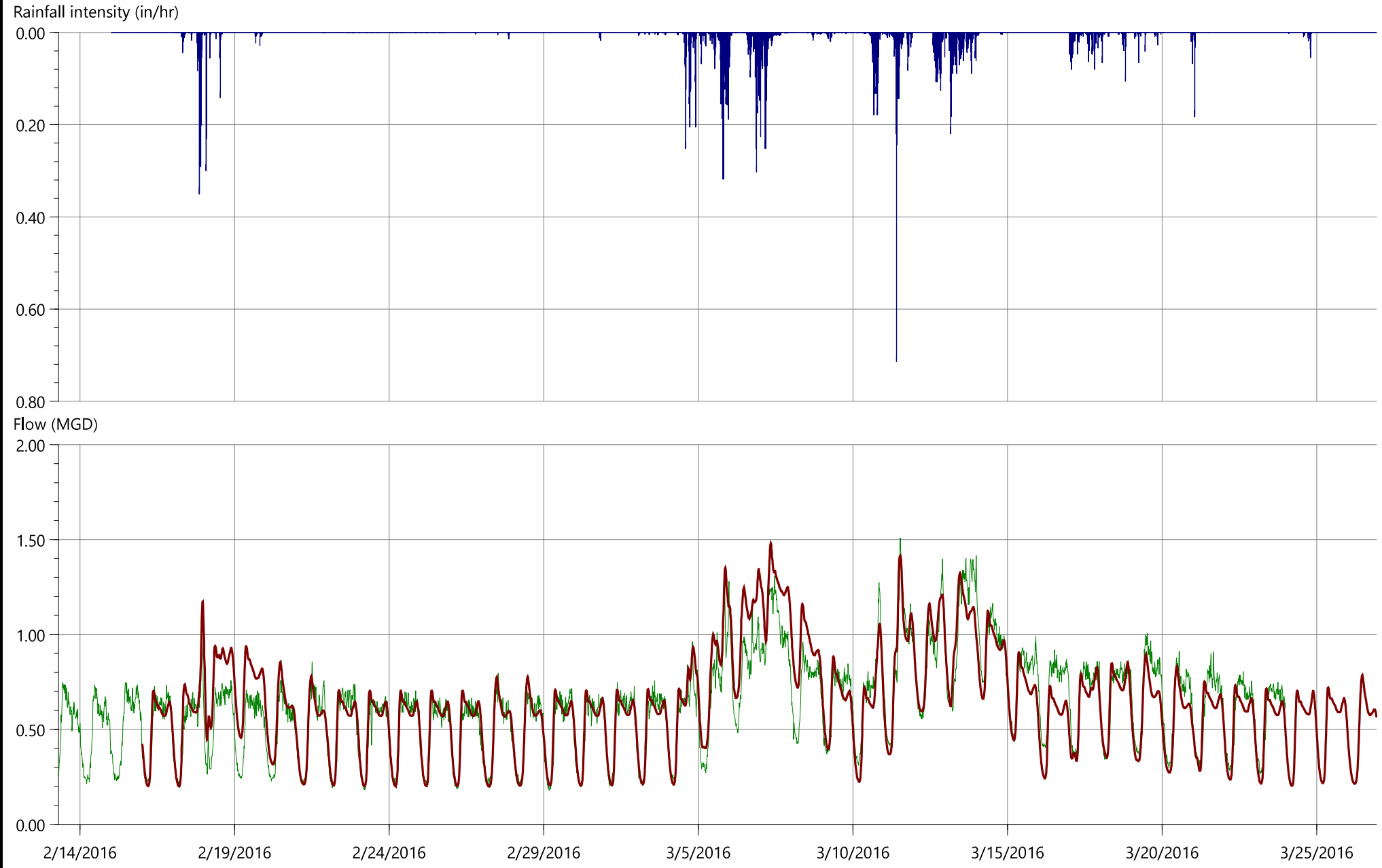
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.524	0.423	0.007			
Observed				0.048	1.091	1332963.500
...ta20160215_20160315				0.143	0.978	1724557.621

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 16, Model Location (Pred.) D/S SMH B05-230.1, Rainfall Profile: 147



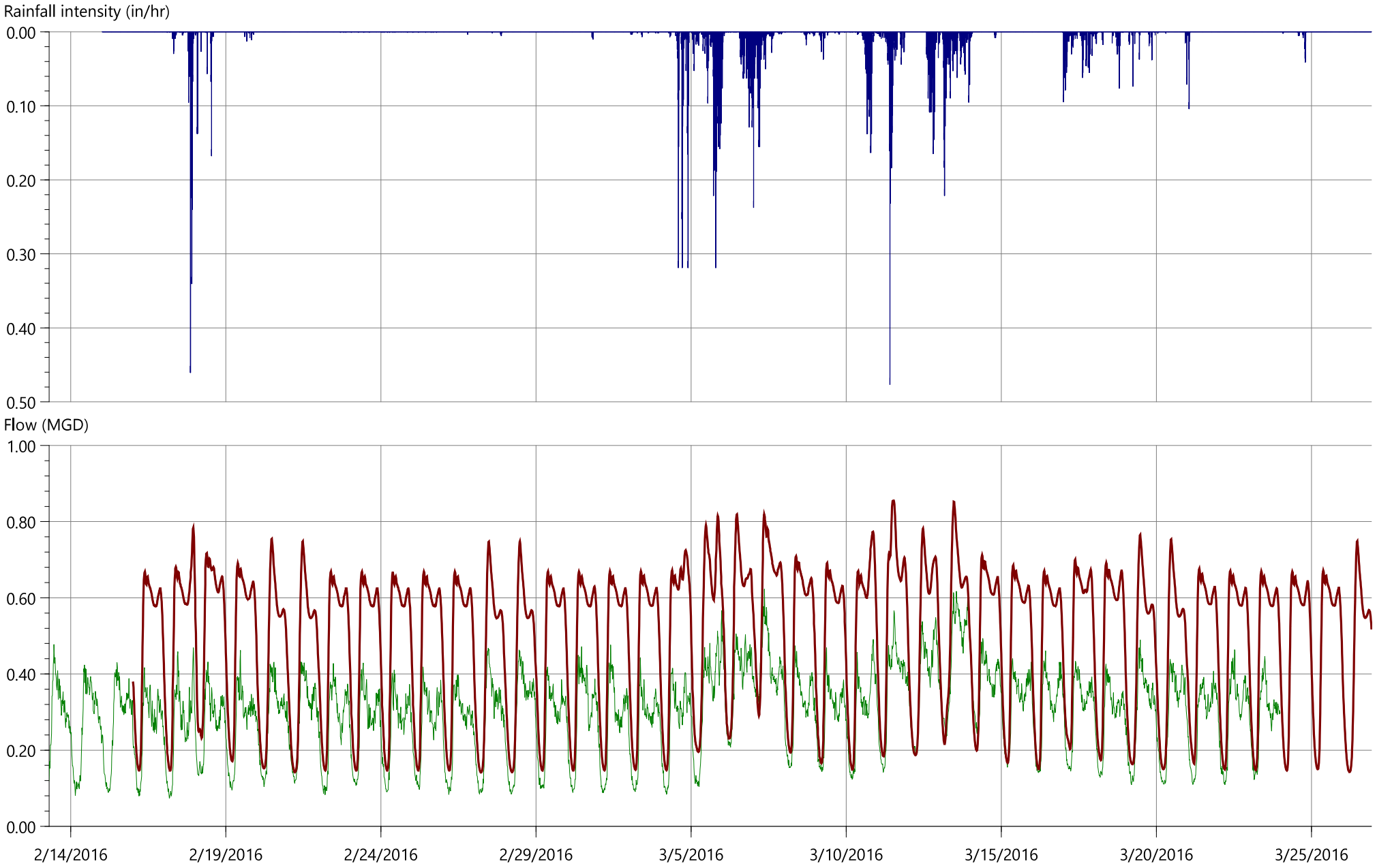
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.581	0.476	0.007			
Observed				0.000	17.190	23376320.562
...ta20160215_20160315				4.111	16.980	30162930.049

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 16A, Model Location (Pred.) D/S SMH B06-148.1, Rainfall Profile: 182



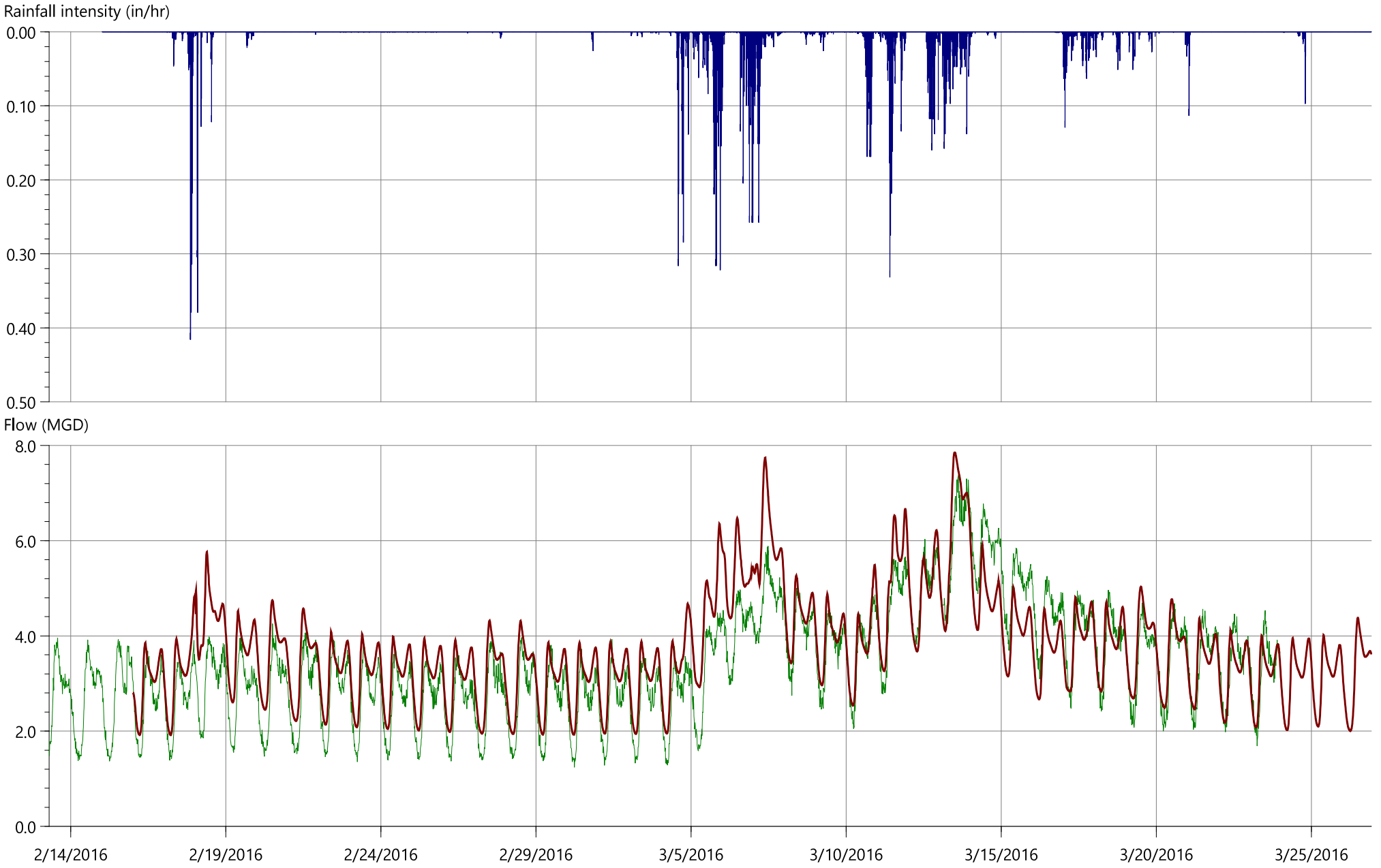
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.006	0.714	0.007			
Observed				0.179	1.509	2154876.607
...ta20160215_20160315				0.200	1.482	2224728.980

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 17, Model Location (Pred.) D/S SMH B05-448.1, Rainfall Profile: 147



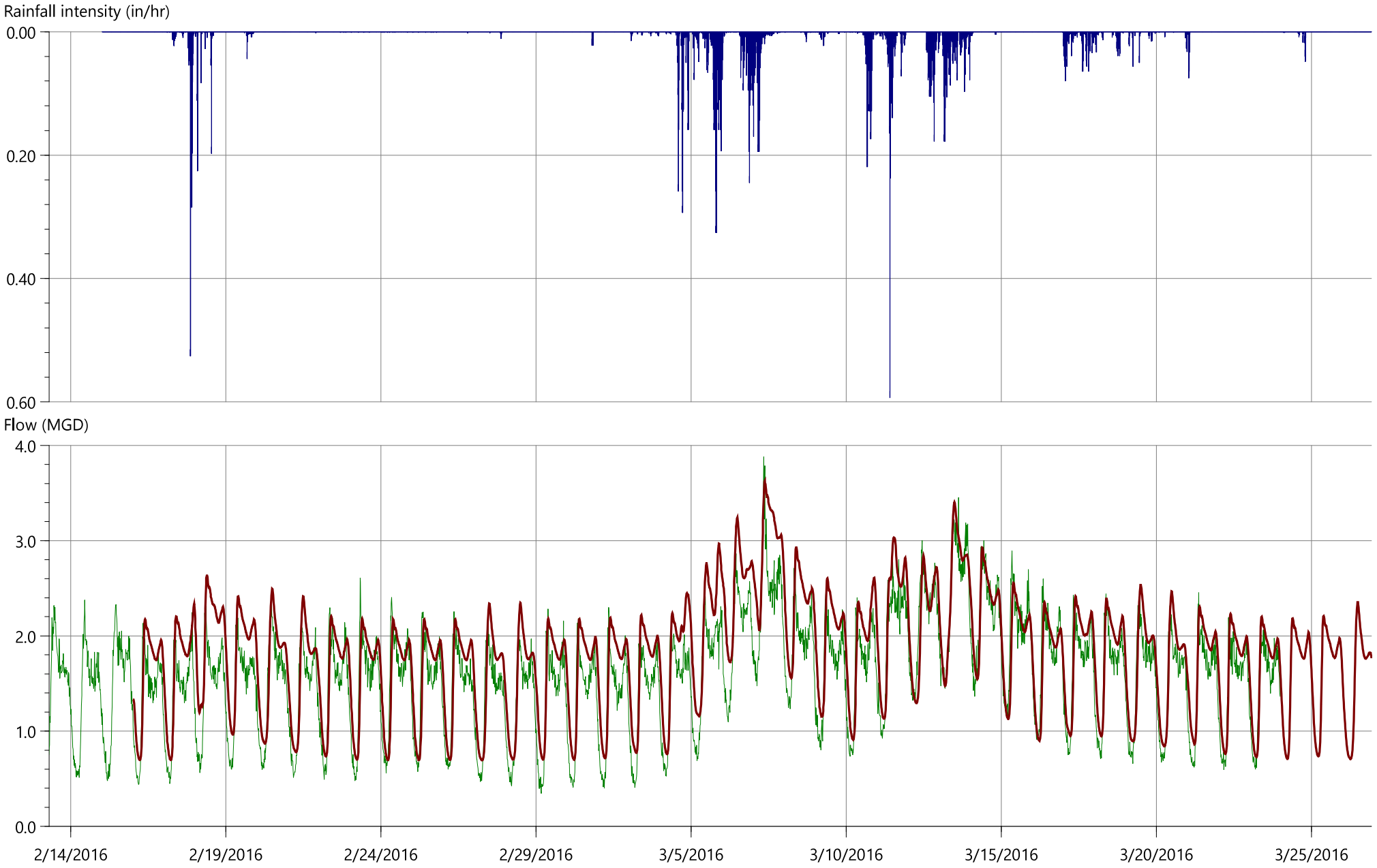
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.581	0.476	0.007			
Observed				0.074	0.623	1027152.765
...ta20160215_20160315				0.141	0.855	1734444.106

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 18, Model Location (Pred.) D/S SMH B07-233.1, Rainfall Profile: 151



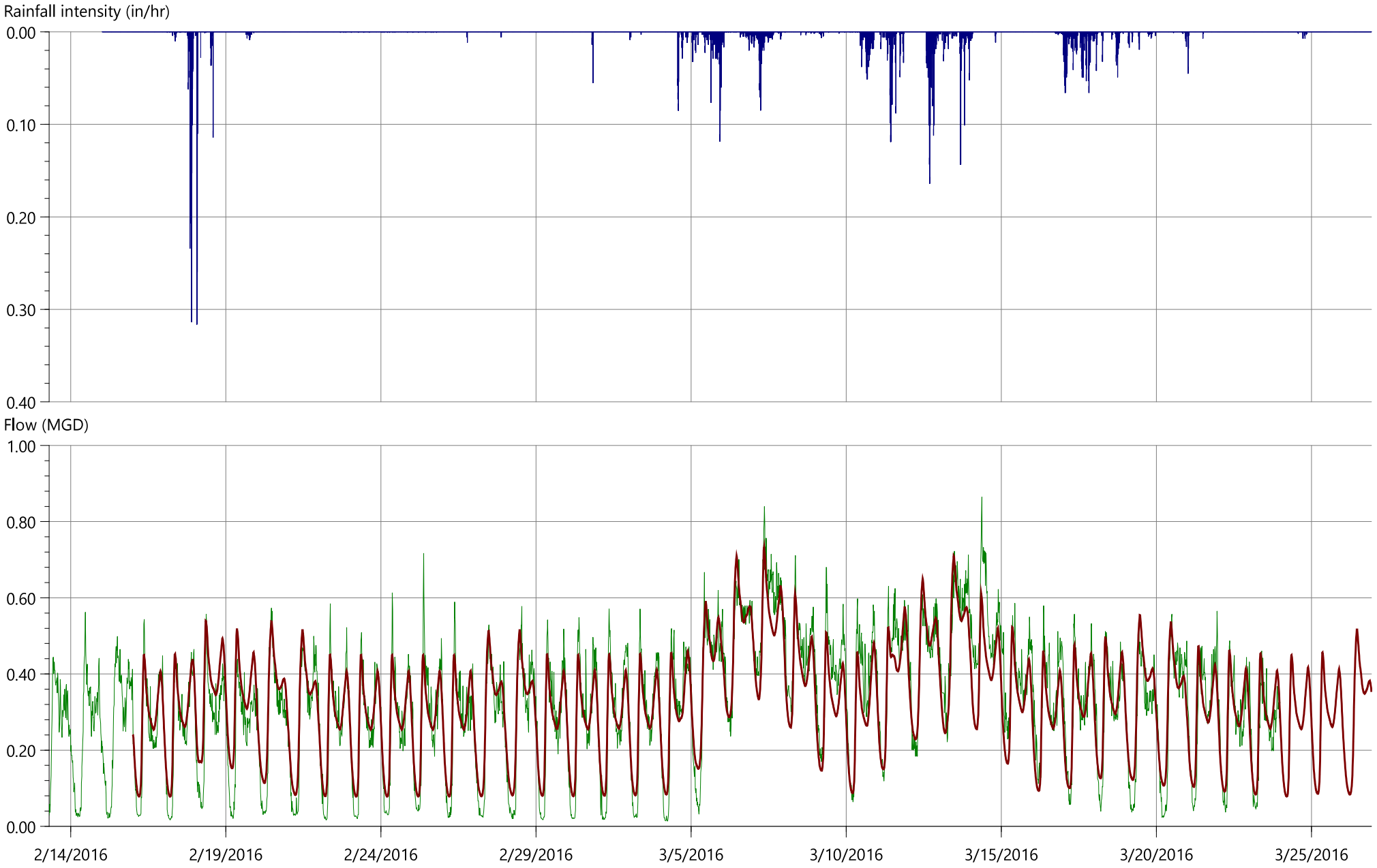
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.452	0.416	0.008			
Observed				1.241	7.372	11745270.797
...ta20160215_20160315				1.920	7.850	12994404.563

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 19, Model Location (Pred.) D/S SMH C06-025.1, Rainfall Profile: 248



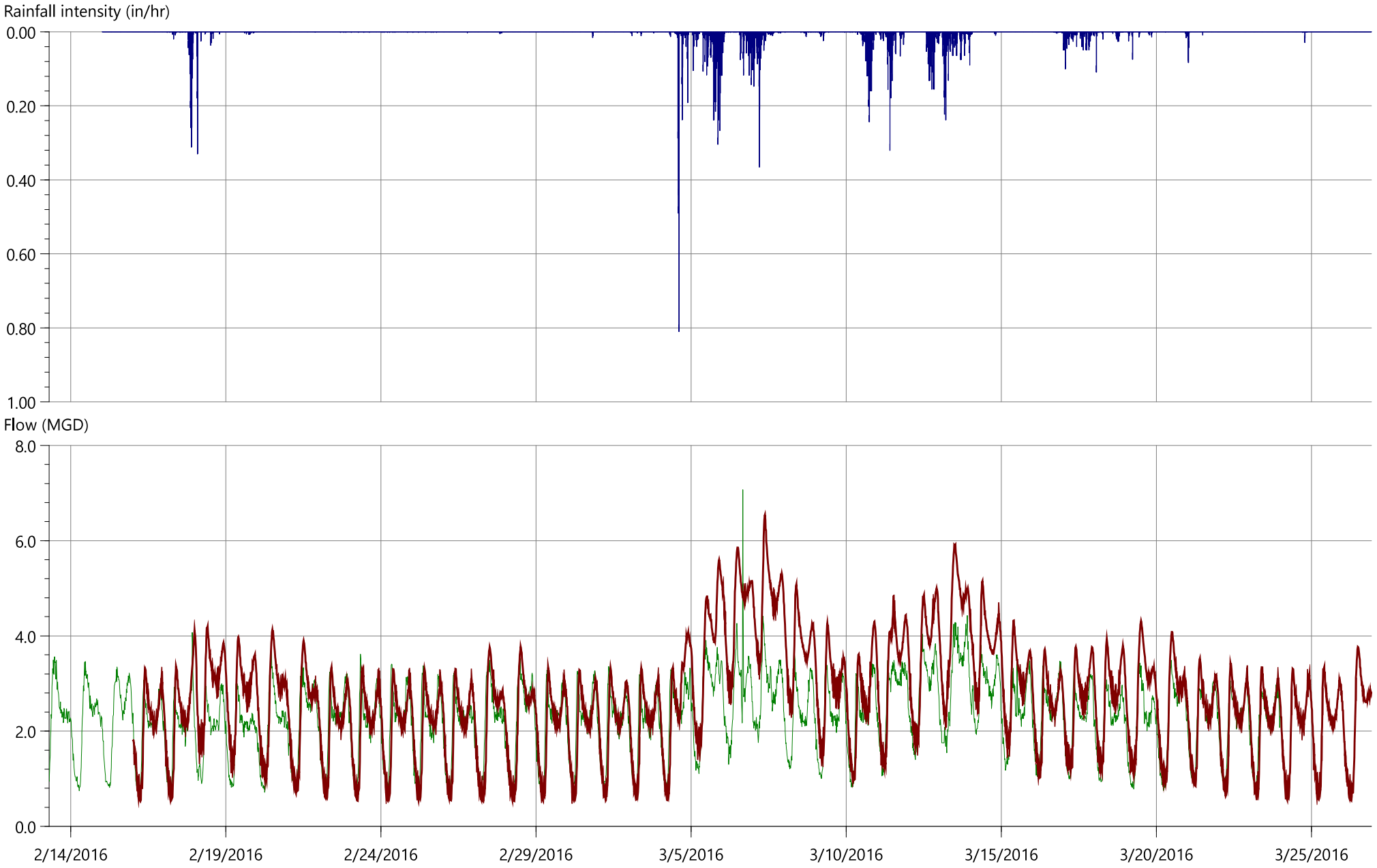
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.748	0.593	0.007			
Observed				0.347	3.882	5522255.777
...ta20160215_20160315				0.691	3.629	6310657.038

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 20, Model Location (Pred.) D/S SMH C07-004.1, Rainfall Profile: 200



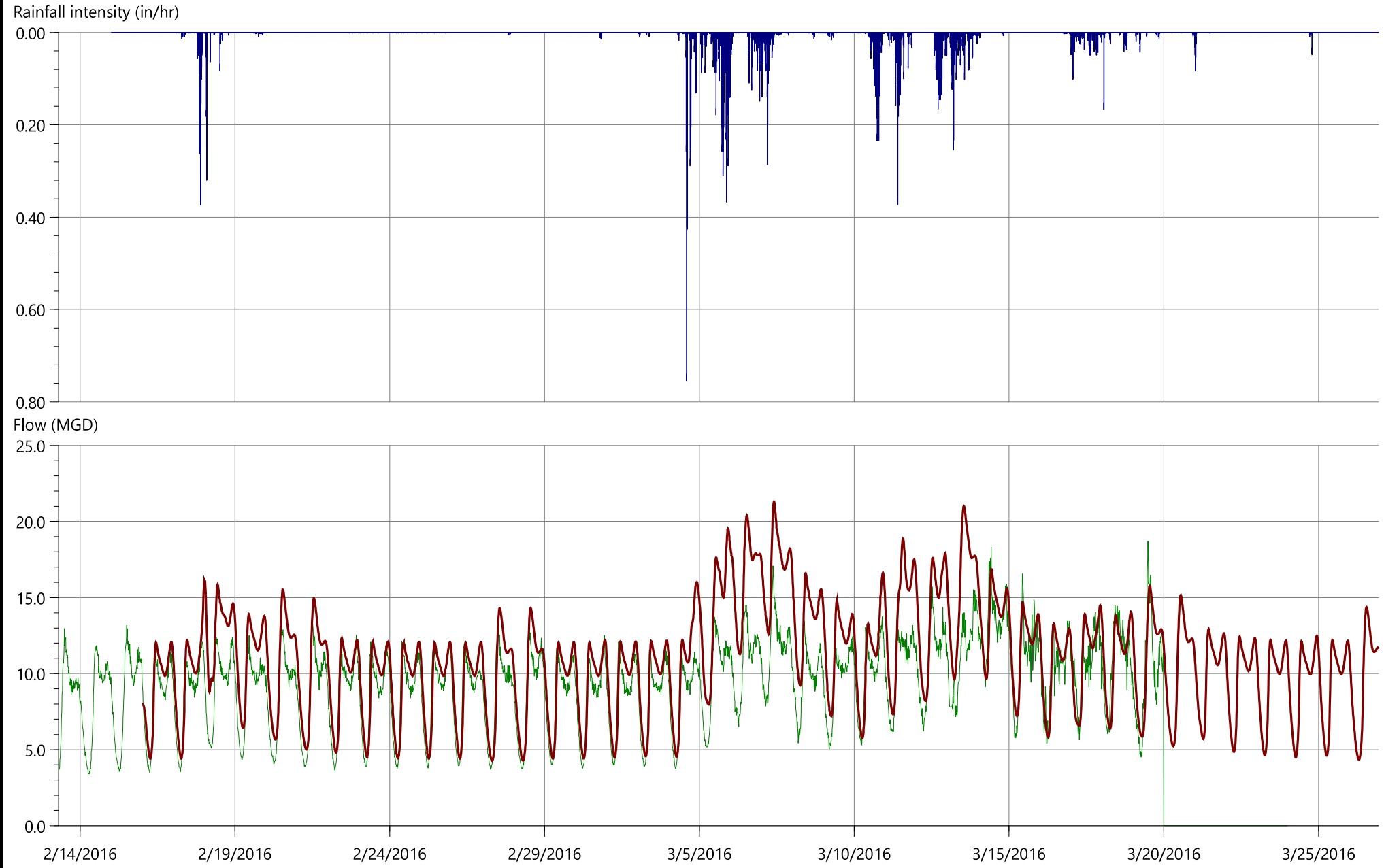
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	3.133	0.316	0.003			
Observed				0.014	0.865	1110452.108
...ta20160215_20160315				0.078	0.732	1119212.084

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 21, Model Location (Pred.) D/S SMH E01-150.1, Rainfall Profile: 305



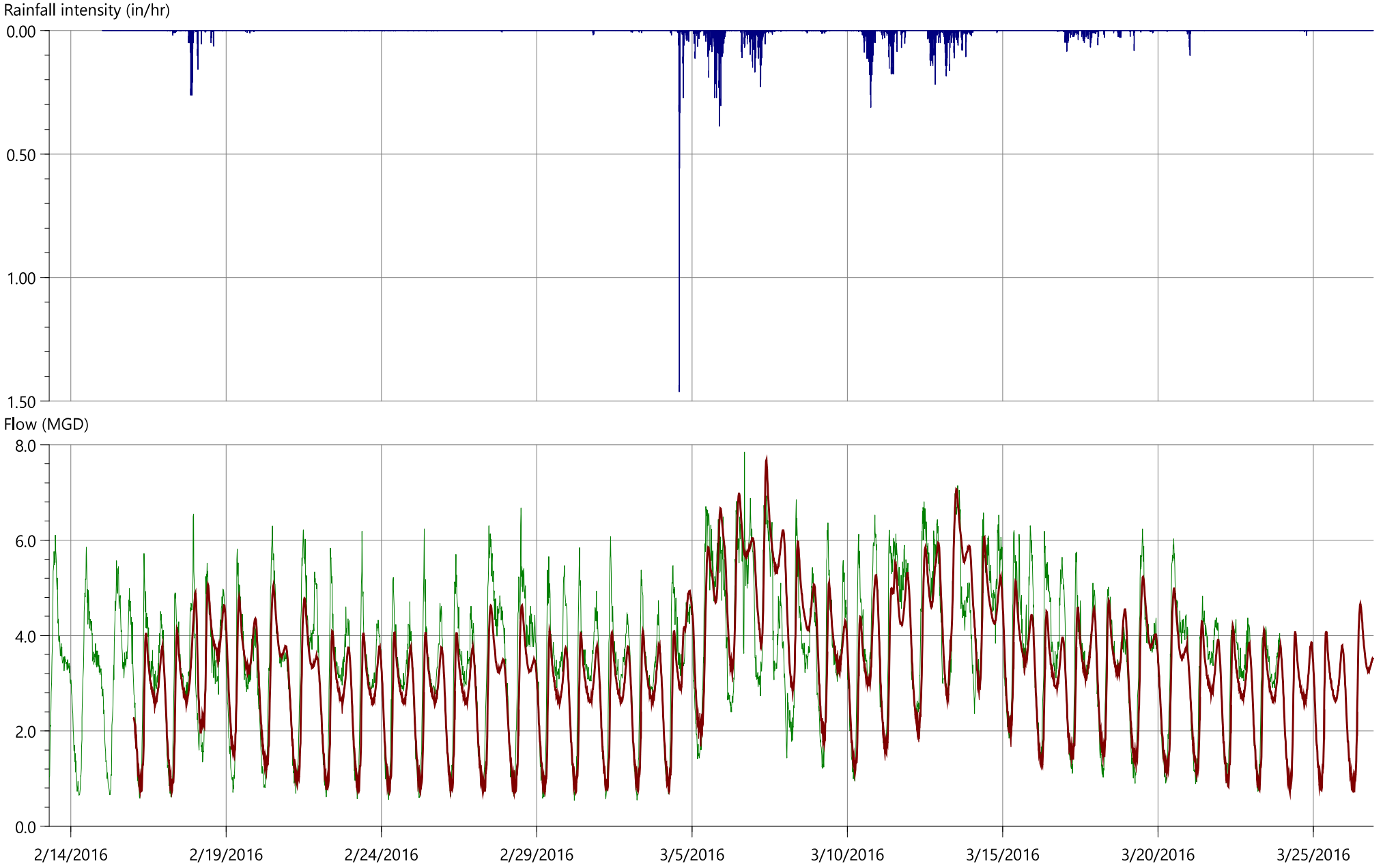
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.168	0.810	0.007			
Observed				0.681	7.071	7871327.215
...ta20160215_20160315				0.529	6.540	9303644.977

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 22, Model Location (Pred.) D/S SMH F01-135.1, Rainfall Profile: 371



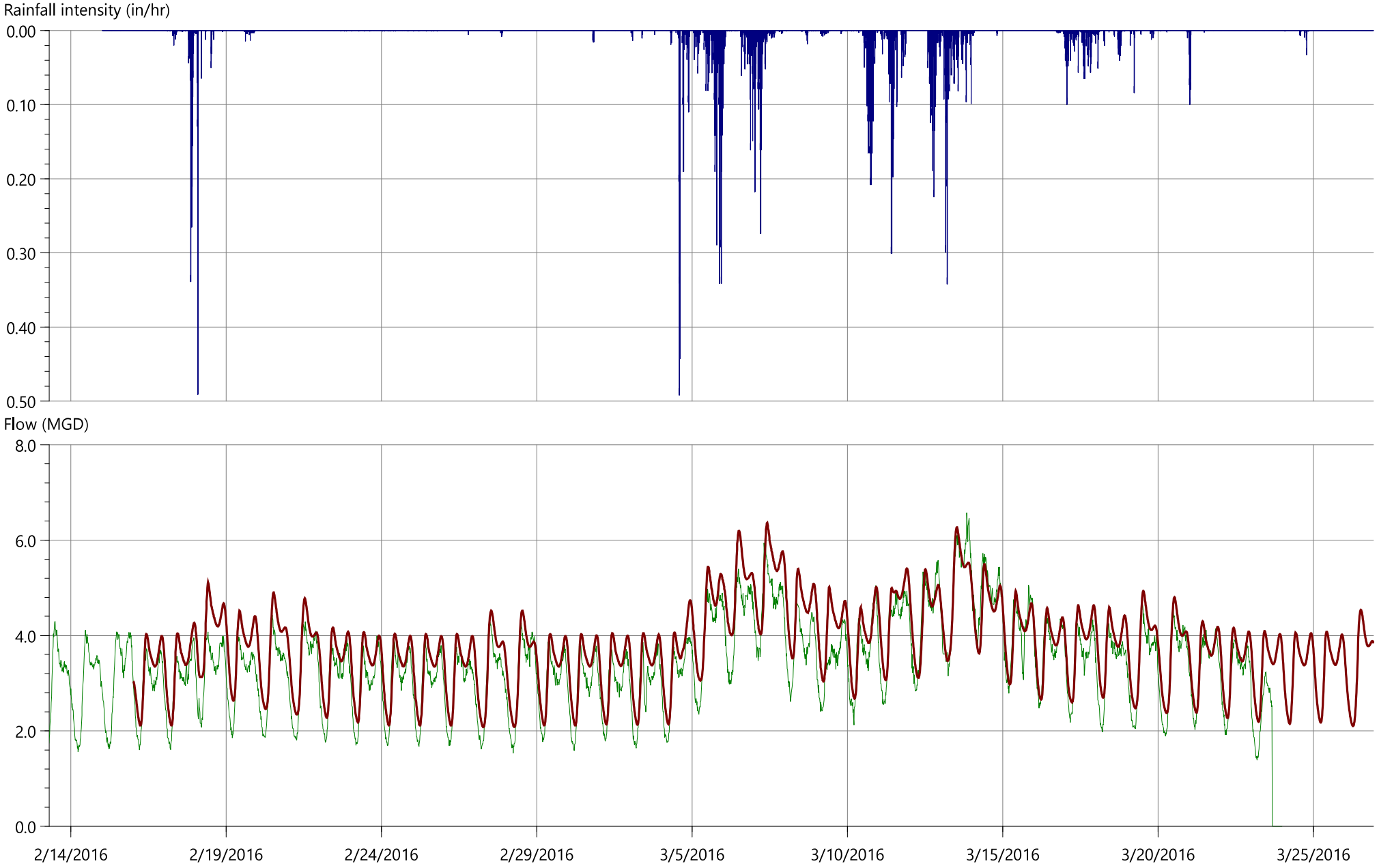
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.422	0.754	0.008			
Observed				0.000	18.708	29305470.700
...ta20160215_20160315				4.271	21.309	38289677.747

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 23, Model Location (Pred.) D/S SMH F01-147.1, Rainfall Profile: 370



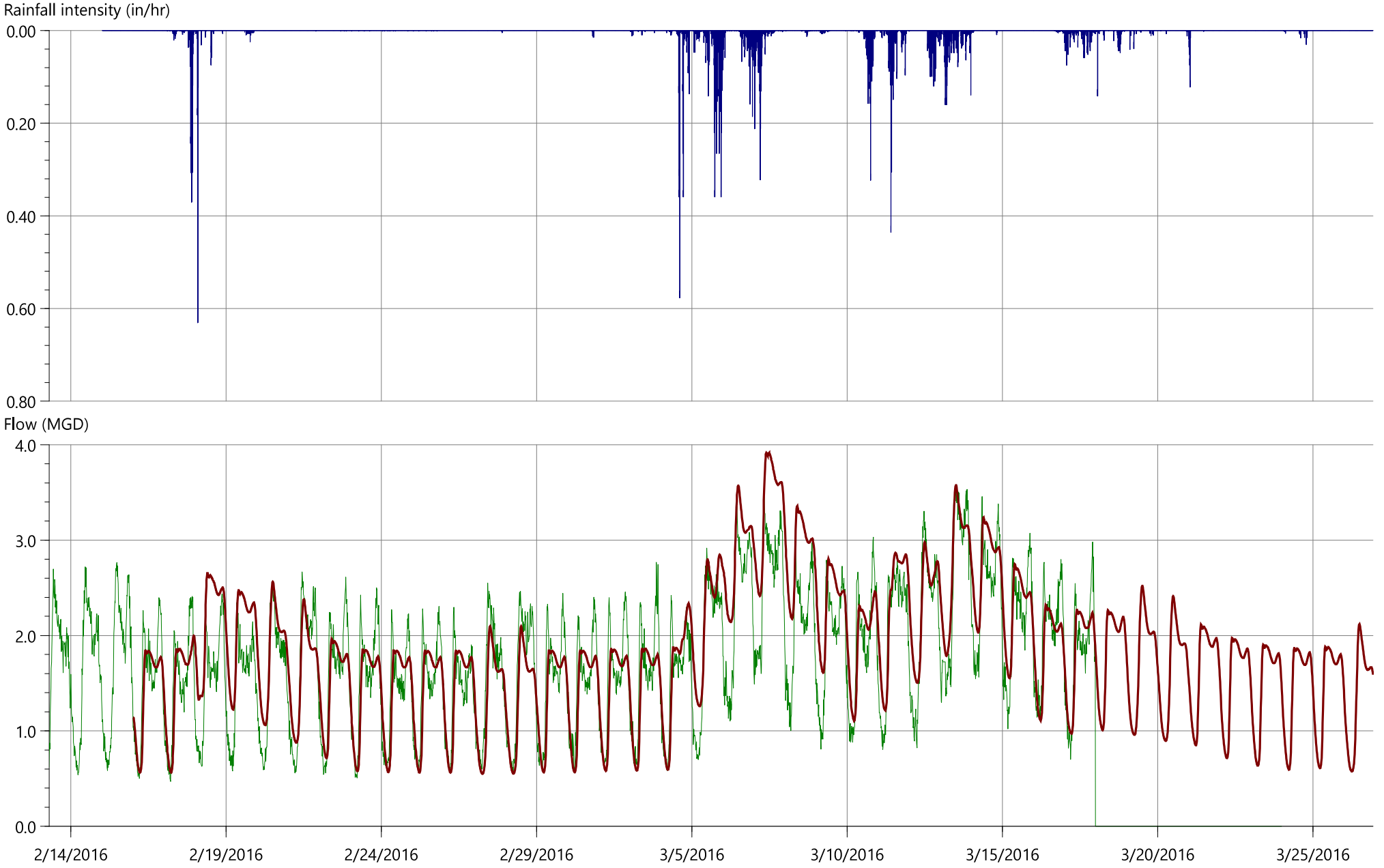
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.432	1.462	0.008			
Observed				0.542	7.848	12177525.807
...ta20160215_20160315				0.707	7.678	11302643.288

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 24, Model Location (Pred.) D/S SMH F02-073.1, Rainfall Profile: 406



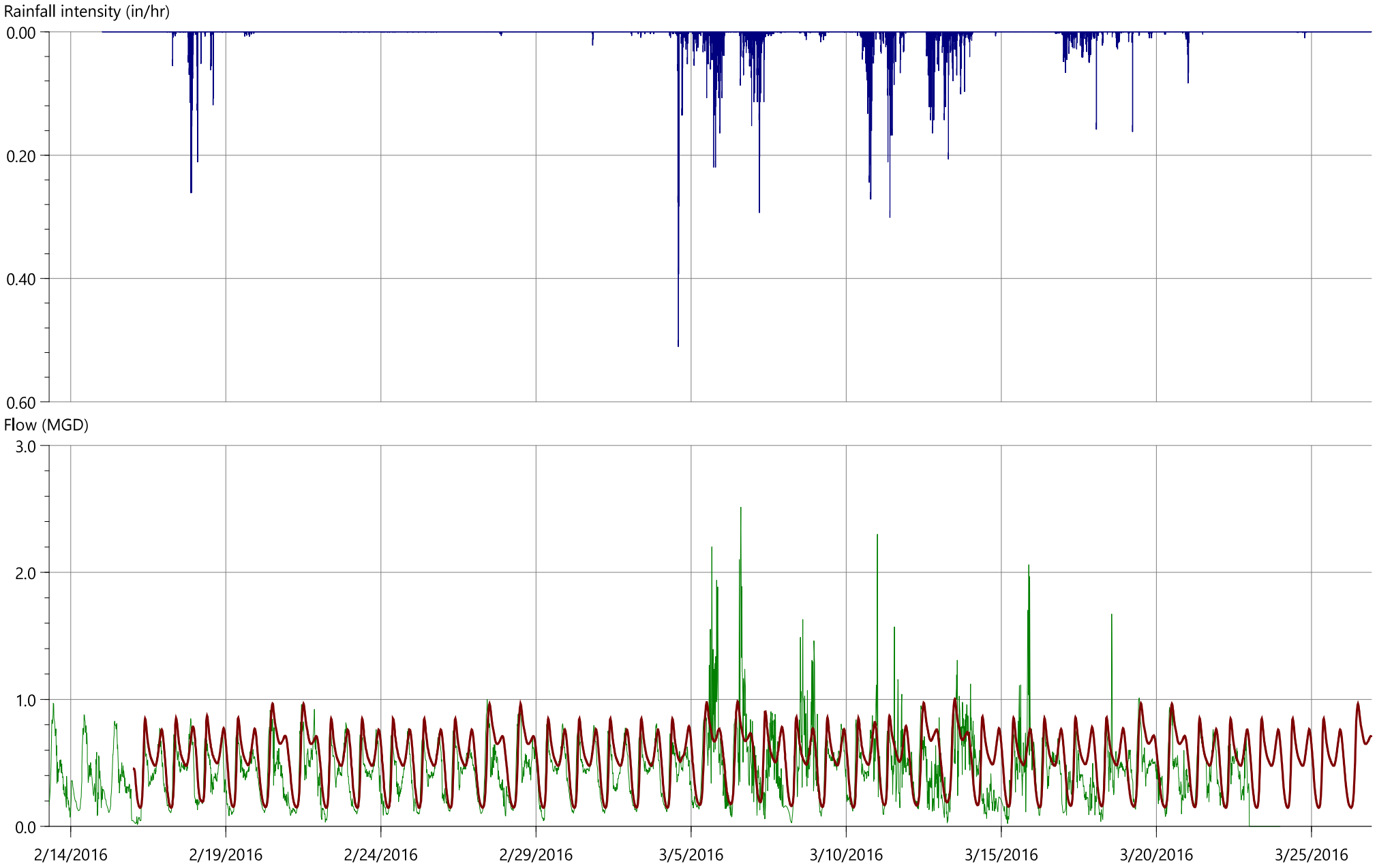
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.235	0.492	0.007			
Observed				0.000	6.569	11673591.208
...ta20160215_20160315				2.078	6.365	13083521.477

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 25, Model Location (Pred.) D/S SMH F04-003.1, Rainfall Profile: 409



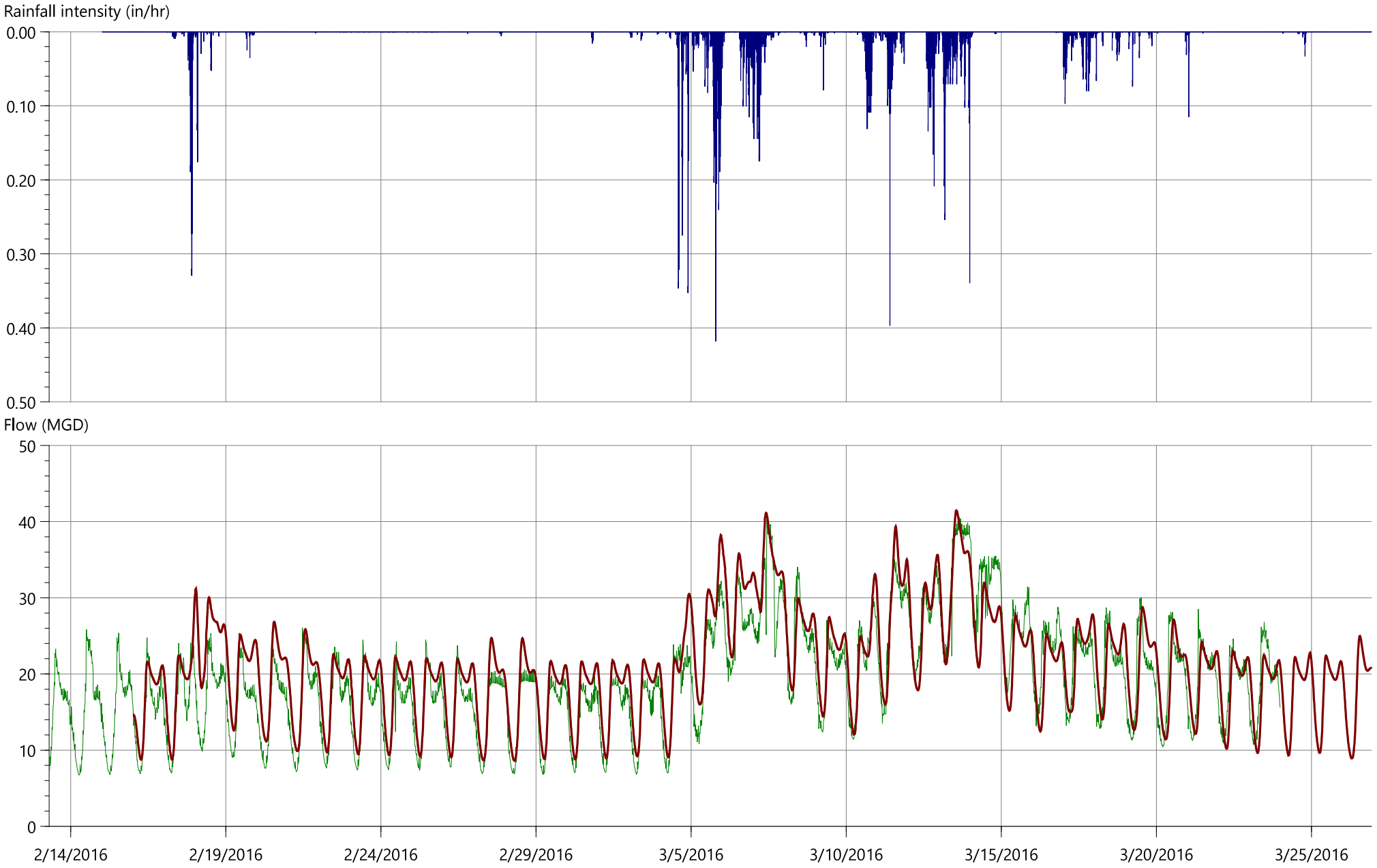
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.213	0.631	0.007			
Observed				0.000	3.566	5191133.127
...ta20160215_20160315				0.550	3.917	6371709.144

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) FM 26, Model Location (Pred.) D/S SMH F99-034.1, Rainfall Profile: 336



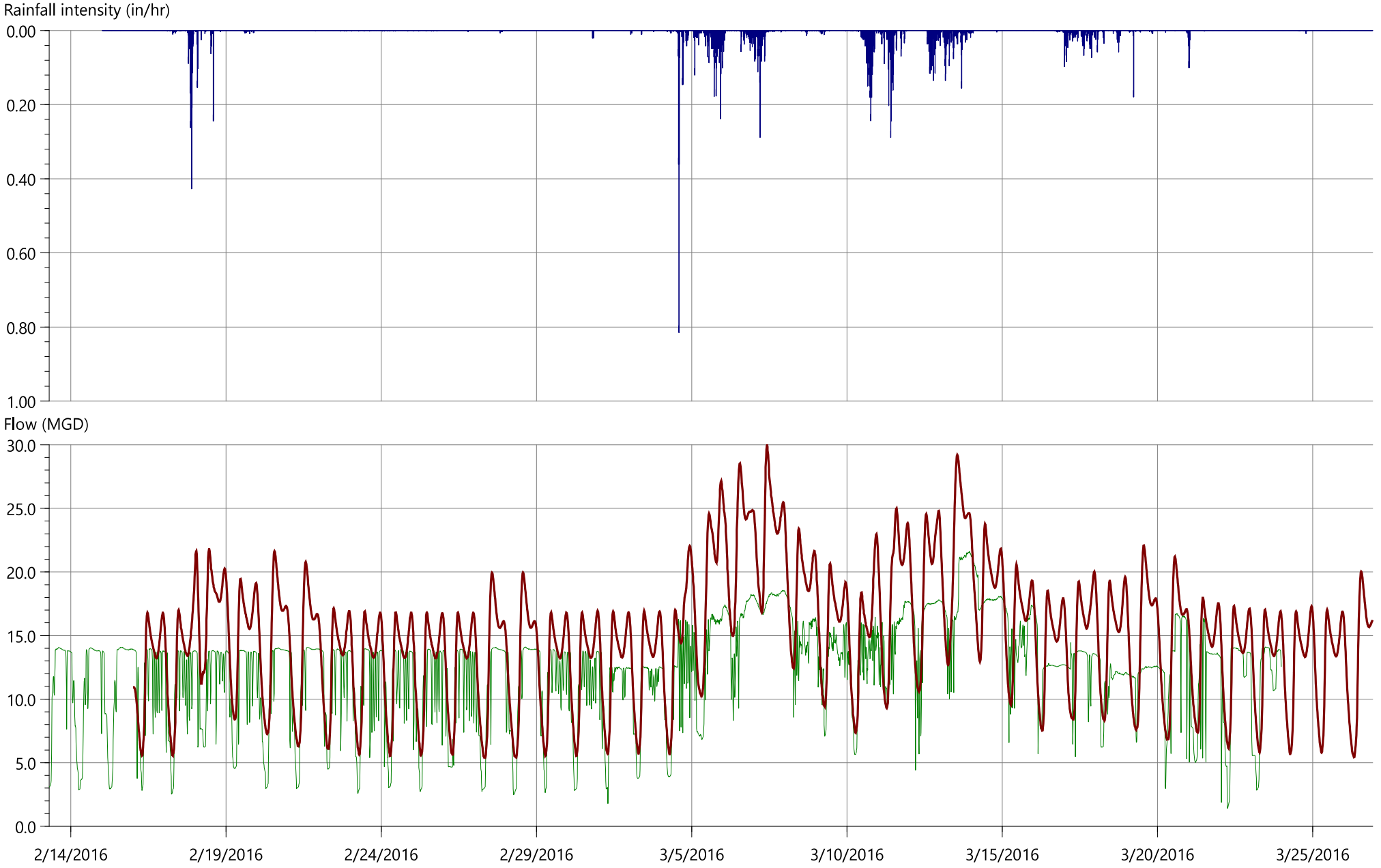
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.185	0.510	0.006			
Observed				0.000	2.513	1488940.567
...ta20160215_20160315				0.146	1.003	1837826.434

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) DC WWTP, Model Location (Pred.) D/S CAP B03-DCWWTP.1, Rainfall Profile: 177



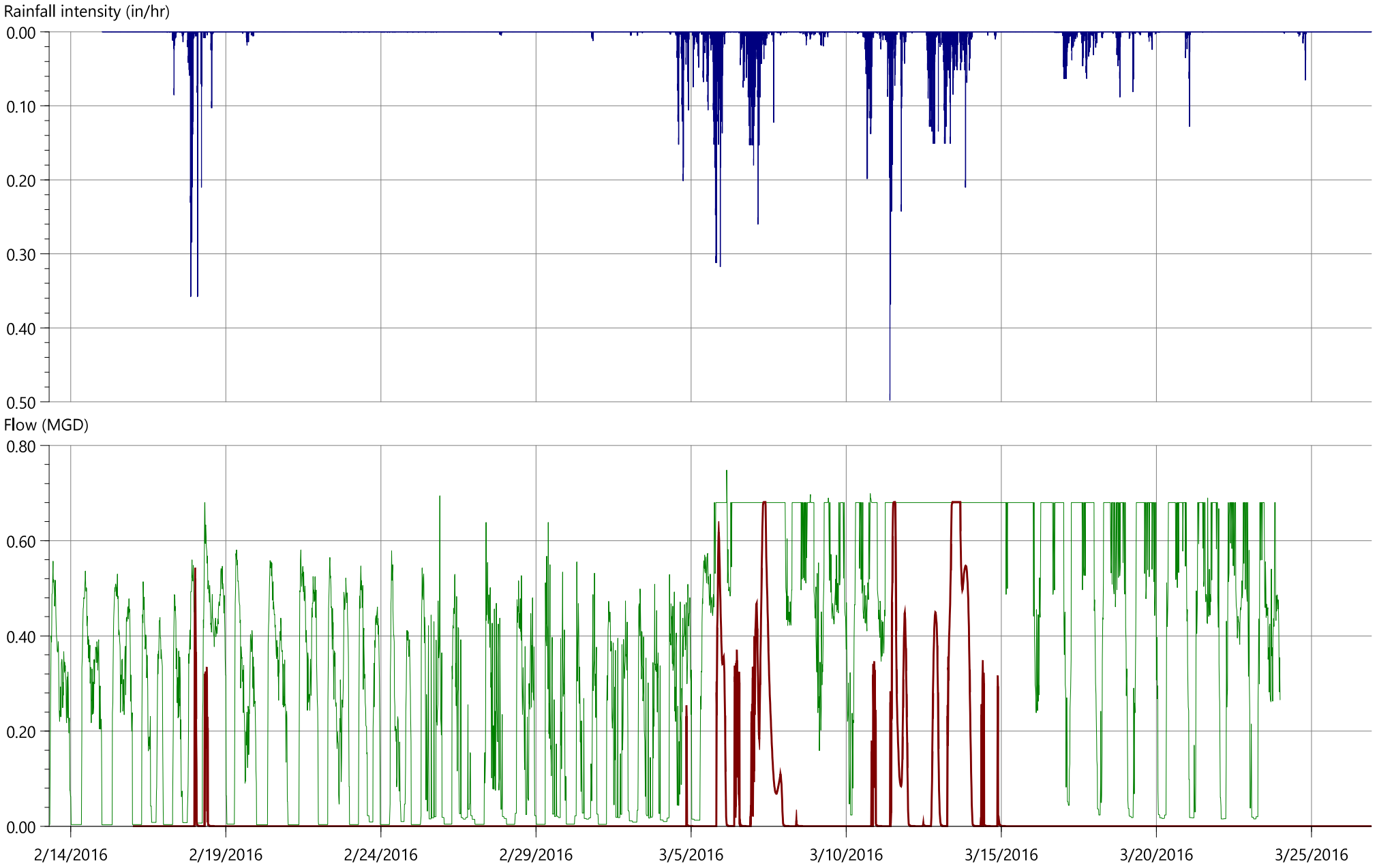
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.394	0.418	0.007			
Observed				6.736	40.725	66602465.109
...ta20160215_20160315				8.618	41.482	73053377.582

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) PG WWTP, Model Location (Pred.) D/S SMH F99-016.1, Rainfall Profile: 368



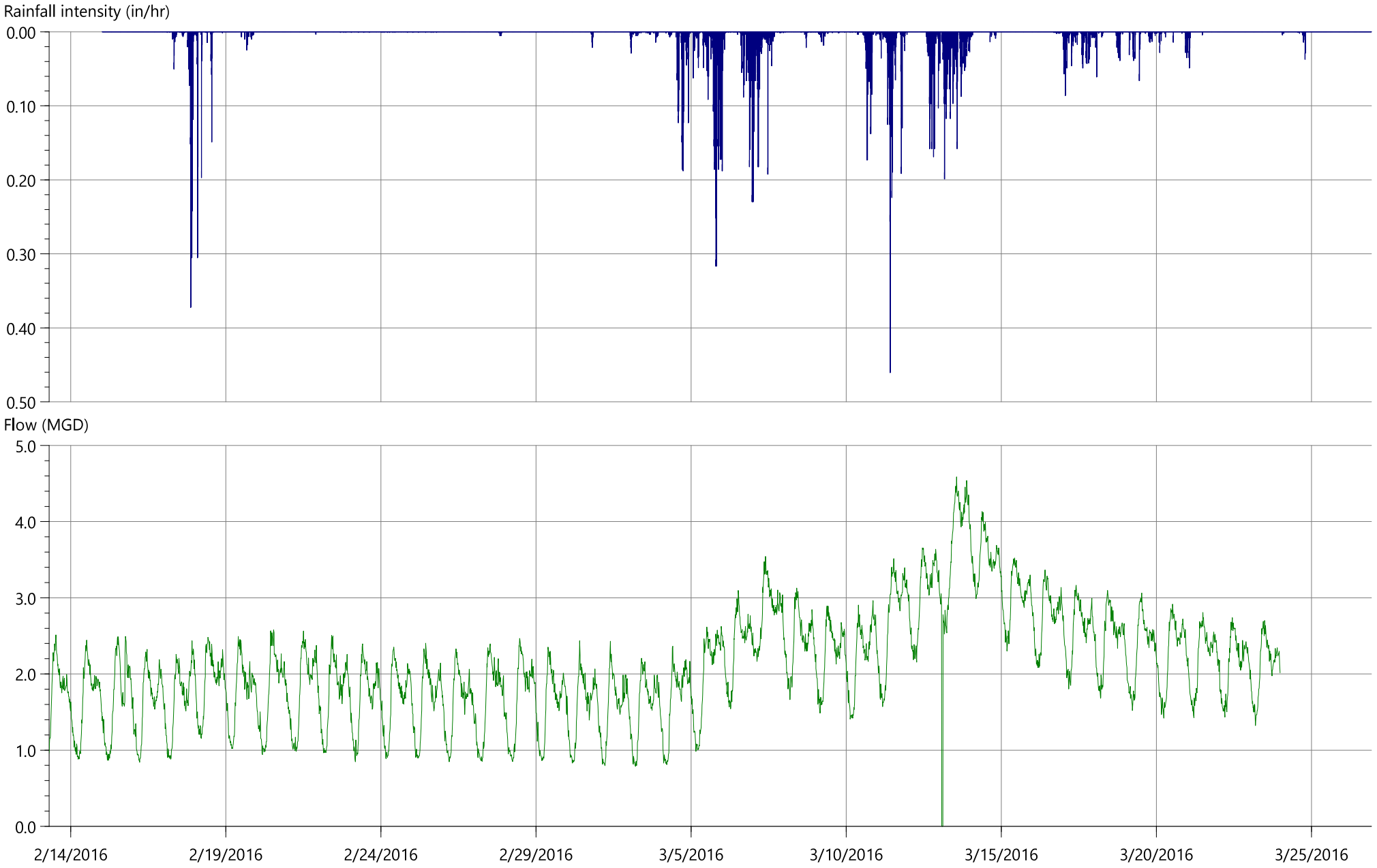
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	5.985	0.815	0.006			
Observed				1.411	21.613	42223364.633
...ta20160215_20160315				5.391	29.963	52253557.072

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) PS 26, Model Location (Pred.) D/S A08-169D1.1, Rainfall Profile: 120



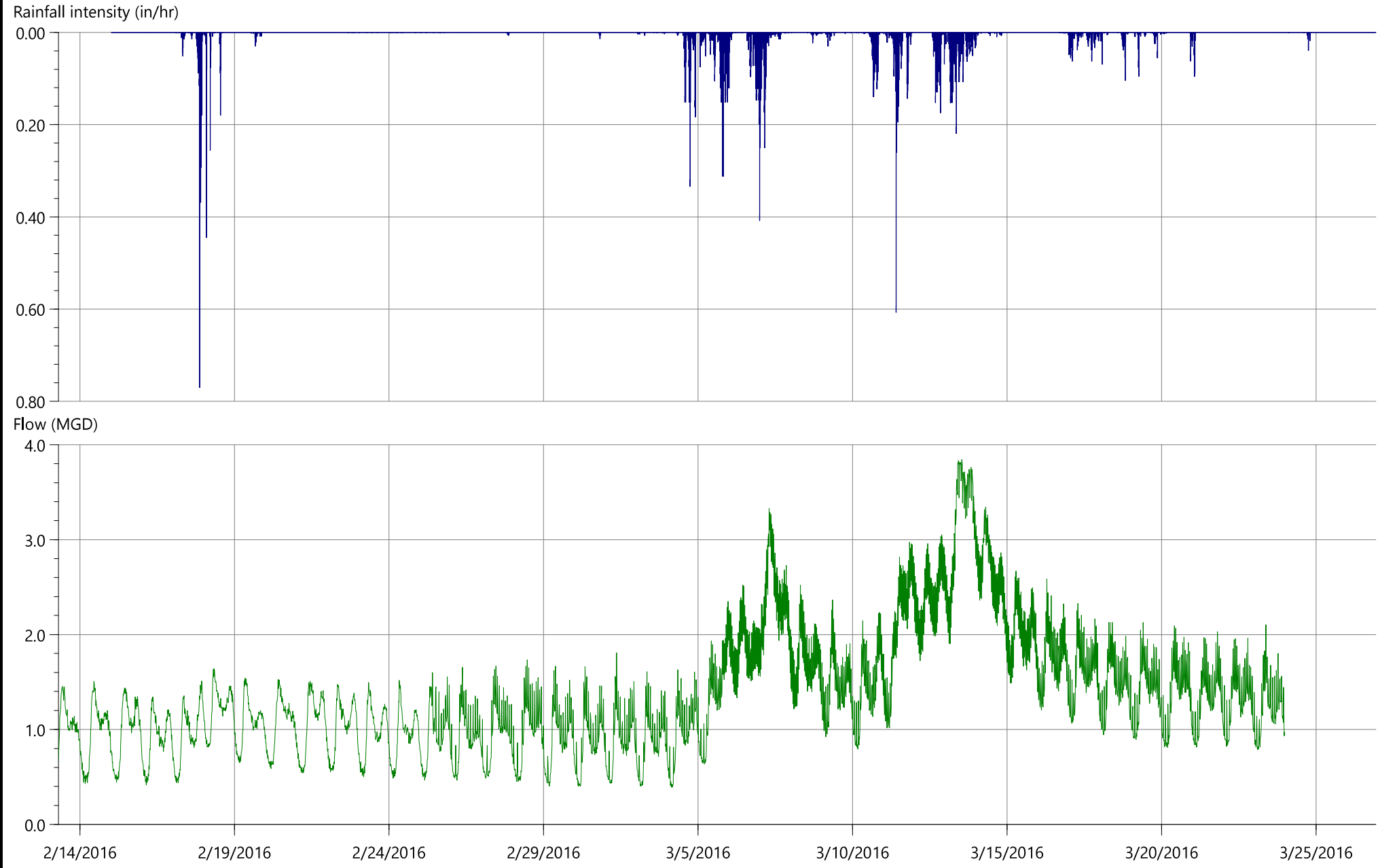
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.479	0.498	0.008			
Observed				0.003	0.748	1268714.090
...ta20160215_20160315				0.000	0.681	104826.425

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) Sierra College (Placer County), Model Location (Pred.) D/S Sierra College.1, Rainfall Profile: 289



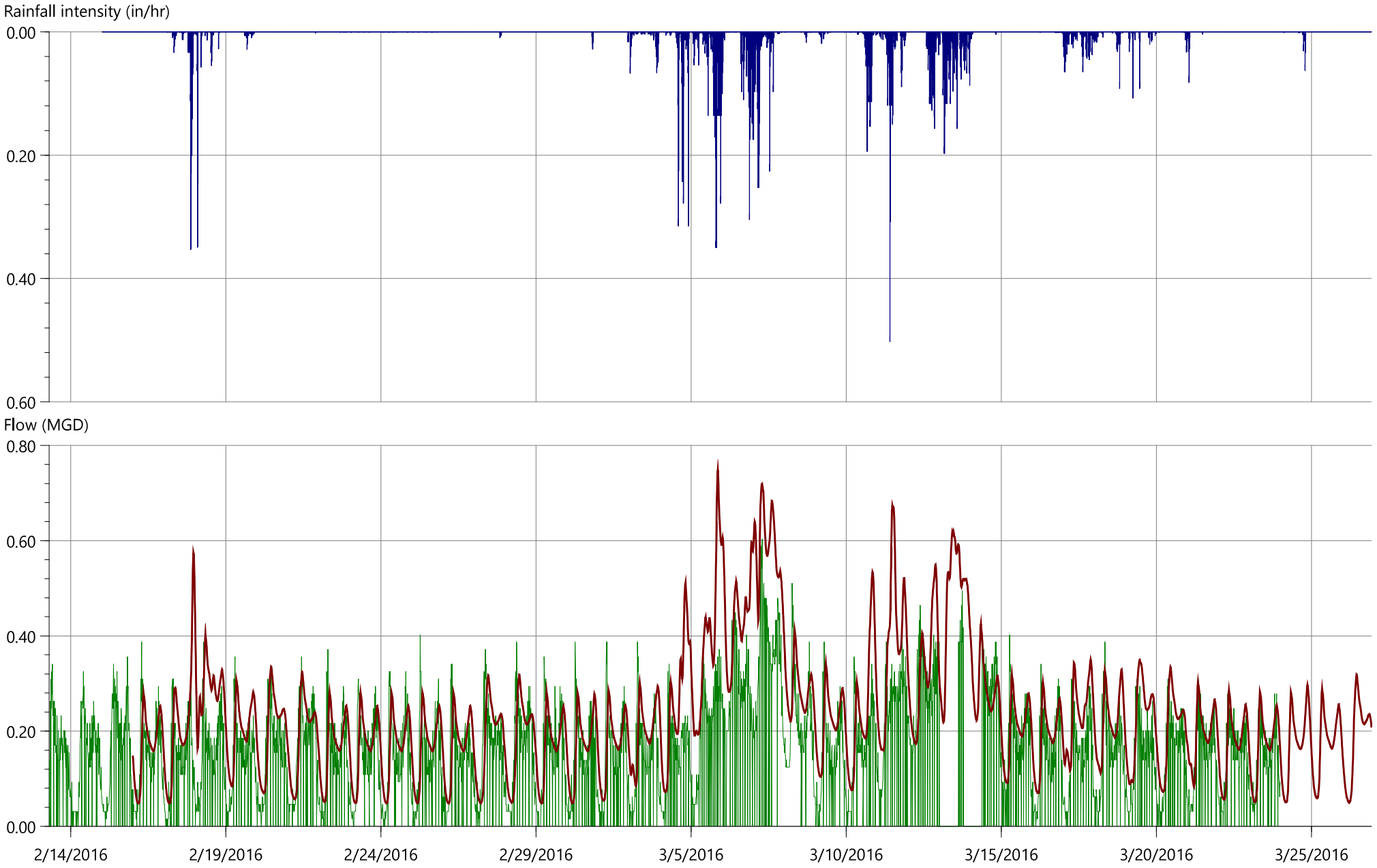
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.146	0.460	0.007			
Observed				0.000	4.589	7230337.020
...ta20160215_20160315						

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) SMD2, Model Location (Pred.) D/S SMH A08-023.1, Rainfall Profile: 157



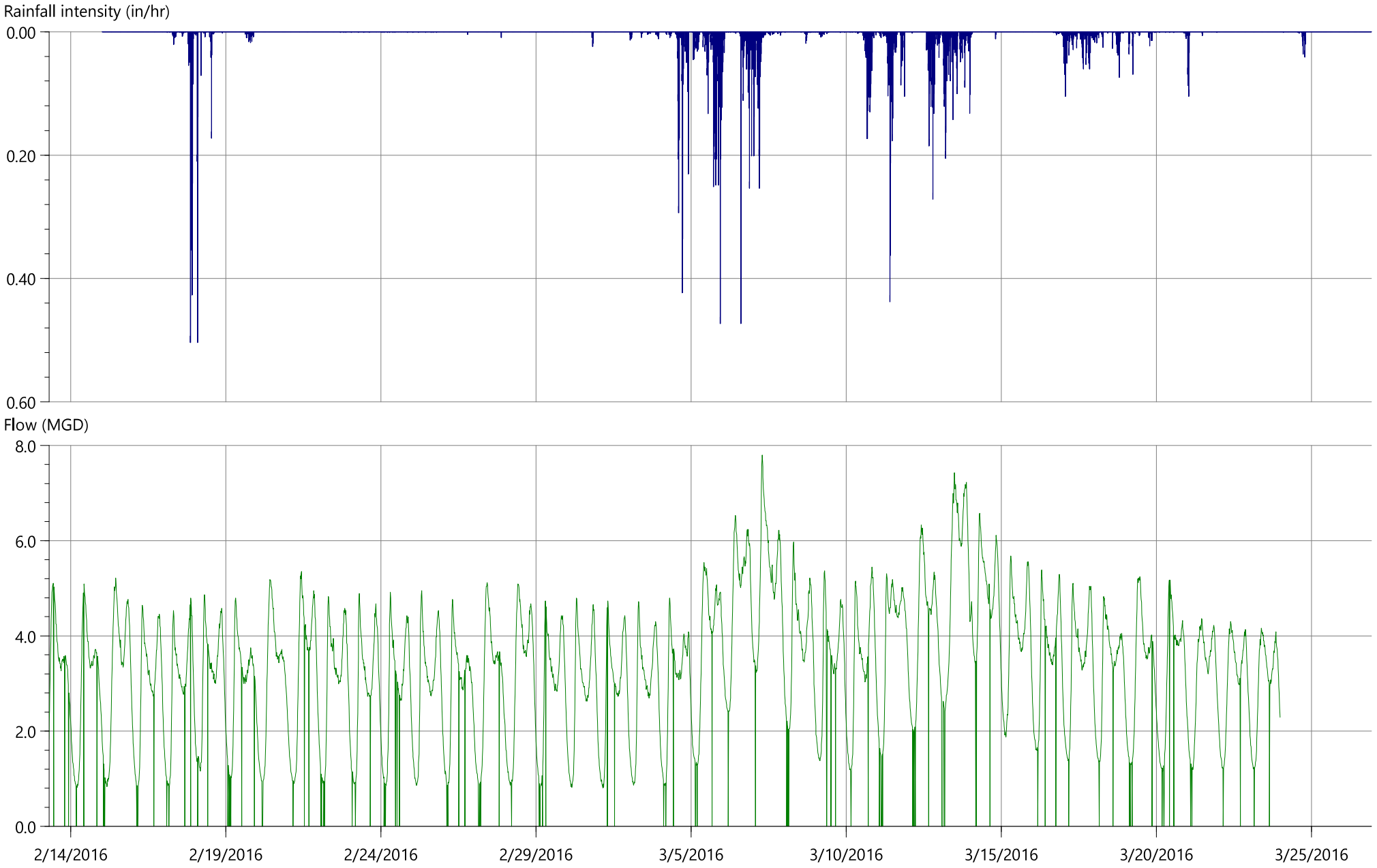
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.706	0.770	0.008			
Observed				0.391	3.843	4692173.351
...ta20160215_20160315						

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) Highlands, Model Location (Pred.) D/S SMH D08-006.1, Rainfall Profile: 318



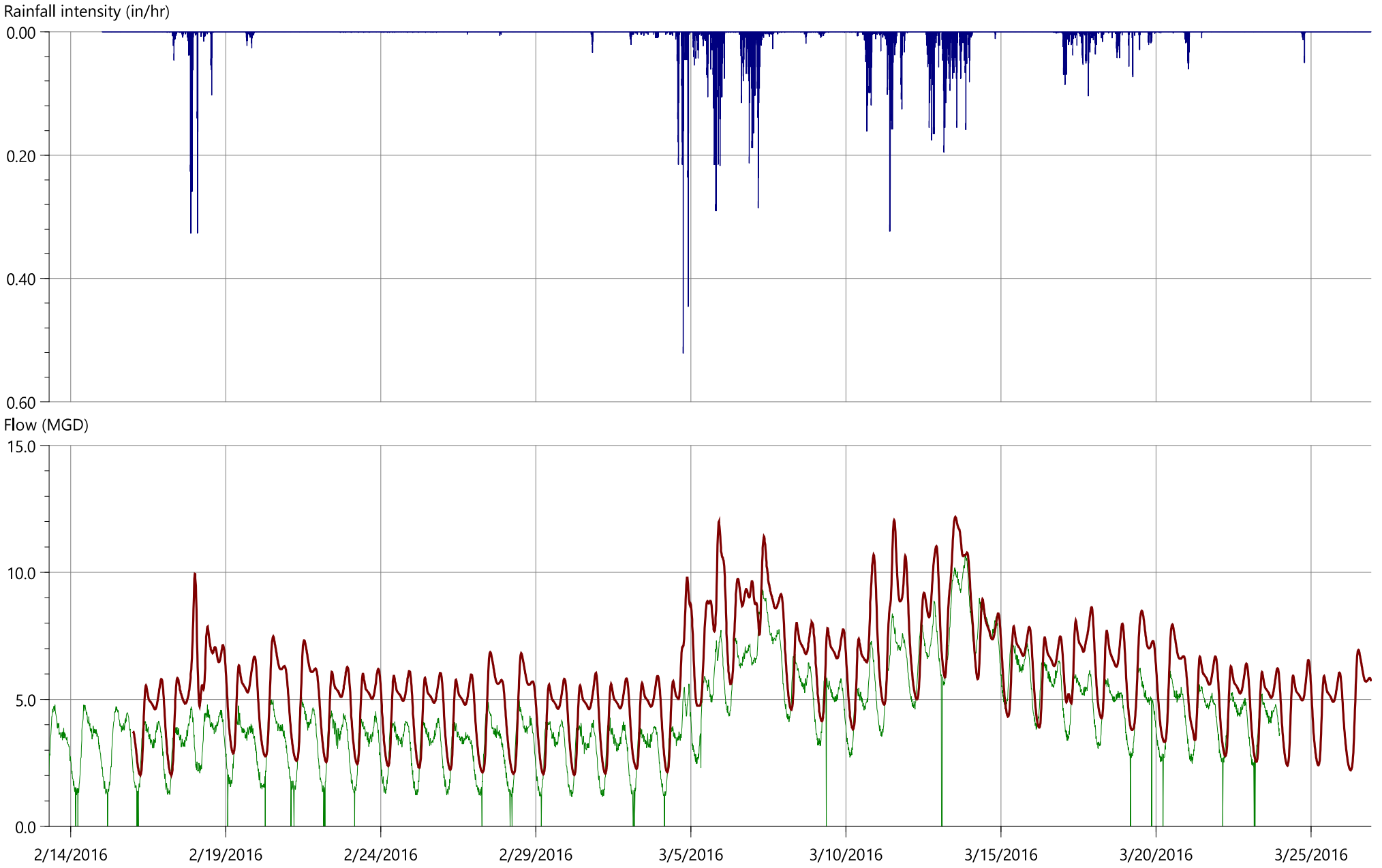
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.486	0.502	0.008			
Observed				0.000	0.603	498513.323
...ta20160215_20160315				0.048	0.748	814212.771

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) North Roseville, Model Location (Pred.) D/S NorthRoseville.1, Rainfall Profile: 479



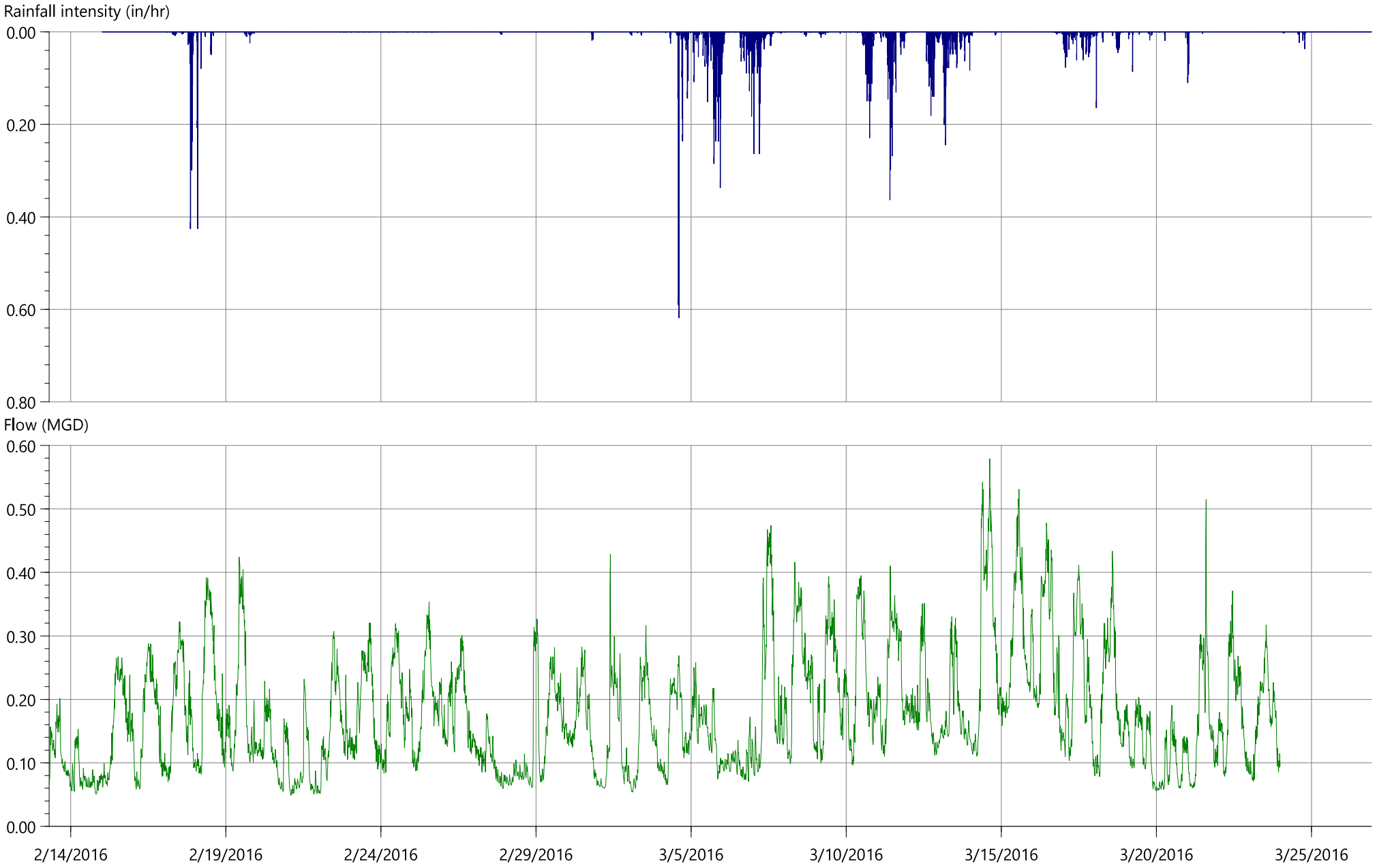
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.580	0.504	0.008			
Observed				0.000	7.798	11333261.397
...ta20160215_20160315						

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) Springview, Model Location (Pred.) D/S SMH C06-213.1, Rainfall Profile: 418



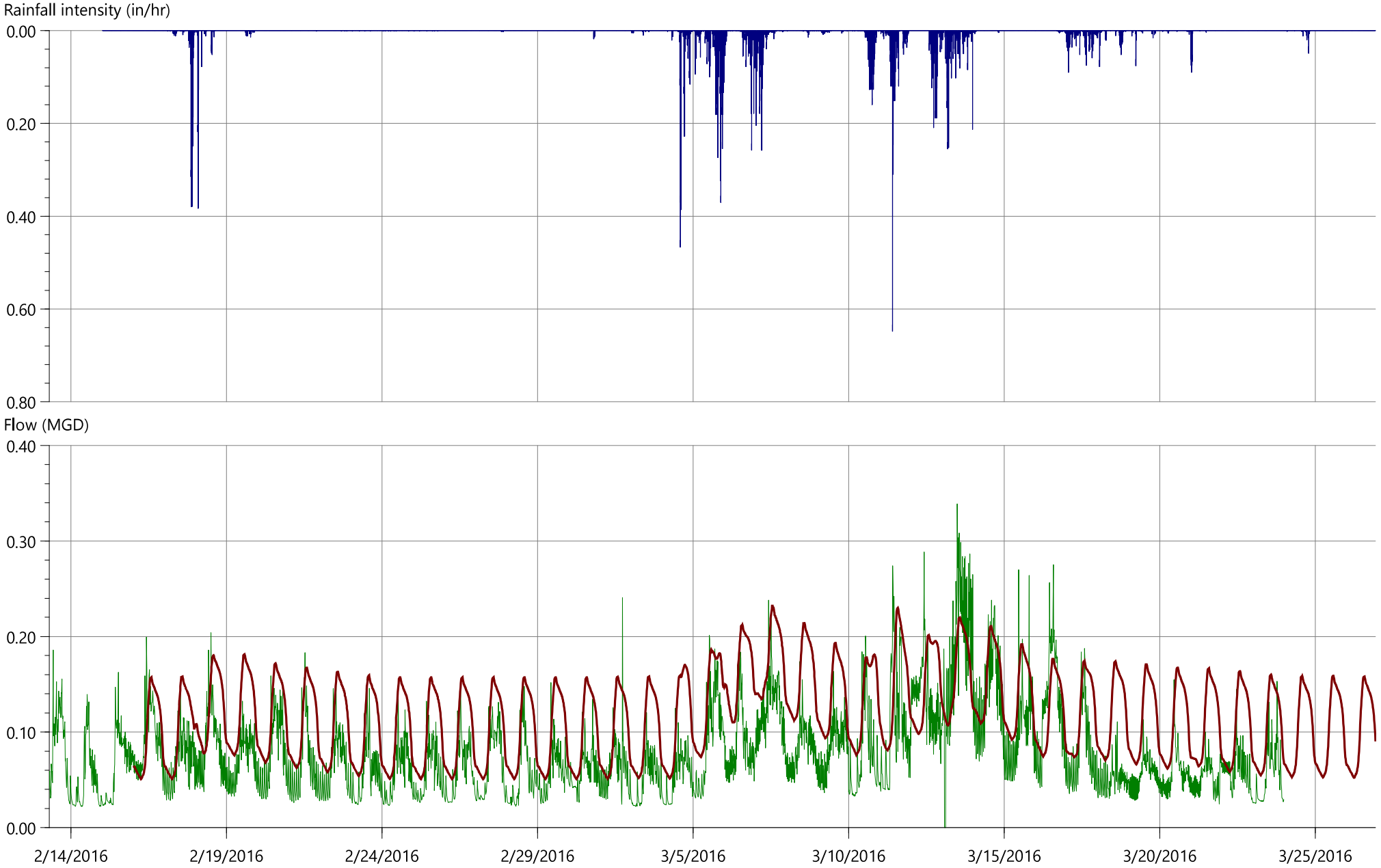
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.461	0.521	0.008			
Observed				0.000	10.738	14884868.215
...ta20160215_20160315				2.010	12.195	20206568.688

Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) Cincinnati, Model Location (Pred.) D/S SMH G03-032.1, Rainfall Profile: 441



	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.365	0.618	0.007			
Observed				0.049	0.579	607274.558
...ta20160215_20160315						

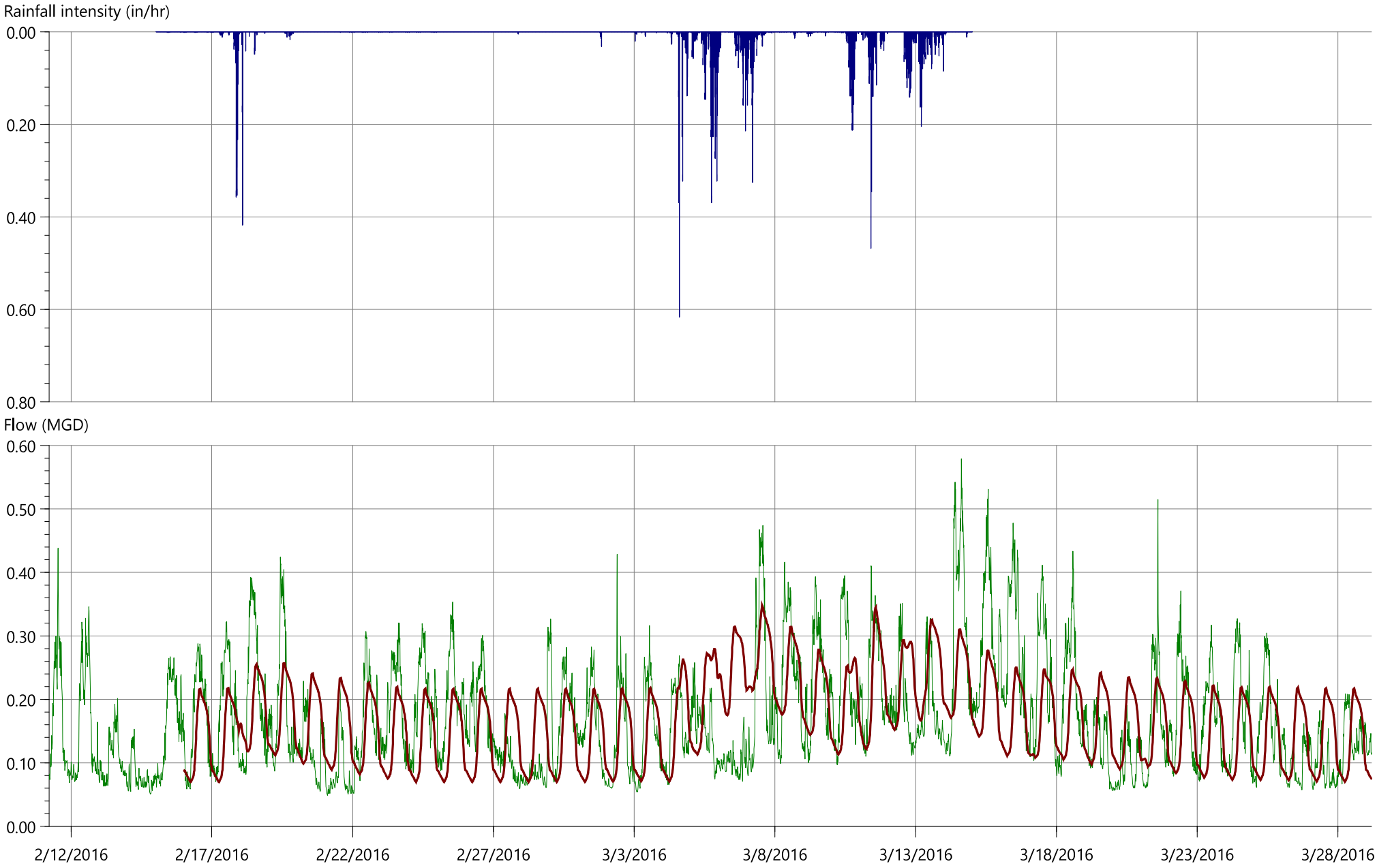
Flow survey: >Roseville>3. Data>Flow Data>Flow survey - All data (12/1/2016 1:53:11 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315 (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) Industrial, Model Location (Pred.) D/S SMH G03-062.1, Rainfall Profile: 475



	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	7.576	0.648	0.008			
Observed				0.000	0.339	266882.195
...ta20160215_20160315				0.051	0.232	407592.659

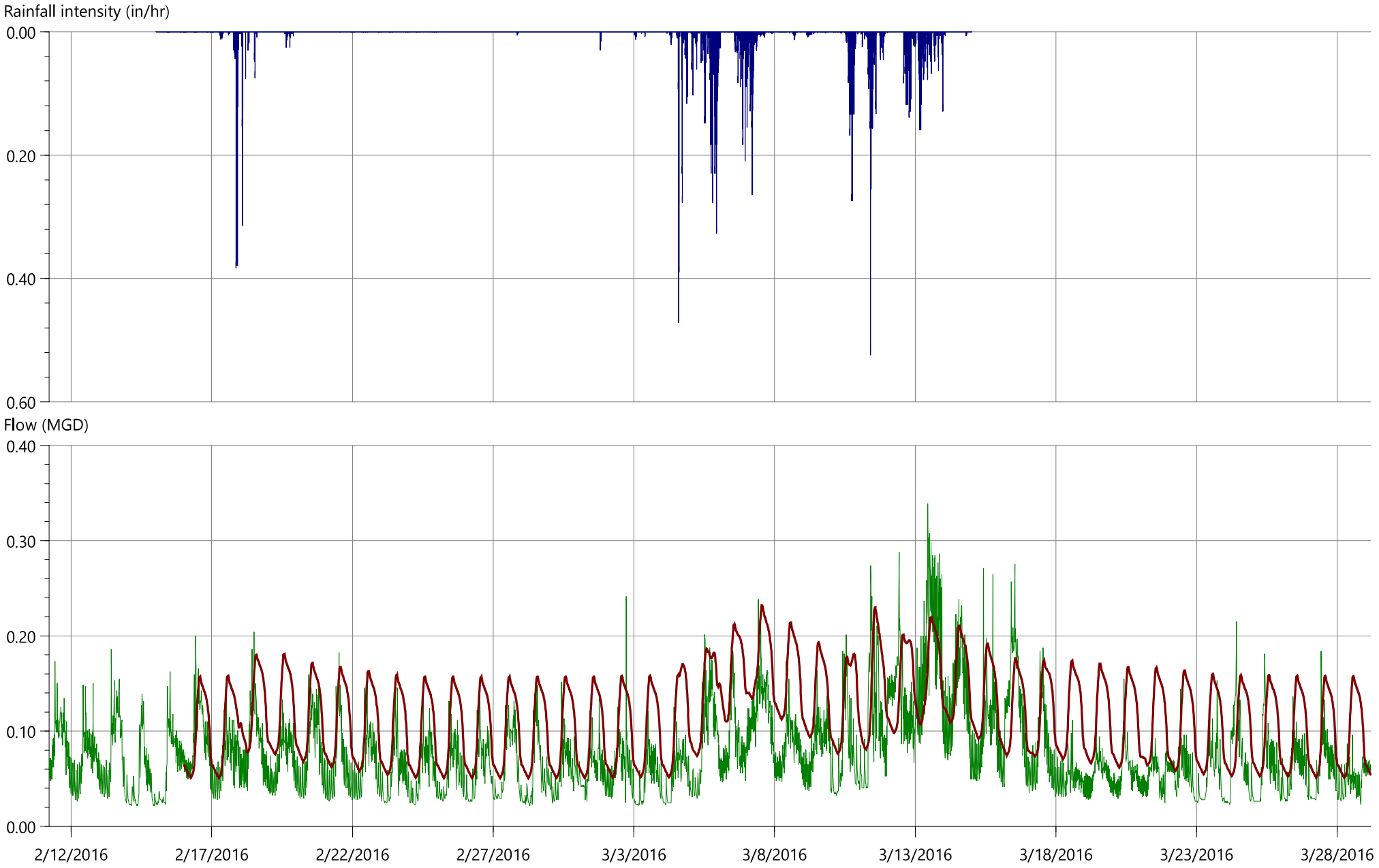
Flow survey: >Roseville>3. Data>Flow Data>Permanent Meter Data (12/1/2016 10:54:47 AM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315_RGBoundaries (11/6/2019 11:21:22 AM)

Flow Survey Location (Obs.) Cincinnati, Model Location (Pred.) D/S CA4-RSVL28.1, Rainfall Profile: 408



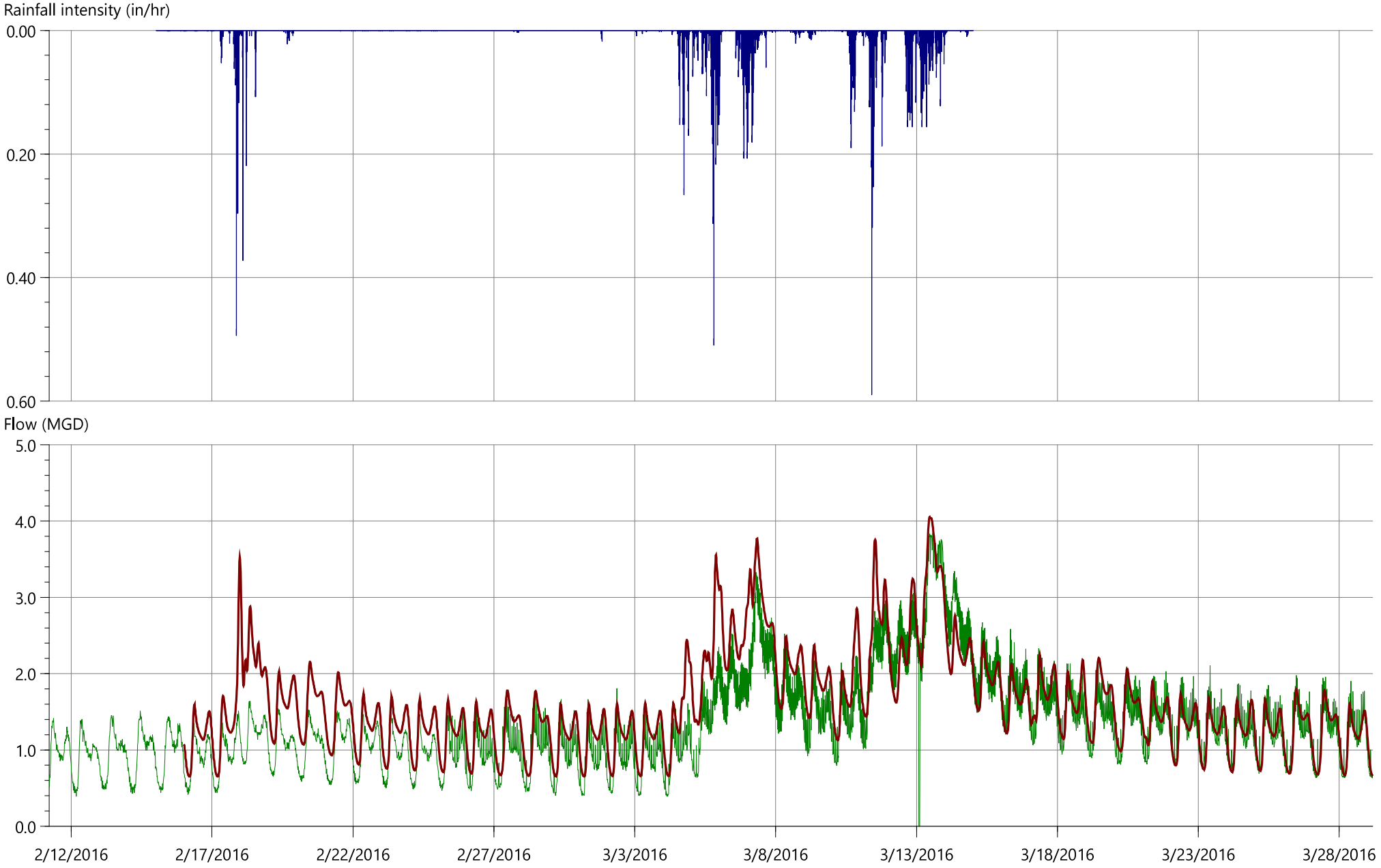
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.438	0.617	0.009			
Observed				0.049	0.579	695745.611
...160315_RGBoundaries				0.069	0.348	611280.586

Flow survey: >Roseville>3. Data>Flow Data>Permanent Meter Data (12/1/2016 10:54:47 AM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315_RGBoundaries (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) Industrial, Model Location (Pred.) D/S SMH G03-062.1, Rainfall Profile: 442



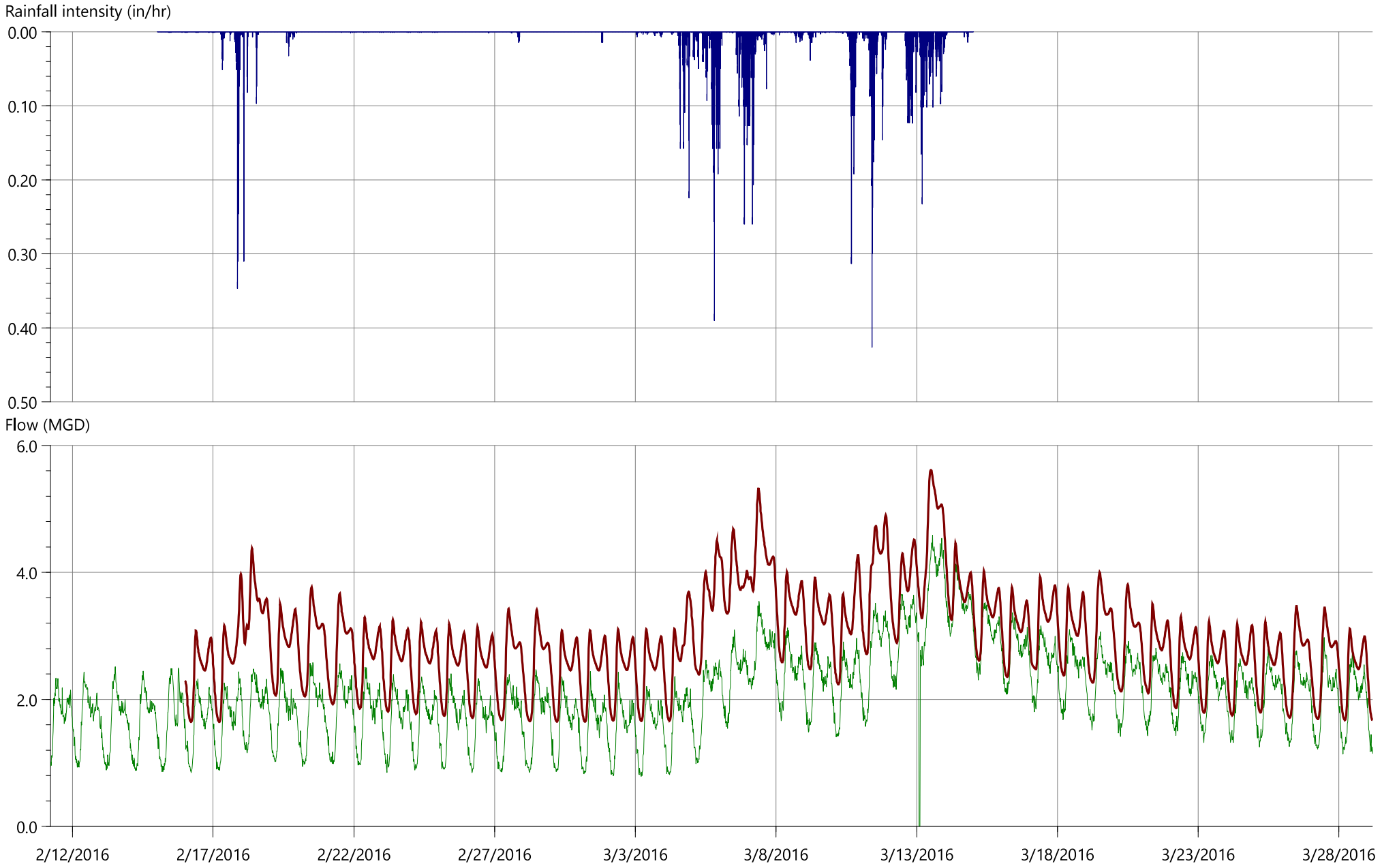
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.635	0.524	0.010			
Observed				0.022	0.339	307302.659
...160315_RGBoundaries				0.051	0.232	426162.383

Flow survey: >Roseville>3. Data>Flow Data>Permanent Meter Data (12/1/2016 10:54:47 AM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315_RGBoundaries (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) SMD2, Model Location (Pred.) D/S A10-03.1, Rainfall Profile: 121



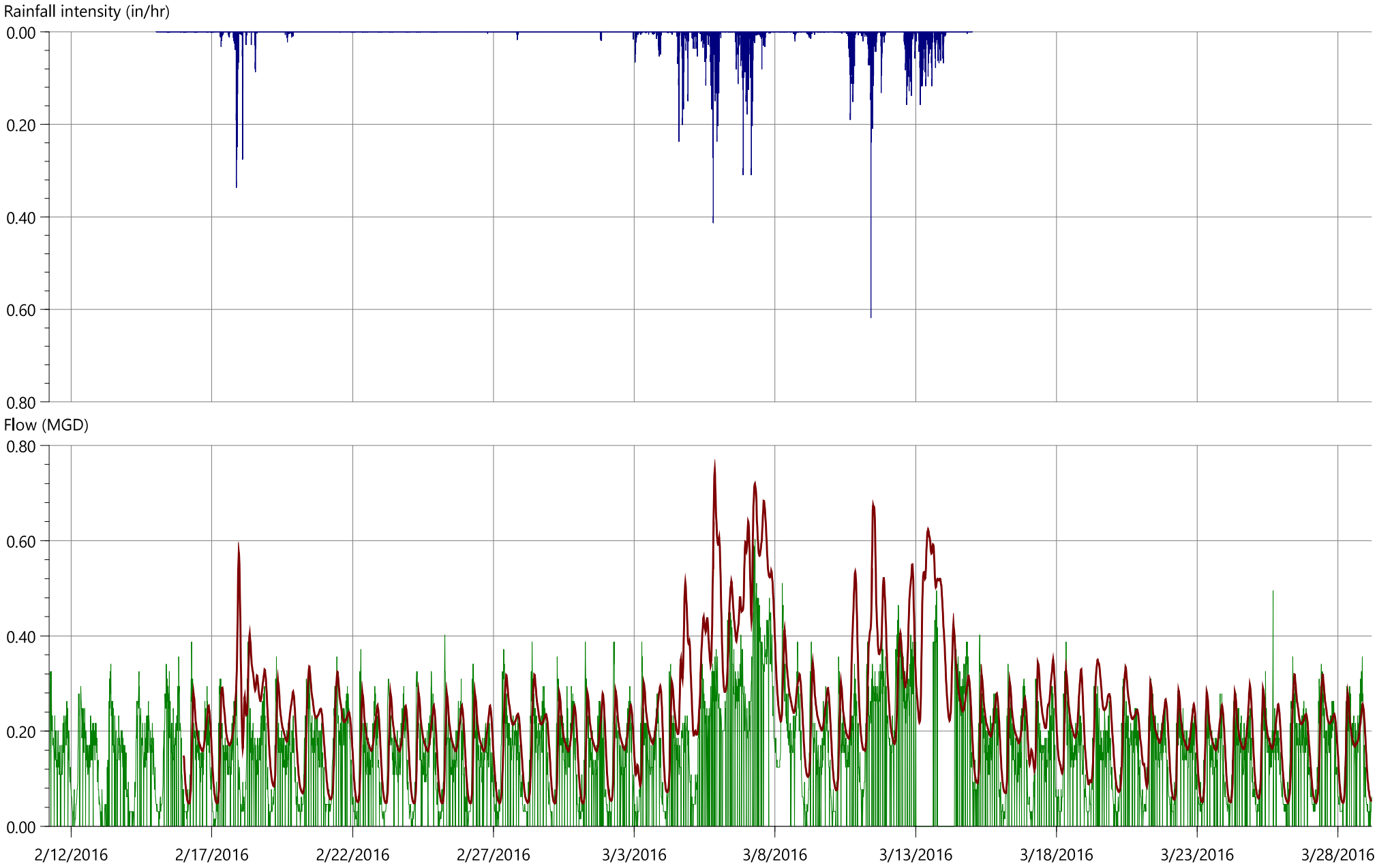
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.898	0.590	0.010			
Observed				0.000	3.843	5383819.870
...160315_RGBoundaries				0.651	4.053	5913576.081

Flow survey: >Roseville>3. Data>Flow Data>Permanent Meter Data (12/1/2016 10:54:47 AM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315_RGBoundaries (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) Sierra College/StrapRav, Model Location (Pred.) D/S SMH B08-040.1, Rainfall Profile: 186



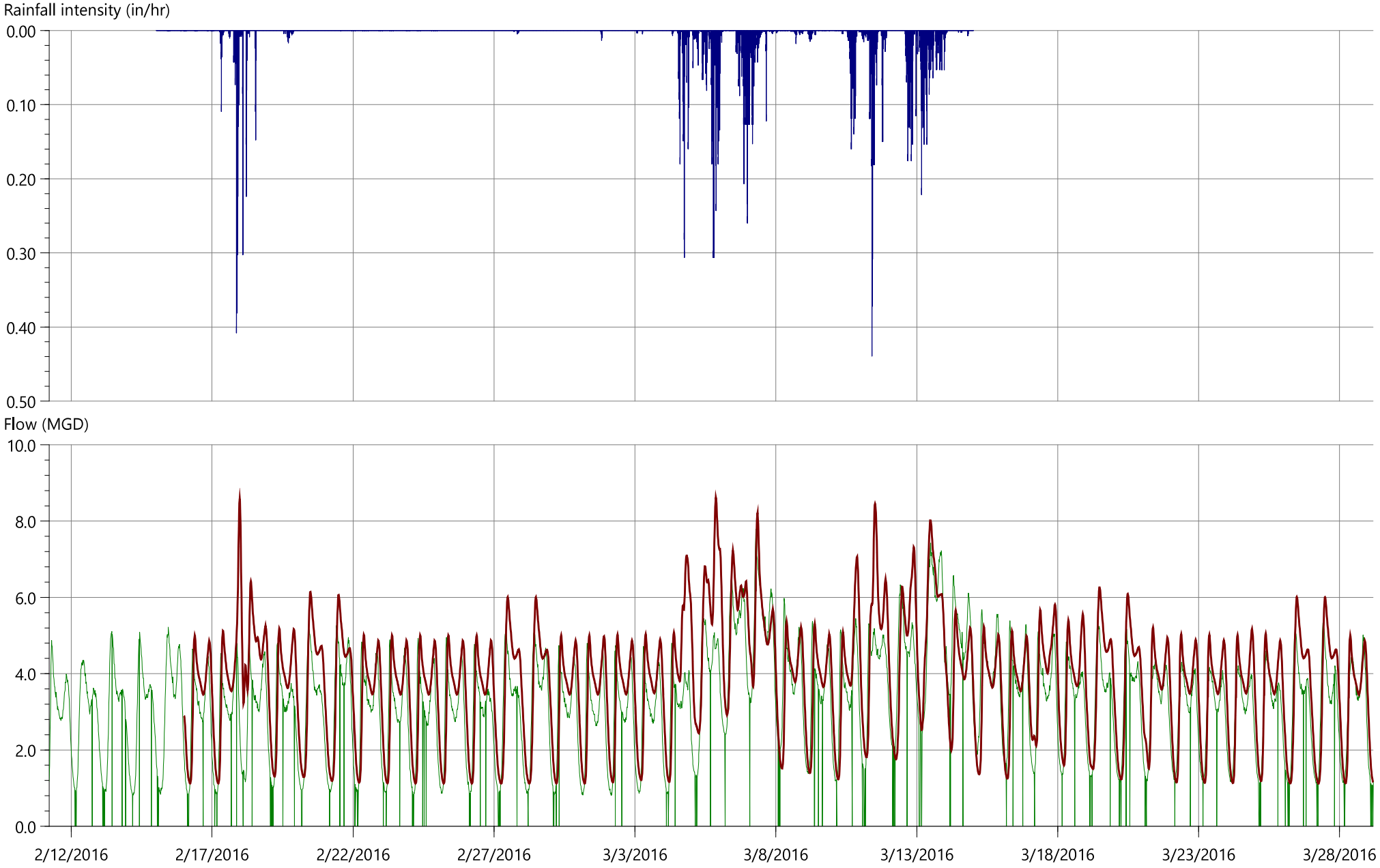
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.450	0.426	0.009			
Observed				0.000	4.589	8440619.727
...160315_RGBoundaries				1.646	5.613	10844812.901

Flow survey: >Roseville>3. Data>Flow Data>Permanent Meter Data (12/1/2016 10:54:47 AM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315_RGBoundaries (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) Highlands, Model Location (Pred.) D/S SMH D08-006.1, Rainfall Profile: 285



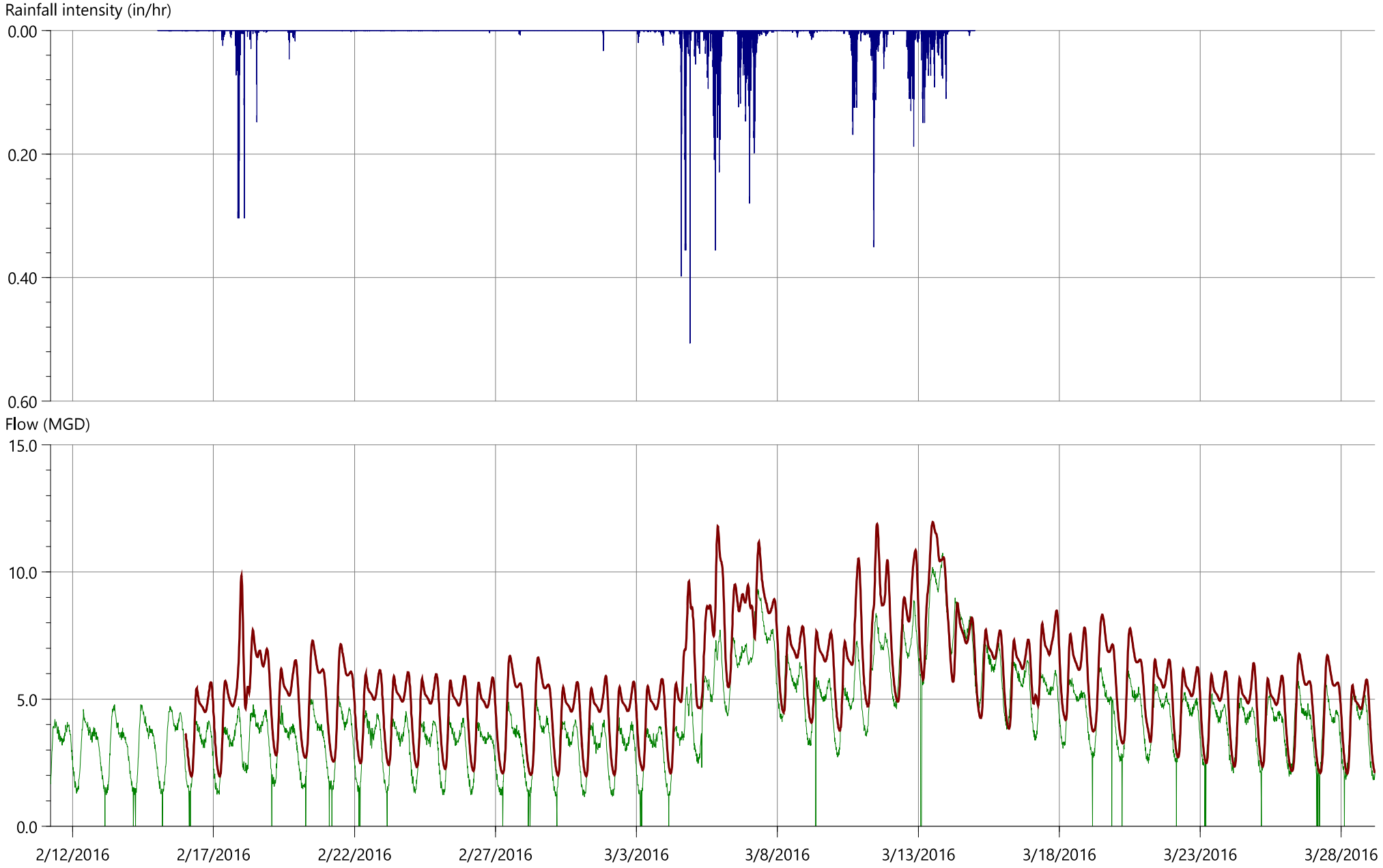
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.502	0.618	0.009			
Observed				0.000	0.603	582182.933
...160315_RGBoundaries				0.048	0.748	847296.033

Flow survey: >Roseville>3. Data>Flow Data>Permanent Meter Data (12/1/2016 10:54:47 AM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315_RGBoundaries (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) North Roseville/PG, Model Location (Pred.) D/S RSVL-001.1, Rainfall Profile: 410



	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.973	0.439	0.010			
Observed				0.000	7.798	13146868.221
...160315_RGBoundaries				1.119	8.612	14109574.857

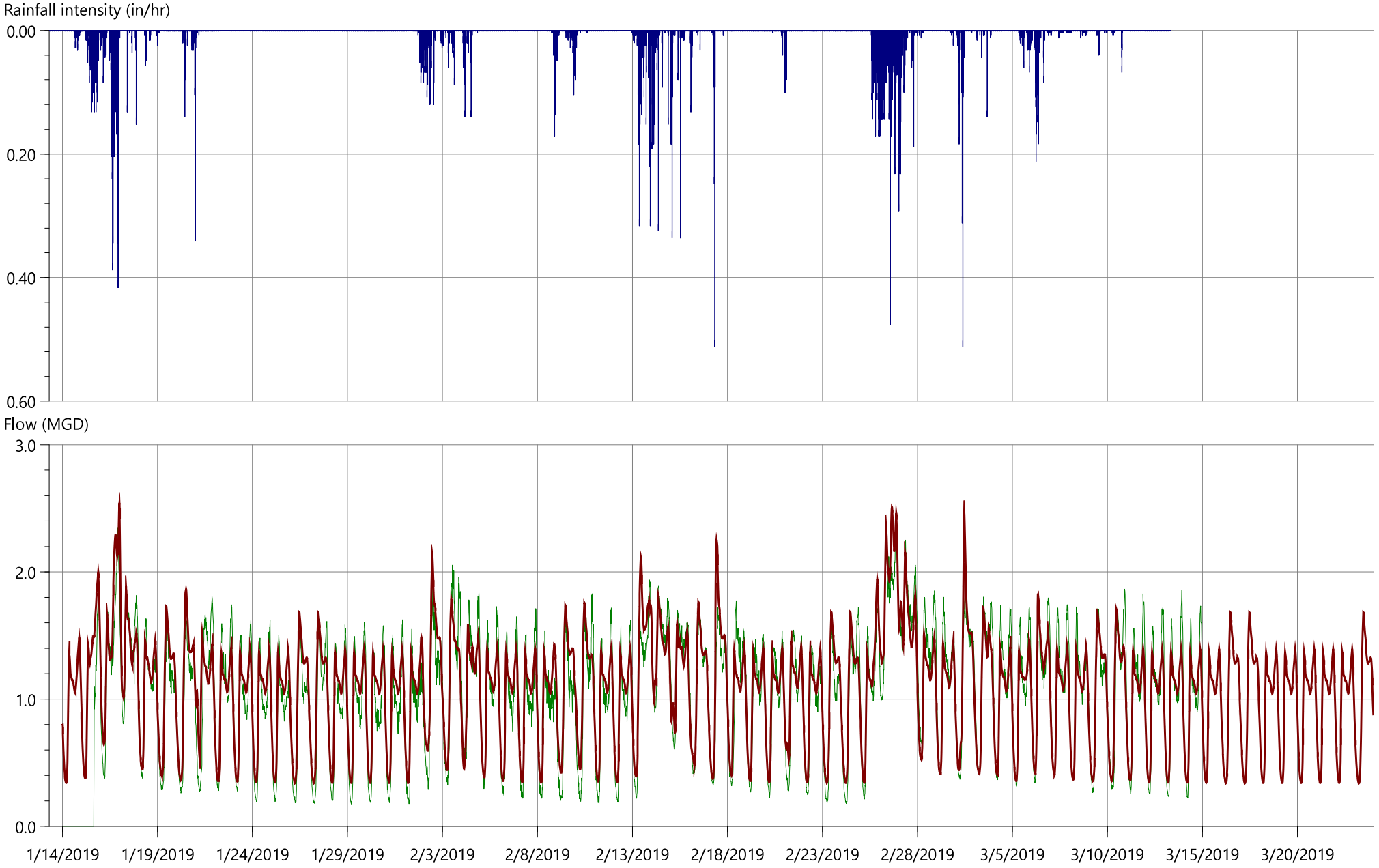
Flow survey: >Roseville>3. Data>Flow Data>Permanent Meter Data (12/1/2016 10:54:47 AM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2016 rainfall)!!>OneRainData20160215_20160315_RGBoundaries (11/6/2019 11:21:22 AM)
Flow Survey Location (Obs.) Springview/DC, Model Location (Pred.) D/S H07-168.1, Rainfall Profile: 315



	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	6.280	0.506	0.009			
Observed				0.000	10.738	17143559.755
...160315_RGBoundaries				1.960	11.958	20629240.945

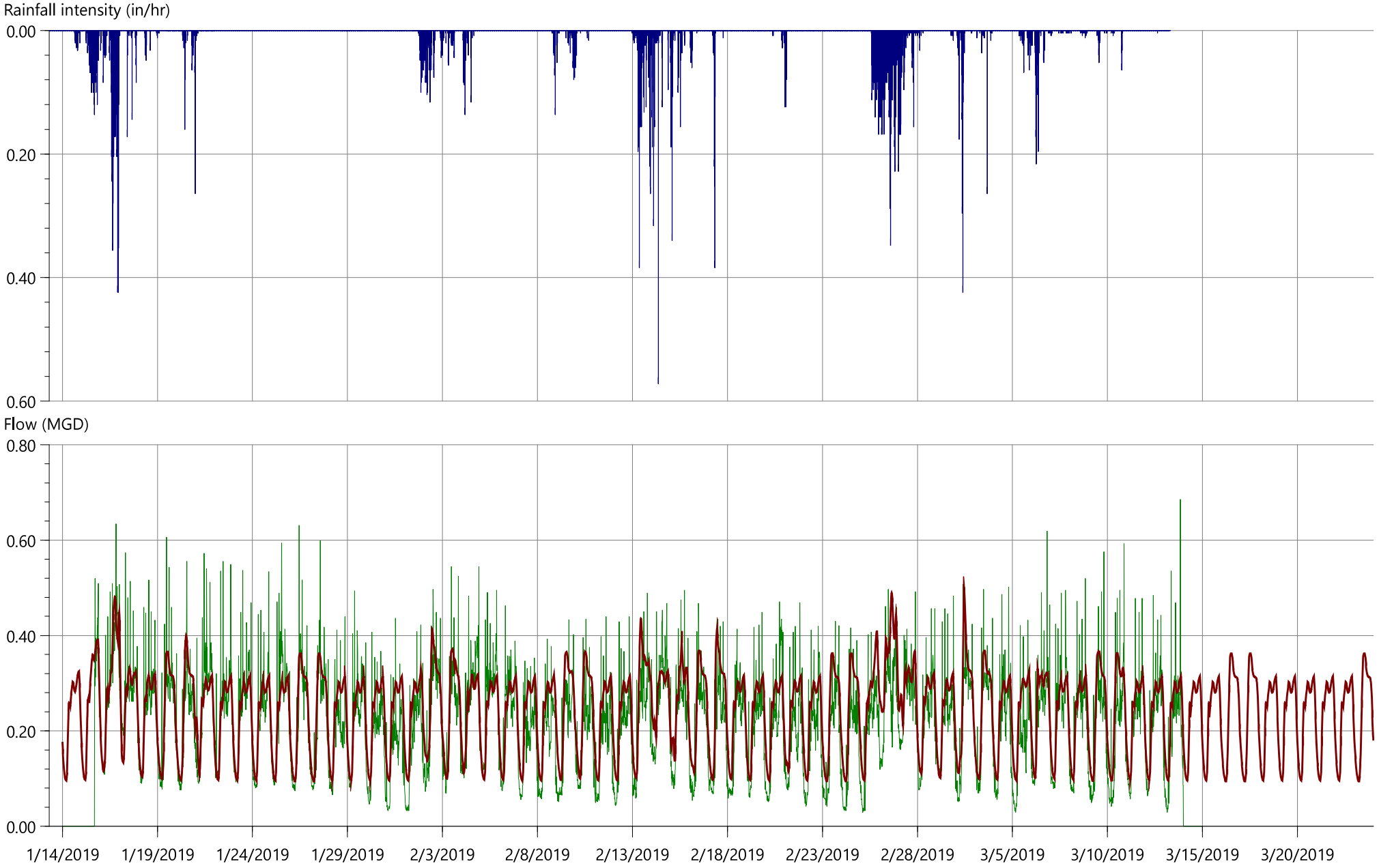
Flow survey: >SPWA>3. Data>Flow Data>Temp Flow Meter Data Jan01-Mar31 (April 16 2019) (2/11/2019 8:55:41 AM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2019 10 01)>OneRainData20190113_20190313 (11/6/2019 11:14:10 AM)

Flow Survey Location (Obs.) SIte 151, Model Location (Pred.) D/S L02-001.1, Rainfall Profile: 443



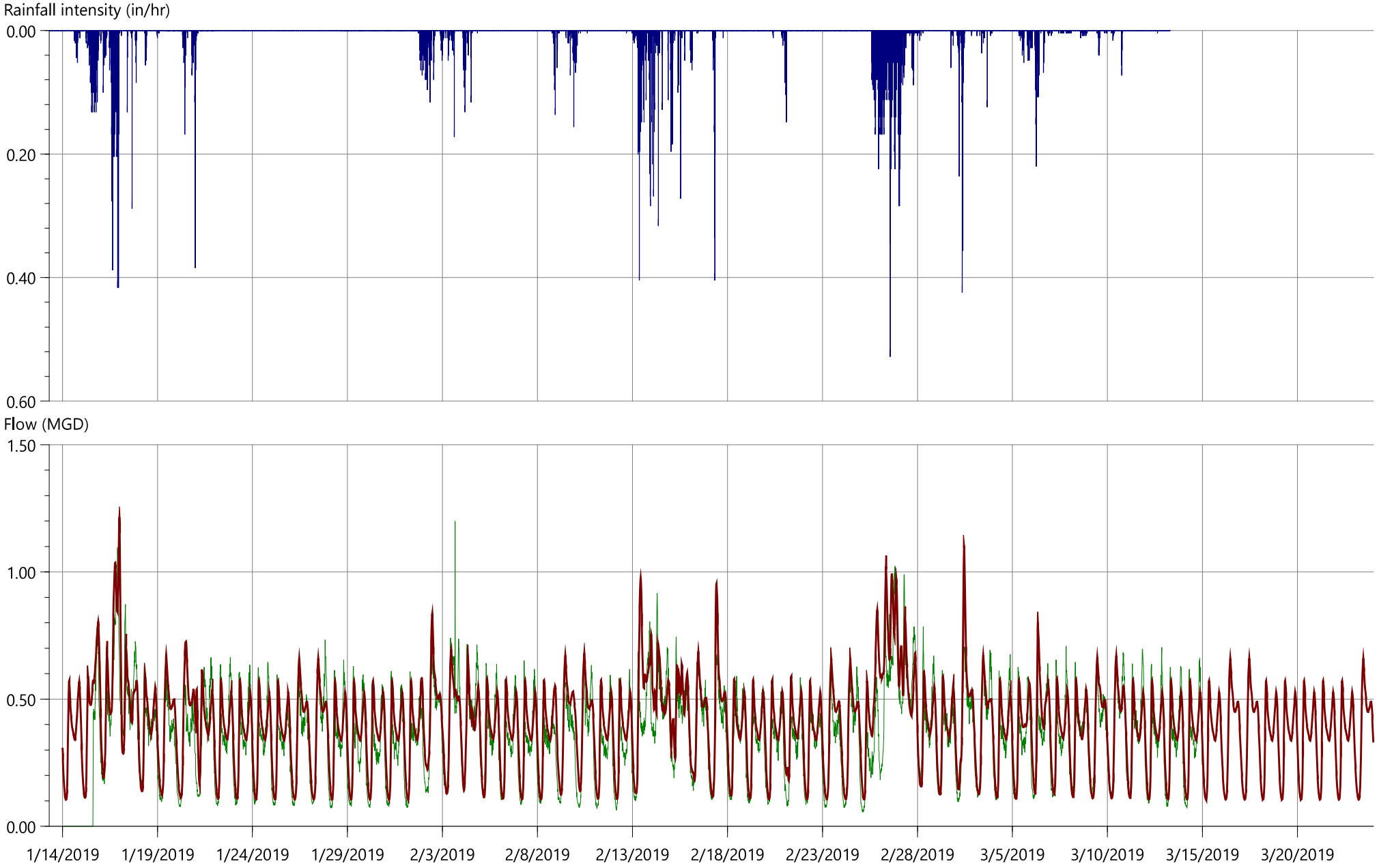
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	13.630	0.512	0.010			
Observed				0.000	2.474	5395503.465
...ta20190113_20190313				0.337	2.542	6508637.228

Flow survey: >SPWA>3. Data>Flow Data>Temp Flow Meter Data Jan01-Mar31 (April 16 2019) (2/11/2019 8:55:41 AM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2019 10 01)>OneRainData20190113_20190313 (11/6/2019 11:14:10 AM)
Flow Survey Location (Obs.) Site 152, Model Location (Pred.) D/S K02-005.1, Rainfall Profile: 410



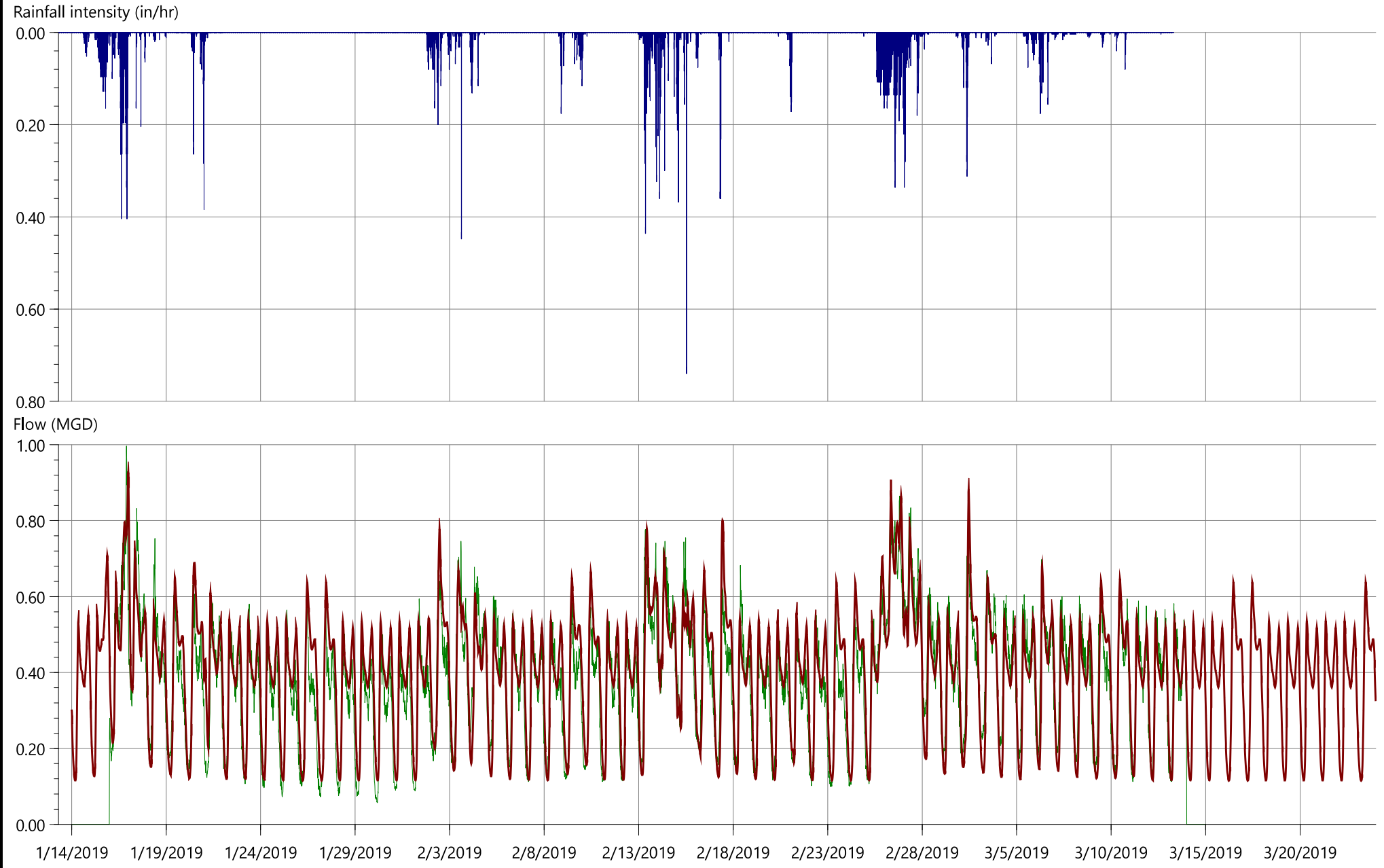
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	13.411	0.572	0.009			
Observed				0.000	0.685	1076804.266
...ta20190113_20190313				0.094	0.501	1458697.862

Flow survey: >SPWA>3. Data>Flow Data>Temp Flow Meter Data Jan01-Mar31 (April 16 2019) (2/11/2019 8:55:41 AM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2019 10 01)>OneRainData20190113_20190313 (11/6/2019 11:14:10 AM)
Flow Survey Location (Obs.) Site 153, Model Location (Pred.) D/S L03-014.1, Rainfall Profile: 411



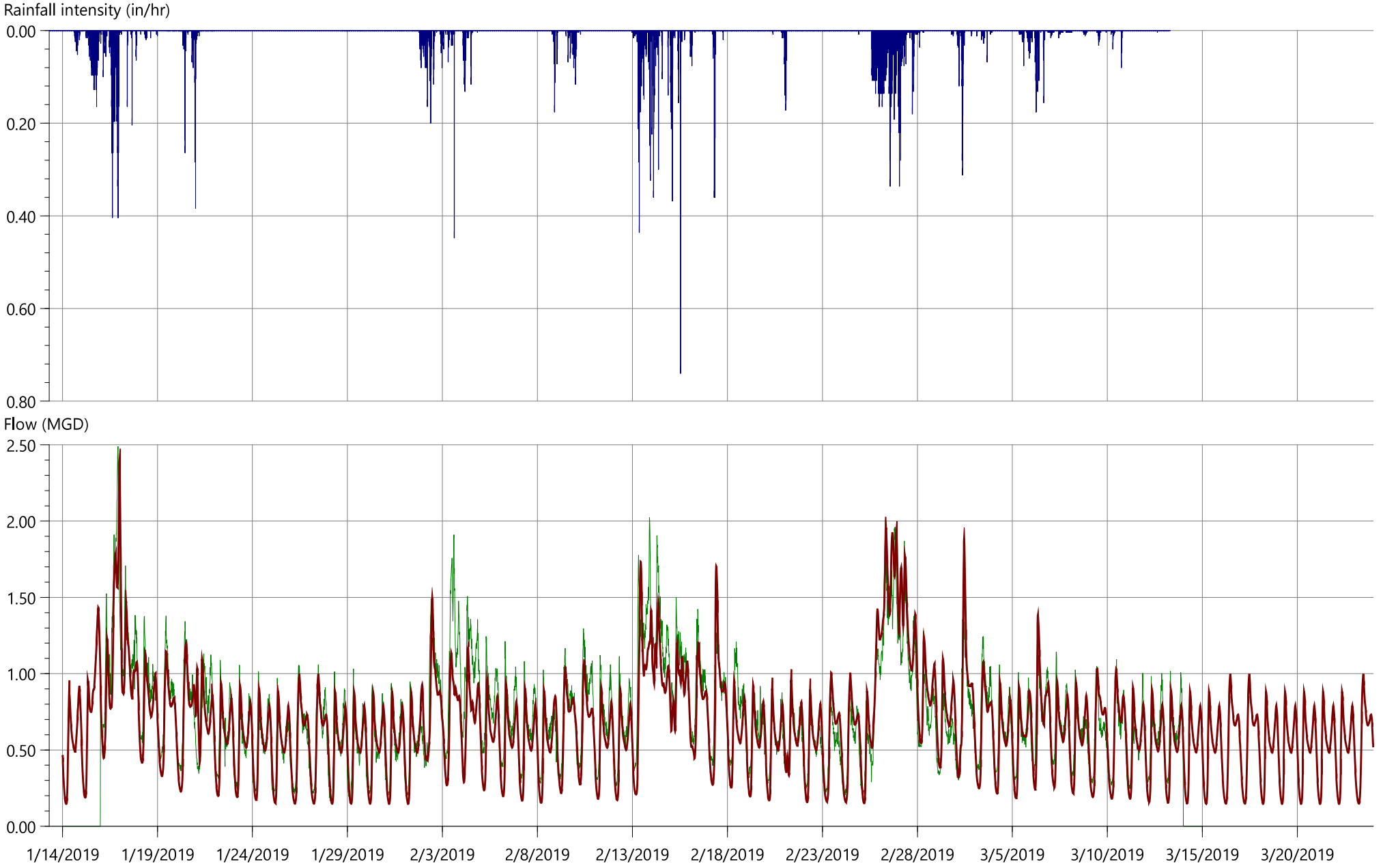
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	13.898	0.528	0.010			
Observed				0.000	1.199	1862998.190
...ta20190113_20190313				0.105	1.214	2386062.923

Flow survey: >SPWA>3. Data>Flow Data>Temp Flow Meter Data Jan01-Mar31 (April 16 2019) (2/11/2019 8:55:41 AM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2019 10 01)>OneRainData20190113_20190313 (11/6/2019 11:14:10 AM)
Flow Survey Location (Obs.) Site 154, Model Location (Pred.) D/S M06-004.1, Rainfall Profile: 446



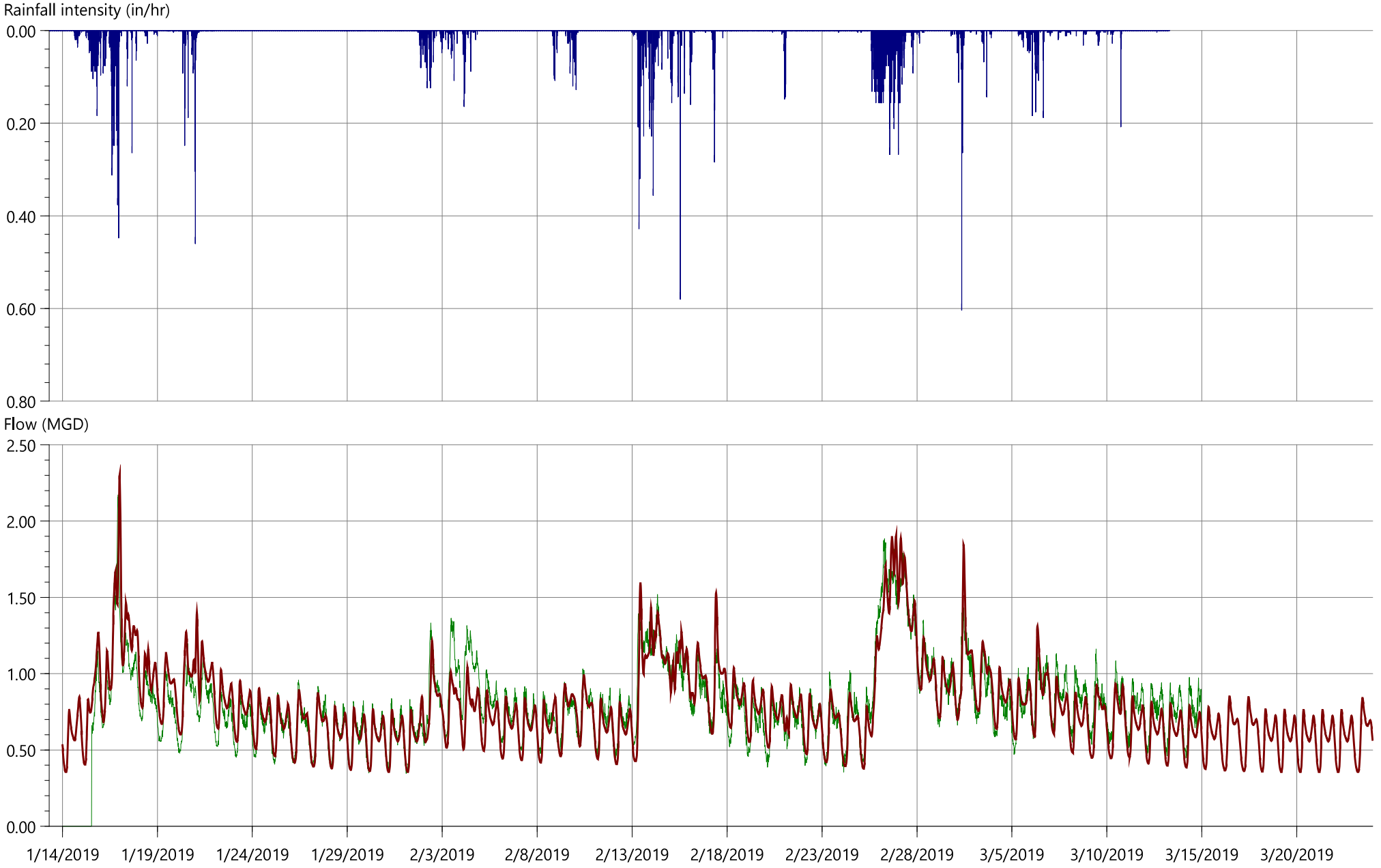
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	14.389	0.740	0.010			
Observed				0.000	0.996	1886813.424
...ta20190113_20190313				0.115	0.927	2363415.830

Flow survey: >SPWA>3. Data>Flow Data>Temp Flow Meter Data Jan01-Mar31 (April 16 2019) (2/11/2019 8:55:41 AM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2019 10 01)>OneRainData20190113_20190313 (11/6/2019 11:14:10 AM)
Flow Survey Location (Obs.) Site 155, Model Location (Pred.) D/S M06-019.1, Rainfall Profile: 446



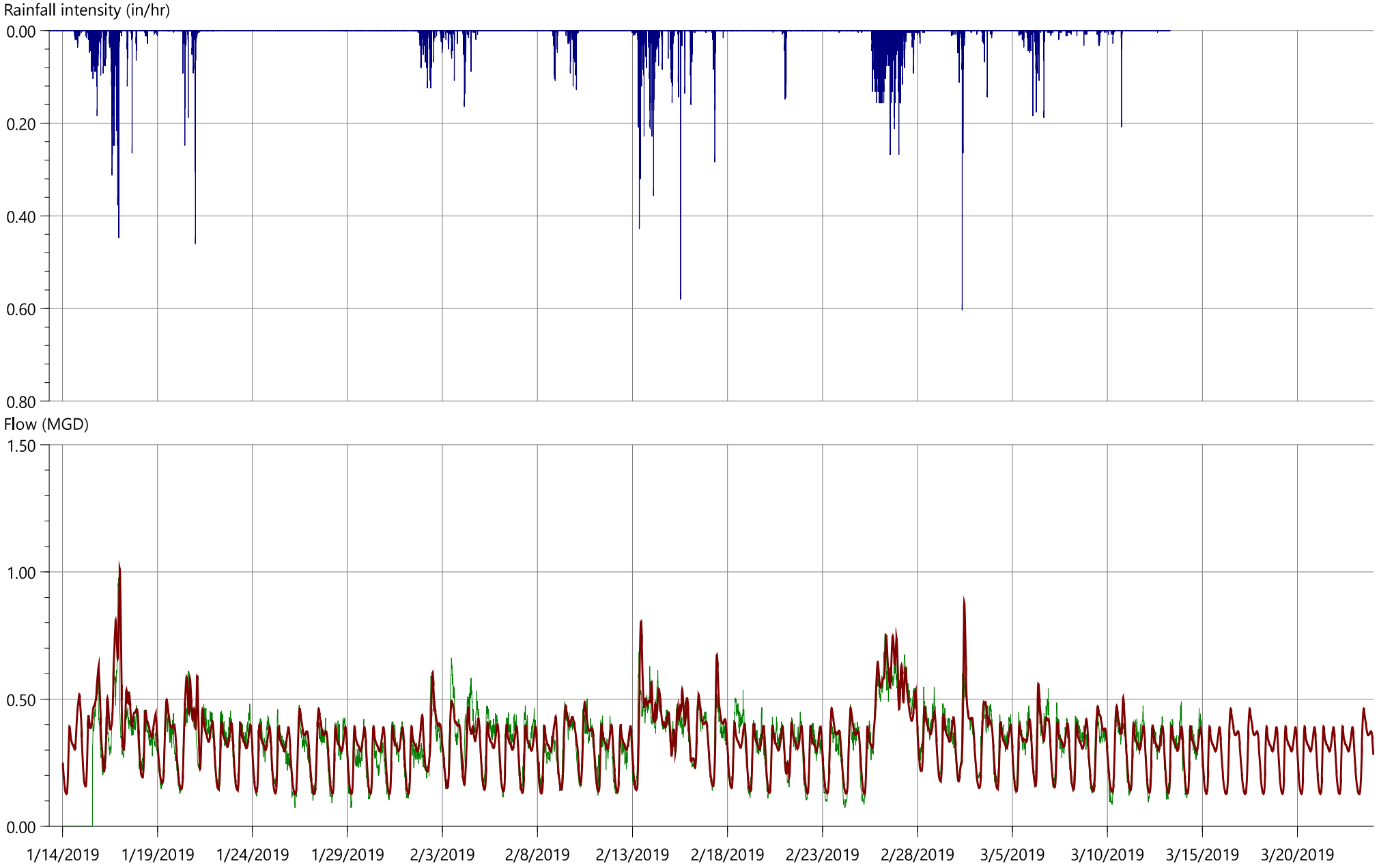
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	14.389	0.740	0.010			
Observed				0.000	2.488	3621783.843
...ta20190113_20190313				0.148	2.402	3981049.716

Flow survey: >SPWA>3. Data>Flow Data>Temp Flow Meter Data Jan01-Mar31 (April 16 2019) (2/11/2019 8:55:41 AM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2019 10 01)>OneRainData20190113_20190313 (11/6/2019 11:14:10 AM)
Flow Survey Location (Obs.) Site 156, Model Location (Pred.) D/S J07-058.1, Rainfall Profile: 382



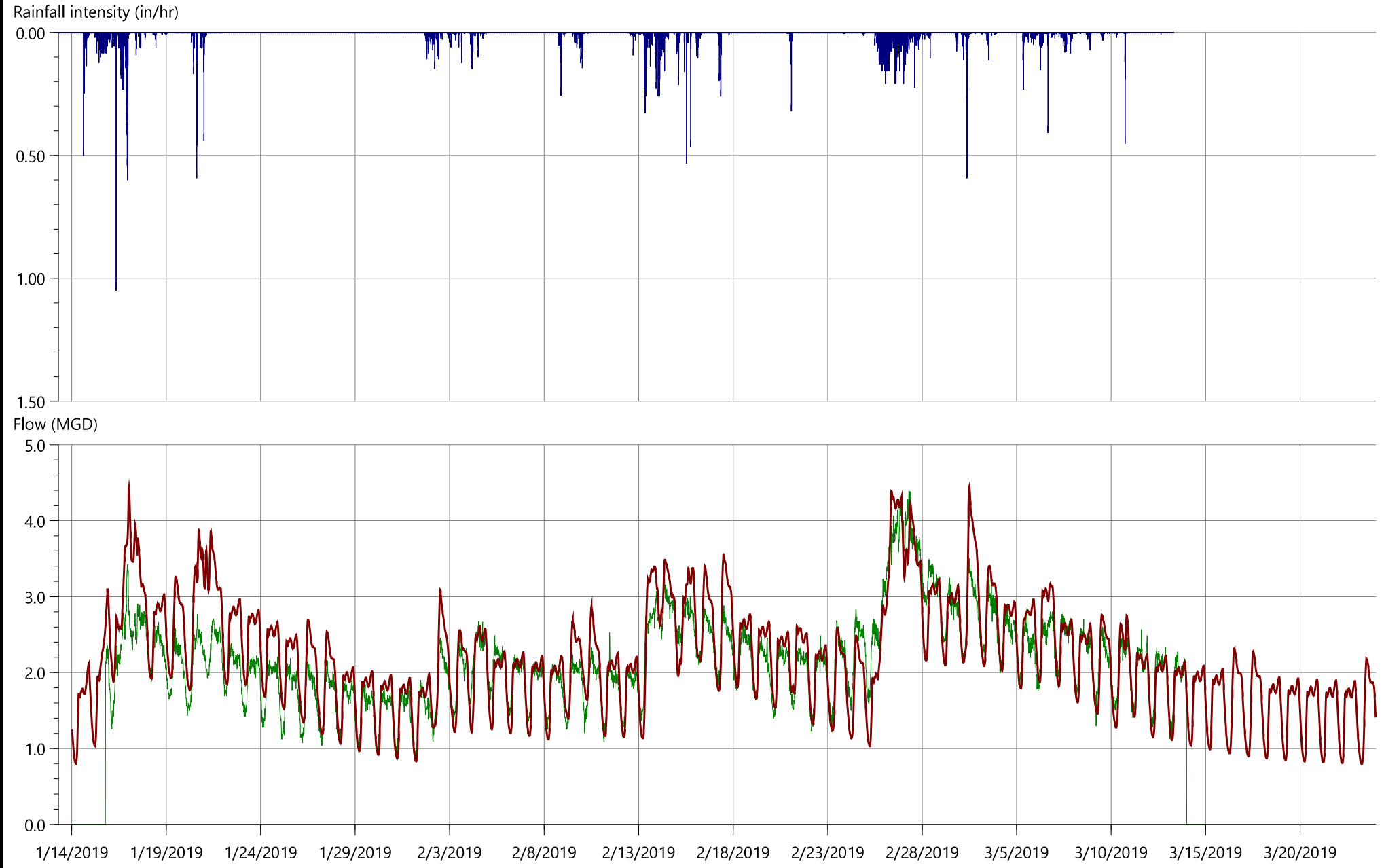
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	13.556	0.604	0.010			
Observed				0.000	2.172	4141187.489
...ta20190113_20190313				0.354	2.300	4657328.067

Flow survey: >SPWA>3. Data>Flow Data>Temp Flow Meter Data Jan01-Mar31 (April 16 2019) (2/11/2019 8:55:41 AM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2019 10 01)>OneRainData20190113_20190313 (11/6/2019 11:14:10 AM)
Flow Survey Location (Obs.) Site 157, Model Location (Pred.) D/S J07-060.1, Rainfall Profile: 382



	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	13.556	0.604	0.010			
Observed				0.000	0.976	1682585.005
...ta20190113_20190313				0.127	1.012	1976167.131

Flow survey: >SPWA>3. Data>Flow Data>Temp Flow Meter Data Jan01-Mar31 (April 16 2019) (2/11/2019 8:55:41 AM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2019 10 01)>OneRainData20190113_20190313 (11/6/2019 11:14:10 AM)
Flow Survey Location (Obs.) Site 158, Model Location (Pred.) D/S I10-037.1, Rainfall Profile: 352



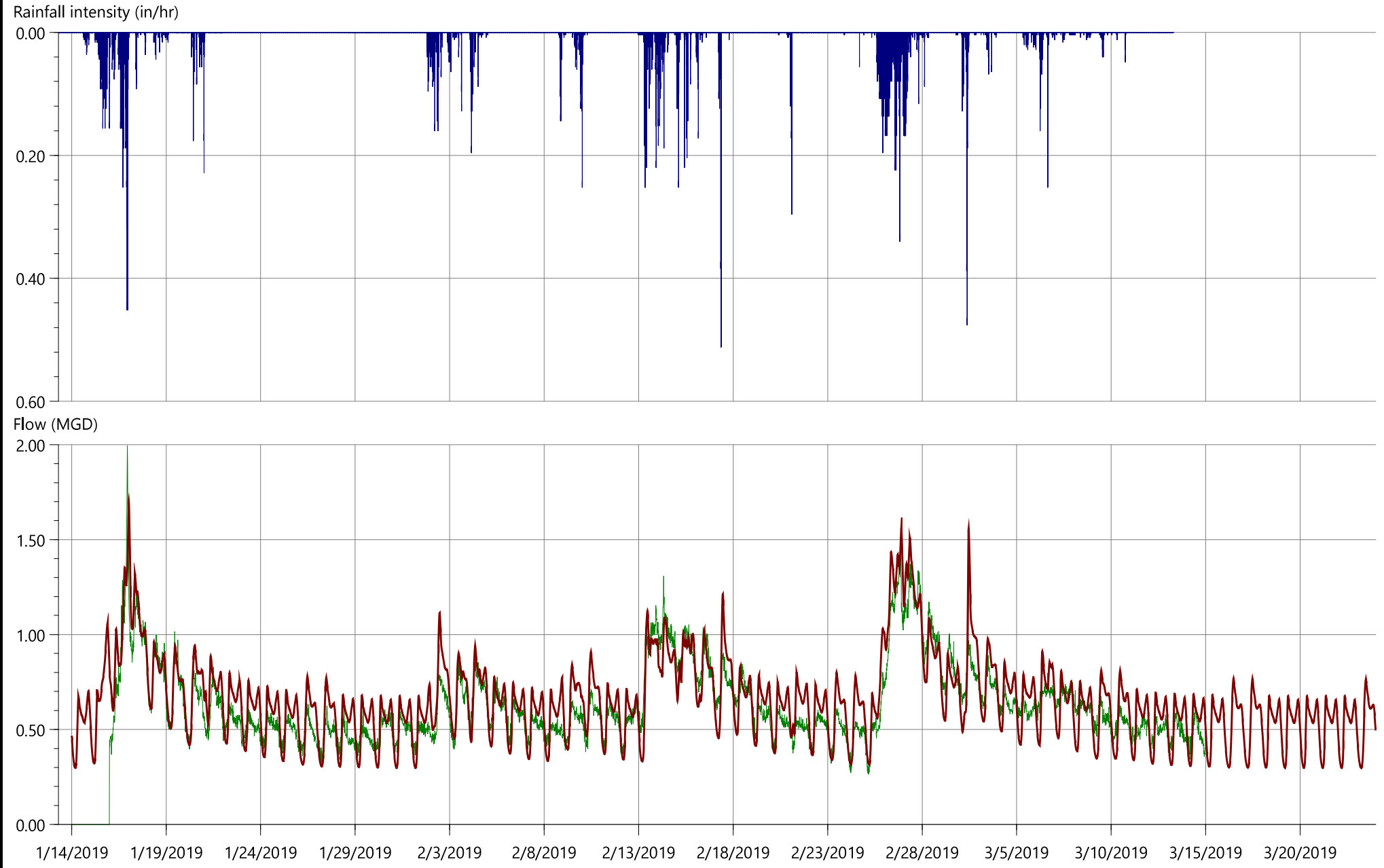
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	14.813	1.048	0.010			
Observed				0.000	4.389	10714291.384
...ta20190113_20190313				0.794	4.452	13146876.273

Flow survey: >SPWA>3. Data>Flow Data>Temp Flow Meter Data Jan01-Mar31 (April 16 2019) (2/11/2019 8:55:41 AM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2019 10 01)>OneRainData20190113_20190313 (11/6/2019 11:14:10 AM)
Flow Survey Location (Obs.) Site 159, Model Location (Pred.) D/S C9-02.1, Rainfall Profile: 186



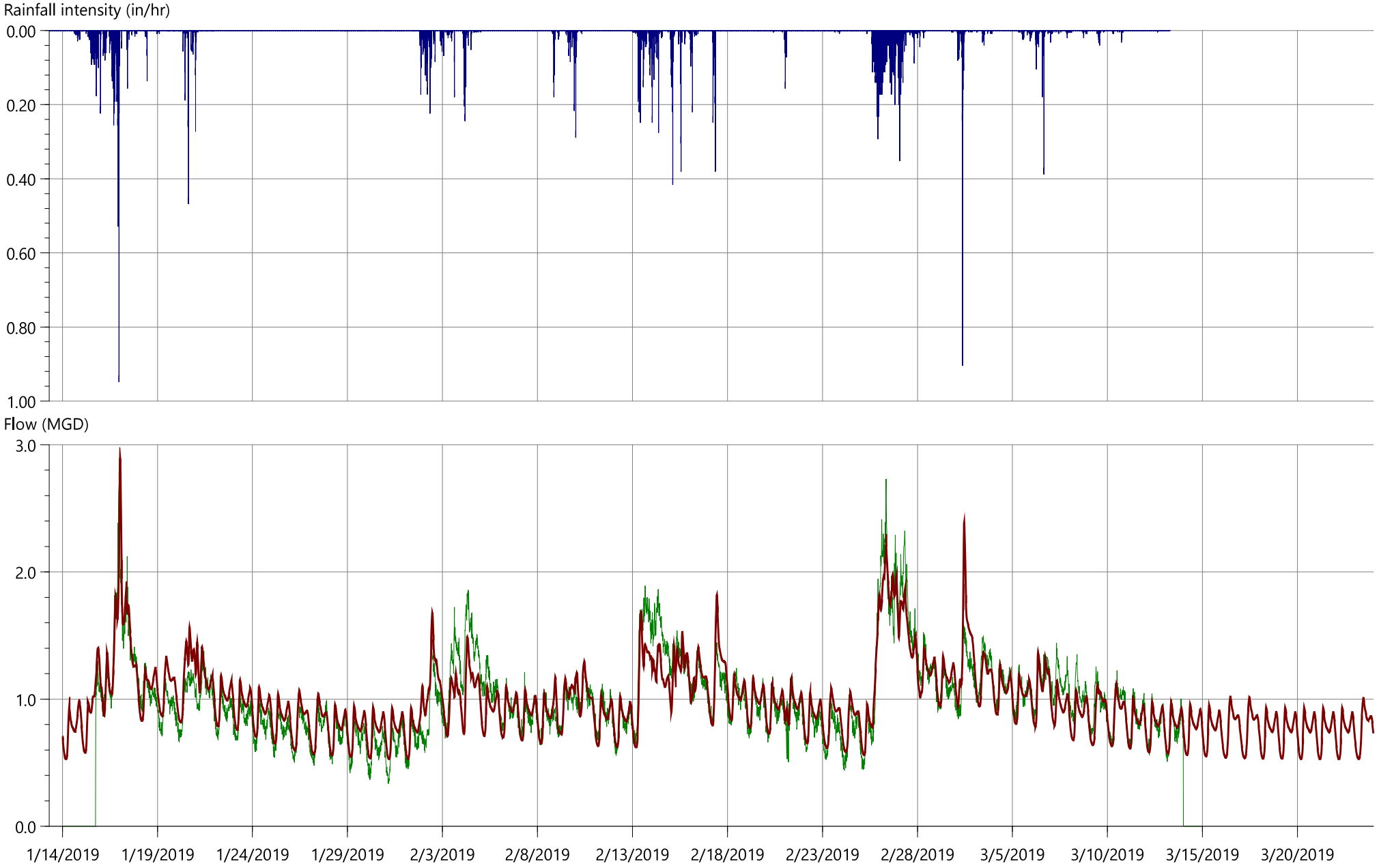
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	13.176	0.512	0.009			
Observed				0.000	4.702	11317470.919
...ta20190113_20190313				1.335	4.375	13934551.632

Flow survey: >SPWA>3. Data>Flow Data>Temp Flow Meter Data Jan01-Mar31 (April 16 2019) (2/11/2019 8:55:41 AM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2019 10 01)>OneRainData20190113_20190313 (11/6/2019 11:14:10 AM)
Flow Survey Location (Obs.) Site 160, Model Location (Pred.) D/S SMH B08-031.1, Rainfall Profile: 186



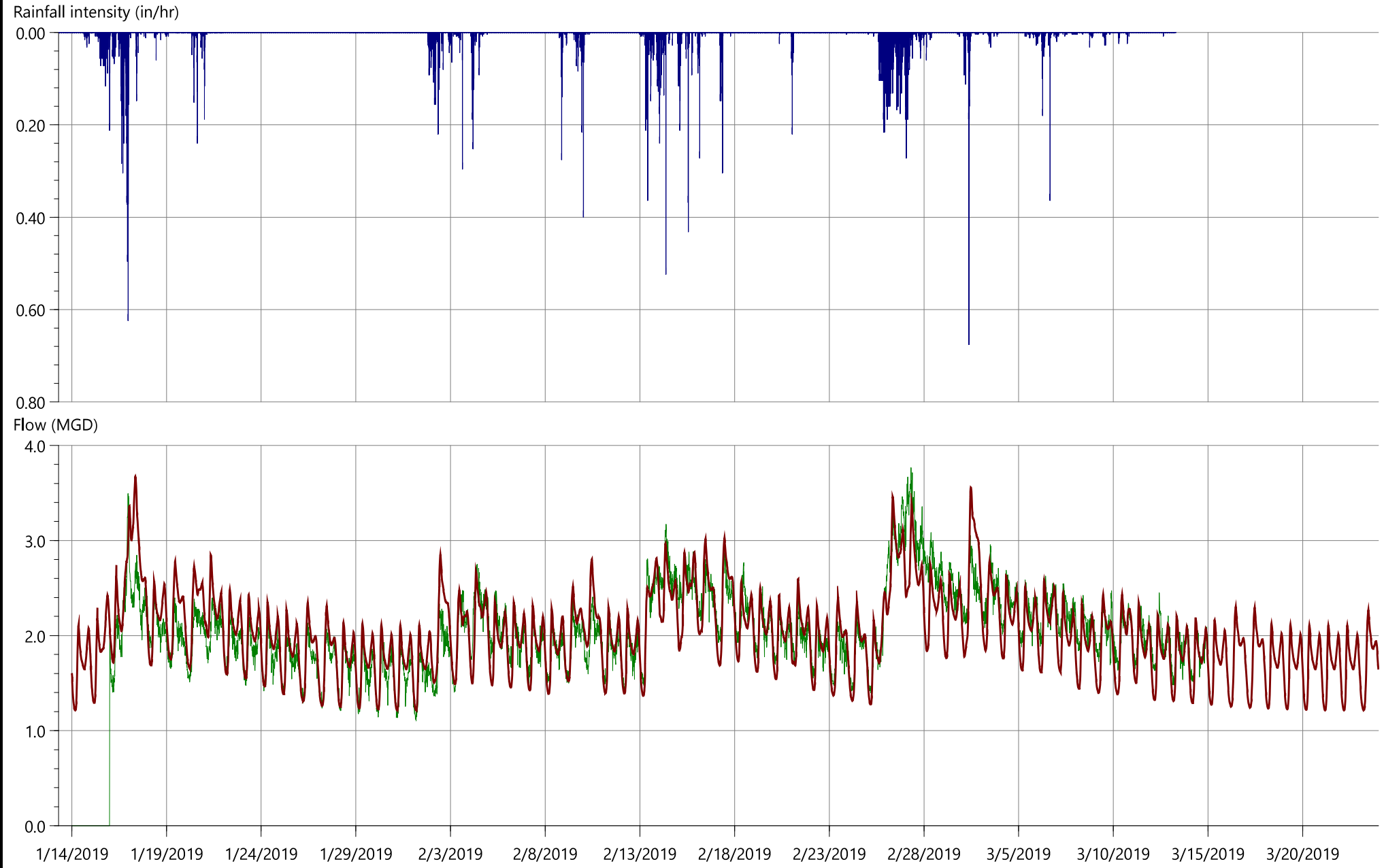
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	13.176	0.512	0.009			
Observed				0.000	1.996	3174137.958
...ta20190113_20190313				0.297	1.702	3927509.288

Flow survey: >SPWA>3. Data>Flow Data>Temp Flow Meter Data Jan01-Mar31 (April 16 2019) (2/11/2019 8:55:41 AM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2019 10 01)>OneRainData20190113_20190313 (11/6/2019 11:14:10 AM)
Flow Survey Location (Obs.) Site 161, Model Location (Pred.) D/S B12-02.1, Rainfall Profile: 156



	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	13.733	0.948	0.010			
Observed				0.000	2.731	4995129.055
...ta20190113_20190313				0.528	2.894	5828937.326

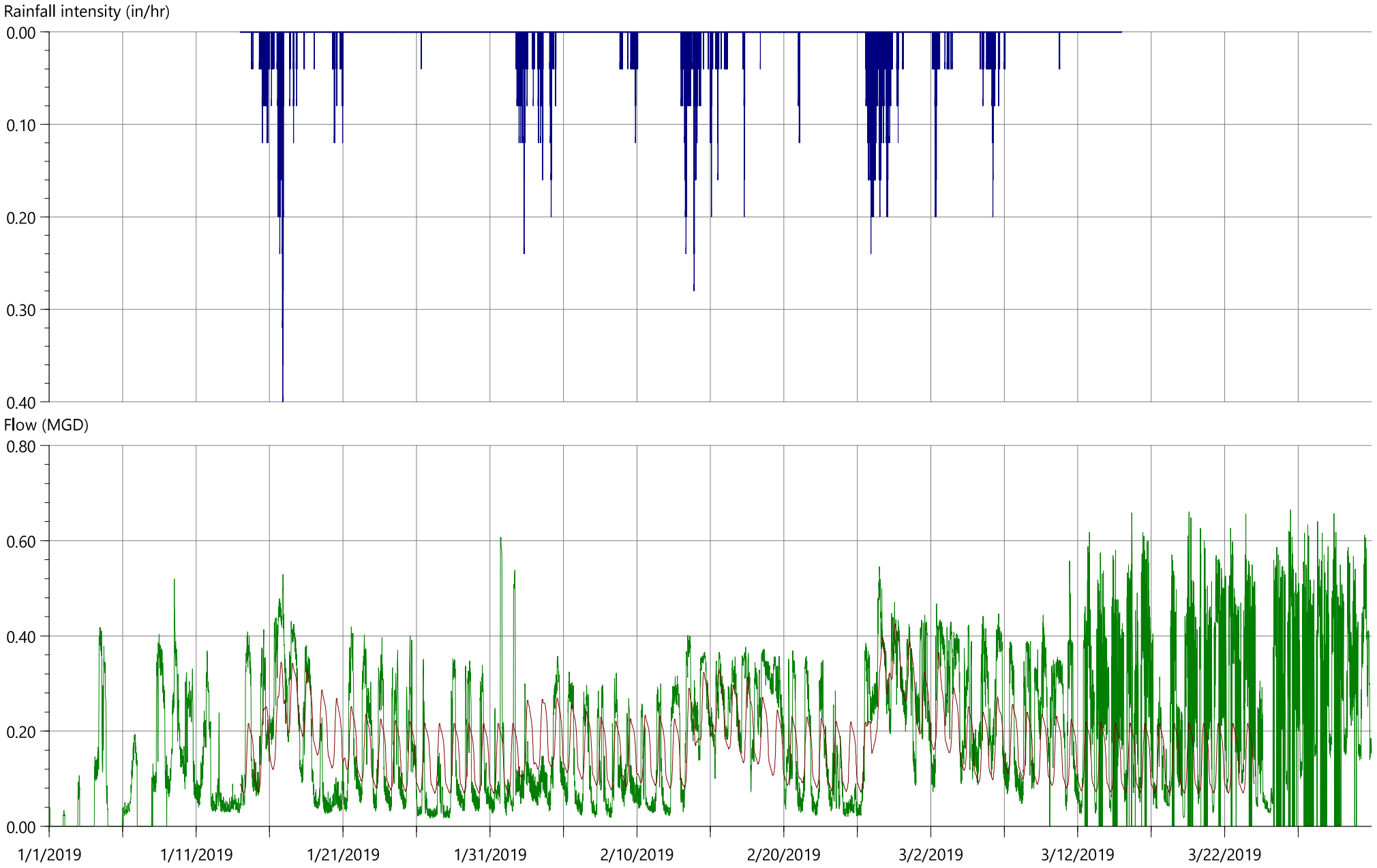
Flow survey: >SPWA>3. Data>Flow Data>Temp Flow Meter Data Jan01-Mar31 (April 16 2019) (2/11/2019 8:55:41 AM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2019 10 01)>OneRainData20190113_20190313 (11/6/2019 11:14:10 AM)
Flow Survey Location (Obs.) Site 162, Model Location (Pred.) D/S D14-03.1, Rainfall Profile: 191



	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	12.949	0.676	0.009			
Observed				0.000	3.767	10312984.650
...ta20190113_20190313				1.214	3.671	12012636.316

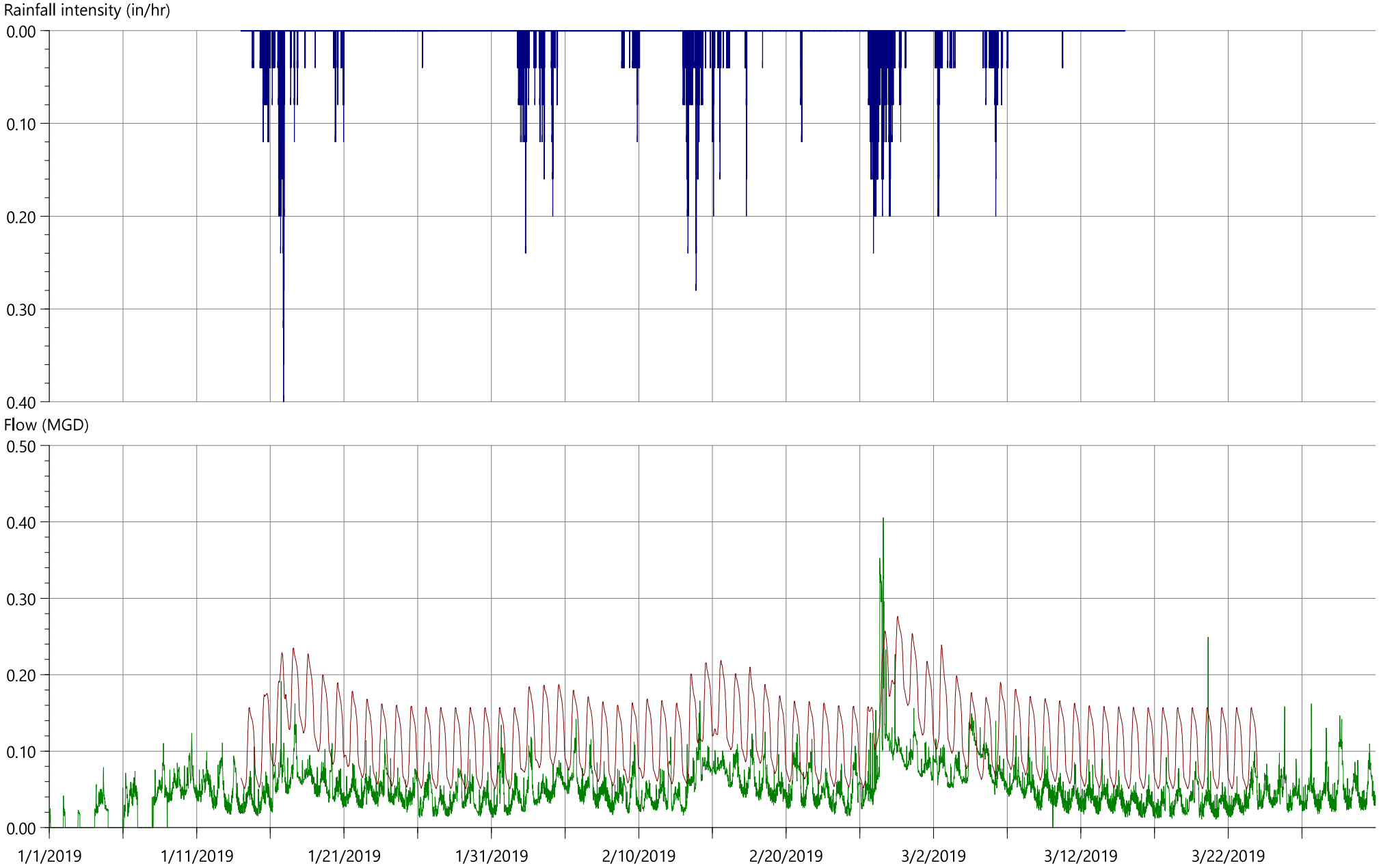
Flow survey: >SPWA>3. Data>Flow Data>Permanent Flow Meter Data Jan01-Mar31 (June 05 2019) (6/5/2019 1:51:15 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2019 10 01)_v29>OneRainData20190113_20190313_*4_RGBoundaries (11/6/2019 11:14:10 AM)

Flow Survey Location (Obs.) Cincinnati, Model Location (Pred.) D/S CA4-RSVL28.1, Rainfall Profile: 408



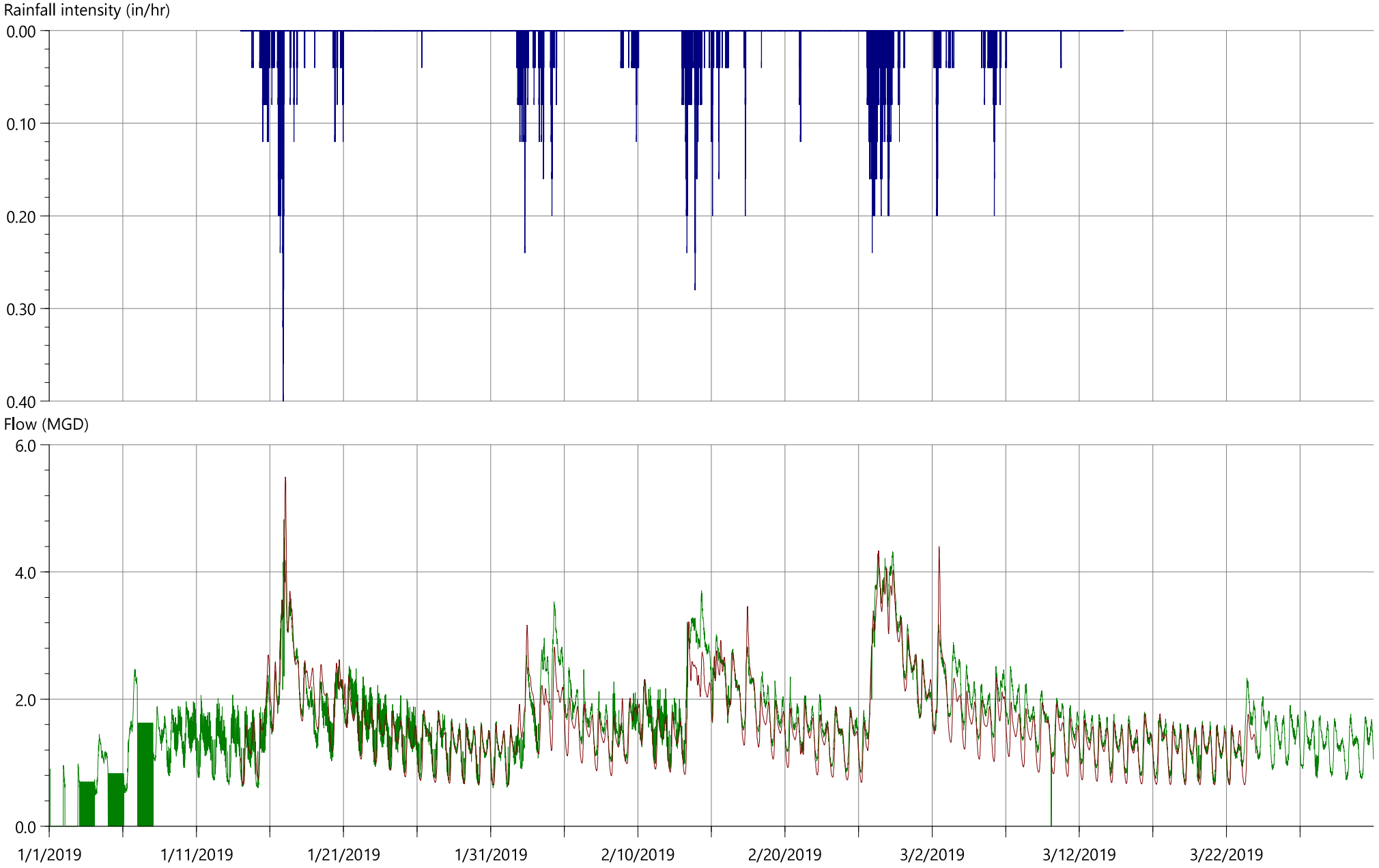
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	15.530	0.400	0.011			
Observed				0.000	0.665	1464913.927
...0313_*4_RGBoundaries				0.069	0.425	1025101.467

Flow survey: >SPWA>3. Data>Flow Data>Permanent Flow Meter Data Jan01-Mar31 (June 05 2019) (6/5/2019 1:51:15 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2019 10 01)_v29>OneRainData20190113_20190313_*4_RGBoundaries (11/6/2019 11:14:10 AM)
Flow Survey Location (Obs.) Industrial, Model Location (Pred.) D/S SMH G03-062.1, Rainfall Profile: 442



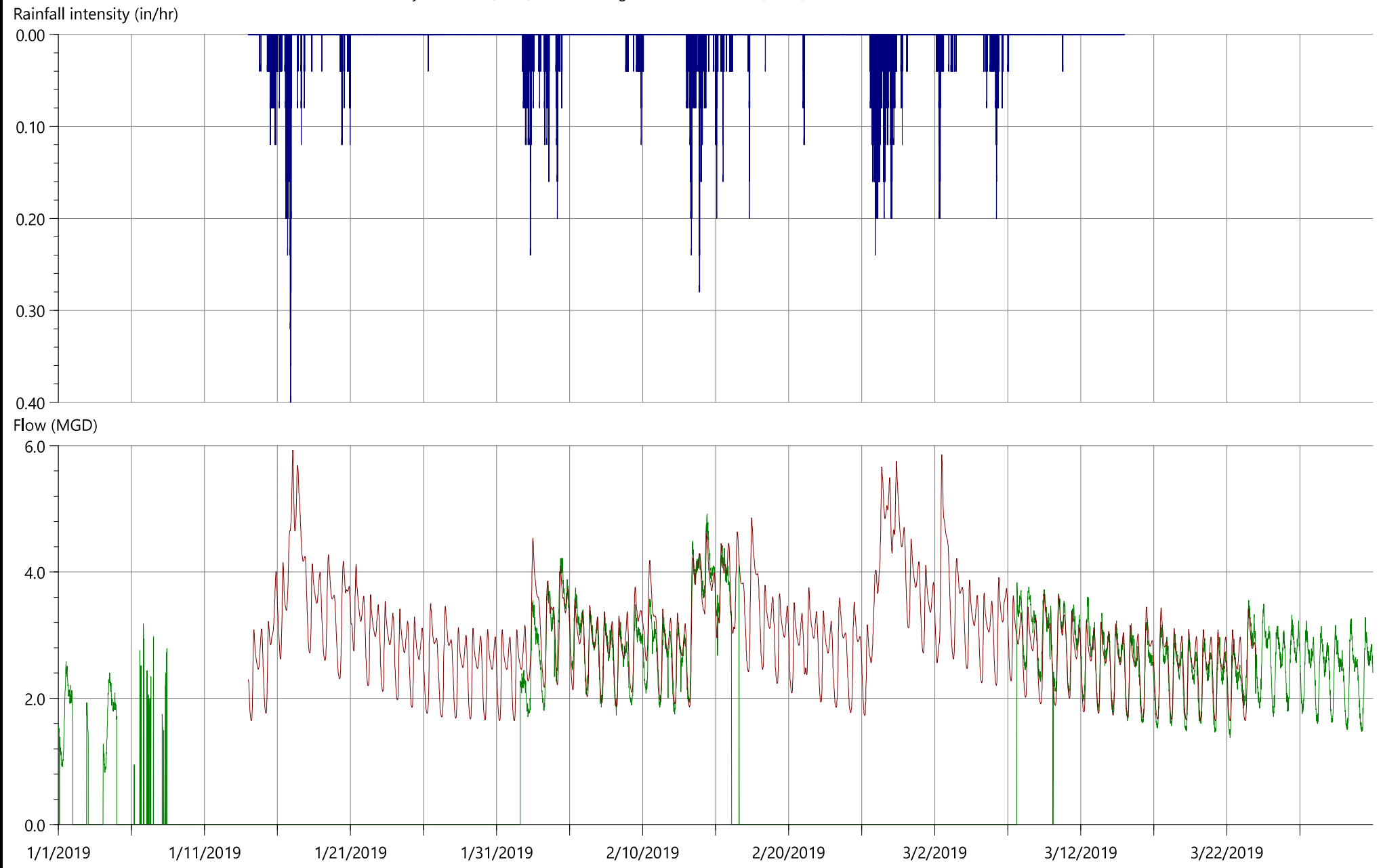
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	15.530	0.400	0.011			
Observed				0.000	0.405	388057.020
...0313_*4_RGBoundaries				0.051	0.276	712709.520

Flow survey: >SPWA>3. Data>Flow Data>Permanent Flow Meter Data Jan01-Mar31 (June 05 2019) (6/5/2019 1:51:15 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2019 10 01)_v29>OneRainData20190113_20190313_*4_RGBoundaries (11/6/2019 11:14:10 AM)
Flow Survey Location (Obs.) SMD2, Model Location (Pred.) D/S A10-03.1, Rainfall Profile: 121



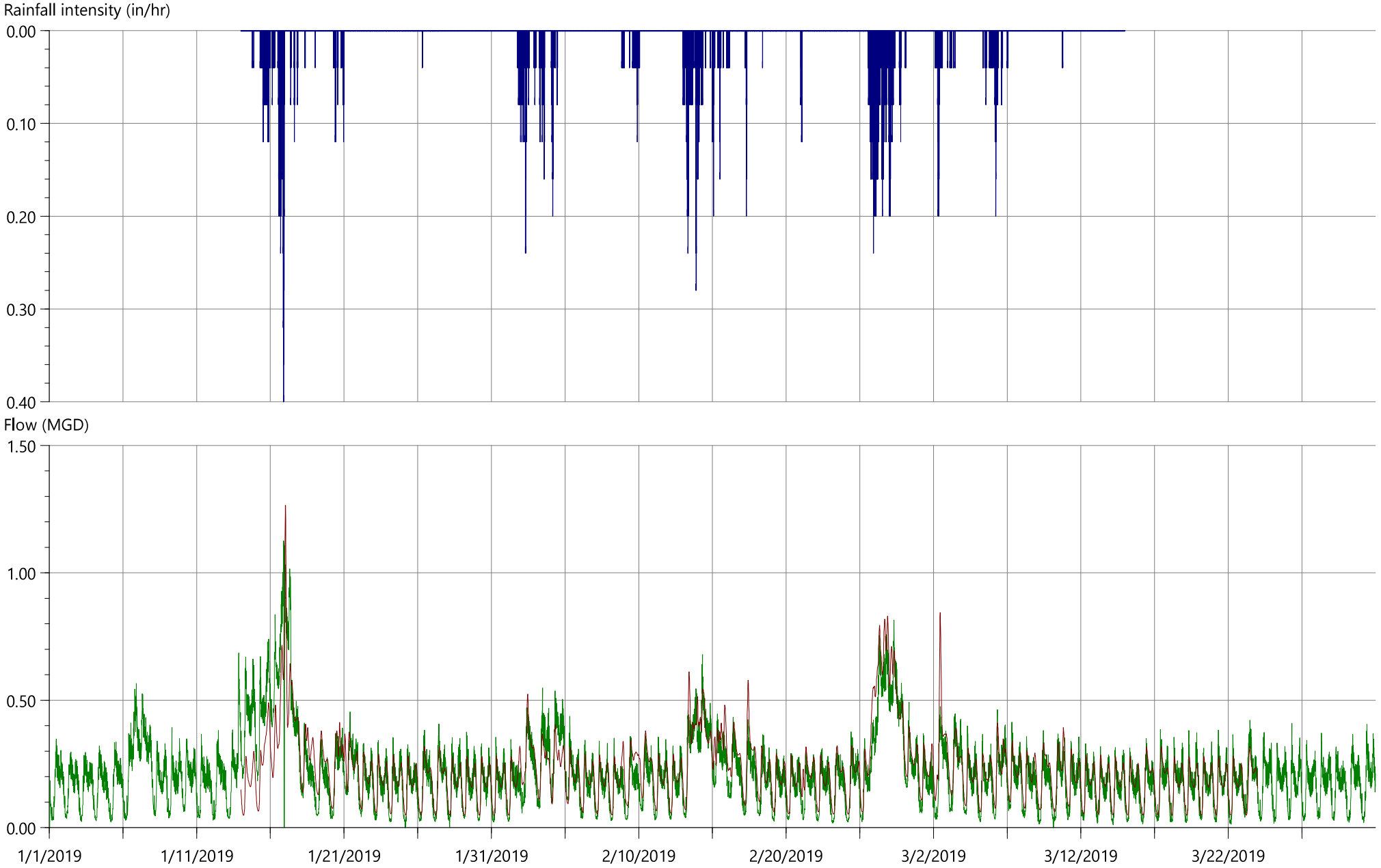
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	15.530	0.400	0.011			
Observed				0.000	4.823	12344642.590
...0313_*4_RGBoundaries				0.651	5.493	9792069.402

Flow survey: >SPWA>3. Data>Flow Data>Permanent Flow Meter Data Jan01-Mar31 (June 05 2019) (6/5/2019 1:51:15 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2019 10 01)_v29>OneRainData20190113_20190313_*4_RGBoundaries (11/6/2019 11:14:10 AM)
Flow Survey Location (Obs.) Sierra College, Model Location (Pred.) D/S SMH B08-040.1, Rainfall Profile: 186



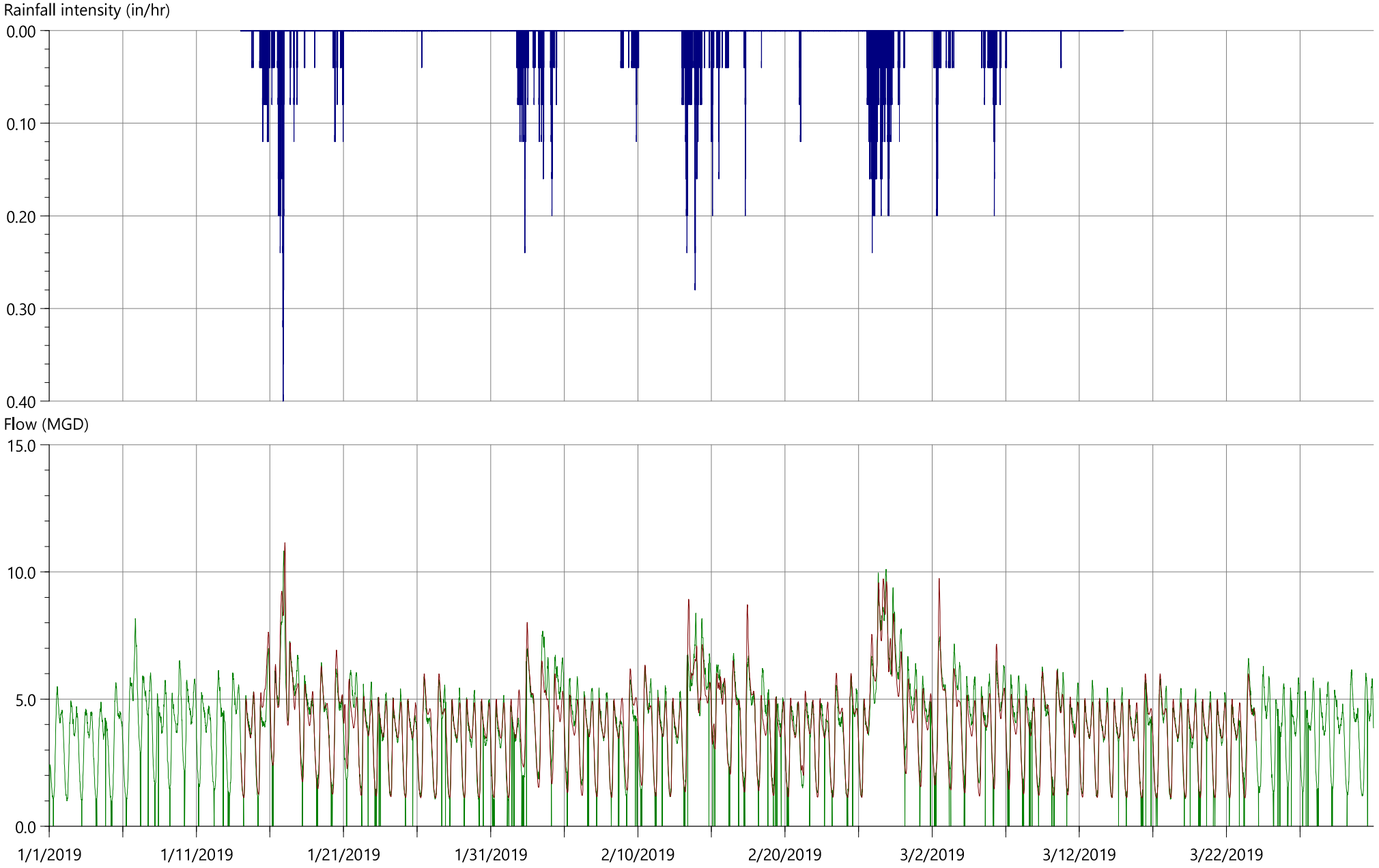
	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	15.530	0.400	0.011			
Observed				0.000	4.921	9530740.132
...0313_*4_RGBoundaries				1.644	5.931	18004207.945

Flow survey: >SPWA>3. Data>Flow Data>Permanent Flow Meter Data Jan01-Mar31 (June 05 2019) (6/5/2019 1:51:15 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2019 10 01)_v29>OneRainData20190113_20190313_*4_RGBoundaries (11/6/2019 11:14:10 AM)
Flow Survey Location (Obs.) Highlands, Model Location (Pred.) D/S SMH D08-006.1, Rainfall Profile: 285



	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	15.530	0.400	0.011			
Observed				0.000	1.126	1614243.848
...0313_*4_RGBoundaries				0.048	1.266	1387804.155

Flow survey: >SPWA>3. Data>Flow Data>Permanent Flow Meter Data Jan01-Mar31 (June 05 2019) (6/5/2019 1:51:15 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2019 10 01)_v29>OneRainData20190113_20190313_*4_RGBoundaries (11/6/2019 11:14:10 AM)
Flow Survey Location (Obs.) Pleasant Grove (SPMUD), Model Location (Pred.) D/S RSVL-001.1, Rainfall Profile: 410



	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	15.530	0.400	0.011			
Observed				0.000	10.836	30336214.148
...0313_*4_RGBoundaries				1.119	11.157	23452688.731

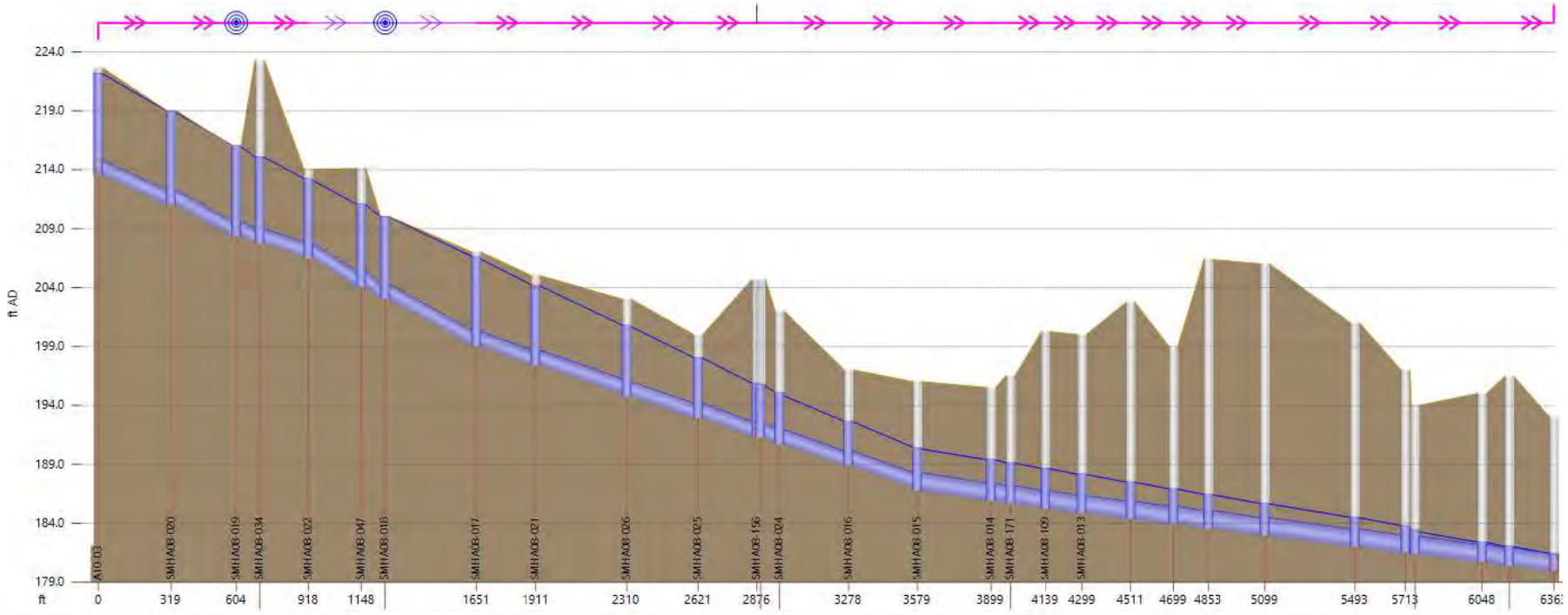
Flow survey: >SPWA>3. Data>Flow Data>Permanent Flow Meter Data Jan01-Mar31 (June 05 2019) (6/5/2019 1:51:15 PM)
Sim: >SPWA>5. Model Runs>Calibration>combined WWF Calibration (2019 10 01)_v29>OneRainData20190113_20190313_*4_RGBoundaries (11/6/2019 11:14:10 AM)
Flow Survey Location (Obs.) Dry Creek, Model Location (Pred.) D/S H07-168.1, Rainfall Profile: 315



	Rainfall			Flow		
	Depth (in)	Peak (in/hr)	Average (in/hr)	Min (ft3/s)	Max (ft3/s)	Volume (ft3)
Rain	15.530	0.400	0.011			
Observed				0.000	15.348	42982669.853
...0313_*4_RGBoundaries				1.944	16.123	35431318.112

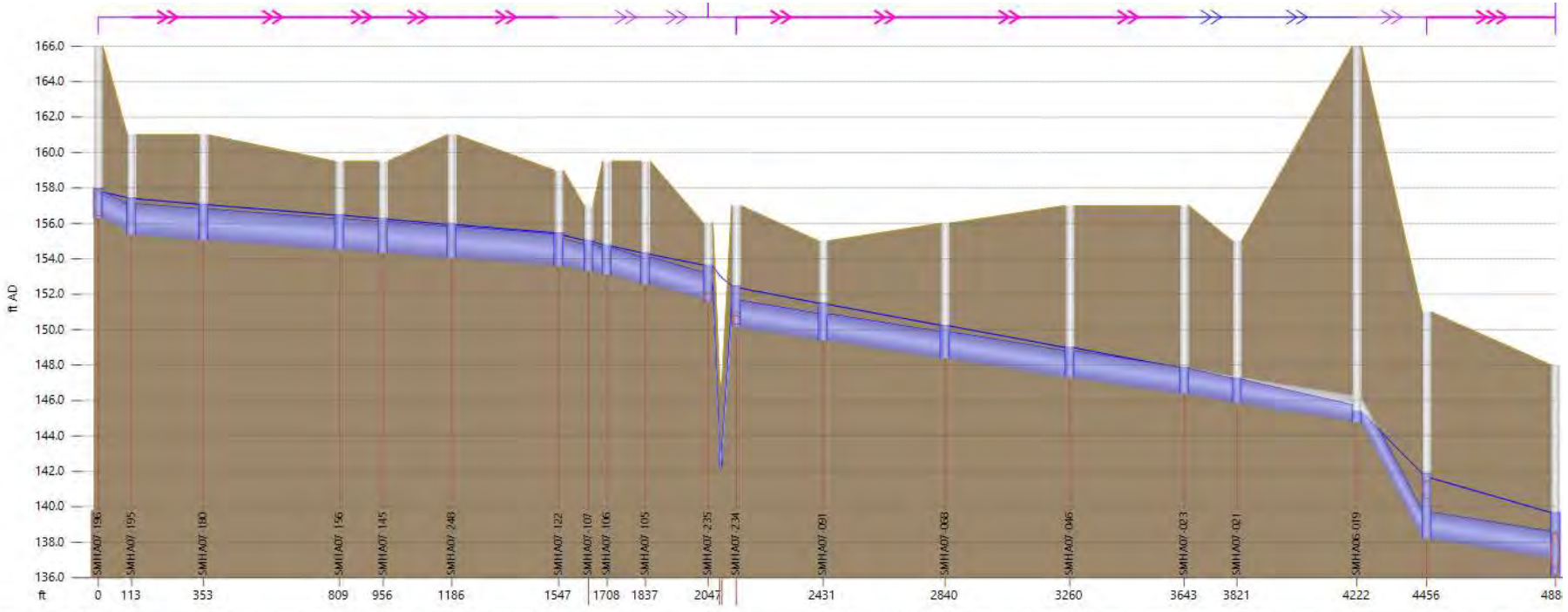
APPENDIX E – MODELED HYDRAULIC PROFILES

EXISTING LAND USE – AREA A



Link	A10-03.1	-	-	-	-	-	SMH A08-018.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
length (ft)	319.0	284.5	-	212.9	230.3	-	398.9	260.9	398.2	311.2	255.4	-	302.2	300.1	320.7	-	155.0	160.0	212.0	188.0	154.0	246.0	393.4	220.7	292.1	-	195.0
width (in)	15.0	15.0	-	15.0	15.0	-	15.0	15.0	15.0	15.0	15.0	-	15.0	15.0	18.0	-	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
us inv (ft AD)	213.530	211.020	-	207.750	206.510	-	203.000	199.010	197.410	194.750	192.920	-	190.690	188.850	186.770	-	-	-	184.840	-	-	183.550	182.960	182.000	181.380	-	-
ds inv (ft AD)	211.020	208.340	-	206.610	204.089	-	199.110	197.420	194.990	192.920	191.390	-	188.850	187.020	185.900	-	-	-	184.350	-	-	182.960	182.000	181.490	180.690	-	-
grad (%)	0.787	0.942	-	0.535	1.051	-	0.975	0.609	0.608	0.588	0.599	-	0.609	0.610	0.271	-	0.265	0.262	0.231	0.229	0.240	0.240	0.244	0.231	0.236	-	0.251
surc	2.00	2.00	-	2.00	1.00	-	1.00	2.00	2.00	2.00	2.00	-	2.00	2.00	2.00	-	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
r.pfc (MGD)	3.70	4.05	-	3.06	4.28	-	4.12	3.26	3.26	3.20	3.23	-	3.26	3.26	3.54	-	3.49	3.48	3.26	3.25	3.33	3.33	3.35	3.26	3.30	3.40	3.40
DS flow (MGD)	4.1241	4.1241	-	3.8486	3.8339	-	3.8972	3.8833	3.8673	3.8545	3.8438	-	3.5282	3.5230	3.5705	-	-	-	3.6413	3.6412	-	3.6412	3.6412	3.6412	3.6412	-	3.6411
Node	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ground (ft AD)	-	219.000	-	-	-	-	210.000	207.000	205.000	203.000	200.000	-	-	197.000	196.000	-	-	-	-	-	-	-	206.000	201.000	-	-	-	-
level (ft AD)	-	218.975	-	-	-	-	210.000	206.621	204.217	200.795	198.059	-	-	192.641	190.421	-	-	-	-	-	-	-	185.682	184.500	-	-	-	-
flood dep (ft)	-	-0.025	-	-	-0.770	-	0.000	-0.379	-0.783	-2.205	-1.941	-	-	-4.359	-5.579	-	-	-	-	-	-	-	-20.318	-16.500	-	-	-	-

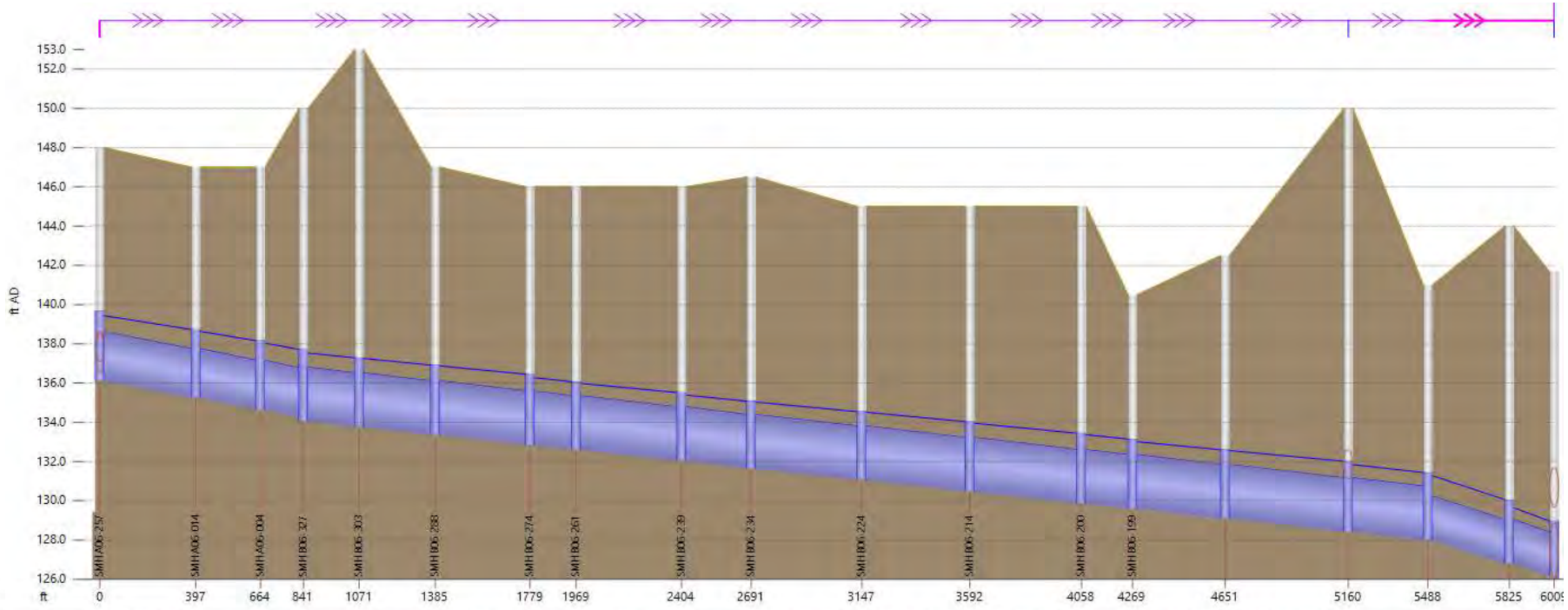
EXISTING LAND USE – AREA B



Link	-	-	SMH A07-180.1	-	-	SMH A07-248.1	-	-	-	-	-	-	SMH A07-091.1	SMH A07-068.1	SMH A07-046.1	-	SMH A07-021.1	-	SMH B06-329.1
length (ft)	112.5	240.7	456.0	146.8	230.3	360.3	99.4	-	128.8	209.5	-	290.6	408.7	419.5	383.8	177.3	401.8	233.8	431.9
width (in)	18.0	21.0	21.0	21.0	21.0	21.0	18.0	-	18.0	18.0	-	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
us inv (ft AD)	-	155.350	155.060	-	154.340	154.060	-	-	-	152.590	-	150.140	149.400	148.380	147.300	146.380	145.830	144.740	138.190
ds inv (ft AD)	-	155.060	154.510	-	154.060	153.630	-	-	-	151.720	-	149.400	148.380	147.300	146.380	145.930	144.840	138.290	137.110
grad (%)	0.622	0.120	0.121	0.116	0.122	0.119	-	-	0.411	0.415	-	0.255	0.250	0.257	0.240	0.254	0.246	2.759	0.250
surc	1.00	2.00	2.00	2.00	2.00	2.00	1.00	-	1.00	1.00	-	2.00	2.00	2.00	2.00	0.95	0.90	1.00	2.00
r.pfc (MGD)	5.36	3.56	3.56	3.49	3.57	3.54	3.79	-	4.36	4.38	-	3.43	3.39	3.45	3.32	3.42	3.37	11.28	3.40
DS flow (MGD)	-	3.6566	3.6456	3.6416	3.6391	3.6354	-	-	-	3.6347	-	3.6346	3.6346	3.6345	3.6345	3.6344	3.6344	3.6338	4.8577

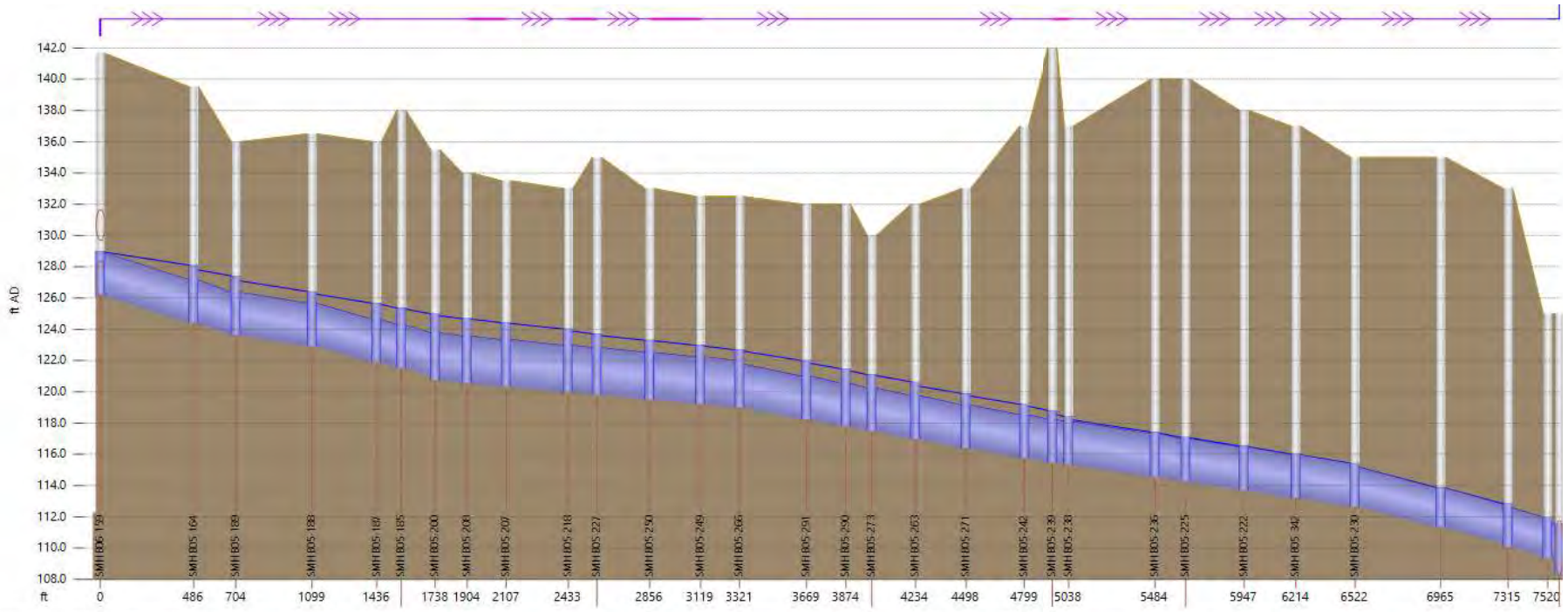
Node	-	SMH A07-180	-	-	-	-	-	-	-	-	-	-	SMH A07-091	SMH A07-068	SMH A07-046	-	-	SMH A06-019	SMH B06-329	-
ground (ft AD)	-	161.000	159.500	-	161.000	159.000	-	-	-	-	-	-	155.000	156.000	157.000	157.000	155.000	166.000	151.000	148.000
level (ft AD)	-	157.080	156.471	-	155.938	155.463	-	-	-	-	-	-	151.496	150.245	148.993	147.847	147.253	145.359	141.881	139.668
flood dep (ft)	-3.561	-3.920	-3.029	-3.231	-5.062	-3.537	-	-	-5.161	-	-4.535	-3.504	-5.755	-8.007	-9.153	-7.747	-20.641	-9.119	-8.332	

EXISTING LAND USE – AREA C



Link	SMH A06-257.1	-	-	-	-	SMH B06-288.1	-	SMH B06-261.1	-	SMH B06-234.1	SMH B06-224.1	SMH B06-214.1	-	SMH B06-199.1	SMH B06-186.1	-	-	-
length (ft)	396.7	267.4	177.3	229.3	314.6	393.4	190.1	435.0	287.1	455.6	445.4	466.4	210.4	382.2	509.2	327.5	337.3	184.4
width (in)	30.0	30.0	30.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	27.0	27.0
us inv (ft AD)	136.110	135.240	-	134.050	133.760	133.360	-	132.600	132.030	131.640	131.060	130.470	129.850	129.600	129.090	128.420	127.990	-
ds inv (ft AD)	135.240	134.660	-	133.760	133.360	132.840	-	132.030	131.640	131.060	130.470	129.850	129.600	129.090	128.420	127.990	126.792	-
grad (%)	0.219	0.217	0.220	0.126	0.127	0.132	0.126	0.131	0.136	0.127	0.132	0.133	0.119	0.133	0.132	0.131	0.355	0.358
surc	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00
r.pfc (MGD)	12.42	12.35	12.43	12.16	12.19	12.43	12.15	12.37	12.60	12.20	12.44	12.46	11.78	12.49	12.40	12.39	11.93	11.98
DS flow (MGD)	11.4670	11.4562	-	11.4373	11.5043	11.4871	-	11.4617	11.4509	11.4344	11.4189	11.4033	11.3963	11.3836	11.3678	12.1626	12.1555	-
Node	-	-	-	-	-	-	-	-	-	-	SMH B06-224	SMH B06-214	-	-	SMH B06-186	SMH B06-163	-	-	-
ground (ft AD)	-	147.000	-	-	153.000	147.000	146.000	146.000	146.000	146.500	145.000	145.000	145.000	140.500	142.500	150.000	141.000	143.984	-
level (ft AD)	-	138.722	-	-	137.284	136.911	136.434	136.062	135.504	135.073	134.537	134.024	133.439	133.133	132.597	131.997	131.432	130.022	-
flood dep (ft)	-8.332	-8.278	-8.851	-	-15.716	-10.089	-9.566	-9.938	-10.496	-11.427	-10.463	-10.976	-11.561	-7.367	-9.903	-18.003	-9.568	-13.962	-

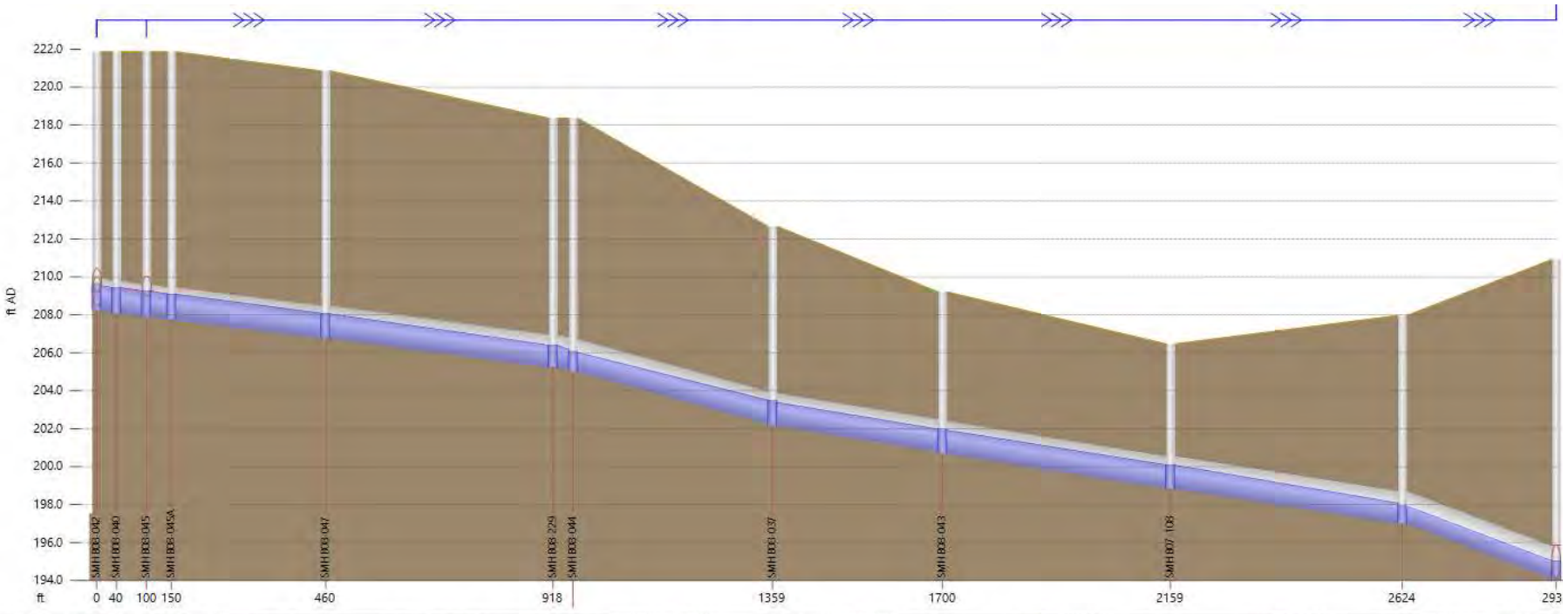
EXISTING LAND USE – AREA D



Link	SMH B06-159.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
length (ft)	485.7	218.4	394.8	337.0	-	176.0	-	202.7	326.1	-	274.6	263.3	201.7	348.2	204.6	-	227.1	263.3	301.6	-	-	446.8	-	303.8	267.3	307.6	443.8	349.1	205.1	
width (in)	33.0	33.0	33.0	33.0	-	33.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	33.0	33.0	-	33.0	33.0	33.0	33.0	-	33.0	33.0	33.0	33.0	33.0	30.0	30.0	30.0	
us inv (ft AD)	126.132	-	123.610	122.900	-	-	-	-	120.330	-	119.810	119.500	-	119.000	-	-	-	116.980	116.390	-	-	115.330	-	114.230	113.690	113.200	112.650	111.330	-	
ds inv (ft AD)	124.392	-	122.900	121.870	-	-	-	-	119.960	-	119.500	119.220	-	118.230	-	-	-	116.390	115.760	-	-	114.550	-	113.690	113.200	112.650	111.330	110.270	-	
grad (%)	0.358	0.358	0.180	0.306	-	0.284	-	0.109	0.113	-	0.113	0.106	0.109	0.221	0.225	-	0.220	0.224	0.209	-	-	0.175	-	0.178	0.183	0.179	0.297	0.304	0.302	
surc	1.00	1.00	1.00	1.00	-	1.00	1.00	2.00	1.00	2.00	1.00	2.00	1.00	1.00	1.00	-	1.00	1.00	1.00	1.00	-	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
r.pfc (MGD)	20.46	20.46	14.50	18.90	-	18.22	-	14.20	14.52	-	14.49	14.06	14.24	16.08	16.21	-	16.04	16.18	15.62	-	-	14.28	-	14.41	14.64	14.46	14.46	14.61	14.58	
DS flow (MGD)	14.6273	-	14.5897	14.5340	-	-	-	-	14.4058	-	14.3370	14.2976	-	14.2118	-	-	-	14.1618	14.1594	-	-	14.1449	-	14.1337	14.1268	14.1198	14.1189	14.1184	-	

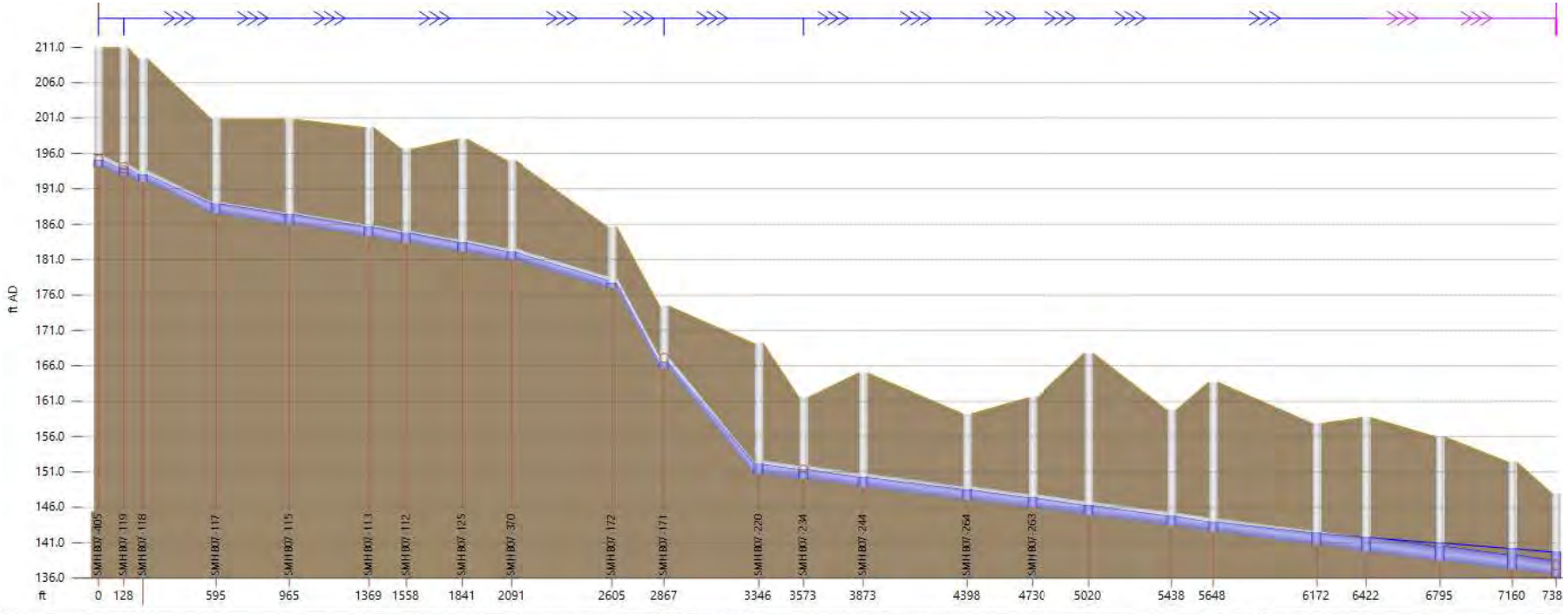
Node	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ground (ft AD)	-	139.514	136.000	136.500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	140.000	-	-	-	135.000	135.000	-	-		
level (ft AD)	-	128.077	127.390	126.402	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	117.423	-	-	-	115.415	113.877	-	-		
flood dep (ft)	-	-11.437	-8.610	-10.098	-	-	-	-	-9.080	-	-	-9.706	-	-9.810	-	-	-	-	-	-	-	-22.577	-	-21.473	-20.988	-19.585	-21.123	-	-		

EXISTING LAND USE – AREA E



Link	-	-	-	SMH B08-045A.1	SMH B08-047.1	-	SMH B08-044.1	SMH B08-037.1	SMH B08-043.1	SMH B07-108.1	SMH B07-107.1	
length (ft)	-	60.0	-	310.0	458.0	-	401.0	341.0	459.2	464.7	308.9	
width (in)	-	21.0	-	21.0	21.0	-	21.0	21.0	21.0	21.0	21.0	
us inv (ft AD)	-	-	-	207.732	206.750	-	205.000	202.150	200.680	198.840	197.000	
ds inv (ft AD)	-	-	-	206.750	205.233	-	202.250	200.780	198.840	197.000	194.107	
grad (%)	-	-	-	0.317	0.331	-	0.686	0.402	0.401	0.396	0.937	
surc	-	0.78	-	0.76	0.73	-	0.71	0.70	0.71	0.70	0.53	
r.pfc (MGD)	-	5.76	-	5.76	5.89	-	8.48	6.49	6.48	6.45	9.91	
DS flow (MGD)	-	-	-	5.2707	5.2707	-	5.3000	5.3032	5.3031	5.3031	5.3031	
Node	-	-	-	SMH B08-047	SMH B08-229	SMH B08-044	SMH B08-037	SMH B08-043	SMH B07-108	SMH B07-107	-	
ground (ft AD)	-	-	221.854	220.847	218.361	218.361	212.662	209.204	206.463	207.955	210.904	
level (ft AD)	-	-	209.080	208.068	206.386	206.059	203.479	201.956	200.078	197.921	195.031	
flood dep (ft)	-	-	-12.774	-12.779	-11.975	-12.302	-9.183	-7.248	-6.385	-10.034	-15.873	

EXISTING LAND USE – AREA F



Link	-	-	-	-	-	-	-	-	-	SMH B07-370.1	-	SMH B07-171.1	-	-	SMH B07-244.1	-	-	-	-	SMH B07-242.1	-	-	-	-
length (ft)	-	-	370.0	370.5	403.7	189.0	282.5	249.9	514.2	262.6	479.1	226.2	300.0	525.4	331.8	289.9	418.2	210.2	523.9	249.6	373.1	365.7	220.5
width (in)	-	-	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
us inv (ft AD)	-	-	192.000	187.500	186.000	-	183.416	182.070	180.950	177.000	165.650	-	149.975	148.860	147.080	145.950	144.870	-	142.540	140.670	139.730	138.470	-
ds inv (ft AD)	-	-	187.500	186.000	184.350	-	182.170	180.950	177.000	165.750	150.740	-	148.960	147.080	145.950	144.970	143.460	-	140.770	139.830	138.470	137.230	-
grad (%)	-	-	1.216	0.405	0.409	0.441	0.441	0.448	0.768	4.284	3.112	0.338	0.338	0.339	0.341	0.338	0.337	0.343	0.338	0.337	0.338	0.339	0.327
surc	-	-	0.78	0.77	0.76	0.74	0.73	0.72	0.61	0.38	0.76	0.66	0.65	0.70	0.68	0.65	0.66	0.65	0.79	0.98	1.00	1.00	1.00
r.pfc (MGD)	-	-	11.30	6.52	6.55	6.80	6.80	6.86	8.98	21.20	18.07	8.50	8.51	8.51	8.53	8.50	8.49	8.56	8.50	8.48	8.50	8.52	8.36
DS flow (MGD)	-	-	5.9914	5.9913	5.9913	-	6.0622	6.0622	6.0814	6.0814	6.3607	6.3607	6.5535	6.5534	6.5534	6.5534	6.5533	6.5533	6.5533	6.5529	6.5487	6.6404	6.6295
Node	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ground (ft AD)	-	-	200.819	200.813	199.641	-	-	194.953	185.616	174.439	169.113	-	164.971	159.204	161.463	167.769	159.712	163.680	157.842	158.647	155.955	152.380	-
level (ft AD)	-	-	188.866	187.346	185.605	-	-	182.039	177.667	166.399	152.061	-	150.223	148.465	147.308	146.245	144.741	143.910	142.341	141.774	140.975	140.198	-
flood dep (ft)	-	-	-11.953	-13.467	-14.036	-	-	-12.924	-7.949	-8.040	-17.052	-	-14.748	-10.739	-14.155	-21.524	-14.971	-19.770	-15.501	-16.873	-14.980	-12.182	-

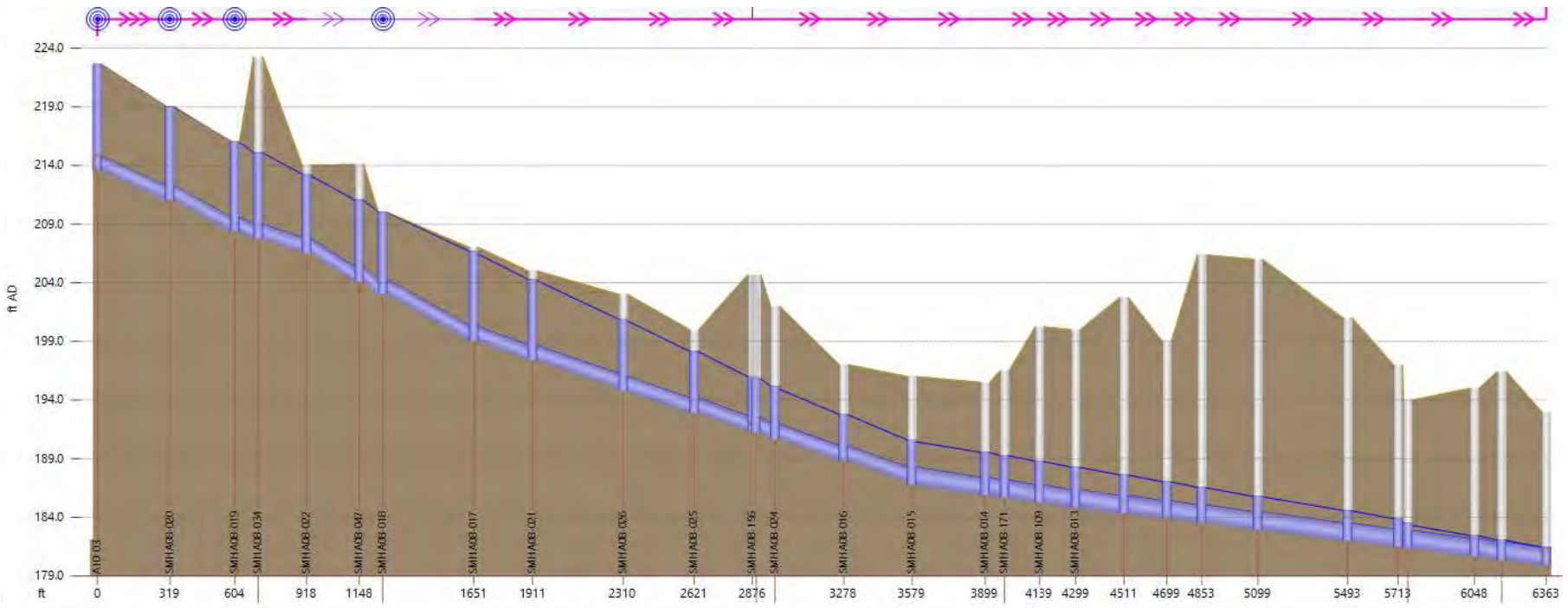
EXISTING LAND USE – AREA G



Link	SMH A08-010.1	-	SMH B08-196.1	-	SMH B08-105.1	SMH B08-083.1	SMH B08-077.1	SMH B08-066.1	-	-	-	-	-	-	-	-
length (ft)	382.5	147.9	234.6	200.3	394.4	399.4	304.0	322.1	179.5	85.6	168.0	178.0	172.0	157.2	100.0	-
width (in)	8.0	8.0	8.0	10.0	10.0	10.0	10.0	10.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	-
us inv (ft AD)	245.580	239.840	235.400	233.990	231.880	229.840	228.440	227.340	226.180	-	216.100	214.030	212.580	211.300	-	-
ds inv (ft AD)	239.840	235.400	233.990	232.080	230.040	228.640	227.530	226.380	223.990	-	214.230	212.580	211.500	210.500	-	-
grad (%)	1.501	3.002	0.601	0.954	0.467	0.300	0.299	0.298	1.220	9.100	1.113	0.815	0.628	0.509	0.929	-
surc	0.38	0.49	0.49	0.31	0.37	0.43	0.43	0.43	0.25	0.19	0.29	0.32	0.32	0.34	0.29	-
r.pfc (MGD)	0.96	1.35	0.61	1.38	0.97	0.78	0.77	0.77	2.54	6.95	2.43	2.08	1.83	1.64	2.22	-
DS flow (MGD)	0.2779	0.2779	0.2779	0.2779	0.2779	0.2900	0.2900	0.2900	0.2900	-	0.3819	0.3819	0.3819	0.3819	0.3819	-

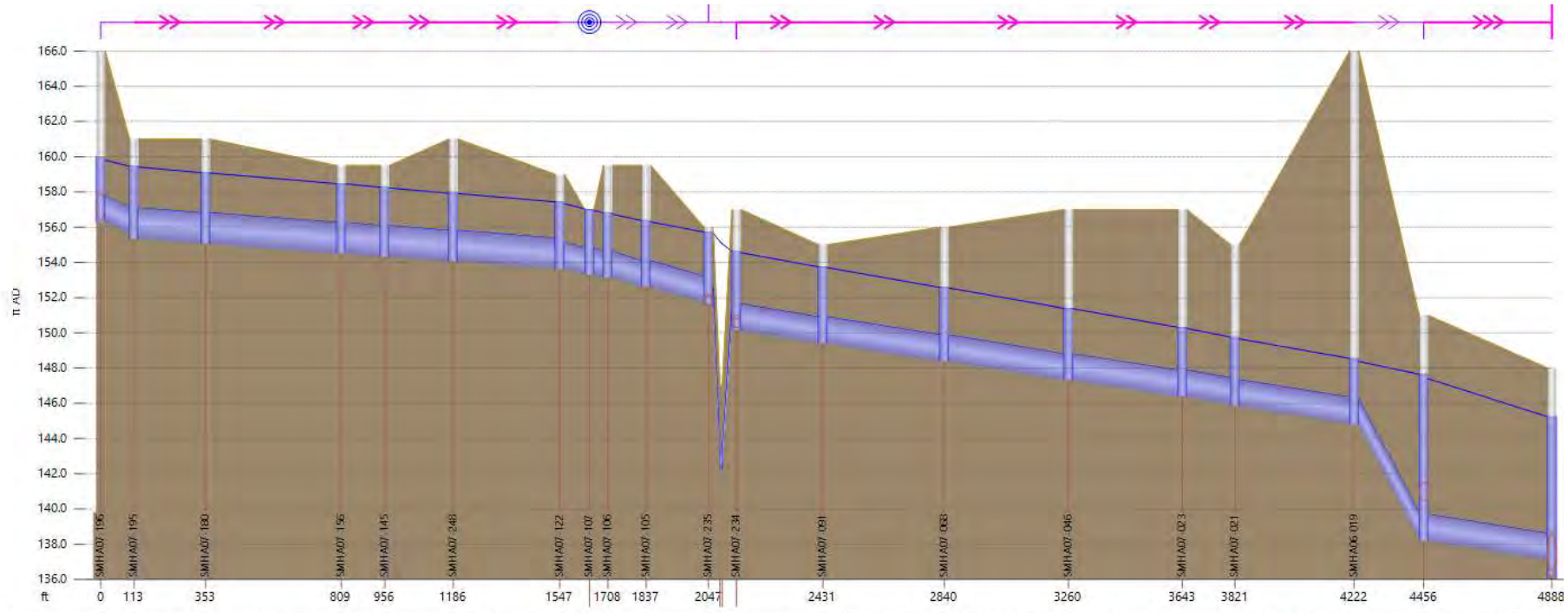
Node	-	SMH B08-143	-	SMH B08-113	SMH B08-105	SMH B08-083	SMH B08-077	SMH B08-066	SMH B08-062	-	-	-	-	-	-	-	-
ground (ft AD)	252.381	246.609	243.258	240.770	239.440	240.920	243.415	243.560	241.150	-	-	230.810	225.000	221.960	-	-
level (ft AD)	245.835	240.057	235.727	234.252	232.191	230.199	228.799	227.700	226.429	-	-	214.326	212.897	211.637	-	-
flood dep (ft)	-6.546	-6.552	-7.531	-6.518	-7.249	-10.721	-14.616	-15.860	-14.721	-12.840	-	-16.484	-12.103	-10.323	-8.412	-

BUILDOUT LAND USE – AREA A



Link	A10-03.1	-	-	-	-	-	SMH A08-018.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
length (ft)	319.0	284.5	-	212.9	230.3	-	398.9	260.9	398.2	311.2	255.4	-	302.2	300.1	320.7	-	155.0	160.0	212.0	188.0	154.0	246.0	393.4	220.7	292.1	-	195.0
width (in)	15.0	15.0	-	15.0	15.0	-	15.0	15.0	15.0	15.0	15.0	-	15.0	15.0	18.0	-	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
us inv (ft AD)	213.530	211.020	-	207.750	206.510	-	203.000	199.010	197.410	194.750	192.920	-	190.690	188.850	186.770	-	-	-	184.840	-	-	183.550	182.960	182.000	181.380	-	-
ds inv (ft AD)	211.020	208.340	-	206.610	204.089	-	199.110	197.420	194.990	192.920	191.390	-	188.850	187.020	185.900	-	-	-	184.350	-	-	182.960	182.000	181.490	180.690	-	-
grad (%)	0.787	0.942	-	0.535	1.051	-	0.975	0.609	0.608	0.588	0.599	-	0.609	0.610	0.271	-	0.265	0.262	0.231	0.229	0.240	0.240	0.244	0.231	0.236	-	0.251
surc	2.00	2.00	-	2.00	1.00	-	1.00	2.00	2.00	2.00	2.00	-	2.00	2.00	2.00	-	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
r.pfc (MGD)	3.70	4.05	-	3.06	4.28	-	4.12	3.26	3.26	3.20	3.23	-	3.26	3.26	3.54	-	3.49	3.48	3.26	3.25	3.33	3.33	3.35	3.26	3.30	3.40	3.40
DS flow (MGD)	4.3727	4.1683	-	3.9082	3.8859	-	3.9267	3.9075	3.8864	3.8696	3.8558	-	3.5250	3.5183	3.5582	-	-	-	3.6701	3.6700	-	3.6700	3.6699	3.6699	3.6699	-	3.6698
Node	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ground (ft AD)	-	219.000	-	-	-	-	210.000	207.000	205.000	203.000	200.000	-	-	197.000	196.000	-	-	-	-	-	-	206.000	201.000	-	-	-	-
level (ft AD)	-	219.000	-	-	-	-	210.000	206.648	204.261	200.863	198.146	-	-	192.766	190.563	-	-	-	-	-	-	185.784	184.585	-	-	-	-
flood dep (ft)	-	-0.000	-	-	-0.764	-	0.000	-0.352	-0.739	-2.137	-1.854	-	-	-4.234	-5.437	-	-	-	-	-	-	-20.216	-16.415	-	-	-	-

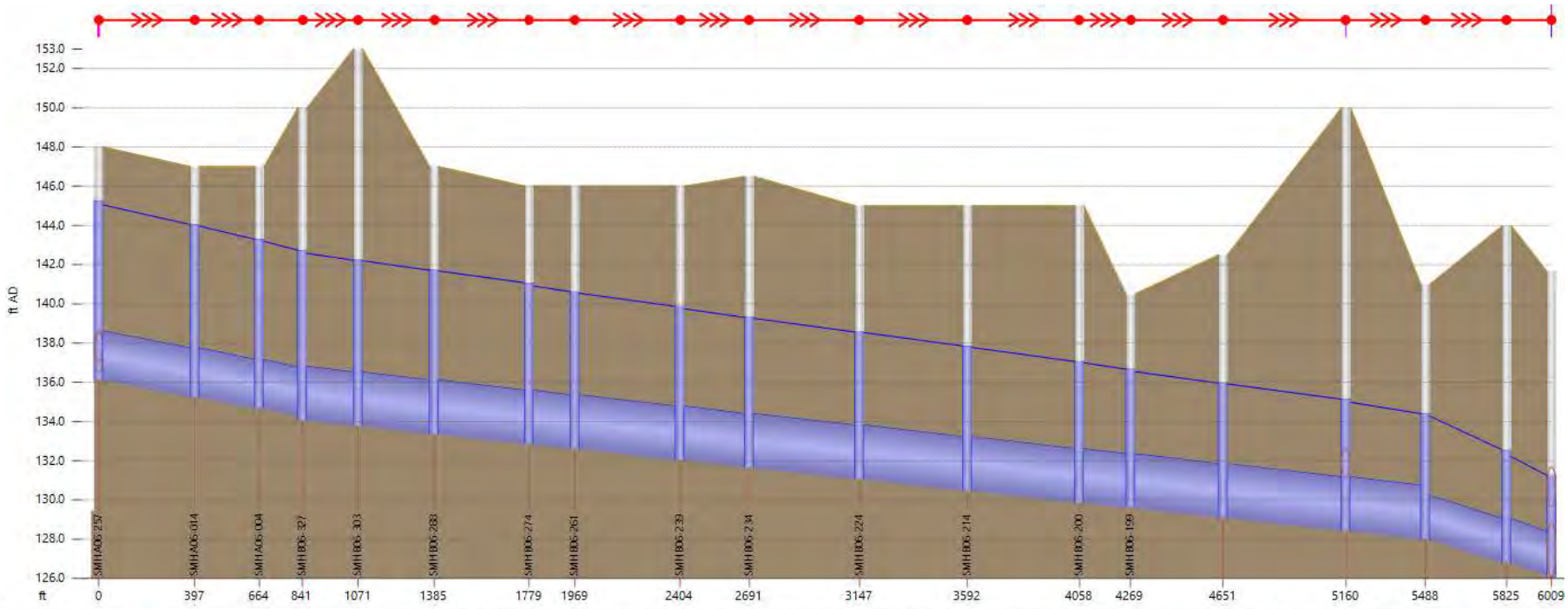
BUILDOUT LAND USE – AREA B



Link	-	-	SMH A07-180.1	-	-	SMH A07-248.1	-	-	-	-	-	-	SMH A07-091.1	SMH A07-068.1	SMH A07-046.1	-	SMH A07-021.1	-	SMH B06-329.1
length (ft)	112.5	240.7	456.0	146.8	230.3	360.3	99.4	-	128.8	209.5	-	290.6	408.7	419.5	383.8	177.3	401.8	233.8	431.9
width (in)	18.0	21.0	21.0	21.0	21.0	21.0	18.0	-	18.0	18.0	-	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
us inv (ft AD)	-	155.350	155.060	-	154.340	154.060	-	-	-	152.590	-	150.140	149.400	148.380	147.300	146.380	145.830	144.740	138.190
ds inv (ft AD)	-	155.060	154.510	-	154.060	153.630	-	-	-	151.720	-	149.400	148.380	147.300	146.380	145.930	144.840	138.290	137.110
grad (%)	0.622	0.120	0.121	0.116	0.122	0.119	-	-	0.411	0.415	-	0.255	0.250	0.257	0.240	0.254	0.246	2.759	0.250
surc	1.00	2.00	2.00	2.00	2.00	2.00	1.00	-	1.00	1.00	-	2.00	2.00	2.00	2.00	2.00	2.00	1.00	2.00
r.pfc (MGD)	5.36	3.56	3.56	3.49	3.57	3.54	3.79	-	4.36	4.38	-	3.43	3.39	3.45	3.32	3.42	3.37	11.28	3.40
DS flow (MGD)	-	3.6922	3.6921	3.6921	3.6921	3.6920	-	-	-	3.6350	-	3.6331	3.6319	3.6309	3.6307	3.6316	3.6328	3.6340	4.8525

Node	-	SMH A07-180	-	-	-	-	-	-	-	-	-	SMH A07-091	SMH A07-068	SMH A07-046	-	-	SMH A06-019	SMH B06-329	-
ground (ft AD)	-	161.000	159.500	-	161.000	159.000	-	-	-	-	-	155.000	156.000	157.000	157.000	155.000	166.000	151.000	148.000
level (ft AD)	-	159.098	158.474	-	157.925	157.432	-	-	-	-	-	153.744	152.576	151.392	150.307	149.750	148.534	147.638	145.233
flood dep (ft)	-1.543	-1.902	-1.026	-1.234	-3.075	-1.568	-	-	-3.128	-	-2.386	-1.256	-3.424	-5.608	-6.693	-5.250	-17.466	-3.362	-2.767

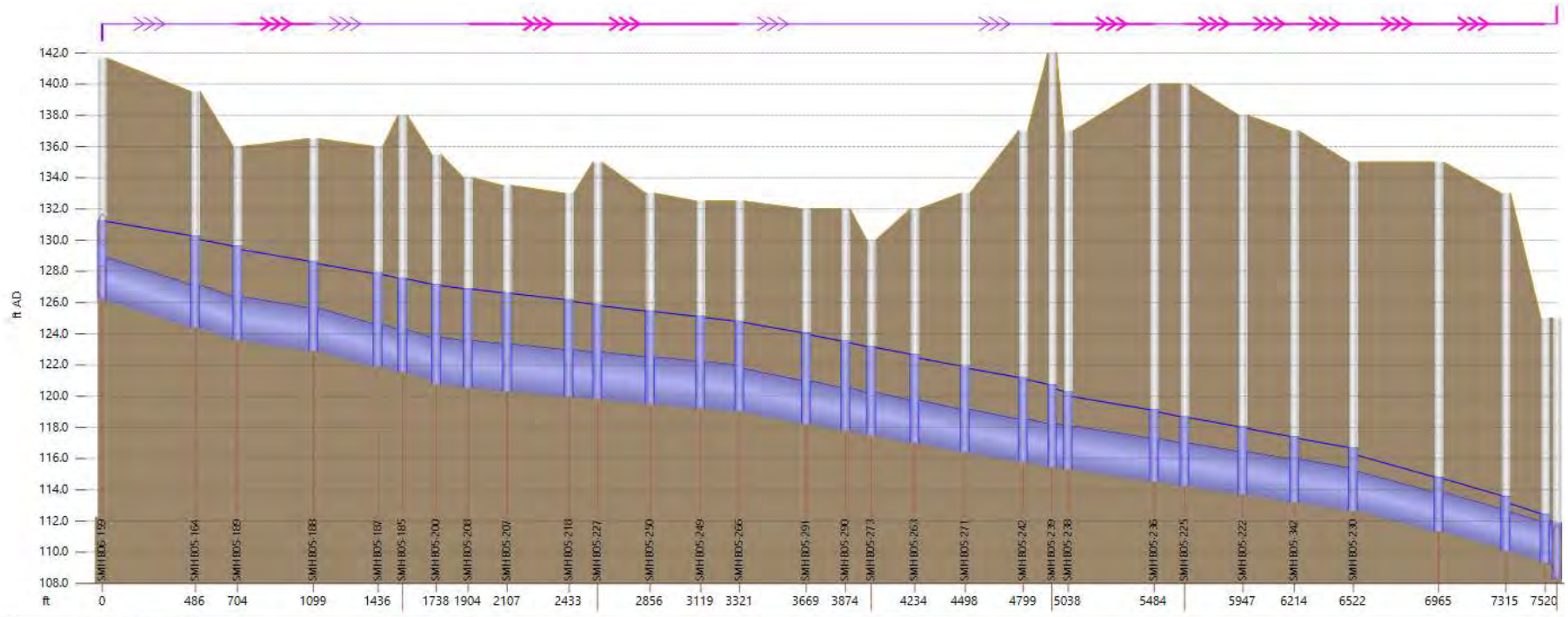
BUILDOUT LAND USE – AREA C



Link	SMH A06-257.1	-	-	-	-	SMH B06-288.1	-	SMH B06-261.1	-	SMH B06-234.1	SMH B06-224.1	SMH B06-214.1	-	SMH B06-199.1	SMH B06-186.1	-	-	-
length (ft)	396.7	267.4	177.3	229.3	314.6	393.4	190.1	435.0	287.1	455.6	445.4	466.4	210.4	382.2	509.2	327.5	337.3	184.4
width (in)	30.0	30.0	30.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	27.0	27.0
us inv (ft AD)	136.110	135.240	-	134.050	133.760	133.360	-	132.600	132.030	131.640	131.060	130.470	129.850	129.600	129.090	128.420	127.990	-
ds inv (ft AD)	135.240	134.660	-	133.760	133.360	132.840	-	132.030	131.640	131.060	130.470	129.850	129.600	129.090	128.420	127.990	126.792	-
grad (%)	0.219	0.217	0.220	0.126	0.127	0.132	0.126	0.131	0.136	0.127	0.132	0.133	0.119	0.133	0.132	0.131	0.355	0.358
surc	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
r,cfc (MGD)	12.42	12.35	12.43	12.16	12.19	12.43	12.15	12.37	12.60	12.20	12.44	12.46	11.78	12.49	12.40	12.39	11.93	11.98
DS flow (MGD)	13.2598	13.2587	-	13.2570	13.3380	13.3370	-	13.3354	13.3348	13.3340	13.3333	13.3327	13.3323	13.3318	13.3313	14.2827	14.2828	-

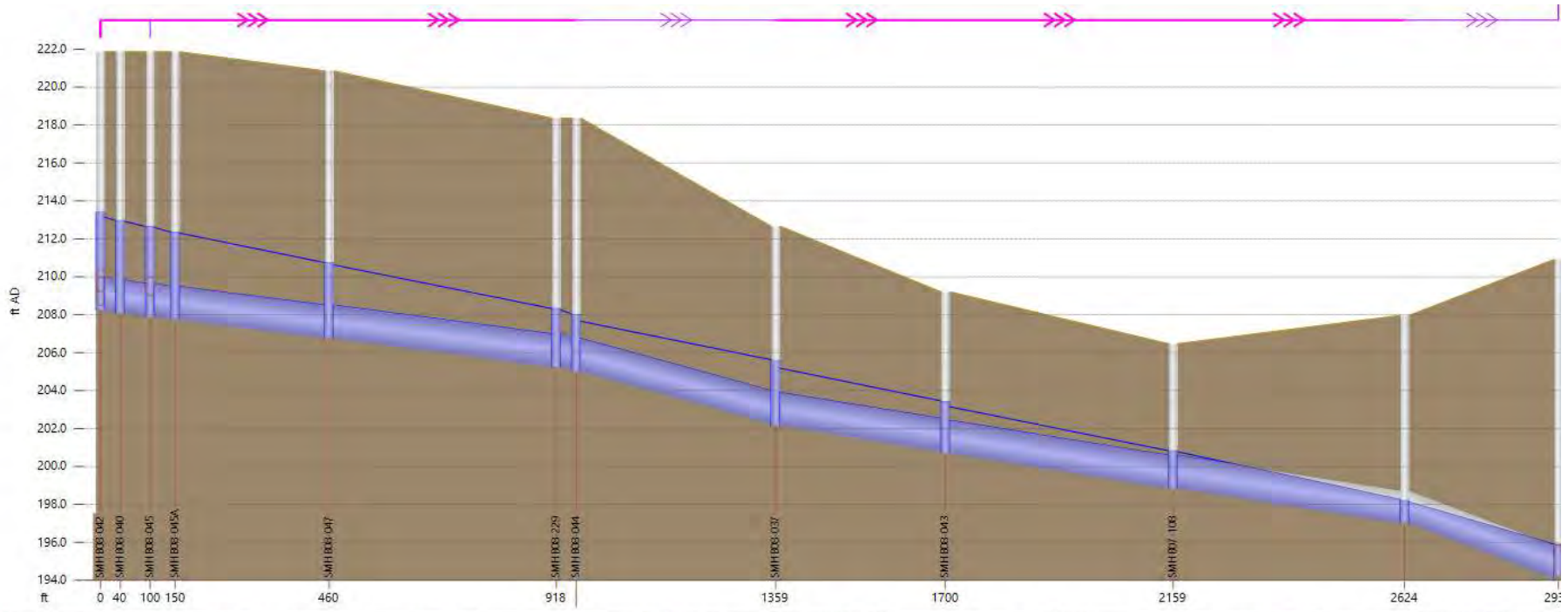
Node	-	-	-	-	-	-	-	-	-	-	-	SMH B06-224	SMH B06-214	-	-	SMH B06-186	SMH B06-163	-	-	-
ground (ft AD)	-	147.000	-	-	153.000	147.000	146.000	146.000	146.000	146.500	145.000	145.000	145.000	140.500	142.500	150.000	141.000	143.984	-	
level (ft AD)	-	144.039	-	-	142.225	141.711	141.059	140.614	139.861	139.304	138.562	137.847	137.055	136.658	135.954	135.125	134.398	132.519	-	
flood dep (ft)	-2.767	-2.961	-3.716	-7.281	-10.775	-5.289	-4.941	-5.386	-6.139	-7.196	-6.438	-7.153	-7.945	-3.842	-6.546	-14.875	-6.602	-11.465	-	

BUILDOUT LAND USE – AREA D



Link	SMH B06-159.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
length (ft)	485.7	218.4	394.8	337.0	-	176.0	-	202.7	326.1	-	274.6	263.3	201.7	348.2	204.6	-	227.1	263.3	301.6	-	-	446.8	-	303.8	267.3	307.6	443.8	349.1	205.1	
width (in)	33.0	33.0	33.0	33.0	-	33.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	33.0	33.0	-	33.0	33.0	33.0	33.0	-	33.0	33.0	33.0	33.0	33.0	30.0	30.0	30.0	
us inv (ft AD)	126.132	-	123.610	122.900	-	-	-	-	120.330	-	119.810	119.500	-	119.000	-	-	-	116.980	116.390	-	-	115.330	-	114.230	113.690	113.200	112.650	111.330	-	
ds inv (ft AD)	124.392	-	122.900	121.870	-	-	-	-	119.960	-	119.500	119.220	-	118.230	-	-	-	116.390	115.760	-	-	114.550	-	113.690	113.200	112.650	111.330	110.270	-	
grad (%)	0.358	0.358	0.180	0.306	-	0.284	-	0.109	0.113	-	0.113	0.106	0.109	0.221	0.225	-	0.220	0.224	0.209	-	-	0.175	-	0.178	0.183	0.179	0.297	0.304	0.302	
surc	1.00	1.00	2.00	1.00	-	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	-	1.00	1.00	1.00	1.00	-	2.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00	
r.pfc (MGD)	20.46	20.46	14.50	18.90	-	18.22	-	14.20	14.52	-	14.49	14.06	14.24	16.08	16.21	-	16.04	16.18	15.62	-	-	14.28	-	14.41	14.64	14.46	14.46	14.61	14.58	
DS flow (MGD)	15.0889	-	15.0329	15.0057	-	-	-	-	14.9060	-	14.8692	14.8577	-	14.8171	-	-	-	14.7435	14.7259	-	-	14.7239	-	14.7225	14.7217	14.7210	14.7201	14.7194	-	
Node	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ground (ft AD)	-	139.514	136.000	136.500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	140.000	-	-	-	135.000	135.000	-	-	
level (ft AD)	-	130.268	129.608	128.638	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	119.125	-	-	-	116.675	114.817	-	-	
flood dep (ft)	-	-9.246	-6.392	-7.862	-	-	-	-	-6.879	-	-	-7.544	-	-7.698	-7.942	-	-	-	-	-	-	-20.875	-	-19.957	-19.586	-18.325	-20.183	-	-	

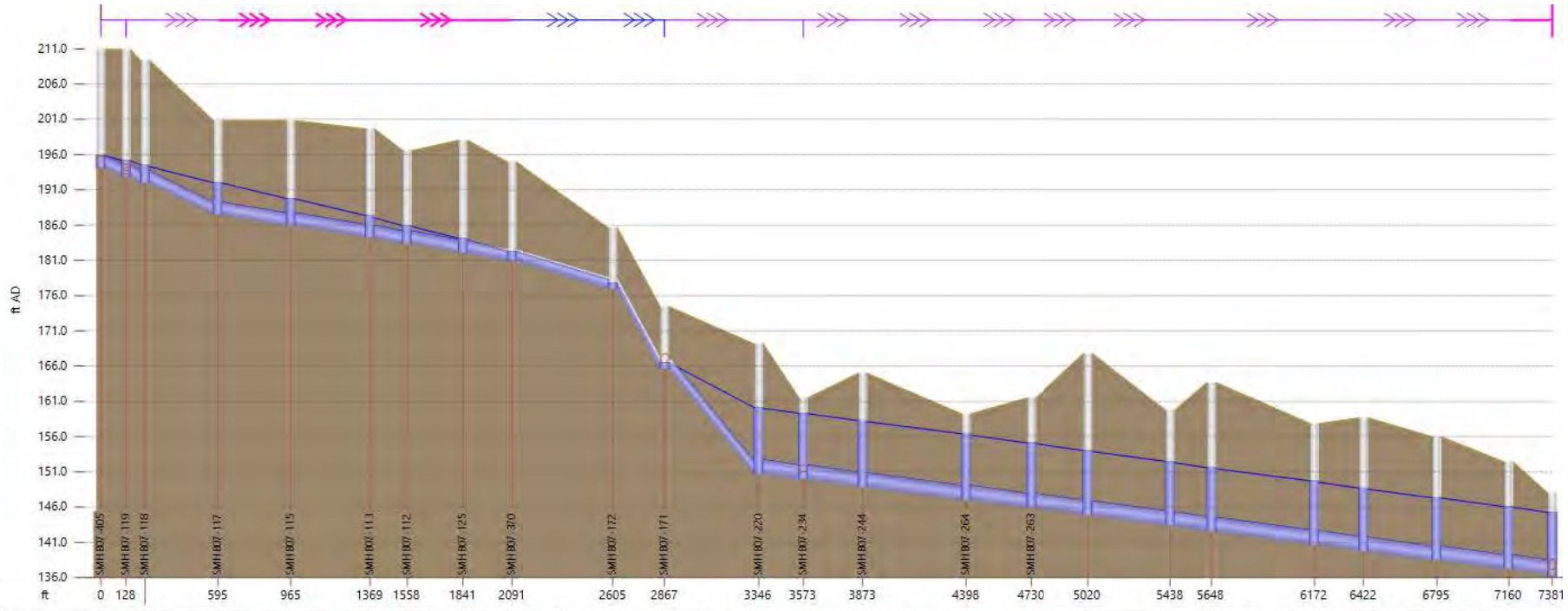
BUILDOUT LAND USE – AREA E



Link	-	-	-	SMH B08-045A.1	SMH B08-047.1	-	SMH B08-044.1	SMH B08-037.1	SMH B08-043.1	SMH B07-108.1	SMH B07-107.1
length (ft)	-	60.0	-	310.0	458.0	-	401.0	341.0	459.2	464.7	308.9
width (in)	-	21.0	-	21.0	21.0	-	21.0	21.0	21.0	21.0	21.0
us inv (ft AD)	-	-	-	207.732	206.750	-	205.000	202.150	200.680	198.840	197.000
ds inv (ft AD)	-	-	-	206.750	205.233	-	202.250	200.780	198.840	197.000	194.107
grad (%)	-	-	-	0.317	0.331	-	0.686	0.402	0.401	0.396	0.937
surc	-	2.00	-	2.00	2.00	-	1.00	2.00	2.00	2.00	1.00
r.pfc (MGD)	-	5.76	-	5.76	5.89	-	8.48	6.49	6.48	6.45	9.91
DS flow (MGD)	-	-	-	7.2196	7.2195	-	7.2509	7.2534	7.2534	7.2534	7.2522

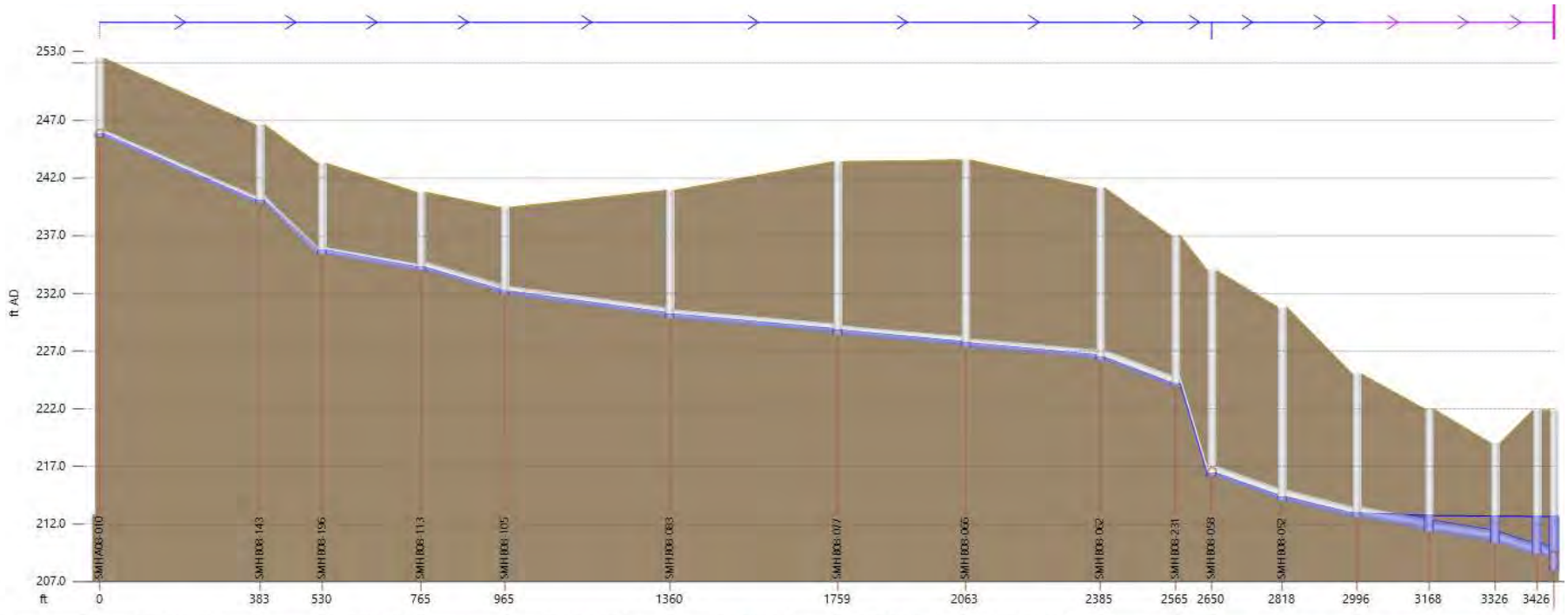
Node	-	-	-	SMH B08-047	SMH B08-229	SMH B08-044	SMH B08-037	SMH B08-043	SMH B07-108	SMH B07-107	-
ground (ft AD)	-	-	221.854	220.847	218.361	218.361	212.662	209.204	206.463	207.955	210.904
level (ft AD)	-	-	212.343	210.734	208.318	208.010	205.584	203.427	200.820	198.192	195.893
flood dep (ft)	-	-	-9.511	-10.113	-10.043	-10.351	-7.078	-5.777	-5.643	-9.763	-15.011

BUILDOUT LAND USE – AREA F



Link	-	-	-	-	-	-	-	-	SMH B07-370.1	-	SMH B07-171.1	-	-	SMH B07-244.1	-	-	-	-	SMH B07-242.1	-	-	-	-	-
length (ft)	-	-	370.0	370.5	403.7	189.0	282.5	249.9	514.2	262.6	479.1	226.2	300.0	525.4	331.8	289.9	418.2	210.2	523.9	249.6	373.1	365.7	220.5		
width (in)	-	-	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0		
us inv (ft AD)	-	-	192.000	187.500	186.000	-	183.416	182.070	180.950	177.000	165.650	-	149.975	148.860	147.080	145.950	144.870	-	142.540	140.670	139.730	138.470	-		
ds inv (ft AD)	-	-	187.500	186.000	184.350	-	182.170	180.950	177.000	165.750	150.740	-	148.960	147.080	145.950	144.970	143.460	-	140.770	139.830	138.470	137.230	-		
grad (%)	-	-	1.216	0.405	0.409	0.441	0.441	0.448	0.768	4.284	3.112	0.338	0.338	0.339	0.341	0.338	0.337	0.343	0.338	0.337	0.338	0.339	0.327		
surc	-	-	1.00	2.00	2.00	2.00	2.00	2.00	0.72	0.44	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00		
r.pfc (MGD)	-	-	11.30	6.52	6.55	6.80	6.80	6.86	8.98	21.20	18.07	8.50	8.51	8.51	8.53	8.50	8.49	8.56	8.50	8.48	8.50	8.52	8.36		
DS flow (MGD)	-	-	7.8057	7.8057	7.8057	-	7.8765	7.8765	7.8969	7.8969	8.1616	8.1590	8.3502	8.3481	8.3468	8.3458	8.3447	8.3440	8.3430	8.3424	8.3418	8.4519	8.4514		
Node	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ground (ft AD)	-	-	200.819	200.813	199.641	-	-	194.963	185.616	174.439	169.113	-	164.971	159.204	161.463	167.769	159.712	163.680	157.842	158.647	155.955	152.380	-		
level (ft AD)	-	-	192.010	189.781	187.328	-	-	182.280	177.763	166.511	160.091	-	158.261	156.391	155.117	154.027	152.482	151.592	149.709	148.676	147.314	146.045	-		
flood dep (ft)	-	-	-8.809	-11.032	-12.313	-	-	-12.683	-7.853	-7.928	-9.022	-2.197	-6.710	-2.813	-6.346	-13.742	-7.230	-12.088	-8.133	-9.971	-8.641	-6.335	-		

BUILDOUT LAND USE – AREA G



Link	SMH A08-010.1	-	SMH B08-196.1	-	SMH B08-105.1	SMH B08-083.1	SMH B08-077.1	SMH B08-066.1	-	-	-	-	-	-	-	-
length (ft)	382.5	147.9	234.6	200.3	394.4	399.4	304.0	322.1	179.5	85.6	168.0	178.0	172.0	157.2	100.0	-
width (in)	8.0	8.0	8.0	10.0	10.0	10.0	10.0	10.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	-
us inv (ft AD)	245.580	239.840	235.400	233.990	231.880	229.840	228.440	227.340	226.180	-	216.100	214.030	212.580	211.300	-	-
ds inv (ft AD)	239.840	235.400	233.990	232.080	230.040	228.640	227.530	226.380	223.990	-	214.230	212.580	211.500	210.500	-	-
grad (%)	1.501	3.002	0.601	0.954	0.467	0.300	0.299	0.298	1.220	9.100	1.113	0.815	0.628	0.509	0.929	-
surc	0.38	0.49	0.49	0.31	0.37	0.43	0.43	0.43	0.25	0.19	0.29	0.36	1.00	1.00	1.00	-
r.pfc (MGD)	0.96	1.35	0.61	1.38	0.97	0.78	0.77	0.77	2.54	6.95	2.43	2.08	1.83	1.64	2.22	-
DS flow (MGD)	0.2779	0.2779	0.2779	0.2779	0.2779	0.2900	0.2900	0.2900	0.2900	-	0.3825	0.3827	0.3871	0.3878	0.3885	-

Node	-	SMH B08-143	-	SMH B08-113	SMH B08-105	SMH B08-083	SMH B08-077	SMH B08-066	SMH B08-062	-	-	-	-	-	-	-
ground (ft AD)	252.381	246.609	243.258	240.770	239.440	240.920	243.415	243.560	241.150	-	-	230.810	225.000	221.960	-	-
level (ft AD)	245.835	240.057	235.727	234.252	232.191	230.199	228.799	227.700	226.429	-	-	214.326	212.939	212.742	-	-
flood dep (ft)	-6.546	-6.552	-7.531	-6.518	-7.249	-10.721	-14.616	-15.860	-14.721	-12.840	-	-16.484	-12.061	-9.218	-6.307	-

APPENDIX F – PROPOSED CAPACITY IMPROVEMENT PROJECT DETAILS

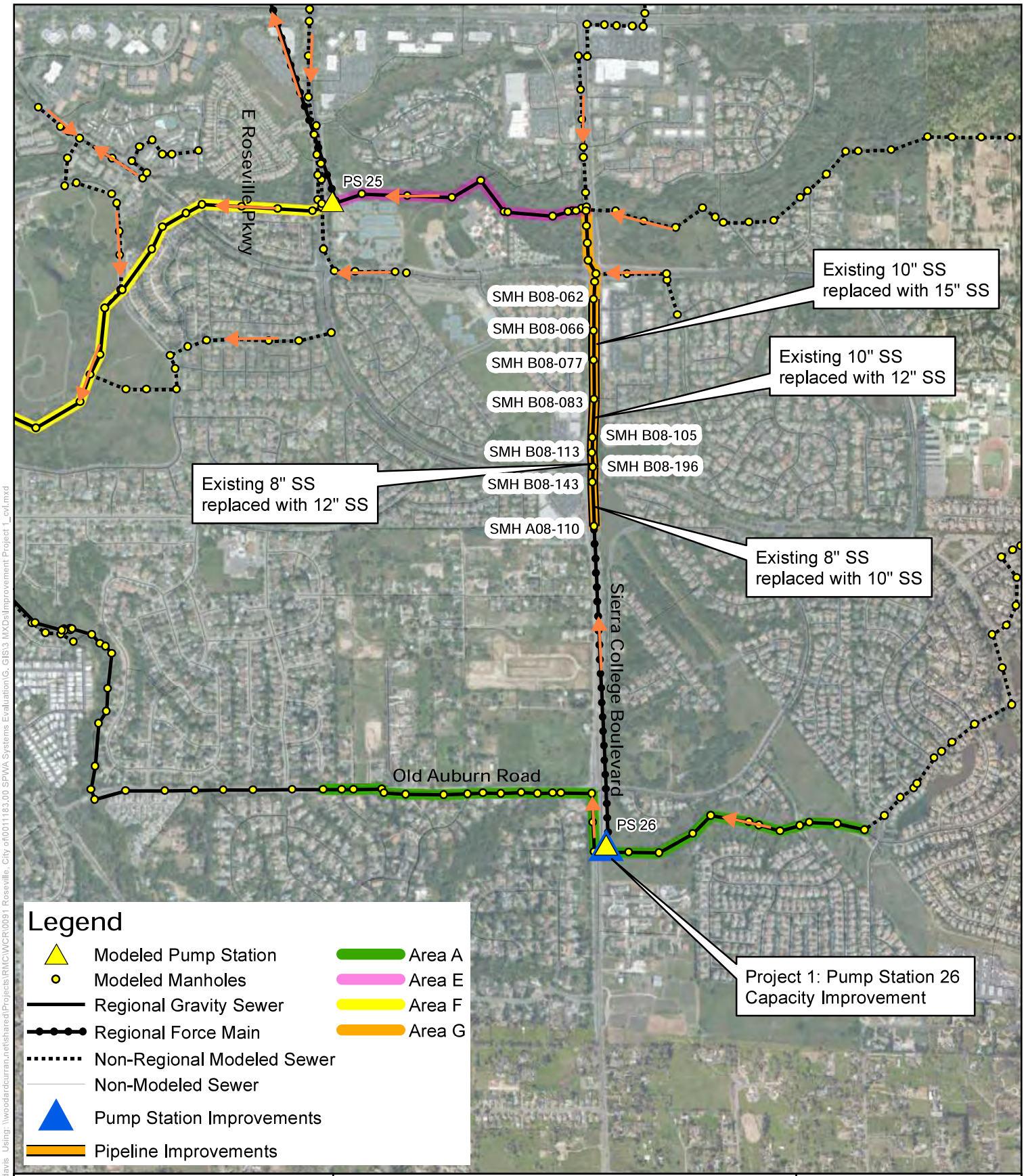
Project 1: Pump Station 26 Capacity Improvement and Sierra College Blvd. Improvement

PROJECT DESCRIPTION

Project ID	1
Project Name	Pump Station 26 Capacity Improvement and Sierra College Blvd. Improvement
Project Location	PS 26 and Sierra College Boulevard
Description	Increased Capacity of PS 26 and sewers on Sierra College Blvd (from 0.43 to 1.6 mgd)
Estimated Capital Imp. Cost	$1,606,000
Comments	(i) Pipes are listed in order from upstream to downstream
Assumptions	(i) Pipe cost estimates are based on the 20 Cities & SF Average April 2020 ENR CCI of 12115
	(ii) Cost assumes project will be implemented using open-cut construction method

PROJECT COST DETAIL

U/S MH ID	D/S MH ID	Existing Diameter (inches)	New Diameter (inches)	Length (feet)	Slope (%)	Pipe Depth (feet BGL)	Construction Method	Unit Cost ($/LF)	Total Cost ($)
SMH A08-010	SMH B08-143	8	10	383	1.50	7	Open Cut	$171	$ 65,363
SMH B08-143	SMH B08-196	8	10	148	3.00	7	Open Cut	$171	$ 25,274
SMH B08-196	SMH B08-113	8	12	235	0.60	7	Open Cut	$189	$ 44,236
SMH B08-113	SMH B08-105	10	12	200	0.95	7	Open Cut	$189	$ 37,769
SMH B08-105	SMH B08-083	10	12	394	0.47	9	Open Cut	$189	$ 74,368
SMH B08-083	SMH B08-077	10	15	399	0.30	13	Open Cut	$242	$ 96,492
SMH B08-077	SMH B08-066	10	15	304	0.30	16	Open Cut	$259	$ 78,818
SMH B08-066	SMH B08-062	10	15	322	0.30	15	Open Cut	$259	$ 83,511
							Baseline Pipeline Construction Cost:		**$ 505,831**
							Sheeting and Shoring for High Groundwater Area		$ -
							Dewatering		$ -
							Bypass Pumping (10% of pipe construction cost)		$ 50,583
							Remove & Replace Factor (5% of pipe construction cost)		$ 25,292
							Major Traffic Control (10% of pipe construction cost)		$ -
							Pipeline Construction Cost Subtotal:		**$ 581,705**
							Pumps (including 8.25% sales tax)		$ 164,540
							Allowance for new PG&E Service		$ 20,000
							Electrical improvements (new service, new MCC, new cables, soft starts)		$ 35,000
							Installation (25% of raw cost)		$ 54,885
							Piping & Structural Modifications Allowance		$ 25,000
							Contractor Overhead & Profit (20%)		$ 59,885
							Pump Station Construction Cost Subtotal:		**$ 359,310**
							Construction Subtotal:		**$ 941,015**
							Mobilization/Demobilization (5% of subtotal)		$ 47,051
							Construction Total:		**$ 988,066**
							Contingencies (30% of construction subtotal)		$ 296,420
							Total Estimated Construction Cost:		**$ 1,284,486**
							Engineering, Administration, Legal (25% of construction cost)		$ 321,121
							Estimated Capital Improvement Cost:		**$ 1,606,000**



Improvement Project 1

South Placer Wastewater Authority
2020 Systems Evaluation

0 750 1,500 3,000 Feet

N

WOODARD &CURRAN

Project #: 0011183.00
Map Created: June 2020

Figure Exported: 6/15/2020 By: apdavis Using: \\woodardcurran.net\shared\Projects\RMC\WCR\0091 Roseville, City of\0011183.00 SPWA Systems Evaluation\G, GIS\3 MXDs\Improvement Project 1_cvl.mxd

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions.
Any reliance upon the map or data contained herein shall be at the users' sole risk. Data Sources: Esri

Project 2: Eureka Road, E Rosevville Parkway Improvement

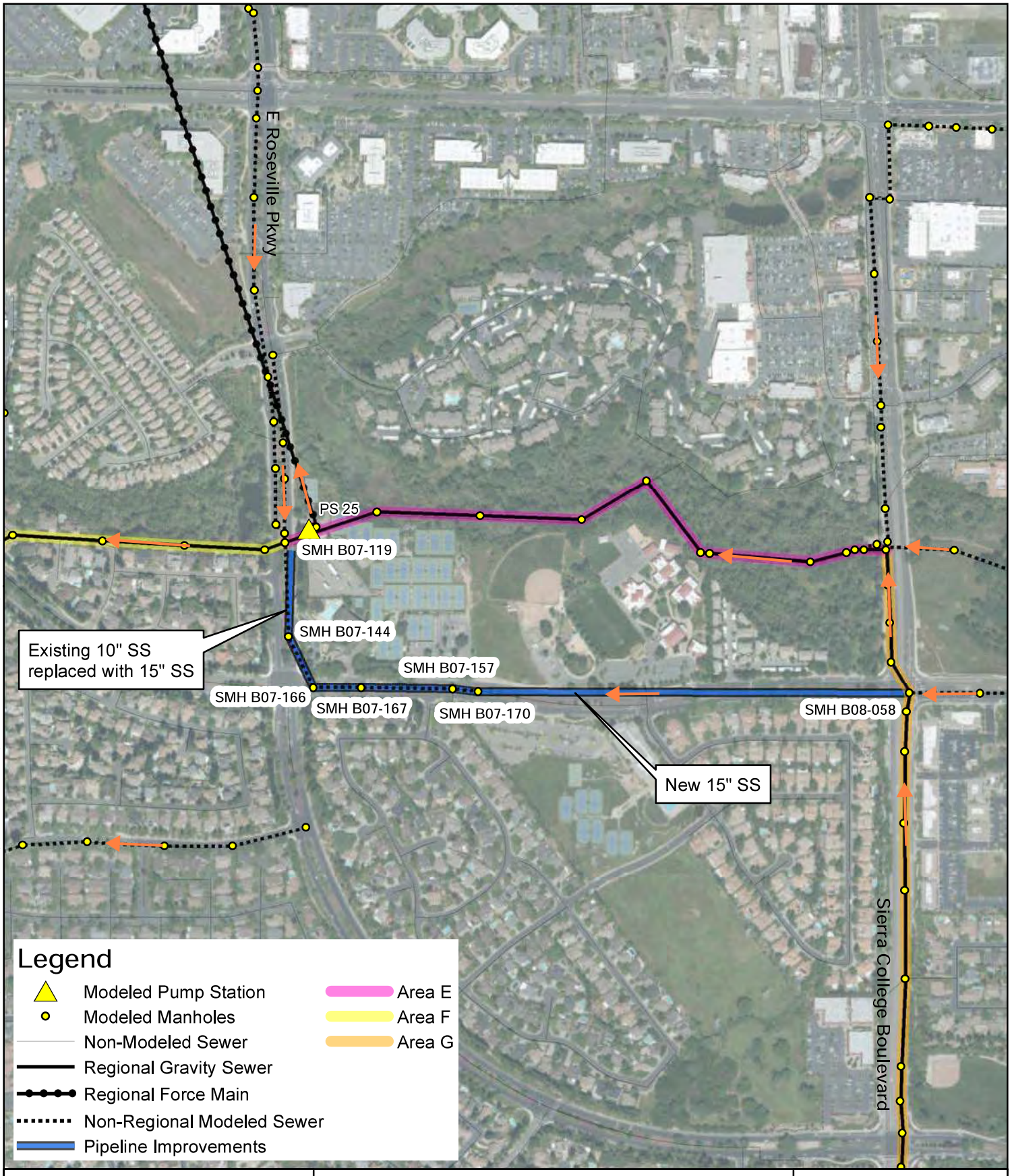
PROJECT DESCRIPTION

Project ID 2
Project Name ..... Eureka Road, E Rosevville Parkway Improvement
Project Location ..... Eureka Road and E. Roseville Parkway
Description ..... Redirect flows from PS 26 and Sierra College Blvd. down Eureka Rd via upsizing of approximately 1,310ft, installing approximately 2,740 ft of new 15in pipe and 4 new manholes.

Estimated Capital Imp. Cost $1,831,000
Comments ..... (i) Pipes are listed in order from upstream to downstream
Assumptions ..... (i) Cost estimates are based on the 20 Cities & SF Average April 2020 ENR CCI of 12115
(ii) Cost assumes project will be implemented using open-cut construction method

PROJECT COST DETAIL

U/S MH ID	D/S MH ID	Existing Diameter (inches)	New Diameter (inches)	Length (feet)	Slope (%)	Pipe Depth (feet BGL)	Construction Method	Unit Cost ($/LF)		Total Cost ($)
SMH B08-058	SMH B07-170	new pipe	15	697	0.22	15	Open Cut	$259	$	180,608
SMH B07-170	SMH B07-157	new pipe	15	1942	0.25	13	Open Cut	$242	$	469,198
SMH B07-157	SMH B07-167	10	15	413	0.97	12	Open Cut	$242	$	99,730
SMH B07-167	SMH B07-166	10	15	216	0.50	12	Open Cut	$242	$	52,112
SMH B07-166	SMH B07-144	10	15	255	0.53	11	Open Cut	$242	$	61,630
SMH B07-144	SMH B07-119	10	15	424	0.48	14	Open Cut	$242	$	102,435
								Baseline Pipeline Construction Cost:	$	965,712
								Sheeting and Shoring for High Groundwater Area	$	-
								Dewatering	$	-
								Bypass Pumping (10% of upsized pipe construction cost)	$	31,591
								Remove & Replace Factor (5% of upsized pipe construction cost)	$	15,795
								Major Traffic Control (10% of pipe construction cost)	$	-
								Pipeline Construction Cost Subtotal:	**$**	**1,013,098**
								Installation of 4 new manholes	$	60,000
								Manhole Construction Cost Subtotal:	**$**	**60,000**
								Construction Subtotal:	**$**	**1,073,098**
								Mobilization/Demobilization (5% of subtotal)	$	53,655
								Construction Total	**$**	**1,126,753**
								Contingencies (30% of construction subtotal)	$	338,026
								Total Estimated Construction Cost:	**$**	**1,464,779**
								Engineering, Administration, Legal (25% of construction cost)	$	366,195
								Estimated Capital Improvement Cost:	**$**	**1,831,000**



Improvement Project 2

South Placer Wastewater Authority
2020 Systems Evaluation

0 375 750 1,500 Feet

N

WOODARD &CURRAN

Project #: 0011183.00
Map Created: June 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions.
Any reliance upon the map or data contained herein shall be at the users' sole risk. Data Sources: Esri

Figure Exported: 6/15/2020 By: apdavis Using: \\woodardcurran.net\shared\Projects\RMC\WCR\0091 Roseville, City of\0011183.00 SPWA Systems Evaluation\G, GIS\3 MXDs\Improvement Project 2.mxd

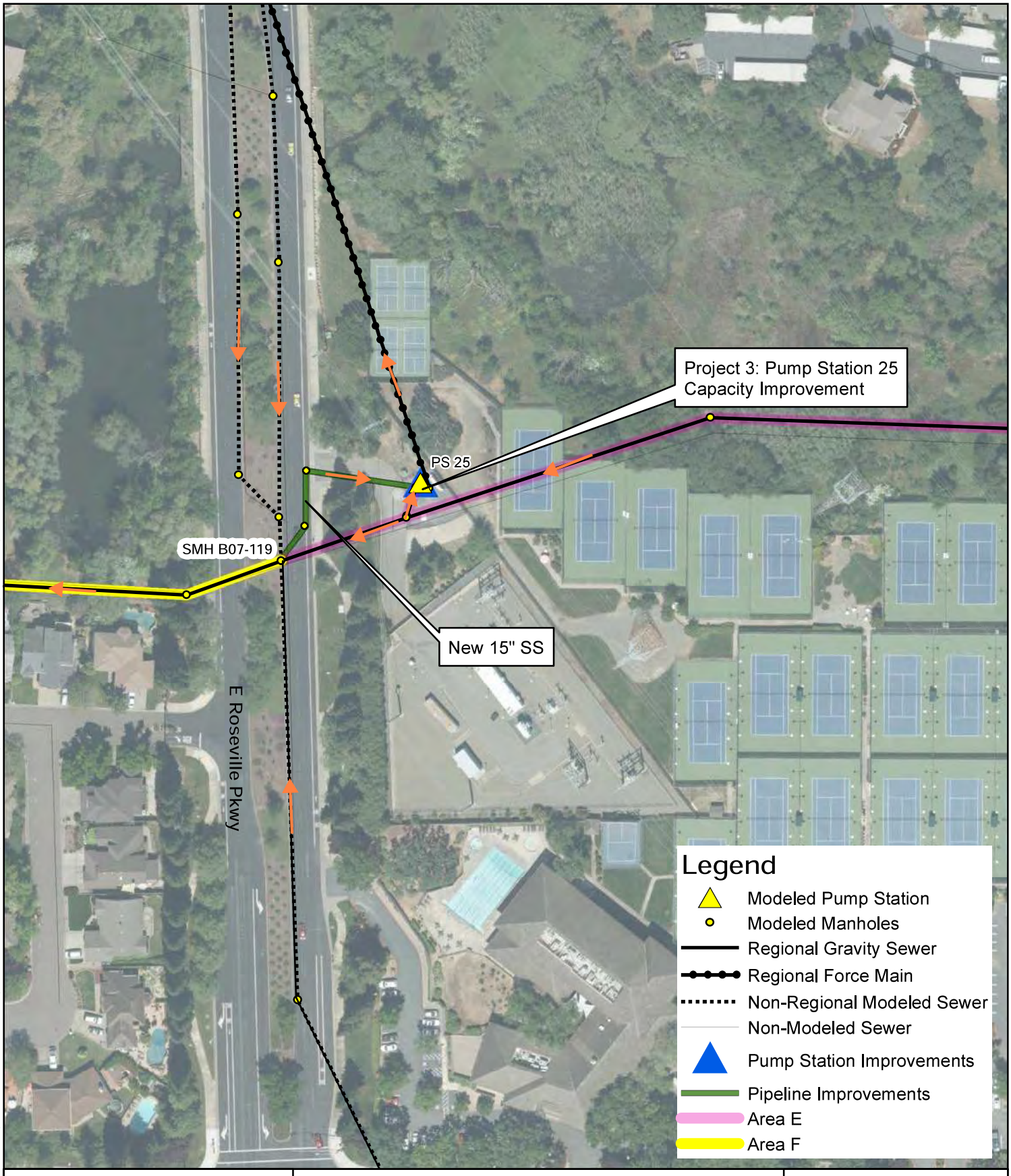
Project 3 Alternative A: Pump Station 25 Improvements

PROJECT DESCRIPTION

Project ID	3 Alternative A
Project Name	Pump Station 25 Improvements
Project Location	PS 25 (pumps)
Description	New weir structure or adjustments to existing structure at PS 25
Estimated Capital Imp. Cost	$758,000
Comments	(i) Pipes are listed in order from upstream to downstream
Assumptions	(i) Cost estimates are based on the 20 Cities & SF Average April 2020 ENR CCI of 12115 (ii) Cost assumes project will be implemented using open-cut construction method

PROJECT COST DETAIL

U/S MH ID	D/S MH ID	Existing Diameter (inches)	New Diameter (inches)	Length (feet)	Slope (%)	Pipe Depth (feet BGL)	Construction Method	Unit Cost ($/LF)		Total Cost ($)
SMH B07-119	SMH B07-119_DU2	new pipe	18	10	2%	17	Open Cut	$298	$	2,982
SMH B07-119_DU2	PS 25 Wetwell	new pipe	15	215	2%	14	Open Cut	$242	$	51,942
								Baseline Pipeline Construction Cost:	**$**	**54,924**
								Sheeting and Shoring for High Groundwater Area	$	-
								Dewatering	$	-
								Bypass Pumping (10% of pipe construction cost)	$	-
								Remove & Replace Factor (5% of pipe construction cost)	$	-
								Major Traffic Control (10% of pipe construction cost)	$	-
								Pipeline Construction Cost Subtotal:	**$**	**54,924**
								Installation of 2 new manhole	$	30,000
								Manhole Construction Cost Subtotal:	**$**	**30,000**
								Pumps (including 8.25% sales tax)	$	164,540
								Allowance for new PG&E Service	$	20,000
								Electrical improvements (new service, new MCC, new cables)	$	35,000
								Installation (25% of raw cost)	$	54,885
								Piping & Structural Modifications Allowance	$	25,000
								Contractor Overhead & Profit (20%)	$	59,885
								Pump Station Construction Cost Subtotal:	**$**	**359,310**
								Construction Subtotal:	**$**	**444,234**
								Mobilization/Demobilization (5% of subtotal)	$	22,212
								Estimated Construction Cost Subtotal:	**$**	**466,446**
								Contingencies (30% of construction subtotal)	$	139,934
								Total Estimated Construction Cost:	**$**	**606,380**
								Engineering, Administration, Legal (25% of construction cost)	$	151,595
								Estimated Capital Improvement Cost:	**$**	**758,000**



Improvement Project 3

South Placer Wastewater Authority
2020 Systems Evaluation

0 75 150 300 Feet

N

WOODARD & CURRAN

Project #: 0011183.00
Map Created: June 2020

Figure Exported: 7/17/2020 By: apdavis Using: \\woodardcurran.net\shared\Projects\RMC\WCR\0091 Roseville, City of\0011183.00 SPWA Systems Evaluation\G, GIS\3 MXDs\Improvement Project 3.mxd

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions.
Any reliance upon the map or data contained herein shall be at the users' sole risk. Data Sources: Esri

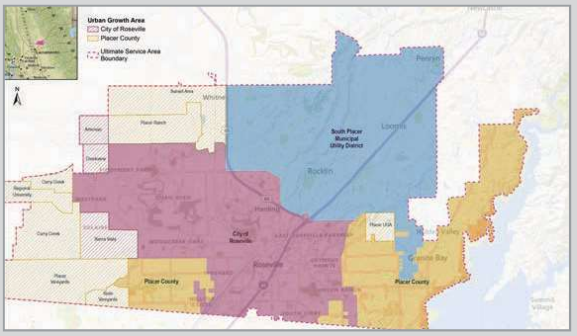


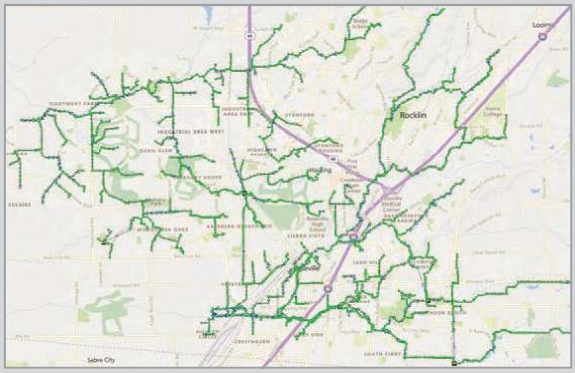
woodardcurran.com

COMMITMENT & INTEGRITY DRIVE RESULTS

801 T Street
Sacramento, CA 95811
916-999-8700
woodardcurran.com









COMMITMENT & INTEGRITY DRIVE RESULTS

Appendix J – 2015 USBR Record of Decision

RECLAMATION

Managing Water in the West

Record of Decision

Central Valley Project Municipal and Industrial Water Shortage Policy

Prepared by

United States Department of the Interior
Bureau of Reclamation
Mid Pacific Region

U.S. Department of the Interior
Bureau of Reclamation
Sacramento, California

November 2015

Mission Statements

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

Record of Decision

Central Valley Project Municipal and Industrial Water Shortage Policy

Recommended:

Richard J. Woodley
Regional Resources Manager
Mid-Pacific Region

Date Nov. 4, 2015

Concur:

Anastasia T. Leigh
Regional Environmental Officer
Mid-Pacific Region

Date 11/9/2015

Approved:

David Murillo
Regional Director
Mid-Pacific Region

Date 11/13/15

Summary of Action

The Bureau of Reclamation (Reclamation) prepared the Central Valley Project (CVP) Municipal and Industrial (M&I) Water Shortage Policy (WSP) Environmental Impact Statement (EIS) to evaluate the potential impacts of CVP M&I WSP alternatives. The M&I WSP would be used by Reclamation to: 1) define water shortage terms and conditions for applicable CVP water service contractors, as appropriate; 2) determine the quantity of water made available to CVP water service contractors from the CVP that, together with the M&I water service contractors' drought water conservation measures and other non-CVP water supplies, would assist the M&I water service contractors in their efforts to protect public health and safety (PHS) during severe or continuing droughts; and 3) provide information to CVP water service contractors for their use in water supply planning and development of drought contingency plans. The alternatives evaluated in this EIS utilize different methodologies for allocating available CVP water supplies to CVP water service contractors during a Condition of Shortage[1]. This EIS evaluates potential impacts of the M&I WSP over a 20-year period, 2010 through 2030. Reclamation's decision is the adoption of an updated M&I WSP.

Background

In January 1993, following the adoption of the Central Valley Project Improvement Act (CVPIA), many CVP M&I water service contractors expressed concerns regarding future allocations of water supplies provided by the CVP. Reclamation subsequently initiated an effort to develop an M&I WSP that would be incorporated into long-term water service contracts during the contract renewal process implemented under the CVPIA. Involved stakeholders submitted language for the M&I WSP as part of several proposed policies. In September 2001, Reclamation released a Draft M&I WSP. Reclamation initiated the preparation of an Environmental Assessment (EA) which included stakeholder input and consideration and evaluation of alternative policies developed in 1993, 1996-1997, and 2000-2001. The M&I WSP EA was released in October 2005 and a Finding of No Significant Impact was signed in December 2005. The M&I WSP currently being implemented by Reclamation is the 2001 Draft M&I WSP, as amended by Alternative 1B from the 2005 EA. Because the assumptions supporting the 2005 EA became outdated and due to significant changes in the Sacramento-San Joaquin River Delta (Delta) and CVP/State Water Project (SWP) operations, Reclamation decided in 2009 to

[1] "Condition of Shortage" is defined in Reclamation water service contracts as "...a condition respecting the Project during any Year *(March 1 through February of the following year)* such that the Contracting Officer is unable to deliver sufficient water to meet the Contract Total".

undertake the M&I WSP EIS to provide an updated M&I WSP that best recognizes the needs of various segments of the water user community and how those needs could be addressed under Conditions of Shortage.

Decision

Reclamation's decision is to implement Alternative 4, Updated M&I WSP (Preferred Alternative). This alternative comprises the updated M&I WSP developed by Reclamation with stakeholder input received during the M&I WSP stakeholder workshops held between May 2010 and January 2011, with clarifying revisions made to address comments from stakeholders received after Stakeholder Workshop 4 (November 2010) and to address public comments received on the Draft EIS (March 2015). The Updated M&I WSP will apply to the CVP water service contractors noted in Table 1. These water service contractors generally comprise those whose contracts currently reference the M&I WSP and those with a water service contract that is expected to reference the updated policy. These water users are located throughout the Sacramento River Valley, San Joaquin River Valley, Tulare Lake Region, and San Francisco Bay/Central Coast area.

Table 1. Water Service Contractors Subject to the Updated M&I WSP

General Geographical Region	CVP Division	Water Service Contractors	M&I	Ag[1]
North of Delta	Shasta and Trinity River	Bella Vista Water District	X	X
		Centerville Community Services District	X	-
		City of Redding	X	-
		City of Shasta Lake	X	-
		Clear Creek Community Services District	X	X
		Mountain Gate Community Services District	X	-
		Shasta Community Services District	X	-
		Shasta County Water Agency	X	-
		United States (U.S.) Forest Service (Shasta)	X	-
	Sacramento River	4-M Water District	X	X
		Colusa County Water District	X	X
		Corning Water District	X	X
		Cortina Water District	X	X
		County of Colusa	X	X
		County of Colusa (Stonyford)	X	-
		Davis Water District	X	X
		Dunnigan Water District	X	X
		Elk Creek Community Services District	X	-
		Glenn Valley Water District	X	X
		Glide Water District	X	X
		Holthouse Water District	X	X

General Geographical Region	CVP Division	Water Service Contractors	M&I	Ag[1]
North of Delta	Sacramento River	Kanawha Water District	X	X
		Kirkwood Water District	X	X
		La Grande Water District	X	X
		Myers-Marsh Mutual Water Company	X	X
		Orland-Artois Water District	X	X
		Proberta Water District	X	X
		Stony Creek Water District	X	X
		Thomes Creek Water District	X	X
		U.S. Forest Service (Salt Creek)	X	-
		Westside Water District	X	X
		Whitney Construction, Incorporated	X	-
	American River	City of Roseville	X	-
		East Bay Municipal Utility District	X	-
		El Dorado Irrigation District	X	-
		Placer County Water Agency	X	-
		Sacramento County Water Agency	X	-
		Sacramento Municipal Utility District	X	-
		San Juan Water District	X	-
	Delta	Banta-Carbona Irrigation District	X	X
		Byron-Bethany Irrigation District	X	X
		City of Tracy	X	X
		Coelho Family Trust	X	X
		Contra Costa Water District	X	-
		Del Puerto Water District	X	X
		Eagle Field Water District	X	X
		Fresno Slough Water District	X	X
		James Irrigation District	X	X
		Laguna Water District	X	X
		Mercy Springs Water District	X	X
		Oro Loma Water District	X	X
		Pajaro Valley Water Management Agency, Westlands Water District	X	X
		Patterson Irrigation District	X	X
		Reclamation District No. 1606	X	X
		Tranquillity Irrigation District	X	X
		Tranquillity Public Utility District	X	X
		U.S. Department of Veteran Affairs	X	-
		West Side Irrigation District	X	X
		West Stanislaus Irrigation District	X	X
		Westlands Water District Distribution Districts	X	X
South of Delta	West San Joaquin	City of Avenal	X	-
		City of Coalinga	X	-
		City of Huron	X	-
		Pacheco Water District	X	X
		Panoche Water District	X	X
		San Luis Water District	X	X
		State of California	X	-

General Geographical Region	CVP Division	Water Service Contractors	M&I	Ag[1]
South of Delta	West San Joaquin	Westlands Water District	X	X
	San Felipe	San Benito County Water District	X	X
		Santa Clara Valley Water District	X	X
	Cross Valley Canal	County of Fresno	X	X
		County of Tulare	X	X
		Hills Valley Irrigation District (includes Rag Gulch Water District)	X	X
		Kern-Tulare Water District	X	X
		Lower Tule River Irrigation District	-	X
		Pixley Irrigation District	X	X
		Tri-Valley Water District	X	X

Note:
[1] Ag = Agricultural water service contractor

Alternatives Considered

No Action Alternative

The No Action Alternative represents continued implementation of the current Draft M&I WSP. This existing draft policy is currently guiding Reclamation's allocation of CVP water to agricultural and M&I water service contractors during Conditions of Shortage and would continue if none of the action alternatives were selected.

During Conditions of Shortage when the CVP is unable to deliver sufficient water to meet the CVP water service contractors' Contract Total, M&I water service contractors allocations are maintained at 100 percent of their Contract Total as the agricultural water service contractor allocations are reduced to 75 percent of their Contract Total in incremental steps. Then, M&I water service contractor allocations are reduced to 75 percent of their historical use in incremental steps as agricultural water service contractor allocations are reduced to 50 percent of their Contract Total. The M&I water service contractor allocations are maintained at 75 percent of historical use until agricultural water service contractor allocations are reduced in incremental steps to 25 percent of Contract Total. M&I water service contractor allocations are then reduced in incremental steps to 50 percent of historical use until agricultural water service contract allocations are reduced in incremental steps from 25 percent to zero.

In years when the M&I water service contractor allocations are less than 75 percent of historical use, Reclamation would attempt to provide the amount of PHS need unmet by contractors' CVP allocation and other available non-CVP

supplies, up to 75 percent of the historical use, subject to the availability of CVP water supplies. There are some years in which allocations to agricultural water service contractors are at or near zero. In those years, CVP water deliveries for unmet PHS need to M&I water service contractors may not be fully realized. Water made available to M&I water service contractors may be reduced below 75 percent of historical use and below the unmet PHS needs when CVP water is not available.

Action Alternatives

The alternatives that moved forward for more detailed analysis in the EIS were those that responded to the National Environmental Policy Act (NEPA) purpose and need, minimized negative effects, were potentially feasible, and represented a range of reasonable alternatives. As a result of initial alternatives screening, four action alternatives were selected to move forward for analysis in the EIS (in addition to the No Action Alternative). Table 2 presents the alternatives analyzed in the EIS. Analysis of these alternatives will provide the information needed for Reclamation to make a decision.

Table 2. Alternatives Analyzed in the EIS

Alternative Number	Alternative Name	Description
Alternative 1	No Action Alternative	Represents a projection of current conditions to the most reasonable future conditions that could occur during the life of the proposed action without any action alternative being implemented. The No Action Alternative represents continued allocation of water in the same way that Reclamation currently allocates CVP water to agricultural and M&I water service contractors during Conditions of Shortage, consistent with the 2001 Draft M&I WSP, as modified by Alternative 1B of the 2005 EA.
Alternative 2	Equal Agricultural and M&I Allocation	Provides no preference for either agricultural or M&I contractors. M&I and agricultural water service contractors receive equal allocation percentages during a Condition of Shortage.
Alternative 3	Full M&I Allocation Preference	M&I water service contractors receive 100% of their Contract Total until CVP supplies are not available to meet those demands. Agricultural allocations are reduced as needed to maintain 100% allocations to M&I contractors.
Alternative 4	Updated M&I WSP (Preferred Alternative)	Similar to Alternative 1 but modified to update the definition of unconstrained years used in calculating historical use. Attempts to provide unmet PHS need, but without a guarantee. Provides implementation guidelines and procedures.
Alternative 5	M&I Contractor Suggested WSP	Similar to Alternative 4 except attempts to provide a greater quantity of unmet PHS need.

Under Alternative 2, Equal Agricultural and M&I Allocation, M&I water service contractors would receive the same allocation, as a percentage of Contract Total, as the agricultural water service contractors. This means that in years when the CVP water supplies are not adequate to provide water to all water service contractors, agricultural and M&I water service contractor allocations would be reduced by the same percentage. This allocation methodology would provide a larger volume of CVP water to agricultural water service contractors than the No Action Alternative, as there would be no reductions to agricultural contractors to provide a larger volume of CVP water to M&I water service contractors. Deliveries to both north of the Delta and south of Delta M&I contractors would be lower than under the No Action Alternative in order to provide an equal allocation to agricultural water service contractors.

Under Alternative 3, Full M&I Allocation Preference, M&I water service contractors would receive a higher allocation as compared to the No Action Alternative and other action alternatives. Under this alternative, Reclamation would attempt to provide a 100 percent allocation to M&I water service contractors during a Condition of Shortage, to the extent that adequate CVP water supplies are available. This would be achieved by reducing allocations to agricultural water service contractors as needed to maximize the frequency of 100 percent allocations to the M&I water service contractors. This allocation methodology would provide the lowest volume of CVP water to agricultural water service contractors compared to the No Action and other action alternatives. Alternative 3 would have no provisions for unmet PHS needs that would be made available by Reclamation from CVP water supplies.

Alternative 4, Updated M&I WSP, is similar to the No Action Alternative. This alternative comprises the M&I WSP developed by Reclamation with stakeholder input received during the M&I WSP stakeholder workshops held between May 2010 and January 2011, with clarifying revisions made to address comments from stakeholders received after Stakeholder Workshop 4 and to address public comments received on the Draft EIS. Reclamation used this feedback to identify elements of the 2001 Draft M&I WSP (represented in the No Action Alternative) that could be improved. The major modifications made to the 2001 Draft M&I WSP that are reflected in the Updated M&I WSP include the following:

- Reclamation deleted the reference to 1996 M&I Water Rate book.
- At the M&I water service contractors' request, Reclamation modified the method that would be used to adjust an M&I water service contractor's historical use.
- Reclamation expanded the definitions of the key terms and also defined terms not previously defined, to provide greater clarity on the intent and requirements of the M&I WSP's key terms and conditions.

- Term and Condition 1 was revised to remove the sentence stating that Reclamation intended contractors to use their non-CVP supplies first and rely on CVP water as a supplemental supply. Instead, Reclamation expects water service contractors, at their discretion, to use CVP water in conjunction with their other non-CVP supplies to meet demand during all years, including years where a Condition of Shortage exists.

- Clarified M&I allocation for contracts with both irrigation and M&I use which do not set forth individual Contract Totals for each use.

Alternative 5, M&I Contractor Suggested WSP, is similar to Alternative 4, Updated M&I WSP. This alternative was developed and recommended by several M&I water service contractors who participated in the M&I WSP workshops held between May 2010 and January 2011. Alternative 5 attempts to provide an increased quantity of CVP water allocated to M&I water service contractors to supply the unmet portion of the PHS needs during a Condition of Shortage. This would be achieved by increasing the upper limit for consideration of additional allocations to assist in meeting unmet PHS need from an initial allocation of 75 percent of historical use (under Alternative 4) to an initial allocation of 95 percent of historical use (under Alternative 5).

Environmentally Preferable Alternative

Section 1505.2(b) of NEPA requires that, in cases where an EIS has been prepared, the Record of Decision must identify all alternatives that were considered, specifying the alternative or alternatives which were considered to be environmentally preferable. The environmentally preferable alternative is the alternative that will promote the national environmental policy as expressed in NEPA's Section 101. Ordinarily, this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources (Council on Environmental Quality 40 Most Asked Questions number 6(a)). It is implicit in NEPA that the environmentally preferable alternative must be reasonable and feasible to implement.

In choosing the environmentally preferable alternative, Reclamation considered impacts to all resources. On balance, Alternative 1, No Action Alternative, and Alternative 4, Updated M&I WSP, would have the least environmental effects associated with implementing a CVP M&I WSP during a Condition of Shortage. Alternative 4 would have no environmental impacts compared to the No Action Alternative. Alternatives 2 and 3 have greater environmental effects to water quality, groundwater resources, air quality, geology and soils, and agricultural resources than Alternative 4. Alternative 5 would have small but greater effects to groundwater resources and air quality compared to Alternative 4.

Basis of Decision

Reclamation's decision to move forward is based on how the alternatives meet the project's purpose and need and the magnitude of environmental effects. While the alternatives would affect different resources in different ways, Alternative 4 provides Reclamation with the greatest degree of flexibility to address CVP water service contractors' needs during Conditions of Shortage while recognizing that CVP deliveries are subject to the amount of CVP water available and cannot be guaranteed, and provides clarity to the terms, conditions, and procedures of the CVP M&I WSP. Additionally, Alternative 4 has no environmental effects compared to the No Action Alternative; therefore, no mitigation measures are necessary.

Purpose and Need

The purpose of updating the 2001 Draft M&I WSP, as amended, is to provide detailed, clear, and objective guidelines for the allocation of available CVP water supplies to CVP water service contractors during a Condition of Shortage. The update to the M&I WSP is needed by water managers and CVP water service contractors to help them better plan for and manage available CVP water supplies, and to better integrate the use of CVP water with the use of other available non-CVP water supplies. The update to the M&I WSP is also needed to clarify certain terms and conditions with regard to the applicability and implementation process of the M&I WSP.

The updated M&I WSP would be used by Reclamation to:

- Define water shortage terms and conditions for applicable CVP water service contracts, as appropriate;
- Determine the quantity of water made available to CVP water service contractors from the CVP, that together with the M&I water service contractors' drought water conservation measures and other non-CVP water supplies, would assist the M&I water service contractors in their efforts to protect PHS during severe or continuing droughts; and
- Provide information to CVP water service contractors for their use in water supply planning and development of drought contingency plans.

All action alternatives meet the purpose and need, but the No Action Alternative does not meet the purpose and need.

Environmental Issues Evaluated

During March 2011, public scoping sessions on the development of the CVP M&I WSP EIS were held in Sacramento, Willows, Fresno, and Oakland, California. Key issues raised during the public scoping process that are applicable for inclusion in the EIS are listed below.

- The final M&I WSP should be a single document that clearly states how Reclamation interprets and implements the M&I WSP.
- Any additional water provided to M&I water service contractors is viewed as water "taken" from agricultural contractors.
- M&I water service contractors would like a guaranteed quantity of CVP water to meet PHS needs and do not want their use of non-CVP supplies to count against their deliveries of CVP water in Conditions of Shortage.
- The analysis should use an appropriate baseline given ongoing regulatory issues regarding CVP/SWP operations.
- The effects analysis should include a cumulative impact discussion in the context of other reasonably foreseeable past, present, and future actions potentially affecting the allocation of CVP water, including the Bay Delta Conservation Plan.
- The EIS should analyze the impacts to water service contractors who have limited access to alternative water supplies and to "mixed use" contractors.
- The M&I WSP EIS should specifically state the agencies that are and are not affected by the policy, and state that the M&I WSP will apply equally to all M&I contractors, including the American River Division contractors.
- Certain American River Division contractors (City of Roseville, Placer County Water Agency, Sacramento Municipal Utility District, and San Juan Water District) disagree with Reclamation's interpretation of Term 14 of State Water Resources Control Board Decision 893 and believe it should provide them with additional supply reliability beyond what the M&I WSP provides in their water service contracts.

The alternatives were evaluated to address issues raised and potential impacts to the range of environmental and socioeconomic resources relevant to NEPA. The action alternatives have the potential to result in impacts to several resources, including surface water, water quality, groundwater, geology and soils, air quality, greenhouse gases (GHGs) and climate change, agricultural

resources, socioeconomics, and power[2]. The differences between the action alternatives for these impacts include:

- *Surface Water*: Alternative 2 would increase CVP deliveries to agricultural water service contractors and decrease CVP deliveries to M&I water service contractors, compared to the No Action Alternative. Alternative 3 would decrease CVP deliveries to agricultural water service contractors and increase CVP deliveries to M&I water service contractors, compared to the No Action Alternative. Alternatives 4 and 5 would have no change in CVP deliveries compared to the No Action Alternative. PHS needs would be met for the Sacramento River Division under all alternatives. The American River, Delta, and San Felipe Divisions would have unmet PHS needs under Alternative 2. There would be unmet PHS needs for the Shasta/Trinity River and West San Joaquin Divisions under Alternatives 2, 3, and 4. The Cross Valley Canal Unit would have unmet PHS needs under all alternatives.

  There are only relatively small to no changes to Shasta and Trinity lakes storages, upper Sacramento River flows, and Lake Oroville storage as a result of action alternatives, which do not result in substantial impacts. The effects of changes to other reservoirs' storage and rivers' flows are addressed under other appropriate resource areas (e.g., water quality, recreation, flood hydrology, water quality, etc.).

- *Water Quality:* Changes in CVP deliveries could affect the salinity and bromide concentrations in the Delta Division. Alternative 5 would have only very minimal changes in reservoir or river flows compared to the No Action Alternative that would not affect salinity and bromide concentrations. Alternatives 2 and 3 would cause an increase in electrical conductivity which could affect water quality in the Delta Division.

- *Groundwater*: A reduction in CVP deliveries to agricultural water service contractors could cause these contractors to supplement their surface water supplies through increased groundwater pumping. Alternative 2 would reduce agricultural groundwater pumping in all regions due to increases in CVP deliveries to agricultural water service contractors, while Alternative 3 would increase agricultural groundwater pumping in all regions due to decreases in CVP deliveries to agricultural contractors. M&I water service contractors may need to make use of all their available groundwater supplies under Alternative 2 in order to meet PHS needs in certain years. Alternatives 4 and 5 would have little to no change in groundwater pumping by CVP water service contractors compared to the No Action Alternative.

[2] It was determined that no impacts or only minor impacts would occur to aquatic resources, terrestrial resources, environmental justice, cultural resources, Indian sacred sites, recreation, flood hydrology, and visual resources.

Increased pumping caused by change in deliveries to supplement supply shortages may cause groundwater level declines that could lead to land subsidence. Alternative 2 would cause a net increase in pumping that could potentially increase land subsidence in the San Francisco Bay/Central Coast region. Alternative 3 would cause a net increase in pumping that could potentially increase land subsidence in the Sacramento Valley, San Joaquin Valley, and Tulare Lake regions.

- *Geology and Soils:* Under Alternative 3, reduced CVP deliveries to agricultural water service contractors could indirectly lead to wind erosion if agricultural water service contractors implement crop idling to manage their water supplies.

- *Air Quality*: Increases in CVP deliveries to agricultural water service contractors under Alternative 2 would result in decreased pollutant emissions from reduced groundwater pumping. Decreases in CVP deliveries to agricultural water service contractors under Alternative 3 would result in increased pollutant emissions due to increased groundwater pumping. Under Alternative 3, the general conformity *de minimis* threshold would be exceeded in the San Joaquin Valley Air Basin. Alternatives 4 and 5 would have little to no changes compared to the No Action Alternative.

- *GHGs and Climate Change:* Changes in CVP deliveries to agricultural water service contractors would decrease GHG emissions under Alternative 2 and increase GHG emissions under Alternatives 3 and 5. Alternative 4 would have no change compared to the No Action Alternative.

- *Agricultural Resources*: Alternative 3 would reduce agricultural acreage primarily in the Tulare Lake Region, but minimally to other regions in the study area.

- *Socioeconomics*: Changes in CVP deliveries for CVP water service contractors would have differing effects for agricultural and M&I water service contractors in Alternatives 2 and 3. Generally, effects would be positive for agricultural water service contractors under Alternative 2 and negative under Alternative 3, while the opposite would be true for M&I water service contractors. Alternatives 4 and 5 would have no change compared to the No Action Alternative.

- Power: Changes in CVP deliveries may cause changes in power generation from hydroelectric power generation facilities by changing reservoir releases or by changing reservoir storage, as represented by changes in reservoir elevations. Alternative 2 and 3 would experience minimal reductions to the amount of power generated at the Folsom and Nimbus power plants and slight fluctuations in the amount of

power generated at San Luis Reservoir. Alternatives 4 and 5 would have no change compared to the No Action Alternative.

- *Indian Trust Assets*: Under Alternatives 2 and 3, the magnitudes of groundwater level fluctuations are very small compared to overall groundwater supplies and would not be substantial enough to create a noticeable change to water supply at existing wells near Indian Trust Asset sites. Therefore, Alternatives 2 and 3 would not interfere with the exercise of federally-reserved water rights and/or reduce the health of tribal members by decreasing water supplies. Alternatives 4 and 5 would have no change compared to the No Action Alternative, and would not result in impacts to Indian Trust Assets.

Section 7 of the Federal Endangered Species Act (ESA)

Reclamation coordinated with the U.S. Fish & Wildlife Service during development of the Draft EIS regarding the impact analysis on special status species and environmental commitments. Reclamation further coordinated with National Oceanic and Atmospheric Administration National Marine Fisheries Service in preparing the Final EIS. A full consultation under Section 7 of the ESA with U.S. Fish & Wildlife Service or National Oceanic and Atmospheric Administration National Marine Fisheries Service was determined not to be needed for this action because the potential impacts are within the range of impacts already observed under current operations of the CVP and are covered by the Biological Opinions on the Coordinated Long-Term Operations of the CVP and SWP.

Section 106 Compliance

Reclamation is responsible for complying with Section 106 of the National Historic Preservation Act. Alternative 4 would not result in the disturbance of land or require any construction activities; therefore, there are no impacts to cultural resources. Under Section 106 of the National Historic Preservation Act, Alternative 4 is the type of activity that does not have the potential to affect historic properties and there are no further obligations under Section 106 [36 Code of Federal Regulations Sec. 800.3(a)(1)].

Comments Received on the Final EIS

Reclamation's Notice of Availability of the Final EIS was published in the Federal Register on September 10, 2015, and the Environmental Protection Agency's Notice of Availability was published on September 18, 2015. The EIS was posted on Reclamation's website, and copies were distributed to those who requested a copy. A press release was released on September 10, 2015, and was sent to participants in public meetings and commenters on the Draft EIS.

Reclamation received comments from three entities after release of Final EIS. The commenters were: Somach Simmons & Dunn for Glenn-Colusa Irrigation District (Kelley Taber); East Bay Municipal Utility District (Michael Tognolini); and Santa Clara Valley Water District (Cindy Kao). These comments either reiterated comments previously provided during the public comment period, or supported Reclamation's choice of the Preferred Alternative. Reclamation had adequately addressed the previous comments in the Final EIS. The comments consisted of the following:

- Glenn-Colusa Irrigation District (GCID) did not agree that their comments on the Draft EIS were adequately addressed in Appendix I of the Final EIS. GCID was concerned that the M&I WSP's definition of PHS is too broad and would allow a greater amount of water than necessary for domestic use and essential public services to be included in the calculation, thereby overestimating system demands during Conditions of Shortage and influencing the allocation of water within the CVP system. Additionally, GCID was concerned that implementation of the M&I WSP could affect water supply reliability under their Settlement Contract. As described in the Final EIS, the determination of any additional CVP water supplied to M&I water service contractors during a Condition of Shortage to assist in meeting PHS needs would take into account a contractor's estimated PHS demand, as well as their non-CVP supplies available in that year, and, most importantly, the availability of CVP water in that year. Reclamation would closely review the data provided by an M&I water service contractor so that CVP water provided for PHS needs is estimated in accordance with California criteria and used appropriately during a Condition of Shortage. The Final EIS also states in Appendix B that Reclamation does not have discretion to determine water supply allocations to Sacramento River Settlement Contractors, San Joaquin River Exchange Contractors, certain named State Wildlife Areas and National Wildlife Refuges, and the privately owned/managed wetlands comprising the Grassland Resources Conservation District as identified under the CVPIA Section 3406(d). Water supply allocations for these water service contractors are determined annually based on the forecasted full natural inflow to Shasta Lake. CalSim II simulates

water supply allocations to these water service contractors based on inflow to Shasta Lake.

- East Bay Municipal Utility District (EBMUD) supports Reclamation's selection of Alternative 4 as the Preferred Alternative for the M&I WSP. However, EBMUD requested that their contractual historic use of 133,000 acre-feet (AF), per their Long Term Renewal Contract, be noted in the M&I WSP as an exception to the methodology used for calculating historical use. Reclamation, when applying the M&I WSP to EBMUD, would use EBMUD's contractual historic use of 133,000 AF as the basis for making adjustments for population growth, extraordinary water conservation measures, and use of non-CVP water supplies. But, Reclamation believes it inappropriate to specifically state or call out such an exception in the M&I WSP.

- Santa Clara Valley Water District (SCVWD) supports Reclamation's selection of Alternative 4 as the Preferred Alternative for the M&I WSP. SCVWD believes an adopted M&I WSP is critically important for water supply reliability in support of the communities and businesses in its service area.

Appendix K – Water Shortage Contingency Plan



DRAFT WATER SHORTAGE CONTINGENCY PLAN

CITY OF ROSEVILLE CALIFORNIA

City of Roseville
Draft Water Shortage Contingency Plan

May 2021

Prepared by Water Works Engineers, LLC
Colleen Boak, PE
Esmeralda Diego

Checked by:
Tim Durbin, PE
Cindy Bertsch, PE

Table of Contents

Water Shortage Contingency Plan 1
1.1 Water Supply Reliability Analysis 1
1.1.1 Constraints on Water Supply 1
1.1.2 Drought Risk Assessment 2
1.1.3 Seismic Risk Analysis 4
1.2 Legal Authorities 4
1.3 Standard Water Shortage Levels 5
1.4 Annual Water Supply and Demand Assessment Procedures 5
1.5 Supply Augmentation and Operational Changes 12
1.6 Compliance and Enforcement 12
1.7 Financial Consequences 13
1.8 Plan Adoption, Submittal, and Availability 14

Tables

WSCP Table 1 Available Surface Water Supply Under Differing Hydrologic Conditions 2
WSCP Table 2 Near-Term Five-Year Drought Risk Assessment 3
WSCP Table 3 Long-Term Single and Five-Year Drought Risk Assessment 3
WSCP Table 4 Relation Between Standard Water Shortage Levels and Existing Stages 5
WSCP Table 5 Water Supply and Demand Assessment Procedure 5
WSCP Table 6 Demand Reduction Actions to be Implemented at Each Shortage Level 8
WSCP Table 7 Supply Augmentation During Stage 3 Droughts and Higher 12

Exhibits

Exhibit A – City of Roseville 2016 Multi-Hazard Mitigation Plan
Exhibit B – City of Roseville Municipal Code 14.09
Exhibit C – Adoption Resolution

Water Shortage Contingency Plan

Following the severe drought of 2012-2016, the State of California Legislature sought to expand the water shortage contingency analysis under former law and mandated that a water shortage contingency plan (WSCP) be adopted by suppliers. The California Water Code (CWC) recognizes WSCPs as a critical tool during a drought emergency and grants that the State defer to locally adopted WSCPs, to the extent practicable.

> *California Water Code Section 10632.3*
>
> *It is the intent of the Legislature that, upon proclamation by the Governor of a state of emergency under the California Emergency Services Act (Chapter 7 (commencing with Section 8550) of Division 1 of Title 2 of the Government Code) based on drought conditions, the board defer to implementation of locally adopted water shortage contingency plans to the extent practicable.*

The WSCP is the City of Roseville Water Utility's (City's) operational plan in the event of a water shortage. Water shortage would occur when available water supplies are insufficient to meet normal customer water demands. Various causes can bring about a water shortage including population growth, climate change, drought, natural disasters, and catastrophic events.

The WSCP shall address the ten following elements:

1. Water supply reliability assessment analysis
2. Annual assessment procedures
3. Six standard shortage stages
4. Shortage response actions
5. Communication protocols
6. Compliance and enforcement
7. Legal authorities
8. Financial consequences of WSCP
9. Monitoring and reporting
10. WSCP refinement procedures

1.1 Water Supply Reliability Analysis

Pursuant to 10632(a)(1) of the CWC, a near-term (5years) and long-term (20 years) water supply reliability analysis is provided herein. The water supply reliability analysis consists of a water service reliability assessment and drought risk assessment (DRA).

1.1.1 Constraints on Water Supply

Most of the City's water is surface water received from Folsom Lake. The City's existing surface water contracts with the U.S. Bureau of Reclamation (USBR), Placer County Water Agency (PCWA), and San Juan Water District (SJWD) are received through the Folsom Dam Diversion, making this a critical facility for the reliability of Roseville's surface water supply. Under normal conditions, the capacities of the Folsom Dam Diversion, Roseville Water Treatment Plant, and distribution network are sufficient to meet the City's water demands. However, the water that the City receives is subject to reductions during dry years pursuant to the Water Forum Agreement, the USBR

Operations Criteria and Plan (OCAP), and the Central Valley Project Municipal and Industrial Water Shortage Policy (CVP M&I WSP).

Although Roseville's annual water contract entitlements total 66,000-acre feet (AF), the City along with other Sacramento-area water suppliers are signatory to the January 2000 Water Forum Agreement (updated in 2015), which includes Purveyor Specific Agreements. The City's Purveyor Specific Agreement includes limitations on City surface water diversions from the American River under different hydrologic conditions. The hydrologic conditions are characterized by three categories of year type and the corresponding limitations for the City are given in WSCP Table 1.

WSCP Table 1 Available Surface Water Supply Under Differing Hydrologic Conditions

Year Type	Unimpaired Flow into Folsom Reservoir	Roseville Available Supply
Normal/ Average or Wet Year	Greater or equal to 950,000 AF	Maximum of 58,900 AF
Drier Year	Between 400,000 and 950,000 AF	Between 43,800 and 58,900 AF
Driest/ Critically Dry Year	Less than 400,000 AF	Maximum of 43,800 AF

In addition to the impacts of the contractual agreements, the reliability of surface water is also subject to physical constraints. In the event that the water level at Folsom Lake drops close to or below the intake elevation, without additional infrastructure, the City would be unable to divert water. The severe drought of 2015, which was preceded by multiple consecutive dry years, demonstrated the vulnerability of the City's surface water as the water elevation did come close to the intake elevation.

Though the City has begun the process of expanding its groundwater program, under current operations the groundwater is not a major source of water for the City. The City has 4 existing wells with aquifer storage recovery (ASR) injection capability. The City's strategy in normal years is to not pump groundwater from the wells in excess of what was injected, thus creating a bank of water for future use. If a significant drought stage is reached the City can pump additional water to augment its water supply and make up for deficits of the surface water supply. The City continues to invest in development of groundwater infrastructure to increase supply reliability in times of drought, however in any given year type, the City must make determinations of drought stage without consideration of groundwater supplies, per the terms of the municipal code. This is further discussed in Section 1.5. For the purpose of this WSCP, only the resources available to the City in determination of a drought stage are included in calculations of the surplus or shortfall for the DRA shown in WSCP Table 2 and WSCP Table 3.

1.1.2 Drought Risk Assessment

The near-term and long-term drought risk assessment was performed by comparing the unconstrained potable water demands to the water supply availability for a single dry year and 5 consecutive dry years. The near-term DRA for a five-year drought is provided in WSCP Table 2. The long-term single and five-year DRA is provided in WSCP Table 3. Note that while typical groundwater supplies are not considered in the calculations of Total Supplies shown in WSCP Table 2 and WSCP Table 3, the volume of groundwater that the City intends to use for each year type is listed separately.

WSCP Table 2 Near-Term Five-Year Drought Risk Assessment

Category	2021	2022	2023	2024	2025
Total Supplies	62,719	57,870	57,920	49,971	42,022
Total Gross Water Use	39,172	42,276	45,380	48,484	51,589
Surplus/ Shortfall absent of WSCP Action	23,547	15,593	12,540	1,487	-9,567
Total Right/ Safe Yield Groundwater Supplies	1,560	1,560	1,560	1,560	7,920
NOTES: All values are in AF. Groundwater supplies are not included in calculation of surplus/ shortfall.					

WSCP Table 3 Long-Term Single and Five-Year Drought Risk Assessment

Drought Type/ Year	Category	2025	2030	2035	2040	2045
Single Year	Total Supplies	42,022	42,435	46,293	46,293	46,293
	Total Gross Water Use	51,589	56,990	62,547	62,547	62,547
	Surplus/ Shortfall absent of WSCP Action	-9,567	-14,555	-16,254	-16,254	-16,254
	Total Right/ Safe Yield Groundwater Supplies	7,920	12,570	14,430	14,430	14,430
Year 1	Total Supplies	62,922	63,335	67,193	67,193	67,193
	Total Gross Water Use	51,589	56,990	62,547	62,547	62,547
	Surplus/ Shortfall absent of WSCP Action	11,333	6,345	4,646	4,646	4,646
	Reasonably Available Groundwater Supplies	1,560	2,720	3,350	3,350	3,350
Year 2	Total Supplies	58,022	58,435	62,293	62,293	62,293
	Total Gross Water Use	51,589	56,990	62,547	62,547	62,547
	Surplus/ Shortfall absent of WSCP Action	6,433	1,445	-254	-254	-254
	Reasonably Available Groundwater Supplies	1,560	2,720	3,350	3,350	3,350
Year 3	Total Supplies	58,022	58,435	62,293	62,293	62,293
	Total Gross Water Use	51,589	56,990	62,547	62,547	62,547
	Surplus/ Shortfall absent of WSCP Action	6,433	1,445	-254	-254	-254
	Reasonably Available Groundwater Supplies	1,560	2,720	3,350	3,350	3,350
Year 4	Total Supplies	50,022	50,435	54,293	54,293	54,293
	Total Gross Water Use	51,589	56,990	62,547	62,547	62,547
	Surplus/ Shortfall absent of WSCP Action	-1,567	-6,555	-8,254	-8,254	-8,254
	Reasonably Available Groundwater Supplies	1,560	2,720	3,350	3,350	3,350
Year 5	Total Supplies	42,022	42,435	46,293	46,293	46,293
	Total Gross Water Use	51,589	56,990	62,547	62,547	62,547
	Surplus/ Shortfall absent of WSCP Action	-9,567	-14,555	-16,254	-16,254	-16,254
	Total Right/ Safe Yield Groundwater Supplies	7,920	12,570	14,430	14,430	14,430
NOTES: All values are in AF. Groundwater supplies are not included in calculation of surplus/ shortfall.						

1.1.3 Seismic Risk Analysis

Seismic risk in California can pose a significant threat to facilities and infrastructure. The City of Roseville 2016 Multi-Hazard Mitigation Plan addresses the seismic risk at critical facilities including those dedicated to water supply and is provided in Exhibit A.

1.2 Legal Authorities

Chapter 14.09 Water Conservation of the Roseville Municipal Code (Municipal Code) also cited as Water Conservation and Drought Mitigation Ordinance (Ordinance 5311 § 2, 2014; Ordinance 2413 § 2, 1991), grants the City the authority to declare a water shortage in the City. Chapter 14.09 of the Municipal Code is provided in Exhibit B.

The purpose and scope of the Water Conservation and Drought Mitigation Ordinance as stated in the Municipal Code is provided below:

14.09.020 General provisions

A. Purpose. The purpose of this chapter is to ensure compliance with all federal, state and local requirements relating to water conservation and drought mitigation for the protection of public health, safety and welfare by:

1. Reducing the per capita water consumption throughout the City of Roseville (the "city") during years of normal precipitation and during years of drought;

2. Protecting and conserving the city's supply of water during specified times of emergency and/or crisis;

3. Minimizing and/or eliminating the waste of water through voluntary compliance or punitive action, if necessary;

4. Promoting the use of drip irrigation and other low volume irrigation methods that reduce outdoor water use by applying water more efficiently than traditional irrigation methods;

5. No person shall use, or cause to be used any city water for landscape irrigation between the hours of 10:00 a.m. and 8:00 p.m., unless the city manager, or designee provides prior written consent to a different time limitation. A waiver may be granted for turf areas if the landscape contains too many irrigation valves to complete an irrigation event within the watering window.

6. Upon city declaration of a water shortage, the city manager, or designee, may impose revised and/or additional limitations on outdoor water use, as specified in Section 14.09.040, and no person shall use, or cause to be used, city water in violation of such limitations while the water shortage remains in effect.

B. Scope. The provisions of this chapter shall apply to all customers, users and/or recipients (hereinafter "users") of the city's potable and recycled water service within the city's territorial limits.

The City's development and adoption of the WSCP upholds 14.09.020 General Provisions of the Municipal Code by ensuring compliance with state requirements.

All components of the WSCP comply with Chapter 14.09 of the Municipal Code. Any actions to be taken under the WSCP not explicitly stated in Chapter 14.09 of the Municipal Code are a further refinement of the existing ordinance.

1.3 Standard Water Shortage Levels

The California Water Code Section 10632(a)(3) defines six standard water shortage levels. Standardization of water shortage levels provide a consistent regional and statewide approach to characterizing and conveying the severity of a water shortage. However, Chapter 14.09 of the City's Municipal Code defines water shortage stages that are different from those listed in CWC. Pursuant to 10632(a)(3)(B), the six standard water shortage levels are related to the existing shortage stages in the Municipal Code in WSCP Table 4.

WSCP Table 4 Relation Between Standard Water Shortage Levels and Existing Stages

CWC Shortage Level Description	CWC Shortage Level	Municipal Code Shortage Stage	Municipal Code Water Conservation and Drought Stage Description
Up to 10%	1	Basic Stage	City's water supply is adequate to meet all projected demands
		Stage One Drought	City's water supply is adequate to meet 90% of projected demands
Up to 20%	2	Stage Two Drought	City's water supply is adequate to meet 80% of projected demands
Up to 30%	3	Stage Three Drought	City's water supply is adequate to meet 70% of projected demands
Up to 40%	4	Stage Four Drought	City's water supply is adequate to meet 60% of projected demands
Up to 50%	5	Stage Five Drought	City's water supply is adequate to meet 50% or less of projected demands
Greater than 50%	6		

1.4 Annual Water Supply and Demand Assessment Procedures

Pursuant to CWC 10632.1, all water suppliers are required to conduct an annual water supply and demand assessment on or before July 1 of each year beginning in 2022. If the supplier receives imported water from the State Water Project or the U.S. Bureau of Reclamation (USBR) they shall submit the report within 14 days of receiving final allocations or by July 1 of each year, whichever is later. The steps for conducting the Annual Water Supply and Demands Assessment are outlined in WSCP Table 5.

WSCP Table 5 Water Supply and Demand Assessment Procedure

Step	Description	Timeframe	Participants
Step 1	Request water utility data from all departments.	Jan 1 - Jan 31	Water Conservation Administrator
Step 2	Coordinate with Planning Division for any significant planned developments and project those water demands.	Jan 15 - Jan 31	Water Conservation Administrator Planning Division
Step 3	Compile water utility data into Water Utility Reporting Master spreadsheet.	Feb 1 - Feb 14	Water Conservation Administrator
Step 4	Calculate total projected unconstrained water demands for current year.	Feb 15-Feb 28	Senior Engineer – Water Utility

Step 5	Identify any constraints on facilities or infrastructure that could impact the supply of water such as planned maintenance that would take facilities offline or known damage to facilities/ infrastructure.	Feb 15-Feb 28	Hydrogeologist Senior Engineer – Water Utility Water Distribution Superintendent Water Treatment Plant Chief Operator
Step 6	Commence preparation of Annual Water Shortage Assessment Report.	March-April	Water Conservation Administrator Senior Engineer – Water Utility
Step 7	Receive final allotments from USBR for current year.	April	EU Assistant Director-Water Utility
Step 8	Subtract current year projected water demand from final allotment volume to determine shortage percentage and volume.	2 Days after notification from USBR	Senior Engineer – Water Utility
Step 9	If a shortage is identified Environmental Utilities (EU) Department is to hold an internal meeting to inform participants that a water shortage for the current year is anticipated and the extent of that shortage. Review the WSCP and Chapter 14.09 of the Roseville Municipal Code. Identify any concerns from the group regarding the ability to carry out the actions described in the WSCP and Chapter 14.09 of the Municipal Code. Assign an individual or group, among the participants, the responsibility of resolving the concern.	Within 7 days of notification from USBR	EU Director EU Assistant Director – Water Utility Hydrogeologist Water Distribution Super Intendent Water Treatment Plant Chief Operator Senior Engineer – Water Utility Water Conservation Administrator Additional participants as needed
Step 10	Inform City Manager of water shortage emergency condition.	Within 14 days of notification from USBR	City Manager EU Director EU Assistant Director – Water Utility Additional participants as needed
Step 11	Finalize and submit Annual Water Shortage Assessment Report to DWR.	By July 1 or 14 days after receiving final allocations	EU Assistant Director – Water Utility Water Conservation Administrator Senior Engineer – Water Utility
Step 11	The City Manager shall inform City Council of the water shortage emergency condition and the "Drought stage," under which the emergency falls. City Council shall declare a water shortage emergency condition to prevail within the area served by the City of Roseville Water Utility.	Within 28 days of notification from USBR	City Manager City Council Public Information Officer
Step 12	The City of Roseville shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency.	Within 28 days of notification from USBR	City Manager City Council Public Information Officer

Step 13	The public, interested parties, and local, regional, and state governments shall be noticed of the water shortage emergency condition and of all water shortage response actions triggered by the emergency declaration. Pursuant to Municipal Code Section 14.09.020(E), the City Manager, or assigned designee, shall be responsible for determining the means by which water users shall be notified. Possible means for notification include mass media, newspaper, public notice, mailings, utility billings, or by any combination of such notice.	Beginning 2 business days after declaration of emergency condition and continuing for as long as the emergency condition persists.	Water Conservation Administrator Senior Engineer – Water Utility Public Information Officer
Step 14	The appropriate Water Shortage Response Actions for the drought stage, outlined in WSCP Table 6 and 7, will be carried out by the public and water utility. The City will enforce compliance in accordance with Roseville Municipal Code 14.09.	Duration of emergency condition	EU – Water Utility Water Users City Manager or designee
Step 15	Track customer water use at a minimum on a monthly basis. Ensure that total gross water use for that month, or more frequent tracking period, is reduced by the necessary percentage when compared to that same tracking period of the last normal supply year.	Duration of emergency condition	Water Conservation Administrator Senior Engineer – Water Utility
Step 16	If the needed water use reduction percentage is not met for any month determine which additional strategies or actions would result in the needed reduction.	Upon determination of insufficient water use reduction	EU Director EU Assistant Director – Water Utility Hydrogeologist Senior Engineer – Water Utility Water Conservation Administrator Additional participants as needed
Step 17	The EU Department management shall propose to the City Manager additional shortage response actions and whether or not those actions would require the WSCP and Chapter 14.09 of the Roseville Municipal Code to be changed.	Upon determination of insufficient water use reduction	City Manager EU Director EU Assistant Director – Water Utility Additional participants as needed
Step 18	If deemed necessary, the City Manager and City Council will revise the WSCP and Chapter 14.09 of the Roseville Municipal Code, observing all required procedures with such adoption.	Upon determination of insufficient water use reduction	City Manager City Council Additional participants as needed
NOTES: It is the intent of the WSCP that the Water Conservation Administrator and Water Utility Senior Engineer shall jointly be responsible for ensuring that the steps of this plan are carried out by noticing the necessary parties for data requests and facilitating meetings.			

WSCP Table 6 Demand Reduction Actions to be Implemented at Each Shortage Level

Standard Shortage Level	Roseville Municipal Code Stage	Demand Reduction Actions	Estimated Percent Reduction	Section of Water Conservation and Drought Mitigation Ordinance corresponding to Demand Reduction Action *Explanations provided as needed*	Penalty, Charge, or Other Enforcement?
1	Basic	Landscape - Restrict or prohibit runoff from landscape irrigation	0%	14.09.030(A)	Yes
1	Basic	Landscape - Limit landscape irrigation to specific times	0%	14.09.020(A)(1); No person shall use, or cause to be used, any city water for landscape irrigation between the hours of 10:00 a.m. and 8:00 p.m., unless the city manager, or designee provides prior written consent to a different time limitation. A waiver may be granted for turf areas if the landscape contains too many irrigation valves to complete an irrigation event within the watering window.	Yes
1	Basic	Landscape - Limit landscape irrigation to specific days	0%	14.09.060(E)(2); Irrigation of new landscaping shall be allowed on any day of the week for a period of 30 days after the new landscaping is planted, unless the city manager, or designee, provides prior written consent to extend this time period based on plant type and the season when the new landscaping is planted. After the 30 days, irrigation days and run times should be decreased to settings appropriate for an established landscape.	Yes
1	Basic	Landscape - Prohibit certain types of landscape irrigation	0%	14.09.030(E); Prohibit operation of an irrigation system that applies water to an impervious surface or that is in disrepair.	Yes
1	Basic	Landscape - Other landscape restriction or prohibition	0%	14.09.030(G); Prohibit irrigation of landscaping during rainfall or 48 hours after a measurable rain event.	Yes
1	Basic	Landscape - Other landscape restriction or prohibition	0%	14.090.060(E)(1); All landscaping installed in the City of Roseville shall comply with the water efficient landscape requirements adopted by resolution of the city council.	Yes
1	Basic	Other water feature or swimming pool restriction	0%	14.09.030(C); Prohibit maintaining ponds, waterways, decorative basins, or swimming pools without water recirculation devices.	Yes
1	Basic	Other water feature or swimming pool restriction	0%	14.09.030(D); Prohibit backwashing so as to discharge to waste swimming pools, decorative basins or ponds in excess of the frequency necessary to ensure the healthful condition of the water or in excess of that required by standards for professionally administered maintenance or to address structural considerations, as determined by the city manager, or designee.	Yes
1	Basic	Other water feature or swimming pool restriction	0%	14.09.030(H); Prohibit overfilling of any pond, pool or fountain which results in water discharging to waste.	Yes

1	Basic	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	0%	14.09.060(C)	Yes
1	Basic	Other - Require automatic shut off hoses	0%	14.09.060(B); Free-flowing hoses for all uses are prohibited. Automatic shut-off devices shall be attached on any hose or filling apparatus in use.	Yes
1	Basic	Other	0%	14.09.030(B); Prohibit water fixtures (including, but not limited to, toilets, faucets, shower heads) or heating or cooling devices to leak or run to waste.	Yes
1	Basic	Other	0%	14.09.030(A); Prohibit water use for washing in excess of that necessary to wash, wet or clean the dirty or dusty object, such as an automobile, sidewalk, or parking area, flows to waste.	Yes
1	Basic	Other	0%	14.09.060(A); Water shall be confined to the user's property and shall not be allowed to run off to adjoining properties, or to the roadside or to the gutter. Care shall be taken not to water past the point of saturation.	Yes
1	Basic	Other	0%	14.09.060(F); All site reviews shall include an evaluation of using recycled water. Recycled water shall be required if economically feasible.	Yes
1	Stage 1	Landscape - Limit landscape irrigation to specific days	1%	14.09.070(C) and 14.09.070(D); Residential and non-residential water users shall be permitted to irrigate with city water according to the schedule provided in 14.09.070(C) and 14.09.070(D), respectively.	Yes
1	Stage 1	Landscape - Other landscape restriction or prohibition	1%	14.09.070(G); City park sites shall, as an aggregate, reduce usage up to 10 percent.	Yes
1	Stage 1	CII - Restaurants may only serve water upon request	1%	14.09.070(I)	Yes
1	Stage 1	Other - Prohibit use of potable water for washing hard surfaces	1%	14.09.070(H); Washing streets, parking lots, driveways, sidewalks or buildings, except as necessary for health or sanitary purposes or pursuant to a term or condition in a permit issued by a state or federal agency, is prohibited.	Yes
1	Stage 1	Other	10%	14.09.070(B); Residential users and non-residential users shall reduce water usage up to 10 percent.	Yes
2	Stage 2	Landscape - Other landscape restriction or prohibition	1%	14.09.070(C); City park sites shall, as an aggregate, reduce usage up to 20 percent.	Yes
2	Stage 2	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	1%	14.09.080(H)	Yes
2	Stage 2	Other	10-18%	14.09.080(B); Residential users and non-residential landscapes shall reduce water usage up to 20 percent.	Yes

3	Stage 3	Landscape - Limit landscape irrigation to specific days	1%	14.09.090(D) and 14.09.090(E); Residential and non-residential water users shall be permitted to irrigate with city water according to the schedule provided in 14.09.090(D) and 14.09.090(E), respectively.	Yes
3	Stage 3	Landscape - Other landscape restriction or prohibition	1%	14.09.090(C); City park sites shall, as an aggregate, reduce usage up to 30 percent.	Yes
3	Stage 3	Landscape - Other landscape restriction or prohibition	1%	14.09.090(H); New or expanded landscaping is limited to drought-tolerant trees, shrubs, and groundcover and be irrigated using a low volume irrigation system. No new turf shall be planted, hydroseeded, or laid, unless prior written consent is received from the city manager. Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.	Yes
3	Stage 3	Water Features - Restrict water use for decorative water features, such as fountains	1%	14.09.090(I)	Yes
3	Stage 3	Pools - Allow filling of swimming pools only when an appropriate cover is in place.	1%	14.09.090(L)	Yes
3	Stage 3	Other - Prohibit use of potable water for construction and dust control	1%	14.09.090(K)	Yes
3	Stage 3	Other	1%	14.09.090(I); Except where recycled water is used, golf courses shall reduce irrigation up to 30 percent.	Yes
3	Stage 3	Other	18-27%	14.09.090(B). Residential users and non-residential landscapes are to reduce water usage up to 30 percent.	Yes
4	Stage 4	Landscape - Limit landscape irrigation to specific days	2%	14.09.100(D) and 14.09.100(E); Residential and non-residential water users shall be permitted to irrigate with city water according to the schedule provided in 14.09.100(D) and 14.09.100(E), respectively.	Yes
4	Stage 4	Landscape - Other landscape restriction or prohibition	1%	14.09.100(C); City park sites shall, as an aggregate, reduce usage up to 40 percent.	Yes
4	Stage 4	Landscape - Other landscape restriction or prohibition	1%	14.09.100(H); Installation of any new landscaping is prohibited unless irrigation is provided through connection to an active recycled water system. In the case of new construction, the city's building official will issue a temporary final upon completion of the structural development of the property. When the city has returned to a stage two drought restriction, landscaping installation can be completed, and a building final will become available upon inspection by the city.	Yes

4	Stage 4	Other water feature or swimming pool restriction	1%	14.09.100(K); Existing pools shall not be emptied and refilled using city water unless required for health or safety reasons until the city has returned to a stage two drought restriction. Pools may be re-filled only to the extent necessary to replace evaporative losses.	Yes
4	Stage 4	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	1%	14.09.100(J); Automobiles or equipment shall be washed only at commercial establishments that recycle their water or by equipment and means that separates debris and recycles wash water for continual use.	Yes
4	Stage 4	Other	1%	14.09.100(I); Except where recycled water is used, golf courses shall reduce irrigation up to 40 percent.	Yes
4	Stage 4	Other	0%	14.09.100(L); No commitments shall be made to provide water service as part of any new land use entitlement (general plan, specific plan or amendments requesting new water allocations) until the city has returned to a stage two drought restriction. Currently approved specific plans with accompanying development agreements and projects or properties that have received water allocations in advance of full entitlements may be issued building permits so long as they comply with the remainder of this chapter.	Yes
4	Stage 4	Other	27-35%	14.09.100(B); Residential users and non-residential landscapes are to reduce water usage up to 40 percent.	Yes
5 & 6	Stage 5	Landscape - Other landscape restriction or prohibition	5%	14.09.110(C); Except where recycled water is used, water users shall reduce landscape irrigation as follows: 1. Turf shall not be irrigated. 2. Trees and shrubs may be irrigated with a properly functioning low volume landscape irrigation system or by use of a handheld hose equipped with a nozzle capable of completely shutting off the flow of water except when positive action or pressure to maintain the flow of water is applied. Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.	Yes
5 & 6	Stage 5	Other water feature or swimming pool restriction	1%	14.09.110(D); Filling new or existing swimming pools and spas with city water is prohibited.	Yes
5 & 6	Stage 5	Other	33%	14.09.110(B); Residential users are to reduce water usage up to 50 percent.	Yes
NOTES: For each successive drought level all preceding restrictions shall continue in place, except to the extent they are replaced by more restrictive conditions.					

1.5 Supply Augmentation and Operational Changes

Under normal operational conditions the City's groundwater strategy is to not pump well water in excess of the potable water that is injected annually. At this time, the City's injection volume of groundwater is planned to exceed extraction volume over time, as the groundwater program is still in development. The positive difference between the injection and extraction volume is the net volume of water that the City places into long-term storage or makes available for other users. Per Section 14.09.050 of the Municipal Code, when determining drought staging, the City cannot consider the effect of well water reducing the need for conservation until a stage three drought level is reached. Specifically, the code mentions that well water cannot be considered as an alternative to declaration of a stage one or stage two drought level. The City may choose to operationalize groundwater infrastructure in any year type based on water supply conditions and/or operations and maintenance strategies for infrastructure, however this shall not be determined to reduce or alleviate the appropriate drought stage given hydrologic conditions and surface water allocations for that year. The percent reduction that could result from this supply augmentation action for the different stages is provided in WSCP Table 7. Note that there are no supply augmentation actions for drought stages 1 and 2.in accordance with the provisions of the Municipal code.

WSCP Table 7 Supply Augmentation During Stage 3 Droughts and Higher

Standard Shortage Level	Roseville Municipal Code Stage	Supply Augmentation Methods and Other Actions by Water Supplier	Percent Reduction	Additional Explanation
3	3	Stored Emergency Supply	0-10%	Groundwater Pumped
4	4	Stored Emergency Supply	0-20%	Groundwater Pumped
5 & 6	5	Stored Emergency Supply	0-30%	Groundwater Pumped

The water utility would need to adjust its operations to support a drought stage that would prompt increased reliance on well water. Tasks for operations may include more frequent maintenance of well pumps and chemical injection pumps, monitoring of ground water level, and filter backwashing.

1.6 Compliance and Enforcement

The Water Conservation and Drought Mitigation ordinance grants the City the authority to enforce compliance with the water use limitations outlined in WSCP Table 6. The sections of the Water Conservation and Drought Mitigation Ordinance, detailing compliance and enforcement authority and measures are provided below.

14.09.020 General provisions

C. Administration and Enforcement. The city manager, or designee, including, but not limited to, an enforcement officer as defined herein, shall administer, implement, and enforce the provisions of this chapter. For purposes of this chapter an "enforcement officer" means any city employee or agent of the city with the authority to enforce any provision of this chapter and the authority to make any decision on behalf of the city manager required or called for by this chapter.

D. Compliance. All provisions of this chapter are subject to the compliance procedures set forth in this chapter unless otherwise expressly stated herein.

14.09.140 Violations

It is Unlawful for any user and/or person to violate any provision or fail to comply with any of the requirements of this chapter. Causing, permitting, aiding, abetting or concealing a violation of any provision of this chapter shall constitute a violation of this chapter. A violation of the provisions of this chapter shall occur irrespective of the negligence or intent of the violator and a violation of or failure to comply with any of the requirements of this chapter may be charged as either an infraction or a misdemeanor in the discretion of the city attorney. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 3834 § 3, 2002; Ord. 2413 § 2, 1991.)

14.09.150 Enforcement authority

A. Whenever the city manager, or designee (including, but not limited to, an enforcement officer), determines that a user and/or person has violated any provision of, or failed to meet a requirement of, this chapter, an administrative citation pursuant to Chapter 2.50 or a written compliance order pursuant to Chapter 2.52 may be issued to any user and/or person responsible for the violation.

B. Any compliance order issued may require without limitation any or all of the following:

1. The allocation of a particular amount of water to a given user and/or person responsible for the violation;
2. The issuance of a fine;
3. The installation of a flow restriction device;
4. The performance of monitoring, analyses, and reporting;
5. That violations shall cease and desist; and/or
6. The discontinuance of water service

The compliance order shall set forth a deadline within which the requirements of the compliance order must be completed. Said compliance order shall further advise that, should the violator fail to comply with the compliance order within the established deadline, a hearing on the compliance order shall be set. (Ord. 5491 § 11, 2015; Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 3034 § 3, 2002; Ord. 2817 § 1, 1994; Ord. 2413 § 2, 1991.)

14.090.180 Separate offense for each day.

Any user and/or person that violates any provision of this chapter shall be guilty of a separate offense for each and every day during any portion of which any user and/or person commits, continues, permits, or causes a violation thereof, and shall be punished accordingly. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

1.7 Financial Consequences

During times of an emergency condition, the City is expected to see significant revenue reduction as a result of demand reduction actions lowering total gross water use. Additionally, enforcement of demand reduction actions, which could include investigating water waste complaints, follow ups to check for compliance, administering warnings or fines, and installation of flow restriction devices, would incur additional expenses that would not be present during non-emergency conditions.

Revenue loss percentage for each drought stage is anticipated to be approximately equal to the demand reduction percentage for each respective shortage level. Enforcement expenses will vary based on customer compliance and drought stage. For instance, at the onset of demand reduction action implementation, resources needed for enforcement may be high as customers adjust to altering their use or compliance from customers could vary seasonally with customers finding it more difficult to comply during warmer months.

The City plans to mitigate the financial consequences associated with water shortage response actions primarily through their recently adopted water rate structure, which allows for adequate reserves to accommodate reductions in revenue and increases in cost due to drought. If the water shortage rate charges are insufficient to make up for the loss in revenue, the City will use financial reserves to mitigate remaining financial consequences.

1.8 Plan Adoption, Submittal, and Availability

The Water Shortage Contingency Plan will be included as an appendix in the 2020 Urban Water Management Plan (UWMP) and will be introduced and discussed with the public and City Council in the same meetings but as separate agenda items. The WSCP is intended to be a stand-alone document and as such will be adopted by the City independently of the UWMP. The WSCP may be updated as needed between the regular 5-year updates of the UWMP and no required WSCP update shall necessitate an update of the UWMP.

The City has encouraged community and public interest involvement in the WSCP using public meetings and web-based communication. A public meeting will be held on June 16, 2021 and will provide an opportunity for the general public to ask questions and raise concerns regarding the WSCP. Prior to the public hearing the draft WSCP was made available for public inspection on the City's website: www.roseville.ca.us/WSCP/.

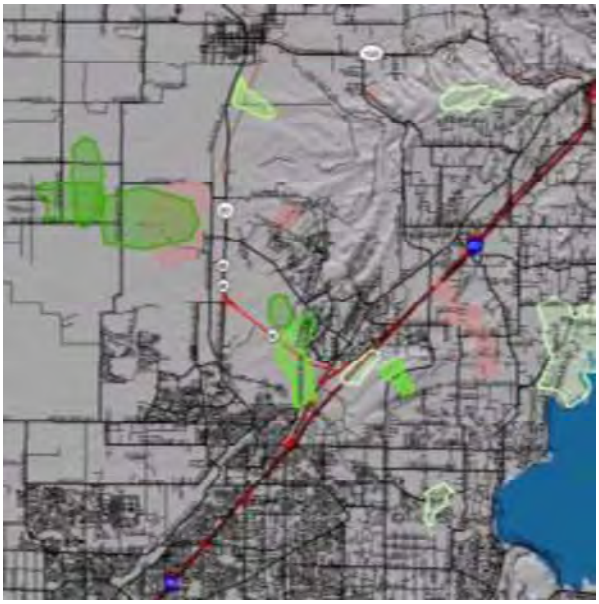
The WSCP will be presented to City Council on June 16, 2021 for adoption. Copies of the adoption resolutions will be provided as Exhibit C. A copy of this WSCP will be submitted to DWR within 30 days of adoption and by July 1, 2021. The adopted WSCP will be submitted electronically to DWR. A CD or hardcopy of the adopted WSCP will also be submitted to the California State Library. No later than 30 days after submittal to DWR, copies of the adopted WSCP will be available for public review at the City's public offices. An electronic copy of this plan will also be available for review and download on the City's website: www.roseville.ca.us/WSCP/.

Exhibit A – City of Roseville 2016 Multi-Hazard Mitigation Plan

CITY OF ROSEVILLE CALIFORNIA

2016 Multi-Hazard Mitigation Plan



TETRA TECH

September 2016

CONTENTS

Executive Summary xvi
Plan Update xvi
Plan Update Methodology xvii
Phase 1—Organize Resources xvii
Phases 2 —Update the Risk Assessment xviii
Phase 3—Engage the Public xviii
Phase 4—Assemble the Updated Plan xviii
Phase 5—Plan Adoption/Implementation xviii
Mitigation Guiding Principle, Goals, and Objectives xix
Guiding Principle xix
Goals xix
Objectives xix
Mitigation Action Plan xx
Implementation xx
1. Introduction to Hazard Mitigation Planning 1-1
1.1 Why Prepare This Plan? 1-1
1.1.1 The Big Picture 1-1
1.1.2 Roseville's Response to the DMA 1-1
1.2 Who Will Benefit From This Plan? 1-2
1.3 Contents of This Plan 1-2
2. Plan Update—What Has Changed 2-1
2.1 The Previous Plan 2-1
2.2 Mitigation Success Stories 2-1
2.3 Why Update? 2-2
2.3.1 Federal Eligibility 2-2
2.3.2 Changes in Development 2-2
2.4 The Updated Plan—What Is Different? 2-2
3. Plan Update Approach 3-1
3.1 Planning Resource Organization 3-1
3.1.1 Internal Funding 3-1
3.1.2 Formation of the Planning Team 3-1
3.1.3 The Steering Committee 3-2
3.1.4 Coordination with Other Agencies 3-2
3.1.5 Review of Existing Programs 3-3
3.2 Risk Assessment Update 3-4
3.3 Public Involvement 3-4
3.3.1 Strategy 3-4
3.3.2 Public Involvement Results 3-7
3.4 Assemble the Updated Plan 3-9
3.5 Plan Development Chronology/Milestones 3-10
4. City of Roseville Profile 4-1
4.1 Geographic Profile 4-1
4.2 Historical Overview 4-3

4.2.1 Pre-Development 4-3
4.2.2 Founding of the Community 4-3
4.2.3 Post-Incorporation Development 4-3
4.2.4 Current Conditions 4-4
4.3 Major Past Hazard Events 4-4
4.4 Physical Setting 4-4
4.4.1 Geology 4-4
4.4.2 Soils 4-4
4.4.3 Climate 4-5
4.5 Development Profile 4-5
4.5.1 Land Use Policies 4-5
4.5.2 Residential Development 4-8
4.5.3 Non-Residential Development 4-8
4.5.4 Critical Facilities and Infrastructure 4-10
4.5.5 Future Trends in Development 4-14
4.6 Open Space and Habitat 4-14
4.6.1 Grasslands 4-14
4.6.2 Oak Woodlands and Riparian Areas 4-14
4.6.3 Seasonal Wetlands 4-15
4.6.4 Sensitive Species 4-15
4.7 Demographics 4-16
4.7.1 Population Trends 4-16
4.7.2 Age Distribution 4-17
4.7.3 Race, Ethnicity and Language 4-19
4.7.4 Individuals with Disabilities and Others with Access and Functional Needs 4-20
4.8 Economy 4-20
4.8.1 Income 4-20
4.8.2 Industry, Businesses and Institutions 4-21
4.8.3 Employment Trends and Occupations 4-22
4.9 Laws and Ordinances 4-23
4.9.1 Federal 4-23
4.9.2 State 4-28
4.9.3 City Plans and Programs 4-32
4.10 Capability Assessment 4-36

5. Identified Hazards of Concern and Risk Assessment Methodology 5-1

5.1 Identified Hazards of Concern 5-1
5.2 Methodology 5-2
5.3 Risk Assessment Tools 5-2
5.3.1 Dam Failure, Earthquake and Flood—Hazus-MH 5-2
5.3.2 Landslide, Severe Weather, and Wildfire 5-3
5.3.3 Drought 5-3
5.3.4 Climate Change 5-4
5.3.5 Health Hazards and Human-Caused Hazards 5-4
5.4 Mapping 5-4
5.4.1 Building and Cost Data 5-4
5.4.2 Hazus-MH Data Inputs 5-4
5.4.3 Other Local Hazard Data 5-5
5.4.4 Data Source Summary 5-5
5.4.5 Limitations 5-5

6. Climate Change Considerations for Hazard Mitigation 6-1
6.1 California Senate Bill No. 379 6-1
6.2 What is Climate Change? 6-2
6.3 How Climate Change Affects Hazard Mitigation 6-3
6.4 Current Indications of Climate Change 6-3
6.5 Projected Future Impacts 6-4
6.5.1 Precipitation 6-4
6.5.2 Temperature 6-5
6.5.3 Snow Pack 6-5
6.5.4 Wildfire 6-5
6.6 Responses to Climate Change 6-6
6.6.1 Mitigation and Adaptation 6-6
6.6.2 Ecosystem-Based Adaptation 6-6
6.6.3 City of Roseville Sustainability Efforts 6-6
6.7 Climate Change Impacts on Hazards 6-7
6.7.1 Drought 6-7
6.7.2 Earthquake 6-8
6.7.3 Flood 6-8
6.7.4 Landslide 6-9
6.7.5 Severe Weather 6-10
6.7.6 Wildfire 6-11
7. Dam Failure 7-1
7.1 General Background 7-1
7.1.1 Causes of Dam Failure 7-1
7.1.2 Regulatory Oversight 7-2
7.2 Hazard Profile 7-3
7.2.1 Past Events 7-3
7.2.2 Location 7-4
7.2.3 Frequency 7-4
7.2.4 Severity 7-4
7.2.5 Warning Time 7-4
7.2.6 Folsom Dam Containment Dike Failure Risk Assessment 7-5
7.3 Secondary Hazards 7-6
7.4 Exposure 7-8
7.4.1 Population 7-8
7.4.2 Property 7-8
7.4.3 Critical Facilities 7-8
7.4.4 Environment 7-8
7.5 Vulnerability 7-9
7.5.1 Population 7-9
7.5.2 Property 7-9
7.5.3 Critical Facilities 7-9
7.5.4 Environment 7-10
7.6 Future Trends in Development 7-10
7.7 Review of Existing Ordinances, Programs and Plans 7-10
7.8 Scenario 7-10
7.9 Issues 7-11
8. Drought 8-1

8.1 General Background 8-1
8.1.1 Water Supply Strategy 8-1
8.1.2 Water Supply Infrastructure 8-2
8.1.3 The Water Forum 8-3
8.1.4 Local Water Contracts—Definition of Drought 8-3
8.2 Hazard Profile 8-4
8.2.1 Past Events 8-4
8.2.2 Location 8-5
8.2.3 Frequency 8-9
8.2.4 Severity 8-9
8.2.5 Warning Time 8-9
8.3 Secondary Hazards 8-10
8.4 Exposure 8-10
8.5 Vulnerability 8-10
8.5.1 Population 8-10
8.5.2 Property 8-10
8.5.3 Critical Facilities 8-10
8.5.4 Environment 8-11
8.5.5 Economic Impact 8-11
8.6 Future Trends in Development 8-11
8.7 Review of Existing Ordinances, Programs and Plans 8-12
8.8 Scenario 8-13
8.9 Issues 8-13

9. Earthquake 9-1

9.1 General Background 9-1
9.1.1 Damage from Earthquakes 9-1
9.1.2 Earthquake Classifications 9-1
9.1.3 Ground Motion 9-3
9.1.4 Effect of Soil Types 9-3
9.2 Hazard Profile 9-4
9.2.1 Past Events 9-4
9.2.2 Location 9-5
9.2.3 Frequency 9-12
9.2.4 Severity 9-12
9.2.5 Warning Time 9-12
9.3 Secondary Hazards 9-13
9.4 Exposure 9-13
9.4.1 Population 9-13
9.4.2 Property 9-13
9.4.3 Critical Facilities 9-13
9.4.4 Environment 9-14
9.5 Vulnerability 9-15
9.5.1 Population 9-15
9.5.2 Property 9-15
9.5.3 Critical Facilities 9-18
9.5.4 Environment 9-18
9.6 Future Trends in Development 9-19
9.7 Review of Existing Ordinances, Programs and Plans 9-19
9.7.1 International Building Codes 9-19

9.7.2 Improvement Standards 9-20
9.7.3 Geotechnical Studies 9-20
9.8 Scenario 9-20
9.9 Issues 9-20

10. Flooding 10-1

10.1 General Background 10-1
10.1.1 Measuring Floods and Floodplains 10-1
10.1.2 Effects of Human Activities 10-1
10.1.3 Floodplain Ecosystems 10-1
10.1.4 Federal Flood Programs 10-2
10.2 Hazard Profile 10-3
10.2.1 Flooding Types 10-3
10.2.2 Past Events 10-4
10.2.3 Location 10-7
10.2.4 Frequency 10-8
10.2.5 Severity 10-10
10.2.6 Warning Time 10-10
10.3 Secondary Hazards 10-12
10.4 Exposure 10-12
10.4.1 Population 10-12
10.4.2 Property 10-12
10.4.3 Critical Facilities and Infrastructure 10-14
10.4.4 Environment 10-15
10.5 Vulnerability 10-15
10.5.1 Population 10-15
10.5.2 Property 10-16
10.5.3 Critical Facilities and Infrastructure 10-19
10.5.4 Environment 10-19
10.6 Future Trends in Development 10-19
10.7 Review of Existing Ordinances, Programs, and Plans 10-21
10.7.1 Structural Mitigation 10-21
10.7.2 Non-Structural Mitigation 10-22
10.7.3 Regulations 10-22
10.7.4 Stormwater Management 10-26
10.7.5 Outreach and Public Education 10-28
10.8 Scenario 10-28
10.9 Issues 10-28

11. Landslide 11-1

11.1 General Background 11-1
11.1.1 Landslide Types 11-1
11.1.2 Landslide Modeling 11-3
11.2 Hazard Profile 11-3
11.2.1 Past Events 11-3
11.2.2 Location 11-3
11.2.3 Frequency 11-4
11.2.4 Severity 11-4
11.2.5 Warning Time 11-6
11.3 Secondary Hazards 11-6

11.4 Exposure 11-6
11.4.1 Population 11-6
11.4.2 Property 11-6
11.4.3 Critical Facilities and Infrastructure 11-7
11.4.4 Environment 11-7
11.5 Vulnerability 11-7
11.5.1 Population 11-7
11.5.2 Property 11-8
11.5.3 Critical Facilities and Infrastructure 11-8
11.5.4 Environment 11-8
11.6 Future Trends in Development 11-8
11.7 Review of Existing Ordinances, Programs, and Plans 11-8
11.8 Scenario 11-10
11.9 Issues 11-10

12. Severe Weather 12-1

12.1 General Background 12-1
12.1.1 Tornadoes 12-2
12.1.2 Windstorms 12-2
12.1.3 Fog 12-5
12.1.4 Heavy Rains, Thunderstorms and Lightning 12-6
12.1.5 Ice and Freezing Rain 12-7
12.2 Hazard Profile 12-7
12.2.1 Past Events 12-7
12.2.2 Location 12-7
12.2.3 Frequency 12-7
12.2.4 Severity 12-9
12.2.5 Warning Time 12-9
12.3 Secondary Hazards 12-9
12.4 Exposure 12-9
12.4.1 Population 12-9
12.4.2 Property 12-9
12.4.3 Critical Facilities and Infrastructure 12-9
12.4.4 Environment 12-10
12.5 Vulnerability 12-10
12.5.1 Population 12-10
12.5.2 Property 12-10
12.5.3 Critical Facilities and Infrastructure 12-11
12.5.4 Environment 12-11
12.6 Future Trends in Development 12-11
12.7 Review of Existing Ordinances, Programs, and Policies 12-11
12.8 Scenario 12-11
12.9 Issues 12-12

13. Wildfire 13-1

13.1 General Background 13-1
13.1.1 Contributing Factors 13-1
13.1.2 Local Conditions Related to Wildfire Hazard 13-1
13.2 Hazard Profile 13-3
13.2.1 Past Events 13-3

13.2.2 Location 13-4
13.2.3 Frequency 13-8
13.2.4 Severity 13-9
13.2.5 Warning Time 13-11
13.3 Secondary Hazards 13-11
13.4 Exposure 13-11
13.4.1 Population 13-11
13.4.2 Property 13-11
13.4.3 Critical Facilities and Infrastructure 13-11
13.4.4 Environment 13-12
13.5 Vulnerability 13-12
13.5.1 Population 13-12
13.5.2 Property 13-13
13.5.3 Critical Facilities and Infrastructure 13-13
13.6 Future Trends in Development 13-13
13.7 Review of Existing Programs, Plans and Ordinances 13-14
13.7.1 Fire Prevention Programs and Standards 13-14
13.7.2 Adopted Service Levels for Response Time 13-15
13.7.3 Annual Monitoring of Fire Department Service Levels 13-16
13.7.4 Personnel Training 13-17
13.7.5 Fire Investigation 13-17
13.7.6 Comprehensive Emergency Medical Services 13-18
13.7.7 Accreditation Recommendation 13-17
13.8 Scenario 13-18
13.9 Issues 13-19

14. Human Health Hazards 14-1

14.1 General Background 14-1
14.1.1 Influenza 14-1
14.1.2 Smallpox 14-3
14.1.3 Viral Hemorrhagic Fevers 14-3
14.1.4 Plague 14-5
14.1.5 Tick-Borne Disease 14-5
14.1.6 Mosquito-Borne Disease 14-7
14.1.7 Anthrax 14-10
14.1.8 Severe Acute Respiratory Syndrome 14-10
14.1.9 Extreme Weather 14-11
14.2 Hazard Profile 14-12
14.2.1 Past Events 14-13
14.2.2 Location 14-13
14.2.3 Frequency 14-14
14.2.4 Severity 14-14
14.3 Secondary Hazards 14-14
14.4 Exposure and Vulnerability 14-14
14.4.1 Population 14-14
14.4.2 Property 14-15
14.4.3 Critical Facilities and Infrastructure 14-15
14.4.4 Environment 14-15
14.4.5 Economy 14-15
14.5 Future Trends in Development 14-15

14.6 Review of Existing Ordinances, Programs and Plans 14-15
14.6.1 Hospital Expansions to Care for Growing Populations 14-15
14.6.2 Memorandums of Agreement 14-16
14.6.3 Integrated Emergency Response 14-17
14.7 Scenario 14-17
14.8 Issues 14-17
15. Human-Caused Hazards 15-1
15.1 General Background 15-1
15.1.1 Man-Made Hazards 15-2
15.1.2 Technological Hazards 15-7
15.1.3 Civil Disorder 15-10
15.2 Hazard Profile 15-10
15.2.1 Past Events 15-10
15.2.2 Location 15-16
15.2.3 Frequency 15-20
15.2.4 Severity 15-20
15.2.5 Warning Time 15-21
15.3 Secondary Hazards 15-21
15.4 Exposure 15-21
15.4.1 Population 15-22
15.4.2 Property 15-23
15.4.3 Critical Facilities and Infrastructure 15-23
15.4.4 Environment 15-24
15.5 Vulnerability 15-25
15.5.1 Population 15-25
15.5.2 Property 15-25
15.5.3 Critical Facilities and Infrastructure 15-25
15.5.4 Environment 15-25
15.5.5 Economic impacts 15-25
15.6 Future Trends in Development 15-26
15.7 Review of Existing Ordinances, Programs, and Plans 15-26
15.7.1 City of Roseville Emergency Response Plan 15-26
15.7.2 City of Roseville Terrorism Contingency Plan 15-26
15.7.3 City of Roseville Hazardous Materials Contingency Plan 15-27
15.7.4 State of California Certified Unified Program Agency 15-27
15.7.5 Roseville Police Department 15-28
15.7.6 Roseville Public Safety Communications 15-28
15.7.7 Roseville Fire Department 15-28
15.8 Scenario 15-31
15.9 Issues 15-31
16. Planning Area Risk Ranking 16-1
16.1 Probability of Occurrence 16-1
16.2 Impact 16-1
16.3 Risk Rating and Ranking 16-3
17. Guiding Principle, Goals and Objectives 17-1
17.1 Guiding Principle 17-1
17.2 Goals 17-1

17.3 Objectives 17-2
18. Mitigation Alternatives 18-1
19. Action Plan and Implementation 19-1
19.1 Hazard Mitigation Action Plan 19-1
19.1.1 Benefit-Cost Review 19-7
19.1.2 Action Plan Prioritization 19-8
19.1.3 Analysis of Mitigation Actions 19-8
19.2 Adoption 19-8
19.3 Plan Maintenance Strategy 19-13
19.3.1 Plan Implementation 19-14
19.3.2 Steering Committee 19-14
19.3.3 Annual Progress Report 19-15
19.3.4 Plan Update 19-15
19.3.5 Continuing Public Involvement 19-16
19.3.6 Incorporation into Other Planning Mechanisms 19-16
References
Glossary

Appendices

Appendix A. Public Outreach Materials
Appendix B. 2015 Progress Report
Appendix C. Steering Committee Participation Documentation

Tables

Table 2-1. Plan Changes Crosswalk 2-3
Table 3-1. Steering Committee Members 3-2
Table 3-2. Summary of Public Meetings 3-7
Table 3-3. Plan Development Chronology/Milestones 3-11
Table 4-1. Presidential Major Disaster, Emergency, and Fire Management Assistance Declarations 4-5
Table 4-2. Roseville Climate 4-6
Table 4-3. Non-Residential Land Uses 4-9
Table 4-4. Non-Residential Development Profile as of July 2016 4-10
Table 4-5. Planning Area Critical Facilities 4-10
Table 4-6. Planning Area Critical Infrastructure 4-10
Table 4-7. General Plan Projections of Residential Units and Population by Specific Plan Area 4-18
Table 4-8. Status of Non-Institutionalized Population with Disabilities 4-20
Table 4-9. Population Under the Poverty Level 4-21
Table 4-10. Legal and Regulatory Capability 4-37
Table 4-11. Administrative and Technical Capability 4-39
Table 4-12. Fiscal Capability 4-39
Table 4-13. National Flood Insurance Program Compliance 4-40

Table 4-14. Education and Outreach 4-40
Table 4-15. Community Classifications 4-41
Table 5-1. Hazus-MH Model Data Documentation 5-6
Table 7-1. Dams in Placer and Sacramento Counties With Potential to impact Roseville 7-4
Table 7-2. Hazard Potential Classification 7-5
Table 7-3. Value of Property Exposed to Dam Failure 7-8
Table 7-4. Critical Facilities in Dam Failure Inundation Areas in Roseville 7-8
Table 7-5. Loss Estimates for Dam Failure 7-9
Table 8-1. City of Roseville Water Supply Contracts and Resources 8-2
Table 8-2. Dry Year Flows into Folsom Lake 8-3
Table 8-3. Water Supply Reliability by 2040 8-11
Table 8-4. City of Roseville Past, Current, and Projected Water Use 8-12
Table 9-1. Richter Magnitude Scale 9-2
Table 9-2. Moment Magnitude Scale 9-2
Table 9-3. Mercalli Scale and Peak Ground Acceleration Comparison 9-3
Table 9-4. NEHRP Soil Classification System 9-4
Table 9-5. Recent Earthquakes Magnitude 5.0 or Larger Within 100-mile radius 9-4
Table 9-6. Critical Facilities Exposed to the Earthquake Hazard 9-13
Table 9-7. Critical Infrastructure Exposed to the Earthquake Hazard 9-13
Table 9-8. Age of Structures in the City of Roseville 9-16
Table 9-9. Building Type 9-16
Table 9-10. Damage Probability (Vulnerability) of Critical Facilities from a 100-Year Earthquake Event 9-18
Table 9-11. Damage Probability (Vulnerability) of Critical Facilities from the Great Valley 3 Scenario 9-18
Table 9-12. Functionality of Critical Facilities, 100-Year Earthquake 9-19
Table 9-13. Functionality of Critical Facilities, Great Valley 3 Scenario 9-19
Table 10-1. Reported Damage from Major Flooding in Roseville (1973 to 2009) 10-4
Table 10-2. Observed Characteristics of Flooding 10-10
Table 10-3. Structures Within the SFHA and the Roseville Regulatory Floodplain 10-12
Table 10-4. Value of Exposed Buildings Within the FEMA SFHA 10-13
Table 10-5. Value of Exposed Buildings Within the Roseville Regulatory Floodplain 10-13
Table 10-6. Critical Facilities in Flood Area 10-14
Table 10-7. Critical Infrastructure in Flood Areas 10-14
Table 10-8. Flood Insurance Statistics for the City of Roseville 10-16
Table 10-9. Estimated Flood Loss for the 10-Year Flood Event (Preliminary FIRM) 10-17
Table 10-10. Estimated Flood Loss for the 100-Year and 500-Year Flood Events (Preliminary FIRM) 10-18
Table 10-11. Estimated Flood Loss for the Regulatory Floodplain 10-18
Table 11-1. Loss Estimates for Buildings Vulnerable to High Landslide Hazard 11-8
Table 11-2. Loss Estimates for Buildings Vulnerable to Moderate Landslide Risk Hazard 11-8
Table 12-1. Monthly Wind Records for Sacramento, California 12-5
Table 12-2. Monthly Dense Fog Occurrence 12-6
Table 12-3. Frequency of Thunderstorms in Sacramento, California, 1948 – 2008 12-6
Table 12-4. Severe Weather Events in Placer County since 1958 (NOAA 2015) 12-8
Table 12-5. Loss Potential for Roseville Buildings Vulnerable to Severe Weather Hazard 12-10
Table 13-1. Wildfire Incident Counts—2011 to 2015 13-8
Table 13-2. Critical Facilities and Infrastructure Adjacent to Potential Wildfire Areas 13-12
Table 13-3. Potential Loss Estimates for the Wildfire Hazard 13-13
Table 15-1. Event Profiles for Terrorism 15-3
Table 15-2. Common Mechanisms for Cyber Attacks 15-6
Table 15-3. Accidents Responded to by McClellan Fire Department, 1950-1980s 15-11

Table 15-4. Traffic Accident Counts—2009 to 2014 15-16
Table 15-7. Criticality Factors 15-21
Table 15-8. Vulnerability Criteria 15-22
Table 15-9. Residential Dwelling Units in the City of Roseville as of 2012 15-23
Table 16-1. Probability of Hazards 16-1
Table 16-2. Impact on People from Hazards 16-2
Table 16-3. Impact on Property from Hazards 16-3
Table 16-4. Impact on Economy from Hazards 16-3
Table 16-5. Hazard Risk Rating 16-3
Table 16-6. Hazard Risk Ranking 16-4
Table 17-1. Objectives for 2011 Multi-Hazard Mitigation Plan 17-2
Table 18-1. Alternatives to Mitigate the Dam Failure Hazard 18-2
Table 18-2. Alternatives to Mitigate the Drought Hazard 18-3
Table 18-3. Alternatives to Mitigate the Earthquake Hazard 18-4
Table 18-4. Alternatives to Mitigate the Flooding Hazard 18-5
Table 18-5. Alternatives to Mitigate the Landslide Hazard 18-6
Table 18-6. Alternatives to Mitigate the Severe Weather Hazard 18-7
Table 18-7. Alternatives to Mitigate the Wildfire Hazard 18-8
Table 18-8. Alternatives to Mitigate Health Hazards 18-9
Table 18-9. Alternatives to Mitigate Human-Cause Hazards 18-9
Table 19-1. Action Plan 19-2
Table 19-2. Prioritization of Mitigation Actions 19-9
Table 19-3. Analysis of Mitigation Actions 19-11

Figures

Figure 3-1. Hazard Mitigation Booth 3-6
Figure 3-2. City of Roseville Earth Day Festival 3-6
Figure 3-3. Hazus-MH Work Station 3-6
Figure 3-4. Sample Printout from Work Station 3-6
Figure 3-5. Twitter Survey Announcement 3-8
Figure 3-6. Facebook Survey Announcement 3-8
Figure 3-7. Nextdoor Survey Announcement 3-8
Figure 3-8. Sample Page from Hazard Mitigation Plan Website 3-9

Figure 4-1. Roseville Planning Area 4-2
Figure 4-2. Total Land Use Allocation in Roseville 4-7
Figure 4-3. Critical Facilities in the Planning Area 4-11
Figure 4-4. Critical Infrastructure in the Planning Area—Transportation 4-12
Figure 4-5. Critical Infrastructure in the Planning Area—Utilities 4-13
Figure 4-6. Placer County and Roseville Population Growth 4-17
Figure 4-7. Planning Area Age Distribution 4-18
Figure 4-8. Planning Area Race Distribution 4-19
Figure 4-9. Industry in the Planning Area 4-21
Figure 4-10. California and Roseville Unemployment Rate (U.S. Census, 2009 – 2014) 4-22
Figure 4-11. Occupations in the Planning Area 4-23

Figure 6-1. Global Carbon Dioxide Concentrations Over Time 6-2

Figure 6-2. Observed and Projected Average Temperatures in the Roseville Area 6-5
Figure 6-3. Projected Future Fire Risk in Placer County Relative to 2010 Levels 6-5

Figure 7-1. Folsom Dam and Folsom Lake on the American River, Looking Northeast 7-6
Figure 7-2. Folsom Dam Containment Dike Failure Flow Direction and Evacuation Routes 7-7

Figure 8-1. Palmer Crop Moisture Index for Week Ending January 30, 2016 8-6
Figure 8-2. Palmer Z Index Short-Term Drought Conditions (December 2015) 8-6
Figure 8-3. Palmer Drought Severity Index (December 2015) 8-7
Figure 8-4. Palmer Hydrological Drought Index Long-Term Hydrologic Conditions (December 2015) 8-8
Figure 8-5. 24-Month Standardized Precipitation Index (January 2013 – December 2015) 8-8

Figure 9-1. Location of Recent Earthquakes in Roseville Vicinity 9-5
Figure 9-2. 100-Year Probabilistic PGA 9-8
Figure 9-3. Concord-Green Valley Fault Scenario PGA 9-9
Figure 9-4. Great Valley 3 Fault Scenario PGA 9-10
Figure 9-5. National Earthquake Hazard Reduction Program Soil Classification 9-11
Figure 9-6. Age of Construction of Structures in Roseville 9-17

Figure 10-1. CRS Communities by Class as of May 1, 2016 10-3
Figure 10-2. Dry Creek Flooding, January 1995 10-6
Figure 10-3. Business Flooding, February 1998 10-7
Figure 10-4. Floodplains 10-9
Figure 10-5. Example of Stream Gauge Graphic Display 10-11
Figure 10-6. Repetitive Loss Area 10-20
Figure 10-7. Floodplain Designation Cross-Sections for Infill Areas 10-23
Figure 10-8. Floodplain Designation Cross-Sections for Areas Other Than Infill Areas 10-23
Figure 10-9. Updated Floodplain Mapping 10-26

Figure 11-1. Deep Seated Slide 11-2
Figure 11-2. Shallow Colluvial Slide 11-2
Figure 11-3. Bench Slide 11-2
Figure 11-4. Large Slide 11-2
Figure 11-5. Typical Debris Avalanche Scar and Track 11-2
Figure 11-6. Roseville Area Landslide Hazard Map 11-5

Figure 12-1. Roseville Regional Surface Elevation 12-1
Figure 12-2. Potential Impact and Damage from a Tornado 12-3
Figure 12-3. Tornado Risk Areas in the Coterminous United States 12-4

Figure 13-1. CAL FIRE FRAP Map for Placer County 13-5
Figure 13-2. View of Ravine, Tree Canopy and Stoneridge Development 13-6
Figure 13-3. Stoneridge Specific Plan Wildfire Threat Areas 13-8
Figure 13-4. Fire Hazard Severity Zones in the Planning Area 13-10
Figure 13-5. City of Roseville Fire Training Center 13-17

Figure 14-1. Areas with Confirmed H5N1 2003-2013 14-2
Figure 14-2. 2014 Distribution of Ebola Virus Outbreaks in Humans and Animals 14-4
Figure 14-3. California 2014 *Yersinia Pestis* Results in Tested Mammals by County 14-6

Figure 15-1. Pop-Up Message Indicating Ransomware Infection 15-6
Figure 15-2. February 12, 2006 Aircraft Crash into Residence 15-12
Figure 15-3. October 21, 2010 Arson Fire at Galleria Mall 15-13
Figure 15-4. 1973 Roseville Rail Yard Disaster 15-14

Figure 15-5. 1997 Bomb Discovery 15-15
Figure 15-6. The J.R. Davis Yard in Roseville, the Largest Train Yard West of the Mississippi..... 15-17
Figure 15-7. Roseville Truck Routes with High Potential for Hazardous Materials Incidents 15-18
Figure 15-8. Kinder Morgan National Pipeline Map 15-19
Figure 15-9. Roseville Civic Center..... 15-24

Figure 19-1. Resolution Adopting the Roseville Hazard Mitigation Plan..... 19-12

ACKNOWLEDGMENTS

City of Roseville

Rob Jensen, City Manager
Wayne Wiley, Associate Planner
Jason Rizzi, Roseville Fire Department
Carl Walker, Senior Civil Engineer
Helen Dyda, Marketing & Communications Analyst

Consultants

Rob Flaner, CFM, Lead Project Planner, Tetra Tech, Inc.
Carol Baumann, Hazus/GIS lead, Tetra Tech, Inc.
Jessica Cerutti, CFM, Planner, Tetra Tech, Inc.
Stephen Veith, GIS Analyst, Tetra Tech, Inc.

Stakeholders

Erik Angle, Sutter Roseville Medical Center
Michael Algots, Union Pacific Railroad
Rick Stalker, Placer County Association of Realtors

Special Acknowledgments

The development of this Plan would not have been possible without the dedication and commitment to this process by the Roseville Hazard Mitigation Plan Steering Committee. The dedication of this volunteer committee to allocate their time to this process is greatly appreciated. Also, the citizens of Roseville are commended for their participation in the outreach strategy identified by the Steering Committee. This outreach success will set the course to the successful implementation of this Plan during its next performance period.

- Grace Keller
- Wayne Wiley
- Rob Jensen
- Jason Rizzi
- Carl Walker
- Helen Dyda
- Erik Angle
- Brenette Macintosh
- Mark Lacher
- Jaime Garrett
- Joseph Van Zant
- Rod Rodriguez
- Rick Stalker
- Michael Algots
- Jim Williams

EXECUTIVE SUMMARY

The Disaster Mitigation Act (DMA; Public Law 106-390) is the latest federal legislation enacted to encourage and promote proactive, pre-disaster planning as a condition of receiving financial assistance under the Robert T. Stafford Act. The DMA emphasizes planning for disasters before they occur. Under the DMA, a pre-disaster hazard mitigation program and new requirements for the national post-disaster hazard mitigation grant program were established.

The DMA encourages state and local authorities to work together on pre-disaster planning and it promotes sustainability as a strategy for disaster resistance. The intent is three-fold:

- To gather hazard, vulnerability, and mitigation information at the local level for use in state-level planning
- To ensure that state and local hazard mitigation planning is coordinated to the greatest extent practical
- To ensure that local jurisdictions are made aware of the hazards and vulnerabilities within their jurisdiction and to develop strategies to reduce those vulnerabilities.

This process ensures that mitigation actions are based on sound planning processes that account for the risks and capabilities of California communities. "Sustainable hazard mitigation" includes the sound management of natural resources, local economic and social resiliency, and the recognition that hazards and mitigation must be understood in the largest possible social and economic context. The enhanced planning network called for by the DMA helps local governments articulate accurate needs for mitigation, resulting in faster allocation of funding and more cost-effective risk reduction projects.

Using this initiative as a foundation for proactive planning, the City of Roseville has developed and maintained a hazard mitigation plan in an effort to reduce future loss of life and property resulting from disasters. It is impossible to predict exactly when and where disasters will occur or the extent to which they will impact the City. However, with careful planning and collaboration among public agencies, stakeholders, and citizens, it is possible to minimize losses that can occur from disasters.

Hazard mitigation is a way to reduce or alleviate the loss of life, personal injury, and property damage that can result from a disaster through long- and short-term strategies. It involves strategies such as planning, policy changes, programs, projects, and other activities that can mitigate the impacts of hazards on the City of Roseville. The responsibility for hazard mitigation lies with many, including private property owners; business and industry; and local, state, and federal government.

PLAN UPDATE

Federal regulations stipulate that hazard mitigation plans must describe the method and schedule for monitoring, evaluating, and updating the Plan. Prescribing an update schedule establishes an opportunity to reevaluate recommendations, monitor the impacts of actions that have been accomplished, and determine if there is a need to change the focus of mitigation strategies. DMA compliance is contingent on meeting the plan update requirement. A jurisdiction covered by a plan that has expired is not able to pursue elements of federal funding afforded under the Robert T. Stafford Act for which a current hazard mitigation plan is a prerequisite. The California Office of

Emergency Services (Cal OES) reviews all local hazard mitigation plans in accordance with DMA 2000 regulations and coordinates with local jurisdictions to ensure compliance with state requirements and the Code of Federal Regulations (Title 44 Section 201.6). Once Cal OES planning staff find the local hazard mitigation plan to be approvable, the Plan is forwarded to mitigation planning staff at Region IX of the Federal Emergency Management Agency (FEMA). FEMA performs final review and designates compliant plans as "approved pending adoption."

The City of Roseville used the plan update process to comprehensively revise its initial hazard mitigation plan, which was adopted in 2005. Due to the success of the initial plan, no major changes were made to the plan's approach and function. The subsequent 2011 Plan was enhanced using recent best available data and technology, especially in the risk assessment. For this 2016 planning effort, the enhanced format of the 2011 Plan has been retained in order to ensure the consistency of discussion points on each hazard of concern and address required elements for plan updates. The Plan update followed the same basic planning process as was followed under the initial effort and subsequent update. A Steering Committee was once again the critical component in the process. The Steering Committee consisted of 14 members of the community representing the public, private industry, and government. The Steering Committee met six times between November 2015 and August 2016 to provide recommendations and support throughout the planning process.

PLAN UPDATE METHODOLOGY

Development of the hazard mitigation plan included five phases:

- Phase 1—Organize resources
- Phase 2—Update the risk assessment
- Phase 3—Engage the public
- Phase 4—Assemble the updated Plan
- Phase 5—Plan adoption

Phase 1—Organize Resources

The City hired Tetra Tech, Inc. as a consultant to assist with development and implementation of the 2016 Plan. The Tetra Tech project manager assumed the role of the lead project planner and reported directly to a City project manager. Once the technical assistance was secured, a planning team was formed to lead the planning effort. The Steering Committee that oversaw the development of the initial plan remained intact during the initial performance period of the Plan and then provided oversight for the 2016 Plan. For the update process, some new members were added and some previous members left the committee. The planning team facilitated each Steering Committee meeting, which addressed a set of objectives based on the work plan established for the update. The Steering Committee met six times from November 2015 through August 2016. Coordination with other local, state and federal agencies involved in hazard mitigation in the region helped to ensure consistency with other ongoing efforts.

One of the Steering Committee's first action items was to review the State of California Hazard Mitigation Plan, the Roseville 2011 Hazard Mitigation Plan and all of the progress reports completed since the 2011 Plan. The Steering Committee identified hazards listed in the state plan to which Roseville is susceptible, in order to determine if there was a need to expand the scope of the risk assessment. Each annual progress report for the initial plan contains a section that recommends changes or enhancements to the Plan or plan development process. These reports effectively completed a key step of the plan update process before the update process began—identifying needs for changes or enhancements.

Phase 2 —Update the Risk Assessment

Federal planning guidance specifies comprehensive updates to the risk assessment portion of local hazard mitigation plans if there have been new technical data pertaining to a hazard developed by a creditable source since the Plan's previous development. Updated risk assessment efforts for the 2016 Plan included the following:

- The latest version of the Federal Emergency Management Agency's Hazus-MH risk assessment software was used to enhance the risk assessments for flood, dam failure and earthquake.
- All hazards of concern were updated with new relevant data.
- The Hazus default general building stock was updated using current address point, building footprint, parcel and tax assessor data.

Phase 3—Engage the Public

The Steering Committee drafted a comprehensive public involvement strategy for this update using multiple media sources. This strategy was built upon the Steering Committee's previous public engagement strategy and enhanced with social media and non-traditional outreach initiatives not regularly employed during the previous planning processes. The planning team identified stakeholders to target through the multi-disciplinary public involvement strategy.

Phase 4—Assemble the Updated Plan

The base format of the 2011 Plan was maintained in the 2016 Plan. However, enhancements were made to include the following components:

- The update describes the process used to review and analyze each section of the Plan.
- The update provides a discussion on how the public was kept apprised of the Plan's actions during the initial performance period.
- The update describes the need for changes to the risk assessment and what changes were made from the previous update.
- The update describes changes to risk exposure due to either of the following:
  - Successful mitigation projects
  - Changes in land use due to annexation or new development.
- The update describes changes to the action plan and the reasons for them.
- The update identifies completed, deleted, or deferred actions or activities from the previously approved plan as a benchmark for progress in the form of the 2015 Progress Report located in Appendix B. It also includes in its evaluation and prioritization new mitigation actions identified since the previous plan

Phase 5—Plan Adoption/Implementation

This Plan details a formal process for implementing and maintaining the Plan so that it remains an active and relevant document. The plan maintenance process includes a schedule for monitoring and evaluating the Plan's progress annually and producing a plan revision every five years. This process seeks to keep a steering body that meets the criteria of the original steering committee intact to perform this annual review. This phase includes strategies for continued public involvement and incorporation of the recommendations of this Plan into other planning mechanisms of the City, such as the comprehensive plan, capital improvement plan, building code, and development design guidelines.

MITIGATION GUIDING PRINCIPLE, GOALS, AND OBJECTIVES

Guiding Principle

The following guiding principle was identified for this hazard mitigation plan:

> Through community partnerships, establish a plan to reduce vulnerability to hazards in order to protect the health, safety, welfare, and economy of the City.

Goals

The Steering Committee established the following goals for the Plan update:

- G-1: Protect lives and reduce injury.
- G-2: Promote hazard mitigation as an integrated policy.
- G-3: Protect the continuity of local government to ensure no significant disruption of services during or due to a disaster.
- G-4: Improve community emergency management preparedness, collaboration and outreach.
- G-5: Minimize or reduce damage to property, including critical facilities.
- G-6: Develop and implement mitigation strategies that optimize public funds in an efficient and cost-effective way.
- G-7: Monitor and support the natural environment's capacity to deal with the impacts of natural hazards, taking into account the potential impacts of global climate change.

Objectives

Plan objectives were developed via a facilitated exercise that focused on finding objectives that meet multiple goals. During this exercise, Steering Committee members were requested to review the 2011 objectives in addition to newly proposed objectives. The selected objectives are listed in Table ES-1.

Table ES-1. Objectives for 2016 Multi-Hazard Mitigation Plan

Objective Number	Objective Statement	Goals for which it can be applied
O-1	Consider the impacts of hazards on future land uses in the City of Roseville by coordinating with other planning mechanisms such as the General Plan and land-use code development.	1, 2, 5, 7
O-2	Protect and sustain reliable local emergency operations and communication facilities during and after disasters.	1, 3, 4
O-3	Develop new or enhance existing early warning response systems and plans.	1, 3, 4, 5
O-4	Seek to enhance emergency response capabilities through improvements to infrastructure and City programs.	1, 4, 5
O-5	Enhance the understanding of all present and future hazards that impact the City of Roseville and the risk they pose.	1, 3, 4, 5, 7
O-6	Seek mitigation projects that provide the highest degree of hazard protection at the least cost.	1, 5, 6
O-7	Seek to update information on natural, environmental, and human-caused hazards, vulnerabilities, and mitigation measures by coordinating planning efforts and creating partnerships with appropriate local, private, county, state, and federal agencies.	1, 2, 3, 4, 5, 7
O-8	Seek to implement codes, standards, and policies that will protect life and property, including natural habitat, from the impacts of hazards within the City of Roseville.	1, 2, 3, 5, 6
O-9	Educate the public on preparedness for and mitigation of potential impacts of hazards on the City of Roseville.	1, 2, 4
O-10	Support efforts to retrofit, purchase, or relocate structures in high hazard areas, including those known to be repetitively damaged.	3, 5, 6

MITIGATION ACTION PLAN

The hazard mitigation action plan is a key element of this Plan. It is through the implementation of this action plan that the City of Roseville can strive to become disaster-resilient through sustainable hazard mitigation. This action plan includes an assessment of the capabilities of the City to implement hazard mitigation actions, a review of alternatives, a prioritization schedule, and a mitigation strategy matrix that identifies the following:

- Description of recommended actions
- Hazards addressed
- Objectives addressed
- Lead implementation agency (or agencies)
- Estimated benefits
- Estimated costs
- Timeframe for implementation
- Funding sources

For the purposes of this document, mitigation actions are defined as activities designed to reduce or eliminate losses resulting from the impacts of natural hazards of concern. Table ES-2 summarizes the hazard mitigation actions identified by this Plan update.

IMPLEMENTATION

Full implementation of the recommendations of this Plan will require time and resources. This Plan reflects an adaptive management approach in that specific recommendations and plan review protocols are provided to evaluate changes in vulnerability and action plan prioritization after the Plan is adopted. Funding resources are always evolving, as are requirements under state or federal mandates, and the true measure of the Plan's success will be its ability to adapt to the ever-changing climate of hazard mitigation.

Roseville has a long-standing tradition of progressive, proactive response to issues that may impact its citizens. This tradition is reflected in the development of this Plan. The Roseville City Council will assume responsibility for adopting the recommendations of this Plan and committing City resources toward its implementation. The City's track record in the mitigation of hazards impacting its citizens is exemplary. The framework established by this Plan will help maintain this tradition in that it identifies a strategy to maximize the potential for implementation based on available and potential resources. It commits the City to pursue actions when the benefits of a project exceed its costs. Most important, the City developed this Plan with extensive public input, which sets the stage for acceptance of the actions recommended for implementation in this Plan.

Table ES-2. Hazard Mitigation Action Plan Matrix

Action Number and Description	Timeframe
DAM FAILURE	
DF-1—Create a dam failure element for the City's emergency response plan that includes a phased warning protocol in response to the findings of the Folsom Dam Containment Dike Risk Assessment.	Short-term
DROUGHT	
D-1—Perform a groundwater recharge feasibility study to determine the most cost-effective way to replenish groundwater resources within Roseville.	Ongoing
D-2—Implement aquifer storage and recovery program that uses direct injection technique in areas identified as appropriate.	Ongoing
D-3—Continue to implement the Environmental Utility Department's recycled water program and seek all opportunities to expand its coverage, focusing first on the Sunset Industrial area. The City pumps recycled water through a system of purple pipes completely separate from potable (drinking water) pipes. The City pumps the recycled water to customers such as streetscapes, golf courses and parks, where it irrigates turf and shrubs. Using recycled water for uses such as landscape irrigation reduces demand on the potable water system, creating a more reliable water supply for the entire City. Recycled water is not subject to the effects of drought.	Ongoing
D-4—Promote active water conservation techniques and strategies to private property owners through Roseville-sponsored outreach projects such as printed media and the City's website.	Ongoing
EARTHQUAKE	
EQ-1—Perform building-specific, structural seismic vulnerability assessment of City-owned critical facilities constructed prior to 1980 (including infrastructure). Included in this assessment will be recommended mitigation alternatives that meet goals and objectives of this Plan.	Short-term; Ongoing
EQ-2—Incorporate earthquake mitigation measures for private property into existing City-sponsored outreach programs such as printed media and the City's website.	Short-term
EQ-3—Reassess the overall vulnerability to the earthquake hazard using the best available science and technology as it becomes available. State-sponsored programs, Seismic Hazards Mapping Act, and future FEMA-sponsored initiatives are anticipated to create a wealth of knowledge regarding this hazard that did not exist during the preparation of this Plan update	Short-term; Ongoing
FLOOD	
F-1—The City shall designate all areas identified as the 100-year floodplain. The boundaries of the 100-year floodplain shall be as specified in the floodplain designations section of this component of the City's general plan. Floodplain areas shall be preserved as specified in the open space and conservation element. Such preservation may include required dedication to the City. If needed, modify the City's ordinances to include floodplain use regulations consistent with the goals, policies, and implementation measures of the safety, land use, open space and conservation, and parks and recreation elements of the City's general plan.	Ongoing
F-2—Refer any development proposal that has a direct or indirect impact on flood protection to Public Works for comment. In addition, forward such proposals to other agencies as applicable, including the U.S. Army Corps of Engineers, California Reclamation Board, FEMA, California Department of Fish and Wildlife, Placer County Resource Conservation District, and Placer County Flood Control District. Consider the comments of the agencies during the development review process.	Ongoing
F 3—Continue City participation in the National Flood Insurance Program and the Community Rating System (CRS). Maintain the City's current CRS status as the nation's only Class 1 CRS community.	Ongoing
F 4—Maintain Roseville's compliance and good standing under the National Flood Insurance program	Ongoing
F 5—Continue the City's outreach program to flood-prone property owners and the citizens of Roseville to program is to help make them aware of the flood threat and how best to deal with them.	Ongoing
F 6—Continue to pursue a regional approach to flood issues by remaining actively involved in the Placer Co Flood Control District. This involvement includes cooperation in the development of a comprehensive regional database. Continue to participate in regional flooding studies, including the Auburn Creek/Coon Creek/Pleasant Grove Creek flood mitigation plan and the Dry Creek watershed flood control plan.	Ongoing

Action Number and Description	Timeframe
F 7—Continue City coordination with other agencies on issues of flood control. Coordination between the City and adjacent jurisdictions occurs through several mechanisms, including distribution of development proposals for review and comment. Continue City cooperation with federal, state, and local agencies, including the U.S. Army Corps of Engineers, California Reclamation Board, FEMA, California Department of Fish and Wildlife, Placer County Resource Conservation District, and Placer County Flood Control District.	Ongoing
F 8—Continue to develop, implement, and expand the Flood Alert and Early Warning Program systems and integrate the systems with other local jurisdictions to form a regional warning program.	Ongoing
F 9—Ensure that future specific plans and specific plan amendments are consistent with the goals and policies of the general plan. The specific plans shall include the designation and preservation of floodplain areas and adjacent habitat. Provisions shall be incorporated to ensure that public infrastructure, utilities, and emergency services remain functional during flood conditions. Such infrastructure and facilities include water, sewer and gas mains, telephone and electric lines, streets and bridges, hospitals, and fire and police stations. Financing mechanisms shall be explored to fund necessary flood protection improvements and maintenance. Development agreements may be used to secure implementation and funding provisions. (Specific plans have 100% cost recovery by developers).	Short -term
F 10—Monitor and regularly update City flood studies, modeling, and associated land use, zoning, and other development regulations at a minimum of every 5 years or whenever information becomes available that would significantly modify previous data. New information could include new studies, change in City policy, consideration of a major development project or specific plan, or implementation of a flood control project.	Short-term; Ongoing
F 11-Require a master drainage plan as part of the approval process for all specific plans and large development projects as determined by the Public Works director. The master drainage plan should consider cumulative regional drainage and flooding mitigation. The plan's intent is to ensure that the overall rate of runoff from a project does not exceed predevelopment levels. If necessary, this objective shall be achieved by incorporating run-off control measures to minimize peak flows and/or assistance in financing or otherwise implementing comprehensive drainage plans.	Short-term
F-12—Continue the Department of Parks, Recreation and Libraries' regular creek maintenance program within the City's creeks and floodplain areas. This program clears and removes debris that could contribute to blockage and flooding and may include the removal of silt. This is only done in areas of high risk to flood damage or where property or facilities are threatened by flooding.	Ongoing
F 13—Continue annual inspection and maintenance program of City storm drain systems. Review after every major storm system function and performance. This program removes debris that could contribute to blockage of the storm drain system.	Ongoing
F 14—Complete the final two phases of the Cirby/Linda/Dry Creek flood control project (Phase 1 and 2). Five of the seven phases of this project have been completed at a cost of about $18,000,000. The basis for determining viability of this project will be a benefit /cost analysis to determine if project meets federal grant eligibility requirements.	Long-term
F 15—Analyze alternative improvements to the Cirby/Linda/Dry Creek flood control project that may be cost effective in the flood-prone areas of Roseville: • Dry Creek from Darling Way to Riverside Avenue • Area on Dry Creek upstream of Folsom Road in the Columbia Avenue/Marilyn Avenue/Bonita Street area • Linda Creek near Samoa Way/Hurst Way area • Cirby Creek in the Trimble Way/Zien Court area	Long –term; depends on funding
F 16—Replace the Huntington Drive/Cirby Creek culvert with a bridge to protect Queens Court/Huntington Drive area. This project is overseen by Public Works department.	Long-term; depends on funding
F 17—Divert the main drainage storm drain system down Crestmont Avenue to Cirby Way and then into Dry Creek so that the existing system will not exceed capacity. If system capacity is exceeded, the intersection on Cirby Way and Crestmont Avenue and nearby homes will flood during major flood events.	Short-term
F 18—Continue to promote and sponsor programs to buy out, relocate, and flood-proof existing flood-prone structures within Roseville.	Long-term; depends on funding
F-19—Implement recommendation of Downtown Roseville Specific Plan to relocate the Public safety Building.	Long-term
F-20—Retrofit the City's Downtown library by sealing the exterior and installing a flood door to protect against flood damage should Dry Creek overspill the existing floodwall.	Short-term; Ongoing

Action Number and Description	Timeframe
F-21—Continue the Tree Mitigation Fund program administered by the Open Space Division in conjunction with non-profit organizations. The planting of oak trees in the open spaces adjacent to riparian zones increases infiltration and slows storm water surges.	Ongoing
F-22—Manage beaver dam sites for flood control protection and habitat restoration after dam removal. One primary issue is impacts to floodwater capacity of creeks. Part of the desired comprehensive approach to beaver management includes establishment of quantitative and qualitative "carrying capacity," including acre-feet of flood capacity lost. Implement a standard monitoring and reporting process to track beaver dam locations, population, and impacts. Gain regulatory approval for beaver management techniques such as biological control and habitat manipulation using the most benign options first.	Ongoing
F-23 – Develop the City's multi-use, multi-benefit stormwater retention project within the Pleasant Grove Creek Watershed, the Reason Farms Stormwater Retention Project.	Long-term
LANDSLIDE	
LS-1—Once California Geological Survey completes soils mapping for the Roseville vicinity under the Seismic Hazards Mapping Act, reassess landslide hazard using best available data to gauge the true vulnerability to this hazard.	Long-term
LS-2—Continue to implement policies adopted by the general plan that promote open space land uses within identified steep slope areas of Roseville. The City of Roseville Northeast Roseville Specific Plan and Stoneridge Specific Plans include the identified steep slope areas within Roseville. Both Plan Areas have continuing development. When individual projects are submitted,	Ongoing
SEVERE WEATHER	
SW-1—Continue the Shade Tree Program, an energy conservation rebate program provided by Roseville Electric	Ongoing
SW-2—Continue ongoing line clearing and weed abatement of electrical utilities to reduce exposure to severe weather hazards.	Ongoing
SW-3—Continue education/outreach programs to improve winter preparedness and minimize loss of life or injury.	Short-term, ongoing
SW-4—Enhance and implement strategies for debris management and removal during severe weather events.	Ongoing
SW 5-Continue to operate the Roseville Energy Park to support the City's electrical requirements and maintain service continuity during severe weather events.	Ongoing
SW 6-Take over ownership and operation of the Roseville Combustion Turbines from Northern CA Power Agency to support the City's electrical requirements and maintain service continuity during severe weather events.	Ongoing
WILDFIRE	
WF-1—Continue "Goat Grazing" program for removal of grassland in areas of Roseville potentially vulnerable to wildfire. Implement goat grazing in City open space and preserve areas for fire and invasive plant species management and native plant restoration.	Ongoing
WF-2—Enhance existing City public outreach programs to include information on fire safety, defensible spaces, and areas of concern.	Short-term; Ongoing
MULTIPLE HAZARDS	
MH-1—Continue to maintain Cal OES certification of all City inspectors for post-disaster damage assessment.	Ongoing
MH-2—Continue to maintain the hazard mitigation page on City website that provides following types of information: • The Hazard Management Plan and its progress reports • Hazard-specific information • Mitigation information by hazard, with specific emphasis on private property • Emergency response and warning information • Links to county, state, and federal related agencies	Ongoing

Action Number and Description	Timeframe
MH-3—Establish/maintain a post-disaster action plan to be part of the City Emergency operations plan that will include following elements: • Procedures for public information • Post-disaster damage assessment • Grant writing • Code enforcement • Redundant operations	Ongoing
MH-4—Implement an "Adopt an Open Space" program in coordination with the open space management program. Develop "adoption contracts" with neighborhoods, organizations, businesses, etc., describing the level of stewardship and the terms of the "adoption." Publicize these activities through online resource directory and other media to encourage participation.	Long--term
MH-5—Develop and disseminate best practices information to private property owners whose land is adjacent to open space areas describing stewardship opportunities and owners' role in preserving beneficial uses of open space areas (including vernal pool grassland and creek or riparian uses). Offer classes to provide in-depth information, such as demonstration projects, techniques for ecologically friendly weed abatement and vegetation control, and creating a backyard habitat compatible with open space areas.	Short-term; Ongoing
MH-6—Work with the Roseville City School District, local high school districts, and non-profit organizations to promote ecology-oriented curricula and stewardship activities. Identify resource and administrative barriers that may be limiting schools' abilities to more actively participate in stewardship, and work collaboratively to identify solutions.	Short-term; Ongoing
MH 7—Strive to maintain high availability of essential communication services	Ongoing
MH 8-Secure the City's physical locations that contain technology infrastructure	Ongoing
HUMAN-CAUSED	
HC 1-Commit support to initiatives within the Sacramento-Roseville-Arden-Arcade Metropolitan Statistical Area; continue to seek funding from other federal sources to fund its initiatives	Short-term
HC-2—Enhance emergency response capability of City by contingency planning for specific events based on identified vulnerabilities.	Short-term, ongoing
HC-3— Seek to establish appropriate staffing levels of public safety personnel to address vulnerabilities identified through an incremental targeted study that provides immediate needs as well as anticipated needs in 1 year, 5 years, and 10 years.	Short Term; depends on funding
HC-4—Prepare a site-specific vulnerability assessment of City-owned critical facilities that use the best available science and technology with regards human-caused hazards.	Long-term
HC-5—Address vulnerabilities identified in vulnerability assessment of water facilities performed by Environmental Utilities Department in response to EPA initiative.	Long-term
HC 6-Maintain compliance with California Energy Commission license conditions for the operations of the Roseville Energy Park with respect to Hazardous Material Management	Ongoing
HC 7-Establish and maintain compliance with state and local laws and regulations for the operation of the Roseville Combustion Turbines upon transfer of ownership from Northern CA Power Agency to City.	Ongoing
HC-8-Maintain compliance with North American Electric Reliability Corporation mandatory reliability standards related to plant operation, sabotage reporting and critical infrastructure protection (cyber security.	Ongoing
HC 9—Protect the City's data, technology infrastructure and staff against Cyber terrorism such as but not limited to: • Identity Theft • Virus/Malware/Ransomware/Spyware/Spam/Phishing • Network and system attacks • Web site hacking	Short Term; depends on funding
HC-10: Improve evacuation transportation routes within the City of Roseville by removing traffic constrictions.	Long-term
HUMAN HEALTH	
HH-1—Continue to collaborate with the Placer County Health Department to ensure the health and welfare of the community	Ongoing

Action Number and Description	Timeframe
HH-2—Support the public education efforts of the Placer County Health Department and the Placer Mosquito Abatement District	Ongoing
HH-3—Collaborate with the Placer County Mosquito Abatement District to review resource protection policies that conflict with human health protection in the City of Roseville and work to resolve these policy issues	Short-term; Ongoing

Part 1. Planning Process and Community Profile

1. INTRODUCTION TO HAZARD MITIGATION PLANNING

1.1 WHY PREPARE THIS PLAN?

1.1.1 The Big Picture

Hazard mitigation is defined as any action taken to reduce or alleviate the loss of life, personal injury, and property damage that can result from a disaster. It involves long- and short-term actions implemented before, during and after disasters. Hazard mitigation activities include planning efforts, policy changes, programs, studies, improvement projects, and other steps to reduce the impacts of hazards.

For many years, federal disaster funding focused on relief and recovery after disasters occurred, with limited funding for hazard mitigation planning in advance. The Disaster Mitigation Act (DMA; Public Law 106-390), passed in 2000, shifted the federal emphasis toward planning for disasters before they occur. The DMA requires state and local governments to develop hazard mitigation plans as a condition for federal disaster grant assistance. Regulations developed to fulfill the DMA's requirements are included in Title 44 of the Code of Federal Regulations (44 CFR).

The responsibility for hazard mitigation lies with many, including private property owners, commercial interests, and local, state and federal governments. The DMA encourages cooperation among state and local authorities in pre-disaster planning. The enhanced planning network called for by the DMA helps local governments articulate accurate needs for mitigation, resulting in faster allocation of funding and more cost-effective risk-reduction projects.

The DMA also promotes sustainability in hazard mitigation. To be sustainable, hazard mitigation needs to incorporate sound management of natural resources and address hazards and mitigation in the largest possible social and economic context.

1.1.2 Roseville's Response to the DMA

Roseville has a long-standing reputation as a national leader in risk reduction through proactive mitigation. This reputation has been built through innovative planning and a commitment to protecting its citizens from the impacts of natural disasters. Embracing the goals of the DMA, Roseville created an initial hazard mitigation plan that became a model nationally and has been touted by the Federal Emergency Management Agency (FEMA) as a "mitigation success story." The *City of Roseville Hazard Mitigation Plan* was adopted by the Roseville City Council on July 20, 2005, and was formally approved by FEMA Region IX on August 10, 2005. The initial plan was developed with the following objectives:

- Meet or exceed program requirements specified under the DMA, thereby enabling the City of Roseville to continue using federal grant funding to reduce risk through mitigation.
- Meet not only state and federal requirements but also the needs of the City (this Plan addresses human-caused hazards, which are not required to be addressed under the DMA).
- Develop the Plan according to FEMA's Community Rating System (CRS) guidelines so that Roseville can meet requirements to become the nation's first CRS Class 1 community.

- Create a risk assessment that focuses on the City of Roseville hazards of concern.
- Coordinate existing plans and programs so that high-priority actions and projects to mitigate possible disaster impacts are funded and implemented.

The initial plan was developed according to the requirements of 44 CFR, qualifying the City to pursue funding under the Robert T. Stafford Act. The City has achieved numerous objectives identified in the Plan. Local hazard mitigation plans must be regularly updated to comply with the DMA. The City responded to this requirement with a plan update process that resulted in the 2011 Multi-Hazard Mitigation Plan, and now this 2016 Multi-Hazard Mitigation Plan.

This hazard mitigation plan update identifies resources, information, and strategies for reducing risk from natural hazards. Elements and strategies in the Plan were selected because they meet a program requirement and because they best meet the needs City residents. The Plan will help guide and coordinate mitigation activities throughout the planning area. It also will meet the planning requirements of the CRS, allowing the City of Roseville to maintain its CRS Class 1 rating.

1.2 WHO WILL BENEFIT FROM THIS PLAN?

All residents and businesses of the City of Roseville are the ultimate beneficiaries of this hazard mitigation plan update. The Plan reduces risk for those who live in, work in, and visit the City. It provides a viable planning framework for all foreseeable natural hazards. Participation in development of the Plan by key stakeholders helped ensure that outcomes will be mutually beneficial. The Plan's goals and recommendations can lay groundwork for the development and implementation of local mitigation activities and partnerships.

1.3 CONTENTS OF THIS PLAN

This hazard mitigation plan is organized into three primary parts:

- Part 1—Planning Process and Community Profile
- Part 2—Risk Assessment
- Part 3—Mitigation Strategy.

Each part includes elements required under federal guidelines. DMA compliance requirements are cited at the beginning of subsections as appropriate to illustrate compliance.

The following appendices provided at the end of the Plan include information or explanations to support the main content of the Plan:

- Appendix A—Public outreach information used in preparation of this update
- Appendix B—The 2015 Progress Report.

2. PLAN UPDATE—WHAT HAS CHANGED

2.1 THE PREVIOUS PLAN

Several factors initiated the first hazard mitigation planning effort for the City of Roseville:

- The Roseville area has significant exposure to numerous natural hazards that have caused millions of dollars in past damage.
- Limited local resources make it difficult to be pre-emptive in risk reduction actions. Being able to leverage federal financial assistance is paramount to successful hazard mitigation in the area.
- The City wanted to be proactive in its preparedness for natural hazards.

With these factors in mind, the City of Roseville committed to the preparation of its initial plan by attaining grant funding for the effort and then securing technical assistance to complete a planning process that complied with all requirements. Five years later, the City followed a similar process to update the Plan.

Due to the success of the 2005 effort, no major changes were made to the Plan's approach and function during the 2011 planning process. The 2011 update enhanced the 2005 effort but remained consistent on discussion points for each hazard of concern. The 2011 Plan format changed to address required elements for plan updates. A major addition to the 2011 Plan, per recommendations from FEMA Region IX, was the inclusion of dam failure as a hazard of concern.

The 2011 Plan update followed a phased approach to planning per FEMA's July 2008 *Local Hazard Mitigation Planning Guidance*.

2.2 MITIGATION SUCCESS STORIES

One of the principal objectives of the initial plan was to create a plan that would help the City achieve the highest possible rating under FEMA's Community Rating System (CRS) program. The CRS program has stringent requirements for Classes 4 or better, and especially for Class 1. Several of these requirements are related to planning, and the initial plan was developed to meet these requirements. The Insurance Services Office (ISO), which performs classification reviews for the CRS, determined that the initial plan met the Class 1 requirements. In December 2005, the City was verified with sufficient credit to become the nation's first and only CRS Class 1 community. This classification went into effect on October 1, 2006, and was confirmed again during the re-verification process in 2008, and most recently in 2014. As of the writing of this Plan, the City of Roseville maintains its status as the nation's only CRS Class 1 community.

Detailed accounts of other successful mitigation actions completed by the City during each reporting period are included in the progress reports on the previous hazard mitigation plan, including the 2015 Progress Report contained in Appendix B of this Plan.

2.3 WHY UPDATE?

2.3.1 Federal Eligibility

Under 44 CFR, hazard mitigation plans must present a schedule for monitoring, evaluating, and updating the Plan. This provides an opportunity to reevaluate recommendations, monitor the impacts of actions that have been accomplished, and determine if there is a need to change the focus of mitigation strategies. A jurisdiction covered by a plan that has expired is not able to pursue elements of federal funding under the Robert T. Stafford Act for which a current hazard mitigation plan is a prerequisite.

2.3.2 Changes in Development

Hazard mitigation plan updates must be revised to reflect changes in development within the planning area during the previous performance period of the Plan (44 CFR Section 201.6(d)(3)). The Plan must describe changes in development in hazard-prone areas that increased or decreased vulnerability since the last plan was approved. If no changes in development impacted the jurisdiction's overall vulnerability, then plan updates may validate the information in the previously approved plan. The intent of this requirement is to ensure that the mitigation strategy continues to address the risk and vulnerability of existing and potential development and takes into consideration possible future conditions that could impact vulnerability.

The Roseville planning area experienced a 31-percent increase in population between 2003 and 2013, an average annual growth rate of 3.1 percent per year (Placer County Office of Economic Development, 2014). The City has adopted a comprehensive plan that governs land-use decisions and policy-making, as well as a building code and specialty ordinances based on state and federal mandates. This Plan update assumes that some new development triggered by the increase in population occurred in hazard areas. Because all such new development would have been regulated pursuant to local programs and codes, it is assumed that vulnerability did not increase even if exposure did.

2.4 THE UPDATED PLAN—WHAT IS DIFFERENT?

The updated Plan differs from the initial plan in a variety of ways:

- **Climate Change Impacts—**The most recent version of the California hazard mitigation plan noted specific hazards that are created or augmented by the environmental impacts of climate change. Additionally, the recent passage of Senate Bill 379 brings the effects of climate change into focus as it relates to mitigation and general planning. As a result, instead of briefly reviewing the impact of climate change in each individual hazard profile, this 2016 Plan update dedicates a comprehensive chapter to the issue of climate change and its effects on the state-identified climate-related hazards.
- **Drought Chapter Enhancements—**Enhancements to the drought Chapter were made to reflect current, historic drought conditions of the stat, region, and city. This information was supplemented with new information provided by the City's 2015 Urban Water Management Plan (UWMP) update.
- **Public Engagement Enhancements through Social Media —**Social media platforms not available during the previous planning initiative were used to enhance public outreach capabilities.
- **Planning Area Changes—**The City adopted 3 new Specific Plans since the previous plan update. As such, all development and demographic information will include data pertaining to these new Specific Plan Areas of Sierra Vista, Creekview, and Amaruso Ranch.
- **Separation of Natural from Non-natural Hazards—**In an effort to draw distinction from the natural hazards from the non-natural hazards, the non-natural hazards (Human Caused and Human Health Hazards) are placed after the natural hazards instead of listed alphabetically with the natural hazards.

- **Human-Caused Hazards—**The human-caused hazards noted in the 2011 effort were updated for the 2016 Plan. These human-caused hazards were moved within the document to after the natural hazards due to the difference in assessing risk. Cyber threat was included as a new human-caused hazard, due to the increase in connectivity, technological advances, and emergence of "hacktivist" groups.
- **Human Health Hazards—**The human health hazards noted in the 2011 effort were updated for the 2016 Plan. These human health hazards were moved within the document to after the natural hazards due to the difference in assessing risk. Ebola was included as a new human health hazard due to the 2014 West Africa Ebola outbreak that threatened the United States, though that threat never fully materialized. Zika virus is included in the discussion, as well.
- **Additional Demographic Information—**Additional demographic data are included—beyond age and disability/access and function need—addressing Roseville's industry, business and institutional footprint. Employment trends and occupations are included to develop a fuller understanding of the population of Roseville.
- **Disabilities, Access and Functional Need Language Revision—**The entire Plan was updated to reflect appropriate references when discussing individuals with disabilities and others with access and functional needs. This includes person-first language and references to individuals instead of the more general term of populations.
- **Guiding Principle—**A guiding principle for the hazard mitigation plan was developed. The goals and objectives of the Plan support the guiding principle.

Table 2-1 indicates the major changes between the 2011 and 2016 plans as they relate to 44 CFR planning requirements.

Table 2-1. Plan Changes Crosswalk

44 CFR Requirement	Previous Plan (2011)	Updated Plan (2016)
§201.6(b): In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include: • **An opportunity for the public to comment on the Plan during the drafting stage and prior to Plan approval;** • **An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and** • **Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.**	The plan development process deployed under this update was similar to the 2005 Plan. Chapters 1, 2, and 3 describe the planning process for the 2011 updated Plan.	The plan development process deployed under this update was similar to the 2011 Plan; however, additional public outreach initiatives were conducted through new social media platforms. Chapters 1, 2, and 3 describe the planning process for the 2016 updated Plan.

44 CFR Requirement	Previous Plan (2011)	Updated Plan (2016)
§201.6(c)(2): The Plan shall include a risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.	Chapters 6 through 15 presents a risk assessment of eight hazards of concern: Climate change, dam failure, drought, earthquake, flood, landslide, severe weather, and wildfire. These hazards are profiled as they impact Roseville. Additionally, human-caused and health hazards were qualitatively assessed to develop a more complete picture of the hazards facing the county.	The 2016 Plan presents a risk assessment of the same hazards as the 2011 Plan—in Chapters 6 through 16. Each hazard was updated with new occurrence information from 2011 through 2015 where applicable, and a new comprehensive risk assessment was conducted using updated building stock, demographics, and land use information.
§201.6(c)(2)(i): [The risk assessment shall include a] description of the … location and extent of all natural hazards that can affect the jurisdiction. The Plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.	Chapters 6 through 15 presents a risk assessment of each hazard of concern. Each chapter includes the following components: • Hazard profile-including maps of extent and location, historical occurrences, frequency, severity and warning time. • Secondary hazards • Climate change impacts • Exposure of people, property, critical facilities and environment. • Vulnerability of people, property, critical facilities and environment. • Future trends in development • Scenarios • Issues	The 2016 Plan presents a risk assessment of the same hazards as the 2011 Plan—from Chapters 6 through 16. Each hazard was updated with new occurrence information from 2011 through 2015 where applicable, and a new comprehensive risk assessment was conducted using updated building stock, demographics, and land use information. Climate change impacts were omitted from the individual hazards of concern, as the new climate change chapter provides a more detailed and comprehensive overview of climate change impacts for identified hazards.
§201.6(c)(2)(ii): [The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i). This description shall include an overall summary of each hazard and its impact on the community	Vulnerability was assessed for all hazards of concern. The Hazus-MH computer model was used for the dam failure, earthquake and flood hazards. These were Level 2 user-defined analyses using City data. Site-specific data on City-identified critical facilities was entered into the Hazus model. Hazus outputs were generated for other hazards by applying an estimated damage function to an asset inventory was extracted from Hazus-MH.	Vulnerability was again assessed for all hazards of concern using the Hazus-MH computer model for dam failure, earthquake, and flood hazards. Level 2 analysis was again conducted for these hazards. Site-specific data on City-identified critical facilities was entered into the Hazus model. Hazus outputs were generated for other hazards by applying an estimated damage function to an asset inventory extracted from Hazus-MH. All assets were updated using current available data.
§201.6(c)(2)(ii): [The risk assessment] must also address National Flood Insurance Program insured structures that have been repetitively damaged floods	The Plan includes a comprehensive analysis of repetitive loss areas that includes an inventory of the number and types of structures in the repetitive loss area. Repetitive loss areas are delineated, causes of repetitive flooding are cited, and these areas are reflected on maps	The Plan includes a comprehensive analysis of repetitive loss areas that includes an inventory of the number and types of structures in the repetitive loss area. Repetitive loss areas are delineated, causes of repetitive flooding are cited, and these areas are reflected on maps.

44 CFR Requirement	Previous Plan (2011)	Updated Plan (2016)
§201.6(c)(2)(ii)(A): The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard area.	A complete inventory of the numbers and types of buildings exposed was generated for each hazard of concern. The Steering Committee defined "critical facilities" for the planning area, and these were inventoried by exposure. Each hazard chapter provides a discussion on future development trends.	Building inventory was updated and the Steering Committee revised the critical facilities definition to reflect 2016 priorities. Each hazard chapter again provides a discussion on future development trends.
§201.6(c)(2)(ii)(B): [The plan should describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) and a description of the methodology used to prepare the estimate.	Loss estimations in terms of dollar loss were generated for all hazards of concern. These were generated by Hazus-MH for the dam failure, earthquake and flood hazards. For the other hazards, loss estimates were generated by applying a regionally relevant damage function to the exposed inventory. In all cases, a damage function was applied to an asset inventory. The asset inventory was the same for all hazards and was generated in Hazus.	Loss estimates were recalculated using new data and the new asset inventory.
§201.6(c)(2)(ii)(C): [The plan should describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.	There is a discussion on future development trends as they pertain to each hazard of concern. This discussion looks predominantly at the existing land use and the current regulatory environment that dictates this land use.	The Plan contains a discussion on development trends from the previous planning period, through future trends anticipated in the next five years as they pertain to each hazard.
§201.6(c)(3): The plan shall include a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.	The Plan contains a guiding principal, goals, objectives and actions. The actions strive to meet multiple objectives. The objectives are broad and overarching; each meets multiple goals and stands alone as a component of the Plan. The City of Roseville completed a capability assessment that looks at its regulatory, technical and financial capabilities.	The Steering Committee reviewed the 2011 guiding principle, goals, objectives, and actions and made minor adjustments to reflect 2016 priorities. The City of Roseville updated its capability assessment to reflect regulatory revisions and new initiatives.
§201.6(c)(3)(i): [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.	The Steering Committee identified a guiding principal, goals and objectives.	The Steering Committee reviewed the 2011 guiding principle, goals, objectives, and actions and made minor adjustments to reflect 2016 priorities.
§201.6(c)(3)(ii): [The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.	Chapter 18 includes a hazard mitigation catalog that was developed through a facilitated process. This catalog identifies actions that manipulate the hazard, reduce exposure to the hazard, reduce vulnerability, or increase mitigation capability. The catalog further segregates actions by scale of implementation. A table in the action plan section analyzes each action by mitigation type to illustrate the range of actions selected.	The hazard mitigation catalog developed in 2011 was enhanced with results of the 2016 planning effort focusing on updated program capabilities and the dam failure and cyber threat hazards.
§201.6(c)(3)(ii): [The mitigation strategy] must also address the jurisdiction's participation in the National Flood Insurance Program, and continued compliance with the program's requirements, as appropriate.	The City of Roseville has identified an action stating its commitment to maintain compliance and good standing under the National Flood Insurance Program. Additionally, the City identified multiple actions to maintain its Class 1 standing under the CRS program.	The City of Roseville has identified an action stating its commitment to maintain compliance and good standing under the National Flood Insurance Program. Additionally, the City identified multiple actions to maintain its Class 1 standing under the CRS program.

44 CFR Requirement	Previous Plan (2011)	Updated Plan (2016)
§201.6(c)(3)(iii): [The mitigation strategy shall describe] how the actions identified in Section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.	Each recommended initiative is prioritized using a qualitative methodology that looked at the objectives the project will meet, the timeline for completion, how the project will be funded, the impact of the project, the benefits of the project and the costs of the project. This prioritization scheme is detailed in Chapter 19.	The updated Plan uses the same qualitative approach to prioritization as used for the 2011 Plan.
§201.6(c)(4)(i): [The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.	Chapter 7 details a plan maintenance strategy	Chapter 19 retains the plan maintenance strategy developed in 2011.
§201.6(c)(4)(ii): [The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.	Chapter 7 details recommendations for incorporating the Plan into other planning mechanisms such as: • General plan • Emergency response plan • Capital improvement programs • Municipal code • Stormwater Master Plan This chapter additionally discusses current and future integration opportunities.	Recommendations are provided for incorporating the Plan into other planning mechanisms. This update additionally discusses current and future integration opportunities.
§201.6(c)(4)(iii): [The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.	Chapter 7 details a comprehensive strategy for continuing public involvement.	A comprehensive strategy is provided for continuing public involvement with additional information regarding social media.
§201.6(c)(5): [The local hazard mitigation plan shall include] documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, County Commission, Tribal Council).	Chapter 6 contains the resolution for adoption of this Plan.	The implementation chapter for this update contains the resolution of adoption.

3. PLAN UPDATE APPROACH

Local governments are required to review and revise their hazard mitigation plans and resubmit them for approval within five years in order to remain eligible for mitigation project grant funding (44 CFR §201.6(d)(3)). FEMA's July 2008 *Local Hazard Mitigation Planning Guidance* outlines five phases for updates:

- Phase 1—Organize resources
- Phase 2—Update the risk assessment
- Phase 3—Engage the public
- Phase 4—Assemble the updated Plan
- Phase 5—Plan adoption/implementation.

Phases 1 through 4 are discussed in the following sections. The elements of Phase 5 are described in Chapter 19.

3.1 PLANNING RESOURCE ORGANIZATION

The first phase of planning was to organize needed resources. This phase had the following primary objectives:

- Secure grant funding
- Form a planning team
- Confirm political support for the process
- Establish a steering committee
- Coordinate with other agencies
- Review existing programs.

3.1.1 Internal Funding

The planning effort was made possible through local funds for the City of Roseville.

3.1.2 Formation of the Planning Team

The City hired Tetra Tech, Inc. as a consultant to assist with the 2016 Plan update. The Tetra Tech project manager acted as lead project planner, reporting directly to a City project manager. Once the technical assistance was secured, a planning team made up of the following members was formed to lead the planning effort:

- Rob Jensen (Roseville City Manager's Office)—City Manager, project oversight
- Carl Walker (City of Roseville Department of Public Works)—Floodplain management
- Jason Rizzi (City of Roseville Fire Department)—Emergency preparedness
- Wayne Wiley (City of Roseville Development Services Department)-City planning lead
- Rob Flaner (Tetra Tech)—Lead project planner
- Carol Baumann (Tetra Tech)—Hazus-MH/GIS lead
- Jessica Cerutti (Tetra Tech)—Hazard Identification and profiling
- Dan Portman (Tetra Tech)—Lead editor.

3.1.3 The Steering Committee

Hazard mitigation planning is one of the best ways to enhance collaboration and gain support among the parties whose interests might be affected by hazard losses. By working together, a broad range of stakeholders can identify and create partnerships that pool resources to achieve a common vision for the community. The Steering Committee that oversaw development of the initial plan remained intact during the performance period of that plan and subsequently provided oversight for the 2011 Plan. For this 2016 update process, some new members were added and some previous members left the committee. Table 3-1 lists the 2016 Steering Committee members.

Table 3-1. Steering Committee Members

Name	Title	Jurisdiction/Agency
Grace Keller[a]	Citizen	Community Emergency Response Team
Wayne Wiley[b]	Associate Planner	The City of Roseville Development Services
Rob Jensen	City Manager	The City of Roseville City Manager's Office
Jason Rizzi	Emergency Preparedness Manager	City of Roseville Fire Department
Carl Walker	Senior Civil Engineer	The City of Roseville Public Works
Helen Dyda	Public Information Specialist	City of Roseville Communications
Jaime Garrett	Fire Department Public Information Officer	City of Roseville Fire Department
Erik Angle	Emergency Preparedness Manager	Sutter Roseville Medical Center
Brenette Macintosh	Safety Officer	Consolidated Communications
Mark Lacher	Risk Manager	Consolidated Communications
Jim Williams	Citizen	Meadow Oaks Neighborhood Association
Joseph Van Zant	Citizen/Hazardous Materials Consultant	Roseville Coalition of Neighborhood Associations
Rod Rodriguez	Senior Emergency Services Specialist	Placer County Office of Emergency Services
Rick Stalker	Stalker & Burnett RE Group	Placer County Association of Realtors
Michael Algots	Manager, Hazardous Materials	Union Pacific Railroad

a. Steering Committee Chairperson
b. Steering Committee Vice Chairperson

Leadership roles and ground rules were reconfirmed during the Steering Committee's initial meeting for the plan update on November 3, 2015. The Steering Committee agreed to meet on the first Tuesday of every month as needed throughout the course of the 2016 Plan's development. The planning team facilitated each Steering Committee meeting, which addressed a set of objectives based on the work plan established for the update. The Steering Committee met six times from November 2015 through June 2016. Meeting agendas, minutes and attendance logs are available for review. All Steering Committee meetings were open to the public, and agendas and meeting minutes were posted to the internet.

3.1.4 Coordination with Other Agencies

Coordination with other local, state and federal agencies involved in hazard mitigation in the region helped to ensure consistency with other ongoing efforts. 44 CFR requires that opportunities for involvement in the planning process be provided to neighboring communities, local and regional agencies involved in hazard mitigation, agencies with authority to regulate development, businesses, academia, and other interests (Section 201.6.b.2). Agency coordination was accomplished as follows:

- **Steering Committee Involvement—**Agency representatives were invited to participate on the Steering Committee.

- **Coordination with Placer County—**Placer County had recently finished updating its multi-jurisdictional hazard mitigation plan and was invited to join the Steering Committee. County staff were able to provide insight into lessons learned through the County's update process. The County's involvement also allowed for integration between the two plan updates.
- **Agency Notification—**The following agencies were invited to participate in the process and were kept apprised of plan development milestones:

  - FEMA Region IX
  - California Governor's Office of Emergency Services (Cal OES)
  - California Department of Water Resources
  - Placer County Office of Emergency Services
  - Placer County Flood Control District
  - Placer County Office of Education
  - Sacramento County Department of Water Resources
  - City of Rocklin
  - City of Citrus Heights
  - Roseville City School District
  - Eureka School District
  - Dry Creek School District
  - Center School Districts
  - Roseville Joint Union High School District
  - U.S. Bureau of Reclamation

  All of these agencies received meeting announcements, meeting agendas, and meeting minutes by e-mail throughout the plan development process. This approach proved to be beneficial when these agencies supported the effort by attending meetings or providing feedback on issues. All of these agencies were also informed about the plan update web page for up-to-date information.

- **Pre-Adoption Review—**All the agencies listed above were provided means to review and comment on the mitigation action plan for the 2016 Plan. The predominant means for this review was through the project web page. Each agency was sent an e-mail informing them that draft portions of the update were available for review. In addition, the complete draft plan was sent for a pre-adoption review to FEMA Region IX, the ISO, and the Placer County Office of Emergency Services. No immediate comments were received from these agencies during the pre-adoption public review period.

3.1.5 Review of Existing Programs

Hazard mitigation planning must include review and incorporation, if appropriate, of existing plans, studies, reports and technical information (44 CFR Section 201.6.b(3)). Chapter 4 of this Plan provides a review of laws and ordinances in effect within the planning area that can affect hazard mitigation actions, as well as an assessment of the City's regulatory, technical and financial capabilities to implement hazard mitigation actions.

Of particular interest for the plan update effort are the City of Roseville General Plan, the City of Roseville Emergency Response Plan (an emergency support function-based plan that directs emergency response actions in the planning area), and the State of California 2013 Enhanced Hazard Mitigation Plan.

One of the Steering Committee's first action items was to review the State of California Enhanced Hazard Mitigation Plan and all of the progress reports completed during the performance period for the initial plan. The Steering Committee identified hazards listed in the state plan to which the Roseville area is susceptible, in order to determine if there was a need to expand the scope of the risk assessment. The committee also reviewed the goals, objectives and strategies of the state plan in order to select goals, objectives, and actions for the City's Plan that are consistent with those of the state.

Each annual progress report for the initial plan contains a section that recommends changes or enhancements to the Plan or plan development process. These reports effectively completed a key step of the plan update process before the update process began—identifying needs for changes or enhancements.

3.2 RISK ASSESSMENT UPDATE

Local hazard mitigation plans must provide sufficient hazard and risk information to identify and prioritize appropriate actions to reduce hazard-related losses. This includes detailed descriptions of all the hazards that could affect the jurisdiction, along with an analysis of the jurisdiction's vulnerability to those hazards. The update of the risk assessment is typically the most involved part of the plan update process.

FEMA planning guidance specifies comprehensive updates to the risk assessment portion of local hazard mitigation plans if there have been new technical data pertaining to a hazard developed by a creditable source since the plan's initial development or previously completed update. Updated risk assessment efforts for the 2016 Plan included the following:

- The latest version (2.2) of FEMA's Hazus-MH risk assessment software was used to enhance the risk assessments for the flood, dam and earthquake hazards.
- All hazards of concern were updated with new relevant data.
- The Hazus default general building stock was updated using current address point, building footprint, parcel and tax assessor data.

A detailed description of the methodology deployed in the update of the risk assessment is provided in Chapter 5.

3.3 PUBLIC INVOLVEMENT

Broad public participation in the planning process helps ensure that diverse points of view about the planning area's needs are considered and addressed. The public must have opportunities to comment on disaster mitigation plans during the drafting stages and prior to plan approval (44 CFR, Section 201.6(b)(1)). The Community Rating System expands on these requirements by making CRS credits available for optional public involvement activities.

3.3.1 Strategy

The Steering Committee drafted a comprehensive public involvement strategy for this update using multiple media sources. This strategy was built upon the Steering Committee's perception of what was effective during development of the update, in addition to the use of social media as a major message distribution vehicle. The planning team identified stakeholders to target through the multi-disciplinary public involvement strategy. The strategy for involving the public in the development of the Plan emphasized the following elements:

- Include members of the public on the Steering Committee.
- As was done for the previous update, use a survey to reassess the public's perception of risk and support of hazard mitigation and to get direction on alternatives.
- Hold public meetings to describe the plan update process and progress and to collect input from a wide range of the public.
- Develop a unified message for distribution on social media platforms.
- Attempt to reach as many citizens in the planning area as possible through the use of multiple media, including websites and brochures.

Steering Committee

Eleven of the fourteen members of the Steering Committee live or work in the City of Roseville. This body has provided a mechanism for continuing public involvement in the maintenance of the Plan by meeting annually to monitor the progress of the plan implementation and creating annual progress reports. The ongoing participation of some members from the time that the initial plan was developed provided a valuable historical perspective for

the committee during the update process. All Steering Committee meetings were open to the public and advertised on the City's hazard mitigation plan website. The Steering Committee met six times during the course of the plan update process. One of the meetings was attended by two members of the public. Steering Committee documentation can be found in Appendix C.

Survey

The Steering Committee elected to use a survey for the update process to collect new information from the public about household preparedness for hazards, the level of knowledge about tools and techniques for reducing loss from hazards, and areas of public concern about hazards.

The Steering Committee reviewed the previous survey and requested a simplification of the process to keep residents engaged while ensuring the collection of useful information. The survey asked 26 quantifiable questions and provided opportunities for written comment. The final survey used some of the same questions asked on the initial survey, which helped to show whether citizens' perception of risk and vulnerability has changed over the last five years. The survey also revised some questions to support the plan update process and fulfill the Steering Committee's request for simplification.

The web-based survey tool "Survey Monkey" was used to set up and deploy the survey. The survey was made available to all citizens of Roseville via a web-link posted on the City's website, advertised via press releases, sent via e-mail to community residents, and linked through various forms of social media, including Nextdoor, a geographically based social media website. Over 670 surveys were completed during the course of the plan update process. These results were distributed to the Steering Committee during the strengths, weaknesses, obstacles and opportunities session to inform the Steering Committee of public concerns and opportunities for new public engagement strategies. Multiple survey respondents indicated concern about radon, which the Steering Committee will consider adding as a hazard of concern during the next plan update. The survey and a summary of its findings are provided in Appendix A.

Public Meetings

Participation in a well-attended community event was used as the vehicle to introduce the plan update process, to share the results of the revised risk assessment, and to gauge the public's perception of risk. A final public hearing was held at the end of the process to provide the public an opportunity to comment on the draft Plan.

Community Event Participation—Public Meeting

A public meeting was held as part of the City of Roseville's Earth Day celebration on Saturday, April 16, 2016 from 10 a.m. to 3 p.m. at the Utility Exploration Center, 1501 Pleasant Grove Boulevard (see Figure 3-1 through Figure 3-4). The public meeting was an open-house-format meeting, allowing citizens to come and go as they pleased during the meeting time frame.

The principal objective of the meeting was to share the results of the revised risk assessment with the public, then gage their perception of risk by having them complete a survey. Multiple members of the Steering Committee and planning team were present to speak with residents and answer questions about the process and their risk. Hazus-MH work stations were set up, allowing citizens to see information on their property, including exposure and damage estimates for earthquake and flood events. The 20 property owners who elected to receive a risk assessment were provided printouts of this information for their properties. This tool was highly effective in illustrating risk to the public. This Earth Day event was well attended, with thousands in attendance. During this event, the planning team recorded direct contact and discussion regarding the Plan with 50 event attendees. One resident, a local veterinarian, requested additional information to share with her clients which was later provided to her in electronic form by the City.



Figure 3-1. Hazard Mitigation Booth



Figure 3-2. City of Roseville Earth Day Festival

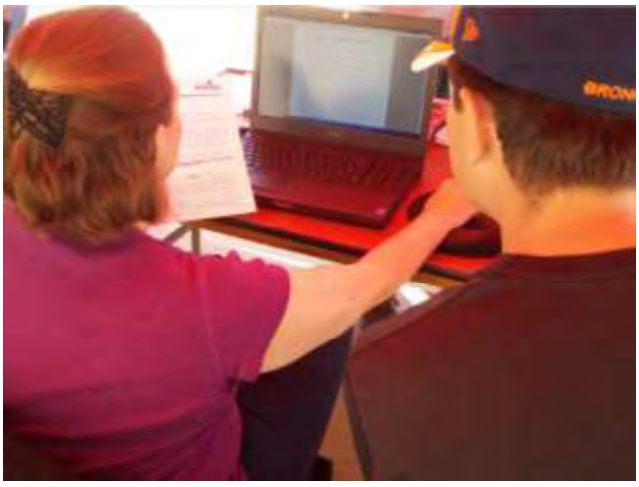


Figure 3-3. Hazus-MH Work Station

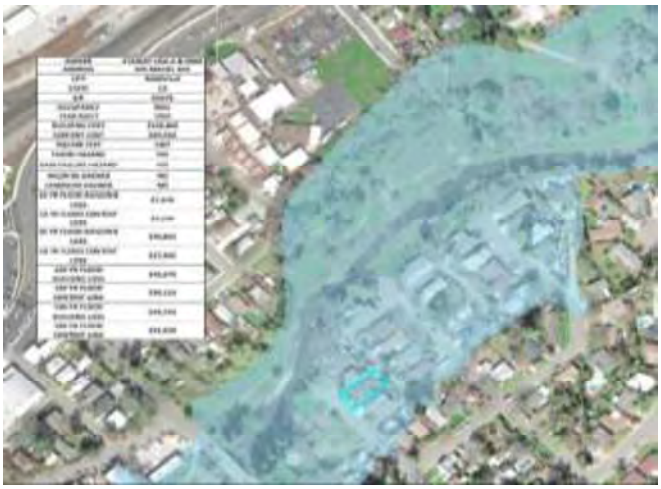


Figure 3-4. Sample Printout from Work Station

Public Comment Period

Once the draft updated Plan was assembled, a comment period for public input was open from August 2, 2016 through August 19, 2016. The public comment period was advertised via the City website, a press-release, and through the use of social media. A public comment link was established on the City's Hazard Mitigation Plan website. During this public comment period, the City received one comment from the public on the Draft Plan regarding the dam failure chapter. This comment requested additional information regarding exposure and vulnerability to the hazard. The City of Roseville decided to address the comment directly with the individual with no change to the plan for dam facility operational security and safety. A copy of the exchange is available upon request.

Use of Media

Press Releases

Press releases were distributed over the course of the 2016 Plan's development as key milestones were achieved and prior to each public meeting.

Social Media

Social media was identified by the Steering Committee as an appropriate method for spreading public messages. The Steering Committee decided to use multiple platforms to reach a variety of audiences:

- Twitter is a messaging platform that allows users to send brief messages to followers (Figure 3-5).
- Facebook is a social network that connects friends, businesses, and governments. The City of Roseville shared messages on its Public Safety Facebook page, allowing other government pages to share (Figure 3-6).
- Nextdoor is a neighborhood social network launched in 2013. On this platform, users must be confirmed members of a community. Once verified, neighbors can receive community updates from local government, share or sell unused goods, or coordinate community events. The City's public information specialists regularly used Nextdoor to engage Roseville's neighborhoods (Figure 3-7).

Internet

The City used its web-based capabilities to keep the public apprised of the plan update process. Upon completion of the initial Plan, a permanent hazard mitigation plan website was established on the Roseville website (see Figure 3-8):

www.roseville.ca.us/HazardPlan

This page can be accessed from the City's home page using the site's search engine. This page housed all pertinent information on the hazard mitigation plan, its progress, and its implementation status. This site has proven to be a highly effective measure for ongoing public access to the Plan. The update scope of work was posted on the website during the update process, along with announcements of all key milestones of the plan update development. Steering Committee meeting announcements, agendas and meeting minutes were also made available on the site. This website also was the principal means of disseminating the survey for the 2016 Plan.

3.3.2 Public Involvement Results

The public involvement strategy used for the plan update introduced the concept of mitigation to the public and provided the Steering Committee with feedback to use in developing the Plan. All citizens of Roseville were provided ample opportunities to provide comment during all phases of this plan update process. Details of attendance and comments received from the public meeting are provided in Appendix A and summarized in Table 3-2. Detailed analysis of the survey findings from the 671 electronically submitted surveys is presented in Appendix A.

Table 3-2. Summary of Public Meetings

Date	Location	Number of Citizens in Attendance	Number of Contacts Made
April 16, 2016	City of Roseville Earth Day	5,000	Over 50
August 2, 2016	Steering Committee Meeting – Public Draft	1	1



Figure 3-5. Twitter Survey Announcement



Figure 3-6. Facebook Survey Announcement

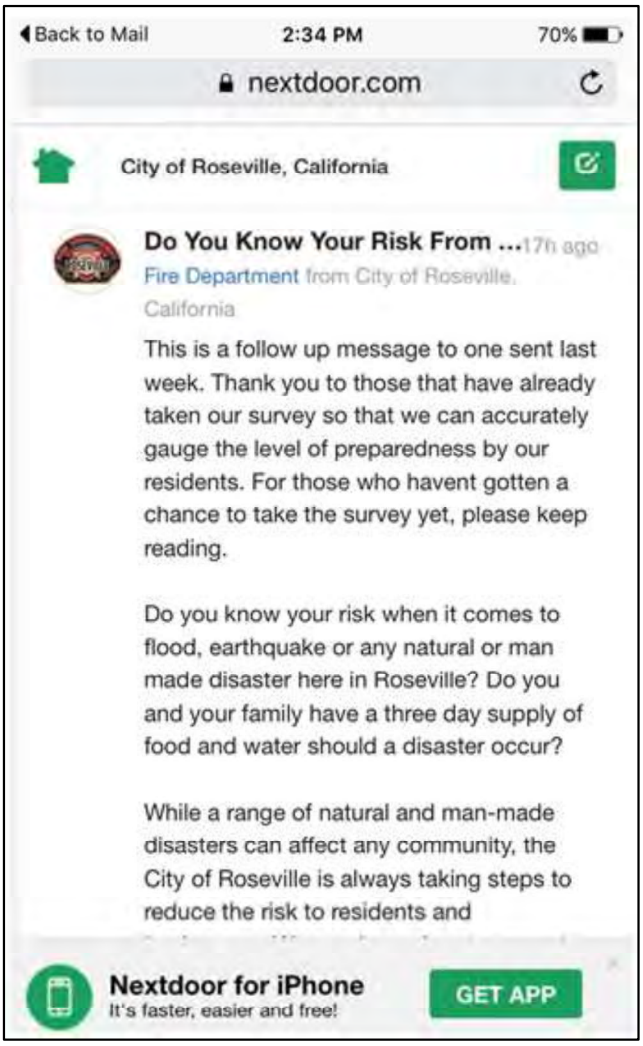


Figure 3-7. Nextdoor Survey Announcement

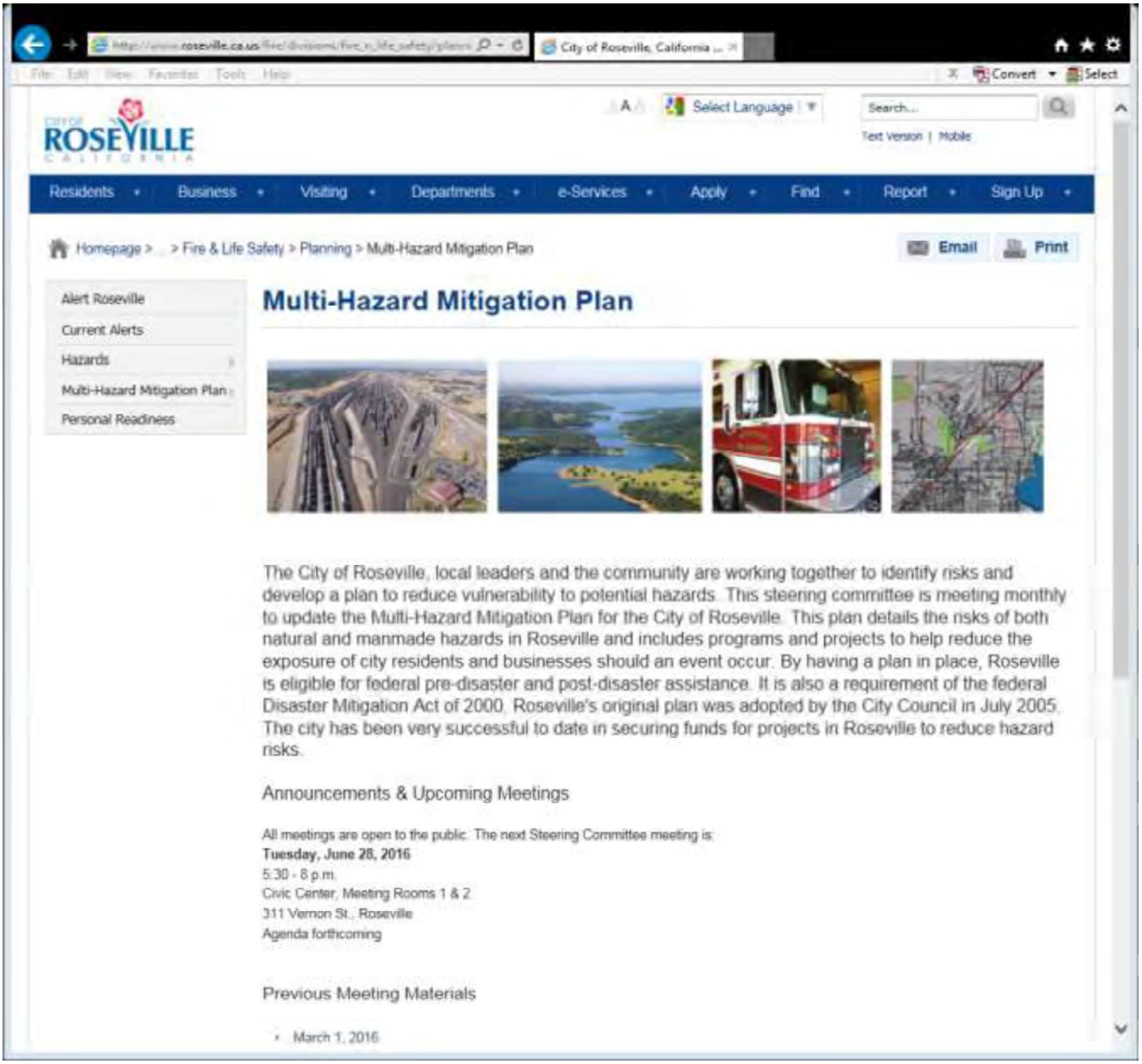


Figure 3-8. Sample Page from Hazard Mitigation Plan Website

3.4 ASSEMBLE THE UPDATED PLAN

The base format of the 2011 Plan was retained for the 2016 Plan. Enhancements were made to include the following components:

- The 2016 update provides a discussion on new mediums used to keep the public apprised of the Plan's actions during the project performance period.
- The 2016 update describes the need for changes to the risk assessment and what changes were made in comparison to the previous plan update.
- The update describes changes to risk exposure due to either of the following:

  - Successful mitigation projects
  - Changes in land use due to annexation or new development.

- The 2016 update describes changes to the action plan and the reasons for them.
- The 2016 update identifies completed, deleted, or deferred actions or activities from the previously approved plan as a benchmark for progress.
- The 2016 Plan includes in its evaluation and prioritization new mitigation actions identified since the previous plan update.
- To be compliant with California Senate Bill 379, the 2016 hazard mitigation plan includes linkage with the City's General Plan. The bill requires the update to include a set of goals, policies, and objectives based on a vulnerability assessment, identification of the risks that climate change poses to the local jurisdiction and the geographic areas at risk from climate change impacts, and specified information from federal, state, regional, and local agencies.

3.5 PLAN DEVELOPMENT CHRONOLOGY/MILESTONES

Table 3-3 summarizes important milestones in the plan update process.

Table 3-3. Plan Development Chronology/Milestones

Date	Event	Description	Attendance
2014			
9/23	CRS re-verification visit	City undergoes its re-verification visit as the nation's only CRS Class 1 community. The Class 1 is re-verified by this process.	N/A
2015			
10/18	Selection of Tetra Tech as plan facilitation consultant through sole source contract	Technical assistance secured	N/A
11/3	1st Steering Committee meeting	Reconfirm Steering Committee organization/ground rules Review the plan update work plan Risk assessment update Review progress reports and state plan	13
11/30	2nd Steering Committee meeting	Progress Report Recommendations Hazards of Concern Confirmation Guiding Principle/Vision/Mission Statement Confirm Goals and Objectives Public Involvement Strategy	14
2016			
1/5	3rd Steering Committee Meeting	Risk Assessment Update Public Involvement Strategy Critical Facilities Definition General Plan Update Emergency Operations Plan Review Debris Management Plan	17
2/2	4th Steering Committee Meeting	Risk Assessment Update Public Involvement Strategy, Survey Finalization Public Involvement, PPI Alternatives Analysis	15
2/8	Survey Deployment	The public survey was deployed via multiple platforms including City websites, Facebook, Nextdoor, Twitter, and public announcement.	N/A
3/1	5th Steering Committee meeting	Risk assessment update Public Involvement Strategy Update, Public Meeting (Strengths, weaknesses, obstacles and opportunities)	16
4/16	Public information open house—Roseville Earth Day	Public open house held at the Roseville Earth Day Festival at Mahany Park outside of the Roseville Utility Exploration Center, 1501 Pleasant Grove Boulevard, Roseville from 10:00 AM to 4:00 PM. Risk assessment data shared with the public as well as distribution of hazard specific information.	50
8/2	6th Steering Committee meeting/Public Review Meeting	Review the public draft and launch the public comment period for the 2016 Plan	13
8/19	Public Comment Period Ends	Draft Plan posted on Hazard Mitigation Plan website. Press release advertising public comment period	N/A
9/01	Plan review	Plan sent to Cal OES and ISO for review and approval pending adoption (APA)	N/A
TBD	Final public meeting and Plan adoption	APA Plan presented to City Council for adoption. The public was provided opportunity to provide comment prior to formal adoption.	##
TBD	CRS approval	Plan was approved by ISO for CRS credit at ___ points	N/A
TBD	Final approval	FEMA granted final approval of the adopted plan	N/A

4. CITY OF ROSEVILLE PROFILE

4.1 GEOGRAPHIC PROFILE

The City of Roseville lies to the west of the foothills of the Sierra Nevada Range, about 16 miles northeast of downtown Sacramento. It is the largest city in Placer County and has experienced considerable residential and commercial growth in the past two decades.

The focus of this Hazard Mitigation Plan is the primary planning area defined in the *City of Roseville General Plan 2035*. The planning area includes 43.39 square miles of incorporated lands and an additional 796 acres making up the City's sphere of influence, as shown in Figure 4-1. It is divided into smaller areas called "Specific Plan Areas" for which more detailed individual plans have been developed to implement the General Plan. The City of Roseville is unusual in that 14 specific plans have been adopted. These Plan Areas contain detailed design guidelines and development agreements to guide development and ensure that development is funded and built as planned.

Roseville is largely urbanized. The greatest area of undeveloped property is in the western portion of the City, which includes the remainder of the developing West Roseville Specific Plan, as well as planned specific Plan Areas including Sierra Vista, Creekview and Amoruso Ranch. The incorporated area and sphere of influence are the primary focus of General Plan policies, but "secondary planning areas" also bear relationship to Roseville planning efforts, depending on the planning issue. For example:

- For the issue of air quality, the secondary planning area includes the City and all areas outside the City that are within the associated Sacramento Valley air basin.
- For flood protection, the secondary planning area encompasses the complete drainage basins of surface waters that flow through Roseville.
- Other secondary planning areas encompass varying boundaries beyond the primary planning area for issues such as solid waste, recycling, transportation and wastewater treatment.

The City's area is characterized by gently sloping terrain with areas of steep ravines in the northeast, and relatively flat valley on the western portion of the City. It is segmented by topographical and physical features, including streams, natural parkways, open space, Interstate 80 and Highway 65, the Union Pacific railroad, and industrial facilities. Traffic is directed around several of these topographical features by bridges and an underpass. These limitations may create traffic congestion and delay emergency response. Heavy traffic congestion at peak commute times on the City's major roadways acts as a barrier to timely response for emergency services. In the event of an accident or other emergency at one of the key intersections between a road and a stream, freeway, or railway, sections of the City could be isolated or have response time slowed.

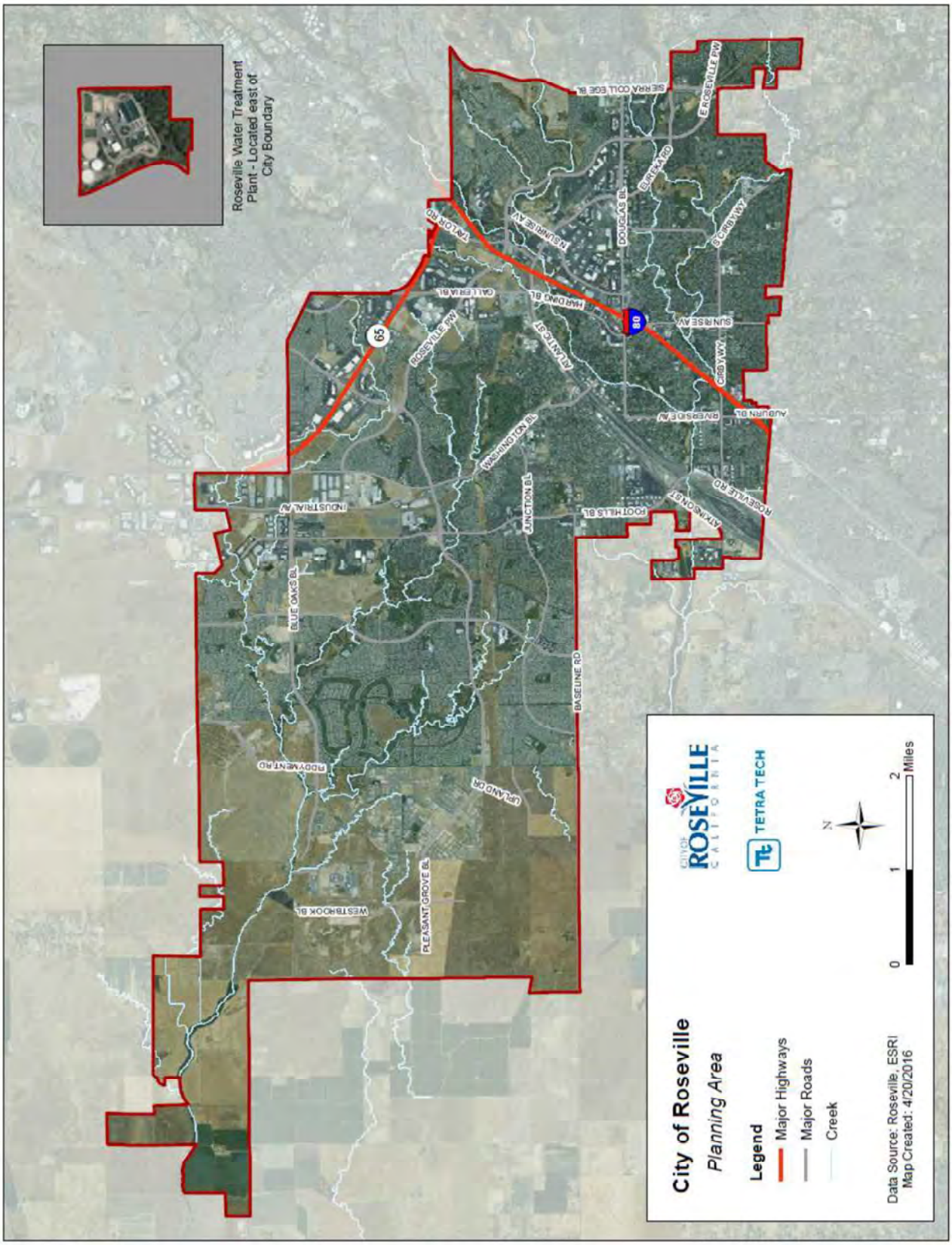


Figure 4-1. Roseville Planning Area

4.2 HISTORICAL OVERVIEW

4.2.1 Pre-Development

The Placer County region was first inhabited by the Maidu Indians, whose territory extended from the Sacramento River Valley to the Sierra Nevada Range. The Southern Maidu occupied the American River basin, along with the Bear and Yuba River basins in the area now recognized as the City of Roseville. An abundance of plants and animals supported the Maidu tribes' large population. Evidence of the Maidu communities still exists along the banks of Strap Ravine and Dry Creek.

4.2.2 Founding of the Community

Fur trapping expeditions came to the area in the early 1800s, and James Marshall discovered gold in the region in 1848. Some of the miners who came in search of gold became the area's first pioneers, taking up farming along the fertile creeks. Eventually, disease, gold miners and early settlers killed or forcibly removed the Maidu from their traditional lands. By 1864, track-laying crews from the Central Pacific Railroad had pushed eastward from Sacramento building the western half of the nation's first transcontinental railroad line. At the site of today's Roseville, the rails of the Central Pacific intersected with those of the California Central, a small line which then linked the towns of Folsom and Lincoln. The place where the two lines joined was labeled on railroad maps as "The Junction." The small freight and passenger center called Roseville developed around the junction.

For many years, Roseville remained a small railroad shipping point of about 250 inhabitants, centered on the train depot and a few small businesses and houses lining the two principal streets, Atlantic and Pacific. This changed between 1906 and 1908, when railroad roundhouse and repair facilities were moved to Roseville from nearby Rocklin. By 1908, the population increased to 2,000. New subdivisions were laid out to accommodate newcomers, many of whom moved from Rocklin. The business district expanded along Lincoln, Main, Church, and Vernon Streets. A chamber of commerce was organized to provide municipal services such as water, electricity, police and fire protection. In April 1909, the town incorporated and began to grow until it became Placer County's largest city.

4.2.3 Post-Incorporation Development

Railroad expansion continued, and local businesses grew as well. In the 1920s, the Pacific Fruit Express ice plant was the world's largest artificial ice plant. Also by the 1920s, the Southern Pacific Railroad boasted the largest freight marshaling yards west of the Mississippi River at Roseville. By the start of the Great Depression in 1929, Roseville's population had risen to 6,425.

During World War II, thousands of troop and munitions trains made their way through Roseville. The City continued to boom as a railroad center into the post-war years, but by the 1950s it faced competition from airlines and interstate trucking. The introduction of jet aircraft and the construction of Interstate 80 through Roseville caused the once-booming passenger train service to decline abruptly. The local depot was closed in 1972 and razed the following year. The Pacific Fruit Express ice plant closed in 1974, rendered obsolete by the introduction of self-refrigerating shipping options.

Completion of Roseville Community Hospital in 1952, the Folsom Dam in 1955, and the Roseville Freeway (Interstate 80) in 1956 gradually shifted the population away from downtown Roseville to what would become known as East Roseville. Roseville Square, the town's first shopping complex, was completed in 1961. Today, Roseville has more than 28 million square feet of commercial, office, and industrial floor space, and is ranked 10th statewide in total taxable retail sales.

In 1964, Roseville was selected as one of Look magazine's All America Cities. Roseville experienced a population surge in the 1980s as developers built up its broad expanses of cheap open land with easy transportation access. As the population expanded, so did the need for water, electrical, sewage, police, fire protection, recreational and educational services.

4.2.4 Current Conditions

The City has continued to grow outward. An expansive industrial zone lies north of Roseville adjacent to Highway 65, along with numerous corporate headquarters along Douglas Boulevard and the Johnson Ranch Road area. Although Roseville is no longer just a railroad town, the railroad remains a major factor in the local economy, and Roseville is still one of the principal railroad centers of the West. Passenger service was reintroduced in 1987 and a new intermodal depot facility was completed.

Today Roseville is an emerging urban center with a mix of residential and employment uses. The center of the City is typified by the downtown and small lot, single-family residences, while newer commercial and office development and larger suburban-type residences characterize the edges of town. As of January 2016, the California Department of Finance estimated the City's population to be 134,073—a 61-percent increase since 2000. It is anticipated that Roseville, along with the remainder of the South Placer/Sacramento Region, will continue to be the focus of significant development. Currently, the focus of new development is along the eastern, western, and northern portions of the community.

4.3 MAJOR PAST HAZARD EVENTS

Presidential disaster declarations are typically issued for hazard events that cause more damage than state and local governments can handle without assistance from the federal government, although no specific dollar loss threshold has been established for these declarations. A presidential disaster declaration puts federal recovery programs into motion to help disaster victims, businesses and public entities. Some of the programs are matched by state programs. Table 4-1 lists the presidential major disasters and other federal declarations since 1950 that have affected Placer County, according to Placer County's Multi-Hazard Mitigation Plan, Cal OES, and FEMA.

Review of these events helps identify targets for risk reduction and ways to increase a community's capability to avoid large-scale events in the future. Many natural hazard events do not trigger federal disaster declaration protocol but have significant impacts on their communities. These events are also important to consider in establishing recurrence intervals for hazards of concern.

4.4 PHYSICAL SETTING

4.4.1 Geology

Roseville is within the Great Valley and Sierra Nevada geomorphic provinces of California. Located on the east side of the Sacramento Valley, Roseville's geology consists of water deposited (alluvial) sediments from the erosion of the Sierra Nevada mountain range.

4.4.2 Soils

Soils in Roseville include some Quaternary (less than 1.8 million years old) sands, sandstones and mudstones, some Upper Tertiary (1.8 to 24 million years old) sandstones, mudstones and limestone, some Lower Tertiary (24 to 64 million years old) mudstones and sandstones, and Franciscan melange and serpentinite. These soils tends to be very dense or in some areas, soft rock. Some Quaternary muds, sands, gravels, silts and mud are located along 100-year floodplains. Soils in Roseville also include mehrten lava flow, which restricts permeability.

Table 4-1. Presidential Major Disaster, Emergency, and Fire Management Assistance Declarations

Type of Event	FEMA Disaster #	Date
Flooding	DR-47	12/23/1955
Flooding	DR-82	4/4/1958
Flooding	DR-138	10/24/1962
Late Winter Storms/Flooding	DR-145	2/7/1963
Late Winter Storms/Flooding	DR-183	12/28/1964
1969 Storms	DR-253	1/26/1969
Winter storms	DR-682	2/9/1983
Spring Storms/Flooding	DR-758	2/18/1986
Severe Winter Storms	DR-1044	1/10/1995
Late Winter Storms	DR-1046	1/13/1995
Winter Storms/Flooding	DR-1155	1/4/1997
Sierra Fire	FM-2463	9/19/2002
Stevens Fire	FM-2541	8/8/2004
Hurricane Katrina Evacuations: Economic	EM-3248	9/13/2005
Severe Rainstorms, Flooding, Landslides, and Mudslides	DR-1628	2/3/2006
Severe Storms, Flooding, Landslides, and Mudslides	DR-1646	6/5/2006
Wildfire	FM-2786	9/1/2008
Wildfire	FM-2832	8/31/2009

Source: FEMA, Placer County Multi-Hazard Mitigation Plan, 2016

4.4.3 Climate

Roseville and the northern Central Valley have a Mediterranean climate with warm, dry days and cool nights during the summer, when the average temperature is 93ºF during the day and 57ºF at night. In 2001, the California Energy Commission developed climate zones based on energy use, temperature, and other factors and created representative temperature data for each zone. Roseville is located in Zone 11: Red Bluff. As a whole, Zone 11 experiences sharply defined seasons with summers consisting of almost constant sunshine and dry air and winters with piercing winds and thick ground fog.

Table 4-2 presents a summary of annual climate conditions. Precipitation from May through October is rare, with most of the rainfall in the Greater Sacramento area, including Roseville, occurring between November and April. Prevailing winds in the summer can be light to gusty from the south. In the late summer and early fall, several wind events typically occur, with northerly winds that cause critical fire weather conditions in the City and surrounding areas.

4.5 DEVELOPMENT PROFILE

4.5.1 Land Use Policies

In addition to a considerable jump in residential growth, Roseville has experienced considerable growth in commercial and industrial development. Based on growth projections and current land use allocations in the General Plan, the City has sufficient development potential through 2035 for both residential and commercial uses. Typically residential land uses will be built out well before complete buildout of nonresidential land could occur, anticipated after 2050.

Table 4-2. Roseville Climate

	Average High Temperature (°F)	Average Low Temperature (°F)	Record High Temperature (°F)	Record Low Temperature (°F)	Total Inches of Precipitation
January	54	39	73	17	4.5
February	61	42	78	19	4.5
March	65	45	86	26	4.3
April	72	47	106	60	1.8
May	80	52	112	35	0.5
June	89	57	115	43	0.3
July	95	61	115	50	0.1
August	94	60	114	45	0.1
September	89	58	108	46	0.5
October	79	53	102	32	1.3
November	64	45	86	26	3.5
December	55	39	74	16	3.4
Annual Average or Total	**77**	**51**	**100**	**36**	**24.8**

Source: The Weather Channel

Numerous factors will influence growth throughout the South Placer County/Sacramento region:

- General economic conditions of the state
- Federal and state budget issues and cutbacks
- Competition from other growth areas
- Perceptions about the quality of life
- Housing costs and availability
- Employment opportunities
- Infrastructure and resource availability.

Management of the City's growth is guided by the Land Use Element of Roseville's General Plan, which consists of a land use map and land use policies. The overall goal of the Land Use Element is to promote a balanced and innovative land use pattern that retains and enhances the distinct character and identity of Roseville. It is organized into the following six components:

- **Existing Conditions and Projections—**Provides a description of the planning area, an existing land use inventory, and future projections.
- **Land Use Designations, Definitions and Standards—**Identifies and defines the City's land use categories, incorporating general use, development, intensity, siting, and compatibility standards.
- **Community Form—**Provides goals and policies to define and direct the future form and pattern of the City. Issues addressed include community character; relationship to transit and pedestrian uses; air quality; downtown and neighborhoods; jobs and housing; economic development; community involvement; and inter-jurisdictional coordination.
- **Community Design—**Includes goals and policies that address aesthetics and function; the integration of the built and natural environment; and community character. Emphasis is on the development of a design framework that reflects the City's goal of high quality, community-wide design.
- **Growth Management—**Focuses on the proactive management of growth in the community. Included is the identification of performance standards to regulate potential future growth areas. Policies addressing annexations and expansion of the City's sphere of influence are also included.

- **Relationship to Specific Plans—**Discusses the interrelationship between the General Plan and the City's Specific Plans.

The land use map included in the Land Use Element generally shows the City's existing and planned land use mix and pattern. The total land use allocation at buildout is shown in Figure 4-2. The land use map reflects only those policies that can be graphically shown. Land use decision-making is guided not only by the land use map but also by the goals, policies and implementation measures in the Land Use Element.

Source: City of Roseville, General Plan, 2015

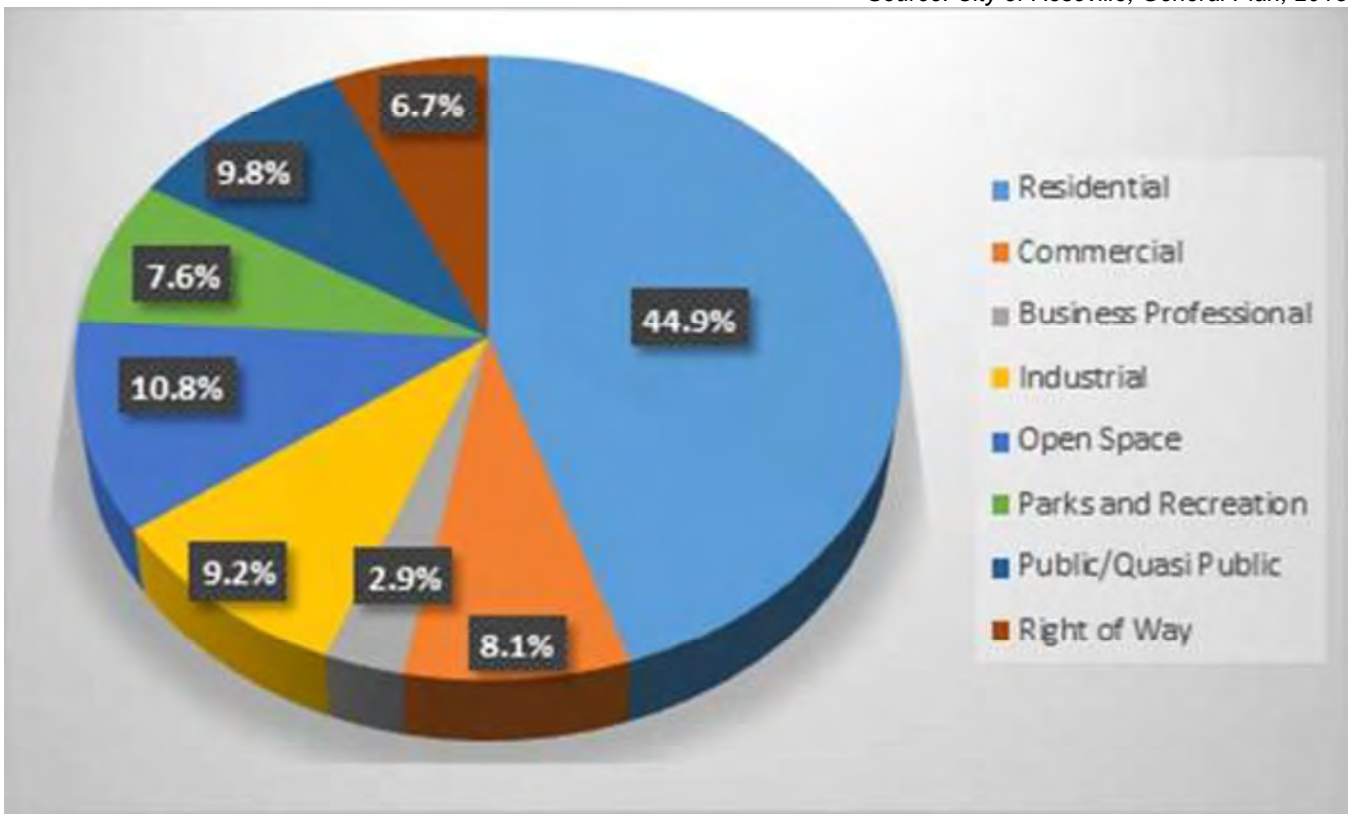


Figure 4-2. Total Land Use Allocation in Roseville

The City's land use policies are built upon underlying principles that were established based on input the City received from its residents and the Growth Management Committee established in 2005. These principles have impacted the overall policy direction and land use pattern in the City of Roseville. They include the following:

- Promote and enhance Roseville's unique character and identity.
- Distinguish Roseville from adjacent communities through the quality of development and design, and the level of public services and facilities provided.
- Protect and enhance Old Town/ Downtown and the City's established neighborhoods.
- Promote new development as an integrated and connected part of the City's land use pattern.
- Provide a variety of housing types and opportunities, including those for all income groups.
- Create a balanced land use pattern with an appropriate mix of uses to accommodate resident employment, service, and social needs within the community.
- Promote a land use pattern that provides a high level of open space and recreational amenities and is sensitive to the natural environment.

- Create a land use mix and pattern that accommodates and promotes alternative transportation modes for ease of access and improved air quality.
- Proactively manage and plan for growth.
- Ensure that new development is fiscally neutral, and does not impact existing residents.

State, regional and local growth projections indicate that Roseville and the South Placer County/Sacramento region will continue to draw residential and employment growth. Much of this attraction can be attributed to desirable location and access, availability of an educated and skilled workforce, land costs and overall quality of life. Local and regional economic conditions will drive the local growth potential, and existing land use allocations may require modification in the near future.

4.5.2 Residential Development

The Land Use Element of the General Plan identifies three primary residential land uses:

- **Low-Density Residential—**The low-density residential land use category is for development of the single-family dwelling units that make up the majority of Roseville's housing supply. The lower densities are assigned to lands that require flexibility to accommodate development constraints (e.g., slopes, trees, etc.). Typically, low-density residential lands should require minimal grading or disturbance of natural features.
- **Medium-Density Residential—**The medium-density residential land use category is for small-lot single-family detached dwelling units and attached patio homes, half-plexes, townhouses, condominiums, and mobile home parks. This residential land use accommodates a variety of housing types and designs, and is often used as a transition or buffer between higher intensity land uses and low-density residential land use. It may also be applied as a transition between higher volume roadways and lower density residential uses.
- **High-Density Residential—**The high-density residential land use category is normally developed with multiple-story apartment or condominium structures containing multiple attached dwelling units. The broad range of densities in this category yields a variety of design options. In some areas, this land use category may be combined with commercial uses to form a mixed-use development where higher densities are desirable and beneficial.

According to the State Department of Finance, there are 51,590 housing units in the City. Single-family detached homes made up over 75 percent of the housing stock as of January 2016. Multi-family homes made up 24 percent, and mobile homes accounted for less than 1 percent. Residential construction valuation reached $208,581,000 in 2015. The Building Division reported that $19,111,000 in new construction was completed during the 2015 – 2016 fiscal year. The Placer County Association of Realtors provided statistics indicating that the median purchase price of single-family houses and condominiums in Roseville rose approximately 9 percent between May 2015 and May 2016, from $391,500 to $425,000 and $168,500 to $178,300, respectively. As indicated by the increase in housing prices, the demand for single-family homes continues and available land for single-family homes is ample.

4.5.3 Non-Residential Development

Roseville's non-residential land use designations include areas designated for commercial, office, industrial uses, special areas, and combining districts. Special designations include Central Business District, Public and Quasi-Public uses, Parks and Recreation, Open Space, and Urban Reserve. Like the residential designations, each non-residential designation includes a purpose statement, primary and secondary uses, and development standards, including a floor area ratio. Unlike the specific secondary uses listed for residential designations, which are intended to be subordinate and may be permitted only to support neighborhood convenience, the non-residential land use designations permit secondary land uses that are supportive and complementary of the primary uses, not

necessarily subordinate. Typically, the size of secondary uses is limited and therefore does not warrant a separate land use designation. Table 4-3 summarizes the non-residential land uses. A summary of non-residential development in Roseville is given in Table 4-4.

Table 4-3. Non-Residential Land Uses

Land Use	Purpose
Neighborhood Commercial	The neighborhood commercial land use designation is intended to provide basic commercial services for the convenience of surrounding neighborhoods within walking distance of major residential areas.
Community Commercial	The community commercial land use designation is distinguished from the neighborhood commercial designation by providing a broader range of goods and services to an expanded service area.
Regional Commercial	The regional commercial land use designation is intended to accommodate larger shopping centers and commercial activities where uses provide goods and services to a citywide and regional service area.
Business Professional	The business professional land use designation provides areas for small and large office uses, including uses supportive of offices.
Light Industrial	The light industrial land use designation is applied to lands reserved for office, industrial, and research and development uses that generate very limited noise, vibration, odor, dust, smoke, light, or other pollutants, and are either integrated or compatible with surrounding uses.
General Industrial	The general industrial land use designation is intended to provide areas for industrial uses that tend to generate noise, vibration, odor, dust, smoke, light, and an aesthetic appearance not compatible with residential and other sensitive receptors. The intent of this category is to provide a place for industrial uses within the City that is properly buffered from other uses.
Central Business District	The Central Business District is a distinct land use category that acknowledges land use patterns of significantly greater intensities and traditional mixed uses of retail, office, and apartment. The district is limited in its application to Central Roseville, the West Roseville Village Center, and areas of greater urban intensity.
Open Space	The open space land use designation is used to preserve and protect public and private lands that are significant due to wildlife habitat, natural features, or flood hazard. Within new development areas, the 100-year floodplain boundaries will be designated as Open Space. In addition, sensitive or unique natural features, including, but not limited to, wetlands, vernal pools, and oak woodlands, are to be designated as open space as part of specific plans and other major development review processes.
Public/Quasi-Public	The public/quasi-public land use designation is used to establish areas for education, religious assembly, governmental offices, municipal corporation yards, and water treatment plants.
Urban Reserve	The urban reserve land use designation is applied to lands that are anticipated to receive urban land entitlements, but at the present time are constrained by growth management policies, availability of services or other limitations.
Park/ Recreation	The park and recreation designation is used to identify public parks in Roseville
Floodplain	The floodplain designation identifies lands that are within the 100-year floodplain boundaries as defined in the Safety Element of the General Plan. Development of lands with a floodplain land use designation is strictly regulated by the City of Roseville. In areas with existing development, the floodplain designation is an overlay or combining land use. As part of a specific plan, the land use designation may be combined with an open space or parks designation, if found consistent with the policies of the Safety Element.
Study Area	The study area land use designation is used as a combining land use to identify future General Plan or neighborhood study areas. This combining designation may be applied to any area where the City believes that additional land use analysis and amendment of the General Plan may be desirable to resolve specific neighborhood or land use issues.
Village Center	The Village Center land use designation is intended allow for a mix and density of land uses common to a traditional downtown, urban setting. It allows for flexibility and deviation from the standards and permitted uses contained in the primary land use designation for which it is combined.
Transfer Station	The transfer station land use designation is intended to preserve and protect industrial areas suitable for a solid waste transfer station.

Table 4-4. Non-Residential Development Profile as of July 2016

Activity/Use	Total Developed Building Area (square feet)	Total Area Zoned for Use (acres)
Commercial	11,249,499	2,249
Office	8,080,479	802.69
Industrial	8,997,392	2,369
Public/Quasi Public	2,037,310	2,702

4.5.4 Critical Facilities and Infrastructure

Critical and essential facilities and infrastructure are those that are critical to the health and welfare of the population. These become especially important after a hazard event. The Steering Committee created the following definition specific to Roseville, regarding which facilities are considered critical:

> *A structure or other improvement, public or private, that, because of its function, size, service area, or uniqueness, has the potential to cause serious bodily harm, extensive property damage, or disruption of vital socioeconomic activities if it is destroyed or damaged or if its functionality is impaired. Critical facilities may include, but are not limited to, health and safety facilities, utilities, government facilities, hazardous materials facilities, and transportation infrastructure.*

The location of critical facilities and infrastructure in the planning area is shown on Figure 4-3 through Figure 4-5. Due to the sensitivity of this information, a detailed list of facilities is not provided. The list is on file with the City of Roseville. Table 4-5 and Table 4-6 provide summaries of the general types of critical facilities and infrastructure, respectively.

Table 4-5. Planning Area Critical Facilities

Facility Type	Number in Planning Area
Medical and Health	2
Government Functions	27
Protective Functions	10
Schools	49
Hazmat	6
Other Critical Functions	78
Total	**172**

Table 4-6. Planning Area Critical Infrastructure

Facility Type	Number in Planning Area
Bridges	68
Water Supply	11
Wastewater	23
Power	18
Communications	98
Other	6
Total	**224**

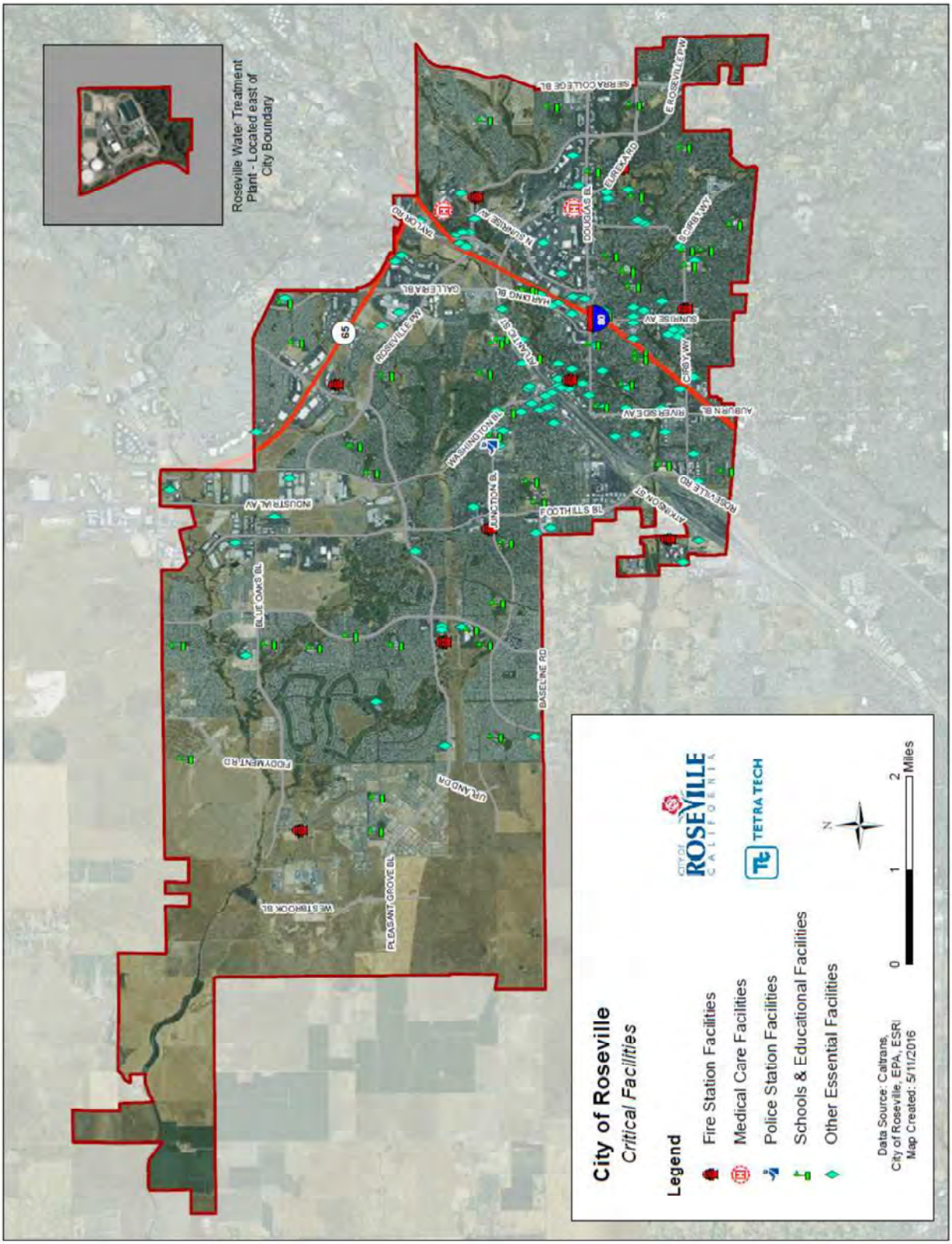


Figure 4-3. Critical Facilities in the Planning Area

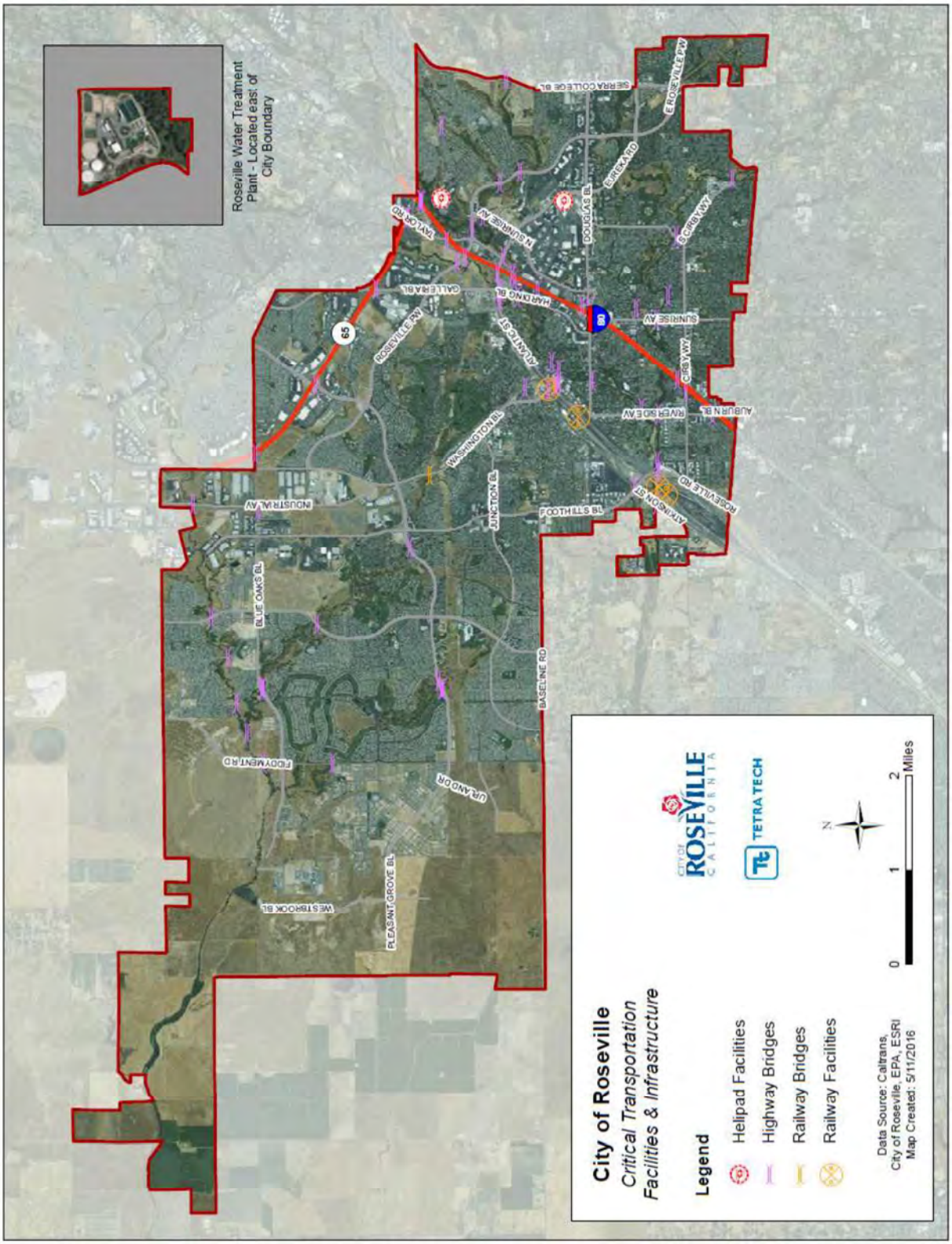


Figure 4-4. Critical Infrastructure in the Planning Area—Transportation

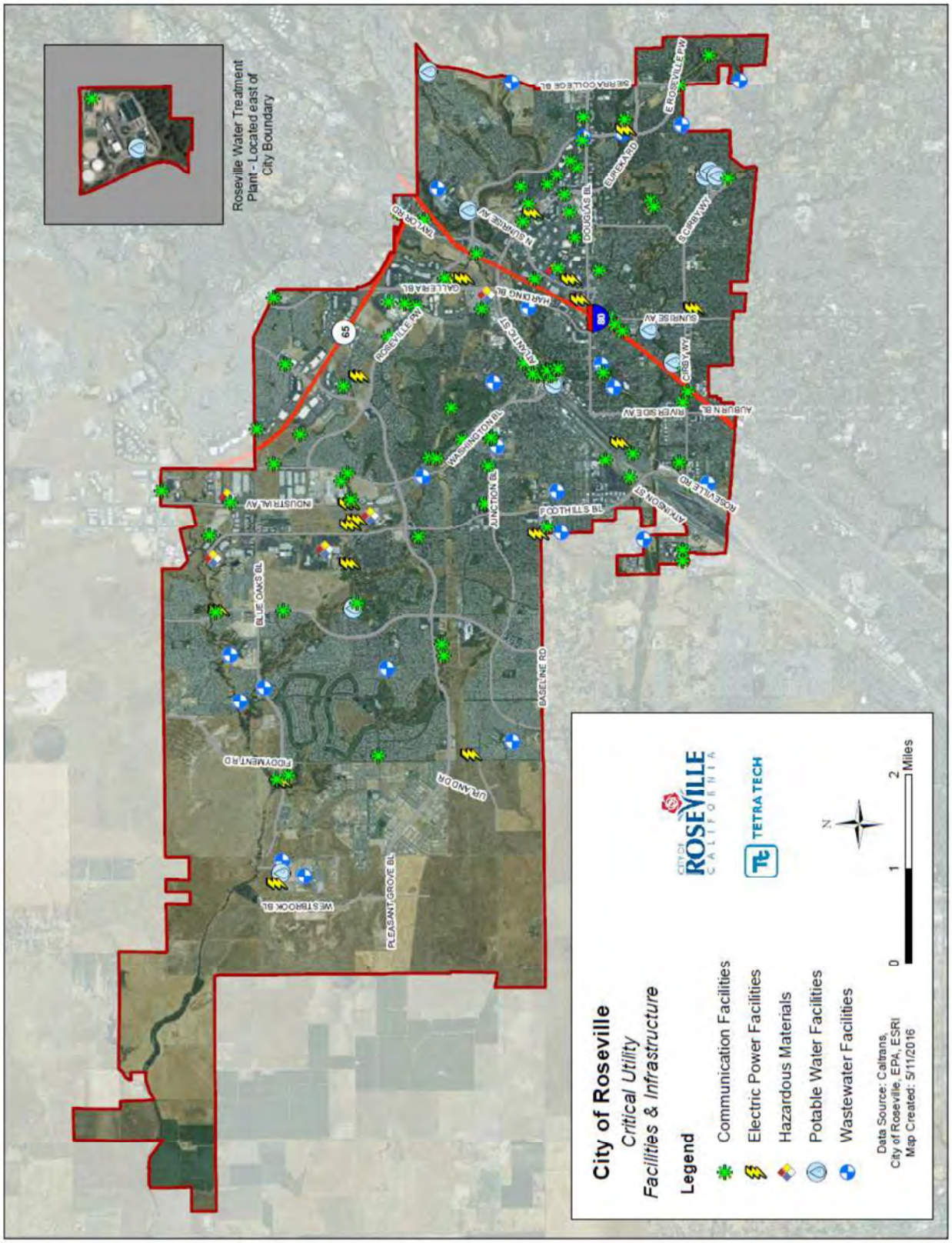


Figure 4-5. Critical Infrastructure in the Planning Area—Utilities

4.5.5 Future Trends in Development

The Roseville General Plan and associated specific area plans govern land use decision and policy-making. Decisions on land use will be governed by these programs. This Plan will work together with these programs to support wise land use in the future by providing vital information on the risk associated with natural hazards in the planning area. The City of Roseville will incorporate by reference the updated Hazard Mitigation Plan in the Safety Element of its General Plan. In addition to proactively planning for the implementation of Senate Bill (SB) 379 upon the next plan update process (see Section 4.9 for a discussion of this state law), this incorporation will ensure that all future trends in development can be established with the benefits of the information on risk and vulnerability to natural hazards identified in this Plan.

4.6 OPEN SPACE AND HABITAT

The City recognizes that open space land is limited and that valuable resources must be conserved wherever possible. For many, the City's open space setting is a highly valued natural resource. Given the strong interrelationship between open space and conservation issues, the City of Roseville has chosen to address these issues in a single element of its General Plan: the Open Space and Conservation Element. Vegetation and wildlife resources and corridors are an important component of the overall open space system and have been the historical focus of preservation efforts in Roseville. If future generations are to enjoy and benefit from the resources available to the present generation, these finite and fragile resources must be preserved and managed.

The vegetation and wildlife resources of Roseville can be broadly classified by habitat type—grasslands, oak woodlands, riparian areas, and seasonal wetlands—as discussed below. Whenever possible, the focus of preservation efforts is multipurpose. It is therefore preferred, for example, to preserve woodlands, grasslands, and wetlands in combined rather than separate and unconnected settings.

4.6.1 Grasslands

Relatively small amounts of self-sustaining grasslands remain in the northern and western undeveloped edges of Roseville. Less extensive areas of grassland are present in smaller undeveloped areas scattered throughout the City. Before Spanish and later settlers arrived in the Central Valley, the grasslands contained native species. The effects of grazing and clearing of large tracts for agriculture resulted in the decline of native species. Today, most of the grasslands in the region contain non-native species. These areas do, however, provide important habitat for birds and other wildlife.

4.6.2 Oak Woodlands and Riparian Areas

Oak woodlands are generally present near the City's major stream channels. The microclimates and alluvial soils in the woodlands provide ideal conditions for deep-rooting shrubs and trees. Most woodland areas are relatively open, with little shrub growth.

Riparian areas support a much wider biological diversity. Situated along and within the City's creeks and watercourses, riparian corridors are a source of food and water and provide cover, nesting sites, and migration and dispersal corridors for wildlife. Riparian areas are also important in flood protection and improve air and water quality through natural filtering.

Oak woodland and riparian areas are City resources not only because of the diversity of species they support but also because they provide natural open space and aesthetic value. The City's creek systems are described in detail in the groundwater recharge and water quality component of the Open Space and Conservation Element. The City regulates the protection of native oak trees through the Tree Preservation Ordinance, which includes standards that limit disturbance within protected zones of oaks and emphasizes avoidance of tree removal. Where avoidance

is not feasible and tree removal is authorized by the City, mitigation is required on an inch-for-inch basis. The Tree Preservation Ordinance is a valuable tool in protecting Roseville's oak trees and habitats. A creek and riparian management and restoration plan is being developed that will provide standards for riparian area management and enhancement. Additionally, the City maintains an overarching management plan for upholding the City's requirements in maintaining open space.

4.6.3 Seasonal Wetlands

Many of the wetland areas in Roseville are seasonal and therefore receive, retain, and transport water only during the wet season. Wetlands are subject to the regulations of the U.S. Army Corps of Engineers under the provisions of Section 404 of the Clean Water Act. Two primary types of seasonal wetlands are present in the City: intermittent drainage and vernal pool wetlands.

Intermittent drainage wetlands typically consist of channels 1 to 10 feet wide that flow over a variety of substrata. Most are wet only during winter and transport runoff. They are typically dry during summer, with scattered ponds, but they may contain water from adjacent urban runoff.

Vernal pools represent a significant seasonal wetland resource in Roseville. Although relatively abundant in Roseville and the Sacramento/Placer County region, they are considered rare statewide for their limited natural occurrence and distribution and for the unique native plant and animal species they support. Found in valley grassland areas, vernal pools are typically small, shallow, hardpan-floored depressions that fill with water during the winter wet season, gradually drying by late spring or early summer. Several plant species occur only in association with these special habitats, which has triggered concern about their inventory and preservation. Two types of vernal pools are present in the Roseville area:

- Northern volcanic mud flow vernal pools occur in shallow depressions on Mehrten mud flow formations where the slope is generally less than 2 percent.
- Northern hardpan pools generally occur on the Inks or Cometa soil series at the lower basin portions of creek floodplains. During the wet season, the pools provide special habitat for unique plant and animal species whose germination, growth, and reproductive cycles coincide with the availability of collected water. Individual pools vary significantly in the length of time they remain wet and in the diversity of plant species present.

4.6.4 Sensitive Species

The California Department of Fish and Wildlife maintains the California Natural Diversity Data Base, which includes known locations of state and federally listed endangered, rare, and threatened plant and animal species, including species considered by the scientific community to be deserving of such listing.

The sensitive plant species that may be present in Roseville are primarily associated with vernal pool environments and include the following: Bogg's Lakehedge Hyssop (*Gratiola heterosepala*), Dwarf Downingia *(Downingia humilis*), and Vernal Pool Brodiaca (*Dichelostemma lacunavernalis*). Bogg's Lake Hyssop is listed as endangered by the state and California Native Plant Society. Dwarf Downingia and Vernal Pool Brodiaca are both included on the California Native Plant Society "watch list" and have sufficiently limited distribution to warrant continued monitoring. Vernal pools in the City may also contain federally listed, endangered vernal pool tadpole shrimp (*Lepidurus packardi*) and federally listed threatened vernal pool fairy shrimp (*Branchinecta lynchi*).

Anadromous chinook salmon (*Oncorhynchus tshawytscha*) and Central Valley steelhead (*Oncorhynchus mykiss*) are known to be present seasonally in Dry Creek and its upper tributaries. Steelhead is listed by the U.S. Fish and Wildlife Service as a threatened species under the Endangered Species Act. Chinook salmon within the Central Valley Fall/Late Fall Run are listed as a candidate species. In addition to the federal and state classified rare or

endangered wildlife species known to inhabit Roseville, favorable habitats for other listed species are present in the area. Other special status species potentially present in Roseville include Cooper's Hawk, Swainson's Hawk, Valley Elderberry, Longhorn Beetle, Sanford's Arrowhead, and the Northwestern Pond Turtle. Bald eagles have been sighted near Folsom Lake, and the American peregrine falcon is present in the Sacramento Valley. All of these species thrive in the riparian habitats of floodplain environments.

Preservation of habitat for sensitive species benefits from the City of Roseville's Open Space Preserve Overarching Management Plan, as described in Section 4.9.3.

4.7 DEMOGRAPHICS

Some populations are at greater risk from hazard events because of decreased resources or physical abilities. Elderly people, for example, may be more likely to require additional assistance. Research has shown that people living near or below the poverty line, the elderly (especially older single men), individuals with disabilities, individuals with access and functional needs, women, children, ethnic minorities and renters all experience, to some degree, more severe effects from disasters than the general population. These vulnerable populations may vary from the general population in risk perception, living conditions, access to information before, during and after a hazard event, capabilities during an event, and access to resources for post-disaster recovery. Indicators of vulnerability often overlap spatially and often in the geographically most vulnerable locations. Detailed spatial analysis to locate areas where there are higher concentrations of vulnerable community members would help to extend focused public outreach and education to these most vulnerable citizens.

4.7.1 Population Trends

According to the California Department of Finance, Roseville's estimated population for 2015 was 134,073 and the estimated daytime population, which includes those coming into Roseville to work, shop, and do business, was 145,000. Roseville is the 45th largest of California's 482 cities. The City has been striving to accommodate growth while retaining and enhancing its distinct character.

The full-time population increased by 38,223 from 2000 to 2010, a 31.9-percent increase (see Figure 4-6). The 2010 population was more than four times that of 1982, when the City had 26,127 residents. The 2.6-percent growth rate from 2009 to 2010 was comparable to average annual growth rates of the past decade. This rate exceeded annual growth rates for Placer County (1.7 percent) and California (1.0 percent) for the same time period.

Between 2010 and the end of 2015, Roseville experienced an estimated 10.9 percent increase in population—averaging 2.2 percent per year. This trend indicates that the population of Roseville will continue to grow through the end of the decade, albeit more slowly than the population boom experienced between 2000 and 2010.

The average household size in Roseville is 2.61 persons, according to U.S. Census Bureau American Community Survey estimates for 2010-2014. This household average may vary by land use and location in the City. For example, the 3,814 age-restricted low-density residential units in the Del Webb and West Roseville planning areas have an estimated average household size of 1.8.

The General Plan's estimates of when Roseville will achieve buildout (the maximum development allowed by zoning) vary based on the methodology used. Under all scenarios, however, Roseville and the Placer County/Sacramento Metropolitan region are expected to remain attractive to both residential and commercial development. As growth rates continue to climb in the region, the City of Roseville has captured an increasing share of that growth. Considerable recent growth in Roseville is attributed to the annexation of the Sierra Vista Specific Plan Area of 2,064 acres and the Creekview Specific Plan of 500 acres in 2012.

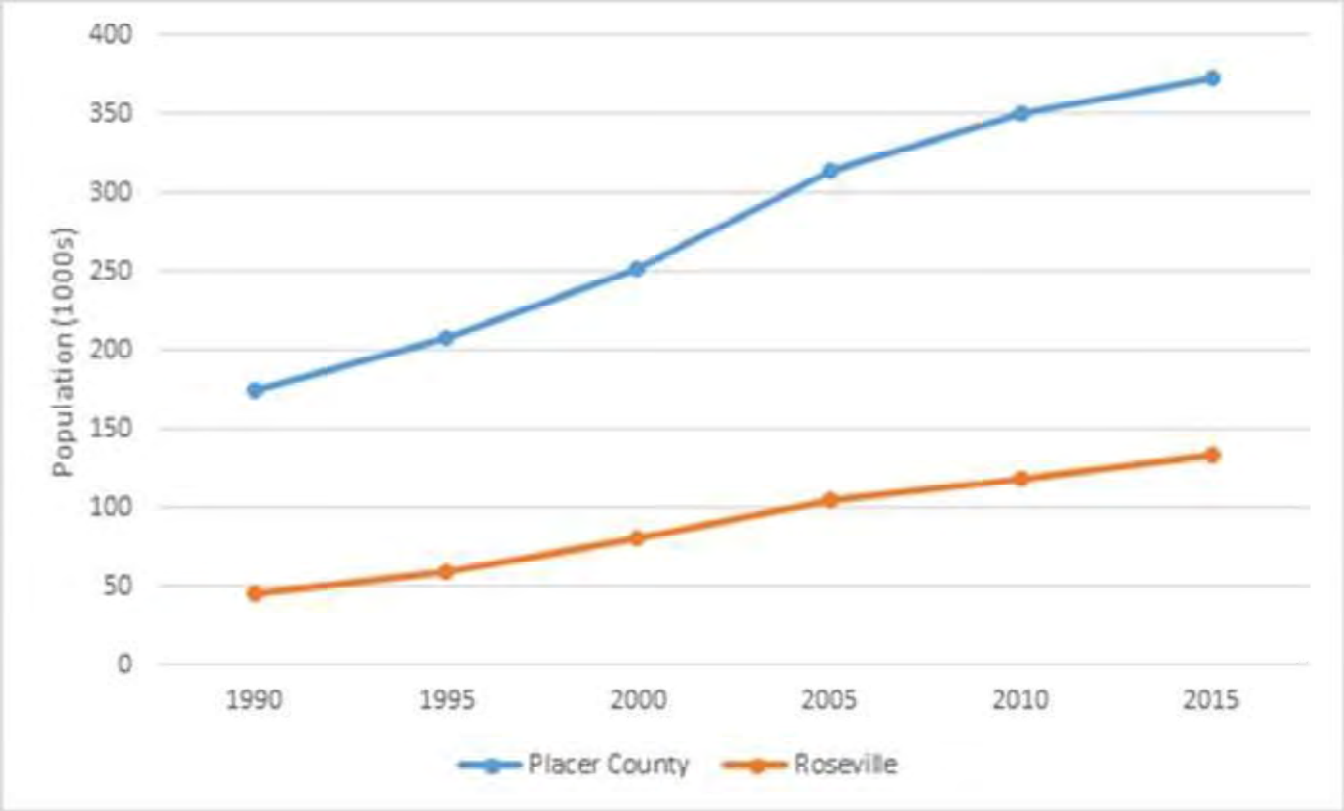


Figure 4-6. Placer County and Roseville Population Growth

Additionally, the City is in the process of annexing the 694-acre Amoruso Ranch Specific Plan, located on the northwest boundary of the City. Through buildout, these western specific Plan Areas are projected to experience the highest increase in population. The overall population, when all residential property is developed, is projected to be over 185,000. Table 4-7 shows the General Plan's population forecasts by Specific Plan Area.

4.7.2 Age Distribution

The vulnerability of elderly citizens can vary significantly based on health, age, and economic security. However, as a group, the elderly are more apt to lack the physical and economic resources necessary for response to hazard events and are more likely to suffer health-related consequences making recovery slower. They are more likely to be vision, hearing, and/or mobility impaired, and more likely to experience mental impairment.

Additionally, the elderly are more likely to live in assisted-living facilities where emergency preparedness occurs at the discretion of facility operators. These facilities are typically identified as "critical facilities" by emergency managers because they require extra notice to implement evacuation. Elderly residents living in their own homes may have more difficulty evacuating their homes and could be stranded in dangerous situations. This population group is more likely to need special medical attention, which may not be readily available during natural disasters due to isolation caused by the event. Specific planning attention for the elderly is an important consideration given the current aging of the American population.

Children under 14 are particularly vulnerable to disaster events because of their young age and dependence on others for basic necessities. Very young children may additionally be vulnerable to injury or sickness; this vulnerability can be worsened during a natural disaster because they may not understand the measures that need to be taken to protect themselves from hazards.

Table 4-7. General Plan Projections of Residential Units and Population by Specific Plan Area

	Dwelling Units			Population		
Specific Plan Area	2016	2035	Buildout	2016	2035	Buildout
Infill	15,409	16,349	16,349	40,217	42,671	42,671
Southeast Roseville	3,047	3,163	3,163	7,953	8,255	8,255
Northeast Roseville	933	1,514	1,514	2,435	3,952	3,952
Northwest Roseville	8,941	9,068	9,068	23,336	23,667	23,667
North Central Roseville	4,247	4,487	4,711	11,085	11,711	12,296
North Industrial	1,043	1,043	1,043	2,722	2,722	2,722
Del Webb	3,210	3,210	3,210	5,895	5,859	5,895
Highland Reserve North	1,669	1,669	1,669	4,356	4,356	4,356
North Roseville	4,887	6,072	6,072	12,755	15,848	15,848
Stoneridge	2,446	2,861	2,861	6,384	7,467	7,467
West Roseville	2,899	10,478	10,478	6,996	26,651	26,651
Riverside Gateway	204	456	456	532	1,190	1,190
Downtown	255	638	2,272	666	1,665	5,930
Sierra Vista	0	5,905	8,679	0	15,412	22,652
Creekview	0	2,011	2,011	0	5,249	5,249
Amoruso Ranch	0	2,827	2,827	0	7,379	7,379
Total	**49,190**	**71,751**	**76,383**	**125,332**	**184,054**	**196,180**

According to the 2010-2014 U.S. Census American Community Survey estimates, 14.3 percent of Roseville's population is 65 or older, 21.1 percent of the population is under the age of 14 and the median age is 37.5. Figure 4-7 shows the age distribution for Roseville.

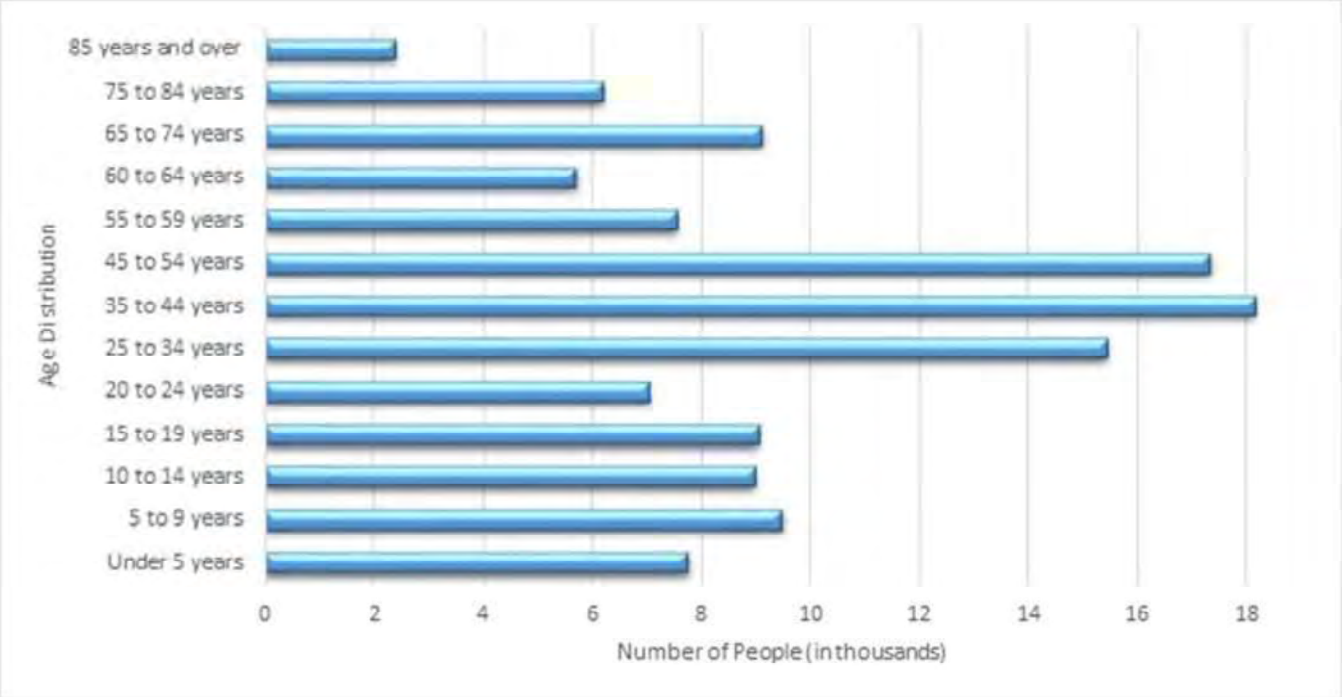


Figure 4-7. Planning Area Age Distribution

4.7.3 Race, Ethnicity and Language

Many disaster researchers have focused on the increased vulnerability that ethnic minorities experience in the United States. Research shows that minorities are less likely to be involved in pre-disaster planning and experience higher mortality rates during a disaster event. Post-disaster recovery can be ineffective and is often characterized by cultural insensitivity. Since higher proportions of ethnic minorities live below the poverty line than the majority white population, poverty can compound vulnerability.

According to the U.S. Census, Roseville's racial composition is predominately white, at about 80 percent of the City population. The largest minority population in Roseville is Hispanic, followed by Asian. Figure 4-8 shows the racial distribution of Roseville.

About 12 percent of Roseville's population is foreign-born, with the majority born in Latin America, according to 2014 U.S. Census estimates. Other than English, the most commonly spoken language in the City is Spanish. In the U.S. Census estimates, 5.6 percent of the City's residents reported speaking English "less than very well." Of the foreign born population, 38.5 percent speak English "less than very well." This has important implications for emergency managers, who must get crucial information out to all members of the population before, during and after emergency events.

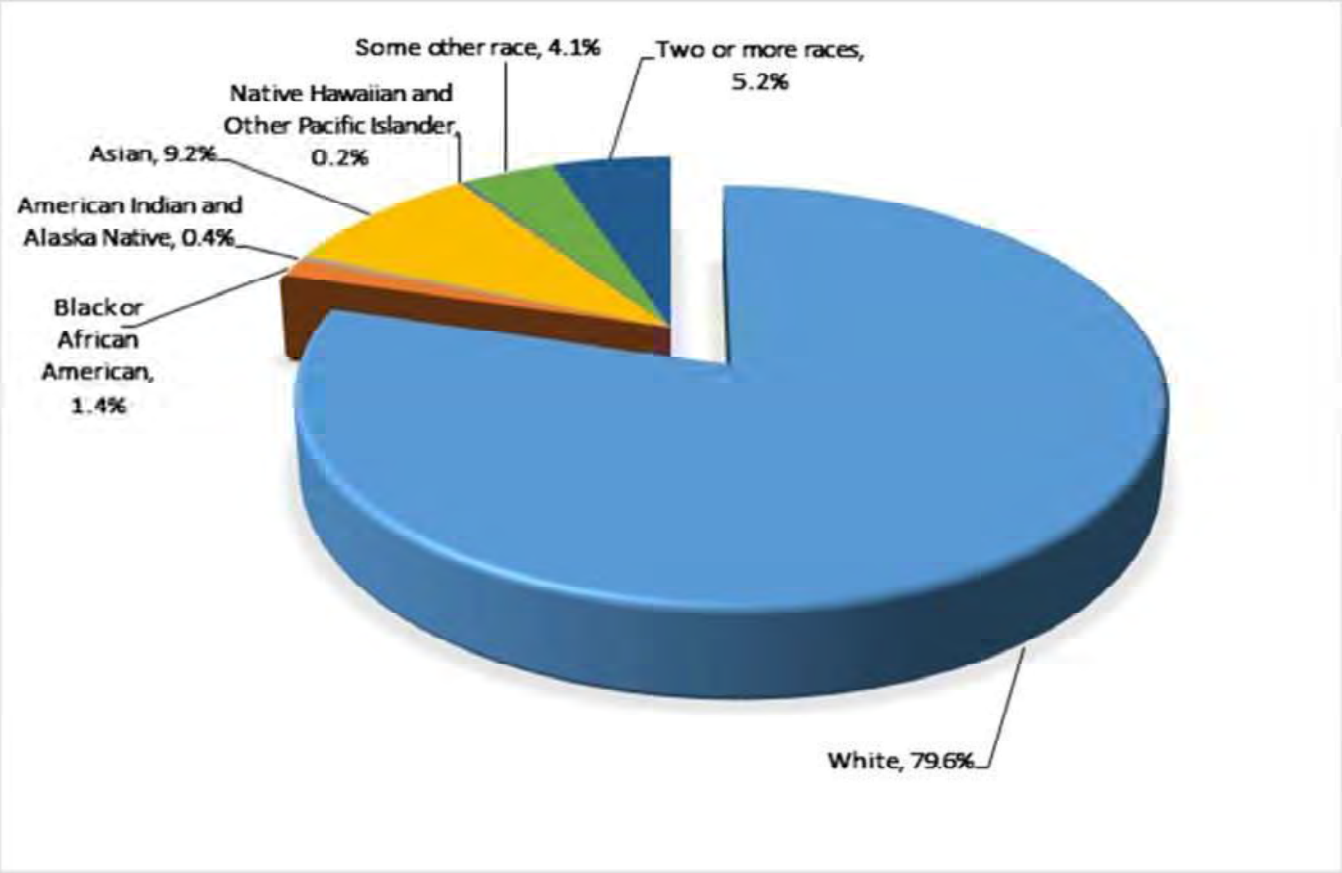


Figure 4-8. Planning Area Race Distribution

4.7.4 Individuals with Disabilities and Others with Access and Functional Needs

Individuals with disabilities and others with access and functional needs have a special stake in emergency planning because they are more likely to have difficulty responding to a hazard event than the general population. According to the 2010 U.S. Census, 12.3 percent of the U.S. noninstitutionalized population lives with a disability. As individuals with disabilities and others with access and functional needs are increasingly integrated into society, relatively large segments of the population may require assistance during the first 72 hours post-disaster, the period generally reserved for self-help.

Disabilities and access/functional needs can vary greatly in severity and permanence, making these individuals difficult to define and track. There is no "typical" disability or need, which can complicate disaster-planning processes that attempt to incorporate them. Furthermore, disabilities and access/functional needs are likely to be compounded with other vulnerabilities, such as age, economic disadvantage and ethnicity, all of which mean that housing is more likely to be substandard.

While the City of Roseville's percentage of individuals with disabilities and others with access and functional needs does not differ much from that of the state as a whole, the overall numbers are significant and warrant attention from planners and emergency managers (see Table 4-8). According to 2014 U.S. Census data, 10.3 percent of the City's population over the age of 5 has a disability.

Table 4-8. Status of Non-Institutionalized Population with Disabilities

Age	Individuals with Disabilities and Others with Access and Functional Needs	% of Age Group Population
5-17 years	1,065	4.7
18-64 years	5,038	7.2
65+ years	5,979	34.9

4.8 ECONOMY

4.8.1 Income

In the United States, individual households are expected to use some private resources to prepare for, respond to and recover from disasters. This means that households living in poverty are automatically disadvantaged when confronting hazards. Additionally, the poor typically occupy more poorly built and inadequately maintained housing. Mobile or modular homes, for example, are more susceptible to damage in earthquakes and floods than other types of housing. In urban areas, the poor often live in older houses and apartment complexes, which are more likely to be made of un-reinforced masonry, a building type that is particularly susceptible to damage during earthquakes. Furthermore, residents below the poverty level are less likely to have insurance to compensate for losses incurred from natural disasters. This means that residents below the poverty level have a great deal to lose during an event and are the least prepared to deal with potential losses. The events following Hurricane Katrina in 2005 illustrated that personal household economics significantly impact people's decisions on evacuation. Individuals who cannot afford gas for their cars will likely decide not to evacuate.

Based on U.S. Census American Community Survey estimates for 2014, per capita income in Roseville was $34,6514, and the median household income was $76,712. Table 4-9 compares the income and poverty estimates at the city, county, and state level. About 8.6 percent of Roseville residents are below the poverty level (meaning they spend more than a third of income on an economy food budget); this includes 10.2 percent of those under the age of 18 and 7.4 percent of those 65 or older.

Table 4-9. Population Under the Poverty Level

	Median Household Income	Percent of Total Population Below Poverty Level	Percent of Children (18 and Under) Below Poverty Level	Percent of Elderly (65 and Older) Below Poverty Level
City of Roseville	$76,712	8.6	10.2	7.4
Placer County	$73,747	8.9	11.2	6.8
California	$61,489	16.4	22.7	10.2

4.8.2 Industry, Businesses and Institutions

The planning area's economy is strongly based in the educational/healthcare/social service industry (22 percent), followed by the retail trade and professional/scientific industries. Information, wholesale trade, and agriculture make up the smallest sources of the local economy, with less than 1 percent of local economy driven by agriculture. Figure 4-9 shows the breakdown of industry types in the planning area.

The planning area benefits from a variety of business activity. Major businesses include Kaiser Permanente, Union Pacific Railroad, Adventist Health and Sutter Roseville Medical Center.

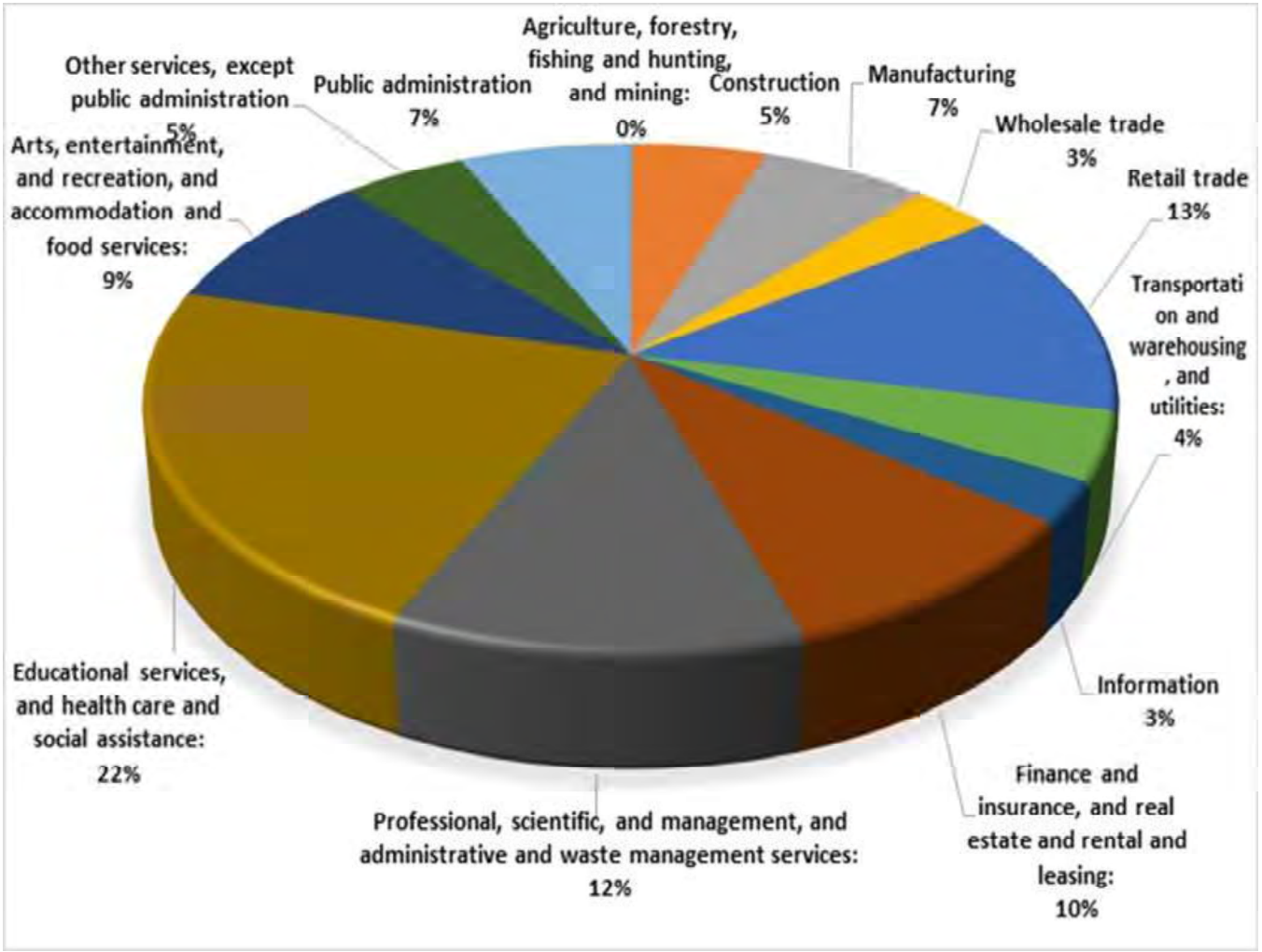


Figure 4-9. Industry in the Planning Area

4.8.3 Employment Trends and Occupations

According to the American Community Survey, about 48.4 percent of the planning area's population is in the labor force. Of the working-age population group (ages 20 – 64), 88.5 percent of men and 75.6 percent of women are in the labor force. Figure 4-10 compares California's and Roseville's unemployment trends from 2009 through 2014. Roseville's unemployment rate was lowest in 2009, at 5.9 percent. Unemployment rates significantly dropped from 9.5 percent to 8.3 percent between 2013 and 2014.

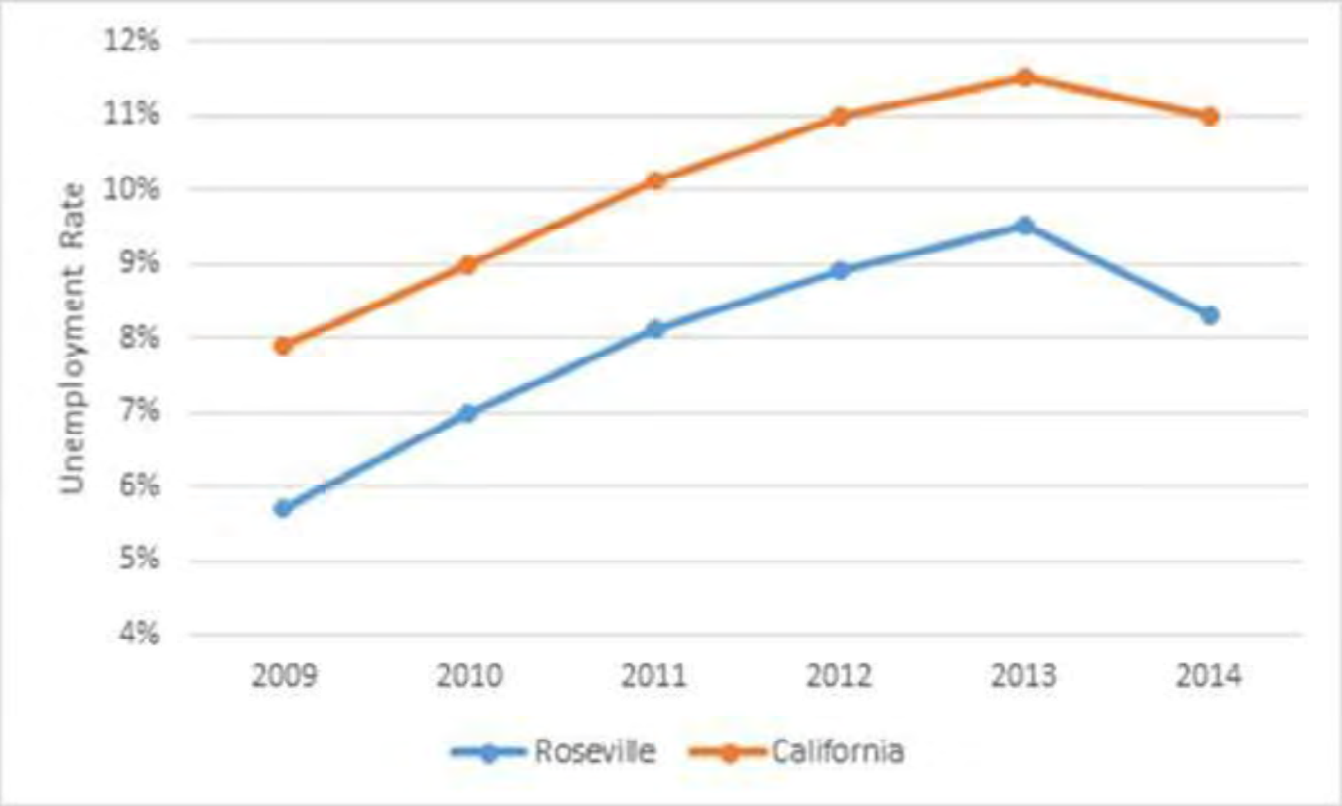


Figure 4-10. California and Roseville Unemployment Rate (U.S. Census, 2009 – 2014)

Management, business, science and arts occupations and sales and office occupations make up 72 percent of the jobs in the planning area (see Figure 4-11). Service occupations make up 16 percent of the local working population.

As of October 2014, the largest employer is Kaiser Permanente, with 3,231 employees, followed by Hewlett-Packard, which employs 2,132. Other major employers include the following:

- Sutter-Roseville Medical Group
- Roseville Joint Union High School District
- Union Pacific Railroad Company
- Adventist Health System West
- Roseville City School District
- City of Roseville
- Wal-Mart Superstore (PG Blvd)
- LB Construction, Inc.

The U.S. Census estimates that over 79.6 percent of workers in the planning area commute alone (by car, truck or van) to work, and mean travel time to work is 26.1 minutes (the state average is 27.6 minutes).

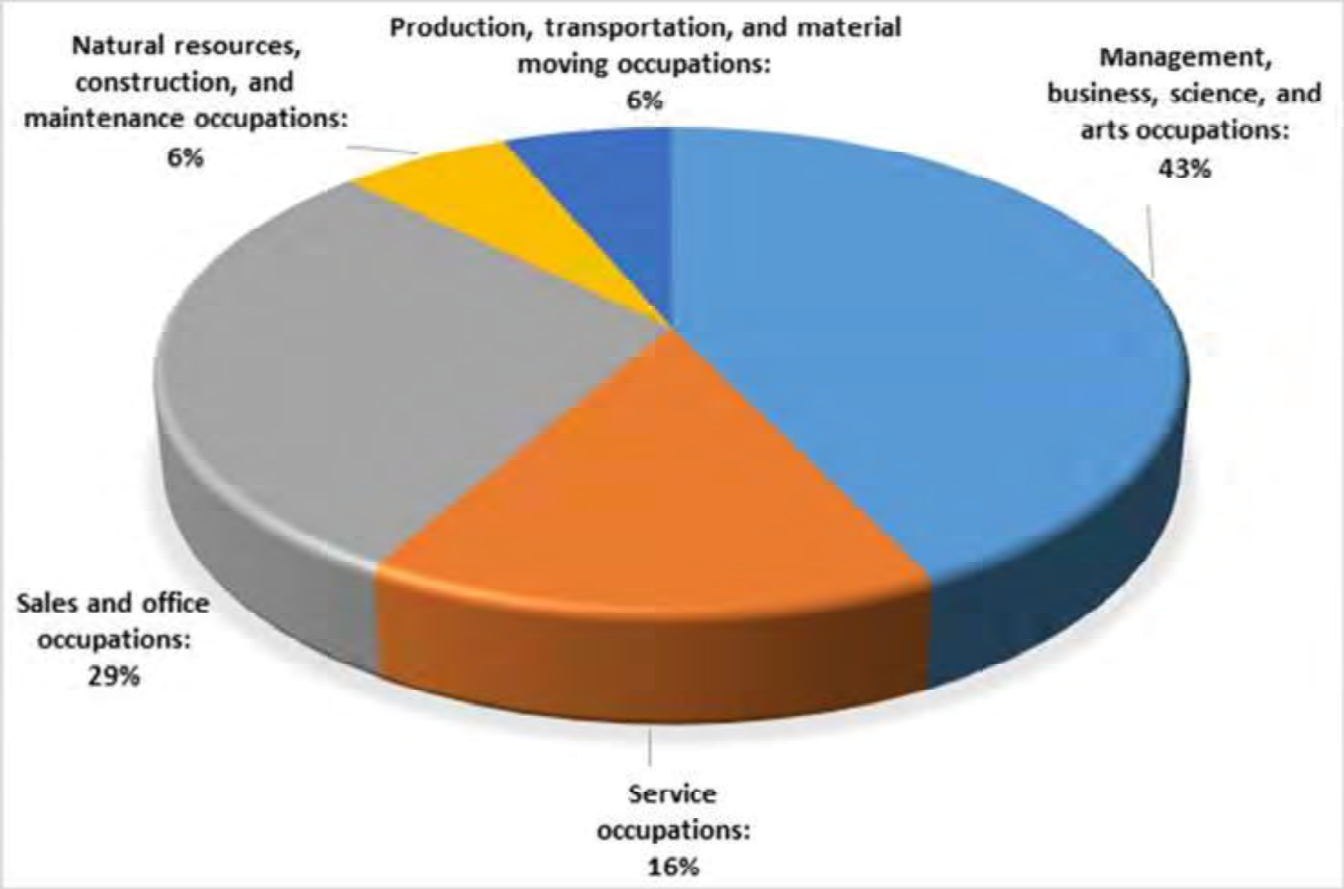


Figure 4-11. Occupations in the Planning Area

4.9 LAWS AND ORDINANCES

Existing laws, ordinances and plans at the federal, state and local level can support or impact hazard mitigation actions identified in this Plan. Hazard mitigation plans are required by 44 CFR to include a review and incorporation, if appropriate, of existing plans, studies, reports, and technical information as part of the planning process (Section 201.6.b(3)). The following federal, state, and local laws described below were reviewed to inform this plan update process. Not all laws and ordinances reviewed during this process are relevant to the immediate process of plan development. In such instances, the City will assure compliance, where relevant, upon implementation of programs that overlap with the requirements of the following programs at project implementation.

4.9.1 Federal

Disaster Mitigation Act of 2000

The DMA is the latest federal legislation addressing hazard mitigation planning. It reinforces the importance of mitigation planning and emphasizes planning for disasters before they occur. It specifically addresses planning at the local level, requiring plans to be in place before Hazard Mitigation Grant Program funds are available to communities. The 2016 Plan is designed to meet the requirements of the DMA.

Endangered Species Act

The Endangered Species Act (ESA) was enacted in 1973 to conserve species that are facing depletion or extinction and the ecosystems that support them. The act sets forth a process for determining which species are threatened and endangered and requires the conservation of the critical habitat in which those species live. The ESA provides broad protection for species of fish, wildlife and plants that are listed as threatened or endangered. Provisions are made for listing species, as well as for recovery plans and the designation of critical habitat for listed species. The ESA outlines procedures for federal agencies to follow when taking actions that may jeopardize listed species and contains exceptions and exemptions. It is the enabling legislation for the Convention on International Trade in Endangered Species of Wild Fauna and Flora. Criminal and civil penalties are provided for violations of the ESA and the Convention.

The purposes of the ESA are to provide a means of conserving the ecosystems upon which endangered and threatened species depend; to provide a program for conserving those species; and to take steps necessary to achieve the purposes of international treaties and conventions. The policy of Congress is that federal agencies must seek to conserve endangered and threatened species and use their authorities in furtherance of the ESA's purposes. The ESA defines three fundamental terms:

- **Endangered** means that a species of fish, animal or plant is "in danger of extinction throughout all or a significant portion of its range." (For salmon and other vertebrate species, this may include subspecies and distinct population segments.)
- **Threatened** means that a species "is likely to become endangered within the foreseeable future." Regulations for a threatened species may be less restrictive than if it were endangered.
- **Critical habitat** means "specific geographical areas that are…essential for the conservation and management of a listed species, whether occupied by the species or not."

Five sections of the ESA are of critical importance to understanding it:

- **Section 4: Listing of a Species—**The National Oceanic and Atmospheric Administration Fisheries Service (NOAA Fisheries) is responsible for listing marine species; the U.S. Fish and Wildlife Service is responsible for listing terrestrial and freshwater aquatic species. The agencies may initiate reviews for listings, or citizens may petition for them. A listing must be made "solely on the basis of the best scientific and commercial data available." After a listing has been proposed, agencies receive comment and conduct further scientific reviews for 12 to 18 months, after which they must decide if the listing is warranted. Economic impacts cannot be considered in this decision, but it may include an evaluation of the adequacy of local and state protections. Critical habitat for the species may be designated at the time of listing.
- **Section 7: Consultation—**Even when a listing has only been proposed, all federal agencies must ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed species or adversely modify its critical habitat. This includes private and public actions that require a federal permit. Once a final listing is made, non-federal actions are subject to the same review, termed a "consultation." If the listing agency finds that an action will "take" a species, it must propose mitigations or "reasonable and prudent" alternatives to the action; if the proponent rejects these, the action cannot proceed.
- **Section 9: Prohibition of Take—**It is unlawful to "take" an endangered species, including killing or injuring it or modifying its habitat in a way that interferes with essential behavioral patterns, including breeding, feeding or sheltering.
- **Section 10: Permitted Take—**Through voluntary agreements with the federal government that provide protections to an endangered species, a non-federal applicant may commit a take that would otherwise be prohibited as long as it is incidental to an otherwise lawful activity (such as developing land or building a road). These agreements often take the form of a "Habitat Conservation Plan."

- **Section 11: Citizen Lawsuits—**Civil actions initiated by any citizen can require the listing agency to enforce the ESA's prohibition of taking or to meet the requirements of the consultation process

The Clean Water Act

The Clean Water Act (CWA) is the cornerstone of surface water quality protection in the United States. (The Act does not deal directly with groundwater or with water quantity issues.) The statute employs a variety of regulatory and non-regulatory tools to sharply reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff. These tools are employed to achieve the broader goal of restoring and maintaining the chemical, physical, and biological integrity of the nation's waters so that they can support "the protection and propagation of fish, shellfish and wildlife and recreation in and on the water."

Evolution of CWA programs over the last decade has included a shift from a program-by-program, source-by-source, pollutant-by-pollutant approach to more holistic watershed-based strategies. Under the watershed approach, equal emphasis is placed on protecting healthy waters and restoring impaired ones. A full array of issues are addressed, not just those subject to CWA regulatory authority. Involvement of stakeholder groups in the development and implementation of strategies for achieving and maintaining state water quality and other environmental goals is another hallmark of this approach.

National Flood Insurance Program

The National Flood Insurance Program (NFIP) provides federally backed flood insurance in exchange for communities enacting and enforcing floodplain regulations. Since its inception in 1968, the NFIP has been successful in requiring new buildings to be protected from probable damage by 100-year flood events. Requirements for participation in this program are stipulated in Parts 59 through 79 of 44 CFR. At the time of the preparation of this Plan, the City is in good standing with the requirements of the NFIP. Participation and good-standing under NFIP are prerequisites for funding eligibility under the Robert T. Stafford Act.

National Incident Management System

The National Incident Management System (NIMS) is a systematic approach for government, nongovernmental organizations, and the private sector to work together to manage incidents involving hazards. The NIMS provides a flexible but standardized set of incident management practices. Incidents typically begin and end locally, and they are managed at the lowest possible geographical, organizational, and jurisdictional level. In some cases, success depends on the involvement of multiple jurisdictions, levels of government, functional agencies, and emergency responder disciplines. These cases necessitate coordination across a spectrum of organizations. Communities using NIMS follow a comprehensive national approach that improves the effectiveness of emergency management and response personnel across the full spectrum of potential hazards (including natural hazards, terrorist activities, and other human-caused disasters) regardless of size or complexity.

Americans with Disabilities Act and Amendments

The Americans with Disabilities Act (ADA) seeks to prevent discrimination against people with disabilities in employment, transportation, public accommodation, communications, and government activities. Title II of the ADA deals with compliance with the Act in emergency management and disaster-related programs, services, and activities. It applies to state and local governments as well as third parties, including religious entities and private nonprofit organizations.

The ADA has implications for sheltering requirements and public notifications. During an emergency alert, officials must use a combination of warning methods to ensure that all residents have all necessary information. Those with hearing impairments may not hear radio, television, sirens, or other audible alerts, while those with visual impairments may not see flashing lights or visual alerts. Two technical documents issued for shelter

operators address physical accessibility needs of people with disabilities as well as medical needs and service animals.

The ADA intersects with disaster preparedness programs in regards to transportation, social services, temporary housing, and rebuilding. Persons with disabilities may require additional assistance in evacuation and transit (e.g., vehicles with wheelchair lifts or paratransit buses). Evacuation and other response plans should address the unique needs of residents. Local governments may be interested in implementing a special-needs registry to identify the home addresses, contact information, and needs for residents who may require more assistance.

Civil Rights Act of 1964

The Civil Rights Act of 1964 prohibits discrimination based on race, color, religion, sex or nation origin and requires equal access to public places and employment. The Act is relevant to emergency management and hazard mitigation in that it prohibits local governments from favoring the needs of one population group over another. Local government and emergency response must ensure the continued safety and well-being of all residents equally, to the extent possible.

Rural Development Program

The mission of the U.S. Department of Agriculture (USDA) Rural Development Program is to help improve the economy and quality of life in rural America. The program provides project financing and technical assistance to help rural communities provide the infrastructure needed by rural businesses, community facilities, and households. The program addresses rural America's need for basic services, such as clean running water, sewage and waste disposal, electricity, and modern telecommunications and broadband. Loans and competitive grants are offered for various community and economic development projects and programs, such as the development of essential community facilities including fire stations (USDA, 2015b).

Community Development Block Grant Disaster Resilience Program

In response to disasters, Congress may appropriate additional funding for the U.S. Department of Housing and Urban Development Community Development Block Grant programs to be distributed as Disaster Recovery grants (CDBG-DR). These grants can be used to rebuild affected areas and provide seed money to start the recovery process. CDBG-DR assistance may fund a broad range of recovery activities, helping communities and neighborhoods that otherwise might not recover due to limited resources. CDBG-DR grants often supplement disaster programs of the Federal Emergency Management Agency, the Small Business Administration, and the U.S. Army Corps of Engineers. Housing and Urban Development generally awards noncompetitive, nonrecurring CDBG-DR grants by a formula that considers disaster recovery needs unmet by other federal disaster assistance programs. To be eligible for CDBG-DR funds, projects must meet the following criteria:

- Address a disaster-related impact (direct or indirect) in a presidentially declared county for the covered disaster
- Be a CDBG-eligible activity (according to regulations and waivers)
- Meet a national objective.

Incorporating preparedness and mitigation into these actions is encouraged, as the goal is to rebuild in ways that are safer and stronger.

Emergency Watershed Program

The USDA Natural Resources Conservation Service (NRCS) administers the Emergency Watershed Protection (EWP) Program, which responds to emergencies created by natural disasters. Eligibility for assistance is not dependent on a national emergency declaration. The program is designed to help people and conserve natural

resources by relieving imminent hazards to life and property caused by floods, fires, wind-storms, and other natural occurrences. EWP is an emergency recovery program. Financial and technical assistance are available for the following activities (Natural Resources Conservation Service, 2016):

- Remove debris from stream channels, road culverts, and bridges
- Reshape and protect eroded banks
- Correct damaged drainage facilities
- Establish cover on critically eroding lands
- Repair levees and structures
- Repair conservation practices.

Presidential Executive Orders 11988 and 13690

Executive Order 11988 requires federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of flood plains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. In accomplishing this objective, "each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by flood plains in carrying out its responsibilities" for the following actions:

- Acquiring, managing, and disposing of federal lands and facilities
- Providing federally-undertaken, financed, or assisted construction and improvements
- Conducting federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulation, and licensing activities (FEMA, 1982).

Executive Order 13690 amends and expands Executive Order 11988, acknowledging that the impacts of flooding are anticipated to increase over time due to the effects of climate change and other threats. It mandates a Federal Flood Risk Management Standard, which is a flexible framework to increase resilience against flooding and help preserve the natural values of floodplains. This standard expands management of flood issues from the current base flood level to a higher vertical elevation and corresponding horizontal floodplain to address current and future flood risk and ensure that projects funded with taxpayer dollars last as long as intended (Office of the Press Secretary, 2015).

Presidential Executive Orders 11990

Executive Order 11990 requires federal agencies to provide leadership and take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands. The requirements apply to the following activities (National Archives, 2016):

- Acquiring, managing, and disposing of federal lands and facilities
- Providing federally undertaken, financed, or assisted construction and improvements
- Conducting federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulation, and licensing.

Emergency Relief for Federally Owned Roads Program

The U.S. Forest Service's Emergency Relief for Federally Owned Roads Program was established to assist federal agencies with repair or reconstruction of tribal transportation facilities, federal lands transportation facilities, and other federally owned roads that are open to public travel and have suffered serious damage by a natural disaster over a wide area or by a catastrophic failure. The program funds both emergency and permanent repairs (Office of Federal Lands Highway, 2016).

4.9.2 State

California General Planning Law

California state law requires that every county and city prepare and adopt a comprehensive long-range plan to serve as a guide for community development. The general plan expresses the community's goals, visions, and policies relative to future land uses, both public and private. The general plan is mandated and prescribed by state law (Cal. Gov. Code §65300 et seq.), and forms the basis for most local government land use decision-making.

The plan must consist of an integrated and internally consistent set of goals, policies, and implementation measures. In addition, the plan must focus on issues of the greatest concern to the community and be written in a clear and concise manner. City actions, such as those relating to land use allocations, annexations, zoning, subdivision and design review, redevelopment, and capital improvements, must be consistent with the plan.

California Environmental Quality Act

The California Environmental Quality Act (CEQA) was passed in 1970, shortly after the federal government passed the National Environmental Policy Act, to institute a statewide policy of environmental protection. CEQA requires state and local agencies in California to follow a protocol of analysis and public disclosure of the potential environmental impacts of development projects. CEQA makes environmental protection a mandatory part of every California state and local agency's decision making process.

CEQA establishes a statewide environmental policy and mandates actions all state and local agencies must take to advance the policy. For any project under CEQA's jurisdiction with potentially significant environmental impacts, agencies must identify mitigation measures and alternatives by preparing an environmental impact report and may approve only projects with no feasible mitigation measures or environmentally superior alternatives.

The Roseville City Council certified a mitigated negative declaration (MND) for the initial City of Roseville hazard plan on July 20, 2005. The MND evaluated potential environmental effects associated with adoption and implementation of the initial hazard plan. It was circulated for a 20-day public review and comment period (per CEQA Guidelines Section 15073(a)), and no comments were received.

Under CEQA guidelines (Section 15164), an addendum to an adopted MND shall be prepared if only minor technical changes or additions are necessary and none of the conditions have occurred calling for the preparation of a new negative declaration or Environmental Impact Report (as described in CEQA Section 15162). The addendum need not be circulated for public review; however, an addendum is to be considered by the decision-making body prior to making a decision on the project.

The City has determined that the 2016 Plan required a new Initial Study/Mitigated Negative Declaration (IS/MND).The public comment period for the IS/MND ran concurrently with the public comment period for the plan update. During this time, no comments were received on the IS/MND. The results of this study were presented to the Council for consideration prior to their consideration of the revised Plan.

AB 52: Addition of Tribal Cultural Resources CEQA

This bill adds "tribal cultural resources" to the categories of cultural resources in CEQA, which had formerly been limited to historic, archeological, and paleontological resources. Recognizing that tribes may have expertise with regard to their tribal history and practices, AB 52 requires lead agencies to provide notice to tribes that are traditionally and culturally affiliated with the geographic area of a proposed project if they have requested notice of projects proposed within that area. If the tribe requests consultation within 30 days upon receipt of the notice, the lead agency must consult with the tribe.

In accordance with AB 52, in July 2016 the City of Roseville provided certified mail notification of the proposed hazard mitigation plan update to tribes that requested such notification. The City's notice included a summary project description, a location map and request for written response should the tribe desire formal AB 52 consultation on tribal cultural resources. Many of the hazard mitigation alternatives and selected actions contained in Chapter 19 are ongoing City activities and programs, some of which were previously subject to CEQA and do not require further CEQA compliance for continued implementation. However future action plan items that still require Council approval would also require future project-level CEQA compliance and therefore an additional opportunity for AB 52 consultation prior to implementation.

AB 162: Flood Planning, Chapter 369, Statutes of 2007

This California State Assembly bill passed in 2007 requires cities and counties to address flood-related matters in the land use, conservation, and safety and housing elements of their general plans. The land use element must identify and annually review the areas covered by the general plan that are subject to flooding as identified in floodplain mapping by either FEMA or the state Department of Water Resources (DWR). Upon the next revision of the housing element on or after January 1, 2009, the conservation element of the general plan must identify rivers, creeks, streams, flood corridors, riparian habitat, and land that may accommodate floodwater for the purposes of groundwater recharge and stormwater management. The safety element must identify information regarding flood hazards including:

- Flood hazard zones
- Maps published by FEMA, DWR, the U.S. Army Corps of Engineers, the Central Valley Flood Protection Board, Cal OES, etc.
- Historical data on flooding
- Existing and planned development in flood hazard zones.

The general plan must establish goals, policies and objectives to protect from unreasonable flooding risks including:

- Avoiding or minimizing the risks of flooding new development
- Evaluating whether new development should be located in flood hazard zones
- Identifying construction methods to minimize damage.

AB 162 establishes goals, policies and objectives to protect from unreasonable flooding risks. It establishes procedures for the determination of available land suitable for urban development, which may exclude lands where FEMA or DWR has determined that the flood management infrastructure is not adequate to avoid the risk of flooding.

AB 2140: General Plans: Safety Element, Chapter 739, Statutes of 2006

This bill provides that the state may allow for more than 75 percent of public assistance funding under the California Disaster Assistance Act only if the local agency is in a jurisdiction that has adopted a local hazard mitigation plan as part of the safety element of its general plan. The local hazard mitigation plan needs to include elements specified in this legislation. In addition this bill requires Cal OES to give federal mitigation funding preference to cities and counties that have adopted local hazard mitigation plan. The intent of the bill is to encourage cities and counties to create and adopt hazard mitigation plans. The City of Roseville linked the Roseville Hazard Mitigation Plan to the Safety Element of the General Plan by City Council resolution on May 10, 2010. The 2016 Roseville Hazard Mitigation Plan will continue to link to the Roseville General Plan.

AB 70: Flood Liability, Chapter 367, Statutes of 2007

This bill provides that a city or county may be required to contribute a fair and reasonable share to compensate for property damage caused by a flood to the extent that it has increased the state's exposure to liability for property damage by unreasonably approving new development in a previously undeveloped area that is protected by a state flood control project, unless the city or county meets specified requirements.

AB 32: The California Global Warming Solutions Act

This bill addresses greenhouse gas emissions. It identifies the following potential adverse impacts of global warming:

> "… the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems."

AB 32 establishes a state goal of reducing greenhouse gas emissions to 1990 levels by 2020 (a reduction of approximately 25 percent from forecast emission levels) with further reductions to follow. The law requires the state Air Resources Board to do the following:

- Establish a program to track and report greenhouse gas emissions.
- Approve a scoping plan for achieving the maximum technologically feasible and cost-effective reductions from sources of greenhouse gas emissions.
- Adopt early reduction measures to begin moving forward.
- Adopt, implement and enforce regulations—including market mechanisms such as "cap and-trade" programs—to ensure that the required reductions occur.

The Air Resources Board recently adopted a statewide greenhouse gas emissions limit and an emissions inventory, along with requirements to measure, track, and report greenhouse gas emissions by the industries it determined to be significant sources of greenhouse gas emissions.

Senate Bill 97

Senate Bill 97, enacted in 2007, amended the California Environmental Quality Act (CEQA) to clearly establish that greenhouse gas emissions and the effects of greenhouse gas emissions are appropriate subjects for CEQA analysis. It directed the Governor's Office of Planning and Research to develop draft CEQA guidelines for the mitigation of greenhouse gas emissions or their effects by July 1, 2009 and directed the California Natural Resources Agency to certify and adopt the CEQA Guidelines by January 1, 2010.

Senate Bill 5: Central Valley Flood Protection Act of 2008

The fundamental change imposed through this legislation was the directive for local agencies to revise their general plans no later than July 2, 2015 to address flood risk for affected land use decisions based on an Urban Level of Flood Protection. The legislation also requires local agencies to revise their zoning codes to reflect this new standard within one year following the adoption of their revised general plans. In areas not subject to the Urban Level of Flood Protection standards, the 100-year floodplain standards will continue to apply.

Senate Bill 1241: General Plans: Safety Element—Fire Hazard Impacts

In 2012, Senate Bill 1241 passed requiring that all future general plans address fire risk in state responsibility areas and very high fire hazard severity zones in their safety element. In addition, the bill requires cities and

counties to make certain findings regarding available fire protection and suppression services before approving a tentative map or parcel map.

Senate Bill 379: General Plans: Safety Element—Climate Adaptation

Senate Bill 379 builds upon the flood planning inclusions into the safety and housing elements and the hazard mitigation planning safety element inclusions in general plans outlined in AB 162 and AB 2140, respectively. SB 379 focuses on a new requirement that cities and counties include climate adaptation and resiliency strategies in the safety element of their general plans beginning January 1, 2017. In addition, this bill requires general plans to include a set of goals, policies and objectives, and specified implementation measures based on the conclusions drawn from climate adaptation research and recommendations. In anticipation of the implementation of this bill in 2017, the 2016 Hazard Mitigation Plan includes relevant information regarding climate adaptation and resiliency strategies for incorporation into the Roseville General Plan through existing linkage resulting from AB 2140.

California State Building Code

California Code of Regulations Title 24 (CCR Title 24), also known as the California Building Standards Code, is a compilation of building standards from three sources:

- Building standards that have been adopted by state agencies without change from building standards contained in national model codes
- Building standards that have been adopted and adapted from the national model code standards to meet California conditions
- Building standards authorized by the California legislature that constitute extensive additions not covered by the model codes adopted to address particular California concerns.

The state Building Standards Commission is authorized by California Building Standards Law (Health and Safety Code Sections 18901 through 18949.6) to administer the processes related to the adoption, approval, publication, and implementation of California's building codes. These building codes serve as the basis for the design and construction of buildings in California. The national model code standards adopted into Title 24 apply to all occupancies in California except for modifications adopted by state agencies and local governing bodies. Since 1989, the Building Standards Commission has published new editions of Title 24 every three years.

On January 1, 2014, California Building Code Accessibility Standards found in Chapter 11B incorporated the 2010 Americans with Disabilities Act (ADA) Standards as the model accessibility code for California. The purpose for this incorporation was to ensure consistency with federal guidelines. As a result of this incorporation, the California standards will fully implement and include 2010 ADA Standards within the California Building Code while maintaining enhanced levels of accessibility already provided by existing California accessibility regulations.

Standardized Emergency Management System

CCR Title 19 establishes the Standardized Emergency Management System (SEMS) to standardize the response to emergencies involving multiple jurisdictions. SEMS is intended to be flexible and adaptable to the needs of all emergency responders in California. It requires emergency response agencies to use basic principles and components of emergency management. Local governments must use SEMS by December 1, 1996 in order to be eligible for state funding of response-related personnel costs under CCR Title 19 (Sections 2920, 2925 and 2930). Individual agencies' roles and responsibilities contained in existing laws or the state emergency plan are not superseded by these regulations.

California State Hazard Mitigation Plan

Under the DMA, California must adopt a federally approved state multi-hazard mitigation plan in order to be eligible for certain disaster assistance and mitigation funding. The intent of the California State Hazard Mitigation Plan is to reduce or prevent injury and damage from hazards in the state through the following:

- Documenting statewide hazard mitigation planning in California
- Describing strategies and priorities for future mitigation activities
- Facilitating the integration of local and tribal hazard mitigation planning activities into statewide efforts
- Meeting state and federal statutory and regulatory requirements.

The plan is an annex to the State Emergency Plan. It identifies past and present mitigation activities, current policies and programs, and mitigation strategies for the future. It also establishes hazard mitigation goals and objectives. The plan will be reviewed and updated annually to reflect changing conditions and new information, especially information on local planning activities.

Governor's Executive Order S-13-08

Governor's Executive Order S-13-08 enhances the state's management of climate impacts from sea level rise, increased temperatures, shifting precipitation and extreme weather events. It required the following key actions:

- Initiate California's first statewide climate change adaptation strategy to assess expected climate change impacts, identify where California is most vulnerable, and recommend adaptation policies by early 2009. This effort will improve coordination within state government so that better planning can more effectively address climate impacts on human health, the environment, the state's water supply and the economy.
- Request that the National Academy of Science establish an expert panel to report on sea level rise impacts in California, to inform state planning and development efforts.
- Issue interim guidance to state agencies for how to plan for sea level rise in designated coastal and floodplain areas for new projects.
- Initiate a report on critical infrastructure projects vulnerable to sea level rise.

4.9.3 City Plans and Programs

General Plan

The City of Roseville General Plan 2035 was developed concurrently with the mitigation planning effort. Roseville proactively addresses problems through the General Plan, which includes a Safety Element designed to address hazards. The 2016 General Plan and the 2016 Hazard Mitigation Plan will work together to achieve the goal of hazard risk reduction. Many of the action items identified in this 2016 Plan are recommendations of the General Plan. Updating the General Plan will serve as a trigger for future updates of the hazard mitigation plan.

Purpose

The General Plan is a long-term policy guide for the City's physical, economic, and environmental growth. City actions, such as those relating to land use allocations, annexations, zoning, subdivision, design review, redevelopment and capital improvements, must be consistent with the General Plan. The General Plan emphasizes performance policies or standards that define levels of service and other less tangible factors that the City is seeking to achieve. It also designates land use categories for the entire City. Land use category definitions in the General Plan include information on general uses, development, intensity, siting and compatibility standards. The General Plan serves these purposes:

- It enables the Roseville City Council and Planning Commission to establish long-range development policies.
- It provides a basis for judging whether private development proposals and public projects are in harmony with the policies.
- It guides public agencies and private developers in designing projects consistent with City policies.

The General Plan is designed to be:

- **Long-range—**Most development decisions have effects lasting more than 20 years. In order to create a useful context for development decisions, the General Plan looks toward 2035 and beyond.
- **Comprehensive—**The General Plan provides direction to coordinate all major components of the community's physical development.
- **General—**The General Plan's purpose is to serve as a framework for detailed public and private development proposals. It establishes requirements for additional planning studies that must be completed before modifying land-use allocations.

Contents

Two primary components constitute the City of Roseville General Plan:

- The General Plan document, which presents goals, policies, and implementation measures
- The land use map, which graphically represents the City's existing and planned land use mix and pattern.

The General Plan document is organized into nine elements. The state-mandated elements are land use, circulation, open space and conservation, safety, housing, and noise. The optional elements are air quality, parks and recreation, and public facilities. Each element includes a brief setting and outlook section describing existing conditions and critical issues for the topic area, followed by goals, policies and implementation measures. The goals state the overall desired conditions that the City would like to achieve. The policies indicate an action or direction that the City must take as a step toward achieving the goals. The implementation measures include precise actions to achieve the stated policies. The general content of each element is as follows:

- **Land Use Element** discusses existing and projected land-use conditions, land-use designations and standards, community form, community design, and growth management. The goals and policies are intended to promote a balanced land-use pattern that supports innovative land-use approaches and retains and enhances the distinct character and identity of Roseville.
- **Circulation Element** identifies the general locations and extent of existing and proposed roadways, highways, railroads, and transit routes. The element identifies policies and programs to reduce traffic congestion, promote alternative forms of transportation, and provide safe travel throughout the City.
- **Air Quality and Climate Change Element** integrates related land-use, transportation and circulation, transit, and energy issues. The policies and implementation measures are intended to improve air quality and encourage cooperation among the jurisdictions involved in regional air quality efforts.
- **Open Space and Conservation Element** provides for the conservation, development, and use of natural resources; details plans and measures for the preservation of open space; and provides for outdoor recreation, public health and safety. It is the overall goal of the element to preserve a comprehensive interconnected system of open space encompassing preservation and enhancement of natural habitat areas for the use and enjoyment of the community.
- **Parks and Recreation Element** provides goals and policies for both traditional "active" park lands and non-traditional "open space recreational" park lands. It specifies standards and conditions as guidelines for planning parks and recreation facilities, including size, type, and location.
- **Public Facilities Element** identifies facility and service needs of the community and performance standards to ensure that desired service levels are maintained. Discussed under this element are civic

facilities, libraries, schools, electric and privately owned utilities, water and wastewater systems, solid waste and recycling, water and energy conservation, and the extension of City services. Emphasis is placed on the fair-share contribution of new development toward the provision of services and facilities.

- **Safety Element** establishes standards and plans for the protection of the community from a variety of hazards, including earthquakes, flooding, crime, fire, hazardous materials, and electromagnetic fields.
- **Noise Element** establishes standards for transportation and fixed noise sources to protect the health and welfare of the community.
- **Housing Element** identifies the existing and projected housing needs and establishes goals, policies, and implementation measures for the preservation, improvement and development of housing to meet the needs of all economic sectors of the community.

Specific Plans

Roseville's specific plans are comprehensive planning documents that guide the development of defined geographic areas. Specific plans typically include more detailed information than the General Plan about land use, traffic circulation, affordable housing programs, resource management strategies, development standards and a comprehensive infrastructure plan. Specific plans currently exist for the Amoruso Ranch, Creekview, Del Webb, Downtown, Highland Reserve North, North Central Roseville, Northeast Roseville, North Industrial, North Roseville, Northwest Roseville, Riverside Gateway, Sierra Vista, Southeast Roseville, Stoneridge, West Roseville, and the Infill Area. All of these specific plans were adopted by the City Council after extensive review by City staff, commissions and the public. Specific plans contain detailed regulations, conditions, programs and design criteria unique to specific areas of the City and serve to implement the General Plan. Each specific plan includes a menu of strategies.

Development Agreements

California planning law authorizes cities and developers to enter into contracts to lock in regulations and policies governing a property. Development agreements benefit the City and its residents by detailing the developer's responsibilities for public improvements and infrastructure, such as street lights and roads. Development agreements also give developers the certainty they need to develop their property. With the obligations of both the City and the developer detailed and in writing, the project is able to move ahead smoothly with few obstacles.

Community Design Guidelines

Community design guidelines identify the City's expectations for planning, designing and reviewing development proposals in Roseville. They establish standards for high quality development and design. The community design guidelines provide design professionals, property owners, commissioners, staff, and residents with a clear and common understanding of the City's expectations for the planning, design, and review of development proposals in Roseville. They also increase the community's awareness and appreciation of design considerations.

Open Space Preserve Overarching Management Plan

In August 2011, the City of Roseville adopted an Open Space Preserve Overarching Management Plan (OSPOMP), which provides a City-wide approach to open space management, maintenance, and monitoring of the City's open space preserves. The OSPOMP also provides the same approach for the management and maintenance of open space areas outside of a preserve areas. Prior to adoption of the OSPOMP, the City managed, monitored, and provided reports to the U.S. Army Corps of Engineers for over 30 individual preserve management plans regulated by natural resource agencies, with various requirements for management and monitoring that had evolved in comprehensiveness and complexity since the 1990s. Adoption of the OSPOMP eliminates the need for additional management plans when new open space is dedicated through the development process or habitat conservation efforts.

Urban Water Management Plan

The City of Roseville Urban Water Management Plan assumes an important role in water supply planning and management. Current drought conditions have resulted in unprecedented State mandates for water conservation, and the 2015 UWMP serves as the primary compliance document for interim water use targets required by the Water Conservation Act of 2009. The primary objective of the UWMP is to provide a framework for long term water supply planning and document how urban water suppliers carry out long term resource planning responsibilities.

The 2015 UWMP describes City water system, historical and projected use, water supply sources, and a comparison of projected water supply to water demands during normal, single-dry, and multiple dry years in 5 year increments from 2020 to 2040.

Emergency Operations Plan

The City of Roseville Emergency Operations Plan (EOP) establishes an emergency management organization and assigns functions and tasks consistent with California's Standardized Emergency Management System. It provides for the integration and coordination of planning efforts of multiple jurisdictions. This plan was reviewed and approved by representatives from each City of Roseville department, local special districts with emergency services responsibilities in the City, and the Placer County Office of Emergency Services. The content is based on guidance approved and provided by the State of California and FEMA. The EOP provides direction on how to respond to an emergency from the initial onset, through an extended response, and into the recovery process.

A key element of the update process for this hazard mitigation plan was the simultaneous review of the EOP. The Steering Committee remained informed of major review findings of the EOP with an eye toward integration with key components of the hazard mitigation plan. Updates to the EOP will continue to coincide with the future updates of the multi-hazard mitigation plan.

4.9.4 Incorporation of Information into the 2016 Planning Process

Pursuant to 44 CFR §201.6(b)(3), the City of Roseville specifically reviewed certain plans and programs for inclusion into this update for the purpose of planning consistency among documents. The full capability assessment includes these reviewed plans, as well as additional regulatory, administrative, fiscal, and NFIP compliance information. Relevant information from reviewed plans, studies, reports, and technical information incorporated into the mitigation plan includes:

- **State Hazard Mitigation Plan –** The State Hazard Mitigation Plan was reviewed for recent updates on state-wide hazard events and hazard information.

- **Placer County Hazard Mitigation Plan –** The Placer County Hazard Mitigation Plan was reviewed for planning consistency and augmented hazard event history for hazards that extend beyond Roseville city limits, such as drought and severe weather.
- **General Plan and Specific Plans –** General Plan demographics and land use was cross referenced for inclusion into this Plan as part of the overall community profile. Additionally, area vulnerabilities identified in Specific Plan Areas were included as part of the vulnerability and risk assessment for wildfire, landslide, and flood. The General Plan and Specific Plans were also included as part of the capability inventory for the City's capability assessment.
- **Urban Water Management Plan –** the information provided in the City's UWMP provided the main resource for illustrating the historical and current conditions for the drought chapter. The UWMP was also included as part of the capability inventory for the City's capability assessment.
- **Open Space Preserve Overarching Management Plan –** This plan was reviewed in reference to the open space policies regarding the City's floodplain management program and the flood chapter of this Plan.
- **Emergency Operations Plan –** The EOP was reviewed to augment hazard information as it relates to response to the assessed natural hazards. Additionally, the EOP underwent a gap analysis review in coordination with the Plan development so as to identify further consistency opportunities among documents. The EOP was also included as part of the capability inventory for the City's capability assessment.
- **Additional Resources and Technical Information –** A complete listing of technical reports, research materials, and articles used during development of this Plan is found in the References section.

4.10 CAPABILITY ASSESSMENT

The planning team performed an inventory and analysis of existing authorities and capabilities called a "capability assessment." A capability assessment creates an inventory of an agency's mission, programs and policies, and evaluates its capacity to carry them out. An assessment of legal and regulatory capabilities is presented in Table 4-10. An assessment of administrative and technical capabilities is presented in Table 4-11. An assessment of fiscal capabilities is presented in Table 4-12. Information on National Flood Insurance Program compliance is presented in Table 4-13. An assessment of education and outreach capabilities is presented in Table 4-14. Classifications under various community mitigation programs are presented in Table 4-15.

Table 4-10. Legal and Regulatory Capability

	Local Authority	State or Federal Prohibitions	Other Jurisdiction Authority	State Mandated
Codes, Ordinances & Requirements				
Building Code	Y	NA	N	Y
Comments: *The 2013 California Building Standards Code was adopted by the City of Roseville and incorporated by reference into the City of Roseville Municipal Code.*				
Zoning Code	Y	NA	N	N
Comments: *RMC, Title 19*				
Subdivisions	Y	NA	N	Y
Comments: *RMC, Title 18*				
Stormwater Management	Y	NA	N	Y
Comments: *RMC, Chapter 14.20*				
Post-Disaster Recovery	N	NA	N	N
Comments: *None at this time.*				
Real Estate Disclosure	N	NA	Y	N
Comments: *California Civil Code 1102 governs real estate and various disclosure laws. It does not mandate disclosure at the local government level but does require local governments to make known information on natural hazards available to the real estate community.*				
Growth Management	Y	NA	N	Y
Comments: *Growth management strategies are incorporated into the Land Use Element of the General Plan.*				
Site Plan Review	Y	NA	N	N
Comments: *The Zoning Ordinance (RMC 19.74.010.(C)) requires a design review permit for all new construction except single-family and two-family residences. Site design, building architecture, landscape design, and lighting are reviewed through the design review permit. Design review permits are reviewed and approved by the City's Design Committee or Planning Commission.*				
Flood Damage Prevention	Y	N/A	Y	Y
Comments: *The Roseville Zoning Ordinance incorporates combining or overlay of districts to regulate floodplain development, open space preservation, and other sensitive habitat. The Flood Damage Prevention Ordinance (RMC 9.80) regulates development in special flood hazard areas. Outside agencies with jurisdiction over sensitive habitats include the U.S. Army Corps of Engineers and California Department of Fish and Wildlife.*				
Public Health and Safety	Y	NA	N	N
Comments: *RMC, Title 9 includes multiple public health and safety regulations.*				
Environmental Protection	N	NA	N	N
Comments: *None at this time.*				
Planning Documents				
General or Comprehensive Plan	Y	NA	N	Y
Is the plan equipped to provide linkage to this mitigation plan? *Yes*				
Comments: *The City's General Plan was most recently updated in 2016 and is implemented through 14 specific plans (Amoruso Ranch, Sierra Vista, Creekview, Downtown, Riverside Gateway, Southeast Roseville, Northeast Roseville, Northwest Roseville, North Central Roseville, North Roseville, Highland Reserve North, Stoneridge, Del Webb, and West Roseville) and one other planning area (North Industrial).*				
Capital Improvement Plan	Y	NA	N	N
What types of capital facilities does the plan address? Roads, water, and sewer				
How often is the plan updated? Every 2-3 Years.				
Comments: *6-year CIP*				

	Local Authority	State or Federal Prohibitions	Other Jurisdiction Authority	State Mandated
Floodplain or Basin Plan	Y	NA	N	N
Comments: *RMC 9.80 and Safety Element of the General Plan*				
Stormwater Plan	Y	NA	Y	Y
Comments: *City of Roseville 2004 Stormwater Management Plan. The plan is required by the State of California as part of the federal National Pollution Discharge Elimination System program. Outside jurisdictional authority is through the State Water Resources Control Board and Regional Water Quality Control Board (Central Valley Region).*				
Habitat Conservation Plan	N	NA	N	N
Comments: *There are no Habitat Conservation Plans within the City. However, preserve areas have been established as a condition of Section 404 permits and biological opinions of the U.S. Fish and Wildlife Service and are regulated through the City's Overarching Open Space Preserve Management Plan approved by the U.S. Fish and Wildlife Service and U.S. Army Corps of Engineers. The Open Space and Conservation Element of the City's General Plan also contains policies relative to habitat conservation.*				
Economic Development Plan	Y	NA	N	N
Comments: *Current economic development strategy was adopted by the City Council on May 23, 2012. This document will guide the City for efforts related to business attraction, retention, expansion and creation.*				
Shoreline Management Plan	Y	NA	N	Y
Comments: *This is not applicable to Roseville. Shoreline management plans are applicable to coastal communities and are incorporated into local coastal plans reviewed and approved by the California Coastal Commission.*				
Community Wildfire Protection Plan	N	NA	Y	Y
Comments:				
Response/Recovery Planning				
Comprehensive Emergency Management Plan	Y	NA	N	Y
Comments: *The City of Roseville emergency operations plan was adopted by the City Council on July 21, 2004 (Resolution #04-301) and previously updated in conjunction with the 2011 hazard mitigation plan update. The EOP was subsequently reviewed parallel to the 2016 hazard mitigation plan update. The plan is mandated by the California Office of Emergency Services.*				
Threat & Hazard Identification & Risk Assessment	N	NA	N	N
Comments:				
Terrorism Plan	Y	NA	N	N
Comments: *Terrorism Contingency Plan, 2004*				
Hazard Mitigation Plan	Y	N	N	N
Comments: *The Roseville Multi-Hazard Mitigation Plan was adopted on January 19, 2011. The City received formal approval by FEMA on March 28, 2011.*				
Post-Disaster Recovery Plan	N	NA	N	N
Comments:				
Continuity of Operations Plan	Y (partial)	NA	N	N
Comments: *The EOP contains a general overview of continuity of government and continuity of operations guidelines. The City does not have a stand-alone plan for continuity of government or continuity of operations.*				
Public Health Plan	N	NA	N	N
Comments:				

Table 4-11. Administrative and Technical Capability

Staff/ Personnel Resources	Available (Y or N)	Department or Agency (Positions)
1. Planners or engineers with knowledge of land development and land management practices	Y	Departments of Development Services, Public Works, Environmental Utilities, Electric, and Parks, Recreation & Libraries (Planners, Engineers, Landscape Architect)
2. Engineers or professionals trained in construction practices related to buildings and/or infrastructure	Y	Public Works, Development Services Department- Engineering Division (Engineering Inspectors); Building Inspection Division (Building Inspectors); Environmental Utilities Department (Engineers and Inspectors for Water/Sewer/Storm water), Parks, Recreation & Libraries (Park Development)
3. Planners or engineers with an understanding of natural hazards	Y	Development Services Department (Planners, Engineering); Public Works (Engineers); Environmental Utilities (Engineers)
4. Floodplain manager	Y	Public Works, Floodplain Management Division (Engineer)
5. Surveyors	N	No licensed surveyors on City staff. City can and has contracted for survey work on as-needed basis.
6. Personnel skilled or trained in GIS Applications	Y	Development Services Department (Business Services Technicians); Public Works (Engineering Assistants); Fire Department (GIS Analysts); Environmental Utilities Department (Mapping Manager); Information Technology Division (GIS Manager)
7. Scientist familiar with local natural hazards	N	
8. Emergency manager	Y	Fire Department (Emergency Preparedness Manager)
9. Grant writers	Y	City Manager's Office (Government Relations Manager)
10. Staff with expertise or training in benefit/cost analysis	Y	Finance Department (administration and budget); City Manager's Office (Economic Development Team); Public Works; Environmental Utilities Department; Electric Department

Table 4-12. Fiscal Capability

Financial Resources	Accessible or Eligible to Use (Y or N)
1. Community Development Block Grants	Y
2. Capital Improvements Project Funding	Y
3. Authority to Levy Taxes for Specific Purposes	Y
4. User Fees For Water, Sewer, Gas or Electric Service	Y
5. Impact Fees for Buyers or Developers of New Development/Homes	Y
6. Incur Debt through General Obligation Bonds	Y
7. Incur Debt through Special Tax Bonds	Y
8. Incur Debt through Private Activity Bonds	N
9. Could Withhold Public Expenditures in Hazard-Prone Areas	N
10. State-Sponsored Grant Programs	Y
11. Other	NA

Table 4-13. National Flood Insurance Program Compliance

Compliance Issue	Local Response
What local department is responsible for floodplain management?	City of Roseville Public Works
Who is your floodplain administrator? (department/position)	Public Works/Senior Civil Engineer
Are any certified floodplain managers on staff in your jurisdiction?	Yes
What is the date of adoption of your flood damage prevention ordinance?	2006
When was the most recent Community Assistance Visit or Community Assistance Contact?	September 10, 2014.
Does your jurisdiction have any outstanding National Flood Insurance Program compliance violations that need to be addressed?	No
Do your flood hazard maps adequately address the flood risk within your jurisdiction?	Yes
Does your floodplain management staff need any assistance or training to support its floodplain management program?	The City's floodplain management is staff is always seeking ways to expand its nationally recognized subject matter expertise in the field of floodplain management.
• **If so, what type of assistance/training is needed? .....**	For this planning performance period, the training will focus on fundamental changes to the NFIP and CRS driven by flood insurance reform.
Does your jurisdiction participate in the Community Rating System?	Yes

Table 4-14. Education and Outreach

Criteria	Response
Do you have a Public Information Officer or Communications Office?	Yes – multiple communications specialists in multiple departments. The Public Works and Fire communications specialists are heavily involved in developing and distributing mitigation-specific information.
Do you have personnel skilled or trained in website development?	Yes
Do you have hazard mitigation information available on your website?	Yes
• **If yes, please briefly describe.**	Fire Department City website contains the maintained mitigation webpage. This page includes information on the Plan, meetings, and progress reports
Do you utilize social media for hazard mitigation education and outreach?	Yes
• **If yes, please briefly describe.**	Facebook, Twitter, Nextdoor
Do you have any citizen boards or commissions that address issues related to hazard mitigation?	Yes – the Roseville Coalition of Neighborhood Associations is an active neighborhood association that participated in the 2016 Plan Steering Committee.
Do you have any other programs already in place that could be used to communicate hazard-related information?	Yes
• **If yes, please briefly describe.**	Email distribution lists, annual events (e.g. Earth Day), Neighborhood Fire Station Tours
Do you have any established warning systems for hazard events?	Yes – Alert Roseville

Table 4-15. Community Classifications

	Participating?	Classification	Date Classified
Community Rating System	Yes	1	10/01/06
Building Code Effectiveness Grading Schedule	Yes	2/2	11/28/2011
Public Protection	Yes	2	May 2015
Storm Ready	Yes	Blue	N/A
Firewise	No	N/A	N/A

Part 2. Risk Assessment

5. IDENTIFIED HAZARDS OF CONCERN AND RISK ASSESSMENT METHODOLOGY

Risk assessment is the process of measuring the potential loss of life, personal injury, economic injury, and property damage resulting from natural hazards. It allows emergency management personnel to establish early response priorities by identifying potential hazards and vulnerable assets. The process focuses on the following elements:

- **Hazard identification**—Use all available information to determine what types of disasters may affect a jurisdiction, how often they can occur, and their potential severity.
- **Vulnerability identification**—Determine the impact of natural hazard events on the people, property, environment, economy and lands of the region.
- **Cost evaluation**—Estimate the cost of potential damage or cost that can be avoided by mitigation.

The risk assessment for this hazard mitigation plan update evaluates the risk of natural hazards prevalent in the planning area and meets requirements of the DMA (44 CFR, Section 201.6(c)(2)).

5.1 IDENTIFIED HAZARDS OF CONCERN

The Steering Committee considered the full range of natural and human-caused hazards that could impact the area, and then identified and ranked the hazards that present the greatest concern. The selection of hazards of concern was based on the following criteria:

- The California State Hazard Mitigation Plan identified Placer County as being susceptible to the hazard.
- Historical occurrence of the hazard within the City of Roseville has caused fatalities, injury, or property damage.
- There is local knowledge and perception that the hazard could significantly impact the planning area, regardless of past occurrence.

Based on review of all available resources, the following hazards of concern were identified for the 2016 Plan:

- Climate change
- Dam failure
- Drought
- Earthquake
- Flooding
- Landslide
- Severe weather
- Wildfire
- Health hazards
- Human-caused hazards.

The Steering Committee did not omit any hazard commonly recognized to affect the City of Roseville.

5.2 METHODOLOGY

The risk assessments in Chapters 6 through 15 describe the risks associated with each identified hazard of concern. Each chapter describes the hazard, the planning area's vulnerabilities, and probable event scenarios. The following steps were used to define the risk of each hazard:

- **Identify and profile each hazard—**The following information is given for each hazard:
  - Geographic areas most affected by the hazard
  - Event frequency estimates
  - Severity estimates
  - Warning time likely to be available for response.
- **Determine exposure to each hazard—**Exposure was determined by overlaying hazard maps with an inventory of structures, facilities, and systems to determine which of them are within the area affected by the hazard.
- **Assess the vulnerability of exposed facilities—**Vulnerability of exposed structures and infrastructure was determined by interpreting the probability of occurrence of each event and assessing structures, facilities, and systems that are exposed to each hazard. Tools such as geographic information systems (GIS) and FEMA's hazard-modeling program called Hazus-MH were used to perform this assessment for the flood, dam failure and earthquake hazards. Outputs similar to those from Hazus-MH were generated for other hazards, using maps generated by the Hazus program.

5.3 RISK ASSESSMENT TOOLS

5.3.1 Dam Failure, Earthquake and Flood—Hazus-MH

Overview

In 1997, FEMA developed the standardized Hazards U.S., or Hazus, model to estimate losses caused by earthquakes and identify areas that face the highest risk and potential for loss. Hazus was later expanded into a multi-hazard methodology, Hazus-MH, with new models for estimating potential losses from hurricanes and floods.

Hazus-MH is a GIS-based software program used to support risk assessments, mitigation planning, and emergency planning and response. It provides a wide range of inventory data, such as demographics, building stock, critical facility, transportation and utility lifeline, and multiple models to estimate potential losses from natural disasters. The program maps and displays hazard data and the results of damage and economic loss estimates for buildings and infrastructure. Its advantages include the following:

- Provides a consistent methodology for assessing risk across geographic and political entities.
- Provides a way to save data so that it can readily be updated as population, inventory, and other factors change and as mitigation planning efforts evolve.
- Facilitates the review of mitigation plans because it helps to ensure that FEMA methodologies are incorporated.
- Supports grant applications by calculating benefits using FEMA definitions and terminology.
- Produces hazard data and loss estimates that can be used in communication with local stakeholders.
- Is administered by the local government and can be used to manage and update a hazard mitigation plan throughout its implementation.

Levels of Detail for Evaluation

Hazus-MH provides default data for inventory, vulnerability and hazards; this default data can be supplemented with local data to provide a more refined analysis. The model can carry out three levels of analysis, depending on the format and level of detail of information about the planning area:

- **Level 1—**All of the information needed to produce an estimate of losses is included in the software's default data. This data is derived from national databases and describes in general terms the characteristic parameters of the planning area.
- **Level 2—**More accurate estimates of losses require more detailed information about the planning area. To produce Level 2 estimates of losses, detailed information is required about local geology, hydrology, hydraulics and building inventory, as well as data about utilities and critical facilities. This information is needed in a GIS format.
- **Level 3—**This level of analysis generates the most accurate estimate of losses. It requires detailed engineering and geotechnical information to customize it for the planning area.

Application for This Plan

The following hazards were evaluated using Hazus-MH:

- **Flood—**A Level 2, user-defined analysis was performed for general building stock in flood zones and for critical facilities and infrastructure. Preliminary planning area flood mapping was used to delineate flood hazard areas and estimate potential losses from the 10-, 100- and 500-year flood events. To estimate damage that would result from a flood, Hazus uses pre-defined relationships between flood depth at a structure and resulting damage, with damage given as a percent of total replacement value. Curves defining these relationships have been developed for damage to structures and for damage to typical contents within a structure. By inputting flood depth data and known property replacement cost values, dollar-value estimates of damage were generated.
- **Dam Failure—**A Level 2 analysis was run for Folsom Dam using the flood methodology described above.
- **Earthquake—**A Level 2 analysis was performed to assess earthquake exposure and vulnerability for two scenario events and one probabilistic event:
  - A Magnitude-6.8 event on the Concord-Green Valley Fault with an epicenter 56 miles southwest of Roseville
  - A Magnitude-7.1 event on the Great Valley Fault with an epicenter 58 miles west northwest of Roseville
  - The standard Hazus-MH 100-year probabilistic event.

5.3.2 Landslide, Severe Weather, and Wildfire

For most of the hazards of concern, historical data was not adequate to model future losses. However, areas and inventory susceptible to some of the hazards of concern were mapped, and exposure was evaluated. For other hazards, a qualitative analysis was conducted using the best available data and professional judgment.

5.3.3 Drought

The risk assessment methodologies used for the 2016 Plan focus on damage to structures. Because drought does not impact structures, the risk assessment for drought was more limited and qualitative than the assessment for the other hazards of concern.

5.3.4 Climate Change

Climate change was addressed to different standards than the above natural hazards for the following reasons:

- Specific data needed to assess risk, such as maps of extent and location and applied damage functions, are not readily available for climate change.
- Standardized climate change models based on greenhouse gas emissions do not currently exist, resulting in a high variation of scenarios that result in differing projections. Until a standardized model is identified, climate change assessment will remain subjective.

5.3.5 Health Hazards and Human-Caused Hazards

The non-natural hazards of concern were assessed to different standards than the natural hazards for the following reasons:

- The assessment of non-natural hazards is optional under federal hazard mitigation planning requirements (44 CFR Section 201.6).
- The data needed to assess risk, such as maps of extent and location and applied damage functions, are not readily available for these types of hazards.
- A key element of risk is the probability of occurrence. Probabilities are usually assigned based on past historical occurrences. While human-caused and human health hazards have had significant impacts on our nation as a whole, they have not impacted regions of the country uniformly as do natural hazard events. The lack of record of past occurrences within a planning area makes it difficult to assign probability of occurrence.

5.4 MAPPING

A review of national, state and county databases was performed to locate available spatially based data relevant to this planning effort. Maps were produced using GIS software to show the spatial extent and location of identified hazards when such data was available. These maps are included in the hazard profile chapters of this document. Information regarding the data sources and methodologies employed in these mapping efforts is provided in the sections below.

5.4.1 Building and Cost Data

Replacement cost values and detailed structure information derived from parcel and tax assessor data provided by the City of Roseville were loaded into Hazus-MH. When available, an updated inventory was used in place of the Hazus-MH defaults for critical facilities and infrastructure.

Replacement cost is the cost to replace the entire structure with one of equal quality and utility. Replacement cost is based on industry-standard cost-estimation models published in *RS Means Square Foot Costs* (RS Means, 2015). It is calculated using the RS Means square foot cost for a structure, which is based on the Hazus-MH occupancy class (e.g., multi-family residential, commercial retail trade), multiplied by the square footage of the structure from the tax assessor data. For single-family residential, the construction class and number of stories also factor into determining the square foot costs.

5.4.2 Hazus-MH Data Inputs

The following hazard data were used for the Hazus-MH Level 2 analysis conducted for the risk assessment:

- **Flood—**The preliminary Digital Flood Insurance Rate Map (DFIRM) for the planning area – dated December 28, 2015 – was used to delineate flood hazard areas and estimate potential losses from the

100-year, 500-year and 10-year flood events. Using the DFIRM floodplain boundaries and base flood elevation information, and the Central Valley Flood Delineation Project 3-foot digital elevation model data, flood depth grids were generated and integrated into the Hazus-MH model.

- **Dam Failure—**Inundation area data from the Folsom Dam Containment Dike Failure Risk Assessment Project, provided by the City of Roseville, and the 3-foot digital elevation model were used to develop depth grids that were integrated into the Hazus-MH model.
- **Earthquake—**Earthquake shake maps and probabilistic data prepared by the U.S. Geological Survey (USGS) were used for the analysis of this hazard. A National Earthquake Hazard Reduction Program (NEHRP) soils map from the California Department of Conservation was also integrated into the Hazus-MH model.

5.4.3 Other Local Hazard Data

Locally relevant information on hazards was gathered from a variety of sources. Frequency and severity indicators include past events and the expert opinions of geologists, emergency management specialists and others. Data sources for specific hazards were as follows:

- **Landslide—**A dataset for landslide probability was created by intersecting slope data with NEHRP soils data. Three landslide probability classifications were created: high (greater than 30 percent slope, D soils), moderate (15 to 30 percent slope, D type soils), and low (0 to 15 percent slope, D type soils). The slope data were generated from the 3-foot digital elevation model. The NEHRP soils data were provided by the California Department of Conservation.
- **Severe Storm—**No GIS format severe storm area data were identified for the City of Roseville.
- **Wildfire—**California Department of Forestry and Fire Protection (CAL FIRE) fire severity data was downloaded from the CAL FIRE website.

5.4.4 Data Source Summary

Table 5-1 summarizes the data sources used for the risk assessment for this project.

5.4.5 Limitations

Loss estimates, exposure assessments and hazard-specific vulnerability evaluations rely on the best available data and methodologies. Uncertainties are inherent in any loss estimation methodology and arise in part from incomplete scientific knowledge concerning hazards and their effects on the built environment. Uncertainties also result from the following:

- Approximations and simplifications necessary to conduct a study
- Incomplete or outdated inventory, demographic, or economic parameter data
- The unique nature, geographic extent and severity of each hazard
- Mitigation measures already employed
- The amount of advance notice residents have to prepare for a specific hazard event.

These factors can result in a range of uncertainty in loss estimates, possibly by a factor of two or more. Therefore, exposure and loss estimates are approximate. These results do not predict precise results and should be used only to understand relative risk. Over the long term, the City of Roseville will collect additional data to assist in estimating potential losses associated with other hazards.

Table 5-1. Hazus-MH Model Data Documentation

Data	Source	Date	Format
Property parcel data	City of Roseville	2016	Digital (GIS) format
Address points	City of Roseville	2016	Digital (GIS) format
Building footprints	City of Roseville	2016	Digital (GIS) format
Building information[a]	City of Roseville	2016	Digital (GIS) format
Building replacement cost	RS Means	2015	Printed. Updated RS Means values
Population data	Hazus-MH v2.2	2010	Digital (GIS and tabular) format
Flood hazard data	FEMA	2015	Digital (GIS) format
First floor elevation data	City of Roseville	2011	Digital (tabular) format
Earthquake shake maps	USGS Earthquake Hazards Program website	2012	Digital (GIS) format
NEHRP Soils	California Department of Conservation	2008	Digital (GIS) format
Dam inundation area	City of Roseville	2010	Digital (GIS) format
Landslide	Tetra Tech Inc.	2016	Digital (GIS) format
Wildfire	CAL FIRE	2008	Digital (GIS) format
Digital Elevation Model	City of Roseville	2015	Digital (GIS) format
CRITICAL FACILITIES AND ASSETS			
Landmarks[b]	City of Roseville	2015	Digital (GIS) format
State and local bridges	Caltrans	2015	Digital (GIS) forma
Rail facilities	Caltrans	2015	Digital (GIS) format
Telecommunications facilities	City or Roseville	2015	Digital (GIS) format
Consolidated communications facilities	Consolidated Communications (from 2011 Hazard Mitigation Plan)	2011	Digital (GIS) format
Hazardous material facilities	U.S. EPA Toxic Release Inventory	2016	Digital (GIS) format
Potable water facilities	City of Roseville	2015	Digital (GIS) format
Sewer facilities	City of Roseville	2015	Digital (GIS) format

a. Building information includes area, occupancy, date of construction, and stories
b. Landmarks include fire stations, police stations, schools, medical care facilities, helipads, rail facilities, electric power facilities, potable water facilities, sewer facilities, and various government facilities

6. CLIMATE CHANGE CONSIDERATIONS FOR HAZARD MITIGATION

6.1 CALIFORNIA SENATE BILL NO. 379

California Senate Bill 379, adopted October 8, 2015, requires that local hazard mitigation plans adopted on or after January 1, 2017 include all of the following:

- A vulnerability assessment that identifies the risks that climate change poses to the local jurisdiction and the geographic areas at risk from climate change impacts, including but not limited to flood and fire hazards. Information available from federal, state, regional and local agencies should be used in the development of this assessment, including the following:
  - Information from the Internet-based Cal-Adapt tool
  - Information from the most recent version of the California Adaptation Planning Guide
  - Information from local agencies on the types of assets, resources, and populations that will be sensitive to various climate change exposures
  - Information from local agencies on their current ability to deal with the impacts of climate change
  - Historical data on natural events and hazards, including locally prepared maps of areas subject to previous risk, areas that are vulnerable, and sites that have been repeatedly damaged
  - Existing and planned development in identified at-risk areas, including structures, roads, utilities, and essential public facilities
  - Federal, state, regional, and local agencies with responsibility for the protection of public health and safety and the environment, including special districts and local offices of emergency services
- A set of adaptation and resilience goals, policies, and objectives based on the available information
- A set of feasible implementation measures designed to carry out the goals, policies, and objectives including, but not limited to, all of the following:
  - Feasible ways to avoid or minimize climate change impacts associated with new uses of land
  - Siting new essential public facilities outside of at-risk areas when feasible (including, but not limited to, hospitals and health care facilities, emergency shelters, emergency command centers, and emergency communications facilities) or, if these facilities are located in at-risk areas, using construction or other methods to minimize damage
  - The designation of adequate and feasible infrastructure in an at-risk area
  - Guidelines for working cooperatively with relevant local, regional, state, and federal agencies.
  - The identification of natural infrastructure that may be used in adaptation projects, where feasible. Where feasible, the plan shall use existing natural features and ecosystem processes or restore natural features and ecosystem processes, when developing alternatives for consideration.

At the time of the development of this hazard mitigation plan, guidelines and resources are still being developed to assist local governments in meeting the intent of Senate Bill No. 379. Information in this chapter addresses the issues presented and the intent of the requirements using the best currently available information. It focuses on the

vulnerability assessment of climate change as it relates to the natural hazards of concern selected by the steering committee. Goals, policies, objectives and implementation measures for climate change are incorporated into this Plan's overall mitigation goals, objectives, and actions presented in Part 3.

6.2 WHAT IS CLIMATE CHANGE?

Climate, consisting of patterns of temperature, precipitation, humidity, wind and seasons, plays a fundamental role in shaping natural ecosystems and the human economies and cultures that depend on them. "Climate change" refers to changes over a long period of time. Worldwide, average temperatures have increased 1.4ºF since 1880 (NASA, 2015). Although this change may seem small, it can lead to large changes in climate and weather.

The warming trend and its related impacts are caused by increasing concentrations of carbon dioxide and other greenhouse gases in the earth's atmosphere. Greenhouse gases are gases that trap heat in the atmosphere, resulting in a warming effect. Carbon dioxide is the most commonly known greenhouse gas; however, methane, nitrous oxide and fluorinated gases also contribute to warming. Emissions of these gases come from a variety of sources, such as the combustion of fossil fuels, agricultural production, changes in land use and volcanic eruptions. According to the U.S. Environmental Protection Agency (EPA), carbon dioxide concentrations measured about 280 parts per million (ppm) before the industrial era began in the late 1700s and have risen 43 percent since then, reaching 399 ppm in 2014 (see Figure 6-1). Scientists are able to place this rise in carbon dioxide in a longer historical context through the measurement of carbon dioxide in ice cores. According to these records, carbon dioxide concentrations in the atmosphere are the highest that they have been in 800,000 years (NASA, 2016).

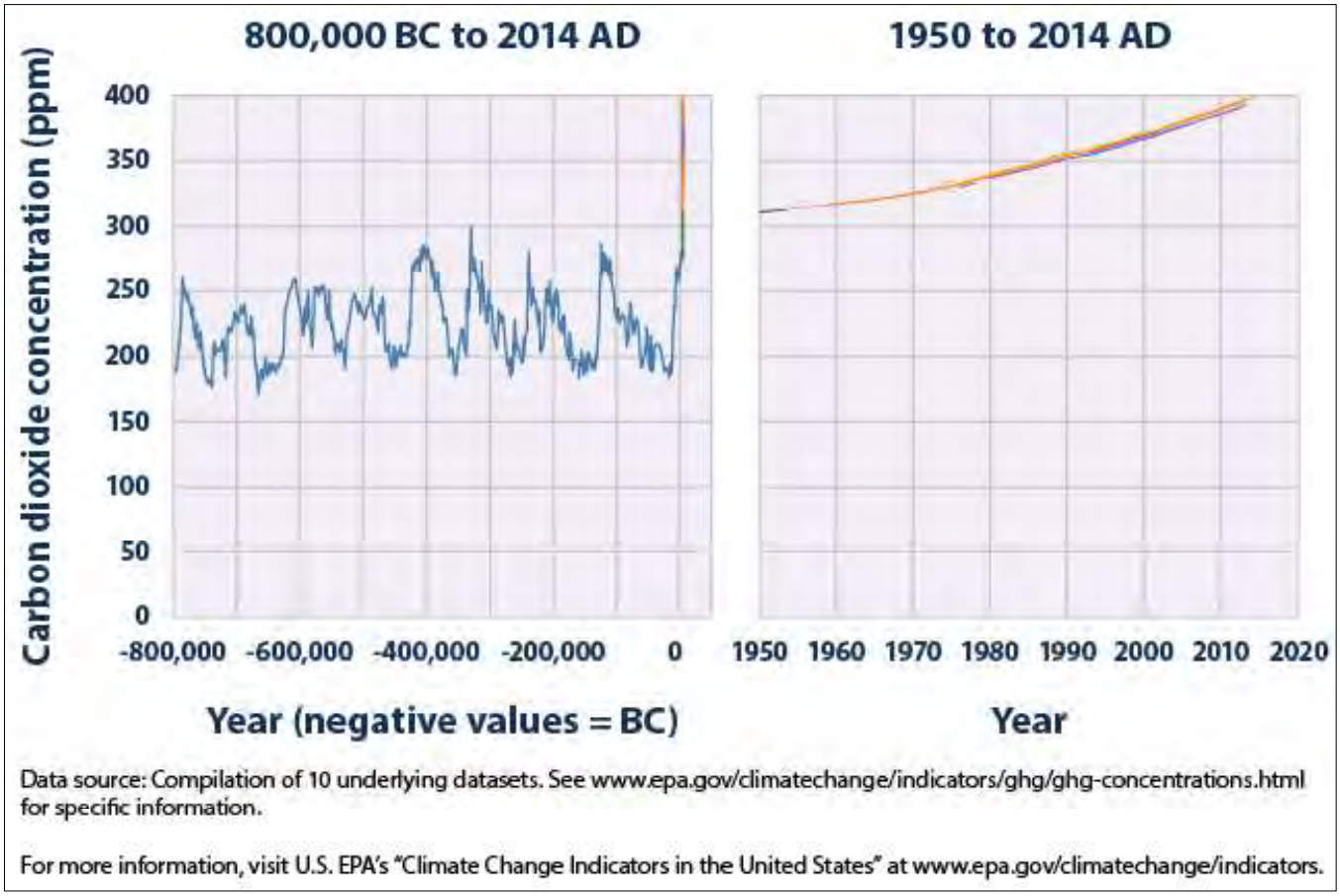


Figure 6-1. Global Carbon Dioxide Concentrations Over Time

According to NASA, most of this trend is very likely human-induced, and the rate of change has not been matched in the past 1,300 years (NASA, 2016). There is broad scientific consensus (97 percent of scientists) that climate-warming trends are very likely due to human activities (NASA, 2016). Unless emissions of greenhouse gases are substantially reduced, this warming trend and its associated impacts are expected to continue.

Climate change will affect the people, property, economy and ecosystems of the City of Roseville in a variety of ways. Climate change impacts are most frequently associated with negative consequences, such as increased flood vulnerability or increased heat-related illnesses and other public health concerns; however, other changes may present opportunities. The most important effect for the development of this Plan is that climate change will have a measurable impact on the occurrence and severity of natural hazards.

6.3 HOW CLIMATE CHANGE AFFECTS HAZARD MITIGATION

An essential aspect of hazard mitigation is predicting the likelihood of hazard events in a planning area. Typically, predictions are based on statistical projections from records of past events. This approach assumes that the likelihood of hazard events remains essentially unchanged over time. Thus, averages based on the past frequencies of, for example, floods are used to estimate future frequencies: if a river has flooded an average of once every 5 years for the past 100 years, then it can be expected to continue to flood an average of once every 5 years.

For hazards that are affected by climate conditions, the assumption that future behavior will be equivalent to past behavior is not valid if climate conditions are changing. As flooding is generally associated with precipitation frequency and quantity, for example, the frequency of flooding will not remain constant if broad precipitation patterns change over time. The risks of, landslide, severe storms, extreme heat and wildfire are all affected by climate patterns as well. For this reason, an understanding of climate change is pertinent to efforts to mitigate natural hazards. Information about how climate patterns are changing provides insight on the reliability of future hazard projections used in mitigation analysis. This chapter summarizes current understandings about climate change in order to provide a context for the recommendation and implementation of hazard mitigation measures.

6.4 CURRENT INDICATIONS OF CLIMATE CHANGE

The major scientific agencies of the United States and the world—including the National Aeronautics and Space Administration (NASA), the National Oceanic and Atmospheric Administration (NOAA) and the Intergovernmental Panel of Climate Change (IPCC)—agree that climate change is occurring. Multiple temperature records from all over the world have shown a warming trend, and the IPCC has stated that the warming of the climate system is unequivocal (IPCC, 2014). Of the 10 warmest years in the 134-year record, all but one (1998) occurred since 2000, and 2015 was the warmest year on record (NASA, 2016).

Rising global temperatures have been accompanied by other changes in weather and climate. Many places have experienced changes in rainfall resulting in more intense rain, as well as more frequent and severe heat waves (IPCC, 2014). The planet's oceans and glaciers have also experienced changes: oceans are warming and becoming more acidic, ice caps are melting, and sea levels are rising (NASA, 2016). Global sea level has risen 6.7 inches, on average, in the last 100 years (NASA, 2016). This has already put some coastal homes, beaches, roads, bridges, and wildlife at risk (USGCRP, 2009).

NASA currently maintains information on the vital signs of the planet and has identified the following trends as of the time of the development of this Plan (NASA, 2016):

- Carbon Dioxide—Increasing trend, currently at 403.28 parts per million
- Global Temperature—Increasing trend, increase of 1.4ºF since 1880
- Arctic Ice Minimum—Decreasing trend, 13.4 percent per decade

- Land Ice—Decreasing trend, 287.0 billion metric tons per year
- Sea Level—Increasing trend, 3.4 mm per year.

6.5 PROJECTED FUTURE IMPACTS

Climate change projections contain inherent uncertainty because they are dependent on future greenhouse gas emission scenarios. Different climate change models may assume different scenarios, resulting in differing projections. Generally, the uncertainty is addressed by developing projections for a range of scenarios: in low-emissions scenarios, greenhouse gas emissions are assumed to be reduced substantially from current levels; in high-emissions scenarios, they are assumed to increase or continue at current levels. Despite these uncertainties, climate change projections present valuable information to help guide decision-making for the future.

The Third National Climate Assessment Report for the United States indicates that impacts resulting from climate change will continue through the 21st century and beyond. Although not all changes are understood at this time and the impacts of those changes will depend on global emissions of greenhouse gases and sensitivity in human and natural systems, the following impacts are expected in the United States (NASA, 2016):

- Temperatures will continue to rise
- Growing seasons will lengthen
- Precipitation patterns will change
- Droughts and heat waves will increase
- Hurricanes will become stronger and more intense
- Sea level will rise 1 to 4 feet by 2100
- The Arctic may become ice free.

The California Climate Adaptation Planning Guide outlines the following climate change impact concerns for the North Sierra Region communities (Cal EMA et al., 2012):

- Increased temperature
- Decreased precipitation
- Reduced snowpack
- Reduced tourism
- Ecosystem change
- Sensitive species stress
- Increased wildfire.

Cal-Adapt, a publicly available resource, offers information on how climate change might impact local communities. It presents visualization tools that present the most current data available whenever possible. The following sections summarize projections by Cal-Adapt for the Roseville area's local climate.

6.5.1 Precipitation

According to Cal-Adapt, precipitation projections for California remain uncertain. Models show differing impacts from slightly wetter winters to slightly drier winters, with potential for a 10- to 20-percent decrease in total annual precipitation (Cal-Adapt, 2016). Changes in precipitation patterns, coupled with warmer temperatures, may lead to significant changes in hydrology. In high-emissions scenarios, more precipitation may fall as rain rather than snow, and snow may melt earlier in the season, impacting the timing of stream flow changes and floods (Cal-Adapt, 2016).

6.5.2 Temperature

The historical average (1961-1990) temperature in the Roseville area is 61.7ºF. By 2090, the average temperature in the City is expected to increase above this baseline in the low- and high-emissions scenarios by 3.8ºF and 6.5ºF, respectively, as shown in Figure 6-2.

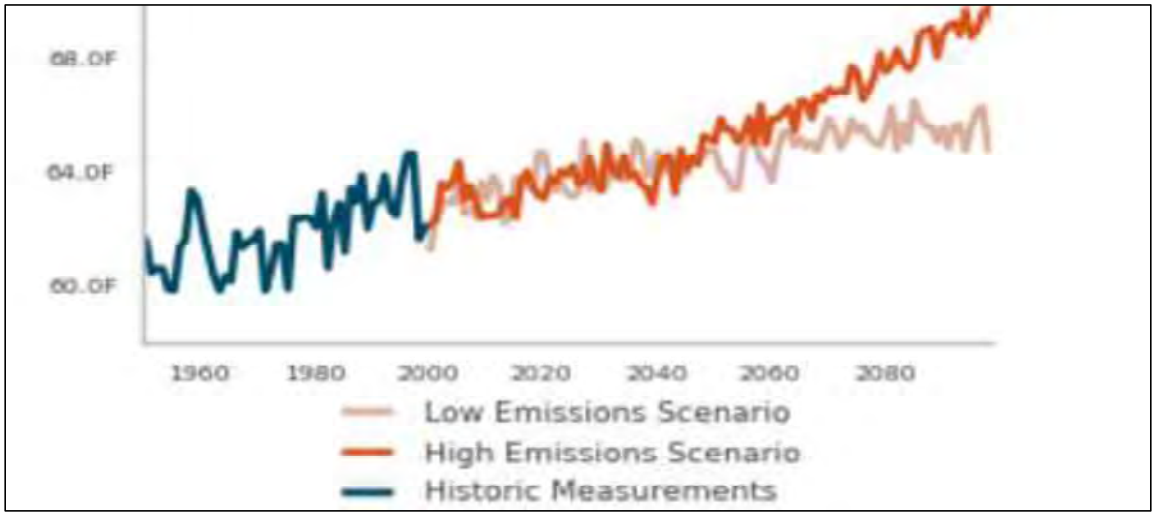


Figure 6-2. Observed and Projected Average Temperatures in the Roseville Area

6.5.3 Snow Pack

While there are no snow-water equivalency measurements for the Roseville area, Cal-Adapt indicates that some parts of California should expect snow pack levels to be reduced by up to 25 inches from the baseline (1961-1990) by 2090.

6.5.4 Wildfire

Wildfire risk is expected to change in the coming decades. Under the high-emissions scenario, the fire risk in Placer County may increase by 1.86 times the current risk by 2085, while the risk may be 1.31 times the current risk for the low-emissions scenario (see Figure 6-3).

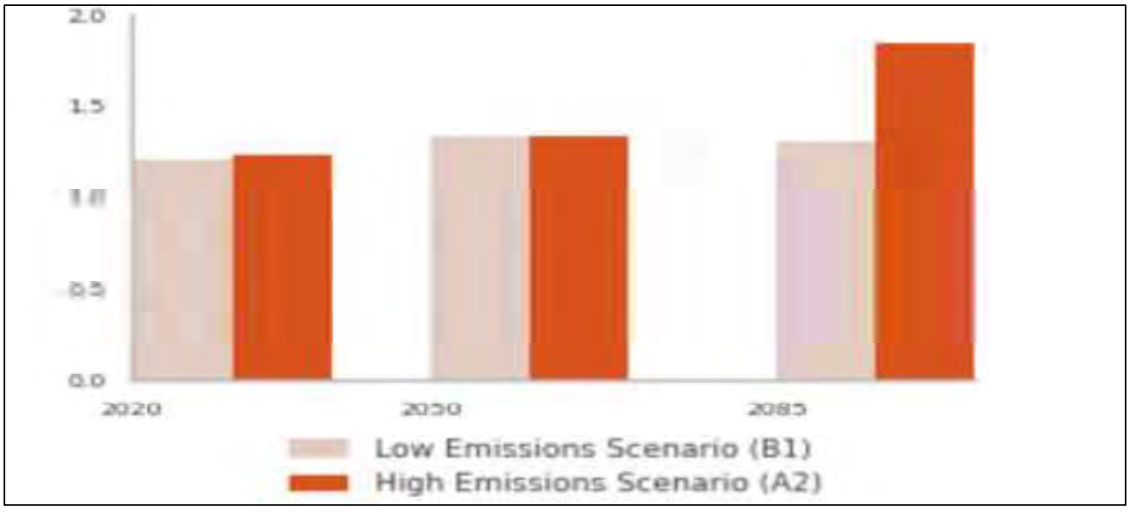


Figure 6-3. Projected Future Fire Risk in Placer County Relative to 2010 Levels

6.6 RESPONSES TO CLIMATE CHANGE

Communities and governments worldwide are working to address, evaluate and prepare for climate changes that are likely to impact communities in coming decades. Societies across the world are facing the need to adapt to changing conditions associated with natural disasters and climate change. Farmers are altering crops and agricultural methods to deal with changing rainfall and rising temperature; architects and engineers are redesigning buildings; planners are looking at managing water supplies to deal with droughts or flooding.

6.6.1 Mitigation and Adaptation

Generally, climate change discussions encompass two separate but inter-related considerations: mitigation and adaptation. The term "mitigation" can be confusing, because it's meaning changes across disciplines:

- Mitigation in climate change discussions is defined as "a human intervention to reduce the impact on the climate system." It includes strategies to reduce greenhouse gas sources and emissions and enhance greenhouse gas sinks (EPA, 2013).
- Mitigation in emergency management is typically defined as the effort to reduce loss of life and property by lessening the impact of disasters (FEMA, 2016a).
- Mitigation in restoration ecology and related fields generally refers to policies, programs or actions that are intended to reduce or to offset the negative impacts of human activities on natural systems. Generally, mitigation can be understood as avoiding, minimizing, rectifying, reducing or eliminating, or compensating for known impacts (U.S. DOT, n.d.).

In this chapter, mitigation is used as defined by the climate change community. In the other chapters of this Plan, mitigation is primarily used in an emergency management context.

Adaptation is defined by the IPCC as adjusting to actual or expected climate and its effects. It includes efforts to moderate or avoid harm to human systems or take advantage of beneficial opportunities. It also includes human intervention to help natural systems adjust to expected climate change (IPCC, 2014).

Mitigation and adaptation are related, as the world's ability to mitigate greenhouse gas emissions will affect the degree of adaptation that will be necessary. Some initiatives and actions can both reduce greenhouse gas emissions and support adaptation to likely future conditions.

6.6.2 Ecosystem-Based Adaptation

Ecosystem-based adaptation is the use of biodiversity and ecosystem services as part of an overall strategy to help people adapt to the adverse effects of climate change. This includes the sustainable management, conservation and restoration of specific ecosystems that provide key services. Most ecosystems show a remarkable ability to adapt to change and to buffer surrounding areas from the impacts of change. Forests can bind soils and hold large volumes of water during times of plenty, releasing it through the year; floodplains can absorb vast volumes of water during peak flows; coastal ecosystems can hold out against storms, attenuating waves and reducing erosion. Other ecosystem services—such as food provision, timber, materials, medicines and recreation—can provide a buffer to societies in the face of changing conditions.

6.6.3 City of Roseville Sustainability Efforts

The City of Roseville has taken steps to reduce the impacts of climate change through greenhouse gas mitigation and community sustainability efforts:

- The City of Roseville's general plan highlights existing policies and programs that either reduce greenhouse gas emissions or assist in protecting residents from the potential adverse impacts of climate change (City of Roseville, 2016).
- In 2009, the City Council adopted the City-operations Climate Action Plan, which set a greenhouse gas emission reduction goal of 22.8 percent (City of Roseville, n.d.).
- In 2010 the Community-wide Sustainability Action Plan was developed, recommending 11 steps to reach the greenhouse gas emission targets. (City of Roseville, 2010a).

6.7 CLIMATE CHANGE IMPACTS ON HAZARDS

The following sections provide information on how each identified hazard of concern for this planning process may be impacted by climate change. They describe how these impacts may alter current exposure and vulnerability to these hazards of the people, property, critical facilities and environment in the City of Roseville. Detailed hazard profiles and risk assessment information on each hazard of concern are presented in Chapters 7 through 15.

6.7.1 Drought

Impacts on Hazard

The long-term effects of climate change on regional water resources are unknown, but global water resources are already experiencing the following stresses without climate change:

- Growing populations
- Increased competition for available water
- Poor water quality
- Environmental claims
- Uncertain reserved water rights
- Groundwater overdraft
- Aging urban water infrastructure.

With a warmer climate, droughts could become more frequent, more severe, and longer-lasting. According to the National Climate Assessment Report, higher surface temperatures caused by global warming increase the potential for drought. Evaporation and the higher rate at which plants lose moisture through their leaves both increase with temperature. Unless higher evapotranspiration rates are matched by increases in precipitation, areas become more dry, promoting drought conditions (Globalchange.gov, 2014).

Because expected changes in precipitation patterns are still uncertain, the potential impacts and likelihood of drought are uncertain. California DWR has already noted the impact of climate change on statewide water resources by charting changes in snowpack, sea level, and river flow. As temperatures rise and more precipitation comes in the form of rain instead of snow, these changes will likely continue or grow even more significant. DWR estimates that the Sierra Nevada snowpack, which supplies water for the City of Roseville and other parts of the state, will experience a 48- to 65-percent loss by the end of the century, based on historical April 1 averages (CA DWR 2016). Increasing temperatures may also increase net evaporation from reservoirs by 15 to 37 percent (CA DWR 2013).

Population

Population exposure and vulnerability to drought are unlikely to increase as a result of climate change. While greater numbers of people may need to engage in behavior change, such as water saving efforts, significant life or health impacts are unlikely.

Property

Property exposure and vulnerability may increase as a result of increased drought resulting from climate change, although this would most likely occur in non-structural property such as landscaping. It is unlikely that structure exposure or vulnerability would increase as a direct result of drought, although secondary impacts of drought, such as wildfire, may increase and threaten structures.

Critical Facilities

Critical facility exposure and vulnerability are unlikely to increase as a result of increased drought resulting from climate change; however, critical facility operators may need to alter standard management practices and actively manage resources, particularly in water-related service sectors.

Environment

The vulnerability of the environment may increase as a result of increased drought resulting from climate change. Ecosystems and biodiversity in the Roseville area are already under stress from development and water diversion. Prolonged or more frequent drought resulting from climate change may further stress the ecosystems in the region, which include many special status species (Cal EMA et al., 2012).

6.7.2 Earthquake

Impacts on Hazard

The impacts of global climate change on earthquake probability are unknown. Some scientists say that melting glaciers could induce tectonic activity. As ice melts and water runs off, tremendous amounts of weight are shifted on the earth's crust. As newly freed crust returns to its original, pre-glacier shape, it could cause seismic plates to slip and stimulate volcanic activity, according to research into prehistoric earthquakes and volcanic activity. NASA and USGS scientists found that retreating glaciers in southern Alaska may be opening the way for future earthquakes (NASA, 2004).

Secondary impacts of earthquakes could be magnified by climate change. Soils saturated by repetitive storms or heavy precipitation could experience liquefaction or an increased propensity for slides during seismic activity due to the increased saturation. Dams storing increased volumes of water due to changes in the hydrograph could fail during seismic events.

Population, Property, Critical Facilities and the Environment

Because impacts of climate change on the earthquake hazard are not well understood, increases in exposure and vulnerability of the local resources are not able to be determined.

6.7.3 Flood

Impacts on Hazard

Use of historical hydrologic data has long been the standard of practice for designing and operating water supply and flood protection projects. For example, historical data are used for flood forecasting models and to forecast snowmelt runoff for water supply. This method of forecasting assumes that the climate of the future will be similar to that of the period of historical record. However, the hydrologic record cannot be used to predict changes in frequency and severity of extreme climate events such as floods. Going forward, model calibration or statistical relation development must happen more frequently, new forecast-based tools must be developed, and a standard of practice that explicitly considers climate change must be adopted. Climate change is already impacting water resources, and resource managers have observed the following:

- Historical hydrologic patterns can no longer be solely relied upon to forecast the water future.
- Precipitation and runoff patterns are changing, increasing the uncertainty for water supply and quality, flood management and ecosystem functions.
- Extreme climatic events will become more frequent, necessitating improvement in flood protection, drought preparedness and emergency response.

The amount of snow is critical for water supply and environmental needs, but so is the timing of snowmelt runoff into rivers and streams. Rising snowlines caused by climate change will allow more mountain areas, such as the Sierra Nevada watersheds, to contribute to peak storm runoff. High frequency flood events (e.g. 10-year floods) in particular will likely increase with a changing climate. Along with reductions in the amount of the snowpack and accelerated snowmelt, scientists project greater storm intensity, resulting in more direct runoff and flooding. Changes in watershed vegetation and soil moisture conditions will likewise change runoff and recharge patterns. As stream flows and velocities change, erosion patterns will also change, altering channel shapes and depths, possibly increasing sedimentation behind dams, and affecting habitat and water quality. With potential increases in the frequency and intensity of wildfires due to climate change, there is potential for more floods following fire, which increase sediment loads and water quality impacts.

As hydrology changes, what is currently considered a 1-percent-annual-chance (100-year) flood may strike more often, leaving many communities at greater risk. Planners will need to factor a new level of safety into the design, operation, and regulation of flood protection facilities such as dams, bypass channels and levees, as well as the design of local sewers and storm drains.

Population and Property

Population and property exposure and vulnerability may increase as a result of climate change impacts on the flood hazard. Runoff patterns may change, resulting in flooding in areas where it has not previously occurred.

Critical Facilities

Critical facility exposure and vulnerability may increase as a result of climate change impacts on the flood hazard. Runoff patterns may change, resulting in risk to facilities that have not historically been at risk from flooding. Additionally, changes in the management and design of flood protection critical facilities may be needed as additional stress is placed on these systems.

Environment

The exposure and vulnerability of the environment may increase as a result of climate change impacts on the flood hazard. Changes in the timing and frequency of flood events may have broader ecosystem impacts that alter the ability of already stressed species to survive.

6.7.4 Landslide

Impacts on Hazard

Climate change may impact storm patterns, increasing the probability of more frequent, intense storms with varying duration. Increase in global temperature is likely to affect the snowpack and its ability to hold and store water. Warming temperatures also could increase the occurrence and duration of droughts, which would increase the probability of wildfire, reducing the vegetation that helps to support steep slopes. All of these factors would increase the probability for landslide occurrences.

Population and Property

Population and property exposure and vulnerability would be unlikely to increase as a result of climate change impacts on the landslide hazard. Landslide events may occur more frequently, but the extent and location should be contained within mapped hazard areas.

Critical Facilities

Critical facility exposure and vulnerability would be unlikely to increase as a result of climate change impacts on the landslide hazard; however, critical facility owners and operators may experience more frequent disruption to service provision as a result of landslide hazards. For example, transportation systems may experience more frequent delays if slides blocking these systems occur more frequently.

Environment

Exposure and vulnerability of the environment would be unlikely to increase as a result of climate change, but more frequent slides in riverine systems may impact water quality and have negative impacts on already stressed species.

6.7.5 Severe Weather

Impacts on Hazard

Climate change presents a challenge for risk management associated with severe weather. The frequency of severe weather events has increased steadily over the last century. The number of weather-related disasters during the 1990s was four times that of the 1950s, and cost 14 times as much in economic losses. Historical data shows that the probability of severe weather events increases in a warmer climate.

An increase in average surface temperatures can also lead to more intense heat waves that can be exacerbated in urbanized areas by what is known as urban heat island effect. Evidence suggests that heat waves are already increasing, especially in western states. According to information on Cal-Adapt, extreme heat days in Roseville (103ºF is the extreme heat day threshold) are likely to increase from a historical average for four days annually. This increase would be coupled with an increase in heat waves and warm nights (67ºF threshold).

Population and Property

For the most part, population and property exposure and vulnerability would be unlikely to substantially increase as a direct result of climate change impacts on the severe weather hazard. Severe weather events may occur more frequently. Disproportionately impacted populations such as the elderly or disadvantaged communities that have substandard living arrangements (homeless populations, etc.) would have a potential for increased exposure and vulnerability from severe weather. Secondary impacts, such as the extent of localized flooding, may increase, thus impacting greater numbers of people and structures.

Critical Facilities

Critical facility exposure and vulnerability would be unlikely to increase as a result of climate change impacts on the severe weather hazard; however, critical facility owners and operators may experience more frequent disruption to service provision. For example, more frequent and intense storms may cause more frequent disruptions in power service.

Environment

Exposure and vulnerability of the environment would be unlikely to increase as a result of climate change impacts on the severe weather hazard; however, more frequent storms and heat events and more intense rainfall may place additional stressors on already stressed systems.

6.7.6 Wildfire

Impacts on Hazard

Wildfire is determined by climate variability, local topography, and human intervention. Climate change has the potential to affect multiple elements of the wildfire system: fire behavior, ignitions, fire management, and vegetation fuels. Hot dry spells create the highest fire risk. Increased temperatures may intensify wildfire danger by warming and drying out vegetation. Additionally, changes in climate patterns may impact the distribution and perseverance of insect outbreaks that create dead trees (increase fuel). When climate alters fuel loads and fuel moisture, forest susceptibility to wildfires changes. Climate change also may increase winds that spread fires. Faster fires are harder to contain, and thus are more likely to expand into residential neighborhoods.

Population, Property and Critical Facilities

According to the Cal-Adapt projections, wildfire risk in the areas surrounding the City of Roseville is expected to increase by 2085. Larger, more frequent fires may impact people, property and critical facilities by increasing the risk of ignition from nearby fire sources. Additionally, secondary impacts such as air quality issues may increase.

Environment

It is possible that the exposure and vulnerability of the environment will be impacted by impacts on wildfire risk from climate change. Natural fire regimes may change, resulting in more frequent or higher intensity burns. These impacts may alter the composition of the ecosystems in areas in and around Roseville.

7. DAM FAILURE

7.1 GENERAL BACKGROUND

7.1.1 Causes of Dam Failure

Dam failures can be catastrophic to human life and property downstream. Dam failures in the United States typically occur in one of four primary ways:

- Overtopping of the primary dam structure, which accounts for 34 percent of all dam failures, can occur due to inadequate spillway design, settlement of the dam crest, blockage of spillways, and other factors.
- Foundation defects due to differential settlement, slides, slope instability, uplift pressures, and foundation seepage can also cause dam failure. These account for 30 percent of all dam failures.
- Failure due to piping and seepage accounts for 20 percent of all failures. These are caused by internal erosion due to piping and seepage, erosion along hydraulic structures such as spillways, erosion due to animal burrows, and cracks in the dam structure.
- Failure due to problems with conduits and valves, typically caused by the piping of embankment material into conduits through joints or cracks, constitutes 10 percent of all failures.

The remaining 6 percent are due to other miscellaneous causes. Many of the historical dam failures in the United States have been secondary results of other disasters. The prominent causes are earthquakes, landslides, extreme storms, massive snowmelt, equipment malfunction, structural damage and foundation failures.

The most likely disaster-related causes of dam failure in Placer County and the Roseville vicinity are earthquakes, excessive rainfall, and landslides. Poor construction, lack of maintenance and repair, and deficient operational procedures are preventable or correctable by a program of regular inspections. Terrorism and vandalism are serious concerns that all operators of public facilities must plan for; these threats are under continuous review by public safety agencies.

DEFINITIONS

Dam—Any artificial barrier, together with appurtenant works, that does or may impound or divert water, and that either (a) is 25 feet or more in height from the natural bed of the stream or watercourse at the downstream toe of the barrier (or from the lowest elevation of the outside limit of the barrier if it is not across a stream channel or watercourse) to the maximum possible water storage elevation; or (b) has an impounding capacity of 50 acre-feet or more. (CA Water Code, Division 3.)

Dam Failure—An uncontrolled release of impounded water due to structural deficiencies in dam.

Emergency Action Plan—A formal document that identifies potential emergency conditions at a dam and specifies actions to be followed to minimize property damage and loss of life. The plan specifies actions the dam owner should take to alleviate problems at a dam. It contains procedures and information to assist the dam owner in issuing early warning and notification messages to responsible downstream emergency management authorities of the emergency situation. It also contains inundation maps to show emergency management authorities the critical areas for action in case of an emergency. (FEMA 2013)

High Hazard Dam—Dams where failure or improper operation will probably cause loss of human life. (FEMA 2004)

Significant Hazard Dam—Dams where failure or improper operation will result in no probable loss of human life but can cause economic loss, environmental damage or disruption of lifeline facilities, or can impact other concerns. Significant hazard dams are often located in rural or agricultural areas but could be located in areas with population and significant infrastructure. (FEMA 2004)

7.1.2 Regulatory Oversight

The potential for catastrophic flooding due to dam failures led to passage of the National Dam Safety Act (Public Law 92-367). The National Dam Safety Program requires a periodic engineering analysis of every major dam in the country. The goal of this FEMA-monitored effort is to identify and mitigate the risk of dam failure so as to protect the lives and property of the public.

National Dam Safety Act

The potential for catastrophic flooding due to dam failures led to passage of the National Dam Safety Act (Public Law 92-367). The National Dam Safety Program requires a periodic engineering analysis of every major dam in the country. The goal of this FEMA-monitored effort is to identify and mitigate the risk of dam failure so as to protect the lives and property of the public. The National Dam Safety Program is a partnership between the states, federal agencies, and other stakeholders that encourages individual and community responsibility for dam safety. Under FEMA's leadership, state assistance funds have allowed all participating states to improve their programs through increased inspections, emergency action planning, and the purchase of needed equipment. FEMA has also expanded existing training programs and initiated new ones. Grant assistance from FEMA provides support for improvement of dam safety programs that regulate most of the dams in the United States (FEMA 2015).

California Division of Safety of Dams

California's Division of Safety of Dams (a division of the Department of Water Resources) monitors dam safety at the state level. When a new dam is proposed, Division engineers and geologists inspect the site and the subsurface. Upon submittal of an application, the Division reviews the plans and specifications prepared by the owner to ensure that the dam is designed to meet minimum requirements and that the design is appropriate for the known geologic conditions. After approval of the application, the Division inspects all aspects of the construction to ensure that the work is done in accordance with the approved plans and specifications. After construction, the Division inspects each dam on an annual basis to ensure that it is performing as intended and is not developing problems. Roughly a third of these inspections include in-depth instrumentation reviews. The Division periodically reviews the stability of dams and their major appurtenances in light of improved design approaches and requirements, as well as new findings regarding earthquake hazards and hydrologic estimates in California (CA DWR, 2016a).

U.S. Army Corps of Engineers Dam Safety Program

The U.S. Army Corps of Engineers is responsible for safety inspections of some federal and non-federal dams in the United States that meet the size and storage limitations specified in the National Dam Safety Act. The Corps has inventoried dams; surveyed each state and federal agency's capabilities, practices and regulations regarding design, construction, operation and maintenance of the dams; and developed guidelines for inspection and evaluation of dam safety (U.S. Army Corps of Engineers, 2011).

Federal Energy Regulatory Commission Dam Safety Program

The Federal Energy Regulatory Commission (FERC) has the largest dam safety program in the United States. The FERC cooperates with a large number of federal and state agencies to ensure and promote dam safety and, more recently, homeland security. Approximately 3,000 dams that are part of regulated hydroelectric projects are in the FERC program. Two-thirds of these dams are more than 50 years old. As dams age, concern about their safety and integrity grows, and oversight and a regular inspection program are extremely important. FERC staff inspects hydroelectric projects on an unscheduled basis to investigate the following:

- Potential dam safety problems
- Complaints about constructing and operating a project

- Safety concerns related to natural disasters
- Issues concerning compliance with the terms and conditions of a license.

Every five years, an independent consulting engineer, approved by the FERC, must inspect and evaluate projects with dams higher than 32.8 feet, or with a total storage capacity of more than 2,000 acre-feet.

FERC staff monitors and evaluates seismic research in geographic areas such as California where there are concerns about possible seismic activity. This information is applied in investigating and performing structural analyses of hydroelectric projects in these areas. FERC staff also evaluates the effects of potential and actual large floods on the safety of dams. During and following floods, FERC staff visits dams and licensed projects, determines the extent of damage, if any, and directs any necessary studies or remedial measures the licensee must undertake. The FERC publication *Engineering Guidelines for the Evaluation of Hydropower Projects* guides the FERC engineering staff and licensees in evaluating dam safety. The publication is frequently revised to reflect current information and methodologies.

The FERC requires licensees to prepare emergency action plans and conducts training sessions on how to develop and test these plans. The plans outline an early warning system if there is an actual or potential sudden release of water from a dam due to failure or accident. The plans include operational procedures that may be used, such as reducing reservoir levels and reducing downstream flows, as well as procedures for notifying affected residents and agencies responsible for emergency management. These plans are frequently updated and tested to ensure that everyone knows what to do in emergency situations.

7.2 HAZARD PROFILE

7.2.1 Past Events

According to the Placer County Multi-Hazard Mitigation Plan, there have been five dam failures in Placer County (none are known to have impacted the Roseville planning area):

- **Hell Hole Dam Failure—**In 1964, construction of the Hell Hole Dam was underway and the contractor had stopped operations for the winter. A major storm event in December caused the Hell Hole Reservoir to fill, and since the dam was not completed, it failed, sending a considerable amount of water toward Auburn. The water washed out a bridge on Highway 49 over the American River at the confluence of the North and Middle Forks and flooded a quarry. Due to the way the construction contract was worded, the contractor had to rebuild the dam at his own expense. As a result, Placer County incurred no costs related to this event. No claims for damage were filed against the Placer County Water Agency (PCWA) by either the quarry owner or the state.
- **1986 Auburn Coffer Dam Failure—**As a result of area flooding, the Coffer Dam at Auburn breached and partially washed away. The U.S. Bureau of Reclamation had designed the Coffer Dam for a controlled failure by building a soft earthen plug into the dam for this purpose. It appears the dam failed as designed.
- **August 2004 Ralston Dam Release Gate Break—**A broken release gate on Ralston Dam in the Middle Fork of the American River prompted the National Weather Service to issue a flash flood warning in Placer County. According to the PCWA, the gate near the Ralston Powerhouse malfunctioned, and the sudden release of water from Ralston Reservoir south of Auburn sent a wall of water 3 to 4 feet high down the river. The volume of water released was 800 to 1,000 acre-feet. Sheriff's deputies and California Highway Patrol officers alerted campers in the Auburn State Recreation Area to move to higher ground. The CHP monitored the muddy water as it approached Highway 49. There were no reports of injuries or damage along the river, which is popular with rafters, kayakers and residents during summer.

- **August 2009 Cottonwood Dam—**A privately owned and constructed dam on Miners Ravine in the Hidden Valley Estates subdivision (the Auburn Folsom Road and Twin Rocks Road area of Granite Bay), failed and leached flows and sediment into Miners Ravine. NOAA Fisheries quickly became involved because of the impacts on critical fish species. A temporary fix—a notch in the concrete portion of the dam—was approved and made while the homeowners association and interested agencies determined next steps. A dam removal project with creek restoration is now being proposed.
- **January 2016 Folsom Dam—**Seepage occurred at the Folsom cofferdam during final construction of the new Folsom Dam Auxiliary Spillway on January 20, 2016. The seepage was in the spillway basin. At no time was there a threat of a dam failure.

7.2.2 Location

According to the California Division of Safety of Dams, as of 2014 there are 45 dams in Placer County. Of these, the western levees along Folsom Lake, which is a reservoir lined by a series of containment dikes, have the potential to significantly impact the City of Roseville in the event of a failure. Another dam, the Miners Ravine Detention Facility located near Roseville's eastern boundary, has the potential to adversely impact Roseville should it fail. Table 7-1 provides summary information about these two facilities.

Table 7-1. Dams in Placer and Sacramento Counties With Potential to impact Roseville

Name	Hazard Class[a]	Water Course	Owner	Year Built	Dam Type	Crest Length (feet)	Height (feet)	Storage Capacity (acre-feet)	Drainage area (sq. mi.)
Folsom	1A	American River	US Bureau of Reclamation	1956	Gravity	102,000	275	975,000	1,885
Miners Ravine Detention Facility	1B	Dry Creek	Placer County Flood & Water Conservation District	2007	Earthen	2000	22.5	120	14

a. Downstream Hazard Class 1A: > 300 lives at risk, 1B: 31 to 300 lives at risk, 1C: 7 to 30 lives at risk

7.2.3 Frequency

Dam failure events are infrequent and usually coincide with the events that cause them, such as earthquakes, landslides and excessive rainfall and snowmelt. There is a "residual risk" associated with dams; residual risk is the risk that remains after safeguards have been implemented. For dams, the residual risk is associated with events beyond those that the facility was designed to withstand. However, the probability of occurrence of any type of dam failure event is considered to be low in today's regulatory and dam safety oversight environment.

7.2.4 Severity

Dam failure can be catastrophic to all life and property downstream. The U.S. Army Corps of Engineers developed the classification system shown in Table 7-2 for the hazard potential of dam failures.

7.2.5 Warning Time

Warning time for dam failure varies depending on the cause of the failure. In events of extreme precipitation or massive snowmelt, evacuations can be planned with sufficient time. In the event of a structural failure due to earthquake, it is possible that there would be no warning time.

Table 7-2. Hazard Potential Classification

Hazard Category[a]	Direct Loss of Life[b]	Lifeline Losses[c]	Property Losses[d]	Environmental Losses[e]
Low	None (rural location, no permanent structures for human habitation)	No disruption of services (cosmetic or rapidly repairable damage)	Private agricultural lands, equipment, and isolated buildings	Minimal incremental damage
Significant	Rural location, only transient or day-use facilities	Disruption of essential facilities and access	Major public and private facilities	Major mitigation required
High	Certain (one or more) extensive residential, commercial, or industrial development	Disruption of essential facilities and access	Extensive public and private facilities	Extensive mitigation cost or impossible to mitigate

a. Categories are assigned to overall projects, not individual structures at a project.
b. Loss of life potential based on inundation mapping of area downstream of the project. Analyses of loss of life potential should take into account the population at risk, time of flood wave travel, and warning time.
c. Indirect threats to life caused by the interruption of lifeline services due to project failure or operational disruption; for example, loss of critical medical facilities or access to them.
d. Damage to project facilities and downstream property and indirect impact due to loss of project services, such as impact due to loss of a dam and navigation pool, or impact due to loss of water or power supply.
e. Environmental impact downstream caused by the incremental flood wave produced by the project failure, beyond what would normally be expected for the magnitude flood event under which the failure occurs.

Source: U.S. Army Corps of Engineers, 1995

A dam's structural type also affects warning time. Earthen dams do not tend to fail completely or instantaneously. Once a breach is initiated, discharging water erodes the breach until either the reservoir water is depleted or the breach resists further erosion. Concrete gravity dams also tend to have a partial breach as one or more monolith sections formed during dam construction are forced apart by the escaping water. The time for breach formation ranges from a few minutes to a few hours (U.S. Army Corps of Engineers, 2011).

The City has established protocols for flood warning and response to imminent dam failure in the flood warning portion of its adopted emergency operations plan.

7.2.6 Folsom Dam Containment Dike Failure Risk Assessment

During the 2005 review of the initial Roseville Hazard Mitigation Plan, FEMA Region IX plan reviewers indicated that there was sufficient risk of dam failure of the western dikes on Folsom Lake (see Figure 7-1) to warrant treating dam failure as a stand-alone hazard in the City's next hazard mitigation plan update. Six dikes, increasing in size and numeric designation (from 1 to 6) from north to south, fill gaps along the western edge of Folsom Lake.

Because there was insufficient data to assess risk to the standards established for the other hazards in the hazard mitigation plan, the City developed a comprehensive, scenario-based risk assessment of the western dikes on the Folsom Dam complex during the 2011 Plan update. Detailed inundation modeling and mapping performed as part of this assessment are available to inform the City's preparedness and response to a dam breach of the Folsom Lake containment dike system. The maps are not presented in this Plan for security purposes. Figure 7-2 shows mapping that has been created by the City to inform citizens of the direction of flow and possible routes for evacuation during a dam failure event.

Source: United States Army Corps of Engineers, Michael Nevins [Public domain], via Wikimedia Commons

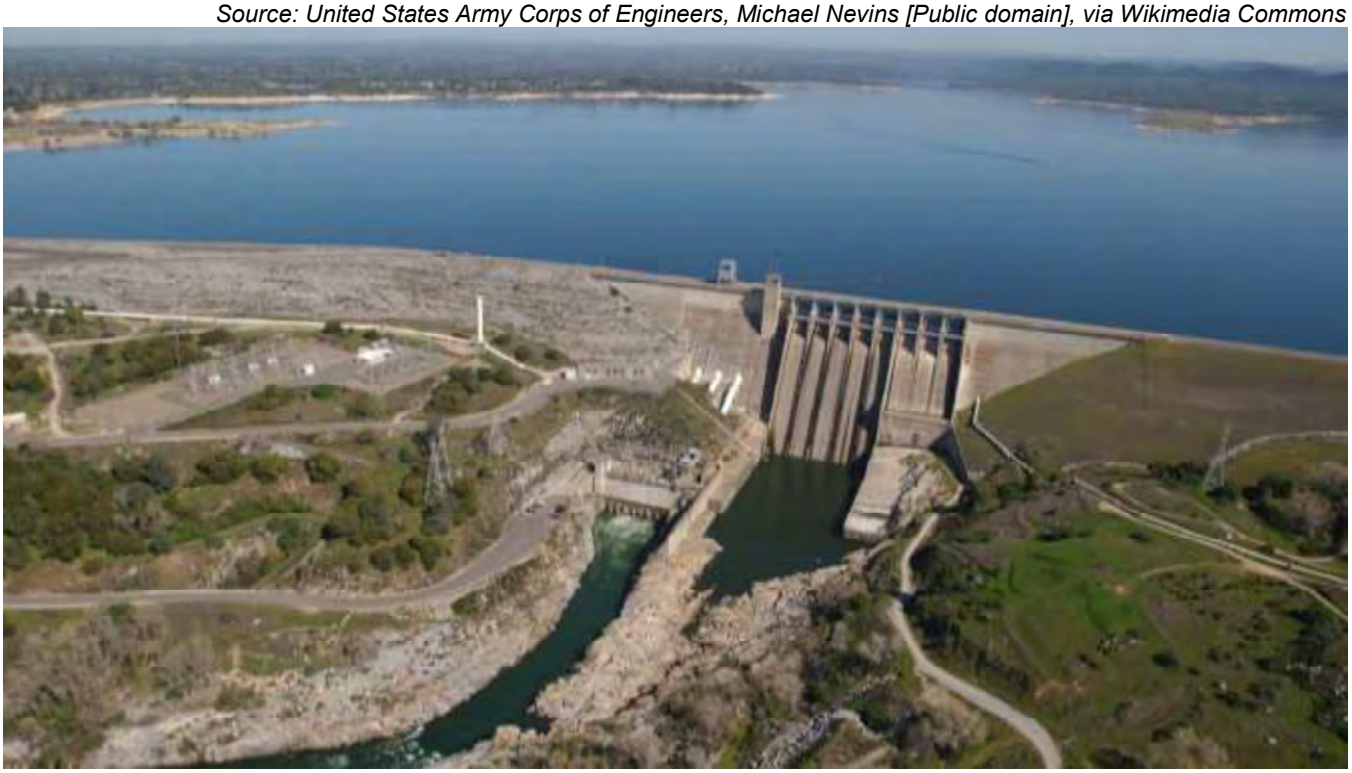


Figure 7-1. Folsom Dam and Folsom Lake on the American River, Looking Northeast

The study provided inundation mapping to determine the probable impact of flooding in Roseville if any of the western dikes were to fail. It addressed the relative risk of failure of each dike based on the frequency with which the dikes impound water, the potential for overtopping, the recent and in-progress work to upgrade the dikes to reduce the risk of failure due to piping, and a new reservoir spillway that is under construction. Models were prepared to simulate dike failures and resulting inundation. These simulations provide the basis for inundation area mapping and other emergency management tools such as maps that illustrate the time from failure to flooding.

The northernmost dikes are relatively low height embankments above the normal operating range of the lake. Though the occurrence of inundation due to dam failure is based on extremely remote conditions, failure of these facilities has the potential to cause significant property damage and loss of life in the City. The degree of impact would be affected by the water level of the lake at the time of failure, which could be just above the top of the dikes in the case of failure by overtopping. The study mapped the maximum depth of flooding and the timing of the flood wave from the time of failure for various scenarios. The study found that flood depths could reach as much as 58 feet in parts of the City.

7.3 SECONDARY HAZARDS

Dam failure can cause severe downstream flooding depending on the magnitude of the failure. Other potential secondary hazards of dam failure include landslides around the reservoir perimeter, bank erosion on the rivers, and destruction of downstream habitat.

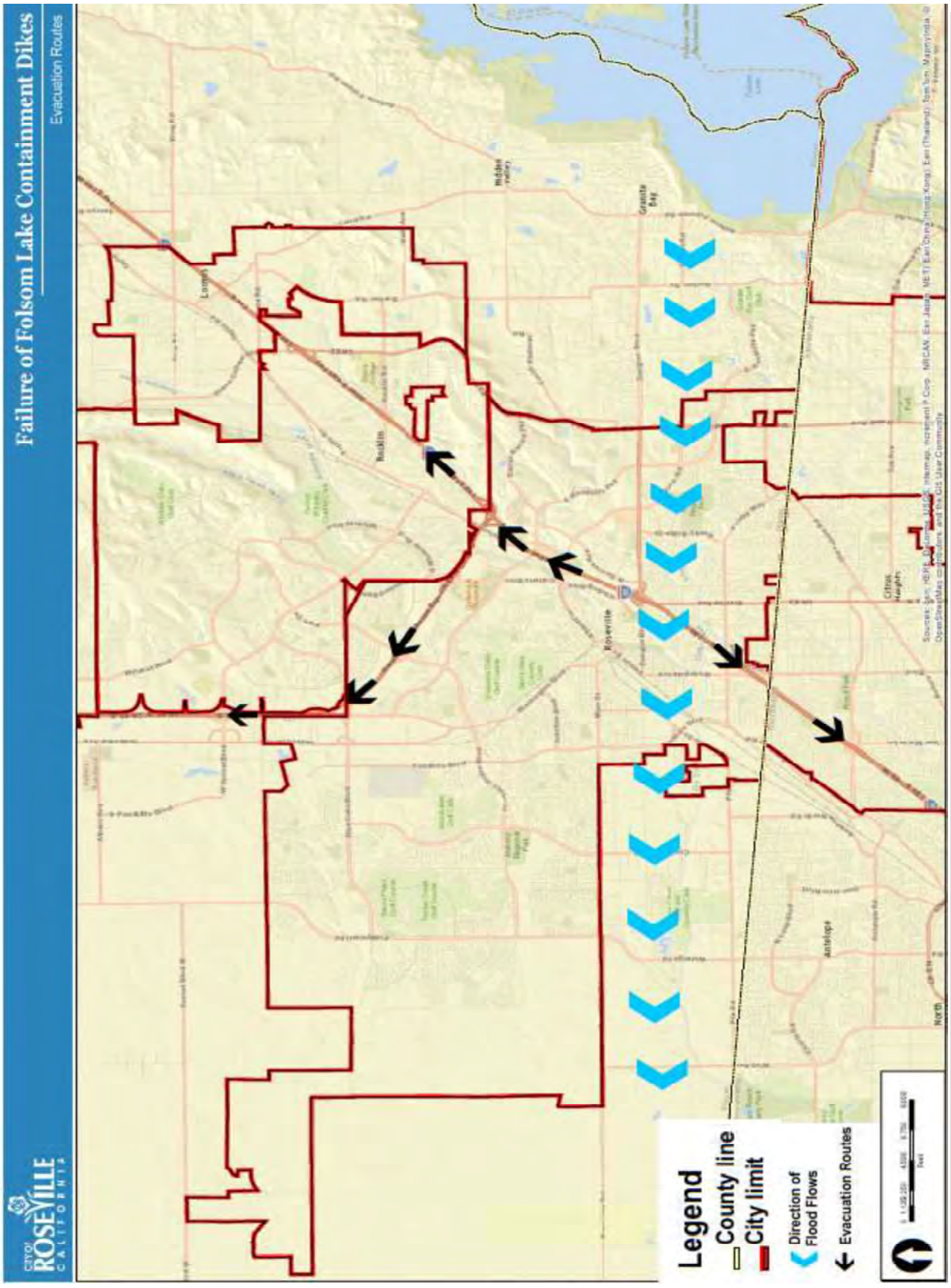


Figure 7-2. Folsom Dam Containment Dike Failure Flow Direction and Evacuation Routes

7.4 EXPOSURE

The flood module of HAZUS-MH was used for a Level 2 assessment of dam failure risk exposure and vulnerability for facilities in Roseville with sufficient data to support modeling. HAZUS-MH uses census data at the block level and FEMA floodplain data, which has a level of accuracy acceptable for planning purposes. Where possible, the HAZUS-MH data for this risk assessment was enhanced using GIS data from county, state and federal sources. The exposure and vulnerability analyses focused on inundation data from the Folsom Dam Containment Dike Failure Risk Assessment.

7.4.1 Population

All populations located in a dam failure inundation zone would be exposed to the risk of a dam failure. The estimated population living in the Folsom Dam failure inundation area is 55,858, or 43.4 percent of the City's population.

7.4.2 Property

The HAZUS-MH model estimated that there are 20,303 structures within the Folsom Dam failure inundation areas. It is estimated that 18,746 or 92 percent, of these structures are residential. The value of exposed buildings in the planning area was generated using HAZUS-MH and is summarized in Table 7-3. This methodology estimated $11 billion worth of building-and-contents exposure to Folsom Dam failure inundation, representing 37.1 percent of the total assessed value of the planning area.

Table 7-3. Value of Property Exposed to Dam Failure

Type	Number of Buildings Exposed	Value Exposed			% of Total Assessed Value
		Building	Contents	Total	
Residential	18,746	$4,877,113,351	$2,438,892,264	$7,316,005,614	39.13%
Commercial	1,017	$1,197,859,838	$1,253,661,717	$2,451,521,555	29.63%
Industrial	260	$210,792,151	$239,393,311	$450,185,463	38.79%
Religion	53	$86,626,396	$86,626,396	$173,252,792	69.13%
Government	18	$19,135,549	$19,135,549	$38,271,098	22.66%
Education	209	$284,707,447	$284,707,447	$569,414,895	52.17%
Total	**20,303**	**$6,676,234,732**	**$4,322,416,685**	**$10,998,651,417**	**37.11%**

7.4.3 Critical Facilities

GIS analysis was used to determine the number of critical facilities in the mapped dam failure inundation areas. As Table 7-4 shows, 96 of the planning area's critical facilities (55.8 percent) are in the inundation areas.

Table 7-4. Critical Facilities in Dam Failure Inundation Areas in Roseville

Medical & Health Services	Government Function	Protective Function	Schools	Hazmat	Other Critical Function	**Total**
0	17	8	25	0	46	**96**

7.4.4 Environment

Reservoirs held behind dams affect many ecological aspects of a river. River topography and dynamics depend on a wide range of flows, but rivers below dams often experience long periods of very stable flow conditions or saw-

tooth flow patterns caused by releases followed by no releases. Water releases from a reservoir, including those exiting a turbine, usually contain very little suspended sediment; this can lead to scouring of river beds and loss of riverbanks.

The environment would be exposed to a number of risks in the event of dam failure. The inundation could introduce many foreign elements into local waterways. This could result in destruction of downstream habitat and could have detrimental effects on many species of animals, especially endangered species such as salmon.

7.5 VULNERABILITY

7.5.1 Population

Vulnerable populations are all populations downstream from dam failures that are incapable of escaping the area within the allowable time frame. This population includes the elderly and young who may be unable to get themselves out of the inundation area. The vulnerable population also includes those who would not have adequate warning from a television or radio emergency warning system. The potential for loss of life is affected by the capacity and number of evacuation routes available to populations living in areas of potential inundation.

7.5.2 Property

Vulnerable properties are those closest to the dam failure inundation area. These properties would experience the largest, most destructive surge of water. Low-lying areas are also vulnerable since they are where the dam waters would collect. Transportation routes are vulnerable to dam failure inundation and have the potential to be wiped out, creating isolation issues. This includes all roads, railroads and bridges in the path of the dam failure inundation. Those that are most vulnerable are those that are already in poor condition and would not be able to withstand a large water surge. Utilities such as overhead power lines, cable and phone lines could also be vulnerable. Loss of these utilities could create additional isolation issues for the inundation areas.

It is estimated that there could be up to $4.46 billion of loss from a dam failure affecting the planning area. This represents 40.5 percent of the total exposure within the inundation area, or 15.0 percent of the total assessed value of the planning area. Table 7-5 summarizes the loss estimates for dam failure.

Table 7-5. Loss Estimates for Dam Failure

	Value Exposed			% of
	Building Loss	Contents Loss	**Total Loss**	Total Assessed Value
Residential	$1,550,424,727	$933,258,844	$2,483,683,571	13.28%
Commercial	$456,285,740	$844,987,114	$1,301,272,854	15.73%
Industrial	$84,633,925	$203,408,629	$288,042,554	24.82%
Religion	$34,364,944	$72,524,654	$106,889,598	42.65%
Government	$11,072,696	$16,609,362	$27,682,057	16.39%
Education	$82,091,723	$166,677,363	$248,769,086	22.79%
Total	**$2,218,873,754**	**$2,237,465,967**	**$4,456,339,721**	**15.03%**

7.5.3 Critical Facilities

HAZUS estimated that critical facilities would receive an average of 40 percent damage to the structure and an average 70 percent damage to the contents during a dam failure event. The estimated functional down-time to restore these facilities to 100 percent of their functionality is 700 days.

7.5.4 Environment

The environment would be vulnerable to a number of risks in the event of dam failure. The inundation could introduce foreign elements into local waterways, resulting in destruction of downstream habitat and detrimental effects on many species of animals, especially endangered species such as coho salmon. The extent of the vulnerability of the environment is the same as the exposure of the environment.

7.6 FUTURE TRENDS IN DEVELOPMENT

All land use decision-making is guided by the goals, policies and implementation measures contained in the Land Use Element of Roseville's General Plan. The Safety Element of the General Plan establishes standards and plans for the protection of the community from hazards. Dam failure is currently not addressed as a stand-alone hazard in the Safety Element, but flooding is. The City has established comprehensive policies regarding sound land use in identified flood hazard areas. Most of the areas vulnerable to the more severe impacts from the bank-full Folsom Dam failure scenario intersect the City's flood hazard areas. Flood-related policies in the General Plan will help to reduce the risk associated with the dam failure hazard for all future development within the City.

The dam failure risk exposure with in the planning area increased by 22% at an increase in value of over $2 billion dollars. This increase in risk exposure can be attributed to the vast extent and location of the dam failure hazard, and a population growth rate of 14.5% over the performance period of the prior plan. The planning area also saw in increase in assessed valuation of real property of over 34%. This increase in value can be attributed to the continued economic recovery from the 2008 economic down turn that had a significant impact on the State of California as well as the City of Roseville. Any increase in asset value will increase risk quotient when risk is being measured by looking at assets exposed as is with this plan.

While the exposure went up within the dam failure inundation area, the loss estimation from Hazus decreased by over 28%. This decrease in vulnerability could be attributed to 2 factors. The first factor is that the new construction that has occurred during the performance period for the plan was built to high code standards that reduce the risk. While the City of Roseville does not have specific standards adopted specifically for the dam failure inundation area, their adopted improvements standards applied city-wide do include several higher standards that would reduce flood risk within a dam failure inundation area. The second factor could be due to the increased accuracy of the Hazus model. For this update, the digital elevation model used in Hazus was developed using LiDAR data available to the City. The accuracy of the Digital Elevation Model (DEM) for this update should be cons9dered more accurate than the DEM from the last update. It is logical to assume that both of these factors plan a role in the reduced vulnerability for the planning area.

7.7 REVIEW OF EXISTING ORDINANCES, PROGRAMS AND PLANS

Since most of the dam failure inundation areas overlay the regulated floodplain within the planning area, ordinances and programs in Chapter 4 are applicable to this hazard. The extent of dam failure inundation as well as the estimated flood depths significantly exceed those projected for flooding. Future revisions to the flood programs may want to consider the potential impacts of dam failure in their scope, even though the statistical probability of such an event is low.

7.8 SCENARIO

According to the 2011Folsom Dam Containment Dike Failure Risk Assessment Project, the worst-case scenario would be a bank-full failure of Dikes 4, 5 and 6 due to overtopping. Overtopping flows may quickly erode the top and downstream portions of the dikes, causing failure. Therefore, there is a possibility of simultaneous failure due to overtopping. However, the likelihood of reservoir inflows that could cause overtopping is extremely low. The

completion of the new Folsom Dam spillway in early 2016 decreased the likelihood even further. Failure from piping could occur at any water surface elevation within the reservoir.

An earthquake within the region could lead to liquefaction of soils around the dams. This could occur without warning during any time of the day. A human-caused failure such as a terrorist attack also could trigger a catastrophic failure of a dam that impacts the planning area.

7.9 ISSUES

The most significant issue associated with dam failure involves the properties and populations in the inundation zones. Flooding as a result of a dam failure would significantly impact these areas. There is often limited warning time for dam failure. These events are frequently associated with other natural hazard events such as earthquakes, landslides or severe weather, which limits their predictability and compounds the hazard. Another significant issue is the loss of the City's primary potable water supply source if the dam were to fail (not overtop). The City would have to rely on significant water demand reductions, interties with other water agencies not dependent on Folsom and groundwater wells to provide some level of water supply to the community. Other important issues associated with dam failure include the following:

- Federally regulated dams have an adequate level of oversight and sophistication in the development of emergency action plans for public notification in the unlikely event of failure. However, the protocol for notification of downstream citizens of imminent failure needs to be tied to local emergency response planning.
- Mapping for federally regulated dams is already required and available; however, mapping that estimates inundation depths is needed for dams that are not federally regulated, in order to better assess the risk associated with failure of these facilities.
- Most dam failure mapping required at federal levels requires determination of the probable maximum flood. While the probable maximum flood represents a worst-case scenario, it is generally the event with the lowest probability of occurrence. For dams that are not federally regulated, mapping of failure scenarios that are less extreme than the probable maximum flood but have a higher probability of occurrence can be valuable to downstream community officials and emergency managers. This type of mapping can illustrate areas potentially impacted by more frequent events to support emergency response and preparedness actions.
- The concept of residual risk associated with structural flood control projects should be considered in the design of capital projects and the application of land use regulations.
- Addressing security concerns and the need to inform the public of the risk associated with dam failure is a challenge for public officials.

8. DROUGHT

8.1 GENERAL BACKGROUND

Most of California's precipitation comes from storms moving across the Pacific Ocean. The path followed by the storms is determined by the position of an atmospheric high pressure belt that normally shifts southward during the winter, allowing low-pressure systems to move into the state. On average, 75 percent of California's annual precipitation occurs between November and March, with 50 percent occurring between December and February. If a persistent Pacific high-pressure zone takes hold over California mid-winter, there is a tendency for the water year to be dry.

DEFINITIONS

Drought—The cumulative impacts of several dry years on water users. It can include deficiencies in surface and subsurface water supplies and generally impacts health, well being, and quality of life.

Hydrological Drought—Deficiencies in surface and subsurface water supplies.

A typical water year produces about 100 inches of rainfall over the North Coast, 50 inches of precipitation (combination of rain and snow) over the Northern Sierra, 18 inches in the Sacramento area, and 15 inches in the Los Angeles area. In extremely dry years, these annual totals can fall to as little as half, or even one-third of these amounts.

Rain and snowfall in the American River watershed eventually flow into Folsom Lake, a reservoir within the U.S. Central Valley Project. These flows directly affect water availability for Roseville water users. The City of Roseville owns the Roseville water system and water treatment plant and has negotiated contracts with the U.S. Bureau of Reclamation, the Placer County Water Agency (PCWA), and the San Juan Water District (SJWD) to ensure that water needs are met for existing and future growth.

Roseville is largely urbanized with little agricultural interests remaining. Lack of sufficient water supply would affect residents and businesses that rely on water for their daily household, employee, and industrial needs.

8.1.1 Water Supply Strategy

The water supply strategy for the City of Roseville uses a comprehensive approach to ensure water reliability for customers. The City has a diverse set of water supply options—including surface water contracts, recycled water, and groundwater wells—to ensure that even following a period of dry years, a combination of available water supplies and water conservation measures will meet the community's water needs. The City has contracts for surface water with three agencies (see Table 8-1):

- The primary water contract is with the U.S. Bureau of Reclamation (USBR) for 32,000 acre-feet per year of surface water from Folsom Lake.
- The City also has a contract with PCWA for 30,000 acre-feet of water from PCWA's American River Middle Fork Project. The City has a long-term agreement with the USBR to wheel PCWA water supplies through Folsom Reservoir for delivery to the City's water treatment plant.

Table 8-1. City of Roseville Water Supply Contracts and Resources

Source	Contract Amount (acre-feet per year) [a]	Supply Projections [b]				
		2020	2025	2030	2035	2040
U.S. Bureau of Reclamation	32,000	32,000	32,000	32,000	32,000	32,000
San Juan Water District	4,000	4,000	4,000	4,000	4,000	4,000
Placer County Water Agency		20,000	30,000	30,000	30,000	30,000
Treated Water (Additional Future Purchase)	N/A	0	0	1,500	1,500	1,500
Exercised	10,000					
Two additional options	20,000					
Placer County Water Agency Total	***30,000***					
Recycled Water	N/A	*4,421*	*4,791*	*5,259*	*5,643*	*5,958*
Total	**66,000**	**60,421**	**70,791**	**72,759**	**73,143**	**73,458**

a. N/A = Not Applicable based on future contract or existing recycled resources
b. Based on reasonable available volume.

- The third source of surface water for the City of Roseville is an additional 4,000 acre-feet of PCWA water transferred through SJWD. SJWD is a water district in Sacramento and Placer Counties that draws water from Folsom Lake. SJWD also wholesales water to Citrus Heights Water District, Fair Oaks Water District and Orangevale Water Company in Sacramento County. The City of Roseville has entered into a reallocation agreement with SJWD for this 4,000 acre-feet per year, which is a normal-year water supply only—it is not available for use during drought conditions.
- With the approval of the Amoruso Ranch Specific Plan, the City is pursuing an additional contract through PCWA, through its planned Ophir Water Treatment Plant facility. This new source and supply of water will not be dependent on Folsom Lake deliveries and will increase water reliability citywide. It is not subject to cutbacks during dry or driest years, and is estimated to provide 1,500 acre-feet of additional supply once the plant is on line.
- The City maintains six groundwater wells for emergency and dry-year supply, with plans to install 10 more in coming years as new development progresses. All wells are equipped for aquifer storage and recovery.

8.1.2 Water Supply Infrastructure

The City of Roseville Water Treatment Plant is on Barton Road east of Roseville. Constructed in 1971, the plant treats water from Folsom Lake to Environmental Protection Agency (EPA) domestic drinking water standards. The City owns a water system network consisting of water mains ranging from 4 to 66 inches in diameter. The system is designed to deliver an adequate supply of water throughout the community at an acceptable pressure level for domestic and fire flow purposes. A booster pump station near East Roseville Parkway and North Sunrise Boulevard is designed to provide sufficient water pressure to the higher elevations of the City and to fill and manage reservoirs in the system. Some areas within the Roseville city limits are served by PCWA, SJWD, or the City of Citrus Heights where topography and facility locations make it beneficial to do so.

The City maintains the capability to supplement its water supply in drought conditions with groundwater wells. These wells are planned to be used primarily to offset surface water cutbacks in times of drought or other emergencies. The City's groundwater wells are equipped to implement aquifer storage and recovery, in which potable water can be injected into the underground aquifers in wet years and recovered in dry years for public use. In addition, the City operates a recycled water system to lessen the use of potable water for irrigating landscaped areas.

8.1.3 The Water Forum

The Water Forum is a group of business and agricultural leaders, citizens groups, environmentalists, water managers, and local governments originally formed in Sacramento County. Water managers in Placer and El Dorado Counties joined the group in 1995. The City of Roseville is a member of the Water Forum and a signatory to the January 2000 Water Forum Agreement. The agreement provides a framework for how future surface water and groundwater supplies will be used in the region through 2040.

Although Roseville's water contract entitlements total 66,000 acre-feet per year, the City's diversions from the American River are limited by the Water Forum Agreement. In normal/wet years, the City has agreed to limit diversions from the American River to 58,900 acre-feet per year. In driest years (also called critically dry years), the maximum diversion from the American River is 39,800 acre-feet. In drier years, the City may divert between 39,800 and 54,900 acre-feet, depending on the unimpaired flow into Folsom Lake.

During the drier and driest years, the City agreed to have PCWA release an additional 20,000 acre-feet per year of water down the American River on the City's behalf through re-operation of PCWA's American River Middle Fork Project. This is not part of the City's contracted supply of 66,000 acre-feet per year. The intent of Middle Fork Project re-operational releases during drier and driest years is to mitigate environmental impacts resulting from increased diversions above 1995 baseline levels.

Roseville's water supply contracts, in combination with future planned supply sources, base level conservation measures, and groundwater resources, ensure that the City is well positioned to meet projected water needs.

8.1.4 Local Water Contracts—Definition of Drought

Roseville's drought levels are defined by the 2000 Water Forum agreement. The definition is based on the type of hydrologic year for inflow to Folsom Lake, as defined by 70 years of hydrologic data into the lake. The hydrological year types are as follows:

- **Baseline**—Baseline means the maximum amount of water that suppliers diverted from the American River in any one year through 1995 or, in certain instances, other amounts specified in a Purveyor Specific Agreement. For the City of Roseville, the baseline amount is 19,800 acre-feet per year.
- **Normal/Wet Years**—When the projected unimpaired flow into Folsom Reservoir is greater than or equal to 950,000 acre-feet
- **Drier Years**—When the projected unimpaired flow into Folsom Reservoir is between 400,00 acre-feet and 950,000 acre-feet
- **Driest Years**—When the projected unimpaired flow into Folsom Reservoir is less than 400,000 acre-feet.

Dry years over the 85-year hydrologic record are listed in Table 8-2, excluding the driest years. The driest years for American River flows in the Folsom Lake vicinity were 1924, with 379,000 acre-feet of unimpaired inflow to Folsom Lake, 1977, with 332,000 acre-feet, and 2015, with 321,000 acre-feet.

Table 8-2. Dry Year Flows into Folsom Lake

Year	Unimpaired Inflow to Folsom Lake (acre-feet)	Year	Unimpaired Inflow to Folsom Lake (acre-feet)
1931	571,000	1987	705,000
1934	690,000	1988	545,000
1939	873,000	1990	873,000
1959	872,000	1992	631,000
1961	854,000	1994	649,000
1976	518,000	2013	778,000
1981	881,000	2014	682,000

8.2 HAZARD PROFILE

Droughts originate from a deficiency of precipitation resulting from an unusual weather pattern. If the weather pattern lasts a short time (a few weeks or a couple months), the drought is considered short-term. If the weather pattern becomes entrenched and the precipitation deficits last for several months or years, the drought is considered long-term. It is possible for a region to experience a long-term pattern that produces drought, and to have short-term changes that result in wet spells within the long-term pattern. Likewise, it is possible for a long-term wet pattern to be interrupted by weather spells that result in short-term drought. Droughts typically occur after two or three years of below-average rainfall for the period from November to March.

8.2.1 Past Events

State of California

The California Department of Water Resources has state hydrologic data back to the early 1900s (http://watersupplyconditions.water.ca.gov). The hydrologic data show multi-year droughts from 1912 to 1913, 1918 to 1920 and 1922 to 1924. Since then, three prolonged periods of drought occurred in California:

- **1929 to 1934 Drought—**The 1929 to 1934 drought established the criteria for designing the supply and yield of many large Northern California reservoirs. The Sacramento Valley runoff was 55 percent of average for the time period from 1901 to 1996, with only 9.8 million acre-feet received.
- **1975 to 1977 Drought—**California had one of its most severe droughts due to lack of rainfall during the winters of 1976 and 1977. 1977 was the driest period on record in California, with the previous winter recorded as the fourth driest in California's hydrological history. The cumulative impact led to widespread water shortages and severe water conservation measures throughout the state. Only 37 percent of the average Sacramento Valley runoff was received, with just 6.6 million acre-feet recorded. Over $2.6 billion in crop damage was recorded in 31 counties. A federal disaster declaration was declared in Placer County and surrounding counties.
- **1987 to 1992 Drought—**California received precipitation well below average levels for four consecutive years. While the Central Coast was most affected by the lack of rainfall and low runoff, the Sierra Nevada range in Northern California and Central Valley counties including Placer County were also affected. During this drought, only 56 percent of average runoff for the Sacramento Valley was received, totaling just 10 million acre-feet. By February 1991, all 58 counties in California were suffering from drought conditions. Urban areas as well as rural and agricultural areas were impacted.
- **2012 to 2016 (Ongoing) Drought—**California's current drought has set several records for the state:
  - The period from 2012 to 2014 ranked as the driest three consecutive years for statewide precipitation.
  - 2014 set new climate records for statewide average temperatures and for record-low water allocations in the State Water Project and federal Central Valley Project.
  - 2013 set minimum annual precipitation records for many communities.

  On January 17, 2014 the governor declared a state of emergency for drought throughout California. This declaration followed release of a report that stated that California had had the least amount of rainfall in its 163-year history. Californians were asked to voluntarily reduce their water consumption by 20 percent. Drought conditions worsened into 2015. On April 1, 2015, following the lowest snowpack ever recorded, the governor announced actions to save water, increase enforcement to prevent wasteful water use, streamline the state's drought response, and invest in new technologies to make California more drought-resilient. The governor directed the State Water Resources Control Board to implement mandatory water reductions in cities and towns across California to reduce water usage by 25 percent on average. The City of Roseville was assigned a 28-percent water conservation target by the State Water Resources Control

Board. The City exceed its water conservation goal. Total impacts of the drought cannot be determined until after its conclusion.

Placer County

The following additional drought impacts have affected Placer County:

- **1977—**A federal disaster declaration was made as a result of a drought affecting Placer and surrounding counties. The PCWA declared a water shortage and restricted water use for both irrigation and treated water users. The restrictions included a 50-percent reduction in water usage by customers and rate increases. This shortage lasted until January 1978 when the PCWA terminated its restrictions.
- **1988—**Again the PCWA declared a water emergency. All customers had their water use reduced by 25 percent, and rates were again increased for excessive usage. The countywide emergency prohibited washing of sidewalks, driveways, parking lots and other hard surfaces, restricted the washing of vehicles, airplanes, and trailers to 3 gallons of water, prohibited fire hydrant flushing and drills, prohibited filling of pools, and prohibited new agricultural land irrigation.
- **1991—**Raw water customers had their water usage reduced by 50 percent annually and by 25 percent seasonally. Treated water users were given most of the same restrictions and prohibitions as in 1988. Due to a very late storm season, the emergency was lifted by April 1991.
- **2008—**The Governor of California declared a drought on June 4, 2008. In July 2009, PCWA reported the implementation of normal ongoing conservation measures.
- **2014—**On February 6, 2014, PCWA adopted a resolution declaring a water shortage emergency. This is the most recent declaration from PCWA. It was rescinded in February 2016.

Roseville Drought History

Roseville's drought history parallels the water shortages for the State of California and Placer County. The Roseville City Council has declared official drought alerts three times:

- From April 1991 to March 1993 when Stage 2 drought water restrictions were in effect and enforced through full-time water patrols
- In May 2008 when the City of Roseville's Environmental Utilities Department activated a Stage 1 drought alert
- In 2014, when the City enacted a Stage 3 drought alert asking residents to reduce water demand by 28 percent compared to 2013 water use.

In response to the 2014 drought, the City of Roseville took a proactive approach to water conservation. The City enacted water waste patrols, limited watering for residential and non-residential customers to specific days of the week depending on the time of year, and enacted funding for utility support. With a 2015 reduction target of 278 gallons per capital per day, Roseville's conservation efforts resulted in an actual accomplishment of 165 gallons per capital per day, far exceeding goals and expectations (Roseville, 2015a).

8.2.2 Location

The National Oceanic and Atmospheric Administration (NOAA) has developed several indices to measure drought impacts and severity and to map their extent and locations:

- The ***Palmer Crop Moisture Index*** measures short-term drought on a weekly scale and is used to quantify drought's impacts on agriculture during the growing season. Figure 8-1 shows this index for the week ending January 30, 2016.
- The ***Palmer Z Index*** measures short-term drought on a monthly scale. Figure 8-2 shows this index for December 2015.

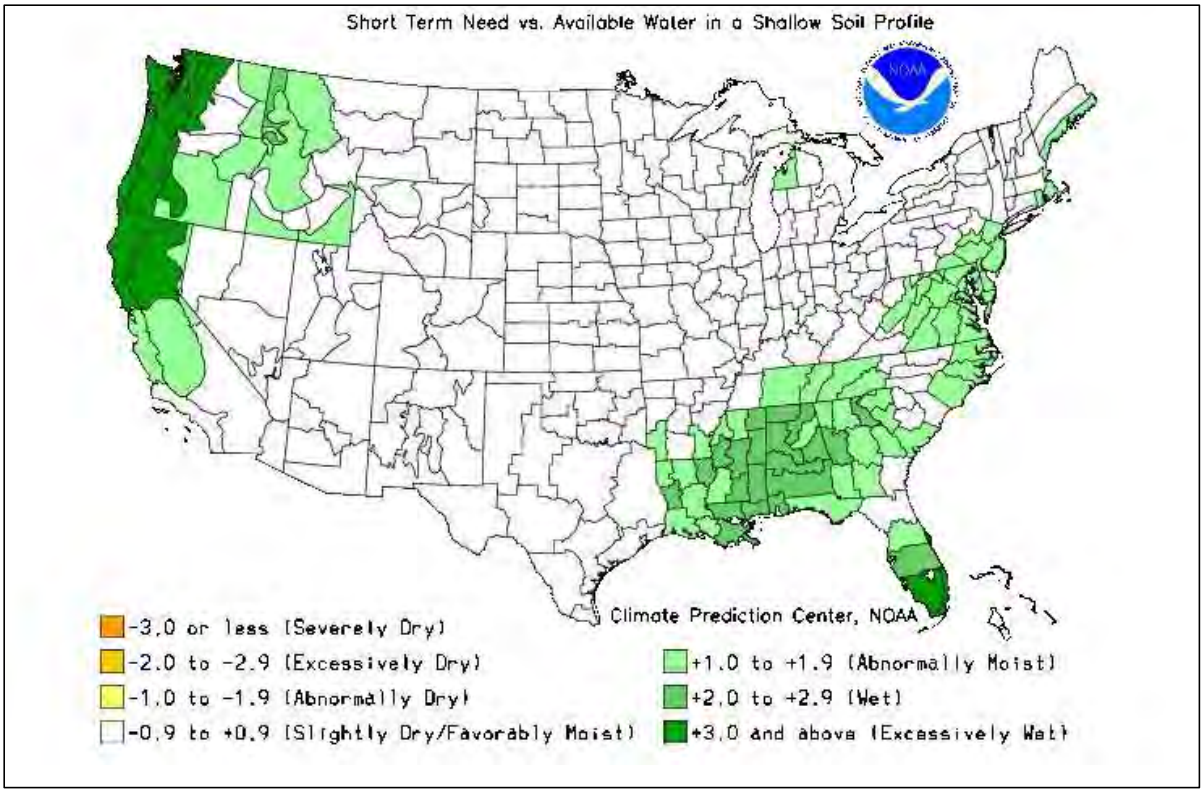


Figure 8-1. Palmer Crop Moisture Index for Week Ending January 30, 2016

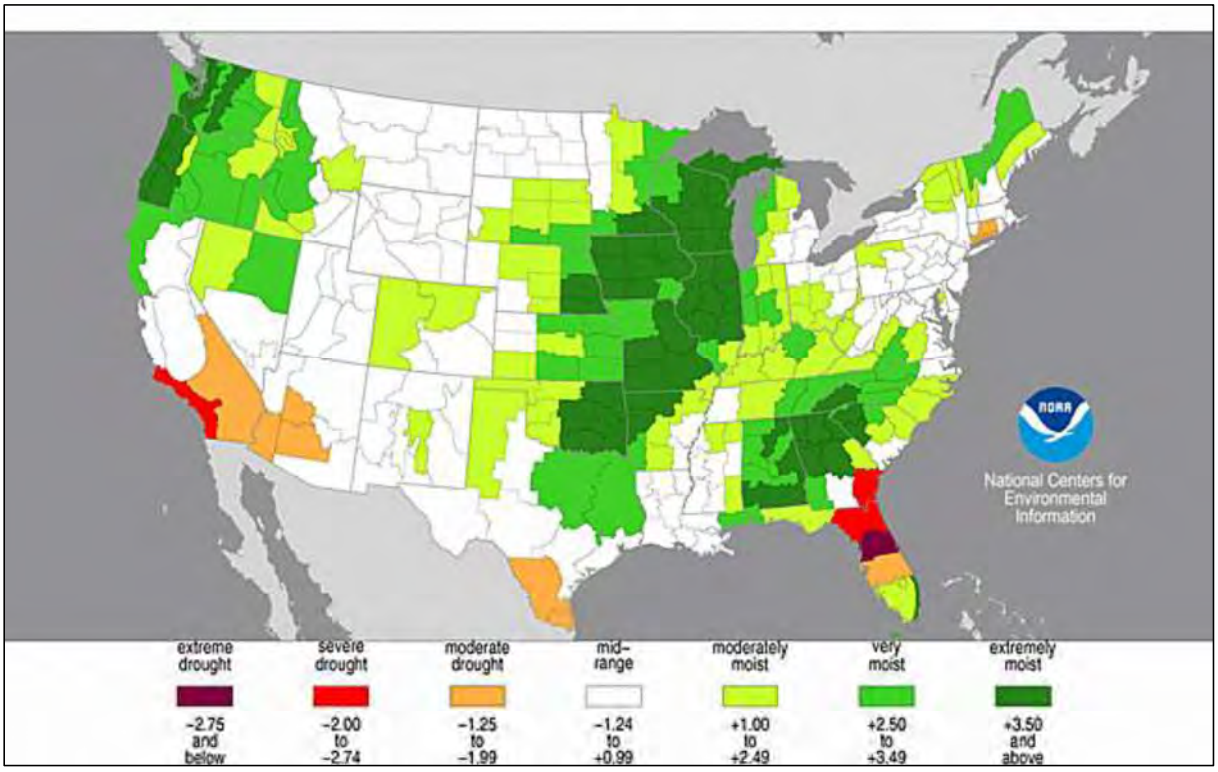


Figure 8-2. Palmer Z Index Short-Term Drought Conditions (December 2015)

- The ***Palmer Drought Index*** measures the duration and intensity of long-term drought-inducing circulation patterns. Long-term drought is cumulative, so the intensity of drought during a given month is dependent on the current weather patterns plus the cumulative patterns of previous months. Weather patterns can change quickly from a long-term drought pattern to a long-term wet pattern, and the Palmer Drought Index can respond fairly rapidly. Figure 8-3 shows this index for January 2016.
- The hydrological impacts of drought (e.g., reservoir levels, groundwater levels, etc.) take longer to develop and it takes longer to recover from them. The ***Palmer Hydrological Drought Index***, another long-term index, was developed to quantify hydrological effects. The Palmer Hydrological Drought Index responds more slowly to changing conditions than the Palmer Drought Index. Figure 8-4 shows this index for January 2013.
- While the Palmer indices consider precipitation, evapotranspiration and runoff, the ***Standardized Precipitation Index*** considers only precipitation. In the Standardized Precipitation Index, an index of zero indicates the median precipitation amount; the index is negative for drought and positive for wet conditions. The Standardized Precipitation Index is computed for time scales ranging from one month to 24 months. Figure 8-5 shows the 24-month Standardized Precipitation Index map for February 2011 through January 2013.

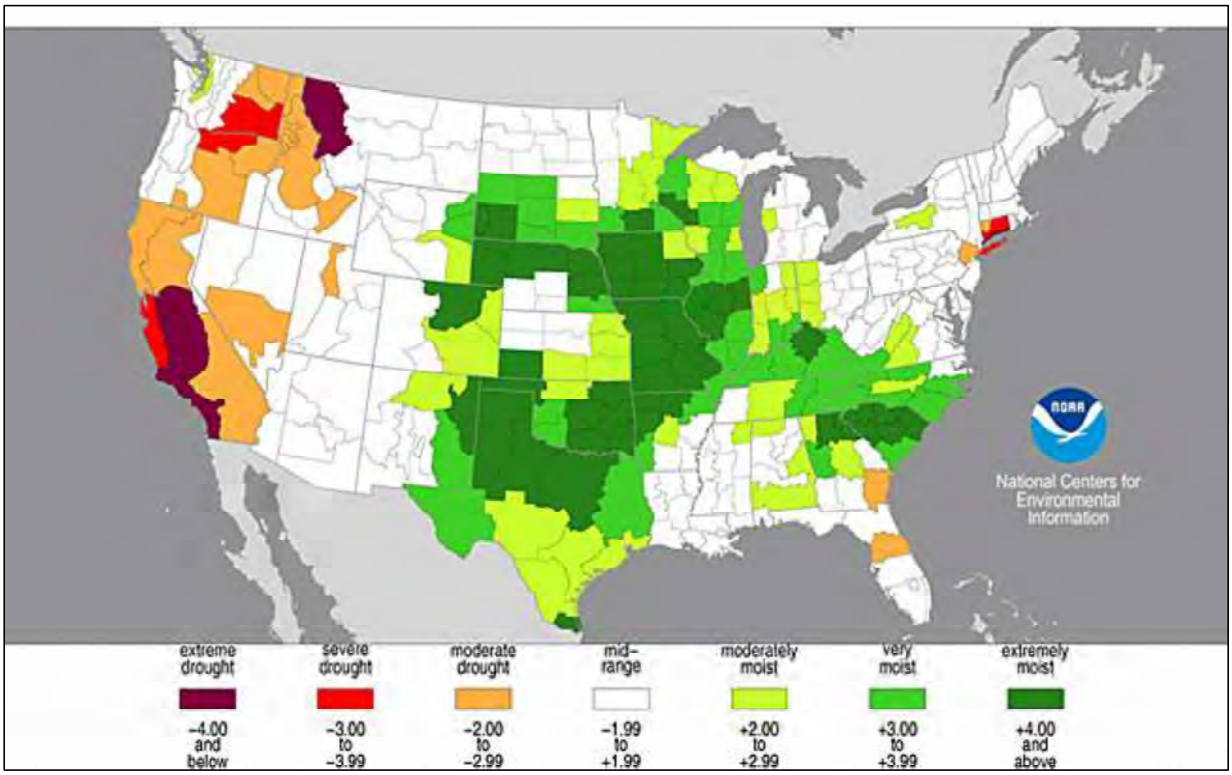


Figure 8-3. Palmer Drought Severity Index (December 2015)

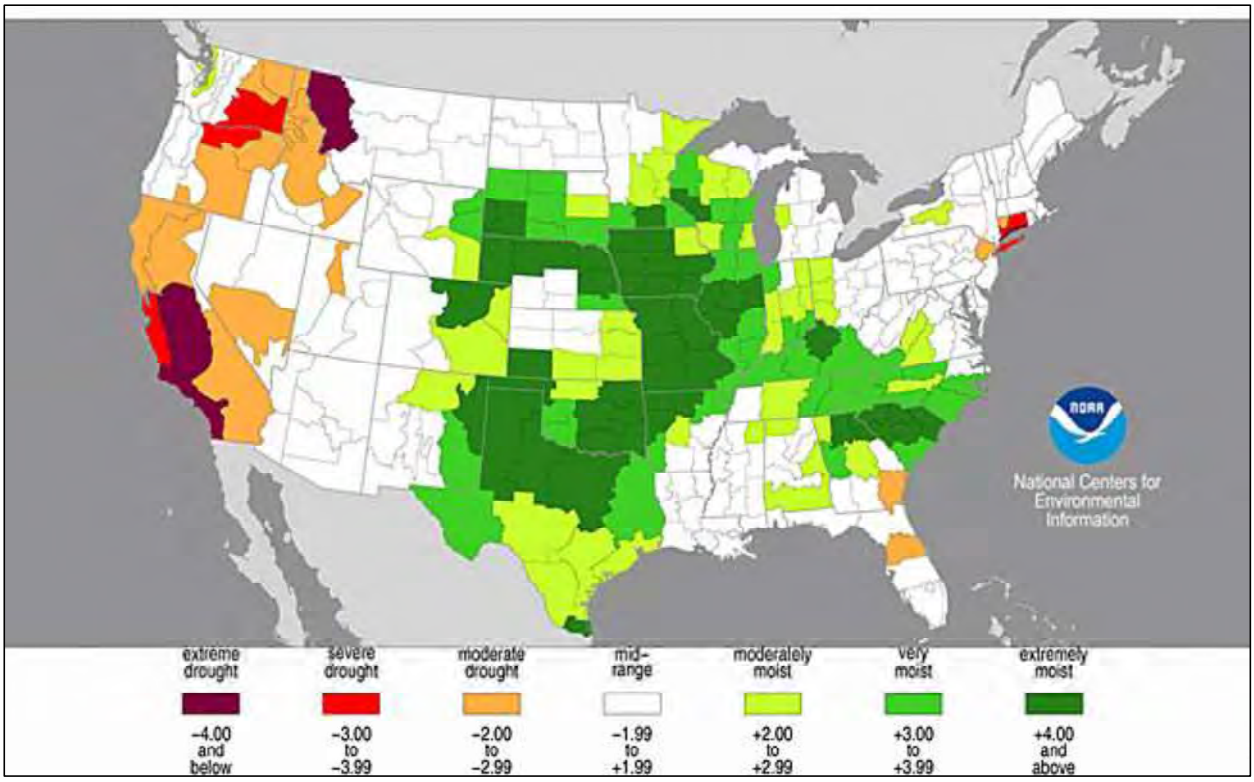


Figure 8-4. Palmer Hydrological Drought Index Long-Term Hydrologic Conditions (December 2015)

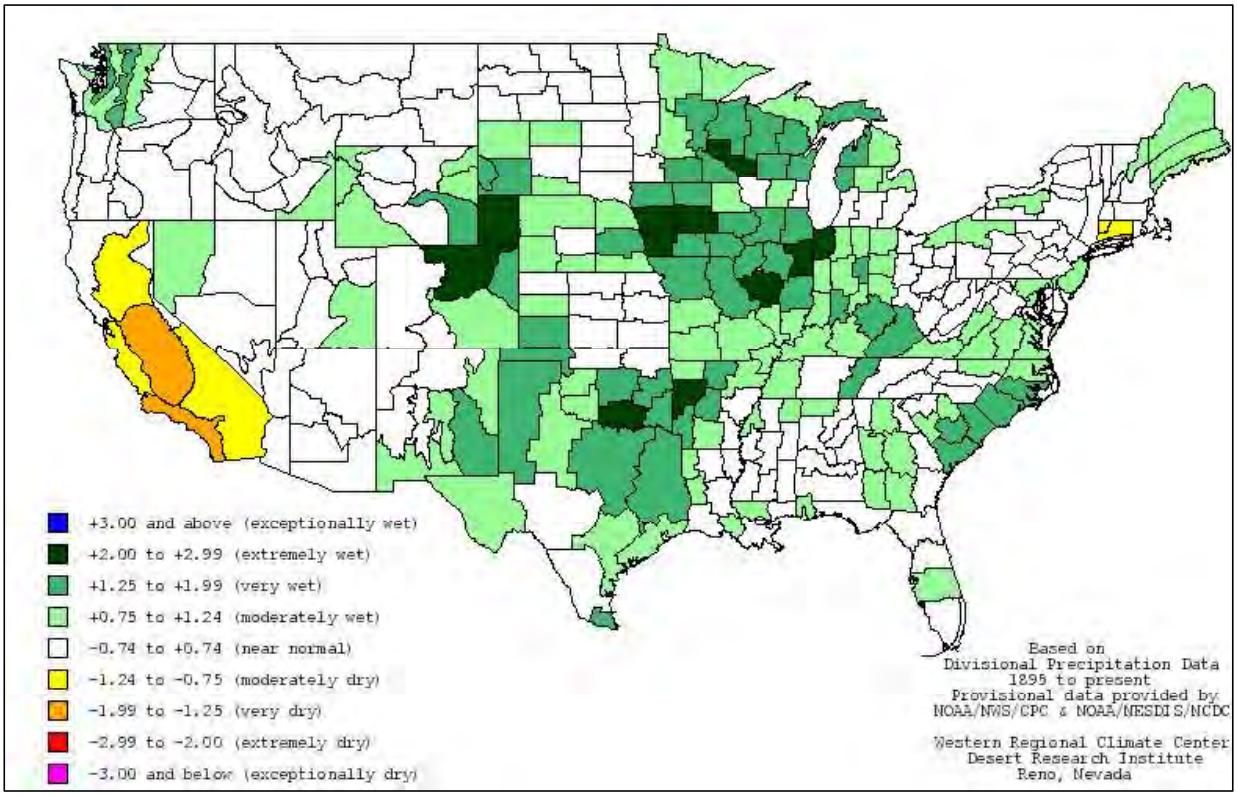


Figure 8-5. 24-Month Standardized Precipitation Index (January 2013 – December 2015)

8.2.3 Frequency

Historical drought data for the Placer County region indicate that, in the 88 years from 1929 through 2016, four multi-year droughts have spanned a total of 20 years. This averages to a five-year drought every 22 years, or a 22 percent chance of a drought in any given year.

8.2.4 Severity

Drought can have a widespread impact on the environment and the economy, although it typically does not result in loss of life or damage to property, as do other natural disasters. Nationwide, the impacts of drought occur primarily in the agriculture, transportation, recreation and tourism, forestry, and energy sectors. Social and environmental impacts are also significant, although it is difficult to put a precise cost on these impacts. The National Drought Mitigation Center uses three categories to describe likely drought impacts:

- Water supply—Drought threatens supplies of water for irrigated crops and for communities.
- Fire hazard—Drought increases the threat of wildfires from dry conditions in forest and rangelands.

The severity of a drought depends on the degree of moisture deficiency, the duration, and the size and location of the affected area. The longer the duration of the drought and the larger the area impacted, the more severe the potential impacts. When measuring the severity of droughts, analysts typically look at economic impacts. All people could pay more for water if utilities increase their rates due to shortages. Other water- or electricity-dependent industries are commonly forced to shut down all or a portion of their facilities, resulting in further layoffs. A drought can harm recreational companies that use water (e.g., swimming pools, water parks, and river rafting companies) as well as landscape and nursery businesses.

Drought generally does not affect groundwater sources as quickly as surface water supplies, but groundwater supplies generally take longer to recover. Reduced precipitation during a drought means that groundwater supplies are not replenished at a normal rate. This can lead to a reduction in groundwater levels and problems such as reduced pumping capacity or wells going dry. Shallow wells are more susceptible than deep wells. Reduced replenishment of groundwater affects streams. Much of the flow in streams comes from groundwater, especially during the summer when there is less precipitation and after snowmelt ends. Reduced groundwater levels mean that even less water will enter streams when steam flows are lowest.

8.2.5 Warning Time

Droughts are climatic patterns that occur over long periods of time. Only generalized warning can take place due to the numerous variables that scientists have not pieced together well enough to make accurate and precise predictions.

Empirical studies conducted over the past century have shown that meteorological drought is never the result of a single cause. It is the result of many causes, often synergistic in nature; these include global weather patterns that produce persistent, upper-level high-pressure systems along the West Coast with warm, dry air resulting in less precipitation.

Scientists at this time do not know how to predict drought more than a month in advance for most locations. Predicting drought depends on the ability to forecast precipitation and temperature. Anomalies of precipitation and temperature may last from several months to several decades. How long they last depends on interactions between the atmosphere and the oceans, soil moisture and land surface processes, topography, internal dynamics, and the accumulated influence of weather systems on the global scale.

8.3 SECONDARY HAZARDS

The secondary hazard most commonly associated with drought is wildfire. A prolonged lack of precipitation dries out vegetation, which becomes increasingly susceptible to ignition as the duration of the drought extends. Millions of board feet of timber have been lost, and in many cases erosion occurred, which caused serious damage to aquatic life, irrigation, and power production by heavy silting of streams, reservoirs, and rivers.

Drought also is often accompanied by extreme heat, exposing people to the risk of sunstroke, heat cramps and heat exhaustion. Pets and livestock are also vulnerable to heat-related injuries.

8.4 EXPOSURE

All people, property and environments within the City of Roseville would be exposed to some degree to the impacts of moderate to extreme drought conditions.

8.5 VULNERABILITY

Based on hydrologic data for the American River, there is a probability that rainfall will be insufficient once every 17 years to supply Folsom Lake and guarantee the City of Roseville its existing contract amounts. In these years, the City by agreement is required to find alternate sources of supply.

Having the flexibility to use both the USBR and PCWA contractual supplies during a drier year or driest year enables the City to provide a reliable surface water supply for municipal and industrial uses. Any shortages can easily be compensated for by water use reductions through conservation (implementation of drought stages as outlined in the Roseville Municipal Code). By incorporating emergency groundwater reserves into the water supply strategy, the City's reliability is increased further still.

The City's 2015 Urban Water Management Plan outlines the potable water supply reliability for normal and dry years, as well as for a three-year drought. Water would be supplied by the American River through Folsom Lake, with conservation measures and groundwater reserves implemented as needed. Roseville's recycled water utility is expected to provide an offset to demand for irrigation supply, thereby reducing the demand for potable water. A summary of the water supply reliability until 2040 for multiple dry water years is provided in Table 8-3.

8.5.1 Population

The City of Roseville, regional water purveyors, members of the Water Forum, and the USBR have spent considerable time and effort to protect life, safety and health should several consecutive dry years occur. Provisions and measures have been taken to analyze and account for anticipated water shortages. The City has the ability to minimize any impacts on residents and water consumers in Roseville. No significant life or health impacts are anticipated as a result of drought in Roseville.

8.5.2 Property

No structures will be directly affected by drought conditions in Roseville, though some structures may become vulnerable to wildfires, which are more likely following years of drought.

8.5.3 Critical Facilities

Critical facilities as defined for this Plan will continue to be operational during a drought. Critical facility elements such as landscaping may not be maintained due to limited resources, but the risk to the City's critical facilities inventory will be largely aesthetic. These aesthetic impacts are not considered significant.

Table 8-3. Water Supply Reliability by 2040

	Normal Water Year	Single Dry Water Year	Multiple Dry Water Years		
			Year 1	Year 2	Year 3
Surface Water (acre-feet)	60,400[a]	39,500[b]	52,894[b]	55,500	46,926[c]
Groundwater (acre-feet)	0	6569	0	0	0
Recycled Water (acre-feet)	4,838	4,838	4,838	4,838	4,838
Projected Demand (acre-feet)	50,907[d]	50,907[d]	50,907 [d]	50,907 [d]	50,907 [d]
Surplus or (Deficit) (acre-feet)[e]	4,655	0	6,826	8,931	857

a. Although additional water is under contract, surface water supplies are available based on Water Forum agreement diversion commitments. This projection includes anticipated PCWA supply from the future Ophir Water Treatment Plant project.
b. Although contracts are in place for normal water year supplies of 67,500 acre-feet, the supply shown is consistent with Water Forum agreement diversion limits and the limitation that 4,000 acre-feet of SJWD supplies are only available for use in normal years.
c. Surface supply reduction is consistent with Water Forum supply agreement anticipating worst case shortage (driest years).
d. No conservation measures are assumed for any year type.
e. Assume full use of available recycled water to offset potable demand for landscape irrigation.

Source: Roseville, 2015a

8.5.4 Environment

Environmental losses are the result of damage to plants, animals, habitat, and air and water quality; wildfires; degradation of landscape; loss of biodiversity; and soil erosion. Some of the effects are short-term and conditions quickly return to normal following the end of the drought. Other environmental effects linger for some time or may even become permanent. Wildlife habitat, for example, may be degraded through the loss of wetlands, lakes, and vegetation. However, many species will eventually recover from this temporary aberration. The degradation of landscape quality, including increased soil erosion, may lead to a more permanent loss of biological productivity. Although environmental losses are difficult to quantify, growing public awareness and concern for environmental quality has forced public officials to focus greater attention and resources on these effects.

8.5.5 Economic Impact

Economic impact will be largely associated with industries that use water or depend on water for their business. For example, landscaping businesses were affected in the droughts of the past as the demand for service significantly declined because landscaping was not watered. The City's Environmental Utilities Department, through the water conservation programs, works to ensure that businesses that rely on water receive allotments to continue operating.

There is always the possibility of some financial exposure for the City as a result of drought conditions. The Environmental Utilities Department plans proactively for this possibility in order to mitigate these impacts to the greatest extent possible.

8.6 FUTURE TRENDS IN DEVELOPMENT

Table 8-4 lists past, current, and projected water use from 2010 to 2040. Water use projections for 2020 through 2040 are based on land use-based water demand projections documented in the City's General Plan.

The general building stock within the planning area increased by 17.7% with an increase in valuation from $21.967 billion to $29.641 billion (34.9%). This increase in valuation of the planning area was impacted by the areas recovery from the economic downturn of 2008. Since the entire planning area would be considered susceptible to drought, it would be perceived that there was an increase in drought exposure over the performance

period of the 2011 plan. However, since droughts typically do not kill or injure people or damage structures, there would be no increase in vulnerability to drought from this increased exposure.

Table 8-4. City of Roseville Past, Current, and Projected Water Use

	Water Use (acre-feet/year)						
	2010	2015	2020	2025	2030	2035	2040
Single family residential	15,836	11,680	21,262	22,425	23,862	25,254	26,365
Multi-Family residential	2,196	1,464	2,399	2,530	2,692	2,849	2,974
Commercial	2,042	1,930	3,402	3,588	3,818	4,041	4,219
Industrial	891	934	1,699	1,792	1,907	2,018	2,107
Institutional and Governmental	667	561	1,001	1,056	1,123	1,189	1,241
Landscape	5,534	4,152	7,559	7,973	8,483	8,978	9,373
Losses[a]	1,195	2,160	3,732	3,936	4,189	4,433	4,628
Total	**28,361**	**22,881**	**41,054**	**43,300**	**46,074**	**48,762**	**50,907**

a. Losses include unbilled/unmetered losses for 2010 and 2015
Source: Roseville, 2015a

8.7 REVIEW OF EXISTING ORDINANCES, PROGRAMS AND PLANS

Since California's 1975 to 1977 drought, Roseville has had a policy of no water waste supported by City ordinances. The City adopted a "No Waste" ordinance in 1989 and updated the Water Conservation Ordinance (Roseville Municipal Code Chapter 14.09—Water Conservation) to include drought mitigation measures in April 1991. The ordinance provides conservation measures for shortages in water supply due to drought. Drought mitigation is achieved through a tiered approach that is based on the surface water available to Roseville. As water supplies decrease, additional restrictions are imposed. Conservation measures (water use restrictions) have been established to address conditions from adequate water supplies to conditions in which surface water supplies are capable of meeting only 50 percent of Roseville's water needs.

A significant portion of Roseville's water is used for landscape irrigation. Landscape irrigation also accounts for a large portion of water wasted in Roseville. Conservation patrols are used to enforce City ordinances restricting water waste. These patrols generally consist of existing service workers that identify and document water waste during daily travels or when responding to complaints. Evening calls are made in response to resident complaints.

In times of reduced water availability, higher drought stages are implemented. In summer 1991, Roseville hired temporary employees to serve as the first dedicated water patrol. This patrol supplemented existing service crew coverage and provided 24-hour-per-day capability. These patrols led to the issuance of over 500 water waste citations that greatly decreased water wasted through malfunctioning irrigation systems and/or excessive watering. In response to the current drought, Roseville instituted these water patrols once more.

Roseville has a number of programs and policies that are implemented as early as possible to reduce water use in the event of a prolonged water shortage. As a USBR contractor, Roseville is required to develop and maintain a water conservation plan consistent with the requirements of the Central Valley Project Improvement Act of 1992. In addition, Roseville is a member and signatory to the American River Water Forum, which also includes requirements for water conservation programs.

To proactively promote water conservation and to be prepared in the event of a water shortage, the City implements demand management (conservation) measures, is developing supplemental water supplies, and has a water shortage contingency plan. These are summarized in the City of Roseville 2010 Urban Water Management Plan Update and detailed in the work programs for the Environmental Utilities Department Water Division.

Given recent legislation and state oversight of the City's water conservation efforts, the Roseville City Council adopted a revised Water Efficient Landscape Ordinance on March 16, 2016. The revised ordinance, effective on April 16, 2016, responds to state legislation mandating stricter requirements for reducing landscape irrigation, water consumption and waste. The revised ordinance addresses the objectives of the Department of Water Resources model ordinance by incorporating the new water efficient landscape requirements into Chapter 14.18 of the Roseville Municipal Code.

8.8 SCENARIO

An extreme multi-year drought can impact the region with little warning. Combinations of low precipitation and unusually high temperatures could occur over several consecutive years. Intensified by such conditions, extreme wildfires could break out throughout Placer County, increasing the need for water. Surrounding communities, also in drought conditions, could increase their demand for water supplies relied upon in the City of Roseville, causing social and political conflicts. If such conditions persisted for several years, the economy of Placer County and Roseville could experience setbacks, especially in water dependent industries.

8.9 ISSUES

The planning team has identified the following drought-related issues:

- Identification and development of alternative water supplies
- Utilization of groundwater recharge techniques to stabilize the groundwater supply
- The probability of increased drought frequencies and durations due to climate change
- The promotion of active water conservation even during non-drought periods.

9. EARTHQUAKE

9.1 GENERAL BACKGROUND

California is seismically active because of movement of the North American Plate, on which everything east of the San Andreas Fault sits, and the Pacific Plate, which includes coast communities west of the fault. The Pacific Plate is constantly moving northwest past the North American Plate, at a relative rate of movement of about 2 inches per year (SHMP 2013). The movement of the tectonic plates creates stress released as energy that moves through the earth as waves called earthquakes.

DEFINITIONS

Earthquake—The shaking of the ground caused by an abrupt shift of rock along a fracture in the earth or a contact zone between tectonic plates. Earthquakes are typically measured in both magnitude and intensity.

Liquefaction—A condition in which water-saturated sands, silts or gravelly soils are shaken so violently that the individual grains lose contact with one another and "float" freely in the water, turning the ground into a pudding-like liquid.

9.1.1 Damage from Earthquakes

Earthquakes can last from a few seconds to over 5 minutes; they may also occur as a series of tremors over a period of several days. The actual movement of the ground in an earthquake is seldom the direct cause of injury or death. Casualties generally result from falling objects and debris, because the shocks shake, damage or demolish buildings and other structures. Disruption of communications, electrical power supplies and gas, sewer and water lines should be expected. Earthquakes may trigger fires, dam failures, landslides or releases of hazardous material, compounding their disastrous effects.

9.1.2 Earthquake Classifications

Earthquakes are typically classified in one of two ways: By the amount of energy released, measured as magnitude; or by the impact on people and structures, measured as intensity.

- Magnitude represents the amount of seismic energy released at the hypocenter of the earthquake. It is based on the amplitude of the earthquake waves recorded on instruments. Magnitude is thus represented by a single, instrumentally determined value.
- Intensity represents the observed effects of ground shaking at any specified location. The intensity of earthquake shaking lessens with distance from the earthquake epicenter. Tabulated peak ground accelerations for a listed "maximum credible earthquake" are a measure of how a site will be affected by seismic events on distant faults.

Magnitude

An earthquake's magnitude is a measure of the energy released at the source of the earthquake. It is commonly expressed by ratings on either of two scales (Michigan Tech University 2016):

- The Richter scale measures magnitude of earthquakes based on the amplitude of the largest energy wave released by the earthquake. Richter scale readings are suitable for smaller earthquakes; however, because

it is a logarithmic scale, the scale does not distinguish clearly the magnitude of large earthquakes above a certain level. Table 9-1 presents the Richter scale magnitudes and corresponding earthquake effects.

- A more commonly used magnitude scale today is the moment magnitude (M_w) scale, with classifications as shown in Table 9-2. The moment magnitude scale is based on the total moment release of the earthquake (the product of the distance a fault moved and the force required to move it). Moment magnitude roughly matches the Richter scale but provides more accuracy for larger magnitude earthquakes.

Table 9-1. Richter Magnitude Scale

Richter Magnitude	Earthquake Effects
2.5 or less	Usually not felt, but can be recorded by seismograph
2.5 to 5.4	Often felt, but causes only minor damage
5.5 to 6.0	Slight damage to buildings and other structures
6.1 to 6.9	May cause a lot of damage in very populated areas
7.0 to 7.9	Major earthquake; serious damage
8.0 or greater	Great earthquake; can totally destroy communities near the epicenter

Source: Michigan Tech University n.d.

Table 9-2. Moment Magnitude Scale

Magnitude Class	Magnitude Range
Great	$M_w \geq 8$
Major	M_w =7.0 - 7.9
Strong	M_w =6.0 - 6.9
Moderate	M_w =5.0 - 5.9
Light	M_w =4.0 - 4.9
Minor	M_w =3.0 - 3.9
Micro	M_w =< 3

Intensity

Currently the most commonly used intensity scale is the modified Mercalli intensity scale, with ratings defined as follows (USGS, 1989):

I. Not felt except by a very few under especially favorable conditions
II. Felt only by a few persons at rest, especially on upper floors of buildings.
III. Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it is an earthquake. Standing cars may rock slightly. Vibrations similar to the passing of a truck.
IV. Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like a heavy truck striking building. Standing cars rocked noticeably.
V. Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI. Felt by all; many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII. Damage negligible in buildings of good design and construction; slight in well-built ordinary structures; considerable in poorly built or badly designed structures. Some chimneys broken.

VIII. Damage slight in specially designed structures; considerable damage in ordinary buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.

IX. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.

X. Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

XI. Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.

XII. Damage total. Lines of sight and level are distorted. Objects thrown into the air.

9.1.3 Ground Motion

Earthquake hazard assessment is also based on expected ground motion. This involves determining the annual probability that certain ground motion accelerations will be exceeded, then summing the annual probabilities over the time period of interest. The most commonly mapped ground motion parameters are the horizontal and vertical peak ground accelerations (PGA) for a given soil or rock type. Instruments called accelerographs record levels of ground motion due to earthquakes at stations throughout a region. These readings are recorded by state and federal agencies that monitor and predict seismic activity.

Maps of PGA values form the basis of seismic zone maps that are included in building codes such as the International Building Code. Building codes that include seismic provisions specify the horizontal force due to lateral acceleration that a building should be able to withstand during an earthquake. PGA values are directly related to these lateral forces that could damage "short period structures" (e.g. single-family dwellings). Longer period response components determine the lateral forces that damage larger structures with longer natural periods (apartment buildings, factories, high-rises, bridges). Table 9-3 lists damage potential and perceived shaking by PGA factors, compared to the Mercalli scale.

Table 9-3. Mercalli Scale and Peak Ground Acceleration Comparison

Modified Mercalli Scale	Perceived Shaking	Potential Structure Damage		Estimated PGA[a] (%g)
		Resistant Buildings	Vulnerable Buildings	
I	Not Felt	None	None	<0.17%
II-III	Weak	None	None	0.17% - 1.4%
IV	Light	None	None	1.4% - 3.9%
V	Moderate	Very Light	Light	3.9% - 9.2%
VI	Strong	Light	Moderate	9.2% - 18%
VII	Very Strong	Moderate	Moderate/Heavy	18% - 34%
VIII	Severe	Moderate/Heavy	Heavy	34% - 65%
IX	Violent	Heavy	Very Heavy	65% - 124%
X - XII	Extreme	Very Heavy	Very Heavy	>124%

a. PGA measured in percent of g, where g is the acceleration of gravity

Sources: USGS, 2008; USGS, 2010

9.1.4 Effect of Soil Types

The impact of an earthquake on structures and infrastructure is largely a function of ground shaking, distance from the source of the quake, and liquefaction, a secondary effect of an earthquake in which soils lose their shear strength and flow or behave as liquid, thereby damaging structures that derive their support from the soil. Liquefaction generally occurs in soft, unconsolidated sedimentary soils. A program called the National Earthquake Hazard Reduction Program (NEHRP) creates maps based on soil characteristics to help identify

locations subject to liquefaction. Table 9-4 summarizes NEHRP soil classifications. NEHRP Soils B and C typically can sustain ground shaking without much effect, dependent on the earthquake magnitude. The areas that are commonly most affected by ground shaking have NEHRP Soils D, E and F. In general, these areas are also most susceptible to liquefaction.

Table 9-4. NEHRP Soil Classification System

NEHRP Soil Type	Description	Mean Shear Velocity to 30 m (m/s)
A	Hard Rock	1,500
B	Firm to Hard Rock	760-1,500
C	Dense Soil/Soft Rock	360-760
D	Stiff Soil	180-360
E	Soft Clays	< 180
F	Special Study Soils (liquefiable soils, sensitive clays, organic soils, soft clays >36 m thick)	

9.2 HAZARD PROFILE

9.2.1 Past Events

The last seismic event recorded in the Roseville vicinity measuring at least 4.0 on the Richter scale occurred between Placerville and Roseville in 1908 on a north-south fault line between Folsom and Auburn. No significant seismic events in the Roseville vicinity have been recorded since then. Significant recent earthquakes in California include the 1906 earthquake in San Francisco, the 1971 San Fernando Earthquake, the 1989 Loma Prieta Earthquake, and the 1994 Northridge earthquake. Table 9-5 lists recent earthquakes with a magnitude of 5.0 or greater within a 100-mile radius of Roseville. Figure 9-1 shows the location of the most recent four events in relation to Roseville.

Table 9-5. Recent Earthquakes Magnitude 5.0 or Larger Within 100-mile radius

Date	Magnitude	Epicenter Location
8/24/2014	6.0	6 miles southwest of Napa, CA
5/24/2013	5.7	12 miles southeast of Chester, CA
4/26/2008	5.1	6 miles west of Reno, NV
10/31/2007	5.6	10 miles northeast of San Jose, CA
8/10/2001	5.5	9 miles west of Portola, CA
9/3/2000	5.17	8 miles northwest of Napa, CA
10/30/1998	5.35	4 miles south-southeast of Truckee, CA
12/28/1995	5.33	7 miles east-northeast of Markleeville, CA
12/23/1995	5.08	8 miles east of Markleeville, CA
9/12/1994	5.95	7 miles north-northeast of Markleeville, CA
9/12/1994	5.12	7 miles north-northeast of Markleeville, CA
3/31/1986	5.70	12 miles east-northeast of Milpitas, CA

Source: Earthquake Catalogs, Northern California Earthquake Data Center, USGS

Source: NCEDC, 2014; Google Earth

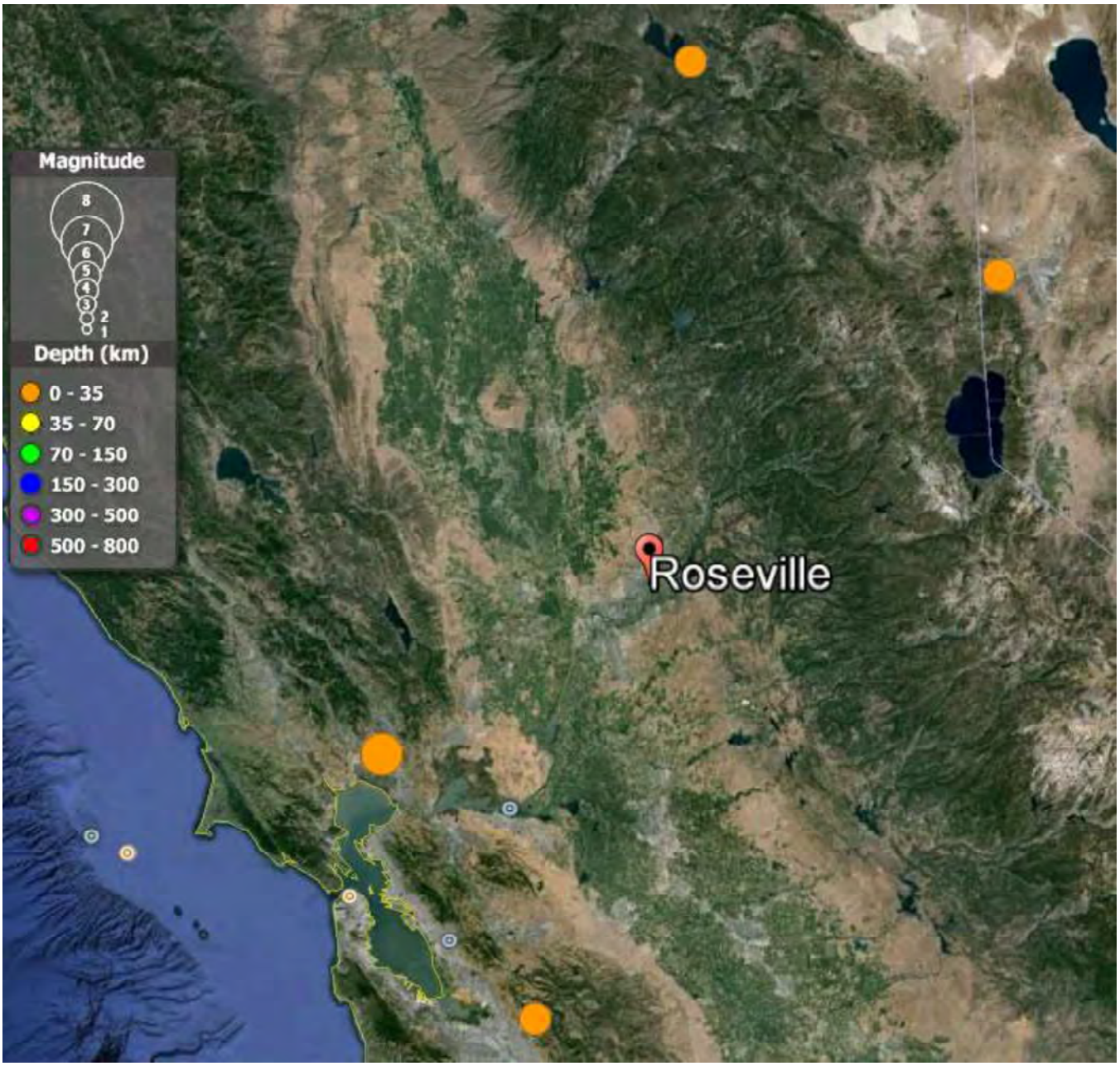


Figure 9-1. Location of Recent Earthquakes in Roseville Vicinity

9.2.2 Location

A direct relationship exists between a fault's length and location and its ability to generate damaging ground motion at a given site. Small, local faults produce lower magnitude quakes, but ground shaking can be strong and damage can be significant in areas close to the fault. Large regional faults can generate earthquakes of great magnitudes but, because of their distance and depth, they may result in only moderate shaking in an area. The City of Roseville is in a region of moderate seismicity between the seismically active Coast Ranges and the historically seismic Foothills Fault Zone in the Sierra Nevada. The primary seismic hazard for the City is potential ground shaking from distant large faults.

East of Roseville

The Great Valley Fault Zone is the geomorphic boundary of the Coast Ranges and the Central Valley. It is underlain by a 300-mile long seismically active fold-and-thrust belt that has been the source of recent earthquakes, such as the 1983 Magnitude-6.5 Coalinga and the 1985 Magnitude-6.1 Kettleman Hills earthquakes. Nearly the entire thrust system is concealed (Krazan & Associates, 2011). The Great Valley fault system consists of 14 segments, named numerically based on location along the fault system from north (1) to south (14).

The Foothill Fault Zone, a complex series of northwest trending-faults that are related to the Sierra Nevada uplift, runs from about Oroville in the north to east of Fresno in the south. This was the source of Oroville's 1975 earthquake and an event in the 1940s. Subsequent research of these events led to the identification and naming of the zone. Earthquakes on fault segments in the zone could be a source of ground shaking in Placer County.

The closest potentially active faults in the near vicinity of Roseville are the Bear Mountain and Melones Faults. The closest recently active fault in the western Sierra Nevada foothills is the Cleveland Hills Fault, about 36 miles northwest of Auburn.

Eastern Placer County borders the Basin and Range geological province, which includes most of Nevada and western Utah. This area is riddled with active faults that form the boundary between each basin or valley and the neighboring mountain range.

The Lake Tahoe Basin is seismically active with earthquakes greater than 7.0 that have occurred beneath Lake Tahoe. According to the Placer County Multi-Hazard Mitigation Plan, a series of small earthquakes also occurred in late 2003 and early 2004 due to volcanic magma (molten rock) moving 20 miles below the Sierra Nevada Mountains. The earthquakes reflect the movement of the Sierra Nevada range to the northwest at a rate of about half an inch per year.

West of Roseville

Tectonic stresses associated with the North American-Pacific Plate boundary can generate damaging earthquakes along faults 30 to 100 miles west of Placer County. Both the San Andreas fault (source of the estimated 8.0-Richter magnitude San Francisco earthquake that caused damage in Sacramento in 1906) and the closer Hayward fault have the potential for experiencing major to great events. Another potential earthquake source is the Midland Fault Zone on the western side of the Sacramento Valley. This was the source of the 1892 Vacaville-Winters earthquake.

The Petrolia (coastal Humboldt County) earthquake increased concern about how amplified long-period motions from much closer major events, such as on the San Andreas Fault or the Hayward Fault, might reach damaging levels and affect Sacramento.

Other potential earthquake sources are the faults associated with the western edge of the Central Valley, recently defined as the Coast Range Central Valley Boundary Thrust Fault System. Various documents define portions of this little known system as the Midland Fault Zone or the Dunnigan Hills fault, where the 1892 Vacaville-Winters earthquake occurred. A southern part of the system may have been the source of the 1983 Coalinga earthquake.

Inactive Faults

Active faults are those that have experienced displacement in historical time. However, inactive faults, for which no such displacements have been recorded, also have the potential to reactivate or experience displacement along a branch sometime in the future. An example of a fault zone that has been reactivated is the Foothills Fault Zone. The zone was considered inactive until evidence of an earthquake (approximately 1.6 million years ago) was found near Spenceville, California. Then, in 1975, an earthquake occurred on another branch of the zone near Oroville, California (now known as the Cleveland Hills Fault). The State Division of Mines and Geology

indicates that increased earthquake activity throughout California may cause tectonic movement along currently inactive fault systems.

No active faults are known to exist in Placer County. The following inactive faults have been identified within the city limits:

- The Volcano Hill fault extends northwest from Volcano Hill for a distance of 1 mile, terminating near Eureka Road. No activity has been recorded along this fault; therefore, it is considered inactive.
- Identified in 1973, the Linda Creek fault is located along Linda Creek in Roseville and Sacramento County. No activity has been recorded along this fault.
- The Willows Fault and Stockton Fault are in the Roseville vicinity and are considered inactive as displacement occurred greater than 1.8 million years ago.
- An unnamed fault extends east to west between Folsom Lake and the City of Rocklin. Segments of the fault are concealed and therefore unmapped. However, the east/west alignment suggests that the fault could connect to the Bear Mountain Fault, branches of which are located beneath Folsom Lake. The Bear Mountain Fault is a fault that could be undergoing reactivation as a result of continental tectonic activity. However, no evidence has been identified along the unnamed fault alignment of such reactivation.

Maps of Earthquake Impact in Roseville

A probabilistic seismic hazard map shows the hazard from earthquakes that seismologists agree could occur. It is probabilistic in the sense that the analysis takes into consideration the uncertainties in the size and location of earthquakes and the resulting ground motions that can affect a particular site. The maps are expressed in terms of probability of exceeding a certain ground motion, such as the 10-percent probability of exceedance in 50 years. This level of ground shaking has been used for designing buildings in high seismic areas. Figure 9-2 shows the estimated ground motion for a 100-year probabilistic earthquake.

Earthquake scenarios describe the expected ground motions and effects of specific hypothetical large earthquakes for a region. Maps of these scenarios can be used to support all phases of emergency management. Two such scenarios were evaluated for this Plan:

- A Magnitude-6.8 event on the Concord-Green Valley Fault with an epicenter 56 miles southwest of Roseville near Vallejo, California (see Figure 9-3)
- A Magnitude-7.1 event on the Great Valley Fault with an epicenter 58 miles west northwest of Roseville (see Figure 9-4)

NEHRP Soil Maps

NEHRP soil types define locations that will be significantly impacted by an earthquake. NEHRP Soils B and C typically can sustain low-magnitude ground shaking without much effect. Areas with NEHRP Soils D, E and F are most commonly affected by ground shaking. Figure 9-5 shows NEHRP soil classifications in the county.

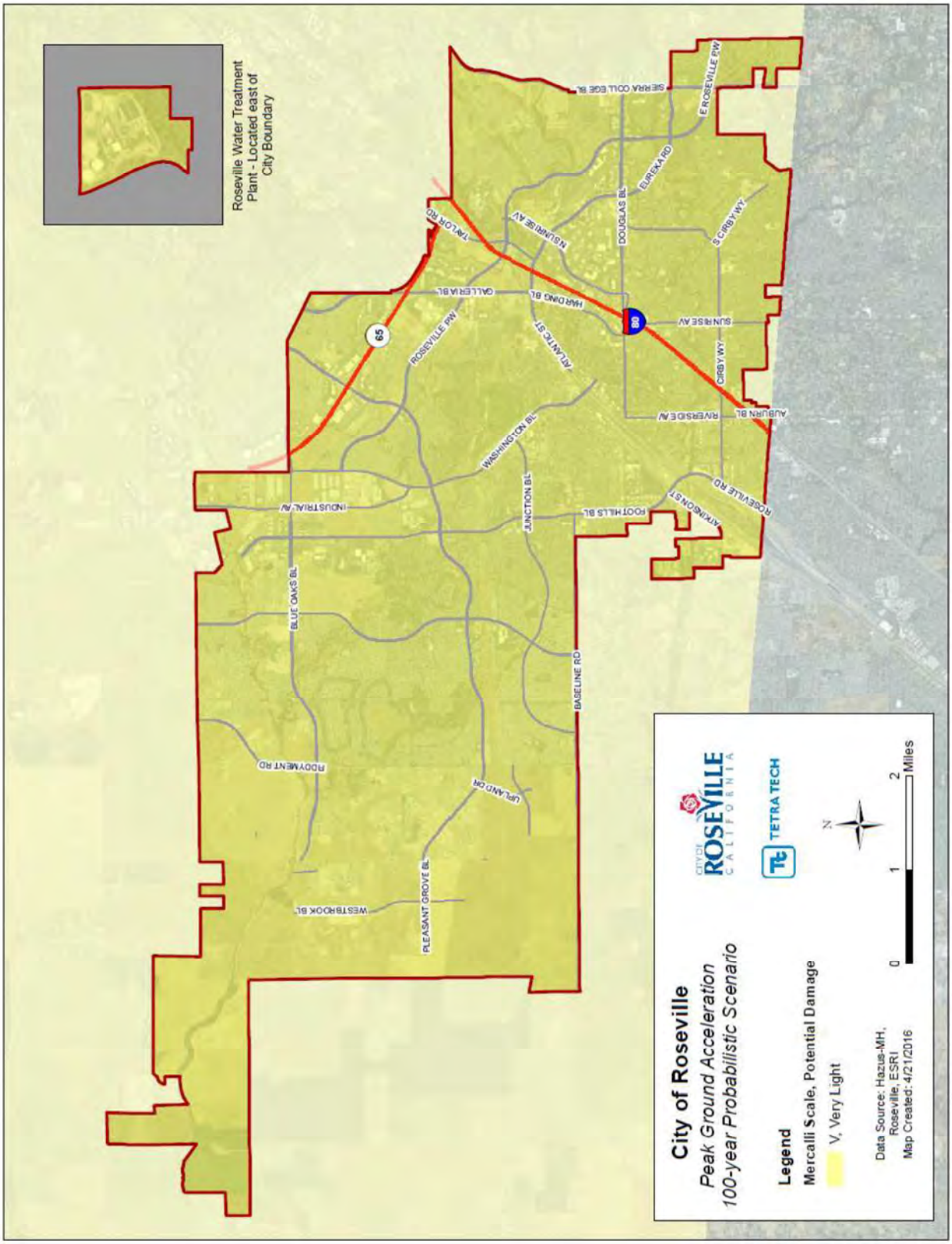


Figure 9-2. 100-Year Probabilistic PGA

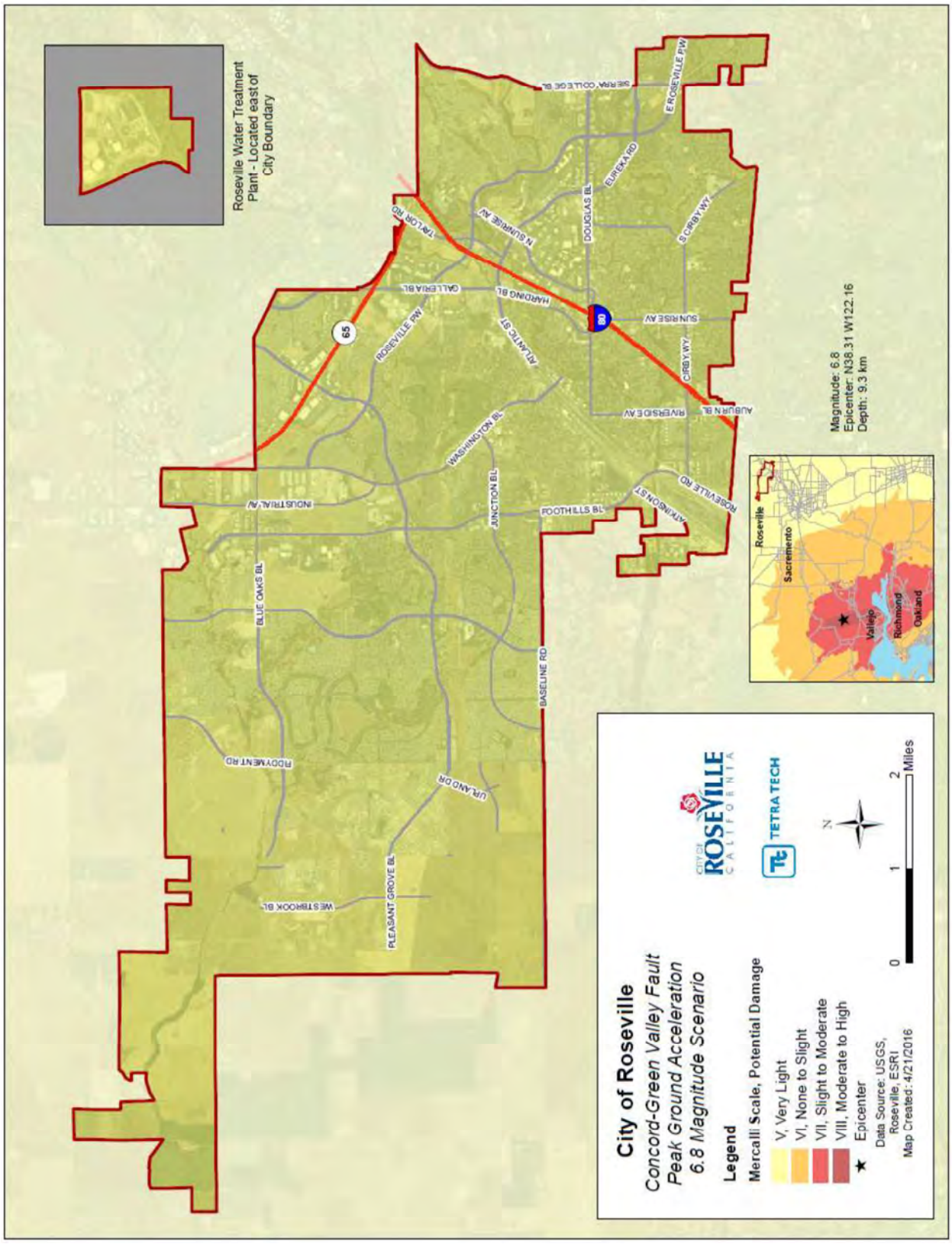


Figure 9-3. Concord-Green Valley Fault Scenario PGA

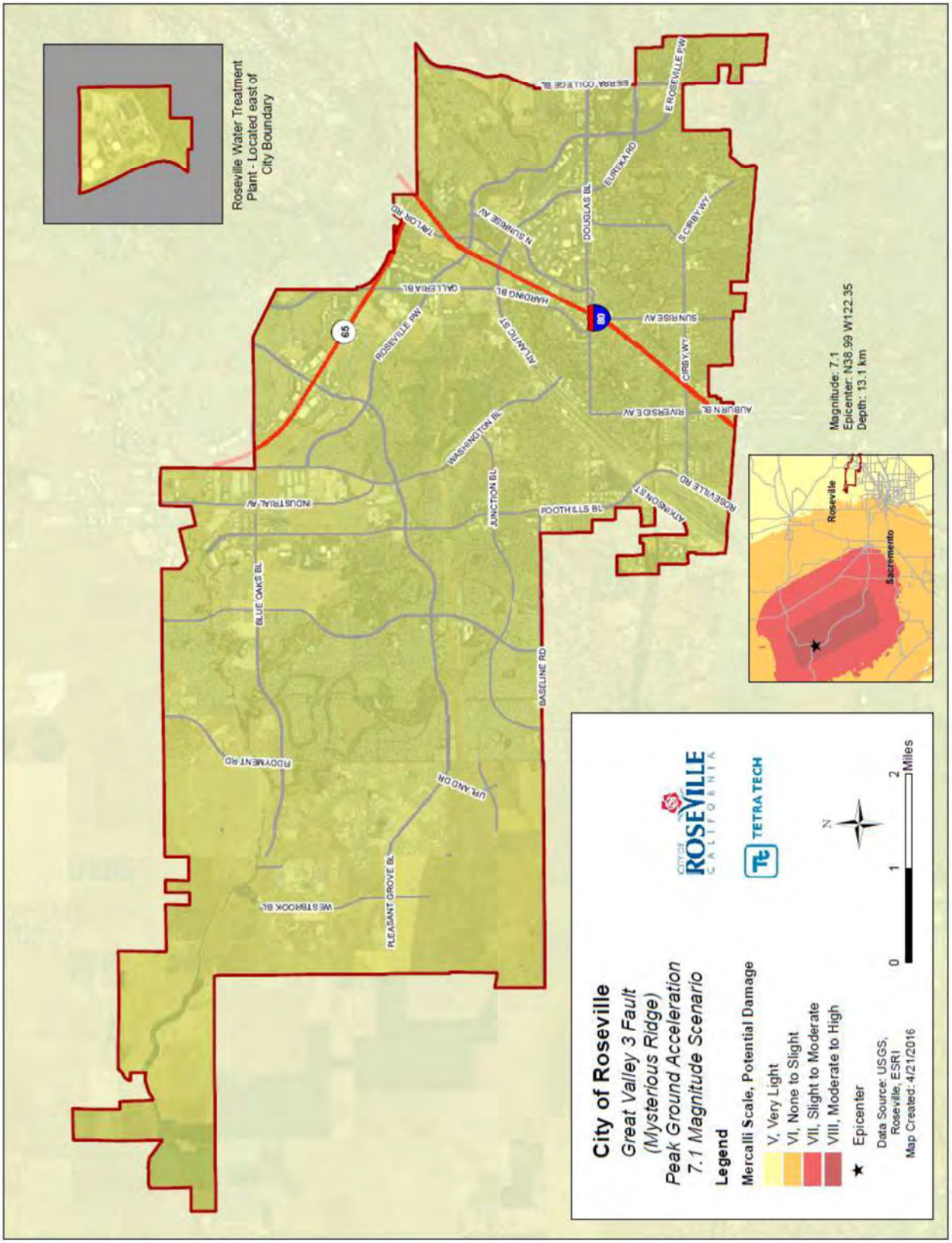


Figure 9-4. Great Valley 3 Fault Scenario PGA

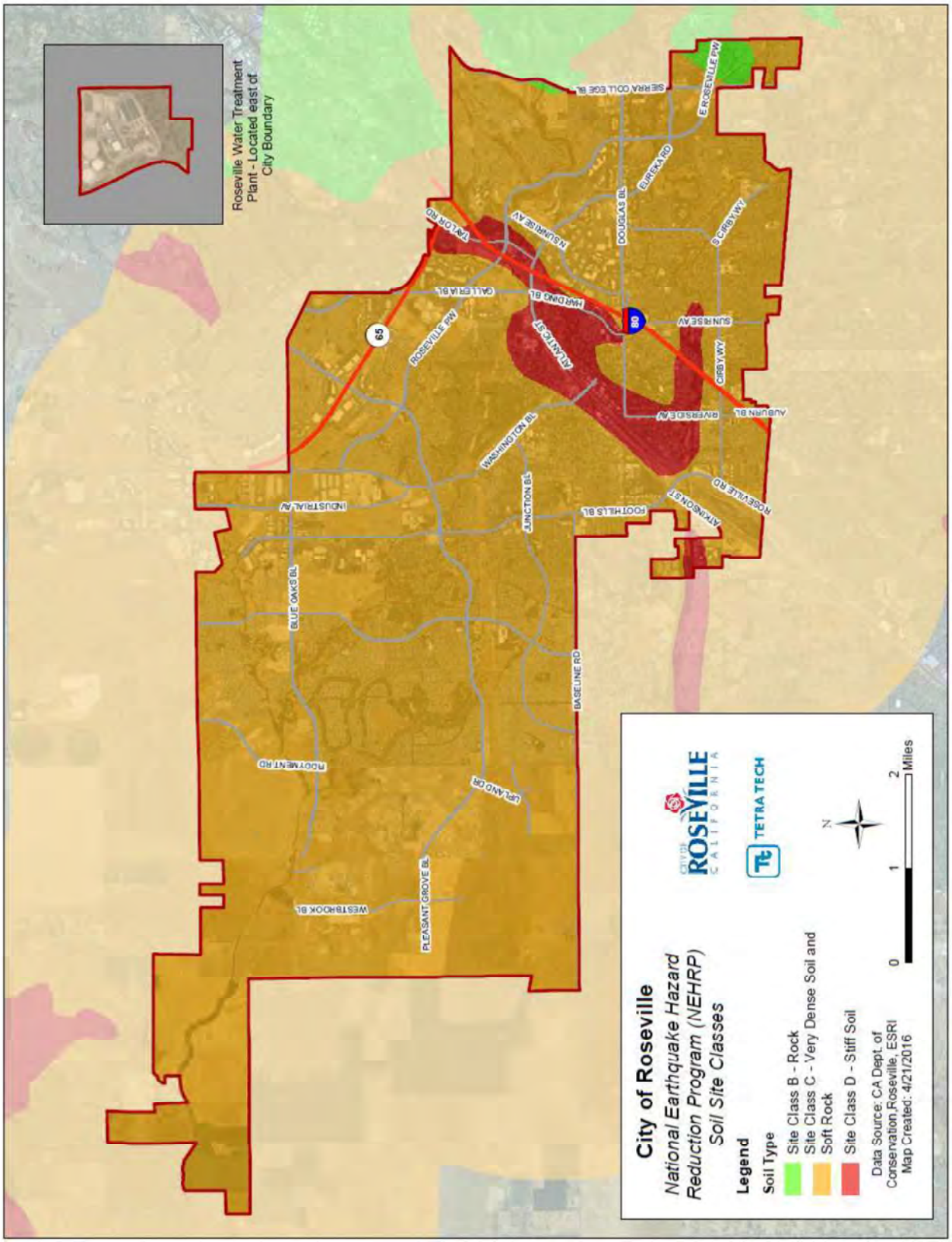


Figure 9-5. National Earthquake Hazard Reduction Program Soil Classification

9.2.3 Frequency

California experiences hundreds of earthquakes each year, most with minimal damage and magnitudes below 3.0 on the Richter Scale. Earthquakes that cause moderate damage to structures occur several times a year. According to the USGS, a strong earthquake measuring greater than 5.0 on the Richter Scale occurs every two to three years and major earthquakes of more than 7.0 on the Richter Scale occur once a decade. Both the San Andreas Fault and the closer Hayward Fault have the potential for experiencing major to great events. The State Hazard Mitigation Plan indicates that in the next 30 years in California there is over a 99-percent probability of a magnitude 6.7 earthquake and a 94-percent probability of a magnitude 7.0 earthquake.

9.2.4 Severity

Placer County and Roseville are identified as a low-severity zone. While there are several faults with the potential for large-magnitude earthquakes in the vicinity, the distance between those faults and the City of Roseville would result in very low, peak-ground accelerations in the City. The biggest contributor to potential intensity of shaking in Roseville is the Foothills Fault Zone.

Liquefaction

Liquefaction of loose sandy soil with a high water content during an earthquake undermines the ground's ability to solidly support building structures. Foundations supported on liquefiable soils can lose their ability to support load, and can experience settlement on the order of several inches or more. Differential settlement can cause significant damage to buildings, lifelines, and transportation structures, with partial or total collapse.

The City of Roseville is not specifically addressed in currently available State Division of Mines and Geology liquefaction risk data. No determination has been made as to whether liquefaction potential exists in Roseville. Based on project-specific analysis that has been done for many of Roseville's development projects, liquefaction has not been identified as a significant problem in Roseville.

The prevailing water table in the vicinity of Roseville is approximately 80 feet below grade. Without water to saturate the soil, liquefaction is not possible. The liquefaction potential in Roseville is, therefore, considered to be very low. The most likely location for liquefaction would be along the City's creek beds. The City's policy of protecting floodplain areas has avoided development in many of the most susceptible areas.

Ground Failure

Roseville's geographic location, soil conditions, and surface terrain combine to minimize risk of major damage from landslides, subsidence (gradual shrinking of the earth's surface due to underground resource extraction), or other geologic hazards resulting from seismic activity and related natural forces.

Slopes

Roseville is located on relatively level terrain, with slopes that gradually increases to the north and east. Recent development in the Stoneridge Specific Plan and Northeast Roseville Specific Plan is adjacent to ravine areas and developed property would be more susceptible in the event of seismic activity due to steep slopes in some areas.

9.2.5 Warning Time

There is no current reliable way to predict the day or month that an earthquake will occur at any given location. Research is being done with warning systems that use the low energy waves that precede major earthquakes. These potential warning systems would give approximately 40 seconds notice that a major earthquake is about to occur. The warning time is very short but it could allow for someone to get under a desk, step away from a hazardous material they are working with or shut down a computer system.

9.3 SECONDARY HAZARDS

Earthquakes can cause large and sometimes disastrous landslides and mudslides. River valleys are vulnerable to slope failure, often as a result of loss of cohesion in clay-rich soils. When soil liquefaction occurs, building and road foundations can lose load-bearing strength and may sink quicksand-like into what was previously solid ground. Unless properly secured, hazardous materials can be released during earthquakes, causing significant damage to the environment and people. Earthen dams and levees are highly susceptible to seismic events and the impacts of their eventual failures can be considered secondary earthquake hazards.

The City of Roseville faces potential social impacts in the wake of mass evacuations should a large seismic event occur in the San Francisco Bay area. As the first major metropolitan city along Interstate 80 east of Sacramento, the City's services and infrastructure could be strained as evacuating populations seek shelter close to home. Evacuees could need shelter for long periods, depending on the magnitude of the event. This could significantly tax hospitals, schools and services in the City, causing significant economic impacts.

9.4 EXPOSURE

9.4.1 Population

All of the population of Roseville, both residents and visitors, would be directly or indirectly exposed to the potential impacts of an earthquake.

9.4.2 Property

All structures within Roseville are exposed to the potential impacts of an earthquake.

9.4.3 Critical Facilities

Since the entire planning area has exposure to the earthquake hazard, all critical facilities and infrastructure components are exposed to the earthquake hazard, as summarized in Table 9-6 and Table 9-7.

Table 9-6. Critical Facilities Exposed to the Earthquake Hazard

Facility Type	Number in Planning Area
Medical and Health	2
Government Functions	27
Protective Functions	10
Schools	49
Hazmat	6
Other Critical Functions	78
Total	**172**

Table 9-7. Critical Infrastructure Exposed to the Earthquake Hazard

Facility Type	Number in Planning Area
Bridges	68
Water Supply	11
Wastewater	23
Power	18
Communications	98
Other	6
Total	**224**

The City's Water Treatment Plant on Barton Road is the only critical facility located near an identified local inactive fault. All other City facilities are within Roseville and are not located near an inactive local fault. However, all are considered to be exposed to the same earthquake risk as the general building stock.

Most of the City's critical facilities have been built since the Uniform Building Code (UBC) was amended to include provisions for seismic safety. For example, the two major hospitals—Sutter Roseville Medical Center and Kaiser Permanente—were both constructed in the 1990s, as were the Roseville Police Department and Roseville Civic Center. The movement of the California Building Code to the International Building Code standard in 2013 has upheld seismic standards previously established by the UBC.

Critical industrial facilities are of concern because of potential hazardous materials spills or the potential for critical employment centers to continue operating. Many forms of hazardous materials are present in Roseville at private businesses, in permanent storage locations, along the Union Pacific Railroad, and on Interstate 80 and Highway 65.

Hazardous Materials

Hazardous material releases from fixed facilities and transportation-related releases can occur during an earthquake event. Roseville's location at the junction of two major rail lines with two freeways increases the potential for a hazardous materials event should a major earthquake occur. Facilities holding hazardous materials are of particular concern because of possible isolation of surrounding populations.

Roads

Roads have the potential to be significantly damaged during an earthquake. Access to major roads is crucial to life and safety after a disaster event as well as to response and recovery operations.

Bridges

Earthquake events can significantly impact bridges, which often provide the only access to some neighborhoods. Since soft soil regions generally follow floodplain boundaries, bridges that cross water courses are considered vulnerable. Since most of the City's bridges provide access across water courses, most are at least somewhat vulnerable to earthquakes. Key factors in the degree of vulnerability are the facility's age and type of construction, which indicate the standards to which the facility was built.

Water and Sewer Infrastructure

Water and sewer infrastructure would likely suffer considerable damage in the event of an earthquake. This is hard to analyze due to the amount of infrastructure and the fact that water and sewer infrastructure are usually linear easements. Without further analysis of individual system components, it should be assumed that these systems are exposed to breakage and failure.

9.4.4 Environment

Environmental problems as a result of an earthquake can be numerous. Secondary hazards will likely have some of the most damaging effects on the environment. Earthquake-induced landslides in landslide prone areas can significantly impact surrounding habitat. It is also possible for streams to be rerouted after an earthquake. This can change the water quality, possibly damaging habitat and feeding areas. There is a possibility of streams fed by groundwater wells drying up because of changes in underlying geology.

9.5 VULNERABILITY

The data in this section was generated using the HAZUS-MH program for earthquakes. Once the location and size of a hypothetical earthquake are identified, HAZUS-MH estimates the intensity of the ground shaking, the number of buildings damaged, the number of casualties, the amount of damage to transportation systems and utilities, the number of people displaced from their homes, and the estimated cost of repair and clean up.

Although Roseville is in California and has three faults documented in the City's General Plan, the seismic hazard is not considered to be a serious risk to life or property. Studies have not identified the Sierra Foothills, including Placer County, as a likely location for a significant seismic event. Roseville is fortunate in that more than three-quarters of the development in the City has occurred in the past two decades and all applicable seismic building codes have been enforced through the planning and development process.

9.5.1 Population

The measurable impact of earthquake on loss of life is minimal in Roseville and has not been estimated for this Plan. The life-safety exposure to earthquake in Roseville is low and would most likely occur in buildings as a result of damage to structures. To prevent damage to structures that could lead to loss of life, the City has a strict code enforcement policy to prevent improper alterations to original buildings. The City has funded façade grants to renovate older commercial structures, and has established an infill development team to work with property owners to upgrade and add value to older properties.

The City encourages residents to be prepared through public education and training via the Roseville Fire Department and local non-profits. Local employers such as Union Pacific, Sutter Roseville Medical Center, Kaiser Hospital, HP and NEC maintain emergency response plans that include earthquake preparedness and response training to protect life and property. Earthquake preparedness and response training prepares employees to continue service to the community in the event of a seismic event.

The vulnerable populations are those living in economically disadvantaged households, those over 65 and those under 16.

9.5.2 Property

Loss Potential

An earthquake would cause property damage in a small percentage of the City's buildings built prior to 1933 and structures such as manufactured homes and older homes that have not been well maintained. Loss estimates for the planning area were generated for the 100-year earthquake event as well as the Concord-Green Valley Fault scenario event and the Great Valley 3 Fault scenario event, through a Level 2 analysis using HAZUS-MH. A summary of results is as follows:

- For a 100-year earthquake, the estimated damage potential is $43.37 million, or 0.15 percent of the total assessed value for the planning area.
- For a 6.8-magnitude event on the Concord-Green Valley Fault, the estimated damage potential is $1.7 million, or 0.01 percent of the total assessed value for the planning area.
- For a 7.1-magnitude event on the Great Valley 3 Fault, the estimated damage potential is $21.3 million, or 0.07 percent of the total assessed value for the planning area.

Age of Structures

The City of Roseville is a relatively new community, with most of its development occurring since 1976. The California Multi-Hazard Mitigation Plan identifies significant milestones in building and seismic code

requirements that affect the structural integrity of development in California. Table 9-8 lists the City's structures by the time period in which they were built, based on age-of-structure data from the City's land inventory database. The number of structures is approximate and is based on best available data currently entered into Roseville and Placer County databases. The number of structures does not reflect the number of total housing units, as many multi-family units and attached housing units are reported as one structure.

Table 9-8. Age of Structures in the City of Roseville

Time Period	Number of Structures in Roseville	Significance of Time Period
Pre-1933	540	Before 1933, there were no explicit requirements for earthquakes in building codes. State law did not require local governments to have building officials or issue building permits.
1933-1940	608	In 1940, the first strong motion recording was made in El Centro.
1941-1960	2,526	In 1960, the Structural Engineers Association of California reached the first statewide consensus on recommended earthquake provisions and published the guidelines.
1961-1975	3,029	In 1975, significant improvements were made to lateral force requirements that were then enforced throughout the state.
1976-1994	12,932	In 1994, the Uniform Building Code was amended to include provisions for seismic safety.
1994 to present	26,423	Seismic code is currently enforced.
Total	**46,058**	

Just over 57 percent of the City's structures were constructed since the UBC was amended in 1994 to include seismic safety provisions. Approximately 1 percent of the City's structures were built before 1933 when there were no building permits, inspections, or seismic standards. Figure 9-6 shows the distribution of structures across the City by age.

Construction Materials

The type of construction is a factor in a building's ability to withstand shaking and liquefaction should an earthquake occur. Developers in Roseville have built primarily wood frame structures. The tallest building in Roseville is currently three stories. HAZUS-MH generated the percentages of each building type in Roseville as shown in Table 9-9.

Table 9-9. Building Type

Building Type	Percent of Total
Wood	96.67%
Reinforced Masonry	<1%
Manufactured Homes	<1%
Concrete	1.2%
Un-reinforced Masonry	<1%
Steel	<1%
Total	**100%**

Sources: HAZUS – MH (Occupancy Class Data)

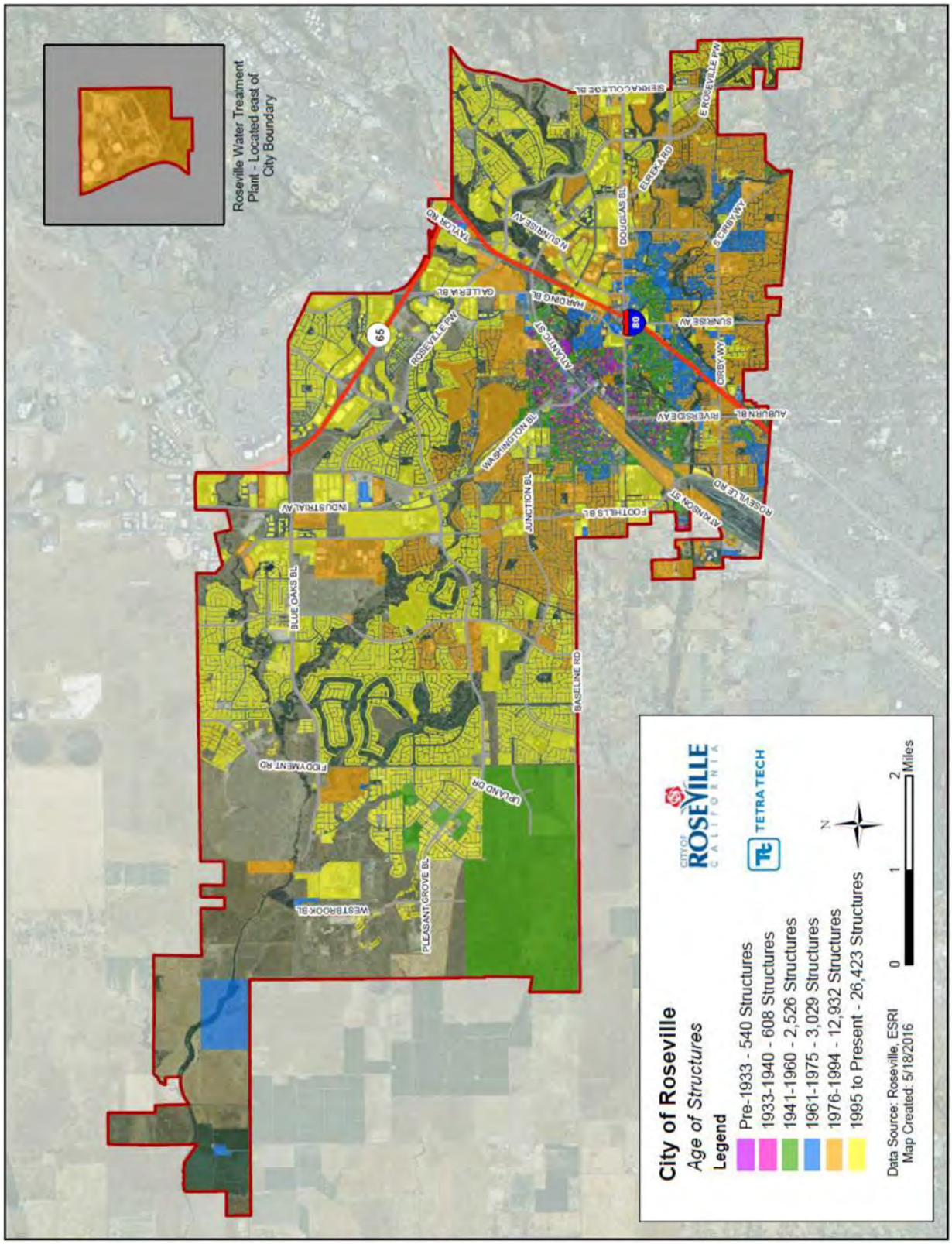


Figure 9-6. Age of Construction of Structures in Roseville

9.5.3 Critical Facilities

Roseville's utilities all have funded rehabilitation programs that identify and replace worn infrastructure to ensure continuous service. The latest technologies, including computerized alarms, video inspections, and mapping of all of the City's water, wastewater, recycled water and electric systems, would identify damaged sections in the event of a seismic event. Private utilities in Roseville also use modern technology to monitor their infrastructure in Roseville and respond quickly to service interruptions.

Level of Damage

The inventory of critical facilities was entered into HAZUS-MH to determine the vulnerability of these facilities to earthquake damage. Critical facilities were categorized into the following levels of damage probability: no damage, slight damage, moderate damage, extensive damage, or complete damage. HAZUS-MH calculated the probability of damage under each of these categories for the 100-year event and the Great Valley 3 Fault Scenario. The results are summarized in Table 9-10 and Table 9-11. The impact on critical facilities for the Concord-Green Valley Fault scenario was not run due to the limited impacts of this event identified by the general building stock analysis.

Table 9-10. Damage Probability (Vulnerability) of Critical Facilities from a 100-Year Earthquake Event

Category	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage
Medical and Health	99.8	0.2	0	0	0
Government Functions	93.4	5.0	1.5	0.1	0
Protective Functions	97.4	2.4	0.2	0	0
Schools	97.3	2.5	0.2	0	0
Other Critical Functions	95.4	4.0	0.6	0	0
Average	**96.7**	**2.8**	**0.5**	**0**	**0**

Table 9-11. Damage Probability (Vulnerability) of Critical Facilities from the Great Valley 3 Scenario

Category	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage
Medical and Health	100	0	0	0	0
Government Functions	99.3	0.7	0	0	0
Protective Functions	99.7	0.3	0	0	0
Schools	99.8	0.2	0	0	0
Other Critical Functions	99.6	0.4	0	0	0
Average	**99.7**	**0.3**	**0**	**0**	**0**

Time to Return to Functionality

HAZUS-MH estimates the expected time required to restore critical facilities to full functional use, in the form of percent probability of being functional at specified time increments post-event: 1, 3, 7, 14, 30 and 90 days after the event occurs. For example, HAZUS-MH may estimate that a facility has 5-percent chance of being fully functional at Day 3, and a 95-percent chance of being fully functional at Day 90. The functionality analysis was performed for all critical facilities and infrastructure components in the planning area for both the 100-year event and the Great Valley 3 Scenario. Results are summarized in Table 9-12 and Table 9-13.

9.5.4 Environment

The environment vulnerable to earthquake hazard is the same as the environment exposed to the hazard.

Table 9-12. Functionality of Critical Facilities, 100-Year Earthquake

Planning Unit	# of Critical Facilities	Probability of Being Fully Functional (%)					
		at Day 1	at Day 3	at Day 7	at Day 14	at Day 30	at Day 90
Medical and Health	2	99.7	99.7	99.9	99.9	99.9	99.9
Government Functions	27	93.4	93.6	98.3	98.3	99.8	99.9
Protective Functions	10	97.3	97.3	99.7	99.8	99.9	99.9
Schools	49	97.2	97.2	99.7	99.8	99.9	99.9
Other Critical functions	78	95.3	95.5	99.3	99.3	99.9	99.9
Total/Average	**166**	**96.6**	**96.7**	**99.4**	**99.4**	**99.9**	**99.9**

Table 9-13. Functionality of Critical Facilities, Great Valley 3 Scenario

Planning Unit	# of Critical Facilities	Probability of Being Fully Functional (%)					
		at Day 1	at Day 3	at Day 7	at Day 14	at Day 30	at Day 90
Medical and Health	2	100	100	100	100	100	100
Government Functions	27	99.2	99.2	99.9	99.9	99.9	99.9
Protective Functions	10	99.7	99.7	99.9	99.9	99.9	99.9
Schools	49	99.8	99.8	99.9	99.9	99.9	99.9
Other Critical functions	78	99.5	99.5	99.9	99.9	99.9	99.9
Total/Average	**166**	**99.6**	**99.6**	**99.9**	**99.9**	**99.9**	**99.9**

9.6 FUTURE TRENDS IN DEVELOPMENT

The general building stock within the planning area increased by 17.7% with an increase in valuation from $21.967 billion to $29.641 billion (34.9%). This increase in valuation of the planning area was impacted by the areas recovery from the economic downturn of 2008. Since the entire planning area would be considered susceptible to earthquake, there was an increase in earthquake exposure over the performance period of the 2011 plan. However, the vulnerability of this new exposure should be considered to be low due to the application of strong seismic building code standards that are contained within the International Building Code.

Roseville is expected to grow considerably in the next 10 years. The moderate potential for earthquake in Roseville is not likely to lessen or prohibit development in the City.

The City's development departments will strictly enforce all seismic building codes and design standards to prevent loss of life and property due to earthquake. Public education, cooperation with the development community, and individual preparedness are essential as Roseville welcomes thousands of new residents and hundreds of new businesses to the City each year.

9.7 REVIEW OF EXISTING ORDINANCES, PROGRAMS AND PLANS

9.7.1 International Building Codes

The State of California provides minimum standards for structural design and site development through the California Building Standards Code (California Code of Regulations (CCR), Title 24). The California Building Code (CBC) is based on the International Building Code (IBC), which is widely used throughout the United States and has been modified for California conditions with numerous more detailed and stringent regulations.

Chapter 18 of the IBC/CBC regulates the excavation of foundations and retaining walls and regulates grading activities, including drainage and erosion control, and construction on expansive soils (soils that expand when

water is added, and shrink when they dry out). Specific minimum seismic safety and structural design requirements are set forth in Chapter 16 of the IBC/CBC. The IBC/CBC requires a site-specific geotechnical study to address seismic issues and identifies seismic factors that must be considered in structural design.

The following uniform codes have been adopted in Chapter 16 of the Roseville Zoning Ordinance to ensure that buildings are designed and sited properly to protect against seismic and unstable soil conditions: CBC (2013), California Plumbing Code (2013), California Green Building Standards (2013), and the California Mechanical Code (2013).

To reduce the risk of seismic-related safety hazards and structural damage to pipelines, roads, and residential homes to an acceptable level, the City of Roseville conditions of approval for development projects require that at the time of tentative map approval, construction be in accordance with the IBC and local building standards, as administered by the Roseville Building Division. Regular monitoring and enforcement through the building permit and plan check process ensures that new development and construction meet all seismic and geologic safety standards, reducing the risk of building damage.

9.7.2 Improvement Standards

The City of Roseville Improvement Standards require the development of a grading plan, an erosion and sedimentation control plan, and mitigation monitoring requirements to reduce the exposure of people and structures to seismic hazards.

9.7.3 Geotechnical Studies

The City of Roseville requires the preparation of site-specific geotechnical studies as part of the building permit process. The technical information that must be compiled for these studies, which address both seismic hazards and soil conditions, is specified in Chapters 16 and 18 of the CBC. The studies provide recommendations to address slope and foundation instability, stream bank protection, and slope evaluation, as well an evaluation of expansive soils and differential settlement. Implementation of recommendations minimizes impacts associated with the exposure of people and structures to seismic hazards, the development of structures on expansive soils, grading that increases slope instability, increased erosion along stream channels, and soil erosion from grading.

9.8 SCENARIO

Inactive faults in the region could significantly impact the City of Roseville should they reactivate, but modeling such impact is difficult due to the lack of data. The direct earthquake risk in Roseville is considered to be low to moderate, but indirect impacts from a significant event in the region could be significant. The City would most likely experience impacts from a large seismic event in the Bay Area. As a large metropolitan center with easy access to transportation corridors, the City would likely become a major evacuation center in response to such an event. This could significantly tax City resources.

9.9 ISSUES

Important issues associated with an earthquake in Roseville include but are not limited to the following:

- Planning is required for mass evacuations into the City of Roseville.
- There is enough older building stock in the City featuring un-reinforced masonry construction to warrant structural and non-structural mitigation.
- There is a need for better comprehensive soils data to better identify the probable earthquake risks in the City.

- A large seismic event in the Sacramento Region could trigger a dam failure on Folsom Lake, causing significant impacts.
- The perceived lack of risk can lead to complacency. Earthquakes provide a significant risk to all populations in California, whether the impacts are direct or indirect.
- There is still much to learn about the impacts of climate change on seismic activity.

10. FLOODING

10.1 GENERAL BACKGROUND

A floodplain is the area adjacent to a river, creek or lake that becomes inundated during a flood. Floodplains may be broad, as when a river crosses an extensive flat landscape, or narrow, as when a river is confined in a canyon.

10.1.1 Measuring Floods and Floodplains

The frequency and severity of flooding are measured using a discharge probability, which represents the probability that a certain discharge level will be equaled or exceeded in a given year. Discharge is the volume of water flowing in a stream or river and over its banks during a given time. Flood studies use historical records to determine the probability of occurrence for different discharge levels. The flood frequency equals 100 divided by the discharge probability. For example, the 100-year discharge has a 1 percent chance of being equaled or exceeded in any given year. The "annual flood" is the greatest flood event expected to occur in a typical year.

The extent of flooding associated with a 1-percent annual probability of occurrence (the base flood or 100-year flood) is commonly used as the regulatory boundary. This boundary is also referred to as the special flood hazard area (SFHA). Many communities have maps that show the extent and likely depth of flooding for the base flood. The base flood elevation is computed using discharge probabilities. The corresponding water-surface elevations describe the exact elevation of water that will result from a given discharge level, which is one of the most important factors used in estimating the potential flood damage in a given area.

10.1.2 Effects of Human Activities

Throughout history, humans have developed settlements in floodplains to take advantage of the benefits of being near the water bodies, but such settlements have always been susceptible to damage from flooding. Human activities concentrate in floodplains for a number of reasons: water is readily available; land is fertile; transportation by water is easily accessible; and land is flatter and easier to develop. But human activity in floodplains frequently interferes with natural processes. It can affect the distribution and timing of drainage, thereby increasing flood problems. Human development creates local flooding problems by altering or confining drainage channels. This increases flood potential in two ways: it reduces the stream's capacity to contain flows, and it increases flow rates or velocities downstream during all stages of a flood event.

10.1.3 Floodplain Ecosystems

Floodplains can support ecosystems that are rich in biological quantity and diversity. Wetting of the floodplain soil releases a surge of nutrients: those left over from the last flood, and those that result from the rapid decomposition of organic matter that has accumulated since then. Microscopic organisms thrive and larger species enter a rapid breeding cycle. Opportunistic feeders—particularly birds—move in to take advantage. The production of nutrients peaks and falls away quickly, but the surge of new growth endures for some time. This makes floodplains particularly valuable for agriculture. Riparian zone species have significant differences from those outside of floodplains. For instance, riparian trees tend to be very tolerant of root disturbance and tend to be very quick-growing compared to non-riparian trees.

10.1.4 Federal Flood Programs

National Flood Insurance Program

The NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in participating communities. For most communities participating in the NFIP, FEMA has prepared a detailed Flood Insurance Study. The study presents water surface elevations for floods of various magnitudes, including the 1-percent annual chance flood and the 0.2-percent annual chance flood (the 500-year flood). Base flood elevations and the boundaries of the 100- and 500-year floodplains are shown on Flood Insurance Rate Maps (FIRMs).

Roseville entered the NFIP on December 15, 1983. The date of the City's current effective FIRM is November 21, 2001. As a participant in the NFIP, the City must, at a minimum, regulate development in its floodplain areas in accordance with NFIP criteria. Before a permit to build in a floodplain area is issued, the City must ensure that two basic criteria are met:

- All new buildings and developments undergoing substantial improvements must, at a minimum, be elevated to protect against damage by the 100-year flood.
- New floodplain development must not worsen existing flood problems or increase damage to other properties.

Properties constructed after a FIRM has been adopted are eligible for reduced flood insurance rates. Such structures are less vulnerable to flooding since they were constructed after regulations and codes were adopted to decrease vulnerability. Properties built before the FIRM was adopted may be more vulnerable to flooding and related damage because they do not meet code or are located in hazardous areas. The first FIRMs for Roseville were available at the end of 1983. According to Placer County Assessor records, 131 of the 154 structures located in the City's regulated floodplain were constructed prior to January 1984 and are therefore considered pre-FIRM under the NFIP. The number of post-FIRM structures in the regulatory floodplain is extremely low because of the City's proactive floodplain management policy of not allowing new development in the floodplain.

The Community Rating System

The Community Rating System (CRS) is a voluntary incentive program within the NFIP. The CRS encourages floodplain management activities that exceed the minimum NFIP requirements (FEMA 2002). Flood insurance premium rates are discounted to reflect the reduced flood risk resulting from community actions meeting the following three goals of the CRS:

- Reduce flood losses.
- Facilitate accurate insurance rating.
- Promote awareness of flood insurance.

For participating communities, flood insurance premium rates are discounted in increments of 5 percent. For example, a Class 1 community would receive a 45 percent premium discount, and a Class 9 community would receive a 5 percent discount. (Class 10 communities are those that do not participate in the CRS; they receive no discount.) The CRS classes for local communities are based on 18 creditable activities in the following categories:

- Public Information
- Mapping and Regulations
- Flood Damage Reduction
- Flood Preparedness

Figure 10-1 shows the nationwide number of CRS communities by class as of May 1, 2016, when there were 1,391 communities receiving flood insurance premium discounts under the CRS program. Although insurance

premium discounts are one benefit of participation in the CRS, more important benefits result from activities that save lives and reduce property damage. Communities participating in the CRS represent a significant portion of the nation's flood risk as evidenced by the fact that over 68 percent of the NFIP's policy base is located in these communities. Communities receiving premium discounts through the CRS range from small to large and represent a broad mixture of flood risks, including both coastal and riverine flood risks.

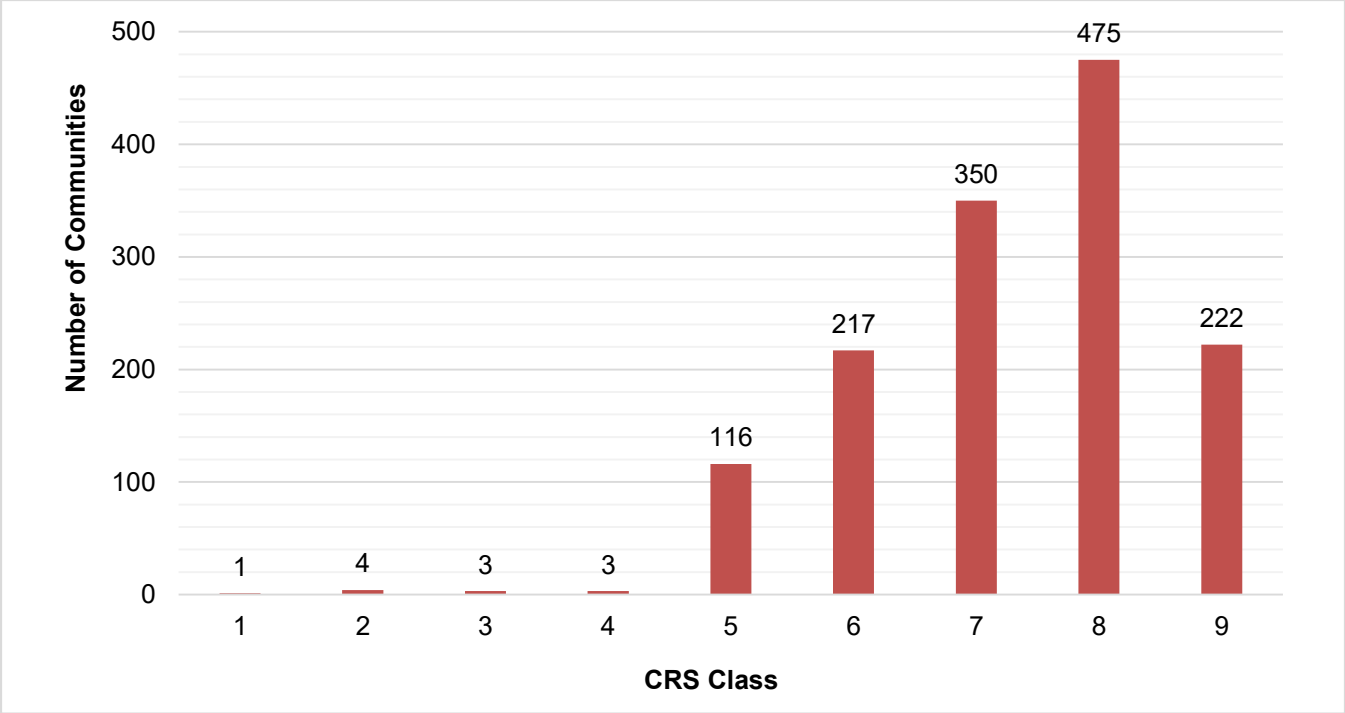


Figure 10-1. CRS Communities by Class as of May 1, 2016

The City of Roseville participated as a pilot-test community during CRS development in the late 1980s. The City began its official participation in the CRS program in 1991 and became the nation's first and only Class 1 community on October 1, 2006. This classification provides flood insurance policy holders in Roseville up to a 45-percent reduction in flood insurance premiums and represents an annual savings of $101,858 in flood insurance premiums; an average of $172 per year for each policy in force.

10.2 HAZARD PROFILE

10.2.1 Flooding Types

Flooding in Roseville is typically caused by high-intensity storms of relatively short duration (1 to 3 hours) concentrated on a stream reach with already saturated soil. In Roseville, two types of flooding typically occur:

- Flash floods that occur suddenly after a brief but intense and concentrated downpour. They move rapidly, end suddenly, and can occur in areas not generally associated with flooding (such as subdivisions not adjacent to a water body and areas serviced by underground drainage systems). Although the duration of these events is usually brief, the damage they cause can be severe. Flash floods cannot be predicted accurately and happen whenever there are heavy storms.

- Riverine floods, which are described in terms of their extent (including the horizontal area affected and the vertical depth of floodwater) and the related probability of occurrence (expressed as the percentage chance that a flood of a specific extent will occur in any given year).

Some localized flooding not associated with creek or stream overflow occurs in Roseville when rainfall runoff volumes exceed the design capacity of drainage facilities or when there are no drainage facilities to control flows. The City has attempted to address this type of flooding with regulations that require an "overland release" of stormwater generated at a site to a recognized stormwater facility. The City also requires mitigation of any increase in runoff generated from new development. However, some developments and facilities in the City were put in place before these policies were adopted.

10.2.2 Past Events

Correspondence from the 1930s between the U.S. Army Corps of Engineers and the City of Roseville indicated a need for establishing flood control measures along Dry, Cirby, and Linda Creeks. The flood of February 1986 was the largest flood on record at its time. This flood caused substantial property damage and was considered to be a 70- to 100-year event, depending on location. In January 1995, the City was subject to flooding that exceeded the 1986 flood event in most streams in Roseville, and that flood is now considered to be the flood of record.

Based on data from the National Climactic Data Center and the University of South Carolina's Spatial Hazard Events and Losses Database for the United States, 16 major flood events were reported in Placer County between January 1950 and December 2009, with an estimated $49,115,460 in property damage. Table 10-1 shows the estimated damage from flooding in Placer County that impacted Roseville from 1973 to 2009.

Table 10-1. Reported Damage from Major Flooding in Roseville (1973 to 2009)

Date	Reported Damage (not adjusted for inflation)
January 1973	$86,207
March 1983	Not Available
February 1986	$5,000,000 (Roseville only)
January 1995	$8,000,000 Total ($4.4 million structural)
January 26,1997	$43,600 (structural)
February 1998	$20,000 (structural)
December 17, 2005	$2,000,000 (county-wide)

Significant flood events impacting the City of Roseville are discussed below with respect to damage, frequency, injuries and fatalities. Unreported injury or illness may be associated with each event. In addition to the events discussed below, flooding occurred during other storms in 1950, 1952 and 1963. However, little information is available to define the extent and impacts of these flooding events.

December 1955

Flooding occurred primarily along Dry Creek. Homes in the Douglas Boulevard area were surrounded by floodwater, and one family was evacuated. Douglas Boulevard was impassable, and pavement was damaged. Royer Park was inundated, and floodwater extended across Park Drive. No injuries or fatalities were reported.

April 1958

This flood, which continued for at least 12 hours, was the second largest event on record at the time. Flooding was most severe on Sunrise Avenue in the southeast portion of the City, on Douglas Boulevard, in the Royer Park area, and on Riverside Avenue at Dry Creek. Agricultural damage occurred along Dry Creek immediately west of

the City. Many homes and businesses were surrounded by floodwater. Several families were evacuated by boat from homes in the Columbia Street and Douglas Boulevard areas. At Royer Park, floodwater covered the ball field and extended across Park Drive. Part of the sewage treatment plant was flooded, but the plant remained operational. No injuries or fatalities were reported.

October 1962

This flood was considered the flood of record at the time. Over 9 inches of rain fell. Creeks overflowed their banks throughout the City, but the areas most affected were along Linda Creek in the Sierra Gardens Subdivision and along Dry Creek. A number of families were evacuated from their homes on Lee Way and Douglas Boulevard. Royer Park was completely inundated for a time, and one deer in the zoo was drowned before animals could be evacuated. Other flood losses in the park included bank erosion, destruction of fencing, damage to a footbridge, and damage to a recreation building and the park office. Restoration of the park required two weeks. Water mains were damaged in the Cresthaven and Atlantic Street areas. The Dry Creek Bridge on Riverside Avenue and the Antelope Creek Bridge on Atlantic Street were damaged. No injuries or fatalities were reported.

December 1964

During this flood event, the fire and police departments evacuated four families when floodwater from Linda Creek surrounded their homes on Champion Oaks Drive and Lee Way. Dry Creek overflowed its banks in several locations, and flood-borne debris was removed in an effort to keep the stream flowing at Booth Road and the Southern Pacific railroad tracks. Floodwater at this location was deep enough to submerge a car stalled in the underpass. Stream-bank erosion occurred along the east bank of Dry Creek behind the Campfire Girls lodge on Sutter Avenue. No injuries or fatalities were reported.

January 1969

A series of downpours beginning on January 16, 1969 caused flooding along Dry Creek, affecting Royer Park, the Champion Oaks area, and the intersection of Cirby Way and Old Auburn Road. Rising water from Linda Creek crested at the doorsteps of five homes along Champion Oaks Drive. City crews prepared to load belongings into vehicles if floodwater entered the homes. A second storm during the week of January 25, caused rising water in Linda Creek that led to the evacuation of five homes on Champion Oaks Drive. Dry Creek Bridge on Douglas Boulevard at Royer Park was closed when Dry Creek washed out fill placed by City crews in response to an earlier washout. No injuries or fatalities were reported.

January 1970

Heavy rains and severe winds caused flooding in Roseville and throughout northern California. High water levels were reported on Champion Oaks Way, Subway Road, and Royer Park. No injuries or fatalities were reported.

January 1973

Heavy rain and high winds impacted northern California border during the week of January 16, 1973. City crews kept watch on Linda Creek at Champion Oaks Drive and closed Subway Road because of flooding. Royer Park flooded after Dry Creek overflowed its banks. No injuries or fatalities were reported.

March 1983

This flood damaged approximately 25 residences along Linda and Cirby Creeks. Portions of Royer Park and areas in the Sierra Lakes Mobile Home Park were inundated. Dry Creek overflowed the Darling Way and Riverside Avenue bridges and flooded six businesses along Riverside Avenue. No injuries or fatalities were reported.

February 1986

This flood caused widespread damage in most of the Dry Creek basin. Nearly all bridges and culverts were overtopped, with 30 sustaining embankment damage. The crossing at Rocky Ridge Drive washed out. Two bridges over Dry Creek were damaged, and street cave-ins occurred at a number of locations. Approximately 209 homes along Dry, Linda, and Cirby Creeks reported flood damage, with water levels up to 5 feet above finished floor levels. The Roseville City Library was closed due to flooding. Floodwaters reached the foundation of the Public Safety Building but did not cause any damage. One fatality associated with this flood event was reported.

January 1995

The January 1995 flood event (Figure 10-2) exceeded the flood event of 1986 on Cirby and Linda Creeks. This event is now considered the flood of record for Dry Creek based on flood heights. The flood was calculated to be a 100-year event. This flood resulted in 358 structures in the Dry Creek Basin being inundated by floodwaters. No injuries or fatalities were reported.



Figure 10-2. Dry Creek Flooding, January 1995

January 1997

Flood events in 1997 were some of the most severe on record for the region. An isolated storm event typical for the Roseville area occurred on soils saturated from repetitive storm events, causing a flash flood. This flooding resulted in 21 structures being inundated with floodwater. The impact of this event was significantly reduced by the partially completed Cirby, Linda, and Dry Creek flood control project. No injuries or fatalities were reported.

February 1998

A small flood occurred on February 3, 1998, resulting in eight structures being inundated by floodwater in the Dry Creek Basin (Figure 10-3). This event was caused by an isolated storm event centered over the basin. No injuries or fatalities were reported.



Figure 10-3. Business Flooding, February 1998

10.2.3 Location

Primary Flood Sources

Upstream flows generated in Placer County enter the City of Roseville's creeks and tributaries from the east and north. Picking up additional stormwater runoff, the creek systems flow west-southwest through Roseville. These flows continue to move west-southwest, passing through Placer, Sacramento, and Sutter Counties to their ultimate destination, the Sacramento and American Rivers.

Roseville is located in portions of two major drainage basins: the Pleasant Grove Creek Basin and the Dry Creek Basin. Pleasant Grove Creek and its tributaries drain most of the western and central areas of the City, and the Dry Creek Basin and its tributaries drain the rest of the City.

The Dry Creek system has year-round flow in its major water courses, and the Pleasant Grove system is intermittent, with only seasonal flow. Since 1950, there have been no reports of structural flood damage along Pleasant Grove Creek. Due to the City's floodplain management policies, no structures in the Pleasant Grove Creek Basin are presently subject to flooding. The focus of flood hazard management is the Dry Creek Basin.

Seven creeks and streams that drain the 80-square-mile Upper Dry Creek Basin pass through and join within the city limits of Roseville. Three of these creeks have primary flooding impacts on the City: Cirby, Dry, and Linda Creeks.

Regulatory Floodplain

The science available at the time that most of the City of Roseville was developed did not accurately project flood heights that could occur from typical rainfall events in the region. Development therefore occurred in areas needed for stormwater conveyance, with insufficient levels of flood protection. Development now exists in low-lying areas adjacent to creek or stream systems needed to convey the over-bank flooding that can occur during storm events.

The City eventually modeled flooding using the best available hydrologic and hydraulic science to better reflect actual rainfall events that can impact the City. This modeling generated a projection of flood heights and areas of inundation that is well supported by conditions observed during the 1986 flood. The City has since used this information to create and enhance its floodplain management program to minimize flood risk to all new developments. Based on the detailed modeling, the City identified a regulatory floodplain that exceeds the SFHA mapped by FEMA. Figure 10-4 shows FEMA's mapped floodplain and the City's regulatory floodplain, as authorized by the Roseville City Code. The City has mapped and regulates 2,372 acres as floodplain, which includes the 1,529 acres of floodplain identified by FEMA on the current effective FIRM for the City. The regulatory floodplain is the area susceptible to risk from flooding based on City-approved studies. These areas are based on detailed hydrologic and hydraulic floodplain modeling that meets or exceeds FEMA criteria for mapping and modeling floodplains. The flood event used to delineate these boundaries is referred to as "the regulatory flood" to differentiate it from the "base flood" used by FEMA.

In many portions of the City, the Nolte Future Floodplain has been used to designate floodplain boundaries. The Nolte Future Floodplain defines floodway and floodway fringe boundaries within the floodplain. The floodway fringe is an area along the boundary of the floodplain that, if totally obstructed, would not result in more than a 1-foot rise in the water surface elevation. The floodway constitutes the remainder of the floodplain area and is typically where floodwaters have the most velocity.

10.2.4 Frequency

Flood magnitude measurements reflect statistical averages only; it is possible for two or more rare floods (with a 100-year or higher recurrence interval) to occur within a short time period. Assigning recurrence intervals to historical floods on different streams can help indicate the intensity of a storm over a large area. For example, the 1995 flood event was determined to be a 100-year flood on Dry Creek and a 50-year flood on Linda Creek.

Recent history has shown that Roseville can expect an average of one episode of minor river flooding each winter. Recent flooding resulting in property damage has occurred about every 3 to 5 years since 1950, except for the period from 1973 to 1981, when no significant flooding occurred. The frequency of flood events that cause significant damage has decreased significantly over the past 10 years due to City efforts to mitigate flood risk. Exposure to events that could cause significant flooding can be expected every 5 to 10 years. Additionally, the City can expect what is often referred to as "nuisance" flooding annually in the historic core due to urban drainage issues.

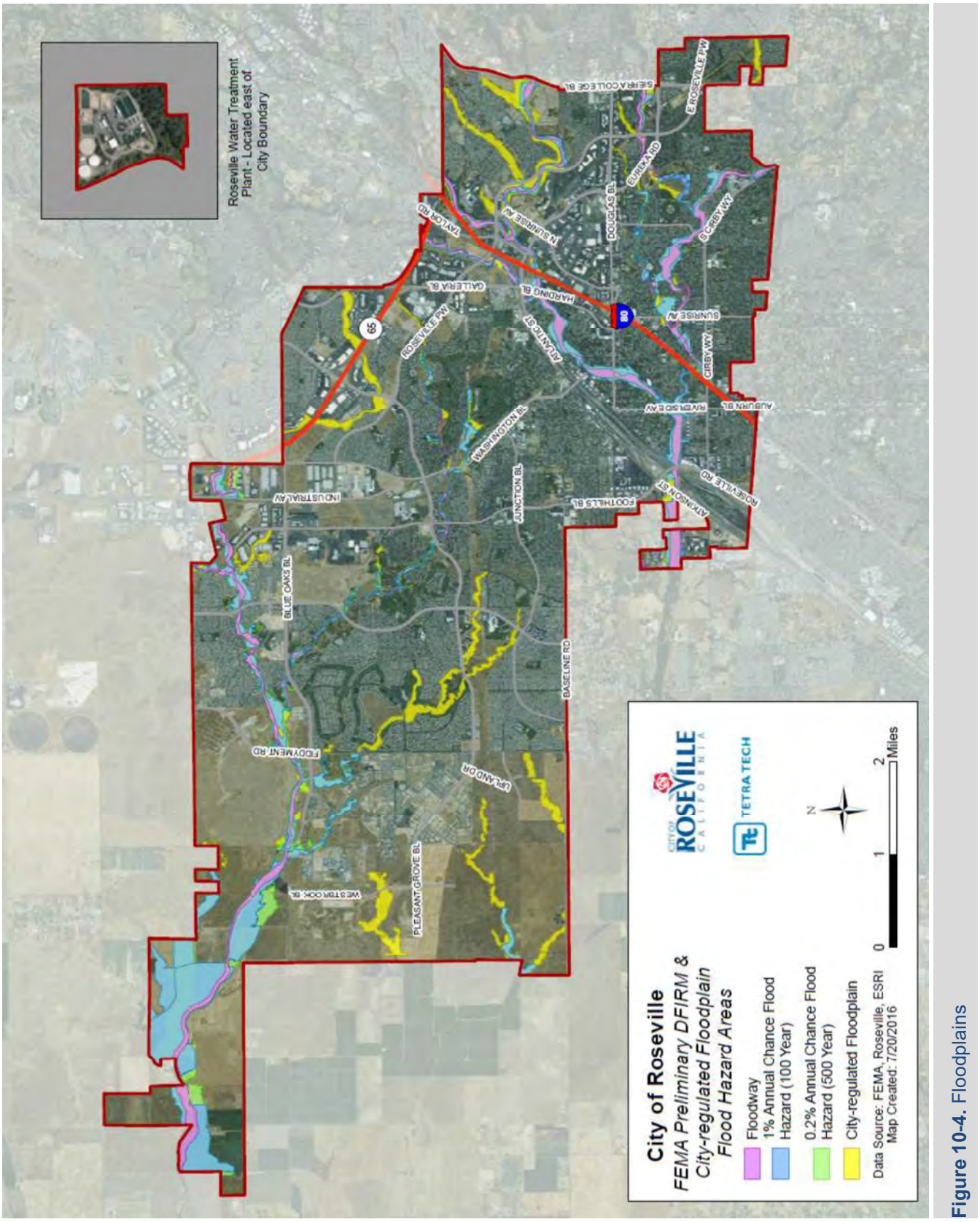


Figure 10-4. Floodplains

10.2.5 Severity

Table 10-2 shows observed flooding characteristics for the Pleasant Grove and Dry Creek basins, based on measurements made during past flood events.

Table 10-2. Observed Characteristics of Flooding

	Pleasant Grove Creek Basin	Dry Creek Basin
Approximate Base Flood Velocity (feet/second)[a]	0.5 to 8.0	2.0 to 14.0
Flow Rate (cubic feet per second)[b]	1,100 to 5,000	900 to 15,000
Base Flood Elevation (feet, National Geodetic Vertical Datum)		
Downstream limit	89.7	79.7
Upstream limit	150.0	210.0
Approximate Depth of Overbank Flooding (feet above existing grade)	0 to 2	0 to 3
Approximate Warning Time (hours)	3	3

a. Higher velocities were observed in the channel; lower velocities were observed in the overbank area
b. 1 cubic foot is about 7.5 gallons

The City recently completed five phases of the seven-phase "Cirby-Linda-Dry Creek Flood Control Project." The purpose of this project is to reduce stormwater backup at constrictions and increase the overall capacity of the floodplain during storm conditions. Project structures were designed to provide 1 foot of freeboard above the projected 500-year flood elevation. This project significantly reduced the flood risk exposure for this area, but did not eliminate it.

10.2.6 Warning Time

Due to the extended precipitation needed to cause serious flooding, it is unusual for a flood to occur without warning. Flash flooding can be less predictable, but hazard areas can be warned in advanced of potential flash flooding. Typical warning times for Roseville range from 1 to 3 hours. The City's flood warning system has four ways to warn the public of potential flooding:

- A comprehensive graphical display of stream levels, broadcast on Channel 14 or 73, with the status of the warning
- The "Stream Level" link on the City of Roseville home web page (www.roseville.ca.us)
- An automatic telephone dialing system to problem areas
- Flooding status broadcasted on radio station 530 AM.

Numerous stream flow and rain gauges form the City's stream monitoring system for the Upper Dry Creek Drainage Basin. These stations are placed at strategic locations throughout the drainage basin. For example, one is mounted on the floodwall just upstream from the pedestrian bridge that crosses between Tina Way and Marlin Drive and another is on Dry Creek at the Vernon Street Bridge. Each station transmits information via radio antenna to a central computer. Stream level information from five of the most critical stream level gauges is broadcasted on cable Channel 14/73 and on the City's web page during significant storm events. City staff uses this information in deciding whether to advise residents to evacuate. The goal is to provide up to 3 hours of advance warning. The continuously changing variables of precipitation, stream levels, and forecasts have a major effect on meeting this goal. The display shown on Channel 14/73 consists of a set of basic graphics shown in 15-second intervals:

- The first, which is shown only once for every complete cycle, is a City of Roseville map that includes major roadways (Vernon Street, Douglas Boulevard, Cirby Way, etc.), the three major streams (Dry Creek, Linda Creek, and Cirby Creek) and the five stream level gauge locations. Residents living in a

designated floodplain can determine which of the five stream gauges best represents their neighborhood. Once this is established, it is important to focus on how the streams are reacting to the weather conditions.

- Following this display, a more specific map identifies a single stream gauge's location in relation to nearby roadways and streams.
- Transmitted information from the gauges is presented in visual formats that include the current stream depth and the stream depth over the past six hours.

The stream level graph is divided into four colored categories of flood depth stages (see Figure 10-5):

- Blue (Normal Stage)—Stream level conditions are normal and safe.
- Green (Advisory Stage)—City staff is continuously monitoring creek levels and weather conditions. Residents should be closely watching for further information about flooding in their area.
- Yellow (Warning Stage)—There is a possibility of flooding in this area. Necessary precautions need to be taken to secure personal property and safety.
- Red (Critical Stage)—Flooding appears imminent in this area. Residents should evacuate their homes.

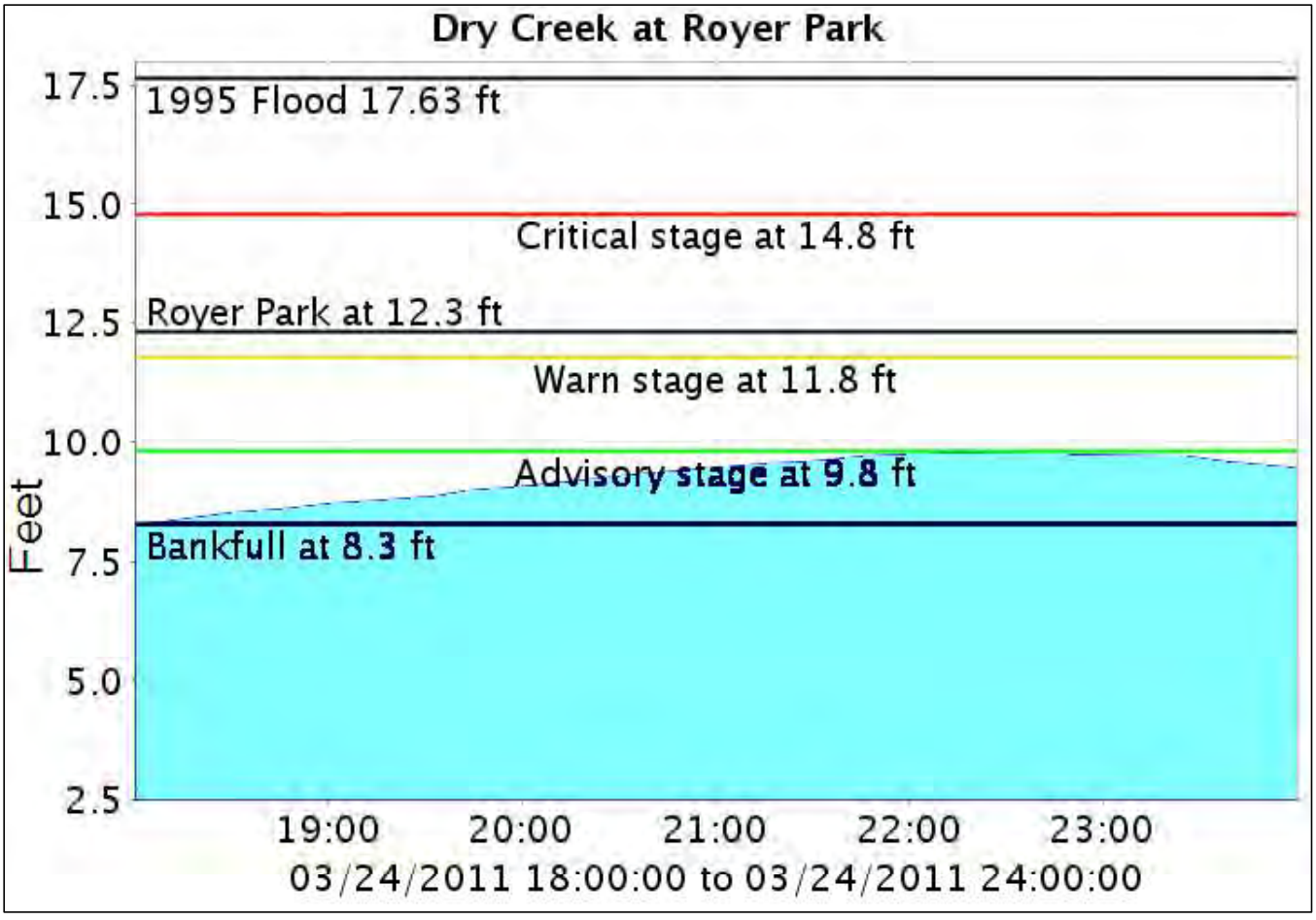


Figure 10-5. Example of Stream Gauge Graphic Display

The numeric values of the stream depths associated with the flood depth stages are shown on the vertical bar graph for all five of the stream level gauges, and reference stream levels are identified for each gauge. For example, the stream level during the 1995 flood is marked for each location. Also identified are other reference

points such as roadway surface, bridge and/or top of berm levels. This enables viewers to identify and understand the present stage of the stream in relation to known benchmarks.

The City of Roseville also has an automated telephone dialing system. During significant storm events, this system is used to phone residents and businesses in the floodplain and provide recorded messages containing important information. The message to be played will depend on the flood threat in the area at that time.

10.3 SECONDARY HAZARDS

The most significant secondary hazard for flooding in Roseville is bank erosion. The dangers of bank erosion often are greater than those of flooding. Flooding is responsible for landslides when high flows over-saturate soils on steep slopes, causing them to fail. Hazardous materials spills are also a secondary hazard of flooding if storage tanks rupture and spill into streams, rivers or drainage sewers.

10.4 EXPOSURE

The Level 2 HAZUS-MH protocol was used to assess the risk and vulnerability to flooding in the planning area. HAZUS-MH uses census data at the block level, FEMA floodplain data, and GIS data for the City's regulatory floodplain. Where possible, the HAZUS-MH data for this risk assessment was enhanced using GIS data from the City and from county, state and federal sources. The following sections describe risk exposure and vulnerability of the general building stock, critical facilities and infrastructure, land use, and environment within the City's mapped regulatory floodplain.

10.4.1 Population

Estimates of the population living in the floodplain in the planning area were generated by analyzing census blocks that intersect with the City's regulatory floodplain. Census blocks do not follow the same boundaries as the floodplain. Therefore, the methodology used to generate these estimates counted census block groups whose centers are in the floodplain or where the majority of the population most likely lives in or near the floodplain. HAZUS-MH estimated the number of buildings within the floodplain in each block, and then estimated the total population by multiplying the number of residential structures by the City average of 2.54 persons per household. Using this approach, the exposed population within the regulatory floodplain was estimated to be 330 (0.25 percent of the total City population). This is only slightly greater than the estimated 322 people exposed in the SFHA.

10.4.2 Property

Structures in the Floodplain

Table 10-3 summarizes the number and type of structures in the floodplain, as calculated from the Level 2 HAZUS-MH analysis. There are 210 structures in the City of Roseville regulatory floodplain. This represents less than 1 percent of the total structures in the City. It includes the 200 buildings identified within FEMA's SFHA.

Table 10-3. Structures Within the SFHA and the Roseville Regulatory Floodplain

	# of Structures in Mapped Floodplain						
	Residential	Commercial	Industrial	Religion	Government	Education	Total
FEMA-Preliminary Mapped SFHA	157	34	7	1	0	1	**200**
Roseville Regulatory Floodplain	156	38	11	2	2	1	210

Exposed Value

The value of exposed buildings within the City's regulated floodplain area and the SFHA was generated using HAZUS-MH and is summarized in Table 10-4 and Table 10-5. This methodology estimated $289 million worth of building-and-contents exposure, representing 0.97 percent of the total building-and-contents value in the City.

Table 10-4. Value of Exposed Buildings Within the FEMA SFHA

	Value of Exposed Property in the Mapped Floodplain			% of Total Value in the City
	Buildings	Contents	**Total**	
Residential	$24,700,000	$12,400,000	$37,000,000	0.2%
Commercial	$75,600,000	$77,000,000	$152,600,000	1.8%
Industrial	$2,400,000	$2,600,000	$5,000,000	0.4%
Religion	$0	$0	$0	0.00%
Government	$0	$0	$0	0.00%
Education	$1,200,000	$1,200,000	$2,500,000	0.2%
Total	**$103,900,000**	**$93,200,000**	**$197,100,000**	**0.7%**

Table 10-5. Value of Exposed Buildings Within the Roseville Regulatory Floodplain

	Value of Exposed Property in the Mapped Floodplain			% of Total Value in the City
	Buildings	Contents	**Total**	
Residential	$39,719,211	$19,859,606	$59,578,817	0.32%
Commercial	$84,278,680	$87,860,805	$172,139,485	2.08%
Industrial	$24,855,494	$25,109,167	$49,964,662	4.30%
Religion	$1,337,875	$1,337,875	$2,675,749	1.07%
Government	$1,032,368	$1,032,368	$2,064,736	1.22%
Education	$1,231,683	$1,231,683	$2,463,365	0.23%
Total	$152,455,311	$136,431,504	$288,886,814	0.97%

Land Use in the Floodplain

To preserve the natural and beneficial functions of open space resource areas adjacent to the floodplain areas of Roseville, the City has adopted policies under the Open Space and Conservation Element of its General Plan that include the following:

- Preserve and rehabilitate continuous riparian corridors and adjacent habitat along the City's creeks and waterways.
- Require dedication of the 100-year floodplain or comparable mechanism to protect habitat and wildlife values in perpetuity.
- Restrict development within the 200-year floodplain subject to the State of California Urban Level of Flood Protection Criteria.
- Require preservation of contiguous areas outside the 100-year floodplain as merited by special resources or circumstances, which may include, but are not limited to, sensitive wildlife or vegetation, wetland habitat, oak woodland areas, grassland connections in association with other habitat areas, slope or topographical considerations, recreation opportunities, and maintenance access requirements.
- Limit recreation activities within the 100-year floodplain and require additional setback areas for trails and other recreation uses so that natural resource areas are not adversely impacted.
- Provide protection and enhancement of fishery resources, including continued coordination with the California Department of Fish and Wildlife to release water to Linda Creek.

Because of these policies, a large portion of the floodplains within Roseville is held for open space use, much of it in a natural or beneficial state. Currently, 1,491.4 acres (97 percent) of the regulatory floodplain within Roseville is designated for open space use, as defined in the Open Space and Conservation Element of the General Plan.

10.4.3 Critical Facilities and Infrastructure

Flooding poses numerous risks to critical facilities and infrastructure:

- Roads or railroads that are blocked or damaged can prevent access throughout the area and can isolate residents and emergency service providers needing to get to vulnerable populations or to make repairs.
- Bridges washed out or blocked by floods or debris from floods also can cause isolation.
- Creek or river floodwaters can back up drainage systems, causing localized flooding.
- Culverts can be blocked by debris from flood events, also causing localized urban flooding.
- Floodwaters can get into drinking water supplies, causing contamination.
- Sewer systems can be backed up, causing waste to spill into homes, neighborhoods, rivers and streams.
- Underground utilities can also be damaged.

The inventory of critical facilities in Roseville's SFHA and regulatory floodplain is shown in Table 10-6 and Table 10-7.

Table 10-6. Critical Facilities in Flood Area

	Critical Facilities within the SFHA	Critical Facilities within the City of Roseville Regulated Floodplain
Medical & Health Services	0	0
Government Function	0	0
Protective Function	0	0
Schools	0	0
Societal Function	2	2
Hazmat	0	0
Other Critical Function	17	1
Total	**19**	**3**

Table 10-7. Critical Infrastructure in Flood Areas

	Critical Infrastructure within the SFHA	Critical Infrastructure within the City of Roseville Regulated Floodplain
Water Supply	0	4
Wastewater	5	4
Power	0	0
Fuel Storage	0	0
Communications	1	2
Bridges	11	27
Total	**17**	**18**

The City of Roseville has determined that the following major roadways and stream crossings (bridges or culverts) would be impassable during a 100-year flood event:

- Dry Creek Road Crossings
- Cirby Creek Road Crossings

  - Vernon Street
  - Riverside Avenue
  - Darling Way
  - Douglas Boulevard
  - Folsom Road
- Linda Creek Road Crossings
  - Rocky Ridge Drive
  - Champion Oaks Drive
  - Sierra College Boulevard
  - Sunrise Avenue
  - Coloma Way
  - Oakridge Road
  - Sierra Gardens Drive
  - Huntington Drive
- Miners Ravine
  - Sierra College Boulevard

10.4.4 Environment

Flooding is a natural event, and floodplains provide many natural and beneficial functions. Nonetheless, with human development factored in, flooding can impact the environment in negative ways:

- Migrating fish can wash into roads or over dikes into flooded fields, with no possibility of escape.
- Pollution from roads, such as oil, and hazardous materials can wash into rivers and streams.
- Pollutants carried by floodwaters can settle onto normally dry soils, polluting them for agricultural uses.
- Human development, such as bridge abutments and levees, and logjams from timber harvesting can increase streambank erosion, causing rivers and streams to migrate into non-natural courses.

With much of Roseville's regulatory floodplain zoned for open space use, the City has taken significant steps to preserve the natural and beneficial functions of the floodplain, while at the same time reducing the risk exposure to the built environment. Still, all vegetation and wildlife resources and corridors in the floodplain open space system—grasslands, oak woodlands, riparian areas, and seasonal wetlands—are exposed to the flood risk.

10.5 VULNERABILITY

10.5.1 Population

Flooding can be a deadly hazard. Roads running through low-lying areas prone to sudden and frequent flooding are a serious threat. Motorists often attempt to drive through barricaded or flooded roadways. Because as little as 18 to 24 inches of water moving across a roadway can carry away most vehicles, floods can present significant potential safety risks. The second largest potential for injuries from flooding results from people walking or playing in or near flooded areas. Generally, floods kill people in one of two situations: when people ignore basic safety precautions (such as evacuations and warnings), and when a flash flood hits an area with no warning.

Although it is possible to analyze life and safety impacts resulting from the flood hazard, injuries and casualties were not estimated for this hazard. One flood-related fatality in Roseville has been recorded, but the flood hazard is not generally considered to pose a serious risk to life in this area, for the following reasons:

- Flooding in Roseville tends to be rapid in terms of the rise and fall of floodwaters. Because of the City's geographical location in the watershed, floods tend to come and go quickly as they move toward their drainage endpoints, thereby decreasing the threat that people become trapped by floodwaters.
- The City has made it a priority to warn and educate its citizens on the dangers and impacts of flooding. The City implements public outreach programs that provide information on flood warnings, property protection, flood safety, and flood insurance. The City also has developed a comprehensive flood warning program that can deliver real-time data to citizens and emergency management personnel through cable

television and the Internet. The program can provide a warning up to 3 hours before a flood event occurs in the 100-year floodplain. The City's approach has resulted in an educated and well-informed constituency.

The June 2004 City of Roseville Emergency Operations Plan, most recently updated in 2010, directs the City of Roseville Emergency Management Organization, coordinates the actions of emergency operations center staff, establishes operational priorities, ensures development and implementation of strategies to meet the needs of the emergency, works with local elected officials on issues related to emergency response and recovery, identifies procedures for evacuation, communicates with the media, coordinates response with outside agencies, and ensures the safety of responders. The Emergency Operations Plan follows California's Standardized Emergency Management System (SEMS) format (see Section 4.9.2).

Regarding health concerns, one of Roseville's sewage treatment facilities is located on the downstream end of Dry Creek. This facility is located above the 100-year floodplain but has overflow ponds within the floodplain. When plant influent loads exceed the plant capacity, untreated sewage is discharged to the overflow ponds. If this scenario occurred simultaneously with a 100-year flood, floodwaters could be contaminated. This situation has not occurred during past flood events, and its probability of occurrence is low. Therefore, its potential impacts on health were not estimated as part of this assessment.

10.5.2 Property

Flood Insurance

Flood insurance statistics help identify vulnerability by showing where there is claim activity, where there is a high rate of flood insurance in force, and where flooding may be occurring in areas not identified as flood-prone. Table 10-8 lists flood insurance statistics for the City of Roseville. The total of $9.9 million paid on 292 claims through July 31, 2010 represents an average of $33,923 per claim.

Table 10-8. Flood Insurance Statistics for the City of Roseville

Date of Entry Initial FIRM Effective Date	December 15, 1983
Current FIRM Effective Date	November 21, 2001
Number of flood insurance policies in force as of 3/31/2016	591
Total annual premium	$311,643
Average policy cost	$527 (national average = $412)
Total insurance coverage	$176,339,200
Total claims filed (1978 to 11/30/2009)	292
Value of claims paid	$9,905,478
Average claim paid	$33,923
Number of flood insurance policies in force within the SFHA	111
X Standard/AR/A99 policies	18
Preferred Risk Policies	462

Flood insurance statistics relevant to reducing flood hazard are as follows:

- Approximately 76 percent of the insurable structures in the SFHA are currently covered by a flood insurance policy. This is well above the national average. According to a study conducted for the NFIP, about 49 percent of single-family homes in special flood hazard areas nationwide are covered by flood insurance.
- 81.2 percent of the current policies in force are for properties outside the SFHA.

- The high percentage of policies outside the SFHA is probably due to the impact of the Cirby-Linda-Dry Creek Flood Control Project and resulting remapping.

Flood Loss Potential of Structures

The HAZUS-MH program calculates losses to structures from flooding by looking at depth of flooding and type of structure. Using historical flood insurance claim data, HAZUS-MH estimates the percentage of damage to structures and their contents by applying established damage functions to an inventory. This inventory comes pre-loaded within the HAZUS-MH model and is based on data from the U.S. Census, state databases, the U.S. Highway Administration, and other sources. Default values can be overridden with locally generated data if available. For this analysis, local data on facilities was used to assess flood risk in the City of Roseville. The City has created a flood inventory database of site-specific information for each property in the regulatory floodplain. This database includes information for the following basic categories:

- Buildings in the regulatory floodplain
- Building use
- Building area
- Building value
- Permit history
- Flood loss history
- Regulatory flood elevation
- Base flood elevation
- Pre- and post-FIRM structures
- Elevation of lowest adjacent grade
- Finished floor elevation

The HAZUS-MH analysis is summarized in Table 10-9 through Table 10-11. It is estimated that there would be up to $2.16 million of flood loss from a 10-year flood event. This represents less than 0.01 percent of the total assessed value of the City. It is estimated that there would be up to $7.04 million of flood loss from a 100-year flood event. This represents 3.6 percent of the total value exposed to the flood hazard in the regulatory floodplain and 0.02 percent of the total assessed value of the City. It is estimated that there would be $7.14 million of flood loss from a 500-year flood event, representing 3.4 percent of the total value exposed to the flood hazard in the regulatory floodplain and 0.02 percent of the total assessed value for the City.

Table 10-9. Estimated Flood Loss for the 10-Year Flood Event (Preliminary FIRM)

	Estimated Flood Loss			% of Total
	Buildings	Contents	**Total**	Assessed Value
Residential	$1,275,990	$609,637	$1,885,627	<0.01%
Commercial	$70,143	$172,585	$242,727	<0.01%
Industrial	$16,759	$21,065	$37,825	<0.01%
Agricultural	$0	$0	$0	0.00%
Religion	$0	$0	$0	0.00%
Government	$0	$0	$0	0.00%
Education	$0	$0	$0	0.00%
Total	**$1,362,892**	**$803,287**	**$2,166,179**	**<0.01%**

Table 10-10. Estimated Flood Loss for the 100-Year and 500-Year Flood Events (Preliminary FIRM)

	Estimated Flood Loss						% of Total Assessed Value	
	Buildings		Contents		**Total**			
	100-year	500-year	100-year	500-year	**100-year**	**500-year**	100-year	500-year
Residential	$2,253,989	$2,253,989	$1,257,030	$1,257,030	$3,511,019	$3,511,019	0.02%	0.02%
Commercial	$686,896	$704,051	$2,366,376	$2,452,152	$3,053,271	$3,156,203	0.04%	0.04%
Industrial	$107,228	$107,228	$375,139	$375,139	$482,368	$482,368	0.04%	0.04%
Agricultural	$0	$0	$0	$0	$0	$0	0.00%	0.00%
Religion	$0	$0	$0	$0	$0	$0	0.00%	0.00%
Government	$0	$0	$0	$0	$0	$0	0.00%	0.00%
Education	$0	$0	$0	$0	$0	$0	0.00%	0.00%
Total	**$3,048,113**	**$3,065,269**	**$3,998,545**	**$4,084,321**	**$7,046,658**	**$7,149,590**	**0.02%**	**0.02%**

Table 10-11. Estimated Flood Loss for the Regulatory Floodplain

	Estimated Flood Loss			% of Total Assessed Value
	Buildings	Contents	**Total**	
Residential	$2,096,568	$944,975	$3,041,544	0.02%
Commercial	$1,322,410	$3,044,262	$4,366,672	0.05%
Industrial	$87,710	$254,384	$342,094	0.03%
Agricultural	$33,023	$240,436	$273,459	0.11%
Religion	$1,603	$9,617	$11,220	0.01%
Government	$0	$0	$0	0.00%
Education	$3,541,314	$4,493,675	$8,034,988	0.03%
Total	**$2,096,568**	**$944,975**	**$3,041,544**	**0.02%**

Repetitive Loss

Several federal government programs encourage communities to identify and mitigate "repetitive loss" properties. Nationwide, repetitive loss properties make up only 1 to 2 percent of the flood insurance policies currently in force, yet they account for 40 percent of the flood insurance claim payments. A report on repetitive loss structures by the National Wildlife Federation found that 20 percent of these structures are listed as outside the 100-year floodplain. In 1998, FEMA reported that the NFIP's 75,000 repetitive loss structures had already cost $2.8 billion in flood insurance payments.

FEMA identifies repetitive loss structures based on flood insurance payments. A repetitive loss area is the portion of the floodplain where numerous buildings have been subject to repetitive flooding. The purpose of identifying repetitive loss areas is to identify structures that are subject to the same risk but are not on FEMA's list because a flood insurance policy was not in force at the time of loss.

The list of repetitive loss properties maintained by FEMA identifies one commerical repetitive loss property within the City's regulatory floodplain. When Roseville first began its participation in the CRS program in 1991, the list of repetitive loss properties totaled 27 locations. Since then, flood protection and mitigation projects (including purchase and relocation of structures) have occurred at 23 repetitive loss locations and all 23 locations are no longer subject to repetitive flood losses. This represents an 85 percent reduction in exposure of insured properties to repetitive flood losses. This reduction is a prime example of how the City of Roseville's proactive flood mitigation practices have decreased the exposure of its citizens to the flood hazard, reduced the number of repetitive loss properties, and minimized reliance on post-disaster assistance provided by the federal government and the nation's taxpayers.

Figure 10-6 shows the location of Roseville's single remaining repetitive loss area. The City is required to address its repetitive loss area as a condition of its participation in the CRS program. This hazard mitigation plan meets this CRS requirement.

10.5.3 Critical Facilities and Infrastructure

HAZUS-MH was used to estimate the flood loss potential of critical facilities exposed to the flood risk. The model uses depth/damage function curves to estimate the percent of damage to a building and its contents and correlates that with an estimate of functional downtime (the time it will take to restore a facility to 100 percent of its functionality). The findings were as follows:

- On average, critical facilities would receive 5 percent damage to the structure and 19 percent damage to the contents during a 100-year flood event, and the estimated time to restore these facilities to full functionality would be 90 days.
- On average, critical facilities would receive 8 percent damage to the structure and 31 percent damage to the contents during a 500-year flood event, and the estimated time to restore these facilities to full functionality would be 160 days.

Six critical facilities are exposed and vulnerable to flooding in Roseville. A detailed vulnerability analysis of all critical facilities is on file with appropriate City staff and will not be published for public review. Of these six critical facilities, two have sufficient vulnerability to flooding to warrant mitigation strategies. Flood protection has been provided to the two churches identified, although it is not 100-year flood protection. The estimated depth of flooding for these two facilities is minimal and there have been no reports of flood damage. The County courthouse has been elevated to above the 100-year flood level. Mitigation strategies outlined in this Plan will mitigate the impact of flooding on the remaining facilities, including retrofitting the floodwall that protects the library and public safety building.

Of Roseville's two wastewater treatment plants, only the Dry Creek Plant is partially located in the floodplain. The storm sewer system is separate from the sanitary sewer system, so the sanitary sewers are not significantly affected by storm events.

10.5.4 Environment

The environment vulnerable to the flood hazard is the same as the environment exposed to the hazard. While flood events have historically caused significant damage to the environment, estimating damage can be difficult. Loss estimation platforms such as HAZUS-MH are not currently equipped to measure environmental impacts of flood hazards. The best gauge of vulnerability of the environment would be a review of damage from past flood events. Loss data that segregates damage to the environment were not available at the time of this Plan. Capturing this data from future events could be beneficial in measuring the vulnerability of the environment for future updates to this Plan.

10.6 FUTURE TRENDS IN DEVELOPMENT

Increased urbanization of western Placer County within the Pleasant Grove and Dry Creek Basins has resulted in the potential for increased flooding problems in Roseville. Land development typically results in increased hard surfaces and decreased vegetation, conditions that limit infiltration opportunities and, without adequate mitigation, can increase stormwater runoff rates and volumes and decrease the time required to reach peak discharge.

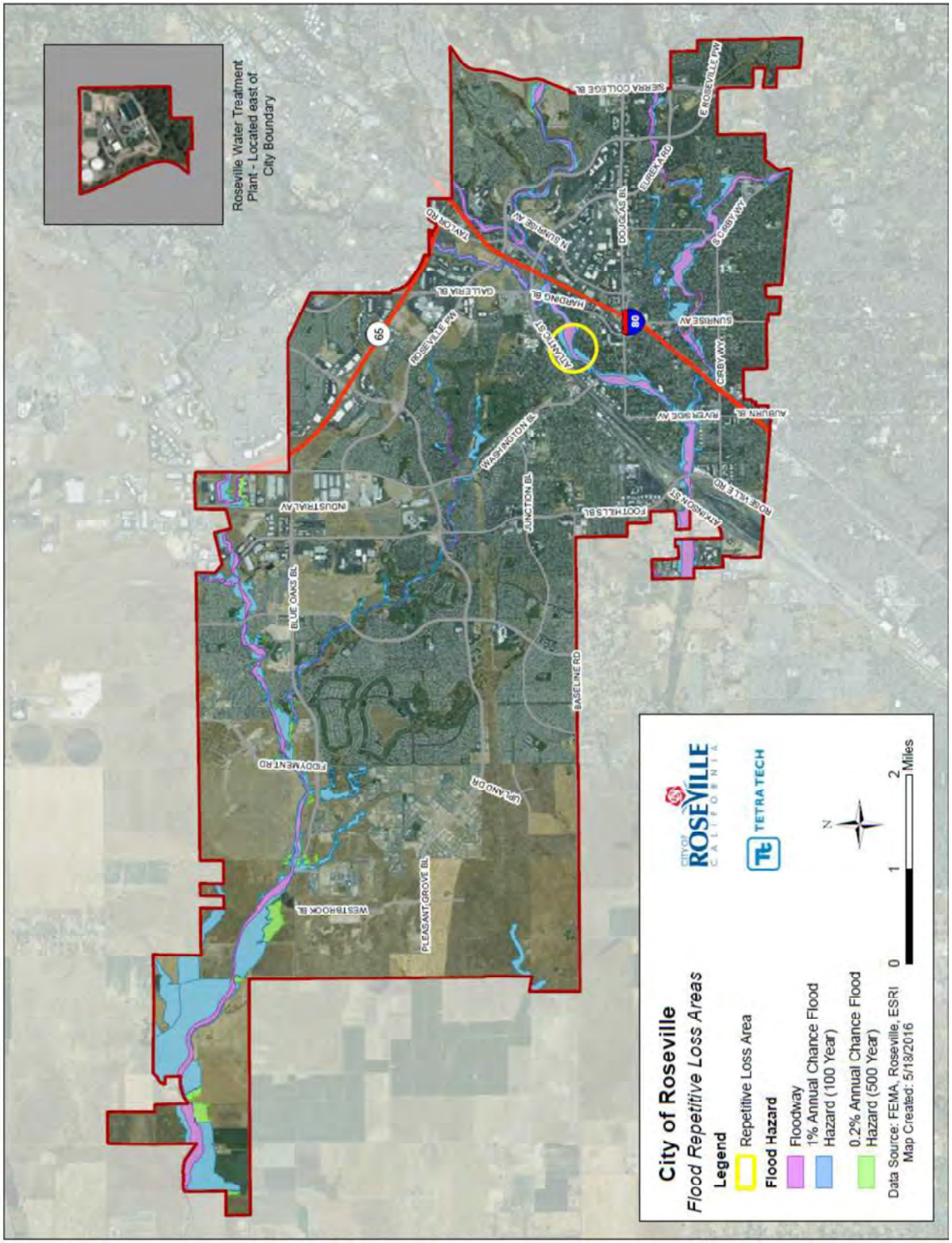


Figure 10-6. Repetitive Loss Area

Recognizing that typical growth patterns in California would impact and exacerbate the flood hazard problem, the City of Roseville took an aggressive, proactive approach to managing its floodplains through the development of its General Plan in 1992. Land-use categories are defined in the General Plan, with information on general uses, development, intensity, siting, and compatibility standards in relation to the flood hazard. City actions, such as land-use allocation, annexations, zoning, subdivision and design review, redevelopment and capital improvements, must be consistent with the General Plan.

Only three parcels in Roseville's regulatory floodplain are in the current buildable lands inventory. These parcels were all created before the City's flood-protection policies were enacted. Any new development on these parcels would be subject to strict regulations.

Because of policies, activities and mitigation measures in place in Roseville, it can be concluded that future land development trends will not impact or be impacted by flooding in Roseville as long as existing policies remain in force.

10.7 REVIEW OF EXISTING ORDINANCES, PROGRAMS, AND PLANS

The City of Roseville has a long-standing policy to proactively manage its floodplains. Under the guidance of the General Plan and its Safety Element, Roseville has been able to decrease the exposure of its citizens to flooding with a comprehensive approach that includes the following measures:

- Structural mitigation (flood control)
- Non-structural mitigation (elevation or acquisition)
- Regulations
- Stormwater management
- Flood warning
- Outreach and public education.

This section discusses each element except flood warning, which is discussed in Section 10.2.6).

10.7.1 Structural Mitigation

The following major flood control improvements have been accomplished by the City of Roseville since the January 1995 flood event:

- **Tina Way/Elisa Way Area—**Completed in 1996 at the cost of $3 million (100 percent City-funded), this project included channel excavation and construction of berms and floodwalls. The project removed 40 structures from the floodplain. Based on the pre-project location and construction of these structures, the entire area would have flooded during the 1997 flood if the improvements had not been implemented.
- **Riverside Avenue/Vernon Street Area—**Completed in 1996 at the cost of $2 million (90 percent funded by the Union Pacific Railroad and 10 percent funded by the City), the construction project included replacing culverts with a new bridge over Dry Creek. The net effect of this project lowered flood elevations for the reach by 5 to 7 feet and removed 150 structures from the floodplain.
- **Sunrise Avenue/Oakridge Drive and Champion Oaks Areas—**Completed in 2001 at the cost of $16.1 million ($8.7 million from FEMA and $7.4 million from the City), this project replaced culverts with a new bridge over Linda Creek at Sunrise Avenue. Twin 9-foot-diameter bypass pipes were installed in the Oakridge Drive area. The project included channel excavation and berm and floodwall construction. The project removed 233 structures from the floodplain; 44 structures remained in the floodplain, but these structures were less likely to be flooded. Features included maintaining a channel in

as natural a state as possible; planting over 500 oak trees; assigning biologists, ornithologists, and arborists to minimize environmental impacts; and monitoring fish passage and plantings for 5 years.

The City has spent more than $22 million on flood mitigation since the January 1995 flood event and has eliminated 445 flood-prone structures from the floodplain.

10.7.2 Non-Structural Mitigation

Structural mitigation projects reduced the flood exposure of property by 91 percent. Roseville offered mitigation through acquisition or home elevation to the remaining 9 percent of properties exposed to flooding. Completed in 2001 at the cost of $1 million (50 percent funded by FEMA, 40 percent funded by the property owners, and 10 percent funded by the City), the project included elevating 27 homes and acquiring (buying out) 4 homes. This effort resulted in 22 flood-prone homes with post-project floor levels higher than the floodplain level.

10.7.3 Regulations

The City of Roseville regulates its floodplain areas through land use, zoning, and other development restrictions, including a policy that prohibits most development within the 100-year floodplain area. Development in floodplain areas in Roseville is restricted by the following:

- 2035 General Plan, Safety Element, Flood Protection Component
- Improvement Standards
- Flood Damage Prevention Ordinance (Roseville Municipal Code [RMC] Chapter 9.80)
- Zoning Ordinance (RMC Chapter 19.18)
- State of California Urban Level of Flood Protection Legislation.

2035 General Plan, Safety Element, Flood Protection Component

The Safety Element of Roseville's General Plan sets forth goals and policies to address community safety concerns. The flood protection component identifies nine policies and 12 measures to achieve the following goals:

- Minimize the potential for loss of life and property due to flooding.
- Pursue flood control solutions that are cost-effective and minimize environmental impacts.

The policies and implementation measures are incorporated into the City's area-specific plans and are legally enforceable. Key to the City's flood-protection effort is the clear definition and application of floodplain boundaries. The flood protection component of the Safety Element establishes policies prohibiting new development in an identified floodplain or requiring an appropriate level of flood protection in design and construction for any development that does occur in the floodplain:

- **Infill Areas—**No development is permitted in the future floodway. Development may be permitted within the future floodway fringe. In accordance with the Nolte Future Floodplain definition, such development is limited to areas within the assumed cumulative 1-foot rise in water surface elevation, if it can be demonstrated that the development will not impact flood levels (see Figure 10-7).
- **Remainder of the City (specific plans and north industrial area)—**No development is permitted within the future floodplain (floodway and floodway fringe). Exceptions may be considered by the City on a case-by-case basis if encroachment is limited to only the future floodway fringe and would not result in any off-site increase in the water surface elevation (see Figure 10-8).

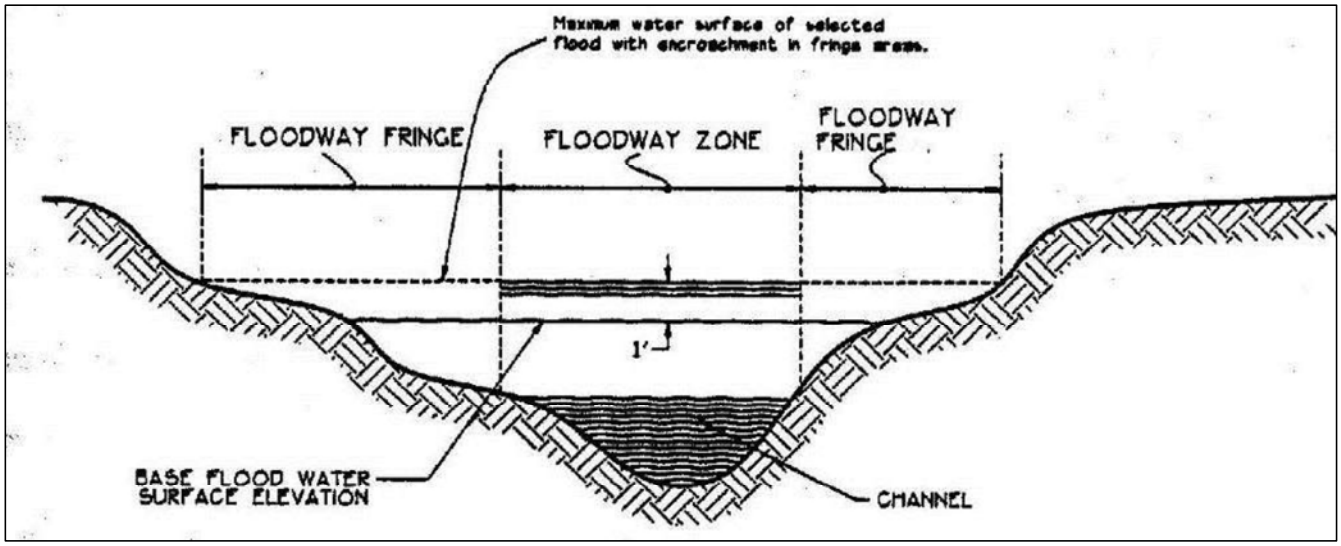


Figure 10-7. Floodplain Designation Cross-Sections for Infill Areas

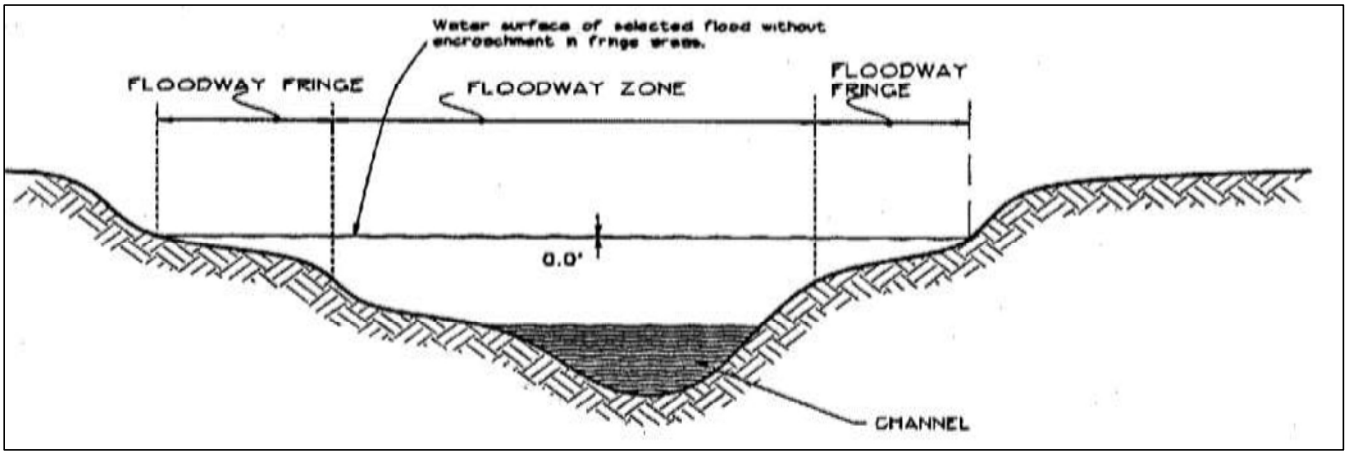


Figure 10-8. Floodplain Designation Cross-Sections for Areas Other Than Infill Areas

The City is committed to exploring environmentally sensitive flood control solutions, so this component is intended to be used in combination with the goals, policies, and implementation measures contained in the Open Space and Conservation Element of the General Plan. Emphasis is placed on protecting floodplain areas and on pursuing regional cooperation on flooding issues.

Improvement Standards

Roseville's improvement standards provide minimum standards for the following:

- Improvements dedicated to the public and accepted by the City for maintenance or operation
- Certain private works
- Improvements to be installed within existing rights-of-way and easements.

Improvement standards provide coordinated development of required facilities used by and for the protection of the public. They apply to, regulate, and guide preparation of traffic impact studies and the design and preparation of plans for construction of streets, highways, alleys, drainage systems, sewage systems, traffic signals, site access structures, water supply facilities and related public improvements. The standards also set guidelines for private

works that involve drainage, grading, tree removal, and related improvements. Section 10 of the improvement standards deals with drainage as follows:

- Requires residential lots developed in and adjacent to a designated floodplain to have a pad elevation a minimum of 2 feet above the regulatory flood elevation.
- Establishes stormwater management provisions that require mitigation of the increase in runoff generated by new development.
- Establishes provisions that require the building pads of structures built outside the regulatory floodplain to be a minimum of 1 foot above the 100-year water surface elevation for the site, assuming total blockage of drainage facilities.

Flood Damage Prevention Ordinance (RMC Chapter 9.80)

The flood damage prevention ordinance provides regulatory provisions for the floodplains of Roseville and is a requirement for participation in the NFIP. Chapter 9.80 of the RMC meets the NFIP requirements (44 CFR, Section 60.3) and includes the following standards that exceed those requirements:

- Adoption of a regulatory floodplain that includes areas not mapped by FEMA for application
- Requirement for elevation to 2 feet above the regulatory flood elevation for all structures within the flood hazard area
- Provisions to track substantial improvements to structures over a period of 10 years.

Zoning Ordinance (RMC Chapter 19.18)

Updated in September 2010, the zoning ordinance implements the City's general and specific plans and establishes regulations governing the use, placement, spacing and size of land and buildings. The zoning ordinance describes permits available through the Planning Division, when permits are needed, and the process for obtaining permits. This ordinance includes policy that prohibits most development within the 100-year floodplain. Exceptions to this policy exist primarily within the infill area and for the maintenance of essential services. Where encroachments may be permitted, improvements are required to minimize cumulative upstream and downstream effects.

The zoning ordinance identifies floodway and floodway fringe zoning districts. The floodway zoning district is not synonymous with FEMA's defined floodway. Development is generally prohibited in the floodway zone, with some level of development allowed in the floodway fringe zones with restrictions. The floodway fringe and floodway zone boundaries are based on previous hydraulic modeling conducted by the U.S. Army Corps of Engineers. The floodplain boundaries have changed over time since this modeling, but the zone district boundaries have not changed. The zone boundaries are updated on a parcel-by-parcel basis at a landowner's request using best available data.

State of California Urban Level of Flood Protection Legislation

The Central Valley Flood Protection Act of 2008 (SB 5) and its subsequent amendments (SB 1278, AB 1965 and AB 1259) include requirements and standards for flood protection that relate to land use planning. The legislation defines the Urban Level of Flood Protection (ULOP) as the level of protection necessary to withstand flooding that has a 1-in-200 (0.5-percent) chance of occurring in any given year (also referred to as the 200-year flood). This legislation directed local agencies to revise their general plans no later than July 2, 2015 to address flood risk for affected land use decisions based on an ULOP. It also required local agencies to revise their zoning codes to reflect the new standard within one year after the adoption of their revised general plans. In areas not subject to the ULOP standards, the 100-year floodplain standards will continue to apply.

The legislation defines five locational criteria that determine whether the ULOP applies. All areas of the City of Roseville meet two of the criteria (the City is an urban area of more than 10,000 people and the City is within the Sacramento-San Joaquin Valley), but only certain areas of the City meet the remaining three criteria:

- Areas mapped as either a special hazard area or an area of moderate hazard on FEMA's official (i.e., effective) Flood Insurance Rate Map
- Areas with a potential flood depth above 3 feet from sources other than localized conditions
- Areas within a watershed with a contributing area of more than 10 square miles.

As required by SB 5 as amended, the City of Roseville will implement the following:

- Updating the General Plan to define the City's regulatory floodplain as the combination of the City's mapped 100-year floodplain, the ULOP floodplain, and the FEMA floodplain.
- Amendment of the Land Use Element to include a reference to the Safety Element map identifying existing and planned development areas within the regulated floodplain as defined above.
- Amendment of the Open Space and Conservation Element setting and background to reflect the current regulatory environment.
- Amendment of the Safety Element to identify and revise flood hazard information and policies which protect communities from flooding risks as follows:

    - Revise the setting, outlook, and floodplain designations portions of the flood protection section to reflect the updated regulatory environment and to identify sources of floodplain mapping and hazard data.
    - Revise the floodplain designation policy and the implementation measures sections to include definitions and floodplain development regulations and implementation for the ULOP floodplain.
    - Provide new floodplain maps showing the extent of the FEMA 100-year, City's regulatory 100-year, and ULOP floodplains.

As required by adopted State law, the various City regulations requiring preservation of the floodplain and elevation of structures above the floodplain will include the ULOP floodplain, which is shown on Figure 10-9. After the modeling analysis was completed by the City, staff examined the data to determine the effect on land uses. Both the ULOP and the 100-year floodplains along Pleasant Grove Creek are almost entirely contained within existing or planned open space and recreation areas. This is generally because these areas of Roseville were planned or developed relatively recently in the City's history, and in compliance with the City's current General Plan goals and objectives restricting development in the floodplain.

The areas where the ULOP floodplain extends into residential or commercial areas are older areas of the City along Dry Creek, where development was planned and implemented prior to Roseville's initial participation in the NFIP in 1983 and prior to adoption of the City's current General Plan. These infill areas are already affected by the FEMA 100-year floodplain, and a few areas will now also be affected by the ULOP.

According to the City's GIS database, 4 of 11 vacant parcels affected by the ULOP are privately owned. The remaining 7 parcels are City-owned. In the future, any new habitable structure along streams affected by the ULOP floodplain will need to be elevated slightly higher (less than 1 foot) than would have been required prior to the legislation. For existing structures, additional elevation would only be required if the owner undertook a "substantial improvement" to the structure (defined within the City's Flood Damage Prevention Ordinance as any work in a 10-year period that is worth 50 percent or more of the value of the structure).

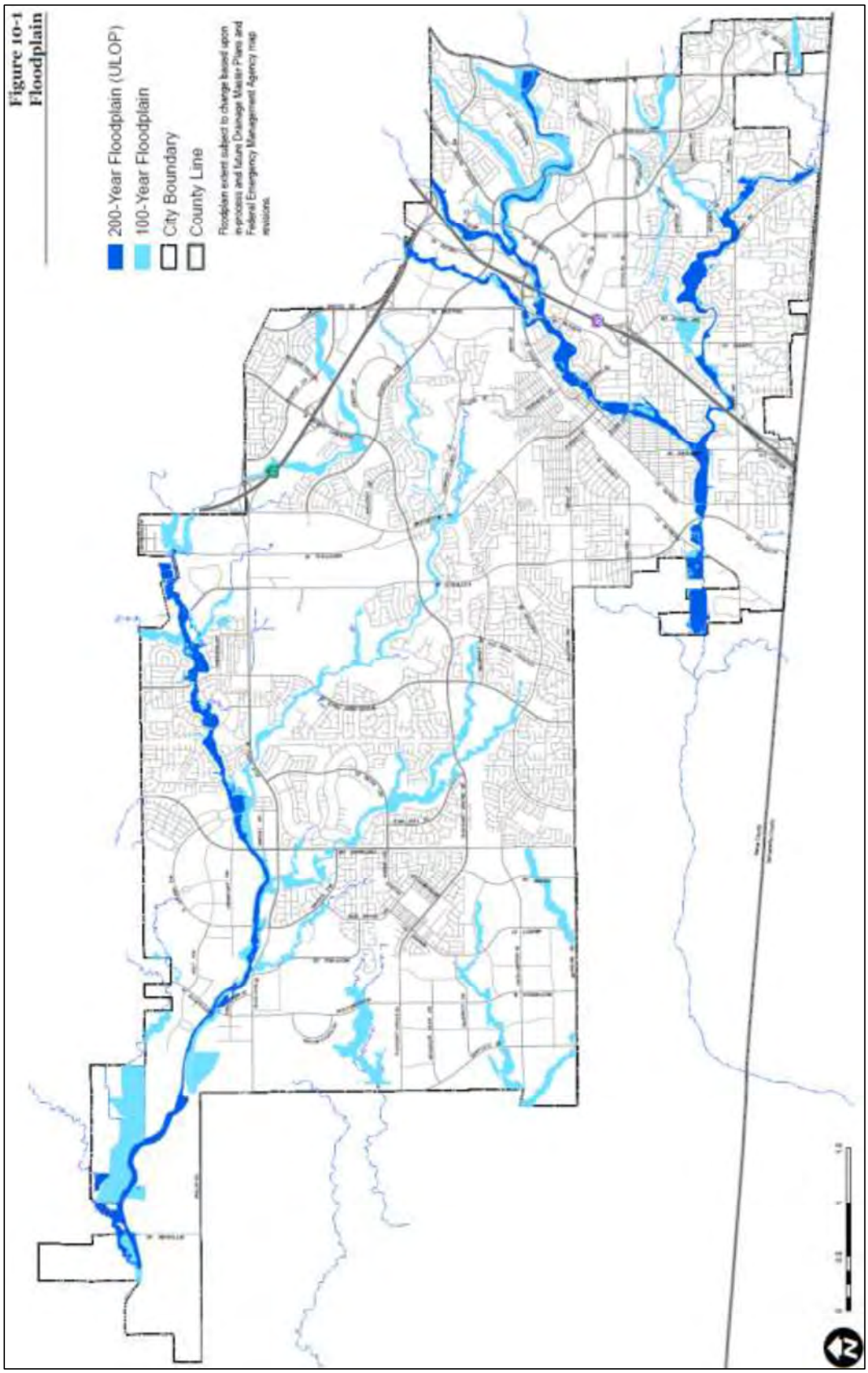


Figure 10-9. Updated Floodplain Mapping

10.7.4 Stormwater Management

Stormwater management in the City of Roseville is accomplished through a multi-tiered approach. The City uses a combination of regional development impact studies, sub-regional impact studies, the City of Roseville improvement standards, the City of Roseville grading ordinance, and the Placer County stormwater management manual. All of these tools manage the City's stormwater system at different levels. The Roseville General Plan is the principal planning document that lays out goals for managing the flooding hazard. Each update to the General Plan reviews these goals to determine their effectiveness in managing watershed characteristics. Regional master planning, sub-regional master planning, and project drainage design are discussed below.

Regional Master Planning

City ordinances establish developer fees to pay for mitigation projects that will reduce development impacts on flooding on major streams in the Dry Creek and Pleasant Grove Creek basins. Regional master planning for each basin has been conducted through the Placer County Flood Control District (PCFCD). Seven communities, including the City of Roseville, are members of this district.

The Dry Creek and Pleasant Grove Creek basins each have a detailed hydrology report that calculates the 5-, 10-, 50-, and 100-year storm frequencies based on total buildout of the basin:

- **Dry Creek Basin Report—**The *Final Report for the Dry Creek Flood Control Plan,* adopted by the Roseville City Council in April 1992, was co-sponsored, supported, and approved by the PCFCD and the Sacramento County flood control agency that oversees floodplains downstream of Placer County.
- **Pleasant Grove Creek Basin Report—**Pleasant Grove Creek Basin hydrology is included in the *Cross Canal Study*. Pleasant Grove Creek is one of several major streams that flow to a reclamation district canal; overflow is stored behind levees during Sacramento River flooding. Except for the PCFCD, this report was supported, sponsored, and approved by all agencies within the basin, in particular Sutter County and State Reclamation Board Districts 1001 and 1000.

Each report defines development impacts on the basin and specifies mitigation procedures and improvements to developers' mitigation. Both reports indicate a strategy for mitigation of floods resulting from new development on a regional scale. The reports indicate that most of Roseville is in the part of the watershed where detention is not recommended. These studies have been submitted to FEMA for approval, and FEMA is currently using the hydrology and hydraulics information provided in the reports to update FIRMs for the region.

Sub-Regional Master Planning

The City requires each sub-region to develop a master plan and mitigation strategy in a specific plan. Specific plans currently exist for Amoruso Ranch, Creekview, Del Webb, Downtown, Highland Reserve North, North Central Roseville, Northeast Roseville, North Industrial, North Roseville, Northwest Roseville, Riverside Gateway, Sierra Vista, Southeast Roseville, Stoneridge, West Roseville, and the Infill Area. Before zoning and development rights are issued for these newly developing areas, a detailed hydrology and hydraulic study dealing with that sub-region's concerns is required, in order to examine local drainage problems, define flood levels based on total buildout of the watershed, and set aside floodplain areas as open space. Floodplains are defined on swales with drainage areas greater than 300 acres. The City of Roseville and PCFCD review and approve each specific plan.

Major drainage infrastructure in the specific plans is designed as part of the infrastructure of the sub-regions and is constructed prior to development in the area; this eliminates the need for on-site detention requirements because regional detention, if required, is built into the infrastructure for the entire specific plan and not on a project-by-project basis. This approach allows for more control of the design and easier maintenance of the facility. In

addition, in newly developing areas, hydraulic requirements used to define floodplains assume well-vegetated swales and creeks, which reduces the need to provide constant cleaning of these streams by maintenance crews.

Project Drainage Design

As each project in the specific plan is developed, the City requires the project to meet drainage improvement standards. The standards require storm drain systems that support more than one parcel to be dedicated to the City for maintenance or that project owners maintain the system. In both cases, the storm drain system is reviewed by the City's Public Works Department to meet the same hydraulic standards. Project owners must demonstrate that in the case of total system failure, surface water would be able to exit the project area without causing damage. For example, if drain inlets are not maintained on a commercial site and water ponds, surface water should be able to discharge into the public drainage system without entering any on- or off-site buildings. This requirement eliminates the need for the City to monitor private storm drain systems to verify that they are adequately maintained.

10.7.5 Outreach and Public Education

The City of Roseville makes a concerted effort to educate and inform its citizens on the impacts of flooding and how to prepare for flooding impacts. The ongoing outreach and public education program uses multiple media:

- Floodplain information is published in "Roseville Reflections," a City-sponsored newsletter sent to all citizens.
- Flood information is published on the City's website and includes real-time flood warning and flood threat recognition information. The website is www.roseville.ca.us/flood/alert/floodalert.html.
- On-line surveying is used to identify public perception of flood risk and support of mitigation.
- An informational brochure, "Weathering the Storm," is available to the public.
- Literature on flood warning, property protection, and flood safety is mailed annually to Roseville residents.

10.8 SCENARIO

The City of Roseville has made great strides to reduce the risk from flooding. Events like those that caused past flooding will continue to occur, but impacts will be significantly less than in the past. Intense isolated rainstorms over the region will cause creeks and streams to overflow their banks, causing road closures and power outages. However, structure damage to personal property will be limited to the few properties that have exposure to significant depths of flooding. Flash flooding caused by rainfall runoff exceeding the capacity of stormwater systems will also continue to occur. However, potential personal property damage will be limited to structures constructed prior to building and stormwater standards adopted by the City to remediate these impacts.

10.9 ISSUES

Important issues associated with flood hazard in Roseville include but are not limited to the following:

- The boundaries of the 100-year floodplain could be as specified in the floodplain designations section of the flood-protection component of the City's General Plan. Floodplain areas shall be preserved as specified in the Open Space and Conservation Element. Preservation may include required dedication to the City. If needed, the City's ordinances can be modified to include floodplain use regulations consistent with the goals, policies, and implementation measures of the Safety Element, Land Use Element, Open Space and Conservation Element, and Parks and Recreation Element of the City's General Plan. This effort would be overseen by the Planning Division and would require no special funding.

- The development, implementation, and expansion of the Flood Alert and Early Warning Program systems should be continued, and the systems should be integrated with other local jurisdictions to form a regional warning program. This effort is overseen by the Public Works Department. Annual funding is provided through the City's general fund and is about $100,000 per year.
- By remaining actively involved in the PCFCD, the City of Roseville should continue to pursue a regional approach to flood issues. Involvement includes cooperation in the development of a comprehensive regional database. Regional drainage planning and design for all individual developments in the Placer County Flood Control District should be encouraged to address cumulative flooding impacts. The City should also continue to participate in regional flooding studies, including the Auburn Creek/Coon Creek/Pleasant Grove Creek flood mitigation plan and the Dry Creek Basin flood control plan. Efforts would be overseen by the Public Works Department. Annual funding for membership to the PCFCD is currently provided by the City's General Fund and is about $90,000 per year.
- The City should continue coordination with other agencies on issues of flood control. Coordination between the City and adjacent jurisdictions occurs through several mechanisms, including the distribution of development proposals for review and comment. The City should also continue its cooperation with federal, state, and local agencies, including the U.S. Army Corps of Engineers, California Reclamation Board, FEMA, California Department of Fish and Wildlife, Placer County Resource Conservation District, and PCFCD. This effort would be overseen by the Community Development Department, Planning Division, and Public Works Department as appropriate and should not require special funding.
- The final two phases of the Cirby-Linda-Dry Creek Flood Control Project should be completed. Five of the seven phases of this project have been completed at a cost of about $18,000,000. This project is overseen by the Public Works Department. The cost for the last two phases would be about $3,000,000. Funding could be from City, state, federal, or private developer sources.
- Alternative improvements to the Cirby-Linda-Dry Creek Flood Control Project could be analyzed. These improvements may be cost-effective in the following flood-prone areas of Roseville:

  - Dry Creek from Darling Way to Riverside Avenue
  - The area on Dry Creek upstream of Folsom Road in the Columbia Avenue, Marilyn Avenue, Bonita Street area
  - The Linda Creek area near Champion Oaks Drive, Samoa Way, and Hurst Way
  - Cirby Creek in the Trimble Way and Zien Court area.

- The existing wood flood wall along Dry Creek that is protecting the City's Main Library and Public Safety Building could be replaced. The wood wall allows floodwater to leak through, and constant pumping is required. This effort would be overseen by the Public Works Department and cost about $300,000. Funding could be from City, state, federal, private developer, property owner sources.
- How will the potential impacts of climate change impact flood conditions in the City of Roseville?

11. LANDSLIDE

11.1 GENERAL BACKGROUND

According to the U.S. Geological Survey (USGS), the term landslide includes a wide range of ground movement, such as rock falls, deep failure of slopes, and shallow debris flows. Although gravity acting on an over-steepened slope is the primary reason for a landslide, there are other contributing factors (USGS, n.d.).

Landslides and mudslides can be initiated by storms, earthquakes, fires, volcanic eruptions or human modification of the land. They can move rapidly down slopes or through channels, and can strike with little or no warning at avalanche speeds.

Landslides can pose a serious hazard to properties on or below hillsides. When landslides occur—in response to such changes as increased water content, earthquake shaking, addition of load, or removal of downslope support—they deform and tilt the ground surface. The result can be destruction of foundations, offset of roads, breaking of underground pipes, or overriding of downslope property and structures.

DEFINITIONS

Landslide—The movement of masses of loosened rock and soil down a hillside or slope. Slope failures occur when the strength of the soils forming the slope is exceeded by the pressure, such as weight or saturation, acting upon them.

Mass Movement—A collective term for landslides and mudslides.

Mudslide (or Debris Flow)—A river of rock, earth, organic matter and other materials saturated with water. Mudslides develop in the soil overlying bedrock on sloping surfaces when water rapidly accumulates in the ground, such as during heavy rainfall or rapid snowmelt. Water pressure in the pore spaces of the material increases to the point that the internal strength of the soil is drastically weakened. The soil's reduced resistance can then easily be overcome by gravity, changing the earth into a flowing river of mud or "slurry."

11.1.1 Landslide Types

Landslides are commonly categorized by the type of initial ground failure. Common types of slides are shown on Figure 11-1 through Figure 11-4 (Ecology 2014). The most common is the shallow colluvial slide, occurring particularly in response to intense, short-duration storms. The largest and most destructive are deep-seated slides, although they are less common than other types.

Mudslides (or debris flows) are rivers of rock, earth, organic matter and other soil materials saturated with water. They develop in the soil overlying bedrock on sloping surfaces when water rapidly accumulates in the ground, such as during heavy rainfall or rapid snowmelt. Water pressure in the pore spaces of the material increases to the point that the internal strength of the soil is drastically weakened. The soil's reduced resistance can then easily be overcome by gravity, changing the earth into a flowing river of mud.

A debris avalanche (Figure 11-5) is a fast-moving debris flow that travels faster than about 10 miles per hour (mph). Speeds in excess of 20 mph are not uncommon, and speeds in excess of 100 mph, although rare, can occur. The slurry can travel miles from its source, growing as it descends, picking up trees, boulders, cars, and anything else in its path. Although these slides behave as fluids, they pack many times the hydraulic force of water due to the mass of material included in them. They can be among the most destructive events in nature.

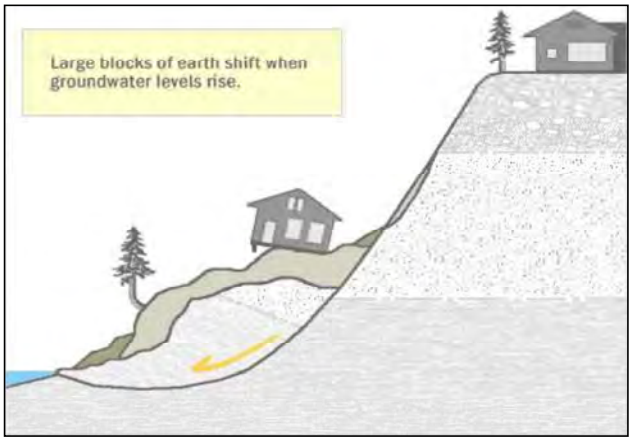


Figure 11-1. Deep Seated Slide

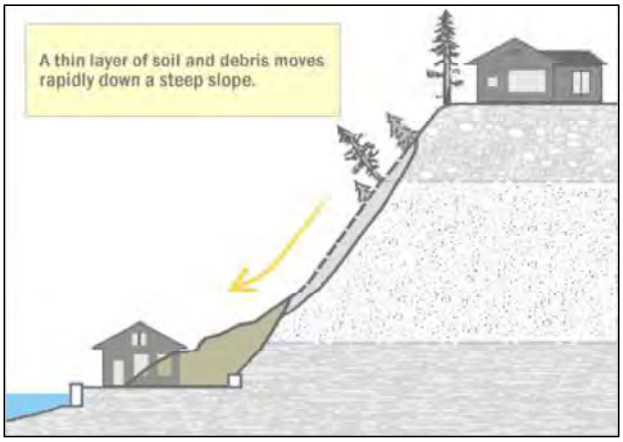


Figure 11-2. Shallow Colluvial Slide

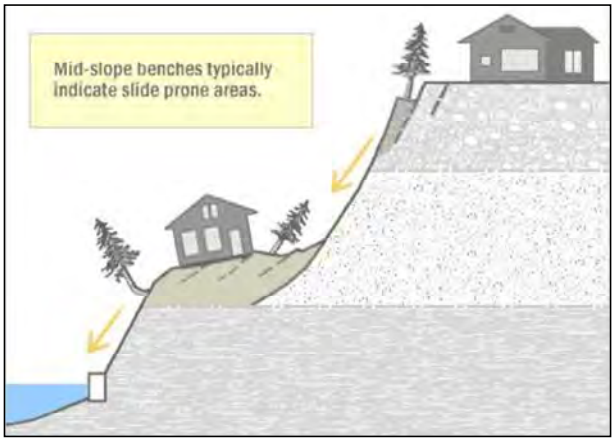


Figure 11-3. Bench Slide

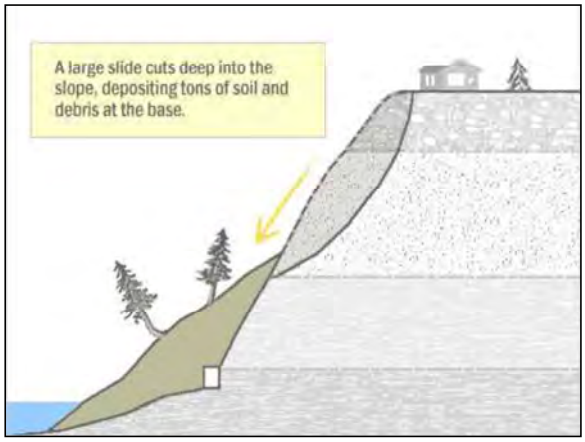


Figure 11-4. Large Slide

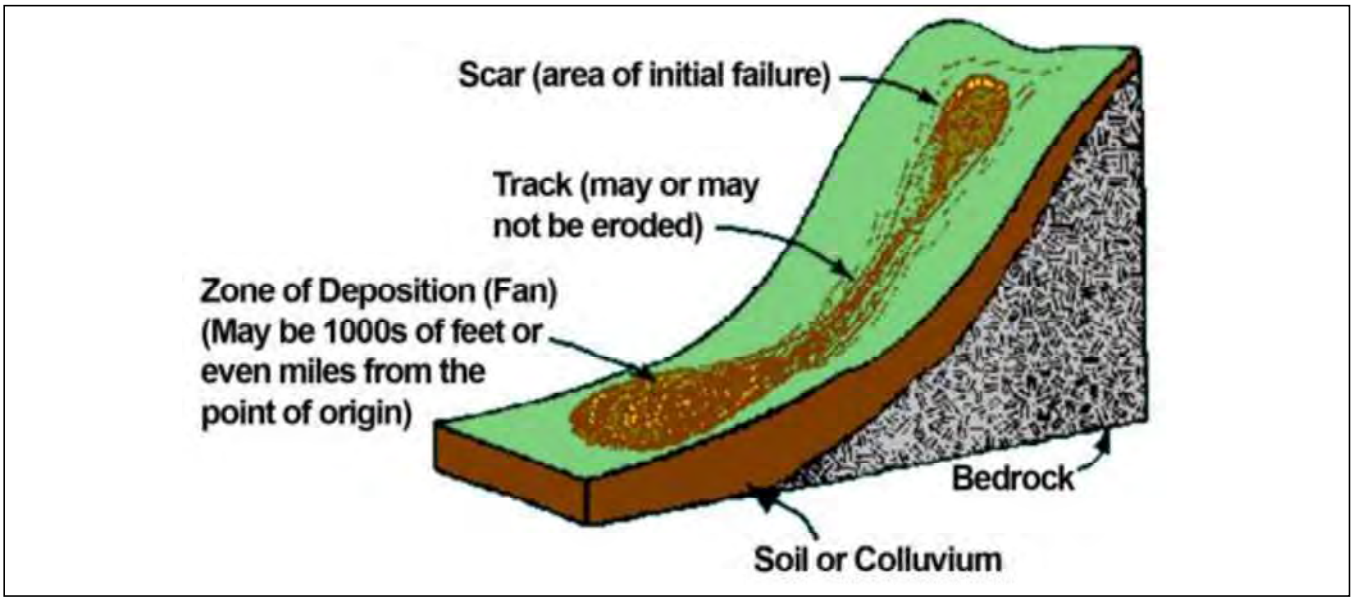


Figure 11-5. Typical Debris Avalanche Scar and Track

Landslides also include the following:

- Rock Falls—blocks of rock that fall away from a bedrock unit without a rotational component
- Rock Topples—blocks of rock that fall away from a bedrock unit with a rotational component
- Rotational Slumps—blocks of fine-grained sediment that rotate and move down slope
- Transitional Slides—sediments that move along a flat surface without a rotational component
- Earth Flows—fine-grained sediments that flow downhill and typically form a fan structure
- Creep—a slow-moving landslide often only noticed through crooked trees and disturbed structures
- Block Slides—blocks of rock that slide along a slip plane as a unit down a slope

11.1.2 Landslide Modeling

Two characteristics are essential to conducting an accurate risk assessment of the landslide hazard:

- The type of initial ground failure that occurs, as described above
- The post-failure movement of the loosened material ("run-out"), including travel distance and velocity.

All current landslide models—those in practical applications and those more recently developed—use simplified hypothetical descriptions of mass movement to simulate the complex behavior of actual flow. The models attempt to reproduce the general features of the moving mass of material through measurable factors, such as base shear, that define a system and determine its behavior. Due to the lack of experimental data and the limited current knowledge about the behavior of the moving flows, landslide models use simplified parameters to account for complex aspects that may not be defined. These simplified parameters are not related to specific physical processes that can be directly measured, and there is a great deal of uncertainty in their definition. Some, but not all, models provide estimates of the level of uncertainty associated with the modeling approach.

Run-out modeling is complicated because the movement of materials may change over the course of a landslide event, depending on the initial composition, the extent of saturation by water, the ground shape of the path traveled and whether there is additional material incorporated during the event (Savage and Hutter 1991; Rickenmann & Weber 2000; Iverson 2004).

11.2 HAZARD PROFILE

11.2.1 Past Events

There is little or no record of landslides occurring in Roseville that caused damage to property. Three notable landslide events have been recorded in Placer County, according to the Placer County Hazard Mitigation Plan. These events occurred in the eastern portion of the county, which is significantly different from Roseville in geologic terms. Therefore, no parallel can be drawn from these events for Roseville.

11.2.2 Location

Landslide hazard areas are areas where characteristics such as the following indicate a landslide risk:

- A slope greater than 15 percent
- A history of landslide activity during the last 10,000 years
- Stream or wave activity that has caused erosion or cut into a bank to cause the surrounding land to be unstable
- The presence of an alluvial fan, which indicates vulnerability to the flow of debris or sediments
- The presence of impermeable soils, such as silt or clay, mixed with granular soils such as sand and gravel.

The California Landslide Hazard Identification Act directs the State Geologist to identify and map hazardous landslide areas for use by municipalities in planning and decision-making on grading and building permits. Three factors that characterize landslide hazard areas include significant slope, weak rocks, and heavy rains. This program focuses on urban areas and growth areas that exhibit these characteristics.

Roseville and the surrounding Sacramento region are not identified as areas prone to landslide hazards. The City's geographic location, soil conditions, and surface terrain combine to minimize risk of major damage from landslides, subsidence (gradual shrinking of the earth's surface due to underground resource extraction), or other geologic hazards resulting from seismic activity and related natural forces. Therefore, the region has not been included as a part of the state's study program. The USGS, in its identification of geologic hazard areas and their susceptibility and rate of incidence, has classified Placer County and the Roseville vicinity as a low rate of incidence, with less than 1.5 percent of the area susceptible to landslides.

Little scientific analysis is available about landslide hazards in Roseville. Assessment of the risk from this hazard is based on past occurrences, observed conditions, and guidance from state and federal agencies. However, with slopes steeper than 15 percent and the frequent occurrence of multiple intense storms that can saturate the soil, there is an exposure to landslides. Future risk assessment of landslides could be enhanced with better data specific to the hazard.

While Roseville is located on relatively level terrain, the slope gradually increases to the east and north. The most significant slopes are along creeks and ravines. The soil in ravine areas is a Mehrten soil typically associated with post-volcanic activity. It is very dense and not considered to be erosion prone.

Areas with slopes greater than 15 percent in the Stoneridge Specific Plan Area exhibit characteristics of potential landslide hazard areas. Landsliding in these areas has likely occurred numerous times in the past, as evidenced by past deposits exposed in erosion gullies. The timeframe for these past occurrences is probably over the last several hundred years, if not thousands.

Due to the lack of available data on this hazard, the extent and location of the hazard has been estimated with an emphasis on steepness of slopes. Figure 11-6 shows the estimated landslide hazard areas in Roseville, based on slopes of 15 to 30 percent (moderate risk) and 30 percent and higher (high risk). The map represents a general assessment of citywide exposure; it does not apply on a site-specific basis and should be used with caution.

11.2.3 Frequency

Landslides are often triggered by other natural hazards such as earthquakes, heavy rain, floods or wildfires, so the frequency of landslides is related to the frequency of these other hazards. In the Roseville vicinity, landslides are most likely to occur during and after major storms. Due to the soil types in the steep slope areas of Roseville and the lack of historical occurrence of significant landslide events, the frequency of occurrence of landslide events in Roseville is considered to be low.

11.2.4 Severity

Landslides destroy property and infrastructure and can take the lives of people. Slope failures in the United States result in an average of 25 lives lost per year and an annual cost of about $1.5 billion. Due to the lack of exposure to this hazard in Roseville, the severity of the impacts of landslides on the people, property and economy of Roseville is considered to be low.

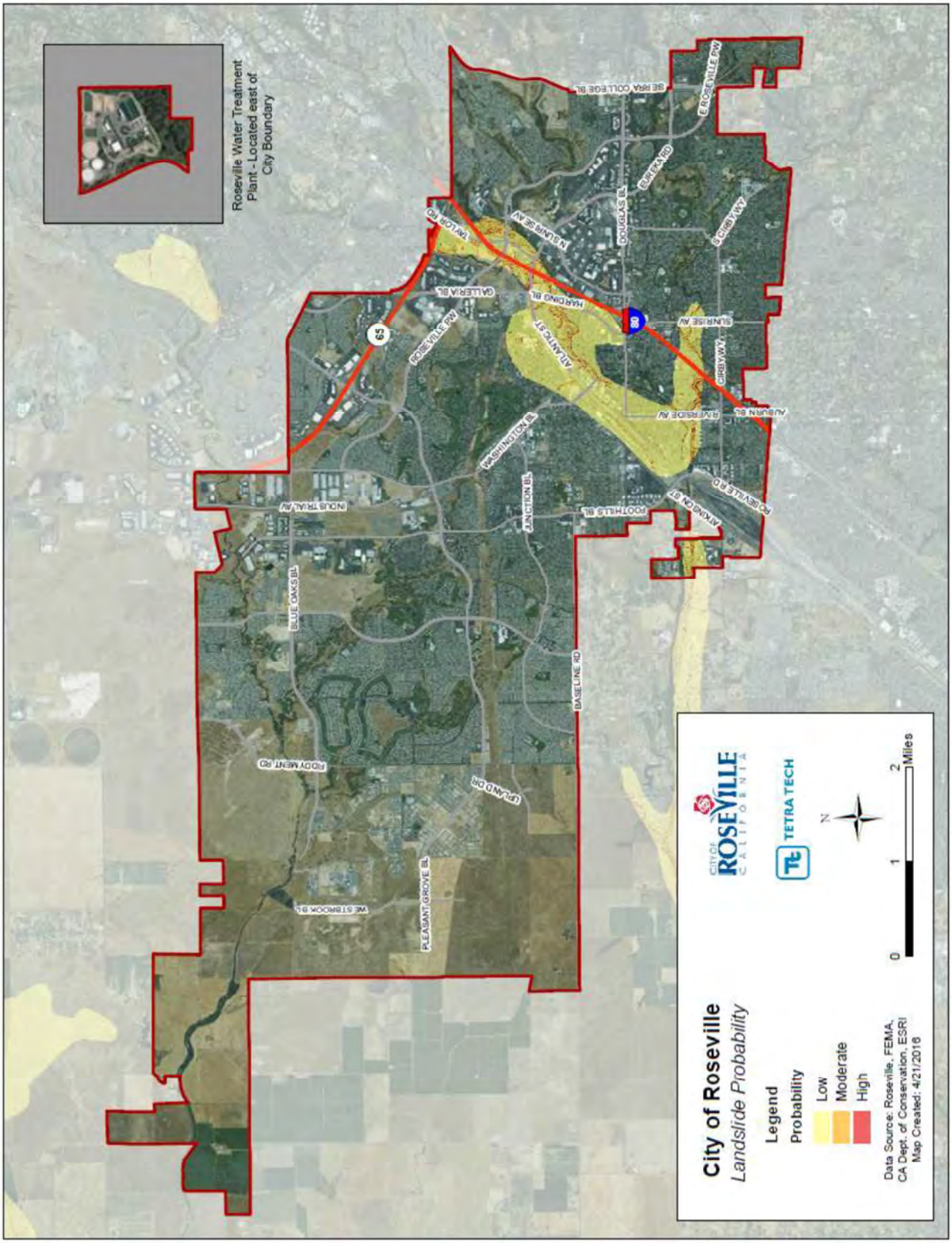


Figure 11-6. Roseville Area Landslide Hazard Map

11.2.5 Warning Time

Mass movements can occur suddenly or slowly. Some methods used to monitor mass movements can provide an idea of the type of movement and the amount of time prior to failure. It is also possible to determine what areas are at risk during general time periods. Assessing the geology, vegetation, and amount of predicted precipitation for an area can help in these predictions. However, there is no practical warning system for individual landslides. Correlations can be made based on soil type, slope and rainfall amount. No known correlations have been made for the Roseville planning area. The current procedure is to monitor situations on a case-by-case basis, and respond after an event has occurred. Generally accepted warning signs for landslide activity include the following:

- Springs, seeps, or saturated ground in areas that have not typically been wet before
- New cracks or unusual bulges in the ground, street pavements or sidewalks
- Soil moving away from foundations
- Ancillary structures such as decks and patios tilting and/or moving relative to the main house
- Tilting or cracking of concrete floors and foundations
- Broken water lines and other underground utilities
- Leaning telephone poles, trees, retaining walls or fences
- Offset fence lines
- Sunken or down-dropped road beds
- Rapid increase in creek water levels, possibly accompanied by increased turbidity (soil content)
- Sudden decrease in creek water levels though rain is still falling or just recently stopped
- Sticking doors and windows, and visible open spaces indicating jambs and frames out of plumb
- Unusual sounds, such as trees cracking or boulders knocking together
- A faint rumbling sound that increases in volume as a landslide nears.

11.3 SECONDARY HAZARDS

Landslides can cause several types of secondary effects, such as blocking access to roads, which can isolate residents and businesses and delay emergency response or commercial, public and private transportation. This could result in economic losses for businesses. Other potential problems resulting from landslides are power and communication failures. Utility poles on slopes can be knocked over, resulting in losses to power and communication lines. Landslides also have the potential of destabilizing the foundation of structures, which may result in monetary loss for residents. They also can damage rivers or streams, potentially harming water quality, fisheries and spawning habitat.

11.4 EXPOSURE

Figure 11-6 was used to estimate the exposure of population and structures to the landslide hazard.

11.4.1 Population

Using the percent of residential buildings exposed, multiplied by the estimated per-household population in 2014, it is estimated that there are 36 persons living in households exposed to the high landslide risk hazard and 140 persons exposed to the moderate landslide risk hazard. This represents 0.03 percent and 0.11 percent of the total population of the City, respectively.

11.4.2 Property

An estimated 12 structures are exposed to high landslide risk and 57 structures to moderate landslide risk. These high landslide risk structures have a total replacement cost value of $3,691,741, or 0.01 percent of the total

replacement cost value of the City. The moderate landslide risk structures have a total value of $49,714,043, or 0.17 percent of the total value of the City. These are residential, commercial and educational structures. These results are based on a spatial GIS exercise identifying all structure locations that intersect the high and moderate risk hazard zones.

11.4.3 Critical Facilities and Infrastructure

Facilities

An analysis of critical facilities inventory to determine exposure to the landslide hazard determined that two of the City's critical facilities are exposed to the landslide hazard.

Infrastructure

Roads and Bridges

A significant amount of infrastructure (roads, bridges and utilities) can be exposed to mass movements. Access to major roads is crucial to life-safety after a disaster event and can help to provide resilience during response and recovery operations. Landslides have the potential to block roads, causing isolation of all or part of the City. Roadway blockages caused by landslides can create traffic problems resulting in delays for emergency vehicles and public and private transportation. This could result in economic losses for businesses.

Landslide events can significantly impact bridges. They can knock out bridge abutments or significantly weaken the soil supporting a bridge, obstructing the bridge or making it hazardous for use. Bridges in areas of high landslide risk often provide the only ingress and egress to large areas and in some cases to isolated areas. None of the City bridges are considered to have exposure to the landslide hazard. However, bridges outside the City within the County are susceptible to landslides. Damage to one of these facilities could close off an access route to the City. These facilities have not been inventoried for this assessment.

Power Lines

Other potential problems resulting from landslides are power and communication failures creating problems for vulnerable populations or businesses and potential loss of life in emergency situations. Power lines are generally elevated above steep slopes, but the towers supporting them can be subject to landslides. A landslide could cause the soil underneath a tower to fail, causing it to collapse, and ripping down the lines. An inventory of these types of facilities was not available for this assessment.

11.4.4 Environment

Environmental problems as a result of mass movements can be numerous. Landslides fall into streams and significantly impact fish and wildlife habitat, as well as affecting water quality.

11.5 VULNERABILITY

11.5.1 Population

Due to the nature of census block group data, it is difficult to determine demographics of populations vulnerable to mass movements. In general, all persons exposed to landslides hazards are considered to be vulnerable.

11.5.2 Property

Loss estimates for the landslide hazard are not based on modeling using damage functions, because no such damage functions have been generated. Instead, loss estimates were developed representing 10 percent, 30 percent and 50 percent of the assessed value of exposed structures. This allows emergency managers to evaluate a range of potential economic impacts based on an estimate of the percent of damage to the building stock. Damage in excess of 50 percent is considered to be substantial by most building codes and typically requires total reconstruction of the structure. Table 11-1 and Table 11-2 list loss estimates to the general building stock in moderate and high landslide hazard areas.

Table 11-1. Loss Estimates for Buildings Vulnerable to High Landslide Hazard

Building Count	Assessed Value	10% Damage	30% Damage	50% Damage
12	$3,691,741	$369,174	$1,107,522	$1,845,871

Table 11-2. Loss Estimates for Buildings Vulnerable to Moderate Landslide Risk Hazard

Building Count	Replacement Cost	10% Damage	30% Damage	50% Damage
57	$49,714,043	$4,971,404	$14,914,212	$24,857,022

11.5.3 Critical Facilities and Infrastructure

Two identified critical facilities are exposed to the landslide hazard, based on the best available data. Several types of infrastructure are exposed to mass movements, including transportation, water and sewer and power infrastructure. At this time, all infrastructure and transportation corridors identified as exposed to the landslide hazard are considered vulnerable until more information becomes available.

11.5.4 Environment

The environment vulnerable to landslide hazard is the same as the environment exposed to the hazard.

11.6 FUTURE TRENDS IN DEVELOPMENT

The areas that are most vulnerable to the landslide hazard make up a small portion of the City of Roseville. Because these ravine areas in the southeastern portion of the City are considered to be non-developable and the probability of occurrence of this type of hazard is low due to the soil type in this region, this hazard should have little or no impact on future development and redevelopment trends. The City's current land use policies should also ensure that no future development or re-development would be impacted by this hazard.

The landslide risk exposure with in the planning did not increase over the performance period of the 2011 Plan. The value of the properties exposed to steep slope hazards increased by 12% which can be attributed to normal appreciation in property values observed for the Roseville planning area. Since there are currently no nationally recognized damage functions for landslide risk modeling, a comparative analysis of vulnerability was not performed. However, since there was no increase in risk exposure, the increase in vulnerability should coincide with the increase in value of the assets at risk.

11.7 REVIEW OF EXISTING ORDINANCES, PROGRAMS, AND PLANS

Since 1975, state law has required that a safety element be included as part of all general plans. In 1984, the state consolidated the safety and seismic elements into one element that includes seismic safety, geologic hazards, fire safety, and flooding. The seismic and geologic hazards component includes goals and policies to protect the

City's residents from danger associated with active faults, liquefaction, ground failure (landslides), and steep slopes.

The Safety Element of the Roseville General Plan includes components that address geologic hazards such as landslides. While the potential for geologic hazards such as landslides in Roseville is not high, the soil and geologic characteristics of the City continue to play an important role in determining safety procedures. Current policies and ordinances reflect the City's ongoing obligations to protect lives and property and include ongoing monitoring of seismic activity and periodic updating of plans for emergency events. Continued implementation of these polices and enforcement of City ordinances and General Plan policies will ensure that efforts are maximized for protecting the safety of Roseville's citizens from potential geologic safety hazards. The following policies identified in the Seismic and Geologic component of the Safety Element will mitigate the potential exposure to geologic hazards within Roseville:

- Continue to mitigate the potential impacts of geologic hazards through building plan review.
- Minimize soil erosion and sedimentation by maintaining compatible land uses, suitable to the existing environment.
- Develop appropriate building designs and implement appropriate construction techniques to decrease the impact of a landslide.
- Create and adopt slope development standards prior to or as part of the planning process for any area identified as having significant slope.
- Require contour grading, where feasible, and re-vegetation to mitigate the appearance of engineered slopes and to control erosion.

These policies are implemented through existing, ongoing programs that include the following:

- **California Building Code—**Through the Building Division of the Development Services Department, continue to enforce and keep abreast of the most recent updates to the CBC that include construction standards for seismic and geologic safety.
- **Development Review Process—**Refer any development proposal that may be impacted by grading, soil, or geologic issues to the Public Works Department. Consider the comments of the Public Works Department in the development review process. The environmental review for projects shall include a full inventory of potential grading impacts and any potential soil or geologic concerns, assessment of potential project impacts, and identification of mitigation and monitoring measures. Issues relating to slopes, liquefaction, ground failure and erosion shall be addressed. Project design, grading, and building construction techniques shall be used to minimize impacts. Sites that are determined to have significant slope shall be identified, and appropriate design restrictions shall be implemented to avoid the risk of erosion or landslide. Graded slopes shall be limited to 2:1 where feasible. Slopes that are less than 2:1 should be encouraged. The use of retaining walls or stepped building designs should be pursued as an alternative to high or steep slopes where feasible and desirable.
- **Grading Ordinance—**Enforce and regularly evaluate the Grading Ordinance. The Grading Ordinance includes standards for project construction and erosion control. This ordinance requires prompt re-vegetation of disturbed areas, avoidance of grading activities during wet weather, avoidance of disturbance in drainage ways, and other erosion control measures.
- **Specific Plans—**Ensure that specific plans are consistent with the goals and policies of the General Plan. Specific plans shall identify potential geologic, soil, and seismic hazards in the planning area and shall include measures to reduce the risk of such hazards. Proposed specific plans shall identify criteria for development on steep slope areas, as applicable, in order to ensure public safety and minimize environmental and aesthetic impacts.

- **Land Use Designation—**In areas where potentially significant soil and erosion impacts are identified, the City should consider open space or other appropriate land use designations, as specified in the Land Use Element, to minimize potential impacts.

11.8 SCENARIO

Due to the lack of significant exposure to this hazard, a scenario where a landslide would have a significant impact on the City of Roseville is currently unlikely. Mass movements are becoming more of a concern as development moves outside of city centers and into areas less developed in terms of infrastructure. Major mass movements in Placer County and areas surrounding Roseville occur as a result of soil conditions that have been affected by severe storms, groundwater or human development activities. After heavy rains, soils become saturated with water. As water seeps downward through upper soils that may consist of permeable sands and gravels and accumulates on impermeable silt, it will cause weakness and destabilization in the slope. As rains continue, the groundwater table rises, adding to the weakening of the slope. Gravity, poor drainage, a rising groundwater table and poor soil exacerbate hazardous conditions.

Roseville's most likely risk exposure to landslides is as a secondary risk associated with an earthquake or wildfire. The ground shaking that could occur during an earthquake could trigger landslides in the steep slope areas. This scenario could be further enhanced should an earthquake occur during a time when the soils are saturated due to repeated storm events. After a wildfire, the landscape becomes denatured and unable to absorb the impacts of repeated intense rainfall. This can cause the soil to become saturated and vulnerable to sliding.

11.9 ISSUES

Important issues associated with landslide hazards in Roseville include but are not limited to the following:

- The data and science regarding the mapping and assessment of landslide hazards is constantly evolving. As new data and science become available, assessments of landslide risk should be re-evaluated.
- The impact of climate change on landslides is uncertain. If climate change impacts atmospheric conditions, the exposure to landslide risks in Roseville could increase.

12. SEVERE WEATHER

12.1 GENERAL BACKGROUND

Most of the federal and state disaster declarations for the Roseville area and Placer County are related to severe weather conditions. Severe weather conditions vary greatly from the western portion of Placer County to the eastern portion, primarily due to variation in topography and elevation across the county. Heavy rainfall and snowfall result when humid air masses blow in from the ocean and move up the mountain ranges. Moist air, traveling inland on prevailing westerly winds, pushes up against the Sierra Nevada mountains, which wrings moisture out of the air as it rises, cools and condenses.

Roseville's location in the western, low-lying portion of the county helps explain why, at well below the 4,000 foot snowfall region, the City avoids the harshest of winter conditions that occur in eastern Placer County. Figure 12-1 shows Roseville's elevation of approximately 165 feet above sea level. Although the climate of Roseville is relatively mild, with an average of 257 sunny days each year, the City is near the foothills of the Sierra Nevada range and can experience severe weather resulting from rapid changes in topography.

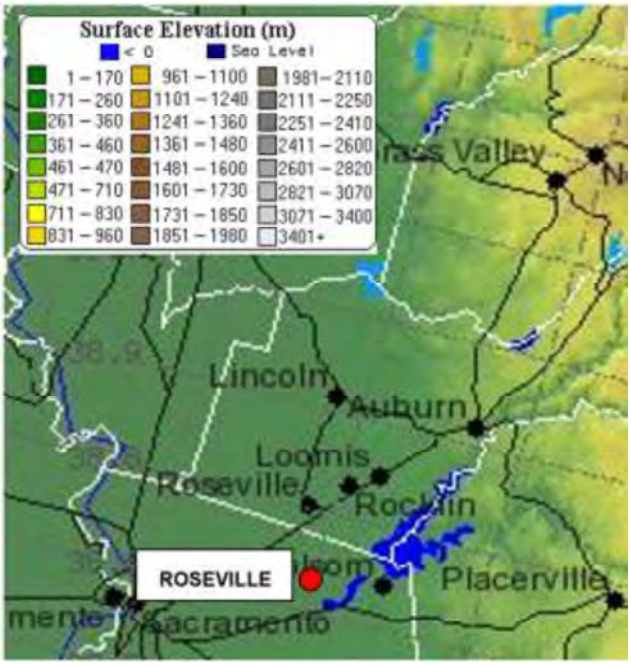


Figure 12-1. Roseville Regional Surface Elevation

DEFINITIONS

Thunderstorm—Typically 15 miles in diameter and lasting about 30 minutes, thunderstorms are underrated hazards. Lightning, which occurs with all thunderstorms, is a serious threat to human life. Heavy rains over a small area in a short time can lead to flash flooding. Strong winds, hail and tornadoes are also dangers associated with thunderstorms.

Tornado—Tornadoes are funnel clouds of varying sizes that generate winds more than 300 miles per hour. A tornado is formed by the turbulent mixing of layers of air with contrasting temperature, moisture, density and wind flow. The mixing layers of air account for most of the tornadoes occurring in April, May and June, when cold, dry air meets warm, moister air moving up from the south. They can affect an area up to a mile wide, with a path of varying length. Tornadoes can come from lines of cumulonimbus clouds or from a single storm cloud. They are measured using the Fujita Scale ranging from F0 to F6.

Windstorm—A storm featuring violent winds. Southwesterly winds are associated with strong storms moving onto the coast from the Pacific Ocean. Southern winds parallel to the coastal mountains are the strongest and most destructive winds. Windstorms tend to damage ridgelines that face into the winds.

12.1.1 Tornadoes

A tornado is a violently rotating column of air extending between, and in contact with, a cloud and the surface of the earth. Tornadoes are often (but not always) visible as a funnel cloud. On a local-scale, tornadoes are the most intense of all atmospheric circulations and wind can reach destructive speeds of more than 300 mph. A tornado's vortex is typically a few hundred meters in diameter, and damage paths can be up to 1 mile wide and 50 miles long. Figure 12-2, adapted from FEMA, illustrates the potential impacts and damage from tornadoes of different magnitude. Tornadoes can occur throughout the year at any time of day but are most frequent in the spring during the late afternoon. As shown in Figure 12-3, California has a relatively low risk compared to states in the Midwestern and Southern U.S.

12.1.2 Windstorms

Windstorms are generally short-duration events involving straight-line winds or gusts of over 50 mph, strong enough to cause property damage. Windstorms are especially dangerous in areas with significant tree stands and areas with exposed property, poorly constructed buildings, mobile homes (manufactured housing units), major infrastructure, and above-ground utility lines. A windstorm can topple trees and power lines, cause damage to residential, commercial and critical facilities, and leave tons of debris in its wake. There are seven types of damaging winds:

- **Straight-line winds—**Any thunderstorm wind that is not associated with rotation; this term is used mainly to differentiate from tornado winds. Most thunderstorms produce some straight-line winds as a result of outflow generated by the thunderstorm downdraft.
- **Downdrafts—**A small-scale column of air that rapidly sinks toward the ground.
- **Downbursts—**A strong downdraft with horizontal dimensions larger than 2.5 miles resulting in an outward burst or damaging winds on or near the ground. Downburst winds may begin as a microburst and spread out over a wider area, sometimes producing damage similar to a strong tornado. Although usually associated with thunderstorms, downbursts can occur with showers too weak to produce thunder.
- **Microbursts—**A small concentrated downburst that produces an outward burst of damaging winds at the surface. Microbursts are generally less than 2.5 miles across and short-lived, lasting only 5 to 10 minutes, with maximum wind speeds up to 168 mph. There are two kinds of microbursts: wet and dry. A wet microburst is accompanied by heavy precipitation at the surface. Dry microbursts, common in places like the high plains and the intermountain west, occur with little or no precipitation reaching the ground.
- **Gust front—**A gust front is the leading edge of rain-cooled air that clashes with warmer thunderstorm inflow. Gust fronts are characterized by a wind shift, temperature drop, and gusty winds out ahead of a thunderstorm. Sometimes the winds push up air above them, forming a shelf cloud or detached roll cloud.
- **Derecho—**A derecho is a widespread thunderstorm wind caused when new thunderstorms form along the leading edge of an outflow boundary (the boundary formed by horizontal spreading of thunderstorm-cooled air). The word "derecho" is of Spanish origin and means "straight ahead." Thunderstorms feed on the boundary and continue to reproduce. Derechos typically occur in summer when complexes of thunderstorms form over plains, producing heavy rain and severe wind. The damaging winds can last a long time and cover a large area.
- **Bow Echo—**A bow echo is a linear wind front bent outward in a bow shape. Damaging straight-line winds often occur near the center of a bow echo. Bow echoes can be 200 miles long, last for several hours, and produce extensive wind damage at the ground.

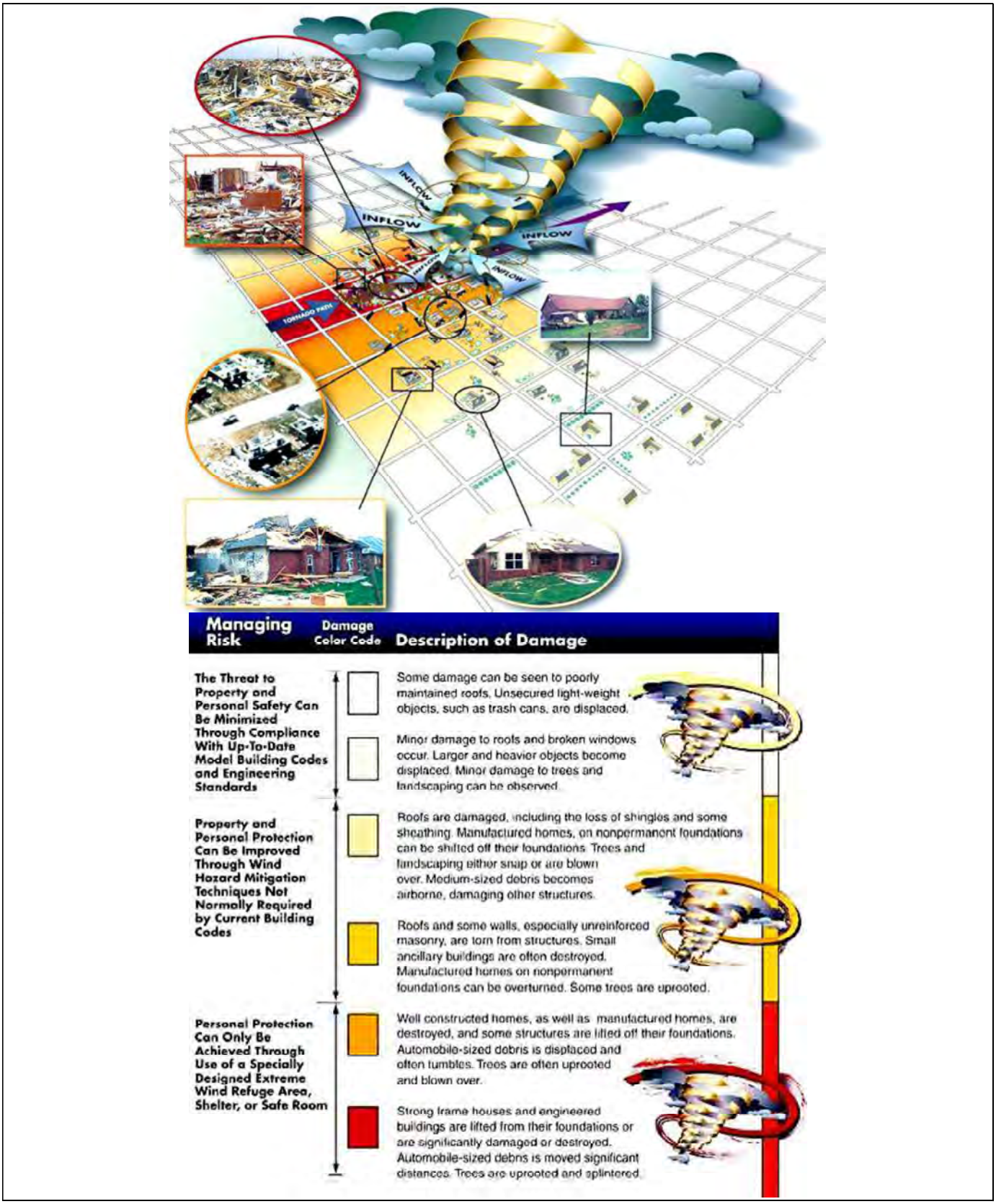


Figure 12-2. Potential Impact and Damage from a Tornado

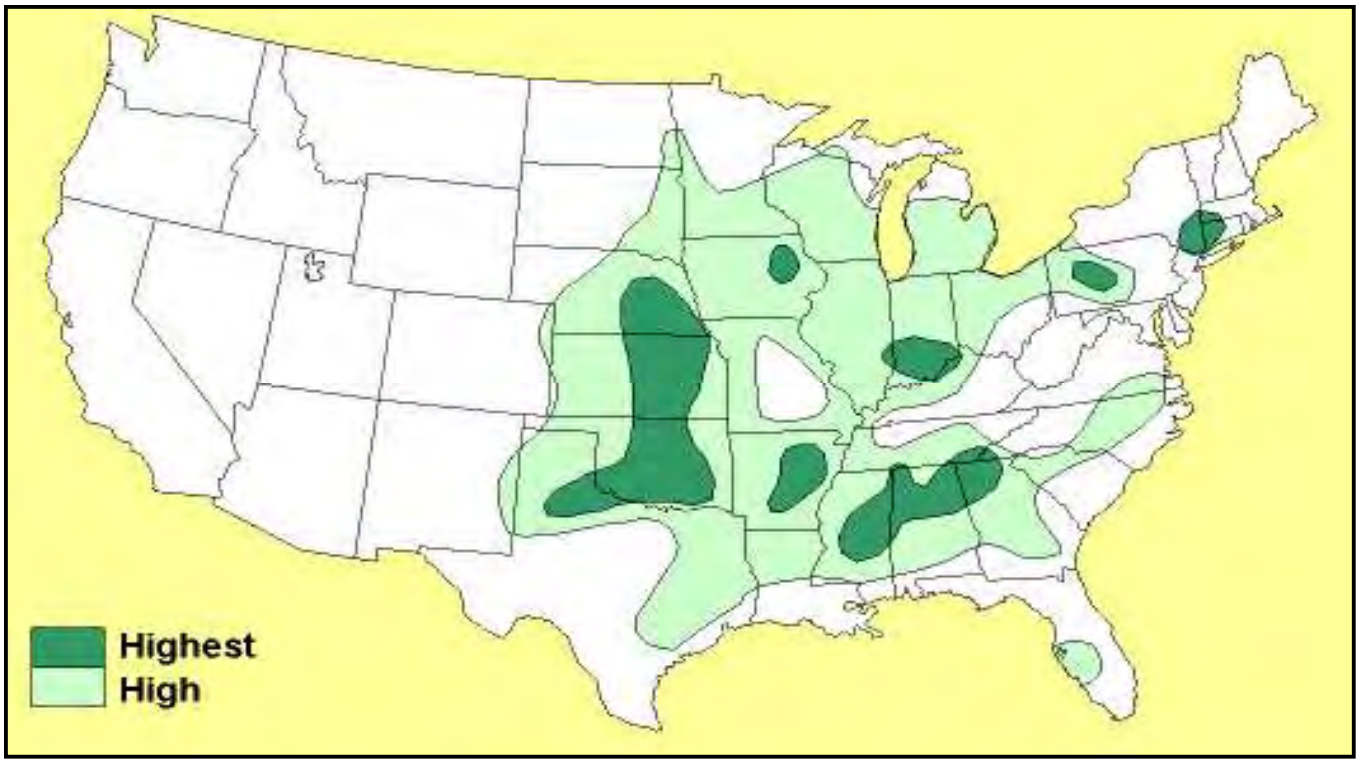


Figure 12-3. Tornado Risk Areas in the Coterminous United States

Windstorms can result in collapsed or damaged buildings, damaged or blocked roads and bridges, damaged traffic signals, streetlights and parks, and other damage. Wind speeds as low as 32 mph can cause structural damage, and winds of 100 mph can actually destroy wood-frame structures (Seattle Office of Emergency Management 2014). High winds can also cause direct losses to buildings, people, and vital equipment. There are direct consequences to the local economy resulting from windstorms related to both physical damage and interrupted services.

Wind pressure can create a direct and frontal assault on a structure, pushing walls, doors, and windows inward. Conversely, passing winds can create lift and suction forces that act to pull building components and surfaces outward. As positive and negative forces impact a building's doors, windows and walls, the result can be roof or building component failures and considerable structural damage. The effects of winds are magnified in the upper levels of multi-story structures.

Debris carried along by extreme winds can contribute directly to loss of life and indirectly to the failure of protective building envelopes. Falling trees and branches can damage buildings, power lines, and other property and infrastructure. Tree limbs breaking in winds of only 45 mph can be thrown over 75 feet, so overhead power lines can be damaged even in relatively minor windstorm events. During wet winters, saturated soils cause trees to become less stable and more vulnerable to uprooting from high winds. Utility lines brought down by summer thunderstorms have also been known to cause fires, which start in dry roadside vegetation. Electric power lines falling down to the pavement create the possibility of lethal electric shock.

Downed trees and power lines, and damaged property also can be major hindrances to emergency response and disaster recovery. Emergency response operations can be complicated when roads are blocked or when power supplies are interrupted. Industry and commerce can suffer losses from interruptions in electric service and from extended road closures.

Windstorms in Placer County are more probable during the fall through early spring. Because of the shape and orientation of the Sacramento Valley, prevailing winds are southerly. When atmospheric conditions are favorable, usually in conjunction with a significant storm tracking along the coast, these winds may combine and become strong enough to cause property damage and personal injury. The most significant windstorm in Northern California was the Columbus Day storm of 1962. Significant damage occurred along the coast and in the far northern part of the Sacramento Valley. Because Roseville lies far enough south in the valley, windstorms such as those during the 1962 Columbus Day Storm, typically do not intensify to damaging levels. It is rare for southwesterly winds flowing parallel to the Sierra Nevada Mountains to reach sustained gusts above 60 mph in the valley floor. The predicted wind speed given in wind warnings issued by the National Weather Service is for a one-minute average; gusts may be 25 to 30 percent higher.

Site-specific data on windstorms in Roseville are incomplete. Regionally, a few windstorm events have resulted in significant damage. The impacts of these events were felt to the north and east of Roseville. There have been a couple of instances of unusual wind bursts that resulted in some property damage. December 1993 saw a downburst of wind that did significant damage to a sound wall that was under construction. Another event occurred on January 1, 1995, when a wind gust through northwest Roseville snapped several power poles. Table 12-1 shows monthly wind records for Sacramento.

Table 12-1. Monthly Wind Records for Sacramento, California

Month	Year of Record	Fastest Wind Speed (miles per hour)	Month	Year of Record	Fastest Wind Speed (miles per hour)
January	1954	60	July	1956	36
February	1938	58	August	1954	38
March	1952	66	September	1965	42
April	1955	45	October	1950	68
May	1912	40	November	1953	70
June	1950	47	December	1952	70

Source: Masters-Bevan 2001.

12.1.3 Fog

Fog is a cloud near the ground that forms when air close to the ground can no longer hold all the moisture it contains. This occurs either when air is cooled to its dew point or the amount of moisture in the air increases. Heavy fog is hazardous because it can restrict surface visibility. Severe fog incidents can close roads, cause vehicle accidents, cause airport delays, and impair the effectiveness of emergency response. Financial losses associated with transportation delays caused by fog have not been calculated in the United States, but they are known to be substantial. Fog can occur almost anywhere during any season and is classified based on how it forms, which is related to where it forms. Certain seasons are more likely to have foggy days or nights based on a number of factors, including topography.

In Placer County, heavy fog occurs mostly during the midwinter. A low-lying, early morning “tule fog” can occur anytime during the wet, cold season. Tule fog or radiation (ground) fog is common on clear nights with little or no wind. It is caused by the rapid cooling of the Earth and corresponding drop in air temperature to the dew point. This type of fog is known as “valley fog” when it persists throughout the day and is thick. Table 12-2 summarizes dense fog events in the southern Sacramento valley. Given the nature of fog in the Roseville area, future severe or dense fog events are expected to happen on an annual basis, but are not expected to occur frequently.

Table 12-2. Monthly Dense Fog Occurrence

Month	Year of Record	Mean Number of Days	Maximum Number of Days
January	1961	9.9	23
February	1963[a]	5.3	13
March	1986	1.7	6
October	1962	1.4	11
November	1982	5.3	11
December	1989*	9.5	22
Annual	1962	33.8	64

a. Also occurred in previous years.
Source: Masters-Bevan 2001.

12.1.4 Heavy Rains, Thunderstorms and Lightning

Severe weather in the City of Roseville generally includes heavy rains and is periodically accompanied by strong winds, lightning, or hail. Heavy rains coupled with low temperatures or other severe weather conditions can result in increases in traffic accidents, disruptions in transportation, commerce, government, and education. Severe weather incidents can also cause utility outages due to falling trees or other debris, as well as injuries.

Roseville's Mediterranean type of climate is typified by nearly 90 percent of the annual precipitation occurring during a window of about 16 weeks. The most severe storms occur during the late fall to early spring. The climate pattern, coupled with the onshore flow of warm, moist Pacific air during the winter, can generate severe and prolonged periods of heavy rain.

Roseville experiences heavy rains every year. Some of these events may include thunderstorms. Thunderstorms are typically few in number and are more likely to appear in spring or late fall. Table 12-3 shows the average and record occurrence of thunderstorms in Sacramento between 1948 and 2008.

Table 12-3. Frequency of Thunderstorms in Sacramento, California, 1948 – 2008

Month	Year of Record	Number of Days with Thunderstorms	
		Average	Maximum
January	1970	0.4	3
February	1970	0.5	4
March	1992	0.8	4
April	1983	0.7	3
May	1967	0.3	3
June	1956	0.2	2
July	1989	0.2	2
August	1991[a]	0.2	2
September	1989[a]	0.5	2
October	1989[a]	0.3	2
November	1979*	0.3	3
December	1970	0.2	2
Annual	**1970**	**4.7**	**10**

a. Also occurred in previous years between January 1948 and December 2000.
Source: Masters-Bevan 2008.

NOAA classifies a thunderstorm as a storm with lightning and thunder produced by cumulonimbus clouds, usually producing gusty winds, heavy rain, and sometimes hail. Thunderstorms are usually short in duration (seldom more than 2 hours). Heavy rains associated with thunderstorms can lead to flash flooding during the wet or dry season.

According to the American Meteorological Society *Glossary of Meteorology*, thunderstorms are reported as light, medium, or heavy according to the following characteristics:

- Nature of the lightning and thunder
- Type and intensity of the precipitation, if any
- Speed and gustiness of the wind
- Appearance of the clouds
- Effect on surface temperature.

Lightning is an electrical discharge that results from the buildup of positive and negative charges within a thunderstorm. When the buildup becomes strong enough, lightning appears as a "bolt." This flash of light usually occurs within the clouds or between the clouds and the ground. A bolt of lightning reaches temperatures approaching 50,000ºF instantaneously. The rapid heating and cooling of air near the lightning causes thunder. Lightning is a major threat during a thunderstorm. In the United States, between 75 and 100 Americans are killed by lightning each year.

12.1.5 Ice and Freezing Rain

Ice and freezing rain are not part of the climate pattern in southern Sacramento valley. Periods have occurred where the daily minimum temperature has been at or below 32°F for several days. Yet the low temperatures reflect diurnal variations with clear skies, not part of a synoptic feature generating any precipitation. The bitterest cold snap on record, occurring December 9 to 15, 1935, was ended by the onset of a Pacific storm bringing warmer air. Although ice storms and freezing rains are a significant natural hazard, the extremely remote possibility of their occurrence in Roseville precludes any further discussion in this analysis.

12.2 HAZARD PROFILE

12.2.1 Past Events

Table 12-4 summarizes past severe weather events in Roseville and Placer County as recorded by the National Oceanic and Atmospheric Administration since 1958.

12.2.2 Location

Severe weather events have the potential to happen anywhere in Placer County. Communities in low-lying areas next to streams or lakes are more susceptible to flooding. Mountainous regions experience heavier snowfall and a greater risk of road closures. Wind events are most damaging to areas that are heavily wooded.

12.2.3 Frequency

The planning area can expect to experience exposure to some type of severe weather event at least annually.

Table 12-4. Severe Weather Events in Placer County since 1958 (NOAA 2015)

Location	Date	Type	Magnitude	Deaths or Injuries	Property Damage
Placer County	01/13/1957	Tornado	F0	0	0
Placer County	04/22/1967	Hail	0.00 Inches	0	0
Placer County	10/15/1972	Tornado	F0	0	0
Placer County	03/03/1983	Tornado	F0	0	0
Placer County	03/22/1983	Tornado	F1	0	$250,000
Placer County	04/23/1990	Tornado	F0	0	$2,500
Placer County	12/30/1992	Hail	0.50 inches	0	0
Description: *Severe thunderstorms produced golf ball-sized hail. Damage occurred at several auto dealers in Roseville.*					
Roseville	12/22/1996	Thunder Storm/Wind	0	0	0
Description: *Downburst winds snapped five 75-foot-high power poles into several pieces.*					
Roseville	01/22/1997	Flash Flood	0	0	0
Description: *Heavy rains on saturated soil caused flooding on Dry Creek and Linda Creek, damaging 21 homes.*					
Roseville	01/26/1997	Flash Flood	0	0	0
Description: *Heavy rain caused flooding on Dry Creek and Linda Creek, damaging 21 buildings.*					
Placer County	01/12/1998	Heavy Rain	N/A	0	0
Description: *Heavy rains caused widespread but minor flooding across the Sacramento Valley and nearby foothills.*					
Placer County	01/18/1998	Heavy Rain	N/A	2	0
Description: *A Pacific storm brought brief but heavy rain to the Sacramento Valley and surrounding foothills. 27,000 customers lost power at some time during the storm. Two teens were drowned when their car flipped into a flooded ditch near Loomis.*					
Roseville	01/22/2000	Heavy Rain	N/A	0	0
Description: *Rainfall totaling 5.43 inches fell in just over 48 hours.*					
Roseville	02/11/2000	Heavy Rain	N/A	0	$10,000
Description: *Heavy rain that persisted for nearly 72 hours was responsible for the closure of Granite Bay High School. The school lost power and phone service. Local businesses were affected by the flooding and closed as well.*					
Placer County	12/17/2005	Heavy Rain	N/A	0	0
Description: A series of storms brought heavy rainfall to Northern California. Five-day rainfall for Roseville was 2.99 inches.					
Placer County	01/01/2006	Severe Storm/Flood	N/A	0	$2,000,000
Description: *Storms brought heavy rain, mudslides, flooding, and high winds to Northern California. Levee overtopping, breaching, and river flooding occurred along numerous rivers, creeks, and streams. Several urban areas had significant street flooding. The Sacramento weir was opened for the first time since 1997. Airports were closed due to high winds and major road closures resulted from flooding and mudslides. Interstate 80 between Sacramento and Reno, NV, was closed for more than a day due to a mudslide, as were both directions of U.S. Highway 50 between Sacramento and South Lake Tahoe. Place County was among the counties declared in need of federal disaster assistance.*					
Placer County	07/25/2013	Hail	N/A	0	0
Description: *Strong to severe thunderstorms affected the Sierra and northeast California.*					
Roseville	03/36/2014	Tornado	EF0	0	0
Description: *EF0 tornado began in a field southwest of Roseville, but did not cause damage until it reached the Pleasant Grove Blvd housing developments in West Roseville. The winds were estimated to be 75 to 85 mph. Several windows were blown out from houses, 25 to 30 feet of fence was blown down, projectile damage to stucco occurred. The tornado lasted 5 to 10 minutes.*					
Roseville	05/14/2015	Heavy Rain	N/A	0	0
Description: *Thunderstorms brought local heavy rain and minor flooding. Unusually late winter snow fell in the Sierra, causing travel delays and chain controls over passes. Funnel clouds were reported with thunderstorms, but no touchdowns were confirmed. Street flooding was reported at Martin Road and East Roseville Parkway from a thunderstorm.*					

12.2.4 Severity

Severe weather disaster declarations for Placer County, as shown in Table 12-4, are often related to heavy rains, thunderstorms, and freezing temperatures. The most common problems associated with severe storms are immobility and loss of utilities. Fatalities are uncommon, but can occur. Roads may become impassable due to flooding, downed trees, or a landslide. Power lines may be downed due to high winds, and services such as water or phone may not be able to operate without power. Lightning can cause severe damage and injury. Windstorms have been known to cause damage to utilities.

Tornadoes are potentially the most dangerous of local storms, but they are not common in the Roseville vicinity. If a major tornado were to strike a populated area such as Roseville, damage could be widespread. Businesses could be forced to close for an extended period or permanently, fatalities could be high, many people could be homeless for an extended period, and routine services such as telephone or power could be disrupted. Buildings may be damaged or destroyed. Compared with other states, California ranks 32nd for frequency of tornadoes, last for number of deaths, 36th for injuries, and 31st for cost of damage. California ranks 44th for the frequency of tornados per square mile.

12.2.5 Warning Time

A meteorologist can often predict the likelihood of a severe storm. This can give several days of warning time. However, meteorologists cannot predict the exact time of onset or the severity of the storm. Some storms come on more quickly and have only a few hours of warning time.

12.3 SECONDARY HAZARDS

The most significant secondary hazards associated with severe weather are floods, falling and downed trees, landslides and downed power lines. Rapidly melting mountain snow combined with heavy rain can overwhelm natural and man-made drainage systems, causing overflow and property destruction. Landslides occur when the soil on slopes becomes oversaturated and fails.

12.4 EXPOSURE

12.4.1 Population

A lack of data separating severe weather damage from flooding and landslide damage prevented a detailed analysis for exposure and vulnerability. However, it can be assumed that the entire Roseville planning area is exposed to severe weather events. Certain areas are more exposed due to geographic location and localized weather patterns. Populations living at higher elevations with large stands of trees or power lines may be more susceptible to wind damage and black out, while populations living in low lying areas are at risk for flooding.

12.4.2 Property

All structures within Roseville are exposed to the potential impacts of severe weather.

12.4.3 Critical Facilities and Infrastructure

All critical facilities exposed to flooding are also likely exposed to severe weather. Additional facilities on higher ground may also be exposed to wind damage or damage from falling trees. The most common problem associated with severe weather is the loss of utilities. Downed power lines can cause blackouts, leaving large areas isolated. Phone, water and sewer systems may not function. Roads may become impassable due to ice or snow or from a secondary hazard such as landslides.

12.4.4 Environment

Severe storm events can drastically affect the physical environment, changing natural landscapes. Natural habitats such as streams and trees risk major damage and destruction during a severe storm. Prolonged rains can saturate soils and lead to slope failure. Flooding caused by severe weather can cause stream channel migration.

12.5 VULNERABILITY

There are currently no loss estimation tools with uniform damage functions for severe weather events. This can be attributed to the variety of impacts that severe weather events generate. Also, the severity of severe weather events varies by location. Since secondary effects of severe weather events include flooding, landslides or even wildfires in drier climates, the vulnerability assessments under those hazards can provide emergency managers a gage of the economic impact of severe weather events. For this section, the vulnerability to severe weather events is discussed qualitatively. Where possible, damage estimates are made using reasonable assumptions and best available data.

12.5.1 Population

Particularly vulnerable populations are the elderly, low income or linguistically isolated populations, people with life-threatening illnesses, and residents living in areas that are isolated from major roads. Power outages can be life threatening to those dependent on electricity for life support. These populations face isolation and exposure during severe weather events and could suffer more secondary effects of the hazard.

12.5.2 Property

All property is vulnerable during severe weather events, but structures in poor condition or constructed to low building code standards risk the most damage. The frequency and degree of damage will depend on specific locations. Those in higher elevations and on ridges may be more prone to wind damage. Those that are located under or near overhead lines or near large trees may be damaged in the event of a collapse.

Estimates of potential loss for the severe weather hazard are not based on damage functions, because no such damage functions have been generated. Instead, estimates were developed representing 10 percent, 30 percent and 50 percent of the assessed value of exposed structures. This allows emergency managers to select a range of potential economic impact based on an estimate of the percent of damage to the general building stock. Damage in excess of 50 percent is considered to be substantial by most building codes and typically requires total reconstruction of the structure. Table 12-5 lists the potential loss estimates to the general building stock.

Table 12-5. Loss Potential for Roseville Buildings Vulnerable to Severe Weather Hazard

	Building Count	Assessed Value	10% Damage	30% Damage	50% Damage
Residential	43,163	$18,695,442,494	$1,869,544,249	$5,608,632,748	$9,347,721,247
Commercial	1,811	$8,274,963,659	$827,496,366	$2,482,489,098	$4,137,481,830
Industrial	475	$1,160,642,905	$116,064,290	$348,192,871	$580,321,452
Agricultural	1	$28,530	$2,853	$8,559	$14,265
Religion	71	$250,600,927	$25,060,093	$75,180,278	$125,300,463
Government	92	$168,856,266	$16,885,627	$50,656,880	$84,428,133
Education	445	$1,091,399,472	$109,139,947	$327,419,842	$545,699,736
Total	**46,058**	**$29,641,934,254**	**$2,964,193,425**	**$8,892,580,276**	**$14,820,967,127**

12.5.3 Critical Facilities and Infrastructure

Incapacity and loss of roads are the primary transportation failures, most of which are associated with secondary hazards. Landslides that block roads are caused by heavy prolonged rains. High winds can cause significant damage to trees and power lines, with obstructing debris blocking roads, incapacitating transportation, isolating population, and disrupting ingress and egress. Of particular concern are roads providing access to isolated areas and to the elderly.

Prolonged obstruction of major routes due to landslides, debris, or floodwaters can disrupt the shipment of goods and other commerce. Large and prolonged storms can have negative economic impacts for an entire region.

Severe windstorms and downed trees or power lines can create serious impacts on power and above-ground communication lines. Broken power and communication lines would result in isolation because some residents would be unable to call for assistance.

12.5.4 Environment

The environment vulnerable to the severe weather hazard is the same as the environment exposed to the hazard.

12.6 FUTURE TRENDS IN DEVELOPMENT

The general building stock within the planning area increased by 17.7% with an increase in valuation from $21.967 billion to $29.641 billion (34.9%). This increase in valuation of the planning area was impacted by the areas recovery from the economic downturn of 2008. Since the entire planning area would be considered susceptible to earthquake, there was an increase in earthquake exposure over the performance period of the 2011 plan. However, the vulnerability of this new exposure should be considered to be low due to the application of strong building code standards that are contained within the International Building Code.

Many of the impacts associated with severe weather hazards can be addressed through proactive planning and the use of best available information in making land use decisions. Roseville has and will achieve this goal through the implementation of its General Plan. The General Plan serves as a long-term policy guide for the physical, economic, and environmental growth of the City. It includes a statement of the community's vision of its ultimate physical growth. Implementation of the General Plan, along with other programs such as Building Code enforcement, public information and early warning, will help Roseville to manage the probable impacts of severe weather hazards as the City grows in the future.

12.7 REVIEW OF EXISTING ORDINANCES, PROGRAMS, AND POLICIES

Roseville implements numerous programs and policies that can impact severe whether hazards. Like most programs and policies sited in this Plan, these are tied to the City's general plan. Maintenance of these existing programs is included in the action plan for this hazard mitigation plan.

12.8 SCENARIO

A worst-case event would involve prolonged high winds during an extreme rainstorm. Such an event would have both short-term and long-term effects. Initially, schools and roads would be closed due to flooding, downed tree obstructions, and downed power lines. Power outages would be common throughout the City. Some subdivisions in the City could experience limitations on ingress and egress. Continuing rains could produce flooding, overtopped culverts with ponded water on roads, and landslides on steep slopes. Flooding and landslides could further obstruct roads and bridges, further isolating residents.

12.9 ISSUES

In general, every household and resident in the City is likely to be exposed to severe weather, but some are more likely than others to experience isolation as a result. Those residing in higher elevations with limited transportation routes may have the greatest vulnerability to isolation from storms. Another group at risk is the portion of the population that is over the age of 65.

13. WILDFIRE

13.1 GENERAL BACKGROUND

13.1.1 Contributing Factors

A wildfire is any uncontrolled fire occurring on undeveloped land that requires fire suppression. Wildfires can be ignited by lightning or by human activity such as smoking, campfires, equipment use, and arson. The potential for wildfire is primarily influenced by the following factors:

- Fuel, which may include living and dead vegetation on the ground, along the surface as brush and small trees, and above the ground in tree canopies.
- Topography, which includes both slope and elevation.
- Air conditions, including temperature, relative humidity, wind speed and direction, cloud cover, precipitation amount and duration, and the stability of the atmosphere.

DEFINITIONS

Wildland-Urban Interface Area—An area susceptible to wildfires where wildland vegetation and urban or suburban development occur together. Examples include dispersed rural housing in forested areas.

Wildfire—A fire that causes uncontrolled destruction of forests, brush, field crops, grasslands, and real and personal property in non-urban areas.

How a fire behaves primarily depends on the following:

- Fuel—Lighter fuels such as grasses, leaves and needles quickly expel moisture and burn rapidly, while heavier fuels such as tree branches, logs and trunks take longer to warm and ignite. Trees killed or defoliated by forest insects and diseases are more susceptible to wildfire.
- Weather—Strong, dry winds produce extreme fire conditions. Such winds generally reach peak velocities during the night and early morning hours.
- Thunderstorm activity—The thunderstorm season typically begins in June with wet storms, and turns dry with little or no precipitation reaching the ground as the season progresses into July and August.
- Terrain—The topography of a region influences the amount and moisture of fuel; the impact of weather conditions such as temperature and wind; potential barriers to fire spread, such as highways and lakes; and elevation and slope of land forms (fire spreads more easily uphill than downhill).
- Time of Day—A fire's peak burning period generally is between 1 p.m. and 6 p.m.

Short-term loss caused by a wildfire can include the destruction of timber, wildlife habitat, scenic vistas, and watersheds. Long-term effects include smaller timber harvests, reduced access to affected recreational areas, and destruction of cultural and economic resources and community infrastructure. Vulnerability to flooding increases due to the destruction of watersheds. The potential for significant damage to life and property exists in areas designated as "wildland-urban interface areas," where development is adjacent to densely vegetated areas.

13.1.2 Local Conditions Related to Wildfire Hazard

Vegetation

The vegetation in Roseville can be broadly classified in three categories:

- There are large tracts of self-sustaining grasslands in the northern and western undeveloped edges of Roseville. Less extensive areas of grassland can be found in smaller, undeveloped areas scattered throughout the City. Most of the grasslands are non-native, following the effects of grazing and clearing for agricultural uses.
- Oak woodland, riparian and creek areas are found in proximity to Roseville's major stream channels where microclimates and alluvial soils provide ideal conditions for the deeper rooting shrubs and trees found in these habitats. Most woodland areas are relatively open, with little shrub growth.
- Seasonal wetlands in Roseville include intermittent drainages and vernal pools. Intermittent drainages are wet only in winter and dry during the summer, with scattered ponds; they may contain water from adjacent urban runoff. Vernal pools represent a significant seasonal wetland resource in Roseville.

Undeveloped Areas

The U.S. Army Corps of Engineers has required developers in Roseville to preserve areas of vernal pools that are dedicated to the City and maintained in perpetuity. These areas are to be left undisturbed and are typically open grassy areas during the hot summer months when the vernal pools are dry.

Preservation of open space, wetlands, natural parkways, riparian corridors along the City's watersheds, vernal pools and endangered species habitat have added to the inventory of vegetation susceptible to wildfire. The City of Roseville has 2,600 acres of dedicated open space within the city limits. Nearly 740 acres will be added on dedication of properties in the West Roseville Specific Plan. The City recently acquired the Reason Farms property in unincorporated Placer County, which will be the site for a retention basin projected to have water only eight days per year. The property will be preserved in perpetuity as open space with passive recreational uses planned, including biking, hiking, camping, and boating on a man-made lake. The Roseville Fire Department will assume fire protection duties for this significant piece of open space at a future date.

Fire-Fighting and Fire Prevention

Federal, state, county, city, and private agencies provide fire protection and firefighting services in California. Wildfires usually are extinguished while smaller than 1 acre, but they can spread to more than 100,000 acres and may require thousands of firefighters and several months to extinguish.

Roseville Fire Protection Services

The Roseville Fire Department is a fully functional agency that primarily provides fire suppression and emergency medical services for the urban environment of the City. The department operates eight stations. The department has eight paramedic engine companies, with a minimum staffing of three, two paramedic truck companies with a minimum staffing of four, and one battalion chief. The department also operates a hazardous materials response unit (cross-staffed the truck company); five grass/wildland units, and one technical rescue unit (cross-staffed by engine companies). The department maintains four reserve engines and one reserve truck.

Regional Services

Regional fire protection is provided by municipal fire departments and those assigned to specially designated lands outside city boundaries. The Placer County Fire Department provides fire protection to much of Placer County including west of the Roseville city limits. The South Placer Fire District serves unincorporated Placer County east of Roseville. The City of Rocklin Fire Department provides services within the City of Rocklin to the north and east of Roseville. The Sacramento Metropolitan Fire District provides fire protection to the City of Citrus Heights and the unincorporated Sacramento County areas to the south of Roseville.

State of California

The California Department of Forestry and Fire Protection (CAL FIRE) is charged with both assessing the threat of fire in California and suppressing fires on state and federal lands, while providing mutual aid if needed to communities that do not include public lands. The California Fire Plan formalizes much of the work that has been done to assess the threat of wildfire statewide. CAL FIRE's Fire and Resource Assessment Program (FRAP) assesses the amount and extent of California's forests and rangelands, analyzes their conditions and identifies alternative management and policy guidelines.

Firewise Communities

The national Firewise Communities program is a multi-agency effort involving homeowners, community leaders, planners, developers, and others to protect people, property and natural resources from the risk of wildfire before a fire starts. The program emphasizes community responsibility for planning a safe community and effective emergency response, and individual responsibility for safer home construction and design, landscaping and maintenance. Firewise Communities is directed and sponsored by the National Wildfire Coordinating Group, a consortium of organizations and federal agencies responsible for wildfire management in the U.S.

13.2 HAZARD PROFILE

13.2.1 Past Events

Fire history shows multiple wildfires in or near Roseville since the 1950s:

- In the 1950s, one fire occurred just east of the current location of Interstate 80 on the Roseville/Rocklin border, including parts of the Stoneridge area. A second fire occurred south of Douglas Boulevard where Roseville Parkway is now located.
- In the 1970s, a significant fire occurred in undeveloped grasslands along what is now Galleria Boulevard and Harding Boulevard in north central Roseville. Another fire occurred just outside the city limits on both sides of Cavitt-Stallman in the Loomis area.
- In the 1980s, five wildfires were mapped, including one in the grasslands of the North Central Roseville Specific Plan just north of Highway 65, where Pleasant Grove Boulevard is now located. Three grassland fires occurred west of Roseville, one just west of Fiddyment Road and two west of Fiddyment Road and south of Athens Road. A major fire occurred in 1983 where Baseline Road and Country Club Drive now intersect. The fire scorched 1,500 acres north past the current Blue Oaks Boulevard, stopping at Pleasant Grove Creek. The area is now developed with urban uses.
- The 2002 Sierra Fire in Loomis and Granite Bay was the largest in recent history near Roseville. The fire charred 900 acres of grass, brush and oaks in the area between Interstate 80 and Cavitt-Stallman Road. The fire destroyed six structures and threatened two schools. One hundred homes were evacuated, and more than 1,000 homes in both communities were threatened.
- On May 17, 2016, a grass fire broke out near Highway 65 north of Roseville. The fire, located at Athens Avenue and Industrial Boulevard, south of Lincoln in Placer County stretched to 169 acres.

Statewide, California experiences frequent significant wildfires. Most recently, the following two fires occurred:

- The 2003 Cedar fire in San Diego County burned 273,246 acres, destroyed 2,820 structures and directly resulted in 15 deaths. The fire was caused by human ignition.
- The 2015 Valley Fire in Lake County is considered the third worst fire in history, based on the number of structures damaged or destroyed. The fire consumed 75,781 acres and killed four people.

CAL FIRE maintains a website (http://www.calfire.ca.gov/general/firemaps/) with interactive maps that detail the fire history in California since 2011.

13.2.2 Location

State

CAL FIRE also developed an estimate of fire risk in designated wildland-urban interface areas, based on a variety of factors affecting fire frequency and fire behavior. The results are combined into a single assessment called fire threat. A significant fire threat is found throughout California, with 48 percent of the state's wildland area ranked as high, very high or extremely high. About 37 percent of the state has a moderate fire threat. Large areas of high threat are found in Southern California, the central coast, the lower elevations of the Sierra Nevada and much of the interior of northern California. Much of the fire threat is near densely populated areas and new development.

Regional

Wildfire safety is an increasing concern in the western Sierra foothills and valley as development continues in rural areas while grasslands and open space border urban areas. The potential for wildfire and urban wildfire is always present, with fire conditions from a combination of hot weather, an accumulation of vegetation, and low moisture content typically present in the warm fire season within the Central Valley and Sierra Nevada foothills. Wildfire risk in Placer County is primarily in the wildland-urban interface areas. A majority of Placer County is deemed to be a high or very high fire threat risk based on analysis by CAL FIRE, as shown on Figure 13-1. These are areas with dense vegetation, increasing elevation, and steep slopes in the foothills and the mountains of the Sierra Nevada Mountain Range.

CAL FIRE's FRAP website (http://frap.cdf.ca.gov/) includes maps of the communities most at risk for wildfire that are within 1.5 miles of a high or very high wildfire threat on federal or non-federal lands. The threat is based on the FRAP fuels and hazard data. The map identifies seven communities in Placer County not adjacent to federal lands that are at risk for wildfire, including the City of Roseville and communities adjacent to or within the Tahoe National Forest.

Local

The City of Roseville does not include any designated wildland-urban interface areas. A significant portion of the area around the City is developed. State maps show that the City has a moderate fire threat. While the City rarely has critical fire weather conditions, a combination of dry grasslands, the topography in northeast Roseville, and hot temperatures with limited rainfall could result in a risk of wildfire on occasion. The following are the most likely wildfire hazards in Roseville:

- Grassland fires on undeveloped properties in the West Roseville Specific Plan Area or west or north of Roseville
- Fires in northeast Roseville where significant slopes are adjacent to ravines and residential development
- Fires in open space and preserve areas within the developed sections of Roseville.

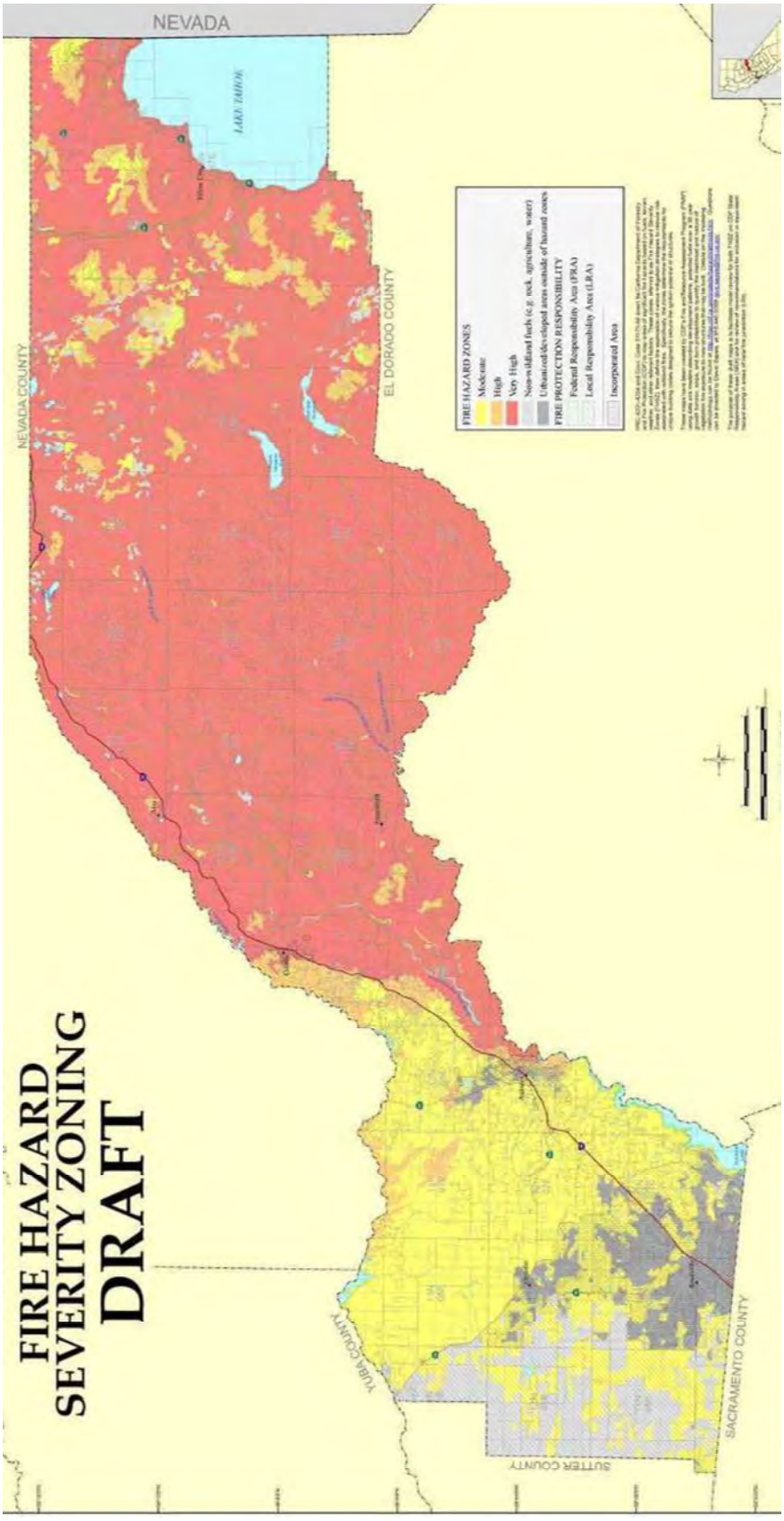


Figure 13-1. CAL FIRE FRAP Map for Placer County

Grassland Fires

Prior to August 2004, Roseville's northwestern boundary was Fiddyment Road. Since the annexation of 3,200 acres in West Roseville, the City now includes a significant amount of undeveloped non-native annual grassland with some riparian and oak woodland along Pleasant Grove Creek and Kaseberg Creek. The property to the west of Roseville along this border is also non-native annual grassland. The 2004 West Roseville Specific Plan Open Space Preserve Operations and Management Plan has provisions for reducing fire hazard if the preserve becomes a fire hazard. The preserve manager will work with the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service and the Roseville Fire Department to decide the best way to reduce the hazard. Fire breaks are allowed within the 50-foot buffer around the preserve. Fire breaks in other locations would require U.S. Army Corps of Engineers and U.S. Fish and Wildlife Service approval.

The Sierra Vista Specific Plan Area, annexed in January 2012, consists of largely nonnative, annual grasslands. The Sierra Vista Specific Plan Area will develop as urban uses, but will also contain 267 acres of preserve areas. A 50-foot wide open space buffer area is maintained at the perimeter of all open space preserves for fuel modification and fire management, among other uses. The Roseville Fire Department's Fire Station #5 serves as the primary responding area for this area.

Ravine Fires

The Stoneridge Specific Plan includes 1,089 acres of land that will include 2,882 dwelling units, along with office and commercial uses, schools, parks, and open space. Approximately 252 acres will be set aside as open space with an extensive network of bike trails. The main ingress and egress to the area is Secret Ravine Parkway, which will link Sierra College Boulevard with East Roseville Parkway. The ravines also border the Northeast Roseville Specific Plan Area, which is largely developed, with some construction continuing along the ravine edges.

The key topographic features in Stoneridge are the three ravines: Secret Ravine, False Ravine, and Miners Ravine. The creek at the base of Miner's Ravine flows year-round. The elevation of the property is among the highest in the City, ranging from 225 feet to 375 feet above sea level. Slopes in Miner's Ravine range from a 5-percent grade to a 26-percent grade.

Vegetation in the Stoneridge Specific Plan Area is primarily annual grasslands, oak woodlands, and oak riparian landscapes (see Figure 13-2). Annual grasses with scattered downed trees and limbs cover the ground. The overstory includes scattered oaks and a few other broad leaf trees. The riparian vegetation includes Blue Oak, Valley Oak and Interior Live Oak, along with willows, cottonwood, and ash trees. The vegetation on the plateaus between the three main ravines is primarily annual grasses. The ravines do not have a continuous fuel ladder from the ground vegetation to the overstory trees.



Figure 13-2. View of Ravine, Tree Canopy and Stoneridge Development

The 1999 Stoneridge Specific Plan Wildfire Safety Plan outlined the following risks resulting from development of the Plan Area (see Figure 13-3):

- Fire in the grass of the open space area was identified as the most serious wildfire threat for the Stoneridge Specific Plan. Extensive grass fuels in the open space areas will quickly ignite and fire will spread rapidly, especially in summer. The plan cites a fire history that has demonstrated that grass and other light fuels are a threat to fire risk for other vegetation types as well as people.
- Wildfire rate of spread can increase with steep slopes. The three ravines in the project area have moderate slopes that can cause a fast rate of wildfire spread.
- Risk of fire starts will increase with development. The greatest risk from fire ignitions will be in the open space areas as use of these areas by future residents and other members of the public increases. Bike trails, for example, will make open space areas more accessible than when the Plan Area was undeveloped.
- Initial work by the developer to reduce the amount of fuel in the area must be maintained over the long-term to keep fire risk in check.
- Home design and siting often do not adequately mitigate wildfire risk. Measures specific to development within the Plan Area have been adopted by the City and are being enforced at the building permit stage. Owners will be required to maintain a clearing of flammable vegetation around the structures, use only fire resistant materials for roofs and fences, and ensure adequate water for fire suppression.

The Stoneridge Wildfire Safety Plan outlines short and long-term mitigation measures to prevent or minimize the impact of wildfire in this area of Roseville. These are included in the mitigation section of this 2016 Plan.

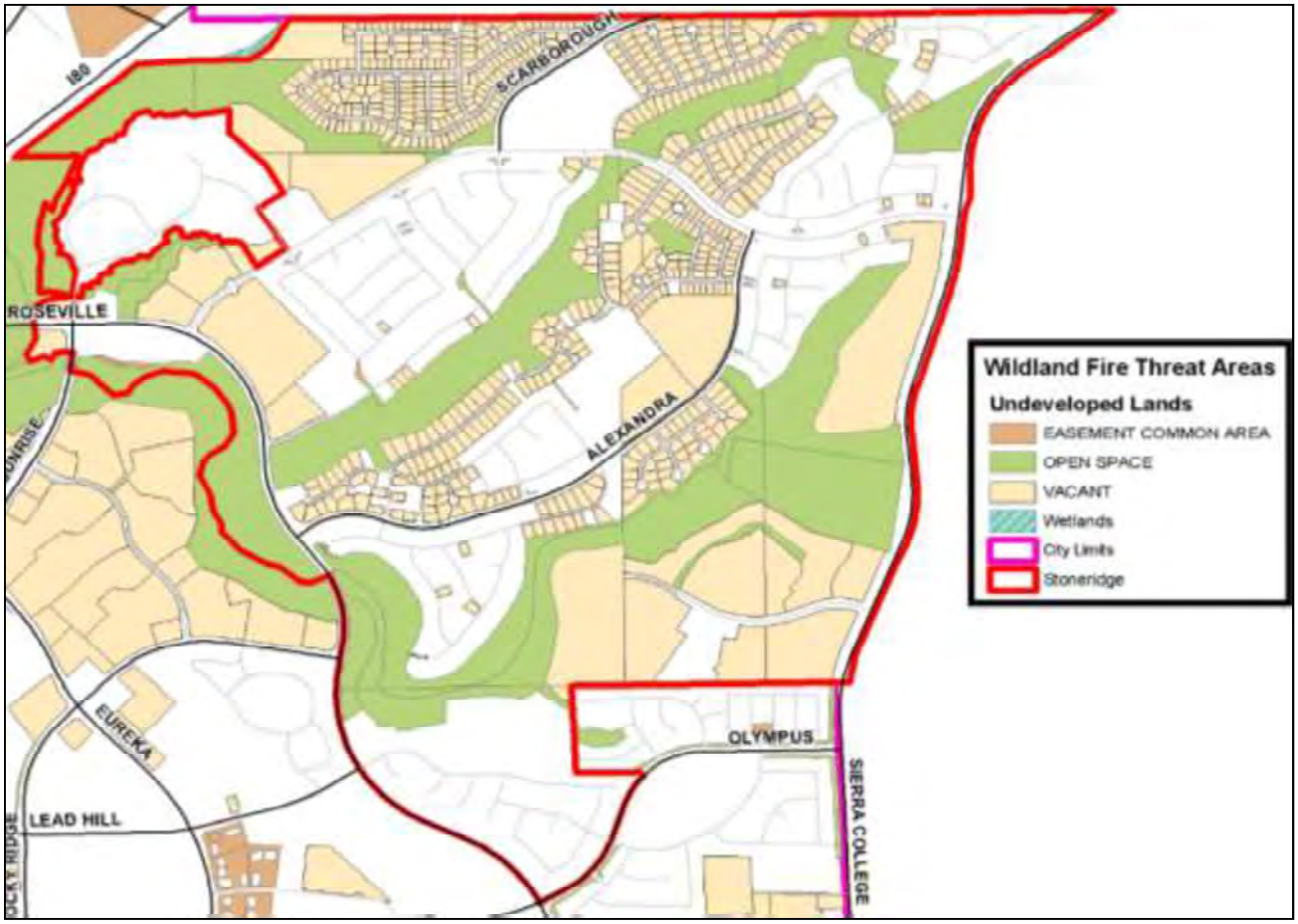


Figure 13-3. Stoneridge Specific Plan Wildfire Threat Areas

Open Space Fires

The City is adding new open space areas through dedication as part of the specific plan process. This will result in construction of new developments immediately adjacent to open space areas, which poses moderate risk to such developments. The Fire Department reviews these during the planning process, and fire safety provisions are accounted for in Specific Plan design guidelines and development agreements.

13.2.3 Frequency

The Roseville Fire Department maintains a database of every incident type responded to by Roseville fire personnel. Wildfires are tracked in four categories: natural or vegetation fire; forest, woods, or wildfire; brush or brush and grass fire; and grass fire. Table 13-1 provides the number of wildfire incidents recorded from 2011 to 2015. Placer County has had nearly 150 significant wildfires since 1908. In California, vegetation fires occur daily. Most are controlled and contained early, with limited damage.

Table 13-1. Wildfire Incident Counts—2011 to 2015

Incident Type	2011	2012	2013	2014	2015
Cultivated vegetation, crop fire	**–**	**1**	**3**	**3**	**2**
Cultivated trees or nursery stock fire	–	–	–	2	1
Cultivated vegetation, crop fire, other	–	1	3	1	1
Fire in mobile property used as fixed structure	**1**	**–**	**1**	**–**	**–**

Fire in mobile home used as fixed residence	–	–	1	–	–
Fire in portable building, fixed location	1	–	–	–	–
Natural Vegetation Fire	**47**	**54**	**70**	**62**	**53**
Brush, or brush and grass mixture fire	11	16	20	14	29
Forest, woods or wildland fire	–	1	2	1	–
Grass fire	24	23	26	29	18
Natural vegetation fire, other	12	14	22	18	6
Outside Rubbish Fire	**67**	**61**	**92**	**70**	**76**
Dumpster or other outside trash receptacle fire	16	8	9	12	17
Outside rubbish fire, other	18	19	39	34	27
Outside rubbish, trash or waste fire	32	34	44	23	32
Outside stationary compactor/compacted trash fire	1	–	–	1	–
Total	115	116	166	135	131

Source: City of Roseville Fire Department Incident Type Count Reports 2010-2015

13.2.4 Severity

Wildfires have never resulted in loss of life in Roseville, though some property damage has resulted from wildfire incidents, including some fences on occasion. CAL FIRE maps areas of significant fire hazard based on fuel, terrain, weather, and other relevant factors. The mapped fire hazard severity zones define the application of mitigation strategies to reduce risk associated with wildfires. Figure 13-4 shows fire hazard severity zones for the Roseville planning area. The City's wildfire hazard is rated as moderate. While the City is also a Community at Risk from Wildfire as designated on the State of California map, the Roseville Fire Department assessment in the General Plan concurs that wildfires in open space areas represent a moderate hazard. Most fires of this type are small and localized. The open space areas are typically easily accessible for fire suppression apparatus, and the response time is such that fires are suppressed rapidly.

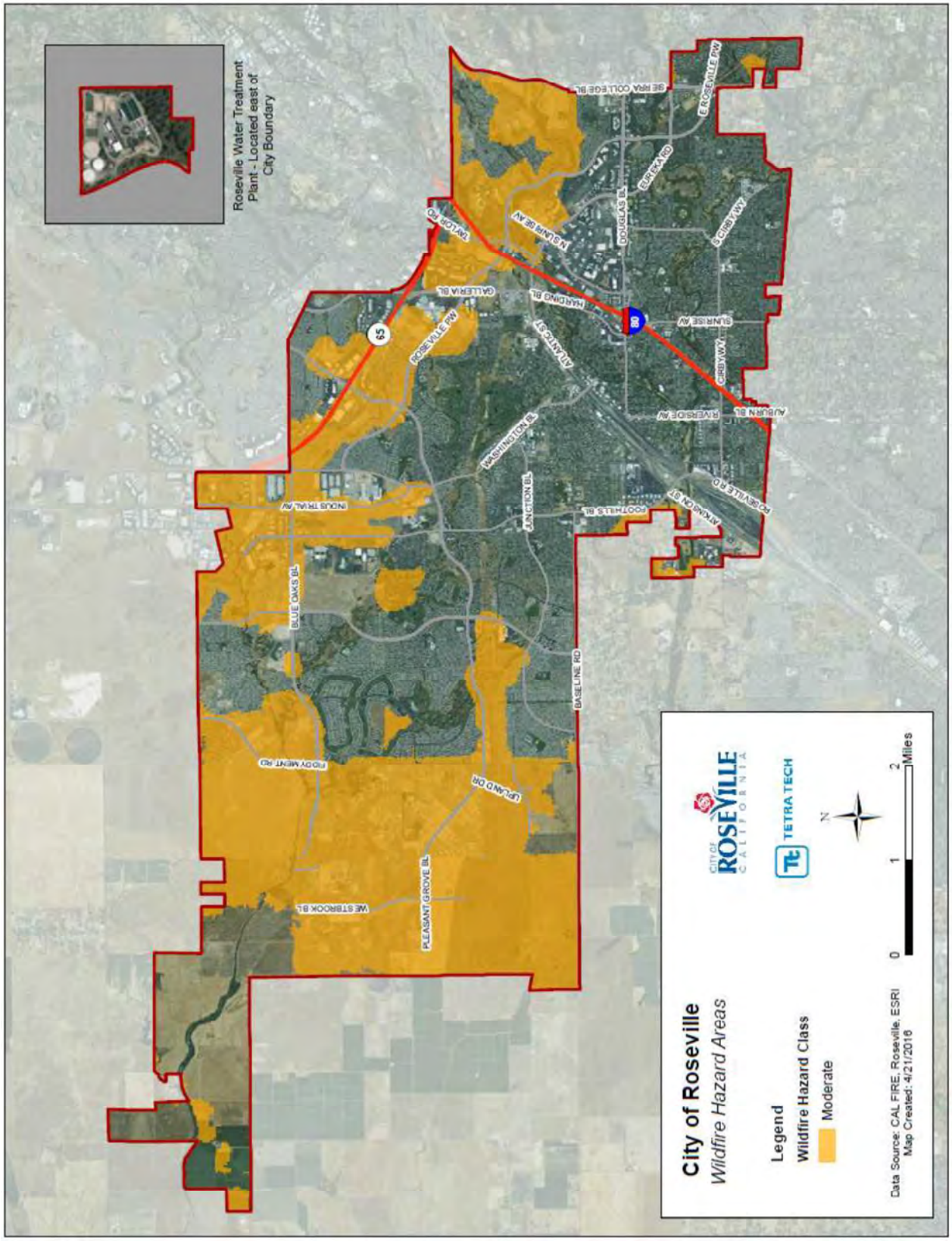


Figure 13-4. Fire Hazard Severity Zones in the Planning Area

13.2.5 Warning Time

Wildfires are typically caused intentionally or accidentally by humans. There is no way to predict when one might break out. Dry seasons and droughts greatly increase fire likelihood. If a fire breaks out and spreads rapidly, residents may need to evacuate within days or even hours. Once a fire has started, fire alerting is reasonably rapid in most cases. The spread of cellular and two-way radio communications has contributed to a significant improvement in warning time.

Since fireworks often cause brush fires, extra diligence can be taken around the Fourth of July when the use of fireworks is highest. Dry lightning may also trigger wildfires, so special attention can be paid during weather events that may trigger wildfires. Reliable National Weather Service lightning warnings are available on average 24 to 48 hours prior to a significant electrical storm. National Weather Service fire weather forecasts for the country (http://www.spc.noaa.gov/products/fire_wx) are monitored by local fire departments, including the City of Roseville Fire Department, to assess the risk for wildfire at any given time and enhance preparedness.

13.3 SECONDARY HAZARDS

Wildfires can generate a range of secondary effects, which in some cases may cause more widespread and prolonged damage than the fire itself. Fires can cause direct economic losses in the reduction of harvestable timber and indirect economic losses in reduced tourism. Wildfires cause the contamination of reservoirs, destroy transmission lines and contribute to flooding. They strip slopes of vegetation, exposing them to greater amounts of runoff. This in turn can weaken soils and cause major landslides several years after the wildfire. Most wildfires burn hot and for long durations that can bake soils, especially those high in clay content, thus increasing the imperviousness of the ground. This increases runoff generated by storm events, increasing the chance of flooding.

13.4 EXPOSURE

13.4.1 Population

Population could not be examined by fire hazard severity zone because census block group areas do not coincide with the fire risk areas. However, the planning team was able to create a population estimate using the structure count of buildings located within the highest-risk fire hazard severity zone for Roseville (moderate), and applying the census value for persons per household for Roseville (2.54). Using this approach, it is estimated that the population living within the moderate fire hazard severity zones is 29,178. This represents 22.7 percent of the total population for the City.

13.4.2 Property

Using the base mapping created to support the HAZUS-MH analyses, the planning team determined that there are 10,338 structures within the moderate fire hazard severity zones within the planning area, with the predominant use being residential. The total assessed value of these structures and their contents is $7.76 billion. This represents 26.2 percent of the total assessed value for the City.

13.4.3 Critical Facilities and Infrastructure

Critical facilities are public and private structures where vital community functions are conducted. If the facility is damaged or destroyed by wildfire, there could be severe consequences to public health and safety. The Roseville Fire Department, all first responders and mutual aid agencies would work to protect those facilities in areas where wildfire is a potential. Table 13-2 provides a list of critical facilities that are in potential wildfire areas.

Table 13-2. Critical Facilities and Infrastructure Adjacent to Potential Wildfire Areas

Facility Type	Number
Communications Facilities	29
Utilities	16
Fire Stations	4
Hazardous Materials Facilities	2
Bridges	21
Medical	1
Government	4
Religious	2
Schools	5

13.4.4 Environment

It can take decades or even centuries for ecosystems to recover from a wildfire, which can cause severe environmental impacts:

- **Damaged Fisheries**—Critical trout, salmon and steelhead fisheries can suffer from increased water temperatures, sedimentation, and changes in water quality.
- **Soil Erosion**—The protective covering provided by foliage and dead organic matter is removed, leaving the soil fully exposed to wind and water erosion. Accelerated soil erosion occurs, causing landslides and threatening aquatic habitats.
- **Spread of Invasive Plant Species**—Non-native woody plant species frequently invade burned areas. When weeds become established, they can dominate the plant cover over broad landscapes and become difficult and costly to control.
- **Disease and Insect Infestations**—Unless diseased or insect-infested trees are swiftly removed, infestations and disease can spread to healthy forests and private lands. Timely active management actions are needed to remove diseased or infested trees.
- **Destroyed Endangered Species Habitat**—Catastrophic fires can have devastating consequences for endangered species. For instance, the Biscuit Fire in Oregon destroyed 125,000 to 150,000 acres of spotted owl habitat.
- **Soil Sterilization**—Topsoil exposed to extreme heat can become water repellant, and soil nutrients may be lost. Some fires burn so hot that they can sterilize the soil.

13.5 VULNERABILITY

Structures, above-ground infrastructure, critical facilities and natural environments are all vulnerable to the wildfire hazard. There is currently no validated damage function available to support wildfire mitigation planning. Except as discussed in this section, vulnerable populations, property, infrastructure and environment are assumed to be the same as described in the section on exposure.

13.5.1 Population

There are no recorded incidents of loss of life from wildfires in Roseville, and the risk from wildfire has been deemed moderate by the State and the Roseville Fire Department. Given the immediate response times to reported fires, the likelihood of injuries and casualties is minimal; therefore, injuries and casualties were not estimated for the wildfire hazard.

Air pollution from wildfires can be a severe health hazard, especially for sensitive populations, including children, the elderly and those with respiratory and cardiovascular diseases. Smoke generated by wildfire consists of visible and invisible emissions that contain particulate matter (soot, tar and minerals), gases (carbon monoxide, carbon dioxide, nitrogen oxides), and toxics (formaldehyde, benzene). Emissions from wildfires depend on the type of fuel, the moisture content of the fuel, the efficiency of combustion, and the weather. Public health impacts associated with wildfire include difficulty in breathing, odor, and reduction in visibility.

Wildfire may also threaten the health and safety of those fighting the fires. First responders are exposed to the dangers from the initial incident and after-effects from smoke inhalation and heat stroke.

13.5.2 Property

Loss estimations for the wildfire hazard are not based on modeling utilizing damage functions, because no such damage functions have been generated. Instead, loss estimates were developed representing 10 percent, 30 percent and 50 percent of the assessed value of exposed structures. This allows emergency managers to select a range of economic impact based on an estimate of the percent of damage to the general building stock. Damage in excess of 50 percent is considered to be substantial by most building codes and typically requires total reconstruction of the structure. Table 13-3 lists the loss estimates for the exposed building stock.

Table 13-3. Potential Loss Estimates for the Wildfire Hazard

	Building Count	Assessed Value	10% Damage	30% Damage	50% Damage
Residential	9,792	$4,811,813,630	$481,181,363	$1,443,544,089	$2,405,906,815
Commercial	322	$2,309,864,426	$230,986,443	$692,959,328	$1,154,932,213
Industrial	108	$365,734,419	$36,573,442	$109,720,326	$182,867,209
Agricultural	0	$0	$0	$0	$0
Religion	5	$33,408,645	$3,340,865	$10,022,594	$16,704,323
Government	52	$79,624,825	$7,962,482	$23,887,447	$39,812,412
Education	59	$175,116,040	$17,511,604	$52,534,812	$87,558,020
Total	**10,338**	**$7,775,561,985**	**$777,556,198**	**$2,332,668,595**	**$3,887,780,992**

13.5.3 Critical Facilities and Infrastructure

Critical facilities of wood frame construction are especially vulnerable during wildfire events. A detailed vulnerability analysis for all critical facilities is on file with City staff and will not be published for review due to security reasons.

In the event of wildfire, there would likely be little damage to most infrastructure. Most roads and railroads would be without damage except in the worst scenarios. Power lines are the most at risk from wildfire because most poles are made of wood and susceptible to burning. Fires can create conditions that block or prevent access and can isolate residents and emergency service providers. Wildfire typically does not have a major direct impact on bridges, but it can create conditions in which bridges are obstructed. Many bridges in areas of high to moderate fire risk are important because they provide the only ingress and egress to large areas and in some cases to isolated neighborhoods.

13.6 FUTURE TRENDS IN DEVELOPMENT

Roseville is expected to grow considerably in the next 10 years. The moderate potential for wildfire in Roseville is not likely to lessen or prohibit development in Roseville.

The wildfire risk exposure with in the planning area increased by 54% at an increase in value of over $3 billion dollars. This increase in risk exposure can be attributed to the vast extent and location of the moderate fire severity zone within Roseville, and a population growth rate of 14.5% over the performance period of the prior plan. The planning area also saw in increase in assessed valuation of real property of over 34%. This increase in value can be attributed to the continued economic recovery from the 2008 economic down turn that had a significant impact on the State of California as well as the City of Roseville. Any increase in asset value will increase risk quotient when risk is being measured by looking at assets exposed as is with this Plan. However, the vulnerability of this new exposure should be considered to be low due to the application of strong building code standards that are contained within the California Fire Code.

13.7 REVIEW OF EXISTING PROGRAMS, PLANS AND ORDINANCES

The City of Roseville and Roseville Fire Department have adopted a number of policies, programs, plans and ordinances to meet the following fire protection goals detailed in the Roseville General Plan:

- Protect against the loss of life, property, and the environment by appropriate prevention and suppression measures.
- Provide emergency services in a well-planned, cost-effective, and professional manner through the best use of equipment, facilities and training available.

13.7.1 Fire Prevention Programs and Standards

Roseville Fire Prevention

Roseville fire prevention includes the fire marshal, hazardous materials officer, two senior fire inspectors, four fire inspectors and one public safety community relations coordinator (shared with the Police Department). The key role of these staff members is improving the safety and quality of life of the citizens of Roseville.

The Roseville Fire Department has an extensive work program to promote and implement fire prevention in developed and undeveloped areas of the City. These programs promote or provide the following services:

- Regular inspection and code enforcement
- Fire-safe roofing requirements
- Adequate access to and fire breaks adjoining open space areas
- Early warning devices such as automatic detection and reporting devices and smoke detectors
- Automatic fire suppression systems such as fire sprinkler systems
- Public education and information
- Code and ordinance development and updates
- Training and planning
- Fire investigation and data analysis
- Hazardous materials process and inspection.

Development Review Process

Section 16.16.050 of the Roseville Municipal Code specifies that all development plans be reviewed and approved by the Roseville Fire Department prior to construction. The code section states the following:

> "…complete plans, specifications, and information for new construction, remodeling, tenant improvements, or additions to buildings shall be submitted for review and approval prior to construction to the Chief or his/her designated representative having jurisdiction. Plan approval shall be required prior to the issuance of a Fire Department Inspection Record Card for those instances where such card may be

required. In addition to the submittal of hard copy plan sets, a digitized copy of the approved drawings for new buildings shall be submitted to the Fire Department for pre-fire documentation purposes. Said copy shall be submitted in an approved format."

The Roseville Fire Department is an integral part of the development planning and review process, with specific emphasis on the provision of access to lands for firefighting purposes, street access to all structures, fire prevention programs, and the enforcement of building and fire codes and City ordinances. The Fire Department also evaluates water supply for firefighting and fire suppression systems.

California Building Code

Roseville Municipal Code Title 16 has been adopted to enforce the 2013 California Building Code for all construction in the City. Roofing and building materials, construction techniques, wiring standards, and fire detection/warning devices are defined and enforced to minimize the risk of structural fire damage.

California Fire Code

Chapter 16.16 of the Roseville Municipal Code includes adoption of, reference to and amendments to the Uniform Fire Code. Last amended in 2013, the code provides specifications and standards for fire safety. Early warning devices such as automatic sprinkler systems, automatic detection and reporting devices, and smoke detectors are required as preventative measures to reduce the risk of fire. The code also states the amount of water needed for fire protection.

Weed Abatement Ordinance

Chapter 9.20 of the Roseville Municipal Code includes provisions for the abatement of weeds, dirt, rubbish, and rank growths. The ordinance specifies that weeds be eradicated by property owners to prevent the presence of fire fuels. Properly implemented, the ordinance ensures accessibility of firefighters to open space areas and creation of firebreaks that slow the spread of fire.

13.7.2 Adopted Service Levels for Response Time

Specific Plans

Roseville's specific plan process is used by the Fire Department to plan future fire station locations and response times based on the circulation systems, and to ensure that revenues from the Fire Service Construction Tax and General Fund are sufficient to provide fire protection services to the area and cumulatively city-wide. The Fire Department is involved in every specific plan process from the initial planning process to adoption, construction, and ongoing inspections.

Should there be significant fire-related concerns, the Fire Department may require supplemental analysis as a condition of the specific plan. For example, a mitigation measure for adoption of the Stoneridge Specific Plan required the preparation of the Stoneridge Plan Wildfire Safety Plan. The Safety Plan analyzes the factors contributing to the risk of wildfire in Stoneridge and mitigation measures to enhance fire prevention.

Capital Improvement Program

The Capital Improvement Program is a five-year plan updated annually with the City's fiscal year budget that includes all public projects under construction and planned within the five-year time frame. The Capital Improvement Program allocates funds from each of the revenue sources collected to pay for City facilities, services, and programs. Fire Department stations and apparatus are included in the Capital Improvement Program along with the status of the Fire Service Construction Tax current and projected revenues to ensure that fire stations are built and apparatus is procured to keep pace with development.

Fire Service Construction Tax

The Fire Service Construction Tax, approved by Roseville voters in 1984, requires that 1/2 percent of the value of any new construction be collected as part of the building permit fee and designated for fire suppression and protection. The funds must be spent on capital improvements such as fire stations, fire apparatus, and other Fire Department equipment. The funds may not be allocated to expenses such as salaries or training. The City's newer Specific Plan Areas include provisions that extend this tax collection to the buildout of each Plan Area.

Dedications, Fees, and Exactions

The City of Roseville, through the specific plan process, and if necessary as part of individual project approvals, requires the dedication of property and payment of fees or exactions. The Fire Department reviews the project proposals and may require dedication of land or payment of appropriate fees and exactions to help offset municipal costs for fire-related facilities and services. The City of Roseville requires the dedication of fire station sites through the specific plan process. Should revenues be deemed insufficient to fully support fire services, additional assessments may be required to ensure adequate protection in the future. For example, recent specific plans through development agreements require owners to pay a special assessment for public safety, including fire protection, as part of their annual property tax bills.

Water System Master Plan

The City of Roseville Environmental Utilities Department maintains and updates a distribution system model to ensure adequate water sources, quantities and water pressure, along with emergency backup systems to ensure maximum firefighting capacity.

Interagency Agreements

The City of Roseville Fire Department participates in the statewide mutual aid agreement, whereby the Fire Department will respond to any other department or district should the need arise. In addition, the Department maintains mutual aid agreements with other agencies, including agreements through Cal OES Mutual Aid Region IV and the Placer County Operational Area.

13.7.3 Annual Monitoring of Fire Department Service Levels

Program Performance Measures

The Roseville Fire Department compiles program performance measures as part of the City's annual budget to monitor service levels and address deficiencies before they become serious. The annual evaluation includes establishment of goals and objectives, formulation of key indicators relating to activities, and efficiencies that can be monitored throughout the year, along with a line item cost for the programs and objectives. The Fire Department budget and program performance measures include a review of fire service levels and department goals.

National Fire Incident Reporting System

The National Fire Incident Reporting System requires local fire departments to report fire service data. Performance indicators are routinely reviewed to evaluate capability and coverage, demand for service and trends. Key components of the system include GIS and mapping, fire incident reporting, emergency medical management, personnel and training management, inspection management, and equipment and supplies inventory management. Fire Department incident data are input into a computer database and submitted to the State Fire Marshal's Office per state standards. The data are also used by the City of Roseville to evaluate operations and track trends in fire service within the City.

13.7.4 Personnel Training

The Roseville Fire Department Training program includes dedicated staff and facilities to ensure that personnel are properly trained and updated as new techniques and equipment become available. The Fire Training staff provides training for all firefighters within the department at the City's state of the art training center (Figure 13-5). This training is the most important ingredient to the readiness of Roseville firefighters and emergency responders to fulfill their assigned mission. The Training Center is also used by other fire departments and local agencies on a fee-for-use basis. The training staff consists of one fire training officer.



Figure 13-5. City of Roseville Fire Training Center

13.7.5 Fire Investigation

Fires in the City of Roseville are investigated by Roseville Fire Department investigators. The program ensures proper investigation of the cause, origin, and circumstances of each fire; collects and preserves evidence; coordinates with authorities in detection, apprehension and prosecution of arsonists; and pursues each investigation to conclusion. Information is reported to the State Fire Marshal for inclusion in annual state reports.

13.7.6 Comprehensive Emergency Medical Services

The state requires a Multi-Hazard Function Plan that details response strategies for all types of emergencies. The plan addresses interagency cooperation, emergency functions, continuity of government, and public awareness. In addition, the plan provides for the operation of police, fire and health services, as well as transportation alternatives in the event of a multi-hazard emergency. The City's Emergency Plan conforms with the Standardized Emergency Management System and is approved by the City Council and Cal OES.

13.7.7 Accreditation Recommendation

The Commission on Fire Accreditation International provides a comprehensive system of fire and emergency service evaluation that helps local governments determine their risks and fire safety needs, evaluate the performance of the organizations involved and provide a method for continuous improvement. The self-assessment process covers 10 categories: governance and administration; assessment and planning; goals and objectives; financial resources; programs; physical resources; human resources; training and competency; essential resources; and external systems relations. Within these categories are several related performance indicators and core competencies that the agency must address. In completing the self-assessment process, agencies must develop a strategic or master plan as well as a standard of response coverage document.

The Roseville Fire Department staff spent more than four years on the self-assessment and preparing the materials for the accreditation. In June 2005 the Commission on Fire Accreditation International recommended accreditation for the Roseville Fire Department. Reaccreditation was obtained in 2010. Only 220 departments in the world are accredited, and only 16 in California.

13.8 SCENARIO

As the future growth of Roseville expands into wildland-urban interface areas, a wildfire in Roseville has the potential to cause significant damage to exposed areas. A major wildfire might begin with a wet spring, adding to fuels already present on the forest floor. Flashy fuels would build throughout the spring. The summer could see the onset of insect infestation. A dry summer could follow the wet spring, exacerbated by dry hot winds. Carelessness with combustible materials or a tossed lit cigarette, or a lighting storm could trigger a multitude of small isolated fires.

The embers from these smaller fires could be carried miles by hot, dry winds. The deposition zone for these embers would be deep in the forests and wildland-urban interface zones. Fires that start in flat areas move more slowly, but wind still pushes them. It is not unusual for a wild fire pushed by wind to burn the ground fuel and later climb into the crown and reverse its track. This is one of many ways that fires can escape containment, typically during periods when response capabilities are overwhelmed. These new small fires would likely merge. Suppression resources would be redirected from protecting the natural resources to saving remote subdivisions.

The worst-case scenario would include an active fire season throughout the American west, spreading resources thin. Firefighting teams would be exhausted or unavailable. Many federal assets would be responding to other fires that started earlier in the season. While local fire districts would be useful in the wildland-urban interface areas, they have limited wildfire capabilities or experience, and they would have a difficult time responding to the ignition zones. Even though the existence and spread of the fire is known, it may not be possible to respond to it adequately, so an initially manageable fire can become out of control before resources are dispatched.

To further complicate the problem, heavy rains could follow, causing flooding and landslides and releasing tons of sediment into rivers, permanently changing floodplains and damaging sensitive habitat and riparian areas. Such a fire followed by rain could release millions of cubic yards of sediment into streams for years, creating new floodplains and changing existing ones. With forests removed from the watershed, stream flows could double.

Floods that had been expected every 50 years may occur every couple of years. With streambeds unable to carry the increased discharge because of increased sediment, floodplain elevations would increase.

13.9 ISSUES

The major issues for wildfire are as follows:

- Public education and outreach to people living in or near the fire hazard zones should include information about and assistance with mitigation activities such as defensible space, and advance identification of evacuation routes and safe zones.
- Wildfires could cause landslides as a secondary natural hazard.
- Climate change could affect the wildfire hazard.
- Future growth into wildland-urban interface areas should continue to be managed.
- The Fire Department needs to continue to train on wildland-urban interface type events.
- Expand the City's vegetation management activities. This would include enhancement through expansion of the target areas as well as additional resources.
- Expand certifications and qualifications for Fire Department personnel. Ensure that all firefighters are trained in basic wildfire behavior, basic fire weather, and that all company officer and chief level officers are trained in the wildland command and strike team leader level.

14. HUMAN HEALTH HAZARDS

14.1 GENERAL BACKGROUND

Human health hazards include transmittable diseases and environmental hazards such as extreme weather. The following sections describe commonly recognized human health hazards.

14.1.1 Influenza

Influenza, commonly called flu, is a viral infection that attacks the respiratory system. Epidemics of the flu typically occur in the fall and winter. The U.S. Centers for Disease Control and Prevention (CDC) estimates that the 2014-2015 flu season for California was moderately severe, with high levels of outpatient illness and influenza-associated hospitalizations, particularly among adults 65 and older. The California Department of Public Health received 42,812 reports of cases tested positive for influenza.

Laboratory-confirmed influenza-associated deaths among patients under 65 have been reportable in California since the 2009 influenza pandemic. For the 2014-2015 flu season, there were 78 fatal cases of influenza-related illness statewide among those under 65. This number is significantly down from the 404 fatal cases during the 2013-2014 influenza season.

H1N1

In April 2009, the World Health Organization (WHO) issued a health advisory on an outbreak of influenza-like illness caused by a new subtype of influenza A (A/H1N1) in Mexico and the United States.

The disease spread rapidly, with the number of confirmed cases rising to 2,099 by May 7, despite aggressive measures taken against the disease by the Mexican government. On June 11, the WHO declared an H1N1 pandemic, marking the first global pandemic since the 1968 Hong Kong flu. On October 25, the U.S. declared H1N1 a national emergency. On August 10,

DEFINITIONS

Anthrax—A disease caused by the bacteria *Bacillus anthracis*. Most forms of the disease are lethal, and it affects both humans and other animals. There are effective vaccines against anthrax, and some forms of the disease respond well to antibiotic treatment.

Epidemic—The spread of an infectious disease beyond a local population, reaching people in a wider geographical area. Several factors determine whether an outbreak will become an epidemic: the ease with which the disease spreads from vectors, such as animals, to people and the ease with which it spreads from person to person.

Influenza—A viral infection that attacks the respiratory system; commonly called flu.

H1N1 "Swine Flu"—A subtype of the Influenza A virus that has mutated into various strains including the Spanish Flu strain, mild human flu strains, endemic pig strains, and various strains found in birds.

H5N1/H7N9 "Bird Flu"—A subtype of the Influenza A virus that causes the flu commonly known as "avian influenza" or "bird flu.

Pandemic—A worldwide epidemic.

Vector—An organism (such as an insect or rodent) that transmits pathogens that cause disease

Vector-Borne Illness—Diseases transmitted to people from insects and other animals. These include, but are not limited to, Hanta Virus, Plague, Tularemia, Lyme Disease, West Nile Virus and the Zika Virus.

Viral Hemorrhagic Fever (VHF)—A group of illnesses caused by a viral infection (usually restricted to a specific geographic area) resulting in fever and gastrointestinal symptoms followed by capillary hemorrhage. These include, but are not limited to, Ebola, Dengue Fever and Yellow Fever.

Severe Acute Respiratory Syndrome (SARS)—An infectious respiratory illness characterized by fever, dry cough, and breathing difficulties, often accompanied by headache and body aches; believed to be caused by a coronavirus.

Smallpox—An infection caused by the variola virus, a member of the poxvirus family. Throughout history, smallpox has been responsible for epidemics that resulted in large numbers of deaths. The last outbreak was in 1977. The disease was declared eradicated in 1980.

2010, the WHO International Health Regulations Emergency Committee declared an end to the 2009 H1N1 pandemic globally.

H1N1 viruses and seasonal influenza viruses are co-circulating in many parts of the world. It is likely that the 2009 H1N1 virus will continue to spread for years to come, like a regular seasonal influenza virus.

H5N1/H7N9

The highly pathogenic H5N1avian influenza virus is an influenza A subtype that occurs mainly in birds, causing high mortality among birds and domestic poultry. Outbreaks of highly pathogenic H5N1 among poultry and wild birds are ongoing in a number of countries.

H5N1 virus infections of humans are rare and most cases have been associated with direct poultry contact during poultry outbreaks. Rare cases of limited human-to-human spread of H5N1 virus may have occurred, but there is no evidence of sustained human-to-human transmission. Nonetheless, because all influenza viruses have the ability to change and mutate, scientists are concerned that H5N1 viruses one day could be able to infect humans more easily and spread more easily from one person to another, potentially causing another pandemic.

While the H5N1 virus does not now infect people easily, infection in humans is much more serious when it occurs than is infection with H1N1. More than half of people reported infected with H5N1 have died. Figure 14-1 summarizes human cases of the virus through 2013.

Source: World Health Organization

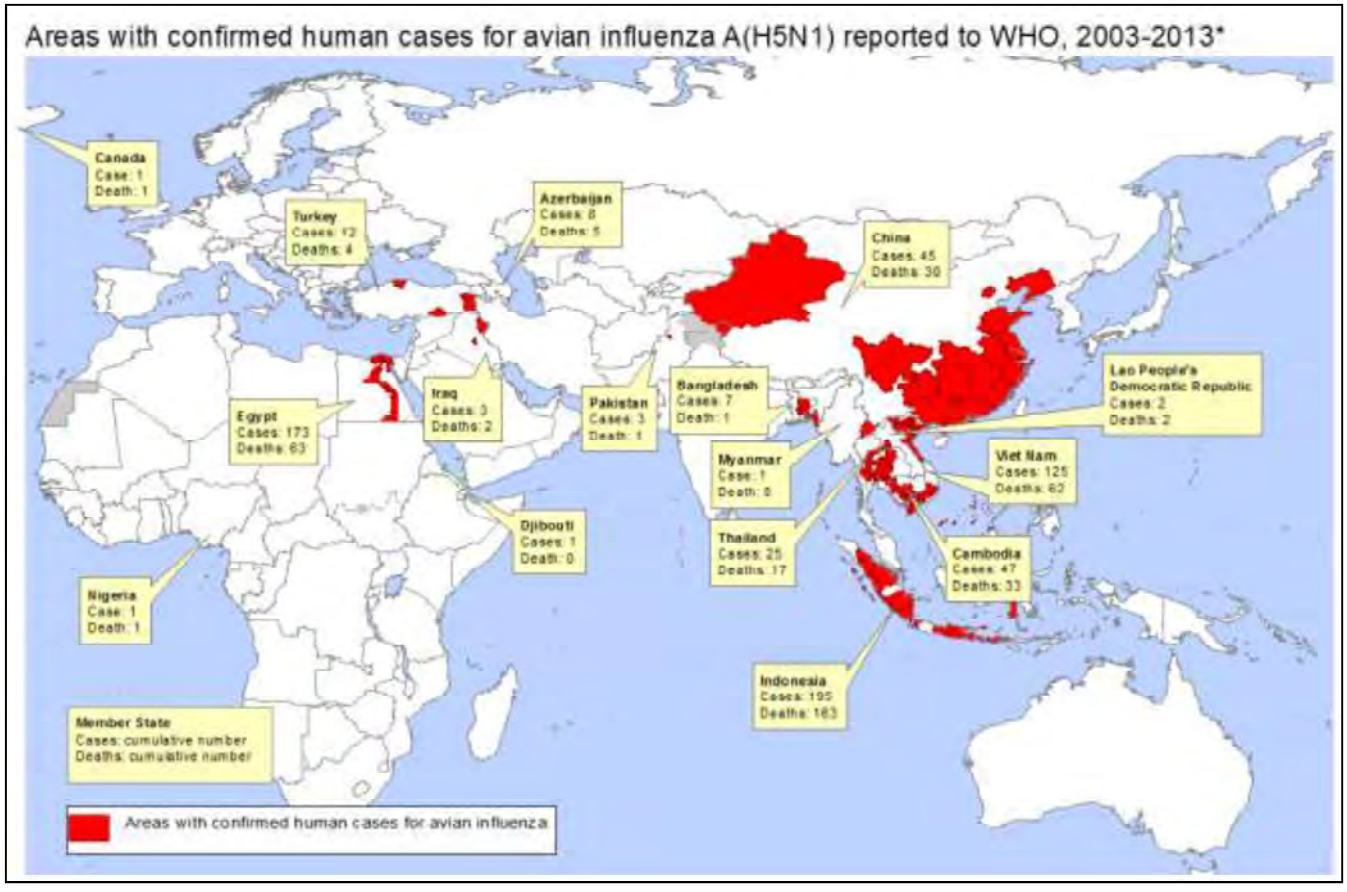


Figure 14-1. Areas with Confirmed H5N1 2003-2013

Infections in humans and poultry by a new avian influenza A virus (H7N9) continue to be reported in China. While mild illness in human cases has been seen, most patients have had severe respiratory illness and some have died. The only case identified outside of China was recently reported in Malaysia.

Source investigation by Chinese authorities is ongoing. Many of the people infected with H7N9 are reported to have had contact with poultry. However some cases reportedly have not had such contact. Close contacts of confirmed H7N9 patients are being followed to determine whether any human-to-human spread of H7N9 is occurring. No sustained person-to-person spread of the H7N9 virus has been found at this time. However, based on previous experience with avian flu viruses, some limited human-to-human spread of this the virus would not be surprising.

As of the publication of this document, H5N1 and the new H7N9 virus have not been detected in people or birds in the United States

14.1.2 Smallpox

Smallpox is a sometimes fatal infectious disease. There is no specific treatment, and the only prevention is vaccination. Symptoms include raised bumps on the face and body of an infected person. The oldest evidence of smallpox was found on the body of Pharaoh Ramses V of Egypt who died in 1157 BC.

Outbreaks have occurred from time to time for thousands of years, but the disease is now eradicated after a successful worldwide vaccination program. The last case of smallpox in the United States was in 1949. The last naturally occurring case in the world was in Somalia in 1977. As of the publication of this document, there are no cases of smallpox in the world. Currently only two locations in the world have samples of smallpox: the CDC in Atlanta and the Ivanovsky Institute of Virology in Russia.

After the disease was eliminated, routine vaccination among the general public was stopped. Therefore, any cases of smallpox in the world would be considered an immediate international emergency. In 2003, the Wisconsin Division of Public Health conducted an investigation of state residents who became ill after having contact with prairie dogs. The cases appeared in May and June of 2003, and symptoms in the human cases included fever, cough, pox-like rash and swollen lymph nodes. CDC laboratory test results indicated that the cause of the human illness was Monkeypox, an orthopox virus that could be transmitted by prairie dogs. This outbreak, and the potential use of smallpox as a weapon of bioterrorism, brought the fear of smallpox back to the forefront of the population. A detailed nationwide smallpox response plan created at the end of 2002 is designed to quickly contain a potential outbreak and vaccinate the population.

14.1.3 Viral Hemorrhagic Fevers

Viral hemorrhagic fevers (VHFs) are a group of illnesses caused by several distinct families of viruses. VHF describes a multisystem syndrome (multiple systems in the body are affected). Characteristically, the overall vascular system is damaged and the body's ability to regulate itself is impaired. These symptoms are often accompanied by hemorrhage (bleeding); however, the bleeding itself is rarely life-threatening. While some types of hemorrhagic fever viruses can cause relatively mild illnesses, many cause severe, life-threatening disease.

The viruses that cause VHFs are distributed over much of the globe. However, because each virus is associated with one or more particular host species, the virus and the disease it causes are usually seen only where the host species live. Some hosts, such as the rodent species carrying several of the New World arenaviruses, live in geographically restricted areas. Therefore, the risk of getting VHFs caused by these viruses is restricted to those areas. Other hosts range over continents, such as the rodents that carry viruses that cause the hantavirus pulmonary syndrome in North and South America, or the rodents that carry viruses that cause hemorrhagic fever with renal syndrome in Europe and Asia.

Ebola

The 2014 Ebola virus outbreak was unprecedented in geographical reach and impact on health care systems across the globe. This was the largest and deadliest Ebola virus outbreak ever recorded. It was the first time the West African countries of Guinea, Liberia, Sierra Leone, Nigeria, Mali, and Senegal saw the virus. Ebola is more common in Central African countries, such as the Democratic Republic of Congo and Sudan, where it was first discovered in 1976. It was also the first time that Ebola made it to the United States and Europe, prompting world-wide preparedness and response efforts. Figure 14-2 shows areas that ultimately were affected. The outbreak was closely monitored and traveler screenings were developed for those returning from West Africa.

Source: World Health Organization

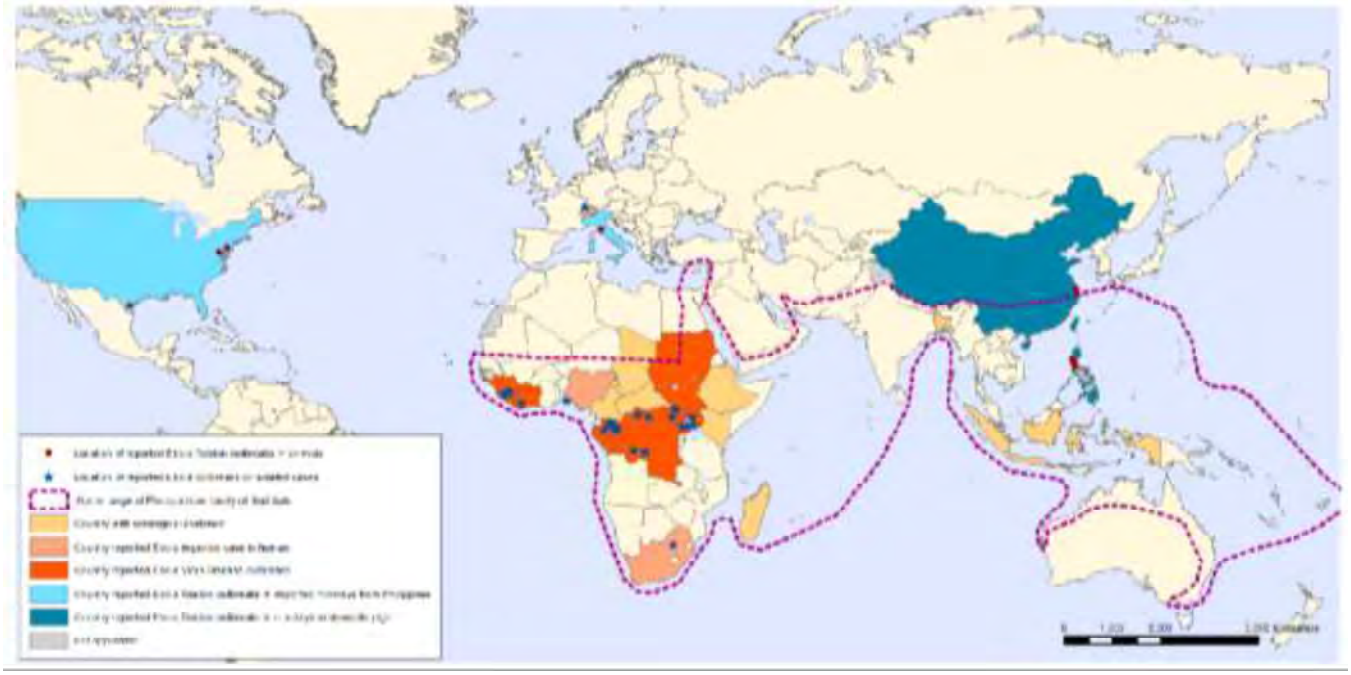


Figure 14-2. 2014 Distribution of Ebola Virus Outbreaks in Humans and Animals

In August 2014 two U.S. healthcare workers returned to the United States for treatment for Ebola. The case that most impacted the health care system in the United States was a patient diagnosed with Ebola in Dallas, Texas who died due to Ebola in October 2014. The nurse who provided care for him later tested positive for Ebola. This caused responses across the country from hospitals, emergency medical teams, fire departments and public health agencies to enhance isolation precautions, develop emergency policies, train with personal protective equipment and conduct multi-agency emergency exercises in case the spread of Ebola became a pandemic.

Before the 2014 outbreak, only 2,200 cases of Ebola had been recorded and 68 percent were fatal. Twenty percent of new Ebola infections were linked to burial traditions in which family and community members wash and touch dead bodies before burial. In Guinea, 60 percent of Ebola infections were linked to traditional burial practices. From 2014 to the publishing of this document, there have been no confirmed cases of Ebola in California.

Hantavirus

Hantavirus is a rodent-borne disease and one of the most important in California. It was discovered in 1993 in the southwestern U.S., and it has determined that the disease had been present, but unrecognized, at least as early as 1959. It has now been identified in over half of the states of the U.S. In 2013, seven cases of Hantavirus occurred in Yosemite National Park. Hantavirus has also been detected in the local Sierra Nevada region.

The hantavirus spreads when individuals touch or eat something contaminated with infected rodent urine, droppings or saliva. It can also be transmitted through aerosolization, which occurs when dried materials contaminated by infected rodent droppings or saliva are disturbed and brought up into the air and inhaled. Infected persons first develop symptoms one to two weeks, and up to five weeks, after exposure. Early symptoms include fever, headache, and muscle aches, especially in the thighs, hips, back, and shoulders. Other early symptoms include dizziness, chills, nausea, vomiting, diarrhea, and abdominal pain. After two to seven days of these symptoms, patients develop breathing difficulties that range from cough and shortness of breath to severe respiratory failure. Approximately 40 percent of hantavirus patients die from the disease.

From 2011 to the publishing of this document there have been 16 cases of hantavirus in California, including one case in Placer County.

14.1.4 Plague

Plague is a potentially fatal infectious disease of animals and humans caused by the *Yersinia pestis* bacterium. People usually get plague from being bitten by a flea that is carrying the plague bacterium or by handling an infected animal. Today, modern antibiotics are effective against plague, but if an infected person is not treated promptly, the disease is likely to cause illness or death.

Plague is an ancient disease but outbreaks throughout the world continue. Major plague epidemics occurred in the middle of the sixth century in Egypt, Europe and Asia; during the 14th century in Europe, following caravan routes; in the 18th century in Austria and the Balkans; and in the late 19th century worldwide (but mostly in China and India). Manchuria in 1910–1911 witnessed about 60,000 deaths due to pneumonic plague with a repeat in 1920–1921. A minor outbreak occurred as recently as the summer of 1994 in Surat, India, closely following an earthquake in September 1993. Globally, the WHO reports 1,000 to 3,000 cases of plague every year. Monitoring of mammals routinely occurs in California to mitigate potential plague (see Figure 14-3).

In North America, plague is found in certain animals and their fleas from the Pacific Coast to the Great Plains, and from southwestern Canada to Mexico. The last urban plague epidemic in the United States occurred in Los Angeles in 1924-25. Since then, human plague in the U.S. has occurred as mostly scattered cases in rural areas (an average of 10 to 15 persons each year per the CDC). Most human cases in the United States occur in northern New Mexico, northern Arizona, southern Colorado, California, southern Oregon, and far western Nevada.

From 2011 to the publishing of this document, there has been one case of plague in California, which occurred in Yosemite National Park.

14.1.5 Tick-Borne Disease

Ticks are small, insect-like creatures most often found in naturally vegetated areas. They feed by attaching to animals and humans, sticking their mouthparts into the skin, and sucking blood for up to several days. Ticks do not fall from trees, jump or fly. Most species are found on wild grasses and low plants. Adult ticks wait at the ends of grass or other foliage for a host to brush by so they may attach. Sometimes ticks carry bacteria or viruses that can be transmitted to a person while the tick is attached and feeding. There are 47 species of ticks in California, but only eight are known to commonly bite humans:

- Western blacklegged tick (*Ixodes pacificus*)
- American dog tick (*Dermacentor variabilis*)
- Pacific Coast tick (*Dermacentor occidentalis*)
- Wood tick (*Dermacentor andersoni*)
- Brown dog tick (*Rhipicephalus sanguineus*)
- *Ornithodoros hermsi*
- *Ornithodoros parkeri*
- *Ornithodoros coriaceus.*

Source: California Department of Public Health

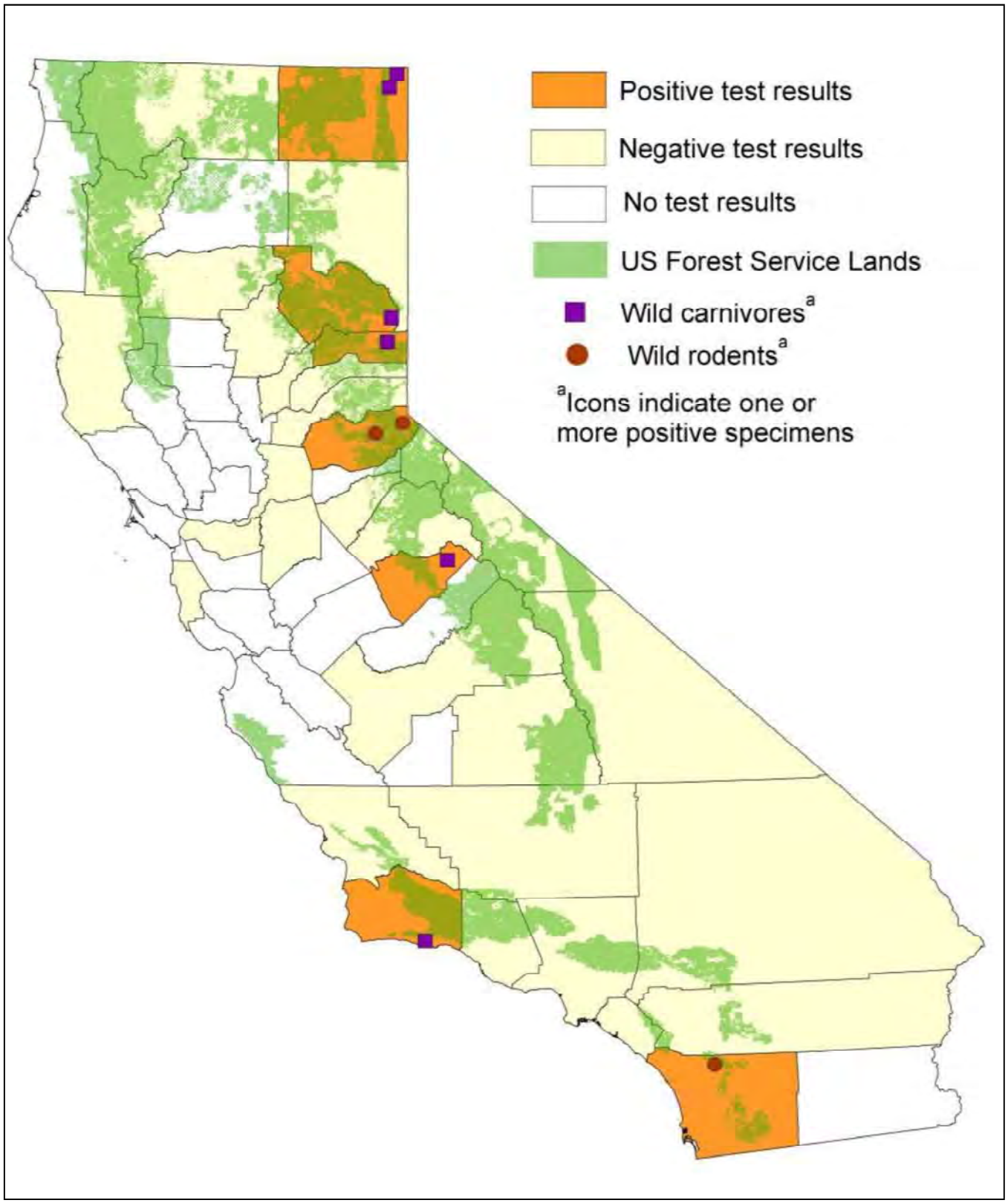


Figure 14-3. California 2014 *Yersinia Pestis* Results in Tested Mammals by County

Tularemia

Tularemia, named after Tulare County in California where it was first described in 1911, is a tick-borne disease of animals and humans caused by the bacterium *Francisella tularensis*. Tularemia is similar to plague, but is typically spread differently. While plague is usually spread to humans by fleas, humans usually become infected with Tularemia by tick and deer fly bites, skin contact with infected animals, ingestion of contaminated water or meat, or inhalation of contaminated dusts or aerosols. Symptoms vary depending upon the route of infection.

Rabbits, hares, and rodents are especially susceptible and often die in large numbers during outbreaks. Although Tularemia can be life-threatening, most infections can be treated successfully with antibiotics. Steps to prevent Tularemia include use of insect repellent, wearing gloves when handling sick or dead animals, and not mowing over dead animals. In the United States, naturally occurring infections have been reported from all states except Hawaii. From 2011to the publishing of this document there have been 11 cases of Tularemia in California.

Lyme Disease

Lyme disease, named after the city in Connecticut where it was first identified in 1975, is a tick-borne disease caused by the bacterium *Borrelia burgdorferi,* which normally lives in mice, squirrels and other small animals. It is transmitted among these animals and to humans through the bites of certain species of ticks. In the northeastern and north-central United States, the black-legged tick (or deer tick, *Ixodes scapularis*) transmits Lyme disease. In the Pacific coastal United States, the disease is spread by the western black-legged tick (*Ixodes pacificus*). Other major tick species found in the United States have not been shown to transmit the disease.

Typical symptoms include fever, headache, fatigue, and a skin rash. If left untreated, infection can spread to joints, the heart, and the nervous system. Lyme disease is diagnosed based on symptoms, physical findings (e.g., rash), and the possibility of exposure to infected ticks. Laboratory testing is helpful in later stages of the disease. Most cases of Lyme disease can be treated successfully with a few weeks of antibiotics. Steps to prevent Lyme disease include using insect repellent, removing ticks promptly, landscaping, and integrated pest management. The ticks that transmit Lyme disease can occasionally transmit other tick-borne diseases as well. From 2011 to the publishing of this document, there have been 458 cases of Lyme disease in California.

Rocky Mountain Spotted Fever

Rocky Mountain spotted fever is a potentially fatal tick-borne disease caused by the bacterium *Rickettsia rickettsii*. It is transmitted to humans by the bite of an infected American dog tick (*Dermacentor variabilis*), Rocky Mountain wood tick (*Dermacentor andersoni*), or brown dog tick (*Rhipicephalus sanguineus)*.

Typical symptoms include fever, headache, abdominal pain, vomiting, and muscle pain. A rash may also develop, but is often absent in the first few days, and in some patients, never develops. Rocky Mountain spotted fever can be a severe or even fatal illness if not treated in the first few days of symptoms. It can be treated successfully with a few weeks of antibiotics. Steps to prevent the disease include using insect repellent, removing ticks promptly, landscaping, and integrated pest management. The ticks that transmit Rocky Mountain spotted fever can occasionally transmit other tick-borne diseases as well. From 2011to the publishing of this document there have been 44 cases of Rocky Mountain spotted fever in California.

14.1.6 Mosquito-Borne Disease

Many of the 48 species of mosquitoes in California can carry disease. The City of Roseville actively supports the Placer County public outreach campaign and task force about the potential for mosquito-borne disease.

Malaria

Malaria is a sometimes fatal mosquito-borne disease caused by a parasite that commonly infects the *Anopheles* mosquito, which feeds on humans. People who contract malaria are typically very sick with high fevers, chills, and flu-like illness. Although malaria can be fatal, illness and death can usually be prevented.

On average 1,500 cases of malaria are diagnosed in the United States each year. The vast majority are in travelers and immigrants returning from countries where malaria transmission occurs, many from sub-Saharan Africa and South Asia. Although rare, cases of malaria have been reported in California. In many temperate areas, such as western Europe and the United States, economic development and public health measures have succeeded in eliminating malaria. However, most of these areas have *Anopheles* mosquitoes that can transmit malaria, and reintroduction of the disease is a constant risk.

Individuals in areas with malaria need to reduce their likelihood of being bitten by mosquitoes. Screens on windows and doors should be examined to confirm that they are in good repair. Repellents containing 20 to 30 percent DEET should be applied to exposed skin and clothing to keep mosquitoes from biting. From 2011to the publishing of this document there have been 44 cases of malaria in California.

West Nile Virus

West Nile virus (WNV) is a potentially serious mosquito-borne that may affect residents in the planning area. Experts believe WNV is established as a seasonal epidemic in North America that flares up in the summer and continues into the fall. WNV is a recent disease to affect California. Mosquitoes transmit the virus to birds, livestock and humans. As of January 2016, human-infection cases of the virus had been reported in all states of the continental U.S. except West Virginia, New Hampshire and Vermont, and those states had reported non-human infections. The Placer County West Nile Virus Task Force has had a strong and active role in the community since WNV arrived in 2004.

According to the CDC, approximately 80 percent of people who are infected with WNV will show no symptoms. Up to 20 percent have symptoms such as fever, headache, and body aches, nausea, vomiting, and sometimes swollen lymph glands or a skin rash on the chest, stomach and back. Symptoms can last for as short as a few days, though even healthy people have become sick for several weeks. About 1 percent of people infected with WNV will develop severe illness, with symptoms that can include high fever, headache, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, vision loss, numbness and paralysis. These symptoms may last several weeks, and neurological effects may become permanent. There is no specific treatment for WNV infection. In more severe cases, people may need to go to the hospital where they can receive supportive treatment including intravenous fluids, help with breathing and nursing care.

Individuals in areas with WNV need to reduce their likelihood of being bitten by mosquitoes. Screens on windows and doors should be examined to confirm that they are in good repair. Repellents containing 20 to 30 percent DEET should be applied to exposed skin and clothing to keep mosquitoes from biting.

From 2011 to the publishing of this document there have been 2,811 cases of WNV in California. Of those, 36 were from Placer County. Between 2005 and 2015, there were 5,205 cases of WNV in California, and Placer County had 82 cases, an average of 7.45 cases per year. Due to proactive mitigation of the hazard with mosquito abatement and education efforts, the number of confirmed cases has trended down. The first year the tracking began, there were 35 human cases of WNV in Placer County. In 2015, there were none. The agricultural nature of Placer County, with the potential for standing water to be present throughout the County, continues to put the planning area at risk from WNV and other mosquito-borne illnesses.

Dengue Fever

Dengue is a mosquito-borne disease caused by any of four closely related dengue viruses (DENV-1, DENV-2, DENV-3 and DENV-4). People get dengue from the bite of an infected mosquito. The mosquito becomes infected when it bites a person who has dengue virus in their blood. It takes a week or more for the dengue virus to replicate in the mosquito; then the mosquito can transmit the virus to another person when it bites. Dengue is transmitted by yellow fever mosquito (*Aedes aegypti)* and the Asian tiger mosquito *(Aedes albopictus)*. These mosquitoes are not native to California, but infestations have been reported in multiple counties in California. Dengue virus cannot be transmitted from person to person.

The main symptoms of dengue are high fever, severe headache, severe pain behind the eyes, joint pain, muscle and bone pain, rash, bruising, and sometimes mild bleeding from the nose or mouth. Generally, younger children and those with their first dengue infection have a milder illness than older children and adults. Severe dengue typically begins with signs and symptoms similar to dengue. Rather than recover, severe dengue patients proceed to experience more bleeding, severe pain in the abdomen, respiratory distress, and fluid accumulation in the abdomen and around the lungs as the smallest blood vessels (capillaries) begin to leak. If not treated, severe dengue can result in death. There is no specific treatment for dengue infection. Rest and fluids are generally sufficient for persons with dengue. Severe dengue may require hospitalization and intensive medical care.

Individuals in areas with dengue need to reduce their likelihood of being bitten by mosquitoes. Screens on windows and doors should be examined to confirm that they are in good repair. Repellents containing 20 to 30 percent DEET should be applied to exposed skin and clothing to keep mosquitoes from biting. From 2011 to the publishing of this document there have been 483 cases of dengue fever in California, with three of the cases in Placer County.

Zika Virus

Zika is a mosquito-borne disease. The most common symptoms of Zika are fever, rash, joint pain, and conjunctivitis (red eyes). The illness is usually mild, with symptoms lasting for several days to a week after being bitten by an infected mosquito. People usually do not get sick enough to go to the hospital, and they rarely die of Zika. For this reason, many people might not realize they have been infected. However, Zika virus infection during pregnancy can cause a serious birth defect called microcephaly, as well as other severe fetal brain defects. Once a person has been infected, he or she is likely to be protected from future infections.

Zika virus is transmitted by yellow fever mosquito (*Aedes aegypti)* and the Asian tiger mosquito *(Aedes albopictus)*. These mosquitoes are not native to California, but infestations have been reported in multiple counties in California. An *Aedes* mosquito can only transmit Zika virus after it bites a person who has this virus in their blood. Thus far in California, Zika virus infections have been documented only in people who were infected while traveling outside the United States or through sexual contact with an infected traveler. Zika virus is not spread through casual contact, but can be spread by infected men to their sexual partners. There is a growing association between Zika and microcephaly (abnormally small head and brain) in newborns, as well as Zika and Guillain-Barré Syndrome, a disease affecting the nervous system. Studies are ongoing to further evaluate these associations. From 2015 to the publishing of this document there has been no local mosquito-borne transmission of Zika virus in California.

Chikungunya

Chikungunya (pronounced chik-en-gun-ye) is an infectious mosquito-borne disease with symptoms that typically include fever and severe joint pain. It is caused by the chikungunya virus, which is transmitted by yellow fever mosquito (*Aedes aegypti)* and the Asian tiger mosquito *(Aedes albopictus)*. These mosquitoes are not native to California, but infestations have been reported in multiple counties in California. An *Aedes* mosquito can only transmit chikungunya virus after it bites a person who has this virus in their blood. A person with chikungunya is

not contagious. As of the publication of this document, chikungunya infections have been documented only in persons who were infected while traveling outside the United States.

14.1.7 Anthrax

Anthrax is a disease caused by *Bacillus anthracis*, a bacterium that forms spores (a spore is a cell that is dormant but may come to life with the right conditions). There are three forms of anthrax:

- **Cutaneous—**The first symptom is a small sore that develops into a blister. The blister then develops into a skin ulcer with a black area in the center. The sore, blister and ulcer do not hurt.
- **Gastrointestinal—**The first symptoms are nausea, loss of appetite, bloody diarrhea, and fever, followed by bad stomach pain.
- **Inhalation—**The first symptoms of inhalation anthrax are like cold or flu symptoms and can include a sore throat, mild fever and muscle aches. Later symptoms include cough, chest discomfort, shortness of breath, tiredness and muscle aches.

Anthrax is a naturally occurring illness and isolated cases occur all over the world yearly. Humans can become infected with anthrax by handling products from infected animals or by breathing in anthrax spores from infected animal products (such as wool). People can become infected with gastrointestinal anthrax by eating undercooked meat from infected animals. Anthrax does occur in California, and animals have tested positive; however, there have been no positive human cases of anthrax in California in the last 10 years. Anthrax can be treated successfully with antibiotics.

Anthrax can be used as a weapon, as happened in the United States in 2001, when anthrax was spread through the postal system by sending letters with powder containing anthrax spores. This caused 22 cases of anthrax infection and brought anthrax back into the public eye. From 2011 to the publishing of this document there have no cases of anthrax in California.

14.1.8 Severe Acute Respiratory Syndrome

Severe Acute Respiratory Syndrome (SARS) is a viral respiratory illness caused by a coronavirus (SARS-CoV). SARS was first reported in Asia in February 2003. Over the next few months, the illness spread to more than two dozen countries in North America, South America, Europe, and Asia before the global outbreak was contained. According to the WHO, 8,098 people worldwide became sick with SARS during the 2003 outbreak and 774 died. In the United States, only eight people had laboratory evidence of SARS-CoV infection. All of these people had traveled to parts of the world where SARS was present. SARS did not spread more widely in the United States.

In general, SARS begins with a high fever, headache, an overall feeling of discomfort and body aches. Some people also have mild respiratory symptoms at the outset. About 10 percent to 20 percent of patients have diarrhea. After two to seven days, SARS patients may develop a dry cough. Most patients develop pneumonia.

The main way that SARS seems to spread is by close person-to-person contact. The virus that causes SARS is thought to be transmitted most readily by respiratory droplets produced when an infected person coughs or sneezes. Droplet spread can happen when droplets from the cough or sneeze of an infected person are propelled a short distance (generally up to 3 feet) through the air and deposited on the mucous membranes of the mouth, nose, or eyes of persons nearby. The virus also can spread when a person touches a surface or object contaminated with infectious droplets and then touches his or her mouth, nose, or eyes. It is also possible that the SARS virus might spread more broadly through the air or by other ways that are not now known.

As of May 2005, according to the CDC, there was no remaining sustained SARS transmission anywhere in the world. However, CDC has developed recommendations and guidelines to help public health and healthcare

officials plan for and respond quickly to the reappearance of SARS if it occurs again. Lessons learned from the SARS outbreak helped healthcare facilities and communities successfully plan and respond to the 2009 H1N1 pandemic. The California Health and Safety Code lists SARS among the communicable diseases that must be reported to health authorities. Placer County is authorized to collect records and data, initiate disease control measures, control property and manage persons (including isolation and quarantine) for containment of communicable disease. From 2011 to the publishing of this document there have no cases of SARS in California.

14.1.9 Extreme Weather

From 2006 to 2010, more people in the U.S. died from extreme heat or extreme cold than from hurricanes, tornadoes, floods and earthquakes combined.The western United States is subject to many weather extremes. Severe spring storms can lead to risk of traumatic injuries, mudslides, flooding and property damage. Extreme heat can lead to dehydration and heat-related illness. Severe winter weather can lead to risk of traumatic injuries, hypothermia and icy conditions.

Severe Spring Storms

Thunderstorms cause most of the severe spring weather. Tornados are rare in California but can occur. Since 2011, a total of 44 tornadoes have occurred in California, one of them in Placer County. When these events occur unexpectedly, the risk of injury and death increases. Advance planning can decrease the risks. Citizens should pay close attention to changing weather conditions when there is a severe thunderstorm watch or warning.

Lightning strikes are a danger during thunderstorms. A lightning bolt is 6 to 8 centimeters in diameter, carrying between 10 and 100 million volts in 20 to 50 thousand amps of direct current. The duration is approximately one millisecond. Volts of 2 billion and 500 thousand amps have been measured. A lightning strike can cause death or injury to one or several persons. Long-term injuries from lightning strike can include memory and attention loss, chronic numbness, muscle spasm, stiffness, depression, hearing loss and sleep disturbance. Seventy percent of all lightning injuries and fatalities occur in the afternoon; 85 percent of victims are children and young men (age 10 to 35) engaged in outdoor recreation and work activities. Hikers, campers, backpackers, skiers, fishermen, and hunters are especially vulnerable.

Extreme Heat

California, Nevada and Arizona experience very high temperatures during the summer. Those susceptible to extreme heat may suffer heat-related illnesses:

- **Heat Exhaustion—**Heat exhaustion is a mild form of heat-related illness that can develop after several days of exposure to high temperatures and inadequate or unbalanced replacement of fluids. It is the body's response to an excessive loss of the water and salt contained in sweat. Those most prone to heat exhaustion are elderly people, people with high blood pressure, and people working or exercising in a hot environment.
- **Heat Cramps—**Heat cramps usually affect people who sweat a lot during strenuous activity. This sweating depletes the body's salt and moisture. The low salt level in the muscles may be the cause of heat cramps. Heat cramps may also be a symptom of heat exhaustion.
- **Heat Stroke—**Heat stroke is a severe, dangerous form of heat-related illness. It occurs when the body's temperature rises rapidly, the sweating mechanism fails, and the body is unable to cool down. Body temperature may rise to 106°F or higher within 10 to 15 minutes. Heat stroke can cause death or permanent disability if emergency treatment is not provided. This is a medical emergency.

Heat has caused 9,000 deaths in the United States from 1979 to 2013. Air-conditioning is the number one protective factor against heat-related illness and death. If a home is not air-conditioned, people can reduce their risk for heat-related illness by spending time in public facilities that are air-conditioned.

The California Office of Emergency Services has a comprehensive contingency plan for excessive heat emergencies. The plan describes state operations during heat-related emergencies and provides guidance for state agencies, local government, and non-governmental organizations in the preparation of heat emergency response plans and related activities. Placer County has an emergency contingency plan and participates in the opening of local cooling centers if extreme heat continues for an extended period of time.

Severe Winter Weather

When winter temperatures drop significantly below normal, staying warm and safe can become a challenge. Extremely cold temperatures often accompany a winter storm, which may also cause power failures and icy roads. Staying indoors as much as possible can help reduce the risk of car crashes and falls on the ice, but cold weather also can present hazards indoors. Many homes will be too cold, either due to a power failure or because the heating system is not adequate for the weather. When people must use space heaters and fireplaces to stay warm, the risk of residential fires increases, as well as the risk of carbon monoxide poisoning.

Extreme cold can bring on health emergencies in susceptible people, such as those without shelter or who are stranded, or who live in a home that is poorly insulated or without heat:

- **Hypothermia—**When exposed to cold temperatures, the body begins to lose heat faster than it can be produced. Prolonged exposure to cold will eventually use up the body's stored energy. The result is hypothermia, or abnormally low body temperature. Body temperature that is too low affects the brain, making the victim unable to think clearly or move well. This makes hypothermia particularly dangerous because a person may not know it is happening and will not be able to do anything about it. Warning signs of hypothermia include shivering, exhaustion, confusion, fumbling hands, memory loss, slurred speech, drowsiness, bright red cold skin, and very low energy.
- **Frostbite—**Frostbite is an injury to the body caused by freezing of the tissues. Frostbite causes a loss of feeling and color in affected areas. It most often affects the nose, ears, cheeks, chin, fingers, or toes. Frostbite can permanently damage the body, and severe cases can lead to amputation. The risk of frostbite is increased in people with reduced blood circulation and among people who are not dressed properly for extremely cold temperatures. A victim is often unaware of frostbite until someone else points it out because the frozen tissues are numb. Signs of frostbite may be a white or grayish-yellow skin area, skin that feels unusually firm or waxy and numbness.

Infants and the elderly are particularly at risk to cold temperatures, but anyone can be affected. If extreme winter weather conditions are expected for an extended period, Placer County has an emergency contingency plan to provide shelter and care areas to provide heating centers for those in need. Preventive action is the best defense against having to deal with extreme cold-weather conditions. Preparing homes and cars in advance for winter emergencies, and observing safety precautions during times of extremely cold weather can reduce the risk of weather-related health problems.

14.2 HAZARD PROFILE

The severity of human health hazards is dependent upon the hazard and the population exposed to it. As the population increases, so does the risk of exposure to hazards. The key to reducing the disease hazard is isolation so that the exposed population does not continue to spread the hazard to the uninfected population. For disease and weather-related human health hazards, promoting education and personal preparedness will help to mitigate and reduce the severity of the hazard.

14.2.1 Past Events

Communicable Diseases

The following is a summary of recent disease outbreak events:

- In the United States during the 2009 H1N1 influenza pandemic, there were 59,979,608 confirmed cases of the disease, 270,435 people hospitalized due to the illness and 12,271 deaths. In California, there were 4,134 people hospitalized due to the illness and 596 deaths. In Placer County, there were 45 confirmed cases, with 5 deaths due to the illness. The pandemic was mild compared to the Spanish Flu pandemic of 1918, which caused 100 million deaths worldwide—a total of 3 percent of the world's total population.
- West Nile Virus arrived in Placer County in July 2004. The first case was diagnosed in September 2004. The 56-year old patient was recovering from meningitis in the hospital when the test came back positive for WNV. From 2011 to the publishing of this document there have been 2,811 cases of WNV in California, 36 of them in Placer County
- There were two confirmed cases of SARS in California during the worldwide outbreak in 2002-2003, none of them in Placer County.
- From 2011 to the publishing of this document there have been 458 cases of Lyme disease in California, 4 of them in Placer County.
- From 2011 to the publishing of this document there have been 16 cases of hantavirus in California, including one in Placer County.
- As of the publishing of this document, no cases of tularemia or plague have been reported in Placer County, but cases of these diseases have been reported in California and nearby counties. Even though these hazards may not be endemic to the area, they can be brought into the planning region and are still considered to be a risk.

Extreme Weather

The following is a summary of recent extreme weather events that threatened human health:

- From 2006 to 2010, excessive heat exposure caused 3,332 deaths in the United States.
- In July 2006, California experienced a heat wave impacting the entire state. Coroners attributed 140 deaths to hyperthermia, and it has been estimated from other data that more than 600 heat-related deaths may have occurred over a 17-day period.
- From 2006 to 2010, hypothermia caused 6,660 deaths in the United States.
- From 2006 to 2010, lightning strikes caused 657 deaths in the United States.

14.2.2 Location

It is difficult to map the extent of human-health hazards compared to others, such as floods, wildfires and dam failures. All of the City of Roseville Planning Area is susceptible to the human health hazards discussed in this chapter. While some hazards, such as the West Nile Virus and Lyme disease, can have a geographic presence within the planning area, other diseases can cause exposure to the planning area from outside the local region. Roseville residents who travel can become exposed to diseases while abroad and bring the diseases back with them, potentially placing the region at risk for exposure. Extreme weather poses an equal human health hazard across the City.

14.2.3 Frequency

Communicable Disease

Due to increased air travel, the growing population and the country's aging population, the probability of a communicable disease epidemic or pandemic is a growing threat. Certain human health hazards, such as influenza, can be expected seasonably, with variations on specific strains year to year. Additionally, tick-borne diseases are likely to increase during spring and fall, when people participate in outdoor activities such as hiking. The frequency of other health hazards is difficult to establish and depends largely on the unique circumstances surrounding a localized outbreak and its subsequent expansion into epidemics and eventually pandemics.

Extreme Weather

Trauma due to injuries directly due to storms (such as motor vehicle collisions and falls), heat related illness and hypothermia are a factor of the weather and in some cases a technological hazard.

14.2.4 Severity

The severity of the human health hazard varies from individual to individual. Typically, young children and older adults are more susceptible to acquiring communicable diseases due to developing or diminishing immune systems or experiencing adverse effects to extreme weather conditions. These populations often experience the most severe of symptoms, as their immune systems are not capable of fighting off infection or efficiently regulating temperature. In general, severity varies depending on the pathology of the disease, the health of the infected, and the availability of treatments for alleviating symptoms or curing the disease.

14.3 SECONDARY HAZARDS

Human health hazards are not like natural hazards that have measurable secondary impacts, such as earthquakes, floods or wildfires. The largest secondary impact caused by human health hazards would be economic. Large outbreaks of any human health hazard could reduce the work force significantly, causing businesses and agencies to close or be greatly impacted.

Another secondary impact could be stigmatization. The fear of the human health hazard and fear of the unknown could lead to isolation, violence and self-inflicted injury. Hospitals and health care providers could be overwhelmed with the "worried well" seeking care and comfort. Providing key and critical information can reduce and mitigate this secondary risk.

14.4 EXPOSURE AND VULNERABILITY

14.4.1 Population

All citizens in the Roseville planning area could be susceptible to the human health hazards discussed in this chapter. A large outbreak or epidemic, a pandemic or a use of biological agents as a weapon of mass destruction could have devastating effects on the population of Roseville.

West Nile Virus and other mosquito-borne illnesses are a significant concern in the local wetlands and west of Roseville in the flooded rice fields. A concentrated at-risk population is on the western border of the city limits near the rice fields where the mosquitoes breed.

While all of the population in the planning area is considered at risk to the human health hazards discussed in this chapter, the young and the elderly, those with compromised immune systems, and those with special needs are

considered the most vulnerable. The City has a large elderly community with a concentration of older residents in areas such as Sun City Roseville. The introduction of a disease such as the plague or influenza could rapidly impact those at risk.

14.4.2 Property

None of the health hazards discussed in this chapter would have significant measurable impact on the structural environment or property of the planning area.

14.4.3 Critical Facilities and Infrastructure

None of the health hazards discussed in this chapter would have significant measurable impact on the critical facilities or infrastructure of the planning area. However, health care facilities (including long-term care and clinics and even veterinary offices) have adopted the recommended "all-hazards" approach to preparedness and have prepared for the health hazards addressed in this chapter.

The acute care hospitals in Roseville have collaborated, trained and planned on a local, regional, state and national level to provide immediate and comprehensive medical care to the citizens of Roseville and the greater western Placer County population. Emergency management and preparedness planning incorporates all response disciplines (fire, law, first responder ground and air ambulance agencies, public health, mental and spiritual health). Planning includes identifying shelters, alternate treatment facilities, isolation capacity and methods to immediately expand physical and human resources.

14.4.4 Environment

None of the health hazards discussed in this chapter would have significant measurable impact on the environment of the planning area. While many of the vectors of the health hazards discussed in this chapter (mosquitoes, rodents, fleas, ticks and deer flies) rely on local or regional environments for their survival, the human health hazard that they carry or potentially transmit would have no significant measurable impact on the environment.

14.4.5 Economy

The economic impact of a human health hazard could be localized to a single region or population, or could be widespread. The impact could be significant, depending on the hazard, number of cases and the availability of resources to care for those affected by the hazard. Other financial impacts could be absorbed or managed by the organization affected.

14.5 FUTURE TRENDS IN DEVELOPMENT

The potential for communicable diseases, vector-borne diseases or extreme weather in Roseville and the planning area is not likely to lessen or prohibit growth or development in Roseville.

14.6 REVIEW OF EXISTING ORDINANCES, PROGRAMS AND PLANS

14.6.1 Hospital Expansions to Care for Growing Populations

Kaiser Permanente operates medical facilities in Roseville as follows:

- In October 1998, Kaiser Permanente opened a 116-bed hospital on Eureka Road adjacent to its medical offices. Since then, the hospital increased the number of beds to 166 (not including the Women's and

Children's Center). In addition to the hospital, comprehensive outpatient, primary, and specialty care services are offered, as well as education, pharmacy, laboratory, radiology, optical, EKG, and physical therapy services at three sites in Roseville.
- Kaiser opened a 75,000 square-foot medical office building in Lincoln in October 2006.
- In December 2008, a $52 million expansion project was completed that quadrupled the size of the Kaiser Roseville emergency room and doubled the number of beds. The radiology department was tripled in size and provided with high tech rooms with advanced diagnostic tools.
- Kaiser Roseville's Women's and Children's Center opened in January 2009 and includes 174 beds, neonatal and pediatric intensive care units, and a second medical office building.
- Kaiser Roseville is a certified Stroke and STEMI (heart attack) Receiving Center.
- Kaiser's Roseville Medical Center was named as a "Top Hospital" on the 2015 Leapfrog Top Hospitals listing—a voluntary program recognizing hospitals that demonstrate success in minimizing mortality rates for high-risk procedures and preventing medical errors.

Sutter Roseville Medical Center operates medical facilities in Roseville as follows:

- The current Sutter Roseville Medical Center campus opened in 1997 and provides comprehensive community health and trauma care for more than seven counties.
- Sutter Roseville Medical Center provides critical care, cardiology, neurology, pulmonary and orthopedic services, a dedicated cancer center, a Family Birth Center, a Neo Natal Intensive Care Unit, wound care, a 24-hour emergency department and the Sutter Rehabilitation Institute, a 55-bed acute rehabilitation center with accreditation from the Commission on Accreditation of Rehabilitation Facilities
- Sutter Roseville Medical Center is an accredited regional Level II trauma center and designated disaster/medical control facility, as well as a certified Stroke Receiving Center, STEMI (heart attack) Receiving Center and National Disaster Medical Systems hospital.
- Sutter Roseville is in the process of expanding its emergency department, intensive care and trauma neuro intensive care units and inpatient and outpatient surgery programs.
- In 2015, Truven Health Analytics named Sutter Health and Sutter Health's Valley Area, which includes Sutter Roseville Medical Center, as two of the nation's top five performers among large health care systems in its 15 Top Health Systems study.

Past and future expansion of these medical centers will enhance the capacity and services offered to treat illness and injury in Roseville and the surrounding region.

14.6.2 Memorandums of Agreement

The following memorandums of agreement enhance Roseville's ability to respond to the human health hazard:

- Sutter Roseville Medical Center has a memorandum of agreement with the Department of Quarantine, a division of the CDC, to provide isolation treatment in the event of a highly contagious and virulent disease.
- Sutter Roseville Medical Center has cooperative memorandums of agreement with Beale Air Force Base and the Placer County Department of Health and Human Services to provide assistance and care in disaster and mass casualty incidents.
- Since 2013 Sutter Roseville Medical Center has been a designated one of the nation's 1,500 National Disaster Medical Systems Hospital by the Department of Defense, Department of Health and Human Services and the Department of Veteran's affairs. This designation can provide the facility and the region more rapid care and assistance if a catastrophe strikes.

- Kaiser Roseville and Sutter Roseville Medical Center are coalition members with Placer County Public Health in the Healthcare Emergency Coalition to prepare, train and exercise to provide services in mass casualty situations.

14.6.3 Integrated Emergency Response

FEMA and the Joint Commission for Accreditation of Healthcare Organizations (JCAHO) expect acute care facilities to provide planning for an "all hazard" disaster response and care for mass casualties, whether the incidents and events are naturally occurring, human caused, or a combination of both. JCAHO requires the integration of emergency response planning with local response agencies, ensuring that the community will receive the highest level of integrated response and protection available. These planning efforts are supported by local, regional, state and federal grant funding.

14.7 SCENARIO

A human health worst-case scenario for the planning area would be an epidemic or large-scale incident of any of the human health hazards discussed in this chapter. Medical treatment facilities in the planning area would be overwhelmed and taxed beyond their capabilities as the numbers of patients escalates. The impacts on the workforce within the planning area could have acute and long-term economic impacts on the primary employers in the planning area. First responders would be exposed to the human health hazards, which could deplete the medical workforce and could have profound impact on the potential escalation of the scenario.

14.8 ISSUES

Important issues associated with the human health hazards include but are not limited to the following:

- Prevention through vaccination and personal emergency and disaster preparation will help to reduce the impacts of human health hazards.
- Medical and response personnel need to be integrated in a unified command to provide care when needed in response to human health hazards.
- Medical and response personnel must be adequately trained and supplied.
- Up-to-date and functional all-hazard contingency planning should be carried out.
- A system needs to be in place for informing the public with a unified message about the human health hazard.
- Health agencies and facilities require surge capacity management and adaptation to the rising number and needs of the region.

15. HUMAN-CAUSED HAZARDS

15.1 GENERAL BACKGROUND

Although the DMA does not require an assessment of human-caused hazards, The City of Roseville is including human-caused hazards in this hazard mitigation plan for the following reasons:

- The City takes a proactive approach to disaster preparedness, especially in an effort to protect the public safety of all citizens.
- Preparation for and response to a human-caused disaster will involve many of the same staff training, critical decisions, and commitment of resources as for a natural hazard.
- The multi-hazard mitigation planning effort is an opportunity to inform the public about all hazards, including human-caused hazards.
- The likelihood of a human-caused hazard in Roseville is greater than several of the identified natural hazards in this Plan.
- The City has a Terrorism Contingency Plan (June 2004) and a Hazardous Materials Contingency Plan (September 2004) already in place with instructions for a response by City of Roseville first responders and staff of the emergency operations center.

Human-caused hazards fall into the following categories:

- Man-made hazards include acts of terrorism and cyber threats. These hazards are intentional, criminal, malicious acts.
- Technological hazards are incidents that arise from human activities such as the manufacture, transportation, storage and use of hazardous materials. These are accidental incidents with unintended consequences.

This report does not address human-caused hazards to the Roseville water treatment facilities, because the City evaluated those facilities in a separate report per EPA requirements. Information on that evaluation is available from the Roseville City Manager's office. In 2003, with input from the City of Roseville, Placer County conducted a State Homeland Security Assessment Survey to review terrorism vulnerabilities, personnel available to respond, and equipment needed. The resulting information is classified and available only to first responders at the time of an emergency (per state and federal laws).

DEFINITIONS

Acts of Terrorism—The unlawful use or threatened use of force or violence against people or property with the intention of intimidating or coercing societies or governments. Terrorism is either foreign or domestic, depending on the origin, base, and objectives of the terrorist or organization.

Technological Hazards—Hazards from accidents associated with human activities such as the manufacture, transportation, storage and use of hazardous materials.

Weapons of Mass Destruction—Chemical, biological, radiological, nuclear, and explosive weapons associated with terrorism.

Hazardous Material—A substance or combination of substances that, because of quantity, concentration, physical, chemical, or infectious characteristics, may cause or contribute to an increase in mortality or an increase in serious irreversible or incapacitating reversible illness, or pose a present or potential hazard to human life, property, or the environment. Hazardous waste is included in the City's working definition.

15.1.1 Man-Made Hazards

Terrorism and Weapons of Mass Destruction

The Federal Bureau of Investigation (FBI) categorizes terrorism in the United States as one of two types:

- Domestic terrorism involves groups or individuals whose terrorist activities are directed at elements of our government or population without foreign direction. The 1995 bombing of the Alfred P. Murrah federal building in Oklahoma City is an example of domestic terrorism. The FBI is the primary response agency for domestic terrorism. The FBI coordinates domestic preparedness programs and activities of the United States to limit acts posed by terrorists including the use of weapons of mass destruction (WMDs).
- International terrorism involves groups or individuals whose terrorist activities are foreign-based and/or directed by countries or groups outside the United States, or whose activities transcend national boundaries. Examples include the 1997 bombing of Mobil Oil's headquarters, the 1983 bombing of the U.S. Capitol, the 1993 bombing of the World Trade Center, and the September 11, 2001 attacks at the World Trade Center and the Pentagon.

The three key elements to defining a terrorist event are as follows:

- Activities involve the use of illegal force.
- Actions are intended to intimidate or coerce.
- Actions are committed in support of political or social objectives.

As detailed in the City's Terrorism Contingency Plan, at least three important considerations distinguish terrorism hazards from other types of hazards:

- In the case of chemical, biological and radioactive agents, their presence may not be immediately obvious, making it difficult to determine when and where they may have been released, who has been exposed, and what danger is present for first responders and emergency medical technicians.
- There is limited scientific understanding of how these agents affect the population at large.
- Terrorism evokes strong emotional reactions, ranging from anxiety to fear to anger to depression.

Those involved with terrorism response, including public health and public information staff, are trained to deal with the public's emotional reaction swiftly as response to the event occurs. The area of the event must be clearly identified in all emergency alert messages to prevent those not affected by the incident from overwhelming local emergency rooms and response resources, thereby reducing service to those actually affected. The public will be informed clearly and frequently about what government agencies are doing to mitigate the impacts of the event. The public will also be given clear directions on how to protect the health of individuals and families.

FEMA defines terrorism as the use of weapons of mass destruction, including biological, chemical, nuclear and radiological weapons; arson, incendiary, explosive and armed attacks; industrial sabotage and intentional hazardous materials releases; agro-terrorism; and cyber-terrorism (FEMA 386-7). The following are potential methods used by terrorists that could affect the City of Roseville as a direct target or collaterally:

- Conventional bomb
- Biological agent
- Chemical agent
- Nuclear bomb
- Radiological agent
- Arson/incendiary attack
- Armed attack
- Cyber-terrorism (see the cyber threats section of this profile)
- Agro-terrorism
- Intentional hazardous material release.

Table 15-1 provides a hazard profile summary for terrorism-related hazards. Most terrorist events in the United States have been bombing attacks, involving detonated or undetonated explosive devices, tear gas, pipe bombs, and firebombs.

Table 15-1. Event Profiles for Terrorism

Hazard	Application Mode[a]	Hazard Duration[b]	Static/Dynamic Characteristics[c]	Mitigating and Exacerbating Conditions[d]
Conventional Bomb	Detonation of explosive device on or near target; delivery via person, vehicle, or projectile.	Instantaneous; additional secondary devices, or diversionary activities may be used, lengthening the duration of the hazard until the attack site is determined to be clear.	Extent of damage is determined by type and quantity of explosive. Effects generally static other than cascading consequences, incremental structural failure, etc.	Overpressure at a given standoff is inversely proportional to the cube of the distance from the blast; thus, each additional increment of standoff provides progressively more protection. Terrain, forestation, structures, etc. can provide shielding by absorbing and/or deflecting energy and debris. Exacerbating conditions include ease of access to target; lack of barriers and shielding; poor construction; and ease of concealment of device.
Chemical Agent	Liquid/aerosol contaminants dispersed using sprayers or other aerosol generators; liquids vaporizing from puddles/ containers; or munitions.	Hours to weeks, depending on the agent and the conditions in which it exists.	Contamination can be carried out of the initial target area by persons, vehicles, water, and wind. Chemicals may be corrosive or otherwise damaging over time if not remediated.	Air temperature can affect evaporation of aerosols. Ground temperature affects evaporation of liquids. Humidity can enlarge aerosol particles, reducing inhalation hazard. Precipitation can dilute and disperse agents but can spread contamination. Wind can disperse vapors but also cause target area to be dynamic. The micro-meteorological effects of buildings and terrain can alter travel and duration of agents. Shielding in the form of sheltering in place can protect people and property from harmful effects.
Arson/ Incendiary Attack	Initiation of fire or explosion on or near target via direct contact or remotely via projectile.	Generally minutes to hours.	Extent of damage is determined by type and quantity of device, accelerant, and materials present at or near target. Effects generally static other than cascading consequences, incremental structural failure, etc.	Mitigation factors include built-in fire detection and protection systems and fire-resistive construction techniques. Inadequate security can allow easy access to target, easy concealment of an incendiary device, and undetected initiation of a fire. Non-compliance with fire and building codes, as well as failure to maintain existing fire protection systems, can substantially increase the effectiveness of a fire weapon.
Armed Attack	Tactical assault or sniping from remote location, or random attack based on fear, emotion, or mental instability.	Generally minutes to days.	Varies based on the perpetrators' intent and capabilities.	Inadequate security can allow easy access to target, easy concealment of weapons, and undetected initiation of an attack.
Biological Agent	Liquid or solid contaminants dispersed using sprayers/ aerosol generators or by point or line sources such as munitions, covert deposits, and moving sprayers.	Hours to years, depending on the agent and the conditions in which it exists.	Depending on the agent used and the effectiveness with which it is deployed, contamination can be spread via wind and water. Infection can spread via humans or animals.	Altitude of release above ground can affect dispersion; sunlight is destructive to many bacteria and viruses; light to moderate wind will disperse agents but higher winds can break up aerosol clouds; the micro-meteorological effects of buildings and terrain can influence aerosolization and travel of agents.

Hazard	Application Mode[a]	Hazard Duration[b]	Static/Dynamic Characteristics[c]	Mitigating and Exacerbating Conditions[d]
Agro-terrorism	Direct, generally covert contamination of food supplies or introduction of pests and/or disease agents to crops and livestock.	Days to months.	Varies by type of incident. Food contamination events may be limited to specific distribution sites, whereas pests and diseases may spread widely. Generally no effects on built environment.	Inadequate security can facilitate adulteration of food and introduction of pests and disease agents to crops and livestock.
Radiological Agent	Radioactive contaminants dispersed using sprayers/ aerosol generators, or by point or line sources such as munitions.	Seconds to years, depending on material used.	Initial effects will be localized to site of attack; depending on meteorological conditions, subsequent behavior of radioactive contaminants may be dynamic.	Duration of exposure, distance from source of radiation, and the amount of shielding between source and target determine exposure to radiation.
Nuclear Bomb	Detonation of nuclear device underground, at the surface, in the air, or at high altitude.	Light/heat flash and blast/shock wave last for seconds; nuclear radiation and fallout hazards can persist for years. Electromagnetic pulse from a high-altitude detonation lasts for seconds and affects only unprotected electronic systems.	Initial light, heat, and blast effects of a subsurface, ground or air burst are static and determined by the device's characteristics and employment; fallout of radioactive contaminants may be dynamic, depending on meteorological conditions.	Harmful effects of radiation can be reduced by minimizing the time of exposure. Light, heat, and blast energy decrease logarithmically as a function of distance from seat of blast. Terrain, forestation, structures, etc. can provide shielding by absorbing and/or deflecting radiation and radioactive contaminants.
Intentional Hazardous Material Release (fixed facility or transportation)	Solid, liquid, and/or gaseous contaminants released from fixed or mobile containers	Hours to days.	Chemicals may be corrosive or otherwise damaging over time. Explosion and/or fire may be subsequent. Contamination may be carried out of the incident area by persons, vehicles, water and wind.	Weather conditions directly affect how the hazard develops. The micro-meteorological effects of buildings and terrain can alter travel and duration of agents. Shielding in the form of sheltering in place can protect people and property from harmful effects. Non-compliance with fire and building codes, as well as failure to maintain existing fire protection and containment features, can substantially increase the damage from a hazardous materials release.

a. **Application Mode—**Application mode describes the human acts or unintended events necessary to cause the hazard to occur.
b. **Duration—**Duration is the length of time the hazard is present. For example, a chemical warfare agent such as mustard gas, if un-remediated, can persist for hours or weeks under the right conditions.
c. **Dynamic or Static Characteristics—**These characteristics of a hazard describe its tendency, or that of its effects, to either expand, contract, or remain confined in time, magnitude, and space. For example, the physical destruction caused by an earthquake is generally confined to the place in which it occurs, and it does not usually get worse unless aftershocks or other cascading failures occur; in contrast, a cloud of chlorine gas leaking from a storage tank can change location by drifting with the wind and can diminish in danger by dissipating over time.
d. **Mitigation and Exacerbating Conditions—**Mitigating conditions are characteristics of the target and its physical environment that can reduce the effects of a hazard. For example, earthen berms can provide protection from bombs; exposure to sunlight can render some biological agents ineffective; and effective perimeter lighting and surveillance can minimize the likelihood of someone approaching a target unseen. In contrast, exacerbating conditions are characteristics that can enhance or magnify the effects of a hazard. For example, depressions or low areas in terrain can trap heavy vapors, and a proliferation of street furniture (trash receptacles, newspaper vending machines, mail boxes, etc.) can provide hiding places for explosive devices.

Source: FEMA 386-7

The effects of terrorism can vary from loss of life and injuries to property damage and disruptions in services such as electricity, water supplies, transportation, or communications. Terrorist acts may have an immediate effect or a delayed effect. Terrorists often choose targets that offer limited danger to themselves and areas with relatively easy public access. Foreign terrorists look for visible targets where they can avoid detection before and after an attack such as international airports, large cities, major special events, and high-profile landmarks.

In dealing with intentional human-caused hazards, the unpredictability of human beings must be considered. People with a desire to perform criminal acts may seek out targets of opportunity that may not fall into established lists of critical areas or facilities. The City of Roseville first responders train not only to respond to organized terrorism events, but also to respond to random acts by individuals who, for a variety of reasons ranging from fear to emotional trauma to mental instability, may choose to harm others and destroy property.

While education, heightened awareness, and early warning of unusual circumstances may deter crime and terrorism, intentional acts that harm people and property are possible at any time. Public safety entities must react to the incident, locate, isolate and neutralize further damage, and conduct investigate to bring criminals to justice.

Cyber Threats

A cyber threat is an intentional and malicious crime that compromises the digital infrastructure of a person or organization, often for financial or terror-related reasons. Such attacks vary in nature and are perpetrated using digital mediums or sometimes social engineering to target human operators. Generally, attacks last minutes to days, but large-scale events and their impacts can last much longer. As information technology continues to grow in capability and interconnectivity, cyber threats become increasingly frequent and destructive. In 2014, internet security teams at Symantec and Verizon indicated that nearly 1 million new pieces of malware—malicious code designed to steal or destroy information—were created every day (Harrison 2015).

Cyber threats differ by motive, attack type and perpetrator profile. Motives range from the pursuit of financial gain to political or social aims. Cyber threats are difficult to identify and comprehend. Types of threats include using viruses to erase entire systems, breaking into systems and altering files, using someone's personal computer to attack others, or stealing confidential information. The spectrum of cyber risks is limitless, with threats having a wide-range of effects on the individual, community, organizational, and national threat (FEMA 2013).

This risk assessment includes cyber attacks and cyberterrorism under the inclusive hazard of cyber threats. The terms often are used interchangeably, though they are not the same. While all cyberterrorism is a form of cyber attack, not all cyber attacks are cyberterrorism.

Cyber Attacks

Public and private computer systems are likely to experience a variety of cyber attacks, from blanket malware infection to targeted attacks on system capabilities. Cyber attacks specifically seek to breach IT security measures designed to protect an individual or organization. The initial attack is followed by more severe attacks for the purpose of causing harm, stealing data, or financial gain. Organizations are prone to different types of attacks that can be either automated or targeted in nature. Table 15-2 describes the most common cyber attack mechanisms faced by organizations today.

Since 2013, a new type of cyber-attack is becoming increasingly common against individuals and small- and medium-sized organizations. This attack is called cyber ransom. Cyber ransom occurs when an individual downloads ransom malware, or ransomware, often through phishing or drive-by download, and the subsequent execution of code results in encryption of all data and personal files stored on the system. The victim then receives a message that demands a fee in the form of electronic currency or cryptocurrency, such as Bitcoin, for the decryption code (Figure 15-1).

Table 15-2. Common Mechanisms for Cyber Attacks

Type	Description
Socially Engineered Trojans	Programs designed to mimic legitimate processes (e.g. updating software, running fake antivirus software) with the end goal of human-interaction caused infection. When the victim runs the fake process, the Trojan is installed on the system.
Unpatched Software	Nearly all software has weak points that may be exploited by malware. Most common software exploitations occur with Java, Adobe Reader, and Adobe Flash. These vulnerabilities are often exploited as small amounts of malicious code are often downloaded via drive-by download.
Phishing	Malicious email messages that ask users to click a link or download a program. Phishing attacks may appear as legitimate emails from trusted third parties.
Password Attacks	Third party attempts to crack a user's password and subsequently gain access to a system. Password attacks do not typically require malware, but rather stem from software applications on the attacker's system. These applications may use a variety of methods to gain access, including generating large numbers of generated guesses, or dictionary attacks, in which passwords are systematically tested against all of the words in a dictionary.
Drive-by Downloads	Malware is downloaded unknowingly by the victims when they visit an infected site.
Denial of Service Attacks	Attacks that focus on disrupting service to a network in which attackers send high volumes of data until the network becomes overloaded and can no longer function.
Man in the Middle	Man-in-the-Middle attacks mirror victims and endpoints for online information exchange. In this type of attack, the attacker communicates with the victims, who believe they are interacting with a legitimate endpoint website. The attacker is also communicating with the actual endpoint website by impersonating the victim. As the process goes through, the attacker obtains entered and received information from both the victim and endpoint.
Malvertising	Malware downloaded to a system when the victim clicks on an affected ad.
Advanced Persistent Threat (APT)	An attack in which the attacker gains access to a network and remains undetected. APT attacks are designed to steal data instead of cause damage.

Source: Danielson 2015



Figure 15-1. Pop-Up Message Indicating Ransomware Infection

With millions of threats created each day, the importance of protection against cyber attacks becomes a necessary function of everyday operations for individuals, government facilities, and businesses. The increasing dependency on technology for vital information storage and the often automated method of infection means higher stakes for the success of measurable protection and education.

Cyberterrorism

Cyberterrorism is the use of computers and information, particularly over the Internet, to recruit others to an organization's cause, cause physical or financial harm, or cause a severe disruption of infrastructure service. Such disruptions can be driven by religious, political, or other motives. Like traditional terrorism tactics, cyberterrorism seeks to evoke very strong emotional reactions, but it does so through information technology rather than a physically violent or disruptive action. Cyberterrorism has three main types of objectives (Kostadinov 2012):

- **Organizational—**Cyberterrorism with an organizational objective includes specific functions outside of or in addition to a typical cyber attack. Terrorist groups today use the internet on a daily basis. This daily use may include recruitment, training, fundraising, communication, or planning. Organizational cyberterrorism can use platforms such as social media as a tool to spread a message beyond country borders and instigate physical forms of terrorism. Additionally, organizational goals may use systematic attacks as a tool for training new members of a faction in cyber warfare.
- **Undermining—**Cyberterrorism with undermining as an objective seeks to hinder the normal functioning of computer systems, services, or websites. Such methods include defacing, denying, and exposing information. While undermining tactics are typically used due to high dependence on online structures to support vital operational functions, they typically do not result in grave consequences unless undertaken as part of a larger attack. Undermining attacks on computers include the following (Waldron 2011):
    - Directing conventional kinetic weapons against computer equipment, a computer facility, or transmission lines to create a physical attack that disrupts the reliability of equipment.
    - Using electromagnetic energy, most commonly in the form of an electromagnetic pulse, to create an electronic attack against computer equipment or data transmissions. By overheating circuitry or jamming communications, an electronic attack disrupts the reliability of equipment and the integrity of data.
    - Using malicious code directed against computer processing code, instruction logic, or data. The code can generate a stream of malicious network packets that disrupt data or logic by exploiting vulnerability in computer software, or a weakness in computer security practices. This type of cyber attack can disrupt the reliability of equipment, the integrity of data, and the confidentiality of communications (Wilson 2008)
- **Destructive—**The destructive objective for cyberterrorism is what organizations fear most. Through the use of computer technology and the Internet, the terrorists seek to inflict destruction or damage on tangible property or assets, and even death or injury to individuals. There are no cases of pure cyberterrorism as of the date of this Plan.

15.1.2 Technological Hazards

Technological hazards are associated with human activities such as the manufacture, transportation, storage and the use of hazardous materials. Incidents related to these hazards are assumed to be accidental, with unintended consequences. Technological hazards in Roseville can be categorized as follows:

- Hazardous materials incidents
- Power utility losses
- Data and telecommunications disruptions

- Water and wastewater disruption
- Air and transportation accidents
- Infrastructure threats.

Hazardous Materials Incidents

Hazardous materials are present in nearly every city and county in the United States in facilities that produce, store, or use them. For example, water treatment plants use chlorine on-site to eliminate bacterial contaminants. Hazardous materials are transported along interstate highways and railways daily. Even the natural gas used in every home and business is a dangerous substance when a leak occurs. Except for severe weather and flooding, hazardous materials incidents are the hazards most likely to affect the City of Roseville.

Title 49 of the CFR lists thousands of hazardous materials, including gasoline, insecticides, household cleaning products, and radioactive materials. State regulated substances that have the greatest probability of adversely impacting the community are listed in the CCR, Title 19. The following are the most common type of hazardous material incidents:

- **Fixed-Facility Hazardous Materials Incident—**This is the uncontrolled release of materials from a fixed site capable of posing a risk to health, safety and property. It is possible to identify and prepare for a fixed-site incident because federal and state laws require those facilities to notify state and local authorities about what is being used or produced at the site.
- **Hazardous Materials Transportation Incident—**A hazardous materials transportation incident is any event resulting in uncontrolled release of materials during transport that can pose a risk to health, safety, and property. Transportation incidents are difficult to prepare for because there is little if any notice about what materials could be involved should an accident happen. Hazardous materials transportation incidents can occur anywhere, although most occur on major federal or state highways or major rail lines. In addition to materials such as chlorine that are shipped throughout the country by rail, thousands of shipments of radiological materials, mostly medical materials and low-level radioactive waste, travel by ground transportation across the United States. Many incidents occur in sparsely populated areas and affect very few people. There are occasions, however, of accidents in areas with much higher population densities, such as the January 6, 2005 train accident in Graniteville, South Carolina, that released chlorine gas killing nine, injuring 500, and causing the evacuation of 5,400 residents.
- **Interstate Pipeline Hazardous Materials Incident—**There are a significant number of interstate natural gas, heating oil, and petroleum pipelines running through California. These are used to provide natural gas to utilities in California and to transport these materials from production facilities to end users.

Power Utility Losses

A power failure is any interruption or loss of electrical service due to disruption of power generation or transmission caused by an accident, sabotage, natural hazards, equipment failure, or fuel shortage. These interruptions can last anywhere from a few seconds to several days. Power failures are considered significant only if the local emergency management organization is required to coordinate basic services such as the provision of food, water, and heating as a result. Power failures are common with severe weather and winter storm activity. However, for medically dependent residents, a power failure can present a life-threatening situation.

The City of Roseville Electric Utility is responsible for operating and maintaining the electrical transmission and distribution system in Roseville. The City supplies electricity to about 56,000 residential and business customers within the service area according to the 2014 Roseville Electric Annual Report. The distribution lines and substations deliver 324 megawatts during peak demand period from June through September.

Roseville Electric has the highest reliability in the country for municipal utilities of its size, due in large part to a redundant system with sophisticated interconnection between the facilities and immediate notification should failure occur along the distribution system. Through its load management program and load shedding agreements with large, local electric users, the City of Roseville avoided any outages during electric crises and brownouts that affected some parts of California in 2000 and 2001.

Roseville has taken a proactive approach to maintaining its reliability standards by building a local generation source—the Roseville Energy Park. The Roseville Energy Park is a natural-gas-fired, combined-cycle electrical generating facility located on an 8.9-acre site adjacent to the Pleasant Grove Wastewater Treatment Plant. Since operations began in 2007, the state-of-the-art, 160-megawatt power generation facility generates enough energy to meet 40 percent of the community's electricity needs.

Data and Telecommunications Disruptions

The loss of data and/or telecommunications is often a secondary hazard to natural and other human-caused hazards. Data and telecommunications provide a primary method for service to the community by the government and the private sector. A loss of data and telecommunications could result in loss of emergency dispatch capabilities, emergency planning services, infrastructure monitoring capabilities, access to statistical data, and loss of financial and personnel records. Losing the primary method of communication for emergency responders (radio) would severely disable their ability to respond in a timely and effective manner.

Water and Wastewater Disruption

Water or wastewater disruption is a secondary impact from a natural disaster or intentional act. The City of Roseville receives surface water from the Folsom Reservoir, a 1 million-acre-foot multi-purpose facility east of the City. A breach in the dam or the pipelines that carry water to the City's Water Treatment Plant on Barton Road in Granite Bay would have significant temporary impacts on the City until alternative water sources, including water from other regional purveyors and groundwater, are pumped and treated. Long-term disruption of the water source from Folsom Lake would have significant impacts on residences and businesses in Roseville should demand exceed secondary supplies and water conservation measures not provide enough relief to reduce demand to equal the secondary supplies.

Disruption of the City's wastewater collection and regional wastewater treatment plants at Dry Creek and Pleasant Grove Creek would also have significant citywide and regional impacts. Such disruption could result if the system were to be overwhelmed by a significant storm or discharge of materials in such quantities that the treatment plant could not adequately treat the waste. Natural hazards such as earthquake or flood, major power outages, or terrorism directed at the facilities and systems could disrupt the process of collecting and treating millions of gallons of waste. Wastewater treatment plants may also have emergencies internal to the plant such as oxygen deficiencies that render them incapable of treating waste. The disruption of service may also have significant environmental impacts on the waterways adjacent to the treatment plants.

Air and Transportation Accidents

Air and transportation accidents are incidents involving air or rail passengers resulting in death or serious injury. The region has a number of airports, including the Sacramento International Airport, as well as several smaller county or municipal airports and private air strips that enhance the potential for an air disaster.

Roseville features several major transportation routes, including Interstate 80 and Highway 65, both of which run through portions of the City. The potential for transportation accidents that block ingress, egress, and movement through the City is significant, as is the likelihood of hazardous material incidents resulting from a traffic accident.

15.1.3 Civil Disorder

Civil disorder refers to incidents that disrupt a community to the degree that law enforcement intervention is required to maintain public safety. These incidents are generally associated with controversial political, judicial, or economic issues and may occur at any time of the year, although statistics indicate that they are more frequent during summer. While Roseville has no history of civil disorder, large public gatherings associated with concerts or sports events have overburdened local law enforcement and fire protection resources in the past.

The effects of civil disorder vary with the type, severity, scope, and duration of event. Essential services (e.g., electricity, water, public transportation, communications) may be disrupted or property damage, injury and loss of life may occur. Facilities most at risk are government buildings, schools, utilities and correctional facilities.

15.2 HAZARD PROFILE

15.2.1 Past Events

State of California

Terrorism Events

According to the Governor's Office of Emergency Services Terrorism Response Plan, California has had a long history of defending the public against domestic and foreign terrorists. Domestic terrorist groups in California have been focused on political or social issues, while the limited internationally based incidents have targeted the state's immigrant communities due to foreign disputes. Advanced technologies and communication have allowed these groups to become more sophisticated and better organized, with remote members linked electronically.

Technological Hazard Incidents

No comprehensive source exists for technological hazard incidents in California. Given the complex system of transportation networks, the large population, and the number of businesses in California, incidents occur on a regular basis throughout the state, as reported by the news media.

Region

Terrorism Events

In 2005, development projects in Placer County were the subject of arson activity by an individual who claimed to be from the Earth Liberation Front or ELF, a splinter group of Earth First!, a radical environmental activist movement. ELF is a somewhat active domestic terrorism group that says it uses eco-sabotage to protect the Earth and to seek revenge on "those who are destroying the Earth and its inhabitants."

On December 3, 1999, the FBI arrested two anti-government militia members who planned a bomb attack at the Suburban Propane facility in Elk Grove, CA. The alleged plot involved a plan to blow up the Suburban Propane site, which stores about 24 million gallons of liquefied propane and is located one mile from residential homes. According to the Sacramento Bee, the plot resulted in heightened on-site security and a year-long investigation resulting in the two arrests.

Technological Hazard Incidents

Placer County and its incorporated cities have experienced many accidental hazardous materials incidents. Accidents involving high pressure gas lines in the County have caused injury and property damage. An underground Kinder Morgan pipeline failed in 2002, causing a significant spill of diesel fuel within a Rocklin

neighborhood adjacent to where the breach occurred (Former Roseville Fire Department Battalion Chief Jeff Carman, pers. com).

Air and Transportation Accidents

The Sacramento region was once the location of three large military installations: the Sacramento Army Depot, Mather Air Force Base and McClellan Air Force Base. All three have been decommissioned and transferred to civilian uses. The only active military installation is Beale Air Force Base, located to the north near Yuba City, California. A review of McClellan Fire Department history prior to the base closure identifies several responses to accidents near Roseville (see Table 15-3).

Table 15-3. Accidents Responded to by McClellan Fire Department, 1950-1980s

Timeframe	Incident
Early 1950s	Apparatus responded to Code 3 alarm at Travis Air Force Base for B-29 crash that involved a nuclear weapon
October 29, 1951	B-29 making an emergency landing crashed and caught fire on Runway 16 injuring 11 crewmen. One firefighter died.
Mid-1950s	EC-121 crashed near Watt Avenue and U Street in Sacramento
Mid-1960s	F-104 crashed next to Haggin Oaks Golf Course.
April 28, 1973	McClellan Fire Department responded to mutual aid at Roseville Rail Yard fire
1982	Multiple alarm fire including a chemical warehouse. Toxic smoke column closed Interstate 80 for several hours
Early 1980s	HH-53 helicopter crashed near PFE Road during an air show at McClellan Air Force Base. The helicopter was attempting a refueling operation with a C-130 refueler when the hose became entangled in the rotor.
Early 1980s	F-111 crashed near Woodland

Source: McClellan Fire Department History

While the risk of military aircraft accidents in the area has been reduced with the closure of McClellan Air Force Base, which was the closest military base to the City of Roseville, the region is not immune to air transportation accidents. On February 16, 2000, an aircraft crashed after take-off from the Sacramento Mather Airport in Rancho Cordova, California. The cargo flight was bound for Dayton, Ohio and all three crewmembers were killed. The cause of the accident was a mechanical failure. The aircraft crashed into an automobile salvage yard.

Local

Air and Transportation Accidents

On February 12, 2006, a Glasair II-S FT kit plane crashed into a home at 1302 Longfellow Drive in Roseville (see Figure 15-2). The pilot was reported to be performing aerial acrobatics when he lost control of the plane and it crashed. The pilot, his passenger, and a resident in the house were killed, and the home was determined to be a total loss. The fire spread to an adjacent home and caused significant damage, however the residents escaped injury.

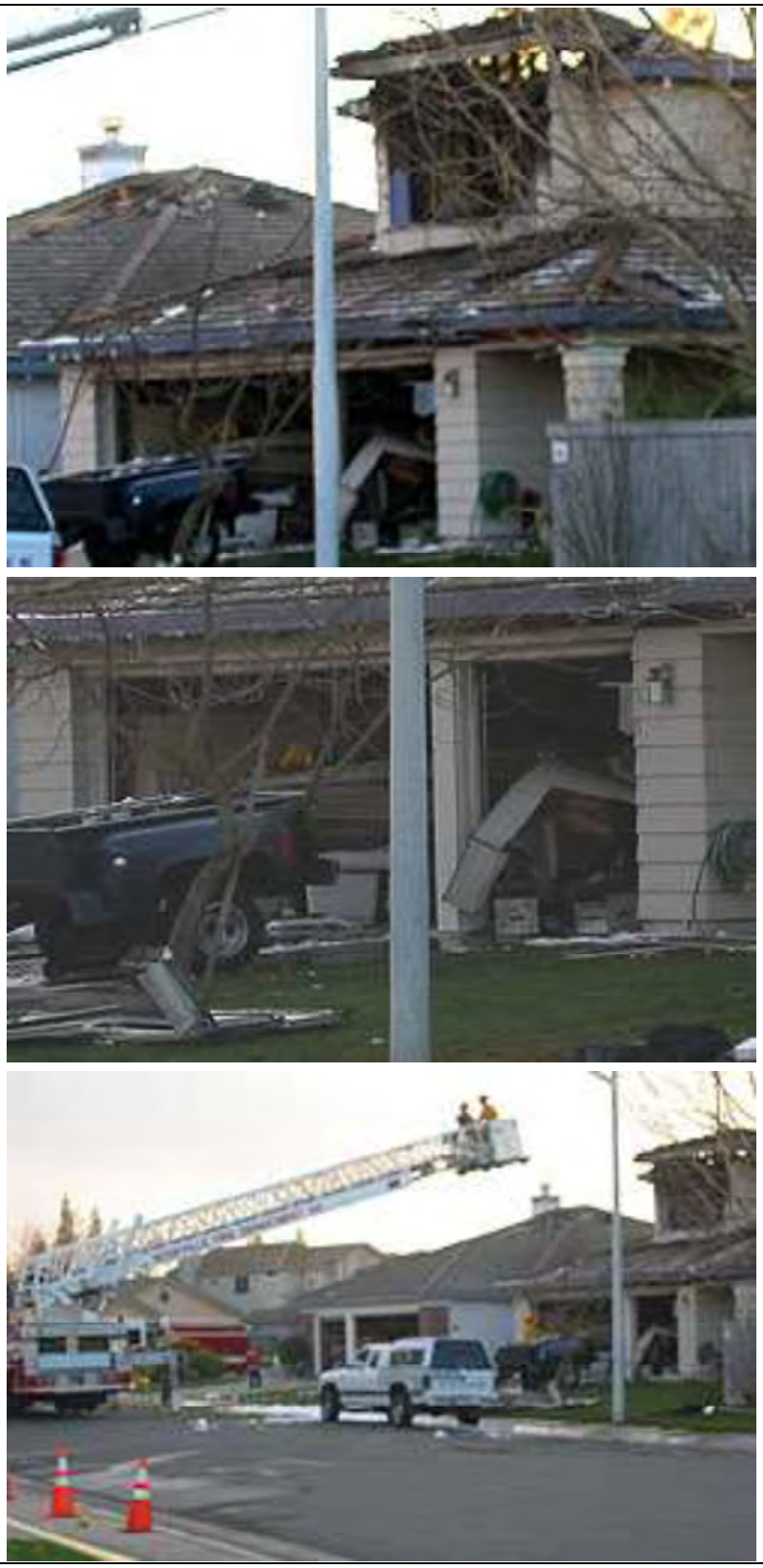


Figure 15-2. February 12, 2006 Aircraft Crash into Residence

Arson Events

On October 21, 2010, an arsonist set fire to the Roseville Galleria Mall that caused an estimated $55 million in property damage (see Figure 15-3). Police responded to the mall after a call from the tenant at GameSpot. They said a young male had entered, said he had a gun, and told them to get out. When police arrived, the male, who did not have a gun, had locked himself in the store. Once barricaded, he started a fire. The blaze destroyed an entire section of the mall, which is a core of the Sacramento economy. With over 240 stores operated by Westfield, the mall – built in 2000 and renovated in 2008 for $270 million – has generated $3.2 million in annual sales tax for the region. Reasons for the arson are unknown. The suspect suffered from mental illness.



Figure 15-3. October 21, 2010 Arson Fire at Galleria Mall

Terrorism Events

Terrorism incidents in Roseville have been limited to individuals seeking to cause damage at Roseville schools. Pipe bombs have been left at a school facility in one past occurrence. No WMDs have been used in a terrorist attack in Roseville.

Technological Hazard Incidents

The City of Roseville has had a number of accidental incidents at the Roseville Rail Yard, private businesses and City facilities. The Fire Department has been called to both the Oakmont High School pool and the Roseville Aquatics Center for chlorine leaks. Sewage spills have occurred on occasion and overflowed into the City's creeks. Roseville Rail Yard accidents have included derailments and leaks of toxic chemicals from transporting hazardous materials in the wrong type of railcars.

The worst human-caused disaster in Roseville's history occurred on April 28, 1973 when a train loaded with munitions bound for Vietnam caught fire in the Roseville Yard (see Figure 15-4). No lives were lost, but significant damage to property in Roseville and jurisdictions in Sacramento County occurred during the 18 hours of explosions. In 1997, a number of unexploded bombs were discovered at the yard during construction of a modernization project (see Figure 15-5).

Roseville's history parallels that of the transcontinental railroad. The federal government passed the act to build the transcontinental railroad in 1862 and shortly thereafter the Central Pacific Railroad was started in Sacramento in 1863. A northern route for the first transcontinental rail line was selected when the South seceded from the Union during the Civil War, and Trustees Charles Crocker, Mark Hopkins, Collis P. Huntington and Leland Stanford started construction on this northern line. The line extended from Sacramento to Rocklin by May 1864 and then construction across the Sierra Nevada Mountains began.

The first structure in Roseville was built in 1864 to serve as a freight and passenger depot for the fledgling railroad. In December 1905, a decision by the Central Pacific Railroad to move the division headquarters from Rocklin to Roseville meant a development boom for Roseville. The junction of the Central Pacific Railroad and the California Central, a north-south line became Roseville, where the largest artificial ice plant in the world operated to keep California's fruit and vegetables fresh as they were transported by rail car to the East. The Pacific Fruit Exchange Ice Plant operated from 1908 to 1974 when all of Southern Pacific's 21,000 rail cars were self-refrigerating.

During wartime, Roseville was a hub of activity as troops and war materials moved through the Roseville rail yards. Thousands of munitions shipments moved through Roseville during World Wars I and II, the Korean and Vietnam conflicts, and Desert Storm.

The largest human-caused disaster in the local area occurred on April 28, 1973 when a wooden floor in a munitions boxcar caught fire from brake shoe sparks. A train engine pulling 103 cars, including 21 Department of Defense freight cars with 7,056 Mark 81 bombs, was loaded at the Navy's ammunition depot in Hawthorne, Nevada on their way to western ports and the Vietnam War.

As the train pulled in to the Roseville yard just west of the Roseville city limits, one of the cars caught fire and the flames spread, igniting other freight cars on the tracks, which were 21 rails wide. Nearly every car was loaded with cargo including paint, lumber, and fertilizer. The most dramatic explosions occurred when cars carrying liquid propane caught fire resulting in explosions that blew out windows five miles away and could be heard 100 miles away. Metal and wood was thrown 3,000 feet into the air.

The result was a series of explosions that caused damages of more than $5.6 million in Roseville and the neighboring communities of Citrus Heights, Antelope, and North Highlands. No lives were lost, but over 100 people were treated for assorted cuts and bruises caused by broken glass and flying debris.







After 18 hours of explosions, Army munitions teams recovered 1,200 unexploded bombs scattered around the area and collected another 300 from rail cars. Aerial photographs from that time show a railroad smoldering and piled with twisted track, shattered cars, and scraps of metal from bomb casings. Much of the debris was buried in the 10-foot-deep craters left by the blast.

Milestones & Memories: the Story of Roseville, California, 1850-2000 by Leonard "Duke" Davis

Figure 15-4. 1973 Roseville Rail Yard Disaster

In 1997, Union Pacific Railroad began work on a $130 million project to modernize the Roseville train yard, including significant automation improvements and the replacement of 86 miles of track with 136 miles of new track.

During project grading, backhoe operators uncovered a Mark 81 bomb intact. Bomb disposal experts from Moffett Field in Mountain View, California were flown in by the Sacramento Sheriff's Department to dispose of the bomb, which they do by digging a pit and exploding the ordnance. When another eight bombs were discovered at the western end of the yard in Antelope, California unexploded ordnance experts from Moffett Field were called back and made the decision to place the bombs in pits and build berms around them. The Sacramento County Sheriff evacuated 300 to 400 homes near the rail yard, and at 2 a.m. blew up the bombs. The explosions shattered windows, cracked walls, and rained shrapnel through the roofs of nearby homes

In all, recovered materials included 16 unexploded MK 81 bombs; 11 partial fragments containing explosive residue; 8,625 pounds (4.31 tons) of bomb fragments; and 131,560 pounds (65.78 tons) of ferrous material. Experts found the bombs were not fused (armed), making them less likely to accidentally detonate. The bombs not destroyed on-site were packaged and transported to a facility in Colfax, Louisiana for detonation.



Figure 15-5. 1997 Bomb Discovery

With growth in the region and in trips through the region to tourist destinations such as the ski resorts at Lake Tahoe, the number of traffic accidents has been steadily increasing. Fatal traffic accidents since 2009 are shown in Table 15-4. Truck with trailer accidents account for a small percentage of the City's reported traffic accidents, but they represent the highest potential for hazardous materials incidents on roadways in the City of Roseville.

Table 15-4. Traffic Accident Counts—2009 to 2014

	2009	2010	2011	2012	2013	2014
Vehicles Involved in Fatal Accidents	10	8	8	12	10	1
Fatalities	6	6	5	6	2	1

Source: http://www.city-data.com/accidents/acc-Roseville-California.html

15.2.2 Location

Large population centers, high visibility tourist attractions, and critical infrastructure accessible to the public present security challenges of an ongoing nature in California. The network of highways, railways, ports and airports used to transport significant amounts of hazardous materials poses a significant technological hazards threat. Hazardous materials incidents may occur anywhere in Placer County. Multiple incidents may happen simultaneously, and all typically require a multi-agency, multi-jurisdictional response. The following sections describe the local areas with the greatest likelihood of hazardous materials incidents, as identified in the *Roseville Hazardous Materials Contingency Plan*.

Transportation Routes

The following transportation facilities have the potential to be affected by human-caused hazards:

- Interstate 80 and State Route 65 bisect the City.
- The J.R. Davis Yard in Roseville, the largest train yard west of the Mississippi, is a major Union Pacific switching center built in 1907 (see Figure 15-6). The 850-acre yard includes 136 miles of track. The site includes a former railcar rebuilding facility, the Antelope Yard, fueling areas, and diesel servicing facilities. The site has been designated as contaminated by the federal government, with substances including volatile organics, chlorinated solvents, polynuclear aromatic hydrocarbons, and heavy metals present due to decades of continuous use as a railroad repair and switching facility. Remediation is ongoing at the site.
- Sacramento International Airport in northwestern Sacramento County operates continuously with two major runways and thousands of passengers traveling via commercial and private airlines. Several major airlines operate out of Sacramento International Airport, with most flying light- to medium-weight passenger jets. Approach and takeoff patterns are usually over rural farmland; however, occasionally patterns are adjusted over more populated locations including Roseville. The City is more than 20 miles from Sacramento International Airport and is not in the direct flight path for the airport, although planes do cross Roseville continuously at high altitudes.
- Additional airports within a 20-mile radius of Roseville include the Lincoln and Auburn Airports in Placer County, Beale Air Force Base (34 miles to the north and the closest active military installation), McClellan Airfield, and the Yuba County airport. The instrument-landing approach to Runway 16 at McClellan crosses a portion of the western edge of the Sierra Vista Specific Plan Area. Aircraft on approach fly as low as 1,600 feet at Baseline Road (approximately 4 miles from the runway threshold). Aircraft using McClellan Airpark include aircraft as large as Boeing 747 and 707 aircraft, in addition to Coast Guard C-130s. Additionally, the National Guard flies T-38 aircraft and Blackhawk helicopters out of Mather Air Force Base.
- Sutter Roseville Medical Center maintains a helistop for critically injured patients flown to the hospital. At one time, the facility was limited to accepting one helicopter. If another patient was being transported

to the medical center, the Roseville Fire Department had to respond to the helipad and emergency medical personnel were on standby should anything occur with more than one helicopter using the helipad. The landing area has been expanded and now the helistop has the capacity to accept more than one helicopter at any one time.

- Emergency and public safety helicopter traffic as well as media aircraft and small commercial aircraft frequently fly over the interstates to respond to emergencies and provide public information via local news media.
- Roseville has a number of established truck routes with a higher potential for hazardous material incidents to occur as a result of traffic incidents, as shown in Figure 15-7.



Figure 15-6. The J.R. Davis Yard in Roseville, the Largest Train Yard West of the Mississippi

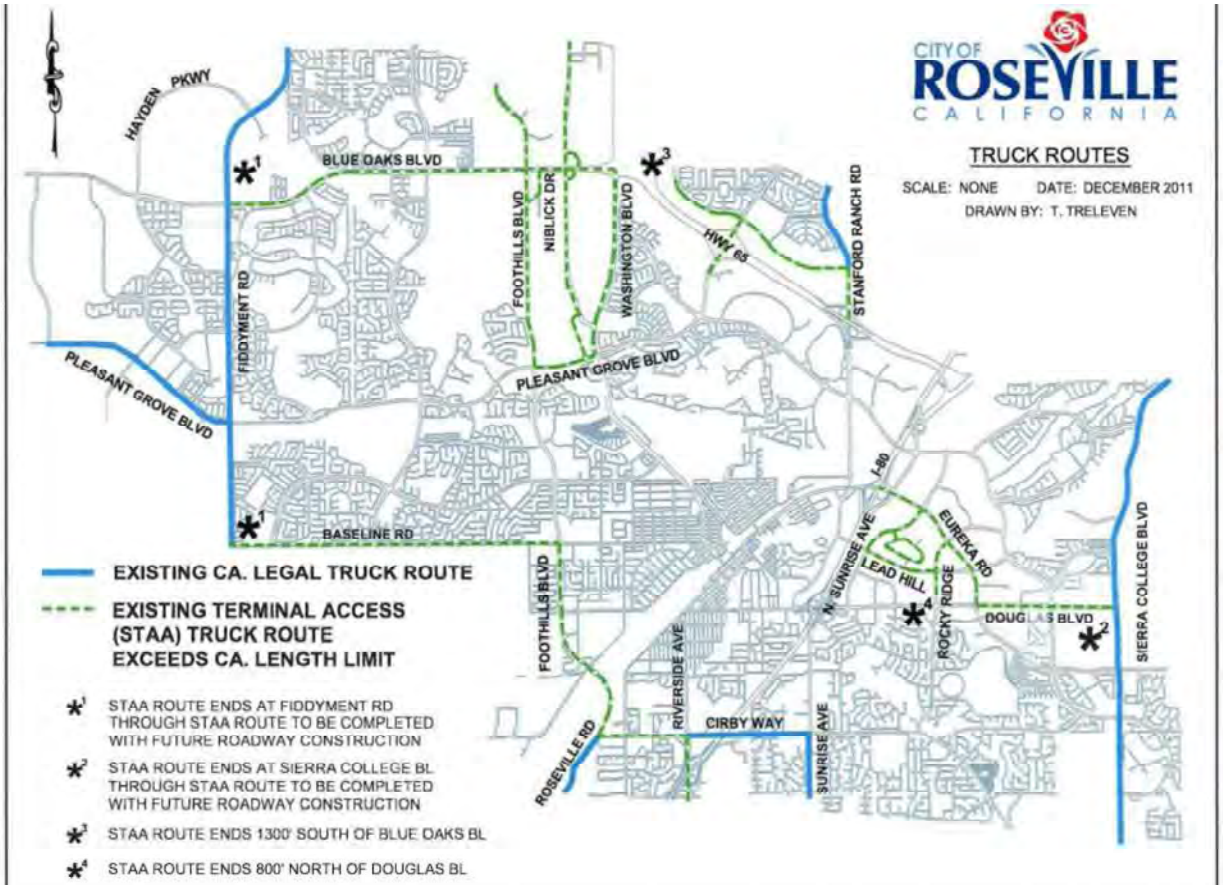


Figure 15-7. Roseville Truck Routes with High Potential for Hazardous Materials Incidents

Pipelines

The Kinder Morgan company owns 3 miles of pipelines generally parallel to the Union Pacific railroad tracks in Roseville that transport high volumes of natural gas through the City (Figure 15-8 shows the company's national pipelines). Other natural gas pipelines run along Interstate 80 with connections between Roseville and Chico. The route to Chico travels through residential areas from the tank farm in Rocklin. The trans-Sierra route from the tank farm in Rocklin to Reno roughly follows the same track as Interstate 80. Pacific Gas and Electric maintains natural gas pipelines in and through Roseville as well.

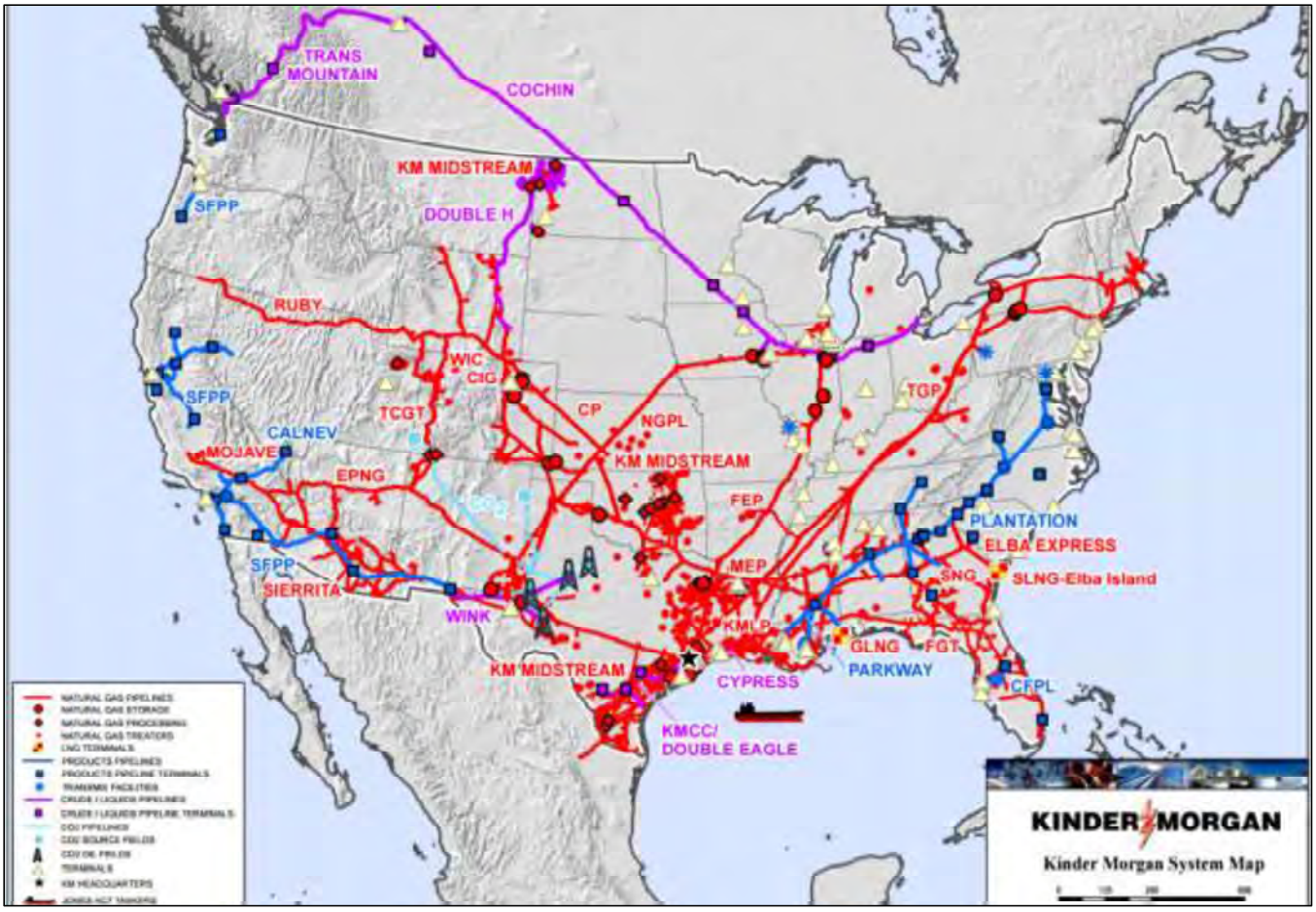


Figure 15-8. Kinder Morgan National Pipeline Map

Business and Industrial Areas

Retail, manufacturing and light industrial firms near State Route 65 (northeastern Roseville and the Sunset Industrial Area of Rocklin) are areas of concern. These facilities have the highest concentration of hazardous materials at fixed facilities in Roseville due to their manufacturing operations. Each business is required to file a detailed, confidential plan with the Roseville Fire Department regarding materials on-site and safety measures taken to protect the public.

Agricultural

Accidental releases of pesticides, fertilizers, and other agricultural chemicals may be harmful to both humans and the environment. Agricultural pesticides are transported daily in and around Roseville en route to their destination in rural areas of Placer County.

Illegal Drug Operations

Illegal operations such as laboratories for methamphetamine pose a significant hazard. Laboratory residues are often dumped along roadways or left in rented hotel rooms, creating a serious health hazard to unsuspecting individuals and to the environment.

Illegal Dumping Sites

Hazardous wastes such as used motor oil, solvents, or paint are occasionally dumped in remote areas of Placer County and Roseville or along roadways, creating a potential health hazard to unsuspecting individuals and to the environment.

Radioactive Materials

Licensed carriers transport radioactive materials along several transportation routes (Interstate 80 and the railroads) through the City of Roseville. The City is notified in advance of these shipments and commits resources as a standby measure should an accident occur.

15.2.3 Frequency

Terrorism

As of 2014, California's economy was the largest of any state in the U.S. Placer County's proximity to the state capitol presents unique conditions for terrorist attacks. The transportation, energy, and communications systems that cross the county have impacts on the local, regional, and even national economy. In general, the risks of a terrorist event involving a WMD are as follows:

- **Chemical—**The risk of a chemical event is present in the City of Roseville. The agricultural community in Placer County uses and stores significant amounts of chemicals for peaceful and productive means that could be used in destructive ways.
- **Explosives—**Pipe bomb and suspicious package events have occurred in Placer County and Roseville in the past. While none of the events has been identified as a WMD, the elements necessary to construct a WMD are readily available. Additionally, the agricultural communities maintain sufficient products and quantities for use in explosive events.
- **Radiological/Nuclear—**The major transportation arteries for vehicles or rail that cross through or near the City of Roseville contribute to the risk of a radiological event. Such products can pass unknown through any one of the regional transportation corridors.
- **Biological—**Anthrax incidents that occurred in the U.S. in October 2001 demonstrate the potential for spreading terror through biological WMDs. The introduction of Newcastle disease in the United States demonstrates how an agent can be introduced to livestock, causing harm to public health and the economy.
- **Combined Hazards—**WMD agents can be combined to have a greater total effect. When combined, the impacts of the event can be immediate and longer-term. Casualties will likely suffer from both immediate and long-term burns and contamination. Given the risks associated with chemical agents in Placer County and the City of Roseville, the possibility exists for such a combined event to occur.

Technological

Hazardous material incidents may occur at any time in the City of Roseville, given the presence of transportation routes bisecting the City, the location of businesses and industry that use hazardous materials, the presence of scattered illegitimate businesses such as clandestine drug laboratories at any given time, and the improper disposal of hazardous waste.

15.2.4 Severity

The severity of human-caused hazards could range from a minor transportation accident or power outage to a full-scale terrorist attack.

The term mass casualty incident (MCI) is often applied to transportation accidents involving air and rail travel, as well as multi-vehicle highway accidents. However, MCIs may also result from hazardous materials incidents or acts of violence, such as shootings or hostage situations. Effects may include serious injuries, loss of life, and associated property damage.

Because large numbers of patients may be involved, significant MCIs may tax local emergency medical and hospital resources, and therefore require a regional response. MCIs may occur throughout the City, day or night, at any time of the year: Interstate 80, State Route 65, and State Route 49 offer the potential for MCIs because of the heavy volume of traffic, although no highway or surface street in the City is exempt from this hazard.

The railroad tracks traversing Placer County, carrying Amtrak passengers as well as freight, also face the risk of an MCI, as do the air corridors above the county. Adverse weather may play a role in roadway, air, or rail accidents. MCIs may also result from acts of violence or terrorism, which could include a chemical, biological or radiological incident, contaminating persons and requiring mass decontamination.

In Placer County, an MCI is defined as any incident with three or more fatalities or critically injured. The first responders, including Roseville Fire, Roseville Police, and emergency room staffs at the local hospitals, follow the same protocol for an MCI whether the number of dead and injured is three, 30 or 300. Mutual aid is requested should Roseville be unable to respond appropriately with available personnel and equipment.

15.2.5 Warning Time

According to the Roseville Terrorism Contingency Plan, only 5 percent of all terrorism incidents are preceded by a warning. In the case of a technological hazard, accidents occur without predictability under circumstances that give responders little time to prepare.

15.3 SECONDARY HAZARDS

The largest secondary impact caused by human-caused hazards would be economic. Economic impacts from human-caused hazards are described in Section 15.5.5.

15.4 EXPOSURE

The risk assessment for this hazard is based on a facility's criticality and physical vulnerability:

- Criticality is a measure of the potential consequence of an accidental or terrorist event as well as the attractiveness of the facility to a potential adversary or threat. The criticality for each critical facility is based on the factors shown in Table 15-5.
- Vulnerability is a measure of the physical opportunity for an accident or an adversarial attack. This assessment takes into consideration physical design, existing countermeasures, and site layout. The vulnerability for each critical facility is based on the criteria shown in Table 15-6.

Table 15-5. Criticality Factors

Criterion	Low Criticality	Medium Criticality	High Criticality
Awareness[a]	Not known/Neighborhood	City/Region/County	State/National
Hazardous Materials[b]	None / limited and secure	Moderate to large and secure	Large, minimum or no security
Collateral Damage Potential[c]	None or low	Moderate/immediate area or within 1 mile radius	High/immediate area or within 1 mile radius

Site Population[d]	0 – 300	301 – 1,000	1,001 or greater
Public/ Emergency Function[e]	No emergency function, or could be used for emergency function in the future	Support emergency function—redundant site	Emergency function—critical service with or without redundancy

a. Awareness—How aware is the public of the existence of the facility, site, system, or location?
b. Hazardous Materials—Are flammable, explosive, biological, chemical and/or radiological materials present on site?
c. Collateral Damage Potential—What are the potential consequences for the surrounding area if the asset is attacked or damaged?
d. Site Population—What is the potential for mass causalities, based on the capacity of the facility.
e. Public or Emergency Functions—Does the facility perform a function during an emergency? Is this facility or function capable of being replicated elsewhere?

Table 15-6. Vulnerability Criteria

Criterion	Low Vulnerability	Medium Vulnerability	High Vulnerability
Accessibility[a]	Remote location, secure perimeter, tightly controlled access	Controlled access, protected or unprotected entry	Open access, unrestricted, patrolling security, sign restrictions
Automobile Proximity[b]	Not within 75' – 100'	Not within 25' – 50'	Adjacent or not within 10'
Asset Mobility[c]	Moves or is relocated frequently	Moves or is relocated occasionally	Permanent/Fixed
Proximity to other Critical Facilities[d]	Greater than 1.5 – 2 miles	Greater than 3/4 - 1 mile	Within 1/2 – 3/4 mile
Secure Design[e]	No areas for concealment of packages, air intakes are on roof, access ways are not under the structure.	Area of concealment present, greater than 25' from the structure; Air intakes located at least 10' above ground, may have under structure access drives.	Areas of concealment within 25', air intakes at ground level, under structure access drives.

a. Accessibility—How accessible is the facility or site to the public?
b. Automobile Proximity—How close can an automobile get to the facility? How vulnerable is the facility to a car bomb attack?
c. Asset Mobility—Is the facility or asset's location fixed or mobile? If mobile, how often is it moved, relocated, or repositioned?
d. Proximity to other critical facilities—If the facility is close to other critical facilities then there could be an increased probability of the facility receiving collateral damage.
e. Secure design—General evaluation of areas of obstruction, air intake locations, parking lot and road design and locations and other site design aspects.

15.4.1 Population

A human-caused hazard event could range from an isolated accident to a coordinated attack by multiple agents upon multiple targets. Large-scale incidents have the potential to kill or injure many citizens in the immediate vicinity, and may also affect people a relative distance from the initial event. Variables affecting exposure for a WMD attack and a hazardous material accident include the physical and chemical properties of the WMD, the ambient temperature, wind speed, wind direction, barometric pressure, and humidity.

Computer models are used by Roseville's Hazardous Materials teams to provide general data to first responders to advise evacuations or sheltering in place. With so many variables to determine "toxic endpoints" as defined by the California Environmental Protection Agency, distances are difficult to forecast. In general, those close to the City's transportation corridors or businesses with acutely hazardous materials are more at risk for some sort of effect. Each chemical incident will be different and the scenarios are too numerous to describe in this Plan.

Hazardous materials pose a significant risk to emergency response personnel. All potential first responders and follow-on emergency personnel in the City of Roseville currently are and will be properly trained to the level of emergency response actions required of their individual position at the response scene. Hazardous materials also pose a serious long-term threat to public health and safety, property and the environment.

15.4.2 Property

According to the City of Roseville's 2035 General Plan, there were 49,998 housing units in the City as of 2010. Single-family detached residential units account for 75.7 percent of the total developed residential units in Roseville according to the City's current General Plan. The total number of units by type of dwelling unit is shown in Table 15-7.

Table 15-7. Residential Dwelling Units in the City of Roseville as of 2012

Type of Unit	Existing Citywide Units
Single Family	35,809
Mobile Home	491
Multi-Family (>=3 units attached)	10,988
Total	**47,288**

Source: City of Roseville 2035 General Plan, Housing Element

Roseville has over 27 million square feet of developed non-residential land uses covering over 3,000 acres city-wide. A majority of this development has occurred since the mid-1980s when the specific plan process was established and large tracts of land were entitled for development. Roseville and Placer County are among the fastest growing communities in California, making them a higher profile target for terrorism. New development has been the target of arson fires and eco-terrorism in the County.

15.4.3 Critical Facilities and Infrastructure

There are no high profile federal or state buildings in Roseville. Critical facilities are limited to City facilities, Placer County facilities, and other government facilities such as the U.S. Post Office, private utility infrastructure and administrative offices, and medical facilities. Roseville's civic facilities are designed to welcome the public, with convenient parking and customer service areas. Except for the Roseville Police Facility, there are limited secure areas that are restricted to the public. Based on the criticality factors and vulnerability criteria described above, these facilities are all at risk because of their accessibility, automobile accessibility, and lack of a secure or hardened design.

Several of Roseville's critical emergency response facilities are located adjacent to the Roseville Rail Yard and pressurized underground pipelines, including the Roseville Civic Center, a primary location for City staff and services (see Figure 15-9), the Roseville Fire Department, which houses administration functions in Fire Station No. 1, and the City's emergency operations center. Significant regional critical facilities such as the Placer County courts and the main office for the U.S. Post Office are also close to the rail yard.



Figure 15-9. Roseville Civic Center

Several factors make gathering places such as the Roseville Civic Center vulnerable to human-caused hazards:

- All are accessible to the general public, to benefit aesthetically pleasing design and customer service.
- Design features, including types of building materials, and screened enclosures for mechanical equipment and solid waste, limit visibility and may contribute to the damage incurred should an intentional or accidental event occur.
- Automobile access is required in the design of most buildings in Roseville, with disabled access parking and easily accessible parking a valued feature.
- Most high population centers do not feature any limitations to access by the public or vehicles, although restricted access to large employment center sites with acutely hazardous materials is built into the design at these facilities.

15.4.4 Environment

The risk of human-caused hazards to the environment is considerable. Hazardous materials spilled along roads or railways could easily pollute rivers, streams, wetlands, riparian areas and adjoining fields. Other hazardous materials released into the air could severely impact plant and animal species. The City of Roseville recognizes this risk and has taken steps to reduce the risk exposure to the natural environment. By reducing the risk exposure to the built environment, the City will also mitigate potential losses to the natural environment.

15.5 VULNERABILITY

15.5.1 Population

Although human-caused hazards have not resulted in a large number of deaths in this area, this type of hazard can be deadly and widespread. Injuries and casualties were not estimated for this hazard. Any individuals exposed to human-caused hazards are considered to be at risk, particularly those working as first responder professionals.

15.5.2 Property

All structures in Roseville are physically vulnerable to a human-caused hazard. The emphasis on accessibility, the opportunity for roof access, driveways underneath some structures, unmonitored areas, the proximity of many structures to transportation corridors and underground pipelines, and the potential for a terrorist to strike any structure randomly all have an impact on the vulnerability of structures. Specific vulnerabilities are on file with the Roseville Fire Department as part of a State Homeland Security Assessment Survey and surveys conducted to complete this mitigation plan.

15.5.3 Critical Facilities and Infrastructure

Most critical facilities and infrastructure in Roseville would be vulnerable to human-caused hazards, including utilities, data and telecommunications systems, and transportation facilities.

15.5.4 Environment

The environment vulnerable to a human-caused hazard is the same as the environment exposed to the hazard. While human-caused disasters have caused significant damage to the environment, estimating damage can be difficult. Loss estimation platforms such as HAZUS-MH are not equipped to measure environmental impacts of these types of hazards. The best gauge of vulnerability of the environment would be a review of damage from past human-caused hazard events. Loss data for damage to the environment were not available at the time of this Plan update. Capturing this data from future events could be beneficial in measuring the vulnerability of the environment for future updates.

15.5.5 Economic impacts

Economic impacts from human-caused hazards could be significant. The cost of a terrorist act would be felt in terms of loss of life and property, disruption of business activity and long-term emotional impacts. Recovery would take significant resources at the local level.

Utility losses could cause a reduction in employment, wholesale and retail sales, utility repairs, and increased medical risks. The City may lose sales tax and property taxes, and the finances of private utility companies and the businesses that rely on them would be disrupted.

The economic impact of data and telecommunications losses can be great, as computer security breaches, crime conducted via the world wide web such as identify theft, and many more forms of human-caused economic losses occur daily. Millions of dollars are lost each year as criminals and cyberterrorists steal sensitive information and funds from individuals and organizations.

The economic impacts would be significant if a transportation facility were rendered impassable. The loss of a roadway or railway would have serious effects on the City's economy and ability to provide services. Loss of travel routes on Interstate 80 or State Route 65 would result in loss of commerce, and may impact the City's ability to provide emergency services to its citizens by delaying response times or limiting routes for equipment such as fire apparatus, police vehicles, and ambulances. Fuel deliveries would also be impacted.

The effects of re-routed traffic could also have a serious impact on local roadways. For example, the closure of the roadway at Folsom Dam has resulted in severe local traffic and the closure of businesses in downtown Folsom due to lack of traffic along the Dam Road route. Heavy traffic on routes through central Roseville already occur at peak commute times when Interstate 80 is congested. Traffic control may burden the City's Public Works Department. Mass transit services would be impacted as routes may be delayed or forced to be detoured, causing economic impacts on Roseville transit and on those who ride buses in Roseville.

15.6 FUTURE TRENDS IN DEVELOPMENT

The potential for human-caused hazards in Roseville is not likely to lessen or prohibit development in Roseville. The threat of human-caused hazards and the availability of Homeland Security Funds will influence future development of the City's critical facilities. Multi-purpose facilities such as the Mahany Library (which also includes a community center and the public access studio) can be used as both an emergency response command center on the west side of Roseville and an information center to inform the public through the internet and broadcast facilities that will be on site.

15.7 REVIEW OF EXISTING ORDINANCES, PROGRAMS, AND PLANS

15.7.1 City of Roseville Emergency Response Plan

Adopted on July 21, 2004 and updated in 2010, the Roseville Emergency Operations Plan addresses the planned response to emergency situations associated with natural disasters, technological (human-caused) emergencies, and war emergency operations in or affecting the City of Roseville. The plan is an operational plan as well as a reference document for pre-emergency planning and emergency operations. It establishes the following:

- An emergency management organization to mitigate any significant emergency or disaster affecting the City of Roseville
- Policies, responsibilities and procedures to protect the health and safety of citizens, public and private property, and the environment from the effects of natural and human-caused emergencies and disasters
- Operational concepts and procedures associated with field response to emergencies, emergency operations center activities, and the recovery process
- A framework for implementing the Standardized Emergency Management System in Roseville.

The Emergency Operations Plan outlines the natural and human-caused hazards most likely to occur in Roseville. It provides significant detail for each responding section assigned to City staff and mutual aid agencies prior to an emergency—management, operations, planning, logistics and finance. Roseville's Emergency Preparedness Manager conducts periodic tabletop and simulated exercises in conjunction with the Placer County Office of Emergency Services and affiliated agencies such as Sutter Roseville Medical Center and Kaiser Permanente Medical Center to ensure that staff is prepared and adequate resources are in place prior to any incident.

City of Roseville departments and other agencies providing emergency response within the City will review this plan at least annually in association with the Multi-Hazard Mitigation Steering Committee. A comprehensive review and subsequent gap analysis report was conducted on the Roseville Emergency Operations Plan in conjunction with the 2016 hazard mitigation planning process. Prioritized recommendations for revisions were provided to the City of Roseville.

15.7.2 City of Roseville Terrorism Contingency Plan

The City of Roseville Terrorism Contingency Plan was prepared in 2004 with grant funds provided through Cal OES by the U.S. Department of Homeland Security. The plan was prepared in collaboration with the Placer

County Office of Emergency Services, Placer County staff and representatives of the six incorporated cities in the Placer County Operational Area. The Terrorism Plan provides an overview of how the Emergency Operations Plan will be activated, how resources will be organized, and how staff will respond with state and federal resources. Specifically, the Terrorism Plan has the following provisions:

- Identifies how local, state, and federal response resources are integrated.
- Establishes a common response protocol to terrorist threats and events.
- Implements existing mutual aid programs.
- Outlines a unified strategic plan for all responders.

The Terrorism Plan is on file with the City of Roseville Fire Department. The City's Emergency Response Manager conducts training for all those assigned responsibilities as part of the plan in addition to coordinating with the Placer County Office of Emergency Services and other agencies charged with protecting the public in the event of a terrorist attack.

15.7.3 City of Roseville Hazardous Materials Contingency Plan

The Hazardous Materials Contingency Plan, completed in September 2004, identifies non-terrorist related hazardous materials responsibilities in order for the City to prepare, respond and recover from an event. The objectives of the Hazardous Materials Plan are as follows:

- Establish policies and responsibilities for protecting the health and safety of the general population and visitors in the City of Roseville and surrounding communities, the environment, and public and private property from the effects of accidental hazardous materials incidents.
- Identify the emergency response organizations that are responsible for managing hazardous materials incidents in or near the City of Roseville.
- Establish operational concepts for staffing, training, operating and supporting the City of Roseville hazardous materials team. The Hazardous Materials Plan is coordinated with the Placer Operational Interagency Response Team Hazard Plan.
- Direct all individuals, agencies, and departments referenced in the Hazardous Materials Plan to develop standard operating procedures and emergency response checklists that are consistent with the Hazardous Materials Plan and the City's Emergency Operations Plan.

15.7.4 State of California Certified Unified Program Agency

The City of Roseville is a State of California Certified Unified Program Agency. This designation identifies the City as a licensing agency for six hazardous-material-related programs. It enables the City of Roseville to implement its own hazardous materials emergency response program. Mutual aid agreements are also in place for incident response. Each business that responds yes to any of the following questions must submit a Unified Program Consolidated Form with facility information to the Roseville Fire Department:

- **Hazardous Materials—**Do you have on-site hazardous materials at or above 55 gallons for liquids, 500 pounds for solids, or 200 cubic feet for compressed gases, or the applicable threshold for an extremely hazardous substance specified in federal law; or do you handle radiological materials in quantities for which an emergency plan is required pursuant to applicable law?
- **Underground Storage Tank—**Do you have on-site underground storage tanks?
- **Above-Ground Storage Tank—**Do you have on-site above-ground storage tanks for storage of petroleum?
- **Hazardous Waste—**Do you operate a facility that generates, recycles, or treats hazardous waste, among other activities?

The Fire Department requires existing and proposed businesses to submit lists of hazardous materials they use. The list is maintained by the Fire Department Life Safety/Hazardous Materials Officer and updated periodically.

15.7.5 Roseville Police Department

Following the provisions and emergency response, mitigation, and recovery structure of the State Emergency Management System, the federally mandated National Incident Management System, and the National Response Plan, the Roseville Police Department is prepared to meet the challenge of intentional criminal acts, including acts of terrorism, as well as technological, accidental, or natural hazards in the following ways:

- Activation of local emergency response plans using multi-disciplinary resources, including but not limited to regional municipal and county law enforcement, the Joint Terrorism Task Force overseen by the FBI, the Department of Justice Anti-Terrorism Information Center, state and federal military personnel, and private resource agencies
- Deployment of local tactical resources to mitigate human-caused acts of terrorism or intentional business disruption, including SWAT, hostage negotiators, rapid containment team, the tactical communications team, and explosive ordnance personnel as necessary
- Use of the Crime Scene Investigations Unit for post-incident evidence collection and investigation
- Intake, processing, analysis, and investigation of all incidents with the potential for large-scale impact in a professional, timely manner.

15.7.6 Roseville Public Safety Communications

Communications personnel are prepared to take the following actions:

- Appropriately recognize and document citizens' reports of suspicious activity.
- Deploy appropriate resources to prevent, investigate, mitigate, and provide recovery services following incidents of human caused hazards, as well as natural and technological disasters.
- Coordinate resource management of personnel, equipment, and facilities during established crisis incidents.
- Work within the framework of the State Emergency Management System to provide emergency communications to field units and emergency operations personnel during emergency events.
- Deploy mutual aid assistance in support of local, state, and national entities during crisis incidents.
- Provide life-saving pre-arrival instructions on emergency medical incidents, both large-scale and of an individual nature.

15.7.7 Roseville Fire Department

Training

Roseville Fire Department personnel are highly trained to handle all aspects of emergency service. All first response personnel are trained in incident command, advanced firefighting skills, basic life support, essential rescue skills, and basic hazardous materials response. All first response personnel are trained to meet or exceed the following state training certification levels: Firefighter I & II, CPR, Emergency Medical Technician I, Hazmat First Responder Operations Decon and ICS 200.

To support these first responders, specialized teams of personnel are trained and certified in tower rescue, above/below grade rescue, confined space rescue, trench rescue, technical rescue, swift water rescue, dive rescue, specialized hazardous materials response, hazardous materials railcar and tank truck response, terrorism response, multi-casualty management, and advanced life support.

The department's staffing includes a full-time training officer who oversees the Fire Training Division. In addition to the training officer, the department draws from a cadre of state certified ICS, fire, EMS, hazmat and technical rescue instructors to conduct regular training exercises to maintain and enhance competency of personnel in all aspects of emergency response. The department also sends personnel to the National Fire Academy, California Specialized Training Institute, Hazmat Continuing Challenge and other off site programs for advanced certifications and training.

The Fire Department maintains a state-of-the-art training facility within the city limits. The Fire Training Center includes two classrooms, a six-story burn tower, command center and other specialized training props such as above- and below-grade vaults, tanks, cargo tanks and a rail tank car. The Roseville Fire Training Center has been state certified as a regional fire academy and for Hazardous Materials Technician / Specialist, Urban Search and Rescue Systems and Confined Space training.

In addition to training in-service response personnel, the Roseville Fire Training Center hosts a regional fire academy in cooperation with Sierra College. The Roseville Fire Training Center also provides regional training to other fire agencies, some of which are under contract with the Department of Homeland Security. Regular regional training includes the Hazardous Materials Technician / Specialist series, Low Angle Rope Rescue, Trench Rescue, Confined Space Rescue, and Urban Search and Rescue Systems I.

Response Time and Mutual Aid

The Roseville Fire Department is a fully functional agency that primarily provides fire suppression and emergency medical services for the urban environment of the City. The department operates eight stations. The department has eight paramedic engine companies, with a minimum staffing of three, two paramedic truck companies with a minimum staffing of four, and one battalion chief. The department also operates a hazardous materials response unit (cross-staffed the truck company); five grass/wildland units, and one technical rescue unit (cross-staffed by engine companies). The department maintains four reserve engines and one reserve truck.

The Fire Department has established a Standards of Response Coverage Plan that includes a travel time standard of 4 minutes from the time the apparatus leaves the station to the arrival of the first engine on scene. Due to significant growth in the City, additional fire stations are needed to achieve this response time. Fire Station 9 opened in May 2013 to serve the new development anticipated in West Roseville.

The City of Roseville has mutual aid agreements with local fire departments and districts in surrounding Placer County and Sacramento County. These personnel cooperate in the same training program as the City firefighters to ensure a high level of competency even with borrowed resources. The department participates in the statewide mutual aid system to bring additional resources from anywhere in California or the nation if this level of aid does not meet the incident needs.

Hazardous Materials Response

Hazardous Materials Listing

All hazardous materials handlers that store in excess of 55 gallons of liquid, 500 pounds of solids, or 200 cubic feet of gas are required to submit Hazardous Materials Management Business Plans to the Roseville Fire Department. These plans provide emergency contact information, site-specific chemical inventories, and vicinity and facility maps. Facilities storing materials that are "acutely" hazardous and in excess of the quantities in CCR, Title 19, Tables I, II or III must submit a more comprehensive Risk Management Plan, which includes off-site consequences analysis, maintenance, and training programs, and an executive summary. Owners/operators of above-ground tanks containing in excess of 660 gallons of petroleum hydrocarbons (or an aggregate quantity of 1,320 gallons) must comply with the California Aboveground Petroleum Storage Act, which requires the preparation of a spill prevention, control, and countermeasure plan.

Development Review Process

The Fire Department reviews any development proposal that may be impacted by or cause an impact related to the storage, handling, or disposal of hazardous materials. A Hazardous Materials Management Plan and, if necessary, a Risk Management Prevention Plan are required as part of the development process per state law. When considering any use, the City analyses the use of toxic or hazardous materials requiring the filing of a business plan for emergency response pursuant to Section 25503.5 of the California Health and Safety Code or materials identified in Section 5194, Title 8 of the CCR. All users must submit a list of hazardous and toxic materials with a qualified discussion of potential chronic and acute long-term health effects, including effects on children, and effects from acute short-term or chronic long-term exposure.

In addition, a plan must be submitted specifying procedures for mitigating the emissions of toxic substances and groundwater monitoring and for identifying methods of hazardous waste disposal. All projects must be reviewed for compliance with the Placer County Hazardous Waste Management Plan.

Intergovernmental Coordination

The Roseville Fire Department works cooperatively with other local and state agencies in a coordinated effort to inform and educate the public regarding the storage, handling, and disposal of household hazardous materials. This includes continued coordination with the Placer County Hazardous Materials Response Teams.

Hazardous Waste Drop-off

The City of Roseville partners with public and private entities to remove household hazardous waste from Roseville's waste stream. The disposals include the following:

- **Household Hazardous Waste Collection—**The Western Placer Waste Management Authority provides a collection service for household hazardous waste. Residents can transport waste to the Authority's facility north of Roseville or schedule a pickup through the Roseville Solid Waste Division.
- **Used Electronic Equipment—**The Materials Recovery Facility accepts old televisions and other electronic waste.
- **Used Motor Oil Recycling—**There are six locations in Roseville designated for used motor oil recycling drop-off.
- **Sharps (or Needles)—**Roseville residents who use medical needles for in-home care are encouraged to purchase sharps containers, which hold 100 needles, at a nominal cost from several drug stores in the City. Residents are asked to dispose of all medical needles and containers properly so they do not enter the waste stream.

Interagency Cooperation for Emergency Response

The City of Roseville Fire Department responds in accordance with the City of Roseville Hazardous Materials Emergency Response Plan to hazardous materials emergencies. Both the California Highway Patrol and the City of Roseville have developed a Hazardous Materials Emergency Plan that discusses the participants' responsibilities, organization and operation to be complied with in the event of a hazardous materials emergency, including clean-up and decontamination procedures.

Hazardous Materials Truck Route

The City of Roseville does not have specific truck routes for hazardous materials. The City does have established truck routes in the city limits, and in the event hazardous materials are to be transported within the city limits, a permit is required from the Roseville Police Department. Typically, trucks with bulk deliveries of hazardous materials use State Route 65 to Blue Oaks Boulevard and then access any of the north-south corridors, including

Washington Boulevard, Industrial Avenue, and Foothills Boulevard where local businesses use hazardous materials in their business activities.

Routes for hazardous materials are coordinated with the California Department of Transportation (Caltrans), the California Highway Patrol, and the Roseville Police, Fire, and Public Works Departments.

Since Blue Oaks Boulevard remains incomplete, there is a risk of hazardous material being transported on bulk trucks through residential areas to reach the Pleasant Grove Wastewater Treatment Plant and the Energy Park. The same is true for transportation of hazardous material to the Booth Road plant, but chlorine gas is no longer used for disinfection there (nor at other water plants serving Roseville).

Hazardous Materials Fee Program

The Roseville Fire Department has adopted a fee schedule for hazardous material permitting, storage, use, handling, and generation. The department also charges for fire and life safety inspections, plan review, and miscellaneous activities such as a Hazardous Materials Business Plan Review.

15.8 SCENARIO

Two human-caused hazard scenarios could have a significant impact on the City of Roseville:

- The first scenario would involve hazardous materials being transported via rail or highway (Interstate 80) across the planning area. The release of hazardous materials via intentional or unintentional means could impact large population centers within the City. Advance knowledge of these shipments and their contents would play a role in preparedness for this scenario, thus reducing its potential impact. The biggest issue in response to hazardous material is material identification and containment.
- The second scenario would be a terrorist event at a large gathering place such as a mall or event center. Terrorist events happen with little or no warning. With a population in excess of 120,000 people, Roseville does possess potential targets for terrorist activities. The City has taken steps to assess these sites as well as probable scenarios in its Terrorism Contingency Plan.

15.9 ISSUES

Future actions needed at the local level to address human-caused hazards include but are not limited to the following:

- Continue all facets of emergency preparedness training for police, fire, public works, and city manager/public information staff in order to respond quickly in the event of a human-caused disaster. Enhance awareness training for all City employees to recognize threats or suspicious activity in order to prevent an incident from occurring.
- Continue all facets of the City's hazardous materials team training and response through commitment of resources from the Fire Department budget and the addition of funding through the Sacramento Regional Homeland Security budget.
- Continue to improve response times for public safety throughout the City so as to reduce exposure to human-caused incidents. The City will maintain appropriate staffing levels of public safety personnel to address vulnerabilities identified in this chapter.
- Train first responders and all appropriate City staff to implement protocols contained in the City of Roseville Terrorism Response Plan.
- Continue to implement the City of Roseville Hazardous Materials Contingency Plan with enhancements as warranted by the type of uses in the City and new technologies in preventing hazardous materials incidents.

- Continue to work proactively with Union Pacific Railroad regarding the following:
  - Placards and labeling of containers
  - Emergency plans and coordination
  - Standardized response procedures
  - Notification of the types of materials being transported through Roseville on at least an annual basis
  - Random inspections of transporters as allowed by Union Pacific
  - Installation of mitigating techniques along the rail yard at critical locations
  - Routine hazard communication initiatives
  - Enhancing security along the rail corridor should the alert system go higher than Orange
  - Continuously looking to the use of safer alternative products to conduct rail transport operations.
- Continue regular testing of the alarm system along the Union Pacific railroad tracks in Central Roseville.
- Utilize Crime Prevention Through Environmental Design (CPTED) in future planning efforts as well as enhancing existing infrastructure and buildings to prevent or mitigate human-cause incidents. CPTED is an urban planning design process that integrates crime prevention with neighborhood design and community development. CPTED is based on the theory that the proper design and effective use of the built environment can reduce crime and the fear of crime and improve the quality of life. CPTED creates an environment where the physical characteristics, building layout, and site planning allow inhabitants to become key agents in ensuring their own security.
- Work with the private sector to enhance and create Business Continuity Plans in the event of an emergency.
- Relocate or construct a redundant Emergency Operations Center farther from the Roseville Rail Yard and floodplain.
- Maintain an emergency services information line that the public can contact 24 hours a day during an emergency incident to ask questions of emergency staff.
- Coordinate with all Roseville school districts to ensure that their emergency preparedness plans include preparation for human-caused incidents.
- Encourage local businesses to adopt Information Technology and telecommunications recovery plans.
- Promote 72-hour self-sufficiency through the Emergency Preparedness Manager's efforts, the Roseville website, Roseville Coalition of Neighborhood Associations, and other media.
- Continue to share the human-caused hazard risk and preparedness presentation given at the public meetings and City Council workshop as part of this preparedness effort.
- Maintain the on-line Citizens Advisory Panel of 2,400 households and periodically e-mail emergency preparedness information including human-caused hazard preparedness instructions and reminders.

Future actions needed at the regional level to address human-caused hazards include but are not limited to the following:

- Participate in regional, state and federal efforts to gather terrorism information at all levels and keep public safety officials briefed at all times regarding any local threats. Staff will then further develop response capabilities based on emerging threats.
- Participate in the Cal OES Disaster Resistant California annual conference and other training sessions sponsored by regional, state and federal agencies.
- Participate in regional training exercises per the requirements of Homeland Security Presidential Directive #8 in support of national preparedness. These training exercises, sponsored by the Sacramento Regional Office of Homeland Security, will test and evaluate the ability to coordinate the activities of city, county and state government first responders, volunteer organizations and the private sector in responding to terrorism and technological hazards. The trainings will enhance interagency coordination,

provide training to staff, test response and recovery capabilities, and activate the National Incident Management System and the mutual aid system.

- Review existing automatic/mutual aid agreements with other public safety agencies to identify opportunities for enhancement.

16. PLANNING AREA RISK RANKING

A risk ranking was performed for the hazards of concern described in this Plan. This risk ranking assesses the probability of each hazard's occurrence as well as its likely impact on the people, property, and economy of the planning area. When available, estimates of risk were generated with data from Hazus-MH or GIS analysis using methodologies promoted by FEMA. For hazards of concern with less robust datasets, qualitative assessments were used. The results are used in establishing mitigation priorities.

The climate change hazard was not ranked because its impacts are factored into each individual hazard and thus are peripherally included in this assessment. The human-health and human-caused hazards were not ranked because they are not considered natural hazards.

16.1 PROBABILITY OF OCCURRENCE

The probability of occurrence of a hazard is indicated by a probability factor based on likelihood of annual occurrence:

- High—Hazard event is likely to occur within 25 years (Probability Factor = 3)
- Medium—Hazard event is likely to occur within 100 years (Probability Factor =2)
- Low—Hazard event is not likely to occur within 100 years (Probability Factor =1)
- No exposure—There is no probability of occurrence (Probability Factor = 0)

The assessment of hazard frequency is generally based on past hazard events in the area. Table 16-1 summarizes the probability assessment for each hazard of concern for this Plan.

Table 16-1. Probability of Hazards

Hazard Event	Probability (high, medium, low)	Probability Factor
Dam Failure	Low	1
Drought	High	3
Earthquake	High	3
Flooding	Medium	2
Landslide	Low	1
Severe Weather	High	3
Wildfire	High	3

16.2 IMPACT

Hazard impacts were assessed in three categories: impacts on people, impacts on property and impacts on the local economy. Numerical impact factors were assigned as follows:

- **People**—Values were assigned based on the percentage of the total ***population exposed*** to the hazard event. The degree of impact on individuals will vary and is not measurable, so the calculation assumes for

simplicity and consistency that all people exposed to a hazard because they live in a hazard zone will be equally impacted when a hazard event occurs. An element of subjectivity can be used in assigning values for impacts on people. Impact factors were assigned as follows:

- High—50 percent or more of the population is exposed to a hazard (Impact Factor = 3)
- Medium—25 percent to 49 percent of the population is exposed to a hazard (Impact Factor = 2)
- Low—25 percent or less of the population is exposed to the hazard (Impact Factor = 1)
- No impact—None of the population is exposed to a hazard (Impact Factor = 0)

- **Property**—Values were assigned based on the percentage of the total ***property value exposed*** to the hazard event:

  - High—30 percent or more of the total assessed property value is exposed to a hazard (Impact Factor = 3)
  - Medium—15 percent to 29 percent of the total assessed property value is exposed to a hazard (Impact Factor = 2)
  - Low—14 percent or less of the total assessed property value is exposed to the hazard (Impact Factor = 1)
  - No impact—None of the total assessed property value is exposed to a hazard (Impact Factor = 0)

- **Economy**—Values were assigned based on the percentage of the total ***property value vulnerable*** to the hazard event. Values represent estimates of the loss from a major event of each hazard in comparison to the total assessed value of the property exposed to the hazard. For some hazards, such as wildfire, landslide and severe weather, vulnerability was considered to be the same as exposure due to the lack of loss estimation tools specific to those hazards. Loss estimates separate from the exposure estimates were generated for the earthquake and flood hazards using Hazus-MH.

  - High—Estimated loss from the hazard is 20 percent or more of the total exposed property value (Impact Factor = 3)
  - Medium—Estimated loss from the hazard is 10 percent to 19 percent of the total exposed property value (Impact Factor = 2)
  - Low—Estimated loss from the hazard is 9 percent or less of the total exposed property value (Impact Factor = 1)
  - No impact—No loss is estimated from the hazard (Impact Factor = 0)

Each category of impact was assigned a weighting factor to reflect its significance: impact on people was given a weighting factor of 3; impact on property was given a weighting factor of 2; and impact on the economy was given a weighting factor of 1. Table 16-2, Table 16-3 and Table 16-4 summarize the impacts for each hazard.

Table 16-2. Impact on People from Hazards

Hazard Event	Impact (high, medium, low)	Impact Factor	Multiplied by Weighting Factor (3)
Dam Failure	High	3	9
Drought[a]	None	0	0
Earthquake	High	3	9
Flooding	Low	1	3
Landslide	Low	1	3
Severe Weather	High	3	9
Wildfire	Medium	2	6

a. All people in the planning area would be exposed to drought, but the impact on the safety of individuals is expected to be minimal.

Table 16-3. Impact on Property from Hazards

Hazard Event	Impact (high, medium, low)	Impact Factor	Multiplied by Weighting Factor (2)
Dam Failure	High	3	6
Drought[a]	None	0	0
Earthquake	High	3	6
Flooding	Low	1	2
Landslide[b]	Low	0	0
Severe Weather	High	3	6
Wildfire	High	3	6

a. All properties in the planning area would be exposed to drought, but the impact on properties is expected to be minimal.
b. Impact on property is less than 0.5% and thus registers as 0.

Table 16-4. Impact on Economy from Hazards

Hazard Event	Impact (high, medium, low)	Impact Factor	Multiplied by Weighting Factor (1)
Dam Failure	High	3	3
Drought	Low	1	1
Earthquake	Low	1	1
Flooding	Low	1	1
Landslide	Low	1	1
Severe Weather	Low	1	1
Wildfire	Low	0	0

16.3 RISK RATING AND RANKING

The risk rating for each hazard was determined by multiplying the probability factor by the sum of the weighted impact factors for people, property and operations, as summarized in Table 16-5.

Based on these ratings, a priority of high, medium or low was assigned to each hazard. The hazards ranked as being of highest concern are earthquake, severe weather, and wildfire. Hazards ranked as being of medium concern are flood and dam failure. The hazards ranked as being of lowest concern are drought and landslide. Table 16-6 shows the hazard risk ranking.

Table 16-5. Hazard Risk Rating

Hazard Event	Probability Factor	Sum of Weighted Impact Factors	Total (Probability x Impact)
Dam Failure	1	18	18
Drought	3	1	3
Earthquake	3	16	48
Flooding	2	6	12
Landslide	1	4	4
Severe Weather	3	16	48
Wildfire	3	12	36

Table 16-6. Hazard Risk Ranking

Hazard Ranking	Hazard Event	Category
1	Severe Weather	High
2	Earthquake	High
3	Wildfire	High
4	Dam Failure	Medium
5	Flood	Medium
6	Landslide	Low
7	Drought	Low

Part 3. Mitigation Strategy

17. GUIDING PRINCIPLE, GOALS, OBJECTIVES, AND PREVIOUS ACTION STATUS

Hazard mitigation plans must identify goals for reducing long-term vulnerabilities to identified hazards (44 CFR Section 201.6(c)(3)(i)). For the purposes of this Plan, goals and objectives are defined as follows:

- **Goals** are general guidelines that explain what is to be achieved. They are usually broad-based, policy-type statements, long-term, and represent global visions. Goals help define the benefits that the Plan is trying to achieve. The success of the hazard mitigation plan should be measured by the degree to which its goals have been met (that is, by the actual benefits in terms of hazard mitigation).
- **Objectives** are short-term aims which, when combined, form a strategy or course of action to meet a goal. Unlike goals, objectives are specific and measurable.

After establishing a guiding principle for this hazard mitigation plan, the City of Roseville developed goals and objectives for the initial plan through discussions, research, and meetings of the Steering Committee and based on input from stakeholders and the public. Information for this process was garnered from the public involvement strategy, the risk assessment, and review of the California and Placer County hazard mitigation plans.

The Steering Committee identified seven goals, working from a catalog of goal statements created through review of other similar plans and FEMA planning guidance. Once the goals were established, objectives that meet multiple goals were selected through a similar exercise.

For the 2016 Plan, the Steering Committee reviewed the goals and objectives established for the previous plan to determine if they still fulfill the vision of reducing risk in the planning area. It was determined that the goals and objectives are still relevant to the vision.

17.1 GUIDING PRINCIPLE

A guiding principle or a mission statement for a plan is a written declaration of the plan's core purpose and focus. It normally remains unchanged over time, regardless of a change to the plan's goals or objectives. Though not required for DMA compliance, the incorporation of a guiding principle provides a clear, singular message that can be a focal point throughout all facets of the planning process. The City of Roseville developed the following guiding principle for 2016 to be carried through to subsequent updates to the hazard mitigation plan:

> *Through community partnerships, establish a plan to reduce vulnerability to hazards in order to protect the health, safety, welfare, and economy of the City.*

17.2 GOALS

The goals for the 2016 Plan, consistent with the hazards identified in this plan, are as follows:

- G-1: Protect lives and reduce injury.
- G-2: Promote hazard mitigation as an integrated policy.

- G-3: Protect the continuity of local government to ensure no significant disruption of services during or due to a disaster.
- G-4: Improve community emergency management preparedness, collaboration and outreach.
- G-5: Minimize or reduce damage to property, including critical facilities.
- G-6: Develop and implement mitigation strategies that optimize public funds in an efficient and cost-effective way.
- G-7: Monitor and support the natural environment's capacity to deal with the impacts of natural hazards, taking into account the potential impacts of global climate change.

17.3 OBJECTIVES

The Steering Committee selected the objectives listed in Table 17-1 to meet multiple goals. The objectives serve as a stand-alone measurement of a mitigation action rather than as a subset of a goal. Achievement of the objectives is a measure of the effectiveness of a mitigation strategy. The objectives are also used to help establish priorities.

Table 17-1. Objectives for 2011 Multi-Hazard Mitigation Plan

Objective Number	Objective Statement	Goals for which it can be applied
O-1	Consider the impacts of hazards on future land uses in the City of Roseville by coordinating with other planning mechanisms such as the General Plan and land-use code development.	1, 2, 5, 7
O-2	Protect and sustain reliable local emergency operations and communication facilities during and after disasters.	1, 3, 4
O-3	Develop new or enhance existing early warning response systems and plans.	1, 3, 4, 5
O-4	Seek to enhance emergency response capabilities through improvements to infrastructure and City programs.	1, 4, 5
O-5	Enhance the understanding of all present and future hazards that impact the City of Roseville and the risk they pose.	1, 3, 4, 5, 7
O-6	Seek mitigation projects that provide the highest degree of hazard protection at the least cost.	1, 5, 6
O-7	Seek to update information on natural, environmental, and human-caused hazards, vulnerabilities, and mitigation measures by coordinating planning efforts and creating partnerships with appropriate local, private, county, state, and federal agencies.	1, 2, 3, 4, 5, 7
O-8	Seek to implement codes, standards, and policies that will protect life and property, including natural habitat, from the impacts of hazards within the City of Roseville.	1, 2, 3, 5, 6
O-9	Educate the public on preparedness for and mitigation of potential impacts of hazards on the City of Roseville.	1, 2, 4
O-10	Support efforts to retrofit, purchase, or relocate structures in high hazard areas, including those known to be repetitively damaged.	3, 5, 6

17.4 STATUS OF PREVIOUS ACTIONS

The City of Roseville develops an annual Progress Report which includes the status of previous actions. This Progress Report details completed actions as well as those actions added outside of the 5-year update cycle. A copy of the 2015 Progress Report is located in Appendix B.

18. MITIGATION ALTERNATIVES

Catalogs of hazard mitigation alternatives were developed that present a broad range of alternatives to be considered for use in the planning area, in compliance with 44 CFR (Section 201.6(c)(3)(ii)). One catalog was developed for each hazard of concern evaluated in this Plan. The catalogs present alternatives that are categorized in two ways:

- By who would have responsibility for implementation:
  - Individuals (personal scale)
  - Businesses (corporate scale)
  - Government (government scale).
- By what the alternative would do:
  - Manipulate the hazard
  - Reduce exposure to the hazard
  - Reduce vulnerability to the hazard
  - Increase the ability to respond to or be prepared for the hazard.

Hazard mitigation actions recommended in this Plan were selected from among the alternatives presented in the catalogs. The catalogs provide a baseline of mitigation alternatives that are backed by a planning process, are consistent with the established goals and objectives, and are within the capabilities of the City of Roseville to implement. Some of these actions may not be feasible based on the selection criteria identified for this Plan. The purpose of the catalog was to provide a list of what could be considered to reduce risk of the flood hazard within the planning area. Actions in the catalog that are not included for the action plan were not selected for one or more of the following reasons:

- The action is not feasible.
- The action is already being implemented.
- There is an apparently more cost-effective alternative.
- The action does not have public or political support.

The catalogs for each hazard are presented in Table 18-1 through Table 18-9.

Table 18-1. Alternatives to Mitigate the Dam Failure Hazard

Personal-Scale	Corporate-Scale	Government-Scale
• **Manipulate the hazard:** ○ **None** • **Reduce exposure to the hazard:** ○ **Relocate out of dam failure inundation areas.** • **Reduce vulnerability to the hazard:** ○ **Elevate home to appropriate levels.** • **Increase the ability to respond to or be prepared for the hazard:** ○ **Learn about risk reduction for the dam failure hazard.** ○ **Learn the evacuation routes for a dam failure event.** ○ **Educate yourself on early warning systems and the dissemination of warnings.**	• **Manipulate the hazard:** ○ Remove dams. ○ Remove levees. ○ Harden dams. • **Reduce exposure to the hazard:** ○ Replace earthen dams with hardened structures. • **Reduce vulnerability to the hazard:** ○ Flood-proof facilities within dam failure inundation areas. • **Increase the ability to respond to or be prepared for the hazard:** ○ Educate employees on the probable impacts of a dam failure. ○ Develop a continuity of operations plan.	• **Manipulate the hazard:** ○ Remove dams. ○ Remove levees. ○ Harden dams. • **Reduce exposure to the hazard:** ○ Replace earthen dams with hardened structures ○ Relocate critical facilities out of dam failure inundation areas. ○ Consider open space land use in designated dam failure inundation areas. • **Reduce vulnerability to the hazard:** ○ Adopt higher regulatory floodplain standards in mapped dam failure inundation areas. ○ Retrofit critical facilities within dam failure inundation areas. • **Increase the ability to respond to or be prepared for the hazard:** ○ Map dam failure inundation areas. ○ Enhance emergency operations plan to include a dam failure component. ○ Institute monthly communications checks with dam operators. ○ Inform the public on risk reduction techniques ○ Adopt real-estate disclosure requirements for the re-sale of property located within dam failure inundation areas. ○ Consider the probable impacts of climate in assessing the risk associated with the dam failure hazard. ○ Establish early warning capability downstream of listed high hazard dams. ○ Consider the residual risk associated with protection provided by dams in future land use decisions.

Table 18-2. Alternatives to Mitigate the Drought Hazard

Personal-Scale	Corporate-Scale	Government-Scale
• **Manipulate the hazard:** ○ **None** • **Reduce exposure to the hazard:** ○ **None** • **Reduce vulnerability to the hazard:** ○ **Drought-resistant landscapes** ○ **Reduce water system losses** ○ **Modify plumbing systems (through water saving kits)** • **Increase the ability to respond to or be prepared for the hazard:** ○ **Practice active water conservation**	• **Manipulate the hazard:** ○ None • **Reduce exposure to the hazard:** ○ None • **Reduce vulnerability to the hazard:** ○ Drought-resistant landscapes ○ Reduce private water system losses • **Increase the ability to respond to or be prepared for the hazard:** ○ Practice active water conservation	• **Manipulate the hazard:** ○ Groundwater recharge through stormwater management • **Reduce exposure to the hazard:** ○ Identify and create groundwater backup sources • **Reduce vulnerability to the hazard:** ○ Reduce water system losses ○ Distribute water saving kits ○ Increase use of recycled water ○ Diversify water supply diversion points • **Increase the ability to respond to or be prepared for the hazard:** ○ Public education on drought resistance ○ Identify alternative water supplies for times of drought; mutual aid agreements with alternative suppliers ○ Implement drought contingency plan ○ Develop criteria “triggers” for drought-related actions ○ Improve accuracy of water supply forecasts

Table 18-3. Alternatives to Mitigate the Earthquake Hazard

Personal-Scale	Corporate-Scale	Government-Scale
• **Manipulate the hazard:** ○ **None** • **Reduce exposure to the hazard:** ○ **Locate outside of hazard area (off soft soils)** • **Reduce vulnerability to the hazard:** ○ **Retrofit structure (anchor house structure to foundation)** ○ **Secure household items that can cause injury or damage (such as water heaters, bookcases, and other appliances)** ○ **Build to higher design** • **Increase the ability to respond to or be prepared for the hazard:** ○ **Practice "drop, cover, and hold"** ○ **Develop household mitigation plan, such as creating a retrofit savings account, communication capability with outside, 72-hour self-sufficiency during an event** ○ **Keep cash reserves for reconstruction** ○ **Become informed on the hazard and risk reduction alternatives available.** ○ **Develop a post-disaster action plan for your household**	• **Manipulate the hazard:** ○ None • **Reduce exposure to the hazard:** ○ Locate or relocate mission-critical functions outside hazard area where possible • **Reduce vulnerability to the hazard:** ○ Build redundancy for critical functions and facilities ○ Retrofit critical buildings and areas housing mission-critical functions • **Increase the ability to respond to or be prepared for the hazard:** ○ Adopt higher standard for new construction; consider "performance-based design" when building new structures ○ Keep cash reserves for reconstruction ○ Inform your employees on the possible impacts of earthquake and how to deal with them at your work facility. ○ Develop a continuity of operations plan	• **Manipulate the hazard:** ○ None • **Reduce exposure to the hazard:** ○ Locate critical facilities or functions outside hazard area where possible • **Reduce vulnerability to the hazard:** ○ Harden infrastructure ○ Provide redundancy for critical functions ○ Adopt higher regulatory standards • **Increase the ability to respond to or be prepared for the hazard:** ○ Provide better hazard maps ○ Provide technical information and guidance ○ Enact tools to help manage development in hazard areas (e.g., tax incentives, information) ○ Include retrofitting and replacement of critical system elements in capital improvement plan ○ Develop strategy to take advantage of post-disaster opportunities ○ Warehouse critical infrastructure components such as pipe, power line, and road repair materials ○ Develop and adopt a continuity of operations plan ○ Initiate triggers guiding improvements (such as <50% substantial damage or improvements) ○ Further enhance seismic risk assessment to target high hazard buildings for mitigation opportunities. ○ Develop a post-disaster action plan that includes grant funding and debris removal components.

Table 18-4. Alternatives to Mitigate the Flooding Hazard

Personal-Scale	Corporate-Scale	Government-Scale
• **Manipulate the hazard:** ○ **Clear storm drains and culverts** ○ **Use low-impact development techniques** • **Reduce exposure to the hazard:** ○ **Locate outside of hazard area** ○ **Elevate utilities above base flood elevation** ○ **Use low-impact development techniques** • **Reduce vulnerability to the hazard:** ○ **Raise structures above base flood elevation** ○ **Elevate items within house above base flood elevation** ○ **Build new homes above base flood elevation** ○ **Flood-proof structures** • **Increase the ability to respond to or be prepared for the hazard:** ○ **Buy flood insurance** ○ **Develop household plan, such as retrofit savings, communication with outside, 72-hour self-sufficiency during and after an event**	• **Manipulate the hazard:** ○ Clear storm drains and culverts ○ Use low-impact development techniques • **Reduce exposure to the hazard:** ○ Locate critical facilities or functions outside hazard area ○ Use low-impact development techniques • **Reduce vulnerability to the hazard:** ○ Build redundancy for critical functions or retrofit critical buildings ○ Provide flood-proofing when new critical infrastructure must be located in floodplains • **Increase the ability to respond to or be prepared for the hazard:** ○ Keep cash reserves for reconstruction ○ Support and implement hazard disclosure for sale of property in risk zones. ○ Solicit cost-sharing through partnerships with others on projects with multiple benefits.	• **Manipulate the hazard:** ○ Maintain drainage system ○ Institute low-impact development techniques on property ○ Dredging, levee construction, and providing regional retention areas ○ Structural flood control, levees, channelization, or revetments. ○ Stormwater management regulations and master planning ○ Acquire vacant land or promote open space uses in developing watersheds to control increases in runoff • **Reduce exposure to the hazard:** ○ Locate or relocate critical facilities outside of hazard area ○ Acquire or relocate identified repetitive loss properties ○ Promote open space uses in identified high hazard areas via techniques such as: planned unit developments, easements, setbacks, greenways, sensitive area tracks. ○ Adopt land development criteria such as planned unit developments, density transfers, clustering ○ Institute low impact development techniques on property ○ Acquire vacant land or promote open space uses in developing watersheds to control increases in runoff • **Reduce vulnerability to the hazard:** ○ Harden infrastructure, bridge replacement program ○ Provide redundancy for critical functions and infrastructure ○ Adopt regulatory standards such as freeboard standards, cumulative substantial improvement or damage, lower substantial damage threshold; compensatory storage, non-conversion deed restrictions. ○ Stormwater management regulations and master planning. ○ Adopt “no-adverse impact” floodplain management policies that strive to not increase the flood risk on downstream communities. • **Increase the ability to respond to or be prepared for the hazard:** ○ Produce better hazard maps ○ Provide technical information and guidance ○ Enact tools to help manage development in hazard areas (stronger controls, tax incentives, and information) ○ Incorporate retrofitting or replacement of critical system elements in capital improvement plan ○ Develop strategy to take advantage of post-disaster opportunities ○ Warehouse critical infrastructure components ○ Develop and adopt a continuity of operations plan ○ Consider participation in the Community Rating System ○ Maintain and collect data to define risks and vulnerability ○ Train emergency responders ○ Create an elevation inventory of structures in the floodplain ○ Develop and implement a public information strategy ○ Charge a hazard mitigation fee ○ Integrate floodplain management policies into other planning mechanisms within the planning area. ○ Consider the probable impacts of climate change on the risk associated with the flood hazard ○ Consider the residual risk associated with structural flood control in future land use decisions ○ Enforce National Flood Insurance Program ○ Adopt a Stormwater Management Master Plan

Table 18-5. Alternatives to Mitigate the Landslide Hazard

Personal-Scale	Corporate-Scale	Government-Scale
• **Manipulate the hazard:** ○ **Stabilize slope (dewater, armor toe)** ○ **Reduce weight on top of slope** ○ **Minimize vegetation removal and the addition of impervious surfaces.** • **Reduce exposure to the hazard:** ○ **Locate structures outside of hazard area (off unstable land and away from slide-run out area)** • **Reduce vulnerability to the hazard:** ○ **Retrofit home** • **Increase the ability to respond to or be prepared for the hazard:** ○ **Institute warning system, and develop evacuation plan** ○ **Keep cash reserves for reconstruction** ○ **Educate yourself on risk reduction techniques for landslide hazards**	• **Manipulate the hazard:** ○ Stabilize slope (dewater, armor toe) ○ Reduce weight on top of slope • **Reduce exposure to the hazard:** ○ Locate structures outside of hazard area (off unstable land and away from slide-run out area) • **Reduce vulnerability to the hazard:** ○ Retrofit at-risk facilities • **Increase the ability to respond to or be prepared for the hazard:** ○ Institute warning system, and develop evacuation plan ○ Keep cash reserves for reconstruction ○ Develop a continuity of operations plan ○ Educate employees on the potential exposure to landslide hazards and emergency response protocol.	• **Manipulate the hazard:** ○ Stabilize slope (dewater, armor toe) ○ Reduce weight on top of slope • **Reduce exposure to the hazard:** ○ Acquire properties in high-risk landslide areas. ○ Adopt land use policies that prohibit the placement of habitable structures in high-risk landslide areas. • **Reduce vulnerability to the hazard:** ○ Adopt higher regulatory standards for new development within unstable slope areas. ○ Armor/retrofit critical infrastructure against the impact of landslides. • **Increase the ability to respond to or be prepared for the hazard:** ○ Produce better hazard maps ○ Provide technical information and guidance ○ Enact tools to help manage development in hazard areas: better land controls, tax incentives, information ○ Develop strategy to take advantage of post-disaster opportunities ○ Warehouse critical infrastructure components ○ Develop and adopt a continuity of operations plan ○ Educate the public on the landslide hazard and appropriate risk reduction alternatives.

Table 18-6. Alternatives to Mitigate the Severe Weather Hazard

Personal-Scale	Corporate-Scale	Government-Scale
• **Manipulate the hazard:** ○ **None** • **Reduce exposure to the hazard:** ○ **None** • **Reduce vulnerability to the hazard:** ○ **Insulate house** ○ **Provide redundant heat and power** ○ **Insulate structure** ○ **Plant appropriate trees near home and power lines ("Right tree, right place" National Arbor Day Foundation Program)** • **Increase the ability to respond to or be prepared for the hazard:** ○ **Trim or remove trees that could affect power lines** ○ **Promote 72-hour self-sufficiency** ○ **Obtain a NOAA weather radio.** ○ **Obtain an emergency generator.**	• **Manipulate the hazard:** ○ None • **Reduce exposure to the hazard:** ○ None • **Reduce vulnerability to the hazard:** ○ Relocate critical infrastructure (such as power lines) underground ○ Reinforce or relocate critical infrastructure such as power lines to meet performance expectations ○ Install tree wire • **Increase the ability to respond to or be prepared for the hazard:** ○ Trim or remove trees that could affect power lines ○ Create redundancy ○ Equip facilities with a NOAA weather radio ○ Equip vital facilities with emergency power sources.	• **Manipulate the hazard:** ○ None • **Reduce exposure to the hazard:** ○ None • **Reduce vulnerability to the hazard:** ○ Harden infrastructure such as locating utilities underground ○ Trim trees back from power lines ○ Designate snow routes and strengthen critical road sections and bridges • **Increase the ability to respond to or be prepared for the hazard:** ○ Support programs such as "Tree Watch" that proactively manage problem areas through use of selective removal of hazardous trees, tree replacement, etc. ○ Establish and enforce building codes that require all roofs to withstand snow loads ○ Increase communication alternatives ○ Modify land use and environmental regulations to support vegetation management activities that improve reliability in utility corridors. ○ Modify landscape and other ordinances to encourage appropriate planting near overhead power, cable, and phone lines ○ Provide NOAA weather radios to the public

Table 18-7. Alternatives to Mitigate the Wildfire Hazard

Personal-Scale	Corporate-Scale	Government-Scale
• **Manipulate the hazard:** ○ **Clear potential fuels on property such as dry overgrown underbrush and diseased trees** • **Reduce exposure to the hazard:** ○ **Create and maintain defensible space around structures** ○ **Locate outside of hazard area** ○ **Mow regularly** • **Reduce vulnerability to the hazard:** ○ **Create and maintain defensible space around structures and provide water on site** ○ **Use fire-retardant building materials** ○ **Create defensible spaces around home** • **Increase the ability to respond to or be prepared for the hazard:** ○ **Employ techniques from the National Fire Protection Association's Firewise Communities program to safeguard home** ○ **Identify alternative water supplies for fire fighting** ○ **Install/replace roofing material with non-combustible roofing materials.**	• **Manipulate the hazard:** ○ Clear potential fuels on property such as dry underbrush and diseased trees • **Reduce exposure to the hazard:** ○ Create and maintain defensible space around structures and infrastructure ○ Locate outside of hazard area • **Reduce vulnerability to the hazard:** ○ Create and maintain defensible space around structures and infrastructure and provide water on site ○ Use fire-retardant building materials ○ Use fire-resistant plantings in buffer areas of high wildfire threat. • **Increase the ability to respond to or be prepared for the hazard:** ○ Support Firewise community initiatives. ○ Create /establish stored water supplies to be used for firefighting.	• **Manipulate the hazard:** ○ Clear potential fuels on property such as dry underbrush and diseased trees ○ Implement best management practices on public lands. • **Reduce exposure to the hazard:** ○ Create and maintain defensible space around structures and infrastructure ○ Locate outside of hazard area ○ Enhance building code to include use of fire resistant materials in high hazard area. • **Reduce vulnerability to the hazard:** ○ Create and maintain defensible space around structures and infrastructure ○ Use fire-retardant building materials ○ Use fire-resistant plantings in buffer areas of high wildfire threat. ○ Consider higher regulatory standards (such as Class A roofing) ○ Establish biomass reclamation initiatives • **Increase the ability to respond to or be prepared for the hazard:** ○ More public outreach and education efforts, including an active Firewise program ○ Possible weapons of mass destruction funds available to enhance fire capability in high-risk areas ○ Identify fire response and alternative evacuation routes ○ Seek alternative water supplies ○ Become a Firewise community ○ Use academia to study impacts/solutions to wildfire risk ○ Establish/maintain mutual aid agreements between fire service agencies. ○ Create/implement fire plans ○ Consider the probable impacts of climate change on the risk associated with the wildfire hazard in future land use decisions

Table 18-8. Alternatives to Mitigate Health Hazards

Personal-Scale	Corporate-Scale	Government-Scale
• **Manipulate the hazard:** ○ **None** • **Reduce exposure to the hazard:** ○ **Eliminate or reduce environments on private property that favor mosquito infestation** • **Reduce vulnerability to the hazard:** ○ **Immunization** • **Increase the ability to respond to or be prepared for the hazard:** ○ **Get informed**	• **Manipulate the hazard:** ○ None • **Reduce exposure to the hazard:** ○ Eliminate or reduce environments on private property that favor mosquito infestation • **Reduce vulnerability to the hazard:** ○ Immunize employees • **Increase the ability to respond to or be prepared for the hazard:** ○ Inform employees on human health hazards	• **Manipulate the hazard:** ○ Mosquito abatement • **Reduce exposure to the hazard:** ○ Eliminate or reduce environments on public property that favor mosquito infestation • **Reduce vulnerability to the hazard:** ○ Immunize employees • **Increase the ability to respond to or be prepared for the hazard:** ○ Collaborate with the Placer County Health Department to ensure the health and welfare of the community ○ Public education on mosquito abatement and general human health issues

Table 18-9. Alternatives to Mitigate Human-Cause Hazards

Personal-Scale	Corporate-Scale	Government-Scale
• **Manipulate the hazard:** ○ **None** • **Reduce exposure to the hazard:** ○ **None** • **Reduce vulnerability to the hazard:** ○ **None** • **Increase the ability to respond to or be prepared for the hazard:** ○ **Increase awareness of vulnerability to threats** ○ **Neighborhood watch program** ○ **Keep informed** ○ **Develop an emergency response plan** ○ **Report suspicious activities**	• **Manipulate the hazard:** ○ None • **Reduce exposure to the hazard:** ○ Incorporate anti-terrorism and security mitigation measures in site and layout design of facilities ○ Consider site security in landscape design of facilities • **Reduce vulnerability to the hazard:** ○ Restrict access by implementing controlled access zones ○ Increase security measures ○ Install physical barriers around critical facilities ○ Employ parking restrictions as a means to reduce vulnerability • **Increase the ability to respond to or be prepared for the hazard:** ○ Become a partner (stakeholder) in mitigation and prevention ○ Educate employees ○ Develop an emergency response plan ○ Develop a Continuity of Operations Plan ○ Use liberal signage techniques to inform and increase capability of users of facilities	• **Manipulate the hazard:** ○ None • **Reduce exposure to the hazard:** ○ Construct new critical facilities with clear zones. ○ Retrofit existing critical facilities • **Reduce vulnerability to the hazard:** ○ Restrict access by implementing controlled access zones ○ Reduce single-point vulnerabilities such as: redundancy for critical lifelines and infrastructure ○ Install physical barriers around critical facilities ○ Provide regular education to personnel regarding cyber attacks • **Increase the ability to respond to or be prepared for the hazard:** ○ Educate public on threats and vulnerability ○ Enhance emergency response capability by contingency planning for specific events based on identified vulnerabilities ○ Consider performance-based zoning as a land use alternative to mitigate impacts of human-caused hazards ○ Employ Crime Prevention Through Environmental Design (CPTED techniques in design of public facilities ○ Consider providing incentives for mitigation ○ Develop a City THIRA ○ Establish secure communications between multiple entities to communicate sensitive information.

19. ACTION PLAN AND IMPLEMENTATION

19.1 HAZARD MITIGATION ACTION PLAN

The Steering Committee reviewed the catalogs of hazard mitigation alternatives and selected actions to be included in a hazard mitigation action plan. The selection of actions was based on the risk assessment of identified hazards of concern and the defined Roseville hazard mitigation goals and objectives. Table 19-1 lists the recommended hazard mitigation actions that make up the action plan. The timeframe indicated in the table is defined as follows:

- Short Term = to be completed in 1 to 5 years
- Long Term = to be completed in greater than 5 years
- Ongoing = currently being funded and implemented under existing programs.

Table 19-1. Action Plan

Hazards Addressed	Funding Options	Timeframe	Objectives Met	In Previous Plan? (# from previous plan)
Lead Agency: Central Services Department				
Action #F-20— Retrofit the City's Downtown library by sealing the exterior and installing a flood door to protect against flood damage should Dry Creek overspill the existing floodwall.				
Flood	Grant funding (PDM, HMGP, and FEMA) based on benefits exceeding costs	Long term	6, 10	Yes (F-21)
Lead Agency: City Council				
Action #HC-3—Seek to establish appropriate staffing levels of public safety personnel to address vulnerabilities identified through an incremental targeted study that provides immediate needs as well as anticipated needs in 1 year, 5 years, and 10 years.				
Human-Caused	General Fund	Short term	2, 4	Yes (HC-3)
Lead Agency: City Manager's Office				
Action #HH-3—Collaborate with the Placer County Mosquito Abatement District to review resource protection policies that conflict with human health protection in the City of Roseville and work to resolve these policy issues				
Human Health	Currently budgeted for under the General Fun	Short term	5, 6, 7, 9	Yes (HH-3)
Lead Agency: Public Affairs & Communications Department				
Action #HH-2—Support the public education efforts of the Placer County Health Department and the Placer Mosquito Abatement District				
Human Health	Currently budgeted for under the General Fund	Short term	5, 6, 7, 9	Yes (HH-2)
Action #MH-2—Continue to maintain the hazard mitigation page on City website that provides following types of information: • The Hazard Management Plan and its progress reports • Hazard-specific information • Mitigation information by hazard, with specific emphasis on private property • Emergency response and warning information • Links to county, state, and federal related agencies				
	General Fund; PDM grant funding	Short term	2, 3, 5, 6, 9	Yes (MH-2)
Lead Agency: Development Services Department				
Action #EQ-1—Perform building-specific, structural seismic vulnerability assessment of City-owned critical facilities constructed prior to 1980 (including infrastructure). Included in this assessment will be recommended mitigation alternatives that meet goals and objectives of this Plan.				
Earthquake	General Fund; Possible grant funding under PDM program	Long term	5, 10	Yes (EQ-1)
Action #EQ-2—Incorporate earthquake mitigation measures for private property into existing City-sponsored outreach programs such as printed media and the City's website.				
Earthquake	City General fund	Short term	1, 9, 10, 11	Yes (EQ-2)
Action #EQ-3—Reassess the overall vulnerability to the earthquake hazard using the best available science and technology as it becomes available. State-sponsored programs, Seismic Hazards Mapping Act, and future FEMA- sponsored initiatives are anticipated to create a wealth of knowledge regarding this hazard that did not exist during the preparation of this Plan.				
Earthquake	General Fund; Possible grant funding under PDM program	Short term	1, 5, 7, 9	Yes (EQ-3)
Action #F-1—The City shall designate all areas identified as the 100-year floodplain. The boundaries of the 100-year floodplain shall be as specified in the floodplain designations section of this component of the City's General Plan. Floodplain areas shall be preserved as specified in the open space and conservation element. Such preservation may include required dedication to the City. If needed, modify the City's ordinances to include floodplain use regulations consistent with the goals, policies, and implementation measures of the safety, land use, open space and conservation, and parks and recreation elements of the City's General Plan.				
Flood	Currently funded by General Fund allocation	Long term	1, 6, 7	Yes (F-1)

Hazards Addressed	Funding Options	Timeframe	Objectives Met	In Previous Plan? (# from previous plan)
Action #F-2—Refer any development proposal that has a direct or indirect impact on flood protection to Public Works for comment. In addition, forward such proposals to other agencies as applicable, including the U.S. Army Corps of Engineers, California Central Valley Flood Protection Board, FEMA, California Department of Fish and Wildlife, Placer County Resource Conservation District, and Placer County Flood Control District. Consider the comments of the agencies during the development review process.				
Flood	Currently funded by General Fund allocation	Short term	1, 5, 7	Yes (F-2)
Action #F-9—Ensure that future specific plans and specific plan amendments are consistent with the goals and policies of the General Plan. The specific plans shall include the designation and preservation of floodplain areas and adjacent habitat. Provisions shall be incorporated to ensure that public infrastructure, utilities, and emergency services remain functional during flood conditions. Such infrastructure and facilities include water, sewer and gas mains, telephone and electric lines, streets and bridges, hospitals, and fire and police stations. Financing mechanisms shall be explored to fund necessary flood protection improvements and maintenance. Development agreements may be used to secure implementation and funding provisions. (Specific plans have 100% cost recovery by developers).				
Flood	Specific plans have 100% cost recovery by developers	Long term	1, 6, 7, 8	Yes (F-9)
Action #F-11—Require a master drainage plan as part of the approval process for all specific plans and large development projects as determined by the Public Works director. The master drainage plan should consider cumulative regional drainage and flooding mitigation. The plan's intent is to ensure that the overall rate of runoff from a project does not exceed predevelopment levels. If necessary, this objective shall be achieved by incorporating run-off control measures to minimize peak flows and/or assistance in financing or otherwise implementing comprehensive drainage plans.				
Flood	General Fund; Developer-based funding under specific plan requirements	Long term	1, 6, 8	Yes (F-11)
Action #LS-2— Continue to implement policies adopted by the General Plan that promote open space land uses within identified steep slope areas of Roseville. The City of Roseville Northeast Roseville Specific Plan and Stoneridge Specific Plans include the identified steep slope areas within Roseville. Both Plan Areas have continuing development.				
Landslide	General Fund; Developer-based funding and specific plan requirements	Short term	1, 6, 8	Yes (LS-2)
Action #MH-1—Continue to maintain Office of Emergency Services certification of all City inspectors for post-disaster damage assessment.				
Multi-Hazard	General Fund	Short term	2, 7	Yes (MH-1)
Lead Agency: Environmental Utilities Department (EUD)				
Action #D-1—Perform a groundwater recharge feasibility study to determine the most cost-effective way to replenish groundwater resources within Roseville.				
Drought	Water utility funds; General fund; Developer-based funding under specific plan requirements	Long term	5, 6	Yes (D-1)
Action #D-2—Implement aquifer storage and recovery program that uses direct injection technique in areas identified as appropriate.				
Drought	Water Construction Fund	Long term	6, 8	Yes (D-2)
Action #D-3—Continue to implement the Environmental Utility Department's recycled water program and seek all opportunities to expand its coverage, currently focusing on urban growth areas. The City pumps recycled water through a system of purple pipes completely separate from potable (drinking water) pipes. The City pumps the recycled water to customers such as streetscapes, golf courses and parks, where it irrigates turf and shrubs. Using recycled water for uses such as landscape irrigation reduces demand on the potable water system, creating a more reliable water supply for the entire City. Recycled water is not subject to the effects of drought.				
Drought	Water utility rates, developer-based fees under specific plan requirements	Short term	6, 8	Yes (D-3)
Action #D-4—Promote active water conservation techniques and strategies to private property owners through Roseville-sponsored outreach projects such as printed media and the City's website.				
Drought	Currently funded by General Fund allocation	Short term	5, 9	Yes (D-4)
Action #HC-5—Address vulnerabilities identified in vulnerability assessment of water facilities performed by the Environmental Utilities Department in response to EPA initiative.				
Human-Caused	EUD CIP, and EPA grant funding	Long term	5, 7	Yes (HC-5)

Hazards Addressed	Funding Options	Timeframe	Objectives Met	In Previous Plan? (# from previous plan)
Action #SW-4—Enhance and implement strategies for debris management and removal during severe weather events.				
	General Fund	Short term	6, 8	Yes (SW-5)
Lead Agency: Information Technology Division				
Action #HC-9—Protect the City's data, technology infrastructure and staff against malicious cyber-attacks and Cyber terrorism, such as but not limited to: • Identity Theft • Virus/Malware/Ransomware/Spyware/Spam/Phishing • Network and system attacks • Web site hacking • Denial-of-service attacks				
Human-Caused	General Fund	Short term	2, 5, 7	Yes (HC-9)
Action #MH-7—Strive to maintain high availability of essential communication services				
Multi-Hazard	EUD CIP, General Fund	Ongoing	2, 3, 4, 7	Yes (MH-7)
Action #MH-8—Secure the City's physical locations that contain technology infrastructure				
Multi-Hazard	EUD CIP, General Fund	Ongoing	2, 3, 4, 7	Yes (MH-8)
Lead Agency: Parks, Recreation & Libraries Department: Open Space Division				
Action #F-12—Continue the Parks, Recreation & Libraries Department's regular creek maintenance program within the City's creeks and floodplain areas. This program clears and removes debris that could contribute to blockage and flooding and may include the removal of silt. This is only done in areas of high risk to flood damage or where property or facilities are threatened by flooding.				
Flood	Currently funded by General Fund allocation	Ongoing	8	Yes (F-12)
Action #F-21—Continue the Tree Mitigation Fund program administered by the Open Space Division in conjunction with non-profit organizations. The planting of oak trees in the open spaces adjacent to riparian zones increases infiltration and slows storm water surges.				
Flood	General Fund	Ongoing	1, 5, 7, 9	Yes (F-22)
Action #F-22—Manage beaver dam sites for flood control protection and habitat restoration after dam removal. One primary issue is impacts to floodwater capacity of creeks. Part of the desired comprehensive approach to beaver management includes establishment of quantitative and qualitative "carrying capacity," including acre-feet of flood capacity lost. Implement a standard monitoring and reporting process to track beaver dam locations, population, and impacts. Gain regulatory approval for beaver management techniques such as biological control and habitat manipulation using the most benign options first.				
Flood	Currently funded by General Fund allocation	Ongoing	1, 6, 8	Yes (F-23)
Action #WF-1—Continue "Goat Grazing" program for removal of grassland in areas of Roseville potentially vulnerable to wildfire. Implement goat grazing in City open space and preserve areas for fire and invasive plant species management and native plant restoration.				
Wildfire	General Fund; Community Facilities District funding; PDM grant funding	Ongoing	6, 9	Yes (WF-2)
Action #MH-4—Implement an "Adopt an Open Space" program in coordination with the open space management program. Develop "adoption contracts" with neighborhoods, organizations, businesses, etc., describing the level of stewardship and the terms of the "adoption." Publicize these activities through online resource directory and other media to encourage participation.				
Multi-Hazard	General Fund; Community Facilities District funding; PDM grant funding	Short term	1, 5, 7, 9	Yes (MH-4)
Action #MH-5—Develop and disseminate best practices information to private property owners whose land is adjacent to open space areas describing stewardship opportunities and owners' role in preserving beneficial uses of open space areas (including vernal pool grassland and creek or riparian uses). Offer classes to provide in-depth information, such as demonstration projects, techniques for ecologically friendly weed abatement and vegetation control, and creating a backyard habitat compatible with open space areas.				
Multi-Hazard	General Fund; PDM grant funding	Short term	1, 5, 7, 9	Yes (MH-5)
Action #MH-6—Work with the Roseville City School District, local high school districts, and non-profit organizations to promote ecology-oriented curricula and stewardship activities. Identify resource and administrative barriers that may be limiting schools' abilities to more actively participate in stewardship, and work collaboratively to identify solutions.				
Multi-Hazard	General Fund; PDM grant funding	Long term	1, 5, 7, 9	Yes (MH-6)

Hazards Addressed	Funding Options	Timeframe	Objectives Met	In Previous Plan? (# from previous plan)
Lead Agency: Police and Fire Department				
Action #DF-1—Create a dam failure element for the City's emergency response plan that includes a phased warning protocol in response to the findings of the Folsom Dam Containment Dike Risk Assessment.				
Dam Failure	General Fund; Department of Homeland Security (DHS) grant funding	Short term	2, 3, 4, 9	Yes (DF-1)
Action #F-19—Implement recommendation of Downtown Roseville Specific Plan to relocate the Public safety Building				
Flood	Grant funding (PDM, HMGP, and FEMA) based on benefits exceeding costs	Short term	6, 10	Yes (F-20)
Action #HC-1—Commit support to initiatives within the Sacramento-Roseville-Arden-Arcade Metropolitan Statistical Area; continue to seek funding from other federal sources to fund its initiatives				
Human-Caused	General Fund	Short term	2, 7	Yes (HC-1)
Action #HC-2—Enhance emergency response capability of City by contingency planning for specific events based on identified vulnerabilities.				
Human-Caused	General Fund; DHS grant funding	Short term	2, 3, 4, 9	Yes (HC-2)
Action #HC-4—Prepare a site-specific vulnerability assessment of City- owned critical facilities that use the best available science and technology with regards to human-caused hazards.				
Human-Caused	General Fund; DHS grant funding	Short term	2, 5, 7	Yes (HC-4)
Action #HH-1—Continue to collaborate with the Placer County Health Department to ensure the health and welfare of the community				
Human Health	Currently budgeted for under the General Fund	Short term	5, 6, 7, 9	Yes (HH-1)
Action #SW-3—Continue education/outreach programs to improve winter preparedness and minimize loss of life or injury.				
	General Fund	Short term	6, 9	Yes (SW-4)
Action #WF-2—Enhance existing City public outreach programs to include information on fire safety, defensible spaces, and areas of concern.				
Wildfire	General Fund; Grant funding under PDM program and HMGP	Short term	6, 9	Yes (WF-3)
Action #MH-3—Establish/maintain a post-disaster action plan to be part of the City Emergency operations plan that will include following elements: • Procedures for public information • Post-disaster damage assessment • Grant writing • Code enforcement • Redundant operations				
Multi-Hazard	General Fund; PDM Grant Funding	Short term	2, 3, 4, 7	Yes (MH-3)
Lead Agency: Public Works Department				
Action #F-3—Continue City participation in the National Flood Insurance Program and the Community Rating System (CRS). Seek CRS classification improvements within capabilities of City programs, including adoption and administration of FEMA-approved ordinances and flood insurance rate maps (FIRM).				
Flood	Currently funded by General Fund allocation	Short term	1, 5, 9	Yes (F-3)
Action #F-4—Maintain Roseville's compliance and good standing under the National Flood Insurance program.				
	General Fund	Short term	2, 3, 4, 5, 10	Yes (F-4)
Action #F-5—Continue the City's outreach program to flood-prone property owners and the citizens of Roseville, to help make them aware of the flood threat and how best to deal with them.				
Flood	Currently funded by General Fund allocation	Short term	5, 9	Yes (F-5)

Hazards Addressed	Funding Options	Timeframe	Objectives Met	In Previous Plan? (# from previous plan)
Action #F-6—Continue to pursue a regional approach to flood issues by remaining actively involved in the Placer County Flood Control District. This involvement includes cooperation in the development of a comprehensive regional database. Continue to participate in regional flooding studies, including the Auburn Creek/Coon Creek/Pleasant Grove Creek flood mitigation plan and the Dry Creek watershed flood control plan.				
Flood	Currently funded by General Fund allocation	Long term	1, 5, 7	Yes (F-6)
Action #F-7—Continue City coordination with other agencies on issues of flood control. Coordination between the City and adjacent jurisdictions occurs through several mechanisms, including distribution of development proposals for review and comment. Continue City cooperation with federal, state, and local agencies, including the U.S. Army Corps of Engineers, California Central Valley Flood Protection Board, FEMA, California Department of Fish and Wildlife, Placer County Resource Conservation District, and the Placer County Flood Control District.				
Flood	Currently funded by General Fund allocation	Short term	1, 5, 7	Yes (F-7)
Action #F-8—Continue to develop, implement, and expand the Flood Alert and Early Warning Program systems and integrate the systems with other local jurisdictions to form a regional warning program.				
Flood	General Fund; Possible grant funding (PDM, HMGP, and Flood Mitigation Assistance)	Long term	2, 3	Yes (F-8)
Action #F-10—Monitor and regularly update City flood studies, modeling, and associated land use, zoning, and other development regulations at a minimum of every 5 years or whenever information becomes available that would significantly modify previous data. New information could include new studies, change in City policy, consideration of a major development project or specific plan, or implementation of a flood control project.				
Flood	General Fund; FEMA map modernization; Developer-based funding and specific plan requirements	Long term	1, 5, 7	Yes (F-10)
Action #F-13—Continue annual inspection and maintenance program of City storm drain systems. Review after every major storm system function and performance. This program removes debris that could contribute to blockage of the storm drain system.				
Flood	Currently funded by General Fund allocation and; gas tax	Short term	8	Yes (F-13)
Action #F-14—Complete the final two phases of the Cirby/Linda/Dry Creek flood control project (Phase 1 and 2). Five of the seven phases of this project have been completed at a cost of about $18,000,000. The basis for determining viability of this project will be a benefit /cost analysis to determine if project meets federal grant eligibility requirements.				
Flood	General Fund; Impact fees; Grant funding (PDM and HMGP) based on benefits exceeding costs	Long term	6, 8, 10	Yes (F-14)
Action #F-15—Analyze alternative improvements to the Cirby/Linda/Dry Creek flood control project that may be cost effective in the flood-prone areas of Roseville: • Dry Creek from Darling Way to Riverside Avenue • Area on Dry Creek upstream of Folsom Road in the Columbia Avenue/Marilyn Avenue/Bonita Street area • Linda Creek near Champion Oaks Drive/Samoa Way/Hurst Way area • Cirby Creek in the Trimble Way/Zien Court area				
Flood	General Funds; Developer-based funds, grant funding (PDM, HMGP, and FEMA) based on benefits exceeding costs	Long term	6, 8, 10	Yes (F-15)
Action #F-16—Replace the Huntington Drive/Cirby Creek culvert with a bridge to protect Queens Court/Huntington Drive area. The Public Works Department oversees this project.				
Flood	General Fund; CIP, developer-based funds, grant funding (PDM, HMGP, and FEMA) based on benefits exceeding costs	Long term	6, 10	Yes (F-16)
Action #F-17—Divert the main drainage storm drain system down Crestmont Avenue to Cirby Way and then into Dry Creek so that the existing system will not exceed capacity. If system capacity is exceeded, the intersection on Cirby Way and Crestmont Avenue and nearby homes will flood during major flood events.				
Flood	General Fund; CIP, developer-based funds, grant funding (PDM, HMGP, and FEMA) based on benefits exceeding costs	Short term	6, 10	Yes (F-17)

Hazards Addressed	Funding Options	Timeframe	Objectives Met	In Previous Plan? (# from previous plan)
Action #F-18—Continue to promote and sponsor programs to buy out, relocate, and flood-proof existing flood-prone structures within Roseville.				
Flood	Grant funding (PDM, HMGP, and FEMA) based on benefits exceeding costs	Short term	6, 10	Yes (F-18)
Action #F-23 – Develop the City's multi-use, multi-benefit stormwater retention project within the Pleasant Grove Creek Watershed, the Reason Farms Stormwater Retention Project.				
Flood	Developer-based funds, grant funding (PDM, HMGP, and FEMA) based on benefits exceeding costs	Long term	6, 10	No
Action #HC-10 – Improve evacuation transportation routes within the City of Roseville by removing traffic constrictions.				
Human Caused	Developer-based funds, grant funding (PDM, HMGP, and FEMA) based on benefits exceeding costs	Long term	6, 10	No
Action #LS-1—Once California Geological Survey completes soils mapping for the Roseville vicinity under the Seismic Hazards Mapping Act, reassess landslide hazard using best available data to gauge the true vulnerability to this hazard.				
Landslide	General Fund; Developer-based funding and specific plan requirements; Possible grant funding under PDM program	Long term	1, 5, 7	Yes (LS-1)
Lead Agency: Roseville Electric				
Action #HC-6—Maintain compliance with California Energy Commission ("CEC") license conditions for the operations of the Roseville Energy Park ("REP") with respect to Hazardous Material Management				
Human-Caused	EUD CIP, General Fund	Short term	5, 7	Yes (HC-6)
Action #HC-7—Maintain compliance with state and local laws and regulations for the operation of the Roseville Power Plant #2.				
Human-Caused	EUD CIP, General Fund	Long term	2, 5, 7	Yes (HC-7)
Action #HC-8—Maintain compliance with North American Electric Reliability Corporation mandatory reliability standards related to plant operation, sabotage reporting and critical infrastructure protection (cyber security.				
Human-Caused	EUD CIP, General Fund	Short term	2, 5, 7	Yes (HC-8)
Action #SW-1—Continue the Shade Tree Program, an energy conservation rebate program provided by Roseville Electric				
Severe Weather	Roseville Electric operational budget	Short term	7, 9	Yes (SW-2)
Action #SW-2—Continue ongoing line clearing and weed abatement of electrical utility facilities in order to reduce public exposure to vegetation hazards and maintain higher reliability during severe weather conditions.				
Severe Weather	CIP	Short term	2	Yes (SW-3)
Action #SW-5—Continue to operate the Roseville Energy Park to support the City's electrical requirements and maintain service continuity during severe weather events.				
Severe Weather	EUD CIP, General Fund	Short term	5, 7	Yes (SW-6)
Action #SW-6— Continue to operate Roseville Power Plant #2 to support the City's electrical requirements and maintain service continuity during severe weather events.				
Severe Weather	General Fund	Short term	5, 7	Yes (SW-7)

19.1.1 Benefit-Cost Review

The action plan must be prioritized according to a benefit/cost analysis of the proposed projects and their associated costs (44 CFR, Section 201.6(c)(3)(iii)). The benefits of proposed projects were weighed against estimated costs as part of the project prioritization process. The benefit/cost analysis was not of the detailed variety required by FEMA for project grant eligibility under the Hazard Mitigation Grant Program (HMGP) and Pre-Disaster Mitigation (PDM) grant program. A less formal approach was used because some projects may not be implemented for up to 10 years, and associated costs and benefits could change dramatically in that time. Therefore, a review was performed of the apparent benefits versus the apparent cost of each project. Parameters were established for assigning subjective ratings (high, medium, and low) to the costs and benefits of these projects.

Cost ratings were defined as follows:

- **High—**Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).
- **Medium—**The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.
- **Low—**The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.

Benefit ratings were defined as follows:

- **High—**Project will provide an immediate reduction of risk exposure for life and property.
- **Medium—**Project will have a long-term impact on the reduction of risk exposure for life and property, or project will provide an immediate reduction in the risk exposure for property.
- **Low—**Long-term benefits of the project are difficult to quantify in the short term.

Using this approach, projects with positive benefit versus cost ratios (such as high over high, high over medium, medium over low, etc.) are considered cost-beneficial and are prioritized accordingly.

For many of the strategies identified in this action plan, the City may seek financial assistance under the HMGP or PDM programs, both of which require detailed benefit/cost analyses. These analyses will be performed on projects at the time of application using the FEMA benefit-cost model. For projects not seeking financial assistance from grant programs that require detailed analysis, the City reserves the right to define "benefits" according to parameters that meet the goals and objectives of this Plan.

19.1.2 Action Plan Prioritization

Table 19-2 lists the priority of each action, based on the qualitative benefit-cost review, the number of plan objectives achieved, and the availability of funding:

19.1.3 Analysis of Mitigation Actions

Each recommended action was classified based on the hazard it addresses and the type of mitigation it involves. Table 19-3 shows the classification based on this analysis.

19.2 ADOPTION

A hazard mitigation plan must include documentation of formal adoption by the governing body of the jurisdiction requesting federal approval of the plan (44 CFR Section 201.6.c.5). This Plan will be submitted to Cal OES and the ISO prior to adoption for a pre-adoption review. Once the Plan has been determined to comply with the criteria specified under the DMA, Cal OES will forward it to FEMA Region IX for review and approval.

ISO is responsible for determining compliance for the CRS program. Since this Plan will be a key element in the City meeting the prescribed requirements for a CRS rating of Class 1, ISO will be asked to review the Plan for CRS Activity 510 compliance. Once pre-adoption approval has been granted by Cal OES, FEMA Region IX and the ISO, the City will initiate its process to formally adopt the Plan.

Table 19-2. Prioritization of Mitigation Actions

Action #	# of Objectives Met	Benefits	Costs	Do Benefits Equal or Exceed Costs?	Is project Grant Eligible?	Can Project be Funded under Existing Programs/ Budgets?	Priority (High, Med., Low)[a]
DF-1	4	High	Low	Yes	Yes	Yes	High
D-1	2	Medium	Low	Yes	No	Yes	Medium
D-2	2	Medium	Medium	Yes	No	Yes	Medium
D-3	2	High	Low	Yes	No	Yes	High
D-4	2	High	Low	Yes	No	Yes	High
EQ-1	2	Medium	Medium	Yes	Yes	Yes	Medium
EQ-2	4	High	Low	Yes	No	Yes	High
EQ-3	4	Medium	Low	Yes	Yes	Yes	Medium
F-1	3	High	Low	Yes	No	Yes	High
F-2	3	High	Low	Yes	No	Yes	High
F-3	3	High	Low	Yes	No	Yes	High
F-4	5	High	Low	Yes	No	Yes	High
F-5	2	High	Low	Yes	No	Yes	High
F-6	3	High	Low	Yes	No	Yes	High
F-7	3	High	Low	Yes	No	Yes	High
F-8	2	High	Medium	Yes	Yes	Yes	Medium
F-9	3	High	Low	Yes	No	Yes	High
F-10	3	High	Medium	Yes	Yes	Yes	Medium
F-11	3	Medium	Medium	Yes	No	Yes	Medium
F-12	1	High	Medium	Yes	Yes	Yes	Medium
F-13	3	Medium	Low	Yes	No	Yes	Medium
F-14	3	High	High	Yes	Yes	No	Low
F-15	3	Medium	Medium	Yes	Yes	Yes	Medium
F-16	2	High	High	Yes	Yes	No	Low
F-17	2	High	Medium	Yes	Yes	No	Medium
F-18	2	High	Medium	Yes	Yes	No	Medium
F-19	2	Medium	High	No	Yes	No	Low
F-20	2	High	High	Yes	Yes	No	Low
F-21	4	High	Low	Yes	No	Yes	High
F-22	3	High	Low	Yes	No	Yes	High
F-23	2	High	High	Yes	Yes	No	Medium
LS-1	3	Low	Low	Yes	Yes	Yes	Low
LS-2	3	High	Low	Yes	No	Yes	High
SW-1	2	High	Low	Yes	No	Yes	High
SW-2	1	High	Low	Yes	No	Yes	High
SW-3	2	Medium	Low	Yes	No	Yes	Medium
SW-4	2	Medium	Medium	Yes	No	Yes	Medium
SW-5	2	High	Low	Yes	No	Yes	High
SW-6	2	High	Low	Yes	No	Yes	High
WF-1	2	High	Low	Yes	No	Yes	High
WF-2	2	Medium	Low	Yes	No	Yes	Medium
MH-1	2	Medium	Low	Yes	No	Yes	Medium

Action #	# of Objectives Met	Benefits	Costs	Do Benefits Equal or Exceed Costs?	Is project Grant Eligible?	Can Project be Funded under Existing Programs/ Budgets?	Priority (High, Med., Low)[a]
MH-2	5	High	Low	Yes	No	Yes	High
MH-3	4	Medium	Low	Yes	Yes	Yes	Medium
MH-4	4	Medium	Low	Yes	Yes	Yes	Medium
MH-5	4	Medium	Low	Yes	Yes	Yes	Medium
MH-6	4	Medium	Low	Yes	Yes	Yes	Medium
MH-7	4	High	Low	Yes	No	Yes	High
MH-8	4	High	Low	Yes	No	Yes	High
HC-1	2	Medium	Low	Yes	No	Yes	Medium
HC-2	4	Medium	Low	Yes	No	Yes	Medium
HC-3	2	High	Low	Yes	No	Yes	High
HC-4	3	Medium	Medium	Yes	Yes	Yes	Medium
HC-5	2	High	High	Yes	Yes	Yes	Low
HC-6	2	High	Low	Yes	Yes	Yes	High
HC-7	3	High	Low	Yes	No	Yes	High
HC-8	3	High	Low	Yes	No	Yes	High
HC-9	3	High	Low	Yes	No	Yes	High
HC-10	2	High	High	Yes	Yes	No	Medium
HH-1	4	Medium	Low	Yes	No	Yes	Medium
HH-2	2	High	Low	Yes	No	Yes	High
HH-3	4	High	Low	Yes	No	Yes	High

a. Priorities defined as follows:

- High Priority—A project that meets multiple objectives, has benefits that exceed cost, has funding secured or is an ongoing project and meets eligibility requirements for the HMGP or PDM grant program. High priority projects can be completed in the short term (1 to 5 years).
- Medium Priority—A project that meets goals and objectives, that has benefits that exceed costs, and for which funding has not been secured but that is grant eligible under HMGP, PDM or other grant programs. Project can be completed in the short term, once funding is secured. Medium priority projects will become high priority projects once funding is secured.
- Low Priority—A project that will mitigate the risk of a hazard, that has benefits that do not exceed the costs or are difficult to quantify, for which funding has not been secured, that is not eligible for HMGP or PDM grant funding, and for which the time line for completion is long term (1 to 10 years). Low priority projects may be eligible for other sources of grant funding from other programs.

Table 19-3. Analysis of Mitigation Actions

Hazard	Actions That Address the Hazard, by Mitigation Type[a]					
	Prevention[a]	Property Protection[b]	Public Education and Awareness[c]	Natural Resource Protection [d]	Emergency Services[e]	Structural Projects[f]
Dam Failure					DF-1	
Drought	D-1, D-2, D-3, D-4					
Earthquake	EQ-3	EQ-1	EQ-2			
Flooding	F-1, F-2, F-3, F-4, F-6, F-7, F-9, F-10, F-11, F-21, F-22	F-13, F-18, F-19, F-20	F-5	F-1, F-21, F-22, F-23	F-8, F-12	F-14, F-15, F-16, F-17, F-23
Landslide	LS-1, LS-2					
Severe Weather	SW-1, SW-6	SW-2, SW-4	SW-3		SW-5	
Wildfire	WF-1		WF-2			
Multiple Hazards	MH-2, MH-3, MH-4	MH-8	MH-5, MH-6	MH-4	MH-1, MH-7	
Health Hazards	HH-1, HH-2		HH-2			
Human-Caused Hazards	HC-3, HC-5, HC-6, HC-7, HC-8, HC-9	HC-4			HC-1, HC-2, HC-3, HC-8, HC-10	

a. **Prevention—**Government, administrative or regulatory actions that influence the way land and buildings are developed to reduce hazard losses. Includes planning and zoning, floodplain laws, capital improvement programs, open space preservation, and stormwater management regulations.
b. **Property Protection—**Modification of buildings or structures to protect them from a hazard or removal of structures from a hazard area. Includes acquisition, elevation, relocation, structural retrofit, storm shutters, and shatter-resistant glass.
c. **Public Education and Awareness—**Actions to inform citizens and elected officials about hazards and ways to mitigate them. Includes outreach projects, real estate disclosure, hazard information centers, and school-age and adult education.
d. **Natural Resource Protection—**Actions that minimize hazard loss and preserve or restore the functions of natural systems. Includes sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.
e. **Emergency Services—**Actions that protect people and property during and immediately after a hazard event. Includes warning systems, emergency response services, and the protection of essential facilities.
f. **Structural Projects—**Actions that involve the construction of structures to reduce the impact of a hazard. Includes dams, setback levees, floodwalls, retaining walls, and safe rooms.

Simultaneous with this process, the draft action plan will be sent to the following agencies with a request for review and comment:

- Placer County Office of Emergency Services
- City of Rocklin
- Sacramento County Department of Water Resources
- California Department of Water Resources
- City of Citrus Heights
- Placer County Flood Control District.

Final FEMA approval was granted on _____, 2016. The Roseville City Council adopted the Plan through Resolution ##-## on _____, 2016. A copy of the resolution is provided in Figure 19-1. The City of Roseville is considered eligible for the benefits afforded under the Disaster Mitigation Act as of this date.



Figure 19-1. Resolution Adopting the Roseville Hazard Mitigation Plan

19.3 PLAN MAINTENANCE STRATEGY

A hazard mitigation plan must present a plan maintenance process that includes the following (44 CFR Section 201.6(c)(4)):

- A method and schedule for monitoring, evaluating, and updating the mitigation plan
- A process for incorporating the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate
- A strategy for continuing public participation through the plan maintenance process.

This section details the formal process that will ensure that the hazard mitigation plan remains an active and relevant document and that the City of Roseville maintains its eligibility for applicable funding sources. The plan maintenance process includes a schedule for monitoring and evaluating the Plan annually and producing an updated plan every five years. This section also describes how public participation will be integrated throughout the plan maintenance and implementation process. It explains how the mitigation strategies outlined in this Plan will be incorporated into existing planning mechanisms and programs, such as comprehensive land-use planning processes, capital improvement planning, and building code enforcement and implementation. The Plan's format allows sections to be reviewed and updated when new data become available, resulting in a plan that will remain current and relevant.

Pursuant to 44CFR 201.6(c)(4)(i), the following matrix provides a synopsis of responsibilities for plan monitoring, evaluation, and update which are discussed in further detail in sections 19.3.1 to 19.3.4 of this Plan:

Task	Approach	Timeline	Lead Responsibility	Support Responsibility
Monitoring	Preparation of status updates and action implementation tracking as part of submission to the Steering Committee for annual progress report. Deputy City Manager or Designee is responsible for initiating status updates with identified secondary responsibility departments.	Annual (July-September)	Deputy City Manager or Designee	• Central Service Dept. • City Council • City Manager's Office • Public Affairs/Communication Dept. • Development Services Dept. • Environmental Utilities Dept. • Information Technology Div. • Parks/Rec/Libraries: Open Space Div. • Police and Fire Dept. • Public Works Dept. • Roseville Electric
Evaluation	Review the status of previous actions as submitted by the monitoring task lead and support entities noted above to assess the effectiveness of the plan; complete and finalize the Annual Progress Report.	Annual (September) – prior to CRS recertification process on October 1	Planning Team • City Manager's Office • Public Works • Fire Dept. • Development Svcs • Technical Consultant	Steering Committee • City Manager's Office • Public Works • Fire Dept. • Development Svcs • Communications • Public Volunteers • Local businesses/organizations

Task	Approach	Timeline	Lead Responsibility	Support Responsibility
Update	The Planning Team will call the Steering Committee to reconvene, at a minimum, every 5 years to guide a comprehensive update to review and revise the Plan.	Every 5 years or upon comprehensive update to General Plan or major disaster	Planning Team • City Manager's Office • Public Works • Fire Dept. • Development Svcs • Technical Consultant	Steering Committee • City Manager's Office • Public Works • Fire Dept. • Development Svcs • Communications • Public Volunteers • Local businesses/organizations

19.3.1 Plan Implementation

The hazard mitigation plan includes a range of action items to reduce losses from hazard events. Together, the action items provide a framework for activities that the City can choose to implement over the next five years. The effectiveness of the Plan depends on the incorporation of the action items into existing City plans, policies, and programs.

The Roseville City Manager's Office and the Development Services Department will be jointly responsible for monitoring the Plan's implementation and maintenance through existing City programs. The Deputy City Manager or designated appointee will assume lead responsibility for facilitating plan implementation and maintenance meetings. Although the City Manager's Office will have primary department responsibility for review, coordination, and promotion, plan implementation and evaluation will be a shared responsibility among all departments and agencies identified as lead agencies in the mitigation action plan (see Chapter).

19.3.2 Steering Committee

The Steering Committee is a volunteer body that contributed greatly to the development of the initial and updated plans. The initial committee oversaw the development of the initial plan and made recommendations on key elements of the Plan, including a maintenance strategy. An oversight committee with representation similar to the initial Steering Committee then took an active role in the maintenance strategy. By maintaining progress reports, and keeping the Plan dynamic, Roseville was able to successfully complete many of the actions identified in the initial action plan. A reactivated Steering Committee then oversaw development of the 2011 and 2016 Plan updates.

A Steering Committee of not more than 14 members, as determined by the Roseville City Manager's Office, should remain involved in key elements of the proposed maintenance strategy. The Steering Committee will convene annually to perform annual reviews of the updated plan and its implementation. The make-up of this Steering Committee will strive for no less than 50 percent representation from citizens, citizen groups, and stakeholders within the planning area. Previous and existing members will be given the option to remain involved in the process.

A technical subcommittee with a make-up similar to the subcommittee used for initial plan development could be used in the plan maintenance strategy, at the discretion of the planning team and the Steering Committee.

19.3.3 Annual Progress Report

The minimum task of the annual Steering Committee meetings will be the evaluation of the progress of the 2016 Plan. This review will include the following:

- Summary of any hazard events that occurred during the prior year and their impact on the planning area
- Review of successful mitigation actions identified in the 2016 Plan
- Brief discussion about why targeted strategies were not completed
- Re-evaluation of the action plan to determine if the timeline for identified projects needs to be amended (such as changing a long-term project to a short-term project because of funding availability)
- Recommendations for new projects
- Changes in or potential for new funding options (grant opportunities)
- Impacts of any other planning programs or actions in the City that involve hazard mitigation

The planning team created a template to guide the Steering Committee in preparing a progress report during the previous planning process. The Steering Committee will provide feedback to the planning team on items included in the template. The planning team will continue to use this progress report template to prepare a formal annual report on the progress of the 2016 Plan. This report will be used as follows:

- Posted on the City website on the page dedicated to the hazard mitigation plan
- Announced on multiple social media platforms
- Provided to the local media through a press release
- Presented to the Roseville City Council
- Provided as part of the CRS annual re-certification package.

The CRS program requires an annual recertification to be submitted by October 1 of every calendar year for which the community has not received a formal audit. To meet this recertification timeline, the planning team will strive to complete the progress report process between June and September every year.

19.3.4 Plan Update

Section 201.6.d.3 of 44 CFR requires that local hazard mitigation plans be reviewed, revised if appropriate, and resubmitted for approval in order to remain eligible for benefits awarded under the DMA. The City of Roseville intends to update its hazard mitigation plan on a 5-year cycle. This cycle may be accelerated to less than 5 years based on the following triggers:

- A Presidential Disaster Declaration that impacts the City of Roseville
- A hazard event that causes loss of life
- A comprehensive update of the City of Roseville General Plan

It will not be the intent of this update process to start from scratch and develop a complete new hazard mitigation plan. Based on needs identified by the planning team, this update will, at a minimum, include the following elements:

- The update process will be convened through a Steering Committee.
- The hazard risk assessment will be reviewed and updated using best available information and technologies.
- The action plan will be reviewed and revised to account for any actions completed, dropped, or changed and to account for changes in the risk assessment or new City policies identified under other planning mechanisms, as appropriate (such as the General Plan).
- The draft update will be sent to appropriate agencies and organizations for comment.

- The public will be given an opportunity to comment on the update prior to adoption.
- The Roseville City Council will adopt the updated Plan.

19.3.5 Continuing Public Involvement

The public will continue to be apprised of hazard mitigation actions through the City website and by providing copies of the annual progress reports to the media. Copies of the 2016 Plan will be distributed to the Roseville City Library System. Upon initiation of the update process, a new public involvement strategy will be initiated based on guidance from the Steering Committee. This strategy will be based on the needs and capabilities of the City at the time of the update. At a minimum, this strategy will include the use of local media outlets within the planning area.

19.3.6 Incorporation into Other Planning Mechanisms

The City began planning for the impacts of hazards through the Safety Element of its 1992 General Plan. The hazard mitigation plan update process provided the City with an opportunity to review and expand on policies contained in the General Plan. The City views the General Plan and the hazard mitigation plan as complementary documents that work together to reduce risk exposure to the citizens of Roseville. A comprehensive update to the General Plan will trigger an update to the hazard mitigation plan. Many of the ongoing recommendations identified in the 2016 Plan are programs recommended by the General Plan. Processes and programs that the City will coordinate with the hazard mitigation plan recommendations include the following:

- City emergency response plan
- Capital improvement programs
- Roseville municipal code
- Community design guidelines
- Stormwater management program

Some action items do not need to be implemented through regulation. Instead, these items can be implemented through the creation of new educational programs, continued interagency coordination, or improved public participation.

Plan Integration During the 2011 RMHMP Performance Period

The 2011 RMHMP identified 24 actions related to plan integration. Due to the nature of plan integration, these actions were identified as ongoing initiatives and were carried over into the 2016 Plan update. Plan integration actions remain ongoing, as they serve as a benchmark for annual progress reporting and encourage the use of the Plan as a living document. During the performance period of the 2011 plan, 23 of the identified actions resulted in measurable plan integration of 2011 RMHMP goals, risk assessment, or recommendations into the following plans and programs:

- Specific Plans and Specific Plan Amendments
- Master Drainage Plan requirements for Specific Plans
- Groundwater Environmental Impact Report
- Water Recycling Master Plan
- Debris Management Plan (Completed in conjunction with the 2016 planning process)

Specific information regarding how each of these plans and programs integrated 2011 RMHMP information is available in the 2015 Progress Report located in Appendix B.

Plan Integration for the 2016 Mitigation Action Plan

Implementation of the 2016 mitigation action plan has and will continue to enhance and expand the integration efforts of the 2011 Plan. Inter-agency coordination occurred through involvement by local, regional, state and federal stakeholders involved in and consulted with during the planning process. This coordination is expected to continue through Steering Committee activities, annual progress reporting, implementation coordination, and the continued public engagement.

As the plan is implemented, all City agencies will use information from this updated plan as the best available science and data on natural hazards impacting the City of Roseville. 24 actions related to plan integration have been recommended for continued implementation in this Plan.

REFERENCES

Cal-Adapt. 2016. http://cal-adapt.org/ Exploring California's Climate Change Research.

California Department of Water Resources (CA DWR). 2013. http://www.water.ca.gov/waterplan/ The California Water Plan

CA DWR. 2016. http://www.water.ca.gov/climatechange/ Climate Change

CA DWR. 2016a. http://www.water.ca.gov/damsafety/FAQAnswer/index.cfm Frequently Asked Questions

California Department of Finance. 2016. http://www.dof.ca.gov/Forecasting/Demographics/Estimates/e-1/ Population Estimates for Cities, Counties, and the State – January 1, 2015 and 2016

California Emergency Management Agency, et al. 2012. http://resources.ca.gov/docs/climate/APG_Understanding_Regional_Characteristics.pdf California Adaptation Planning Guide: Understanding Regional Characteristics.

CAL FIRE. 2012. http://frap.cdf.ca.gov/. California Department of Forestry and Fire Prevention. 2012. Fire and Resource Assessment Program. Website mapping and data, 2012.

Danielson, Tess. 2015. http://www.businessinsider.com/ransomware-is-everywhere-but-this-software-can-save-you-2015-10 How to avoid the curse of Ransomware.

Federal Emergency Management Agency (FEMA). 1982. http://www.archives.gov/federal-register/codification/executive-order/11988.html Executive Order 11988-Floodplain management

FEMA. 2001. Understanding Your Risks; Identifying Hazards and Determining your Risks. FEMA (386-2). August 2001

FEMA. 2002. Getting Started; Building support for Mitigation Planning; FEMA (386-1). September 2002

FEMA. 2003. Developing the Mitigation Plan; Identifying Mitigation Actions and Implementing Strategies. FEMA (386-3). April 2003

FEMA. 2003. Integrating Manmade Hazards into Mitigation Planning. FEMA (386-7). September 2003

FEMA. 2004. http://www.damsafety.org/media/Documents/PDF/fema-333.pdf Federal Guidelines for Dam Safety

FEMA. 2007. FEMA, National Flood Insurance Program, Community Rating System; CRS Coordinator's Manual FIA-15/2007 OMB No. 1660-0022

FEMA. 2013. http://www.fema.gov/news-release/2013/10/18/be-cyber-smart-stay-cyber-secure Be Cyber Smart, Stay Cyber Secure

FEMA. 2015. https://www.fema.gov/national-dam-safety-program National Dam Safety Program

FEMA. 2016. https://www.fema.gov/disasters Disaster Declarations

FEMA. 2016a. http://www.fema.gov/what-mitigation What is Mitigation?

Harrison, Virginia. 2015. http://money.cnn.com/2015/04/14/technology/security/cyber-attack-hacks-security/. CNN Money

Intergovernmental Panel on Climate Change. 2014. http://www.ipcc.ch/report/ar5/wg2/ Climate Change 2014: Impacts, Adaptation, and Vulnerability

International Strategy for Disaster Reduction. 11/11/2008. "Disaster Risk Reduction Strategies and Risk Management Practices: Critical Elements for Adaptation to Climate Change"

Iverson, R.M., 2004, Granular avalanches across irregular three-dimensional terrain: 1. theory and computation, Journal of Geophysical Research, v. 109, F01014, doi: 10.1029/2003JF000085. 14 p.

Kostadinov, Dimitar. 2012. http://resources.infosecinstitute.com/cyberterrorism-distinct-from-cybercrime/ Cyberterrorism Defined

Michigan Tech University. n.d. http://www.geo.mtu.edu/UPSeis/intensity.html How Are Earthquake Magnitudes Measured?

National Archives. 2016. http://www.archives.gov/federal-register/codification/executive-order/11990.html Executive Order 11990 -Protection of wetlands

NASA. 2016. http://climate.nasa.gov/vital-signs/carbon-dioxide/ Global Climate Change – Vital Signs of the Planet. Carbon Dioxide.

NASA. 2015. http://www.nasa.gov/audience/forstudents/5-8/features/nasa-knows/what-is-climate-change-58.html What are Climate and Climate Change?

NASA. 2004. http://www.nasa.gov/home/hqnews/2004/jul/HQ_04252_glaciers.html Retreating Glaciers Spur Alaskan Earthquakes

NOAA. 2016. https://www.ncdc.noaa.gov/stormevents/. NOAA, National Climatic Data Center website, Storm Events Database

Northern California Earthquake Data Center. 2014. UC Berkeley Seismological Laboratory. Dataset. doi:10.7932/NCEDC.

Office of Federal Lands Highway. United States Department of Transportation, Federal Highway Administration. 2016. https://flh.fhwa.dot.gov/programs/erfo/ Emergency Relief for Federally Owned Roads (ERFO)

Office of the Press Secretary. 2015. https://www.whitehouse.gov/the-press-office/2015/01/30/executive-order-establishing-federal-flood-risk-management-standard-and- Executive Order – Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input

Placer County. 2016. Placer County Local Hazard Mitigation Plan Update.

Placer County Office of Economic Development. 2014. Placer County Economic and Demographic Profile.

Rickenmann, Dieter and Weber, Daniel. 2000. ftp://ftp.wsl.ch/pub/rickenmann/Rickenmann-pdf/2000/Rickenmann-Weber-2000_DFHM.pdf Debris Flow Hazards Mitigation: Mechanics, Prediction, and Assessment.

Roseville. 2015. City of Roseville General Plan 2035.

Roseville. 2015a. Urban Water Management Plan.

Roseville. 2010. http://www.roseville.ca.us/visiting/history_of_roseville/default.asp History of Roseville on City of Roseville Website, accessed 2016

Roseville. n.d. https://www.roseville.ca.us/civicax/filebank/blobdload.aspx?blobid=18782 Sustainability Efforts

Roseville. 2010a. https://roseville.ca.us/civicax/filebank/blobdload.aspx?blobid=18854 Special Presentation – City of Roseville Communitywide Sustainability Action Plan.

Savage, S. B., and K. Hutter. 1991. Dynamics of avalanches of granular materials from initiation to run-out. Part 1: Analysis, Acta Mech., 86, 201–223, doi:10.1007/BF01175958.

Seattle Office of Emergency Management. 2014. http://www.seattle.gov/Documents/Departments/Emergency/PlansOEM/SHIVA/SHIVAv6.3Final.pdf Seattle Hazard Identification and Vulnerability Assessment.

Spatial Hazard Events and Losses Database for the United States maintained by the University of South Carolina's (USC) Hazard Research Lab

United States Army Corps of Engineers. 2011. http://planning.usace.army.mil/toolbox/library/ERs/ER1100_2_1156_28Oct11.pdf Safety of Dams - Policies and Procedures

United States Census. 2010. Data from 2010 U.S. Census. U.S. Census Bureau.

United States Census. 2016. http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml American FactFinder

United States Department of Transportation. n.d. https://www.environment.fhwa.dot.gov/projdev/tdmmitig2.asp Mitigation of Environmental Impacts

United States Environmental Protection Agency. 2013. https://www3.epa.gov/climatechange/glossary.html Glossary

United States Global Change Research Program. 2009. https://nca2009.globalchange.gov/ Global Change Impacts in the United States: 2009 Report

United States Geological Survey (USGS). 1989. http://pubs.usgs.gov/gip/earthq4/severity_text.html The Severity of an Earthquake. U.S. Government Printing Office: 1989-288-913.

USGS. 2008. An Atlas of ShakeMaps for Selected Global Earthquakes. U.S. Geological Survey Open-File Report 2008-1236. Prepared by Allen, T.I., Wald, D.J., Hotovec, A.J., Lin, K., Earle, P.S. and Marano, K.D.

USGS. 2010. PAGER—Rapid Assessment of an Earthquake's Impact. U.S. Geological Survey Fact Sheet 2010-3036. September 2010.

USGS. n.d. http://landslides.usgs.gov/learn/ls101.php Landslides 101

Washington Department of Ecology. 2014. http://www.ecy.wa.gov/programs/sea/landslides/about/about.html Puget Sound Landslides The website of the Washington Department of Ecology.

Weather Channel. 2016. https://weather.com/weather/monthly/l/USCA0957:1:US Roseville

Wilson, C. 2008. Botnets, Cybercrime, and Cyberterrorism. Federation of American Scientists.

GLOSSARY

ACRONYMS

Cal EMA—California Emergency Management Agency

CAL FIRE—California Department of Forestry and Fire Protection

Cal OES— California Office of Emergency Services

CBC—California Building Code

CCR—California Code of Regulations

CDBG-DR—Community Development Block Grant Disaster Recovery grants

CEQA—California Environmental Quality Act

CIP—Capital Improvements Plan

CFR—Code of Federal Regulations

CPTED—Crime Prevention Through Environmental Design

CRS—Community Rating System

DFIRM—Digital Flood Insurance Rate Map

DHS—Department of Homeland Security

DMA —Disaster Mitigation Act

DWR—Department of Water Resources

EOP—Emergency Operations Plan

EPA—U.S. Environmental Protection Agency

ESA—Endangered Species Act

EUD—Environmental Utilities Department

FEMA—Federal Emergency Management Agency

FIRM—Flood Insurance Rate Map

FRAP—Fire and Resource Assessment Program

GIS—Geographic Information System

HAZUS-MH—Hazards, United States-Multi Hazard

HMGP—Hazard Mitigation Grant Program

IBC—International Building Code

MCI—Multi-Casualty Incident

MM—Modified Mercalli Scale

MND— Mitigated Negative Declaration

NEHRP—National Earthquake Hazards Reduction Program

NFIP—National Flood Insurance Program
NIMS—National Incident Management System
NOAA—National Oceanic and Atmospheric Administration
OES—Office of Emergency Services
OSPOMP—Open Space Preserve Overarching Management Plan
PCFCD—Placer County Flood Control District
PCWA—Placer County Water Agency
PDM—Pre-Disaster Mitigation Grant Program
PGA—Peak Ground Acceleration
RMC—Roseville Municipal Code
SARS—Severe acute respiratory syndrome
SEMS—Standardized Emergency Management System
SFHA—Special Flood Hazard Area
SJWD—San Juan Water District
SPI—Standardized Precipitation Index
STEMI—ST-elevation myocardial infarction
UBC—Uniform Building Code
ULOP—Urban Level of Flood Protection
USBR—U.S. Bureau of Reclamation
USGS—United States Geological Survey
VHF— Viral Hemorrhagic Fevers
WMD—Weapon of Mass Destruction
WNV—West Nile Virus

DEFINITIONS

100-Year Flood: The term "100-year flood" can be misleading. The 100-year flood does not necessarily occur once every 100 years. Rather, it is the flood that has a 1 percent chance of being equaled or exceeded in any given year.. Thus, the 100-year flood could occur more than once in a relatively short period of time. The Federal Emergency Management Agency (FEMA) defines it as the 1 percent annual chance flood, which is now the standard definition used by most federal and state agencies and by the National Flood Insurance Program (NFIP).

Acre-Foot: An acre-foot is the amount of water it takes to cover 1 acre to a depth of 1 foot. This measure is used to describe the quantity of storage in a water reservoir. An acre-foot is a unit of volume. One acre foot equals 7,758 barrels; 325,829 gallons; or 43,560 cubic feet. An average household of four will use approximately 1 acre-foot of water per year.

Act of Terrorism: According to the Federal Bureau of Investigation (FBI), an act of terrorism is "a violent act or an act dangerous to human life, in violation of the criminal laws of the United States or of any state, to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social goals." Acts of terrorism are intentional, criminal, and malicious and can be foreign or domestic, depending on the origin, base, and objectives of the terrorist or organization. Acts of terrorism can involve the use of weapons of

mass destruction, arson, and incendiary, explosive, and armed attacks; industrial sabotage and intentional hazardous materials releases; agro-terrorism; and cyber-terrorism.

Asset: An asset is any man-made or natural feature that has value, including, but not limited to, people; buildings; infrastructure, such as bridges, roads, sewers, and water systems; lifelines, such as electricity and communication resources; and environmental, cultural, or recreational features such as parks, wetlands, and landmarks.

Base Flood: The flood having a 1% chance of being equaled or exceeded in any given year, also known as the "100-year" or "1% chance" flood. The base flood is a statistical concept used to ensure that all properties subject to the National Flood Insurance Program (NFIP) are protected to the same degree against flooding.

Basin: A basin is the area within which all surface water – whether from rainfall, snowmelt, springs, or other sources – flows to a single water body or watercourse. The boundary of a river basin is defined by natural topography, such as hills, mountains, and ridges. Basins are also referred to as "watersheds" and "drainage basins."

Benefit: A benefit is a net project outcome and is usually defined in monetary terms. Benefits may include direct and indirect effects. For the purposes of benefit-cost analysis of proposed mitigation measures, benefits are limited to specific, measurable, risk reduction factors, including reduction in expected property losses (buildings, contents, and functions) and protection of human life.

Benefit/Cost Analysis: A benefit/cost analysis is a systematic, quantitative method of comparing projected benefits to projected costs of a project or policy. It is used as a measure of cost effectiveness.

Benioff Earthquake: Sometimes called "deep quakes," these occur in the Pacific Northwest when the Juan de Fuca plate breaks up underneath the continental plate, approximately 30 miles beneath the earth's surface.

Building: A building is defined as a structure that is walled and roofed, principally aboveground, and permanently fixed to a site. The term includes manufactured homes on permanent foundations on which the wheels and axles carry no weight.

Capability Assessment: A capability assessment provides a description and analysis of a community's current capacity to address threats associated with hazards. The assessment includes two components: an inventory of an agency's mission, programs, and policies, and an analysis of its capacity to carry them out. A capability assessment is an integral part of the planning process in which a community's actions to reduce losses are identified, reviewed, and analyzed, and the framework for implementation is identified. The following capabilities were reviewed under this assessment:

- Legal and regulatory capability
- Administrative and technical capability
- Fiscal capability

Certified Unified Program Agency: An agency (such as the City of Roseville) certified to act as a licensing agency for six hazardous materials-related programs. The Certified Unified Program Agency enables the City of Roseville to implement its own hazardous materials emergency response program. Mutual aid agreements are also in place for incident response. Each business that deals with hazardous materials generally must submit a Unified Program Consolidated Form with facility information to the Roseville Fire Department.

Civil Disorder: Civil disorder results from incidents intended to disrupt a community to the degree that law enforcement intervention is required to maintain public safety. Civil disorder is generally associated with controversial political, judicial, or economic issues and events and may occur at any time, although statistics indicate that civil disorder is more frequent during the summer months. Although the City of Roseville does not

have a history of civil disorder or rioting, large public gatherings, often associated with concerts or sports events, have overburdened local law enforcement and fire protection resources in the past. The effects of civil disorder and riots vary and depend on the type of event and its severity, scope, and duration. Essential services (such as electricity, water, public transportation, and communications) may be disrupted, and property damage, injuries, and loss of life may occur.

Communicable Disease: For the purposes of this Plan, communicable diseases include severe acute respiratory syndrome (SARS), flu, small pox, and diseases carried by insects. Diseases carried by insects include plague (fleas), encephalitis, malaria, West Nile virus (mosquitoes), and Lyme disease (ticks).

Community Rating System (CRS): The CRS is a voluntary program under the NFIP that rewards participating communities (provides incentives) for exceeding the minimum requirements of the NFIP and completing activities that reduce flood hazard risk by providing flood insurance premium discounts.

Critical Facility: A critical facility is vital to the City's ability to provide essential services and protect life and property. Loss of a critical facility would result in a severe economic or catastrophic impact. Under the Roseville hazard mitigation plan definition, critical facilities include the following:

- Police stations, fire stations, vehicle and equipment storage facilities, and emergency operations centers needed for disaster response before, during, and after hazard events
- Public and private utilities and infrastructure vital to maintaining or restoring normal services to areas damaged by hazard events
- Hospitals, nursing homes, and housing likely to contain occupants who may not be sufficiently mobile to avoid death or injury during a hazard event
- Structures or facilities that produce, use, or store highly volatile, flammable, explosive, toxic, and/or water-reactive materials

Crustal Earthquake: Crustal quakes occur at a depth of 5 to 10 miles beneath the earth's surface and are associated with fault movement within a surface plate.

Dam: A dam is any artificial barrier or controlling mechanism that can or does impound 10 acre-feet or more of water.

Dam Failure: Dam failure refers to a partial or complete breach in a dam (or levee) that impacts its integrity. Dam failures occur for a number of reasons, such as flash flooding, inadequate spillway size, mechanical failure of valves or other equipment, freezing and thawing cycles, earthquakes, and intentional destruction.

Debris Avalanche: Volcanoes are prone to debris and mountain rock avalanches that can approach speeds of 100 mph.

Debris Flow: Dense mixtures of water-saturated debris that move down-valley; looking and behaving much like flowing concrete. They form when loose masses of unconsolidated material are saturated, become unstable, and move down slope. The source of water varies but includes rainfall, melting snow or ice, and glacial outburst floods.

Debris Slide: Debris slides consist of unconsolidated rock or soil that has moved rapidly down slope. They occur on slopes greater than 65 percent.

Depth of Flooding: The depth of flooding is difference between regulatory flood elevation and the elevation of the lowest grade adjacent to a structure.

Disaster Mitigation Act of 2000 (DMA); The DMA is Public Law 106-390 and is the latest federal legislation enacted to encourage and promote proactive, pre-disaster planning as a condition of receiving financial assistance under the Robert T. Stafford Act. The DMA emphasizes planning for disasters before they occur. Under the DMA, a pre-disaster hazard mitigation program and new requirements for the national post-disaster hazard mitigation grant program (HMGP) were established.

Drainage Basin: A basin is the area within which all surface water (whether from rainfall, snowmelt, springs, or other sources) flows to a single water body or watercourse. The boundary of a river basin is defined by natural topography, such as hills, mountains, and ridges. Drainage basins are also referred to as "watersheds" and "basins." The City of Roseville is located within portions of two major drainage basins: the Pleasant Grove Creek Basin and the Dry Creek Basin. Pleasant Grove Creek and its tributaries drain most of the western and central areas of the City, and the Dry Creek Basin and its tributaries drain the remainder of the City. The Dry Creek system has year-round flows in its major watercourses, and the Pleasant Grove Creek system is intermittent, with only seasonal flows. As a result, portions of the City lie within a flood hazard area. However, since 1950, there have been no reports of structural flood damage along Pleasant Grove Creek and there are presently no structures subject to flooding within the Pleasant Grove Creek Basin.

Drought: Drought is a period of time without substantial rainfall or snowfall from one year to the next. Drought can also be defined as the cumulative impacts of several dry years or a deficiency of precipitation over an extended period of time, which in turn results in water shortages for some activity, group, or environmental function. A hydrological drought is caused by deficiencies in surface and subsurface water supplies. A socioeconomic drought impacts the health, well being, and quality of life or starts to have an adverse impact on a region. Drought is a normal, recurrent feature of climate and occurs almost everywhere.

Duration: For the purposes of this Plan, duration is defined as the length of time that a hazard occurs. For example, the duration of a tornado can be minutes, but release of a chemical warfare agent such as mustard gas can persist for hours or weeks if not remediated.

Earthquake: An earthquake is defined as a sudden slip on a fault, volcanic or magmatic activity, and sudden stress changes in the earth that result in ground shaking and radiated seismic energy. Earthquakes can last from a few seconds to over 5 minutes, and have been known to occur as a series of tremors over a period of several days. The actual movement of the ground in an earthquake is seldom the direct cause of injury or death. Casualties may result from falling objects and debris as shocks shake, damage, or demolish buildings and other structures.

Exposure: Exposure is defined as the number and dollar value of assets considered to be at risk during the occurrence of a specific hazard.

Extent: The extent is the size of an area affected by a hazard.

Fire Behavior: Fire behavior refers to the physical characteristics of a fire and is a function of the interaction between the fuel characteristics (such as type of vegetation and structures that could burn), topography, and weather. Variables that affect fire behavior include the rate of spread, intensity, fuel consumption, and fire type (such as underbrush versus crown fire).

Fire Frequency: Fire frequency is the broad measure of the rate of fire occurrence in a particular area. An estimate of the areas most likely to burn is based on past fire history or fire rotation in the area, fuel conditions, weather, ignition sources (such as human or lightning), fire suppression response, and other factors.

Flash Flood: A flash flood occurs with little or no warning when water levels rise at an extremely fast rate

Flood Insurance Rate Map (FIRM): FIRMs are the official maps on which the Federal Emergency Management Agency (FEMA) has delineated the Special Flood Hazard Area (SFHA).

Flood Insurance Study: A report published by the Federal Insurance and Mitigation Administration for a community in conjunction with the community's Flood Insurance rate Map. The study contains such background data as the base flood discharges and water surface elevations that were used to prepare the FIRM. In most cases, a community FIRM with detailed mapping will have a corresponding flood insurance study.

Floodplain: Any land area susceptible to being inundated by flood waters from any source. A flood insurance rate map identifies most, but not necessarily all, of a community's floodplain as the Special Flood Hazard Area (SFHA).

Floodway: Floodways are areas within a floodplain that are reserved for the purpose of conveying flood discharge without increasing the base flood elevation more than 1 foot. Generally speaking, no development is allowed in floodways, as any structures located there would block the flow of floodwaters.

Floodway Fringe: Floodway fringe areas are located in the floodplain but outside of the floodway. Some development is generally allowed in these areas, with a variety of restrictions. On maps that have identified and delineated a floodway, this would be the area beyond the floodway boundary that can be subject to different regulations.

Fog: Fog refers to a cloud (or condensed water droplets) near the ground. Fog forms when air close to the ground can no longer hold all the moisture it contains. Fog occurs either when air is cooled to its dew point or the amount of moisture in the air increases. Heavy fog is particularly hazardous because it can restrict surface visibility. Severe fog incidents can close roads, cause vehicle accidents, cause airport delays, and impair the effectiveness of emergency response. Financial losses associated with transportation delays caused by fog have not been calculated in the United States but are known to be substantial.

Freeboard: Freeboard is the margin of safety added to the base flood elevation.

Frequency: For the purposes of this Plan, frequency refers to how often a hazard of specific magnitude, duration, and/or extent is expected to occur on average. Statistically, a hazard with a 100-year frequency is expected to occur about once every 100 years on average and has a 1 percent chance of occurring any given year. Frequency reliability varies depending on the type of hazard considered.

Fujita Scale of Tornado Intensity: Tornado wind speeds are sometimes estimated on the basis of wind speed and damage sustained using the Fujita Scale. The scale rates the intensity or severity of tornado events using numeric values from F0 to F5 based on tornado wind speed and damage. An F0 tornado (wind speed less than 73 miles per hour [mph]) indicates minimal damage (such as broken tree limbs), and an F5 tornado (wind speeds of 261 to 318 mph) indicates severe damage.

General Plan: California state law requires that every county and city prepare and adopt a comprehensive long-range plan to serve as a guide for community development. The plan must consist of an integrated and internally consistent set of goals, policies, and implementation measures. In addition, the plan must focus on issues of the greatest concern to the community and be written in a clear and concise manner. City actions, such as those relating to land-use allocation, annexations, zoning, subdivision and design review, redevelopment, and capital improvements, must be consistent with such a plan. The City of Roseville's general plan serves these purposes. As the principle planning document that directs the City's growth and land use, the general plan is as an integral part of the Roseville hazard mitigation plan. A technical update to Roseville's general plan was completed in January 2003.

Goal: A goal is a general guideline that explains what is to be achieved. Goals are usually broad-based, long-term, policy-type statements and represent global visions. Goals help define the benefits that a plan is trying to achieve.

The success of the Roseville hazard mitigation plan, once implemented, should be measured by the degree to which its goals have been met (that is, by the actual benefits in terms of actual hazard mitigation).

Geographic Information System (GIS): GIS is a computer software application that relates data regarding physical and other features on the earth to a database for mapping and analysis.

Hazard: A hazard is a source of potential danger or adverse condition that could harm people and/or cause property damage. Natural hazards include floods, winds, and earthquakes. Man-made hazards include acts of terrorism and hazardous material spills.

Hazardous Material: A hazardous material is a substance or combination of substances that (1) can cause or contribute to an increase in mortality or serious irreversible or incapacitating reversible illnesses, or (2) pose a present or potential hazard to human life, property, or the environment. Hazardous materials could cause these effects because of their quantity, concentration, or physical, chemical, or infectious characteristics. Hazardous waste is included in the City's working definition of hazardous material.

Hazardous Material Incident: This type of incident involves the accidental or intentional release of hazardous materials to the environment. Such incidents typically occur as fixed facility incidents or transportation incidents. It is possible to identify and prepare for a fixed facility incident because federal and state laws require facilities to notify state and local authorities about hazardous materials used or produced at the facility. Transportation incidents are more difficult to prepare for because there is little (if any) notice about the materials involved. Except for severe weather and flooding, hazardous materials incidents are the most likely hazards to affect the City of Roseville.

Hazard Mitigation Grant Program (HMGP): Authorized under Section 202 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, the HMGP is administered by FEMA and provides grants to states, tribes, and local governments to implement hazard mitigation actions after a major disaster declaration. The purpose of the program is to reduce the loss of life and property due to disasters and to enable mitigation activities to be implemented as a community recovers from a disaster

Hazards U.S. Hazard (HAZUS-MH) Loss Estimation Program: HAZUS-MH is a GIS-based program used to support the development of risk assessments as required under the DMA. The HAZUS-MH software program assesses risk in a quantitative manner to estimate damages and losses associated with natural hazards. HAZUS-MH is FEMA's nationally applicable, standardized methodology and software program and contains modules for estimating potential losses from earthquakes, floods, and wind hazards. HAZUS-MH has also been used to assess vulnerability (exposure) for other hazards facing Roseville.

Hydraulics: Hydraulics is the branch of science or engineering that addresses fluids (especially water) in motion in rivers or canals, works and machinery for conducting or raising water, the use of water as a prime mover, and other fluid-related areas.

Hydrology: Hydrology is the analysis of waters of the earth. For example, a flood discharge estimate is developed by conducting a hydrologic study.

Intensity: For the purposes of this Plan, intensity refers to the measure of the effects of a hazard.

Inventory: The assets identified in a study region comprise an inventory. Inventories include assets that could be lost when a disaster occurs and community resources are at risk. Assets include people, buildings, transportation, and other valued community resources.

Landslide: Landslides can be described as the sliding movement of masses of loosened rock and soil down a hillside or slope. Fundamentally, slope failures occur when the strength of the soils forming the slope exceeds the pressure, such as weight or saturation, acting upon them.

Large Gathering Places: For the purposes of this Plan, such places are defined as follows:

- Any facility listed as a Type A-2.1 in the California Uniform Building Code (UBC) because it has an assembly room with an occupant load of 300 or more without a stage (34 locations in Roseville)
- Any buildings listed as E-1 used for educational purposes through the 12th grade by 50 or more persons for more than 12 hours per week or 4 hours any 1 day (29 buildings in Roseville)
- Any facility likely to have an occupancy of greater than 300, such as a large employment centers, retail centers, cultural centers, and places of worship

Lightning: Lightning is an electrical discharge resulting from the buildup of positive and negative charges within a thunderstorm. When the buildup becomes strong enough, lightning appears as a "bolt," usually within or between clouds and the ground. A bolt of lightning instantaneously reaches temperatures approaching 50,000°F. The rapid heating and cooling of air near lightning causes thunder. Lightning is a major threat during thunderstorms. In the United States, 75 to 100 Americans are struck and killed by lightning each year (see http://www.fema.gov/hazard/thunderstorms/thunder.shtm).

Liquefaction: Liquefaction is the complete failure of soils, occurring when soils lose shear strength and flow horizontally. It is most likely to occur in fine grain sands and silts, which behave like viscous fluids when liquefaction occurs. This situation is extremely hazardous to development on the soils that liquefy, and generally results in extreme property damage and threats to life and safety.

Local Government: Any county, municipality, city, town, township, public authority, school district, special district, intrastate district, council of governments (regardless of whether the council of governments is incorporated as a nonprofit corporation under State law), regional or interstate government entity, or agency or instrumentality of a local government; any Indian tribe or authorized tribal organization, or Alaska Native village or organization; and any rural community, unincorporated town or village, or other public entity.

Magnitude: Magnitude is the measure of the strength of an earthquake, and is typically measured by the Richter scale. As an estimate of energy, each whole number step in the magnitude scale corresponds to the release of about 31 times more energy than the amount associated with the preceding whole number value.

Mass movement: A collective term for landslides, mudflows, debris flows, sinkholes and lahars.

Mitigation: A preventive action that can be taken in advance of an event that will reduce or eliminate the risk to life or property.

Mitigation Actions: Mitigation actions are specific actions to achieve goals and objectives that minimize the effects from a disaster and reduce the loss of life and property.

Nolte Future Floodplain: The Nolte Future Floodplain is the portion of the regulatory floodplain based on the Roseville City of Roseville Floodplain Analysis published by Nolte and Associates in August 1986. This analysis used hydrologic parameters that better represented the observed flooding scenarios that caused flooding in Roseville. The study also used hydrologic parameters based on projected growth for the region assuming total development of the watershed instead of existing conditions used by FEMA. This approach generated a floodplain area greater than that reflected of on the FIRM for portions of Roseville. Although this study was never formally adopted, it is used by the City as the best available information for regulatory and land- use programs such as the specific plan program and improvement standards.

Objective: For the purposes of this Plan, an objective is defined as a short-term aim that, when combined with other objectives, forms a strategy or course of action to meet a goal. Unlike goals, objectives are specific and measurable.

Peak Ground Acceleration: Peak Ground Acceleration (PGA) is a measure of the highest amplitude of ground shaking that accompanies an earthquake, based on a percentage of the force of gravity.

Preparedness: Preparedness refers to actions that strengthen the capability of government, citizens, and communities to respond to disasters.

Presidential Disaster Declaration: These declarations are typically made for events that cause more damage than state and local governments and resources can handle without federal government assistance. Generally, no specific dollar loss threshold has been established for such declarations. A Presidential Disaster Declaration puts into motion long-term federal recovery programs, some of which are matched by state programs, designed to help disaster victims, businesses, and public entities.

Probability of Occurrence: The probability of occurrence is a statistical measure or estimate of the likelihood that a hazard will occur. This probability is generally based on past hazard events in the area and a forecast of events that could occur in the future. A probability factor based on yearly values of occurrence is used to estimate probability of occurrence.

Regulatory Floodplain: This term refers to an area regulated by the City of Roseville as floodplain through its land-use regulations and improvement standards. It includes areas identified by FEMA and published on FIRMs and additional areas identified by Roseville as being susceptible to flooding. These areas are delineated based on detailed hydrologic and hydraulic floodplain modeling that meets or exceeds FEMA criteria for mapping and modeling floodplains. The flood event used to delineate these boundaries is referred to as "the regulatory flood" in this Plan to differentiate it from the "base flood" used by FEMA. The City of Roseville designates the 100-year floodplain area on its land-use map in accordance with best available floodplain information as determined by the Public Works Director. In many portions of the City, the Nolte Future Floodplain (May 1987) has been used to designate floodplain boundaries. When Nolte Future Floodplain information does not exist or does not represent the best available information, new floodplain information is generated by the project proponent. New floodplain information is generally developed (1) consistent with build-out development assumptions used by the Nolte Future Floodplain analysis, and (2) in compliance with the most recent Placer County floodplain manual. Floodplain boundaries can normally be terminated where the 100-year floodplain narrows to a width of 200 feet or less and where the associated drainage area is less than 300 acres. Precise termination of boundaries must be approved by the Public Works Director.

Repetitive Loss Property: Any NFIP-insured property that, since 1978 and regardless of any changes of ownership during that period, has experienced:

- Four or more paid flood losses in excess of $1000.00; or
- Two paid flood losses in excess of $1000.00 within any 10-year period since 1978 or
- Three or more paid losses that equal or exceed the current value of the insured property.

Return Period (or Mean Return Period): This term refers to the average period of time in years between occurrences of a particular hazard (equal to the inverse of the annual frequency of occurrence).

Riverine: Of or produced by a river. Riverine floodplains have readily identifiable channels. Floodway maps can only be prepared for riverine floodplains.

Risk: Risk is the estimated impact that a hazard would have on people, services, facilities, and structures in a community. Risk measures the likelihood of a hazard occurring and resulting in an adverse condition that causes

injury or damage. Risk is often expressed in relative terms such as a high, moderate, or low likelihood of sustaining damage above a particular threshold due to occurrence of a specific type of hazard. Risk also can be expressed in terms of potential monetary losses associated with the intensity of the hazard.

Risk Assessment: Risk assessment is the process of measuring potential loss of life, personal injury, economic injury, and property damage resulting from hazards. This process assesses the vulnerability of people, buildings, and infrastructure to hazards and focuses on (1) hazard identification; (2) impacts of hazards on physical, social, and economic assets; (3) vulnerability identification; and (4) estimates of the cost of damage or costs that could be avoided through mitigation.

Risk Ranking: This ranking serves two purposes, first to describe the probability that a hazard will occur, and second to describe the impact a hazard will have on the people, property, and economy of Roseville. Risk estimates for the City are based on the methodology that the City used to prepare the risk assessment for this Plan. The following equation shows the risk ranking calculation:

Risk Ranking = Probability + Impact (people + property + economy)

Robert T. Stafford Act: The Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 100-107, was signed into law on November 23, 1988. This law amended the Disaster Relief Act of 1974, Public Law 93-288. The Stafford Act is the statutory authority for most federal disaster response activities, especially as they pertain to FEMA and its programs.

Sinkhole: A collapse depression in the ground with no visible outlet. Its drainage is subterranean. It is commonly vertical-sided or funnel-shaped.

Slab: This refers to one or more layers of snow in which the grains are bonded together. A slab initially fails over a large area instead of at a single point.

Special Flood Hazard Area: The base floodplain delineated on a Flood Insurance Rate Map. The SFHA is mapped as a Zone A in riverine situations and zone V in coastal situations. The SFHA may or may not encompass all of a community's flood problems

Stakeholder: Business leaders, civic groups, academia, non-profit organizations, major employers, managers of critical facilities, farmers, developers, special purpose districts, and others whose actions could impact hazard mitigation.

Steering Committee: The Steering Committee is the Roseville City Council-approved group that oversaw all phases of the hazard mitigation plan's development. The members of this committee included key city personnel, citizens, and other stakeholders from within the planning area.

Stream Bank Erosion: Stream bank erosion is common along rivers, streams and drains where banks have been eroded, sloughed or undercut. However, it is important to remember that a stream is a dynamic and constantly changing system. It is natural for a stream to want to meander, so not all eroding banks are "bad" and in need of repair. Generally, stream bank erosion becomes a problem where development has limited the meandering nature of streams, where streams have been channelized, or where stream bank structures (like bridges, culverts, etc.) are located in places where they can actually cause damage to downstream areas. Stabilizing these areas can help protect watercourses from continued sedimentation, damage to adjacent land uses, control unwanted meander, and improvement of habitat for fish and wildlife.

Steep Slope: Different communities and agencies define it differently, depending on what it is being applied to, but generally a steep slope is a slope in which the percent slope equals or exceeds 25%. For this study, steep slope is defined as slopes greater than 33%.

Subduction Zone Earthquake: This type of quake occurs along two converging plates, attached to one another along their interface. When the interface between these two plates slips, a sudden, dramatic release of energy results, propagated along the entire fault line.

Sustainable Hazard Mitigation: This concept includes the sound management of natural resources, local economic and social resiliency, and the recognition that hazards and mitigation must be understood in the largest possible social and economic context.

Technical Subcommittee: This City of Roseville group convened to provide guidance, support, and feedback to the planning team during all phases of Roseville hazard mitigation plan development. The technical subcommittee consisted of key staff from City departments integral to implementing City programs pertinent to hazard mitigation.

Technological Hazard: A technological hazard arises from human activities such as the manufacture, transportation, storage, and use of hazardous materials. Technological hazards are assumed to be accidental in nature, with unintended consequences.

Thunderstorm: A thunderstorm is a storm with lightning and thunder produced by cumulonimbus clouds. Thunderstorms usually produce gusty winds, heavy rains, and sometimes hail. Thunderstorms are usually short in duration (seldom more than 2 hours). Heavy rains associated with thunderstorms can lead to flash flooding during the wet or dry seasons.

Tornado: A tornado is a violently rotating column of air extending between and in contact with a cloud and the surface of the earth. Tornadoes are often (but not always) visible as funnel clouds. On a local scale, tornadoes are the most intense of all atmospheric circulations, and winds can reach destructive speeds of more than 300 mph. A tornado's vortex is typically a few hundred meters in diameter, and damage paths can be up to 1 mile wide and 50 miles long.

Vulnerability: Vulnerability describes how exposed or susceptible an asset is to damage. Vulnerability depends on an asset's construction, contents, and the economic value of its functions. Like indirect damages, the vulnerability of one element of the community is often related to the vulnerability of another. For example, many businesses depend on uninterrupted electrical power. Flooding of an electric substation would affect not only the substation itself but businesses as well. Often, indirect effects can be much more widespread and damaging than direct effects.

Water Supply Strategy: A water supply strategy is a comprehensive approach to ensure water reliability for Roseville's customers. The City has a diverse set of water supply options, including surface water contracts, recycled water, and groundwater wells to ensure that even after a period of dry years, a combination of available water supplies and water conservation measures will ensure that the community has adequate water. The City has contracts for surface water with three agencies

Watershed: A watershed is an area that drains downgradient from areas of higher land to areas of lower land to the lowest point, a common drainage basin.

Weapon of Mass Destruction (WMD): WMDs include chemical, biological, radiological, nuclear, and explosive weapons associated with terrorism.

West Nile Virus: West Nile virus is a recent natural hazard affecting California. Mosquitoes transmit this potentially deadly disease to livestock and humans alike. West Nile virus first struck the northern hemisphere in Queens, New York, in 1999 and killed four people. In 2003, all 50 states warned of an outbreak from any of the 30 mosquito species known to carry it. From 62 severe cases in 1999, confirmed human cases of the virus spread

to 39 states in 2002 and killed 284 people. Less than 1 percent of those infected develop severe illness. People over 50 years of age appear to be at high risk for the severe aspects of the disease.

Wildfire: These terms refer to any uncontrolled fire occurring on undeveloped land that requires fire suppression. The potential for wildfire is influenced by three factors: the presence of fuel, topography, and air mass. Fuel can include living and dead vegetation on the ground, along the surface as brush and small trees, and in the air such as tree canopies. Topography includes both slope and elevation. Air mass includes temperature, relative humidity, wind speed and direction, cloud cover, precipitation amount, duration, and the stability of the atmosphere at the time of the fire. Wildfires can be ignited by lightning and, most frequently, by human activity including smoking, campfires, equipment use, and arson.

Windstorm: Windstorms are generally short-duration events involving straight-line winds or gusts exceeding 50 mph. These gusts can produce winds of sufficient strength to cause property damage. Windstorms are especially dangerous in areas with significant tree stands, exposed property, poorly constructed buildings, mobile homes (manufactured housing units), major infrastructure, and aboveground utility lines. A windstorm can topple trees and power lines; cause damage to residential, commercial, critical facilities; and leave tons of debris in its wake.

Zoning Ordinance: The zoning ordinance designates allowable land use and intensities for a local jurisdiction. Zoning ordinances consist of two components: a zoning text and a zoning map.

Appendix A. Public Outreach Materials

City of Roseville Survey: 2016 Hazard Mitigation Plan Update Questionnaire

1. Survey Introduction

City of Roseville Hazard Mitigation Questionnaire

A range of natural and man-made disasters can affect any community. The City of Roseville works diligently to mitigate threats and prepare for disasters, and has been recognized nationally for its level of excellence in the area of hazard mitigation. This ensures our community minimizes the impact of adversity and can recover as quickly as possible.

To remain at this high level of preparedness, we need your help to identify and plan for future disasters. Data collected through this survey will help the City of Roseville Multi-Hazard Mitigation Committee:

- **Assess our residents' level of awareness regarding disasters;**
- **Determine areas vulnerable to various types of disasters;**
- **Coordinate activities to reduce the risk of injury or property damage in the future; and,**
- **Update the City of Roseville Hazard Mitigation Plan.**

The City of Roseville Hazard Mitigation Plan is required to be updated every five years by the federal Disaster Mitigation Act of 2000.

The Plan details the risks of both natural and manmade hazards in Roseville and includes programs and projects that can help reduce the exposure of City residents and businesses should an event occur in Roseville. The Plan also makes the City eligible for federal pre-disaster and post-disaster assistance. The City has been very successful to date in securing funds for projects in Roseville to lessen the risks associated with natural hazards in Roseville.

This survey consists of three sets of questions: The first section consists of demographic information that will be used in evaluating the responses to the questionnaire. The second section is about the potential hazards near you and whether your knowledge of potential hazards influenced your decision to choose where you live. The last section is about your experience and knowledge of natural and manmade hazards in general, and steps your household has taken to prepare for disasters.

Thank you for taking the time to participate in the 2016 Hazard Mitigation Questionnaire!

City of Roseville Survey: 2016 Hazard Mitigation Plan Update Questionnaire

2. About You

First, please tell us about yourself. This information will aid the City's Multi-Hazard Mitigation Plan Steering Committee in evaluating the responses to this questionnaire. The answers will be used only for the preparation of this Plan and will not be provided to any other group or interest.

1. How much is your gross household income?

- ◯ $20,000 or less
- ◯ $20,001 to $49,999
- ◯ $50,000 to $74,999
- ◯ $75,000 to $99,999
- ◯ $100,000 or More

2. Do you work in Roseville?

- ◯ Yes
- ◯ No

3. Please indicate the primary language spoken in your household.

- ◯ English
- ◯ Spanish
- ◯ Other (please specify)
- ◯ Other Indo-European Language
- ◯ Asian and Pacific Island Languages

4. Which of the following digital media outlets do you subscribe to receive news and information about the City of Roseville?

Select all that apply.

- ☐ Facebook
- ☐ Twitter
- ☐ Nextdoor
- ☐ Other (please specify)
- ☐ E-mail and/or text messages
- ☐ Alert Roseville

City of Roseville Survey: 2016 Hazard Mitigation Plan Update Questionnaire

3. Location

Please tell us about where you live and if the potential impacts of natural or manmade hazards influenced your decision.:

* 5. Do you live in Roseville?

- Yes
- No

6. Do you own or rent your place of residence?

- Own
- Rent

7. How long have you lived in at your current residence?

- Less than a year
- 1 – 2 years
- 3 – 5 years
- 6 – 10 years
- 11 – 15 years
- 16 – 20 years
- More than 20 years
- I don't live in Roseville

* 8. When you moved into your home, did you consider the impact a natural or human-caused disaster could have on your home?

- Yes
- No

* 9. Was the presence of a natural hazard risk zone (e.g., dam failure zone, flood zone, landslide hazard area, high fire risk area) disclosed to you by a real estate agent, seller, or landlord before you purchased or moved into your home?

- Yes
- No

* 10. Is your residence located in or near a FEMA designated floodplain?

- Yes
- No
- Not Sure

11. Is your residence located in a dam failure zone?

- Yes
- No
- Not sure

* 12. Do you have flood insurance?

- Yes
- No
- Not Sure

* 13. Is your residence located near an earthquake fault?

- Yes
- No
- Not Sure

* 14. Do you have earthquake insurance?

Yes | No | Not Sure

* 15. Is your property located in an area at risk for wildfires?

Yes | No | Not Sure

16. Have you ever had problems securing homeowners or renters insurance due to risks from hazards?

Yes | No

If "yes," what hazard was the cause of the difficulty?

17. Do you support policies to restrict or prohibit development in designated hazard zones?

Yes | No

* indicates a question that requires an answer.

City of Roseville Survey: 2016 Hazard Mitigation Plan Update Questionnaire

4. Hazard Knowledge

The next set of questions is about your experience and knowledge of natural and manmade hazards and steps your household has taken to prepare for disasters:

18. Which of the following natural hazard events have you or has anyone in your household experienced within the past 20 years in Roseville? (Check all that apply)

- [ ] Dam Failure
- [ ] Drought
- [ ] Earthquake
- [ ] Epidemic/Pandemic (flu, avian flu, H1N1, West Nile)
- [ ] Extreme Heat
- [ ] Flood
- [ ] Freeze
- [ ] Landslide & Other Earth Movements (non-seismic induced landslides and earth movements;subsidence;sinkholes;geologic hazard)
- [ ] Severe Weather (wind, lightning, winter storm, etc.)
- [ ] Wildfire
- [ ] None
- [ ] Other (please specify)

* 19. How concerned are you about the following natural hazards in Roseville? (Please check one for each hazard)

	Not concerned	Somewhat concerned	Concerned	Very concerned	Extremely concerned
Dam Failure					
Drought					
Earthquake					
Epidemic/Pandemic (flu, avian flu, H1N1, West Nile, Ebola)					
Extreme Heat					
Flood					
Freeze					
Landslide & Other Earth Movements (non-seismic induced landslides and earth movements;subsidence;sinkholes;geologic hazard)					
Severe Weather (wind, lightning, winter storm, etc.)					
Wildfire					
Other Natural Hazard					

If you are concerned about a natural hazard not listed above, please specify.

* 20. How concerned are you with the following manmade hazards in Roseville? (Check all that apply)

	Not concerned	Somewhat concerned	Concerned	Very concerned	Extremely concerned
Energy Shortage					
Act of Terrorism					
Hazardous Materials Release					
Cyber Threats					
Other Human-Caused Hazard					

If you are concerned about a human-caused hazard not listed above, please specify.

* 21. The FEMA website - Ready.gov - provides important information on how to prepare you and your family in the event of a disaster.

How prepared is your household for a natural or human-caused hazard event? (Check one)

- ◯ Not at all Prepared
- ◯ Somewhat Prepared
- ◯ Adequately Prepared
- ◯ Well Prepared
- ◯ Very Well Prepared

* 22. How would you expect to be notified in case of an immediate threat caused by a natural or human-caused hazard.

Select all that apply.

- ☐ Television
- ☐ Radio
- ☐ Facebook
- ☐ Twitter
- ☐ Nextdoor
- ☐ Alert Roseville
- ☐ Other (please specify)

23. FEMA suggests that households have at least 3 days of food, water, and vital supplies (e.g. medications) in hand in the event of a disaster. How many days of food, water, and vital supplies does your family have on hand in the event of a disaster?

◯ 1 ◯ 2 ◯ 3 ◯ 4 ◯ 5 ◯ 6 ◯ 7 ◯ 8 ◯ 9 ◯ 10 ◯ None

24. How prepared are you to get along without electricity or natural gas for one to five days?

- ◯ Not at all prepared
- ◯ Somewhat prepared
- ◯ Very prepared

25. Where would you expect to find useful information to help you be prepared?

Select all that apply.

- ☐ Television
- ☐ Internet
- ☐ Social Media
- ☐ Newspaper/magazine
- ☐ Other (please specify)
- ☐ City of Roseville Public Library
- ☐ Public government meetings
- ☐ Schools/academic institutions

26. Which of the following steps has your household already undertaken to prepare for a natural or manmade disaster?

Select all that apply.

- [ ] Received first aid/CPR training
- [ ] Made a fire escape plan
- [ ] Designated a meeting place
- [ ] Identified utility shutoffs
- [ ] Community Emergency Response Training (CERT)
- [ ] Prepared a disaster supply kit
- [ ] Installed smoke detectors on each level of the house
- [ ] Stored food and water
- [ ] Stored flashlights and batteries
- [ ] Stored a battery-powered radio
- [ ] Stored a fire extinguisher
- [ ] Stored medical supplies (first aid kit, medications)
- [ ] Other (please specify)

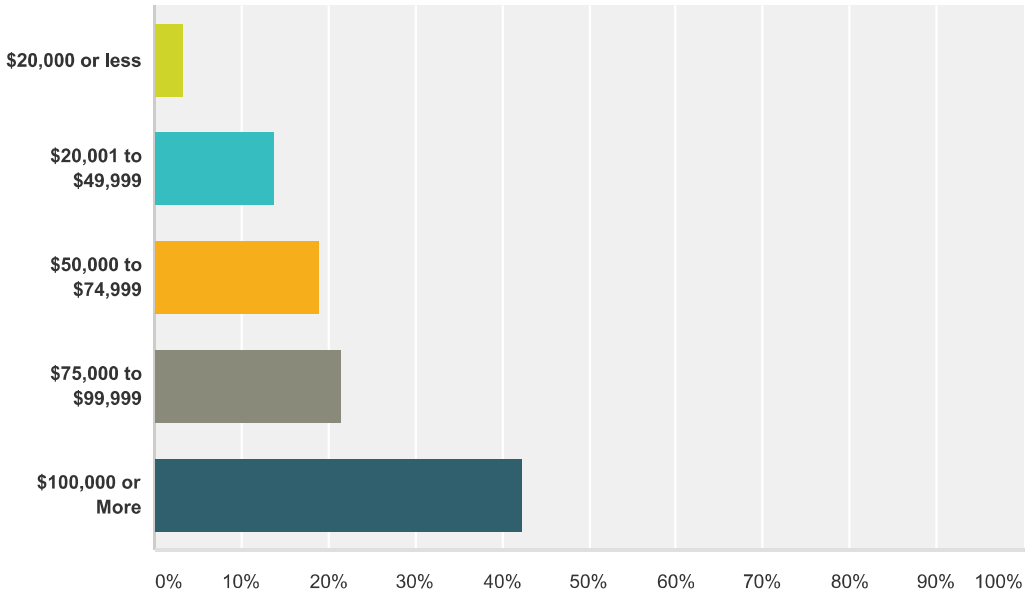
27. Please provide any additional comments you would like to share with the City of Roseville Planning Team.

* indicates a question that requires an answer.

28. If you would like to receive information regarding upcoming public events and other participatory opportunities regarding hazard mitigation, please provide your email address below.

Q1 How much is your gross household income?

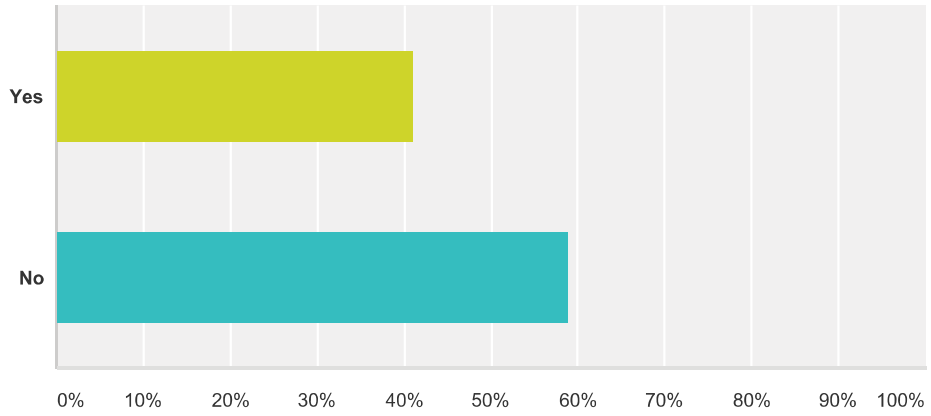
Answered: 641 Skipped: 30



Answer Choices	Responses	
$20,000 or less	3.28%	21
$20,001 to $49,999	13.73%	88
$50,000 to $74,999	19.03%	122
$75,000 to $99,999	21.53%	138
$100,000 or More	42.43%	272
Total		641

Q2 Do you work in Roseville?

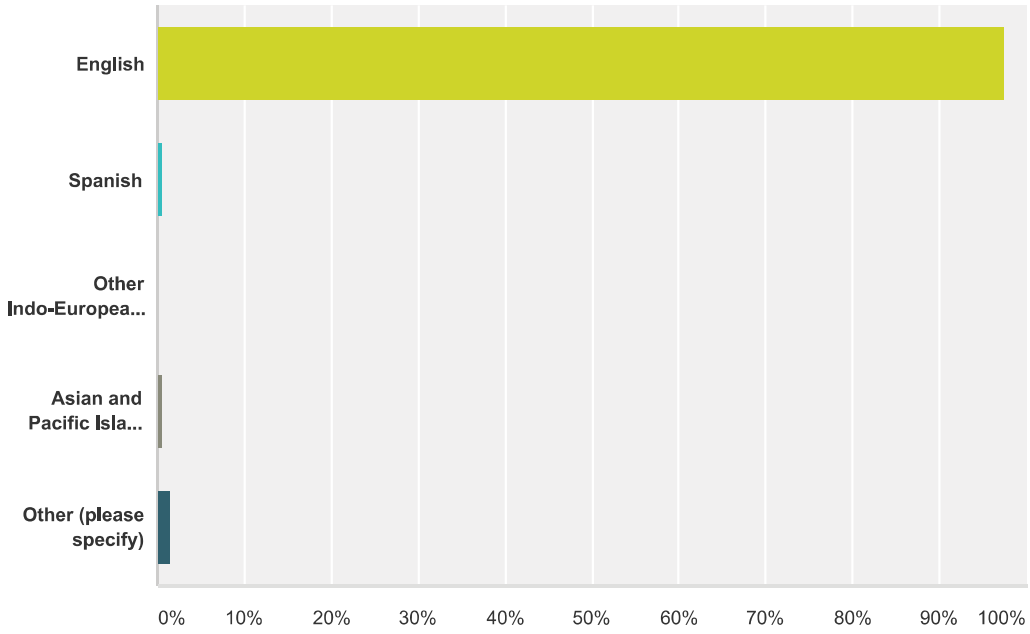
Answered: 650 Skipped: 21



Answer Choices	Responses	
Yes	**41.23%**	268
No	**58.77%**	382
Total		**650**

Q3 Please indicate the primary language spoken in your household.

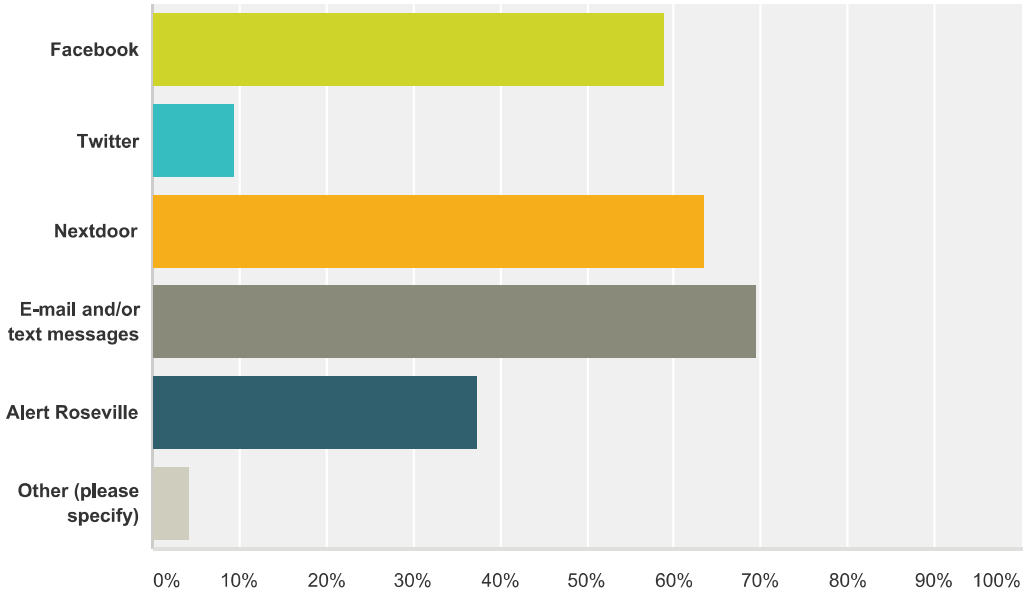
Answered: 662 Skipped: 9



Answer Choices	Responses	
English	97.43%	645
Spanish	0.60%	4
Other Indo-European Language	0.00%	0
Asian and Pacific Island Languages	0.60%	4
Other (please specify)	1.36%	9
Total		662

Q4 Which of the following digital media outlets do you subscribe to receive news and information about the City of Roseville? Select all that apply.

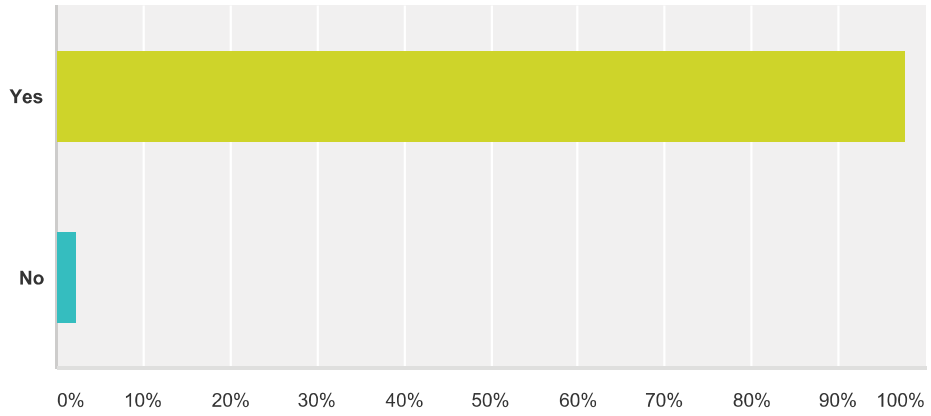
Answered: 658 Skipped: 13



Answer Choices	Responses	
Facebook	**58.97%**	388
Twitter	**9.42%**	62
Nextdoor	**63.37%**	417
E-mail and/or text messages	**69.45%**	457
Alert Roseville	**37.39%**	246
Other (please specify)	**4.10%**	27
Total Respondents: 658		

Q5 Do you live in Roseville?

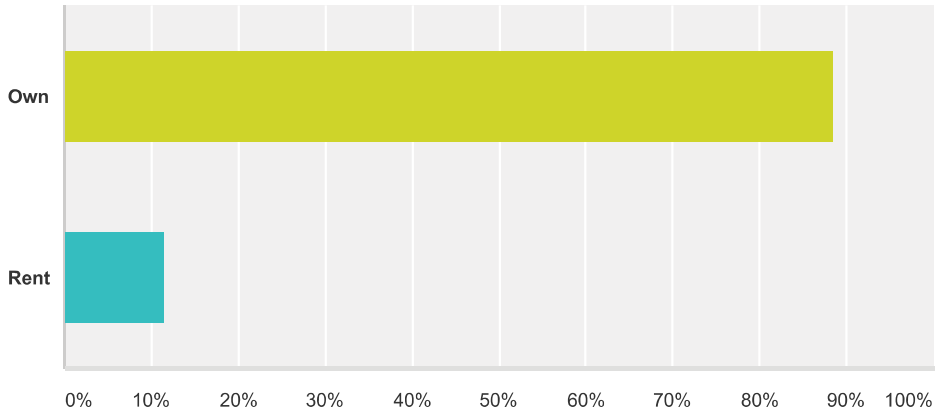
Answered: 646 Skipped: 25



Answer Choices	Responses	
Yes	**97.68%**	631
No	**2.32%**	15
Total		**646**

Q6 Do you own or rent your place of residence?

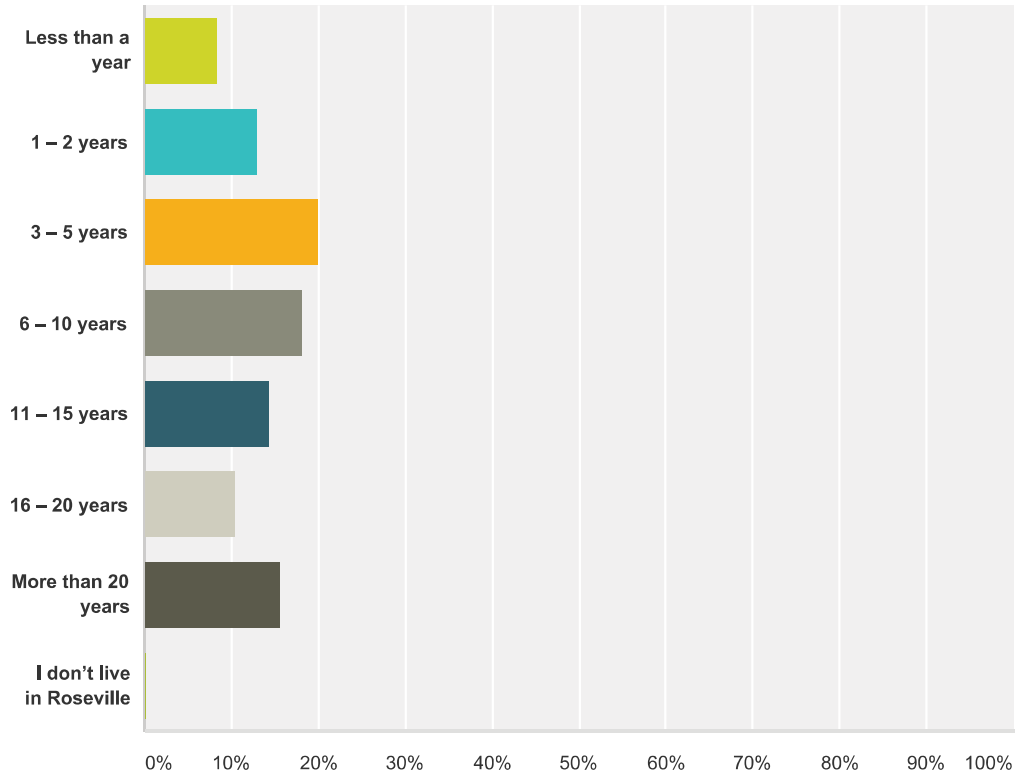
Answered: 641 Skipped: 30



Answer Choices	Responses	
Own	**88.46%**	567
Rent	**11.54%**	74
Total		**641**

Q7 How long have you lived in at your current residence?

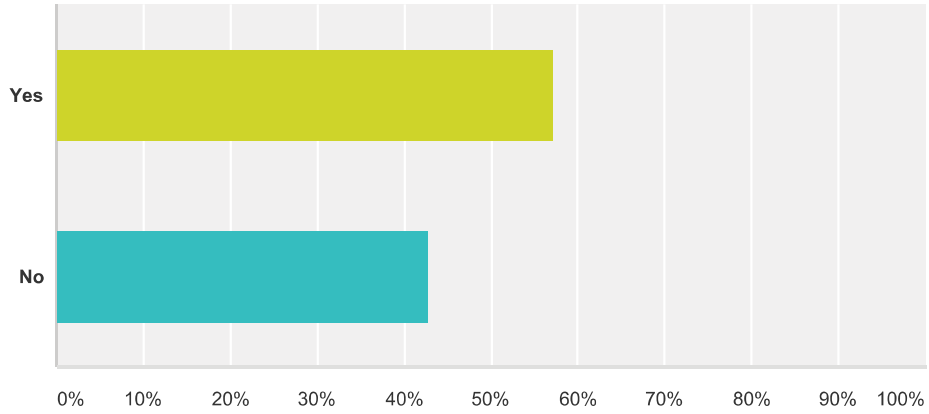
Answered: 642 Skipped: 29



Answer Choices	Responses	
Less than a year	**8.41%**	54
1 – 2 years	**12.93%**	83
3 – 5 years	**19.94%**	128
6 – 10 years	**18.22%**	117
11 – 15 years	**14.33%**	92
16 – 20 years	**10.44%**	67
More than 20 years	**15.58%**	100
I don't live in Roseville	**0.16%**	1
Total		**642**

Q8 When you moved into your home, did you consider the impact a natural or human-caused disaster could have on your home?

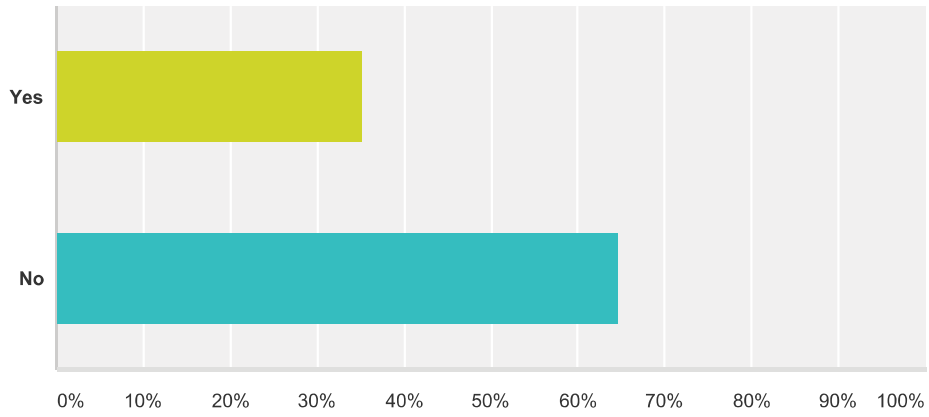
Answered: 646 Skipped: 25



Answer Choices	Responses	
Yes	**57.12%**	369
No	**42.88%**	277
Total		**646**

Q9 Was the presence of a natural hazard risk zone (e.g., dam failure zone, flood zone, landslide hazard area, high fire risk area) disclosed to you by a real estate agent, seller, or landlord before you purchased or moved into your home?

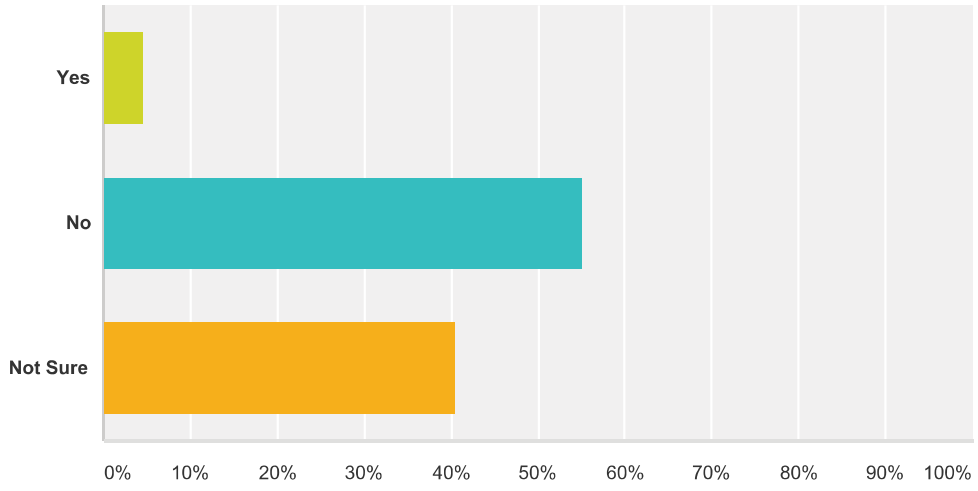
Answered: 646 Skipped: 25



Answer Choices	Responses	
Yes	**35.29%**	228
No	**64.71%**	418
Total		**646**

Q10 Is your residence located in or near a FEMA designated floodplain?

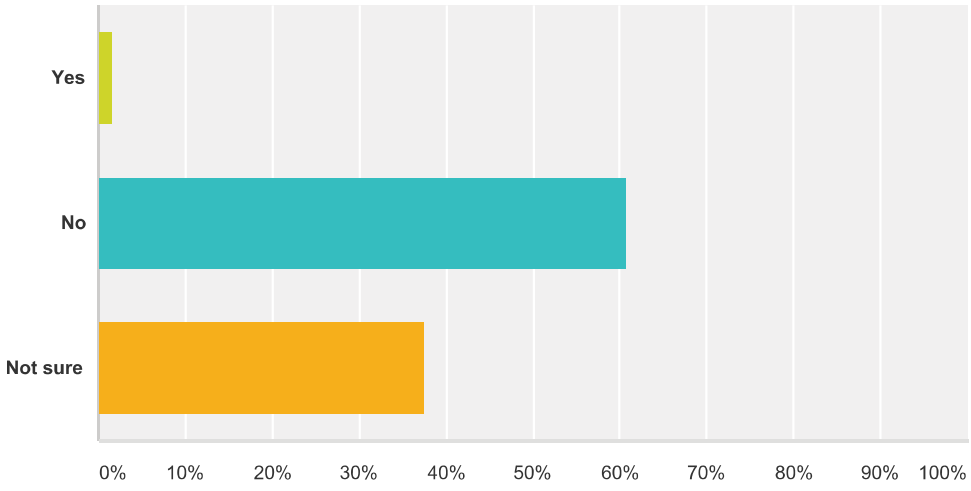
Answered: 646 Skipped: 25



Answer Choices	Responses	
Yes	**4.49%**	29
No	**55.11%**	356
Not Sure	**40.40%**	261
Total		**646**

Q11 Is your residence located in a dam failure zone?

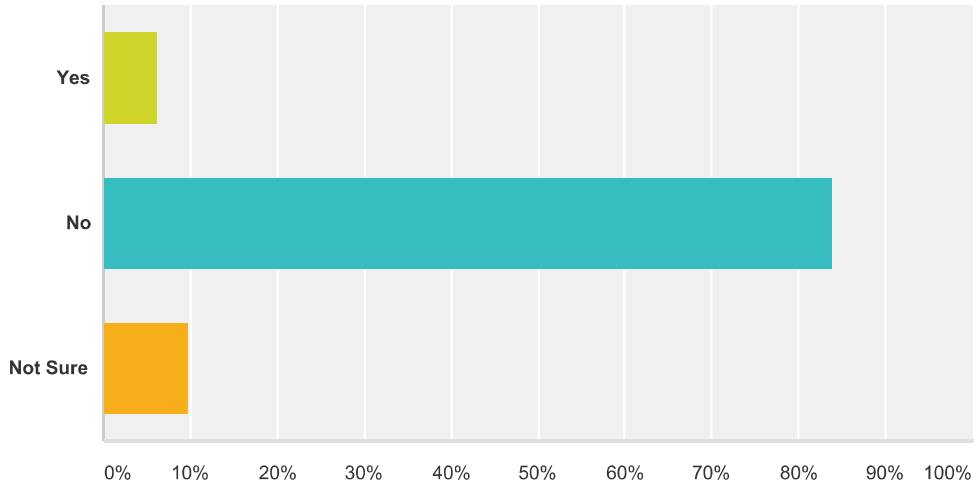
Answered: 642 Skipped: 29



Answer Choices	Responses	
Yes	**1.71%**	11
No	**60.75%**	390
Not sure	**37.54%**	241
Total		**642**

Q12 Do you have flood insurance?

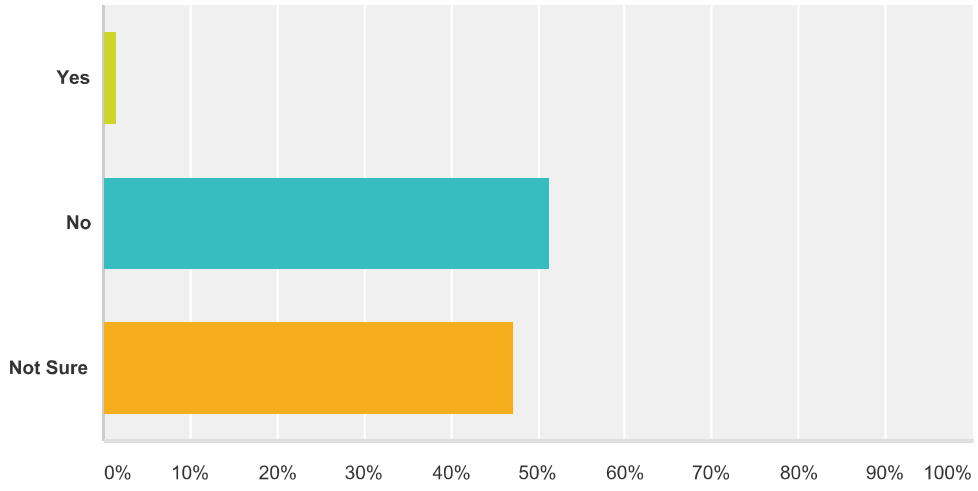
Answered: 646 Skipped: 25



Answer Choices	Responses	
Yes	**6.19%**	40
No	**83.90%**	542
Not Sure	**9.91%**	64
Total		**646**

Q13 Is your residence located near an earthquake fault?

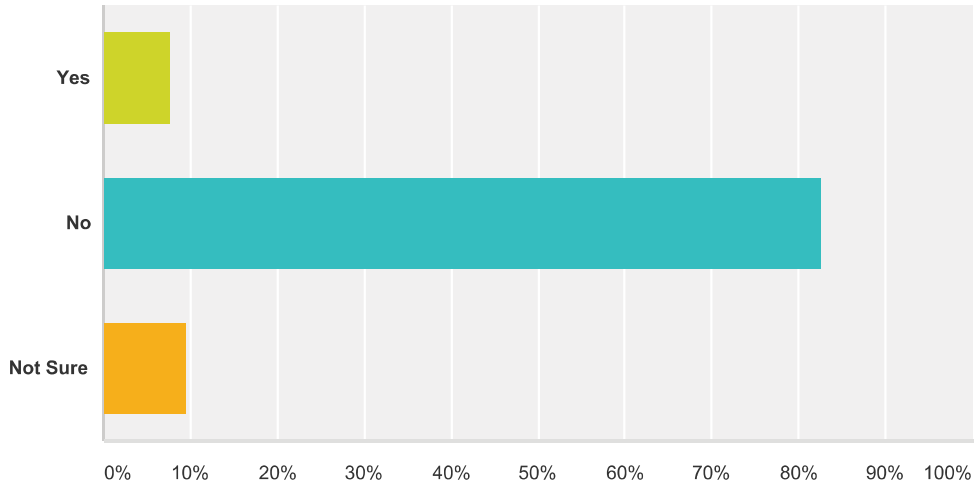
Answered: 646 Skipped: 25



Answer Choices	Responses	
Yes	**1.39%**	9
No	**51.39%**	332
Not Sure	**47.21%**	305
Total		**646**

Q14 Do you have earthquake insurance?

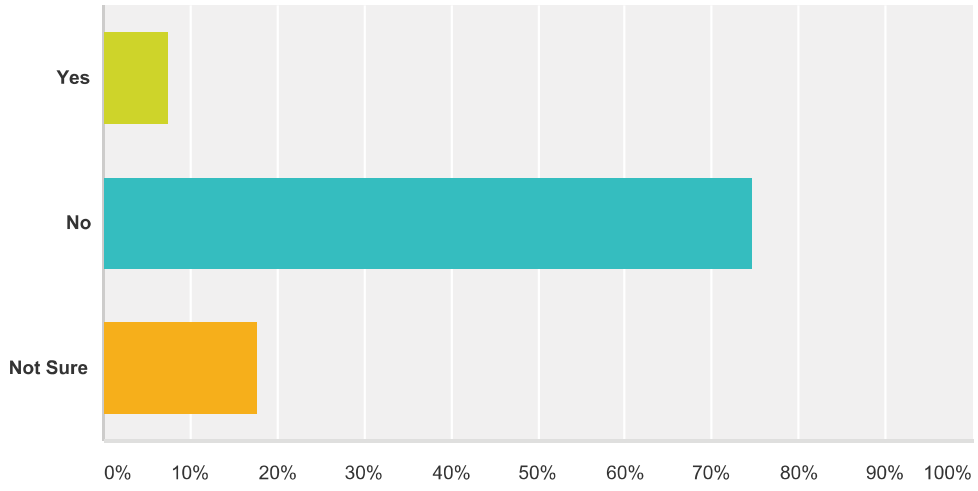
Answered: 646 Skipped: 25



Answer Choices	Responses	
Yes	**7.74%**	50
No	**82.66%**	534
Not Sure	**9.60%**	62
Total		**646**

Q15 Is your property located in an area at risk for wildfires?

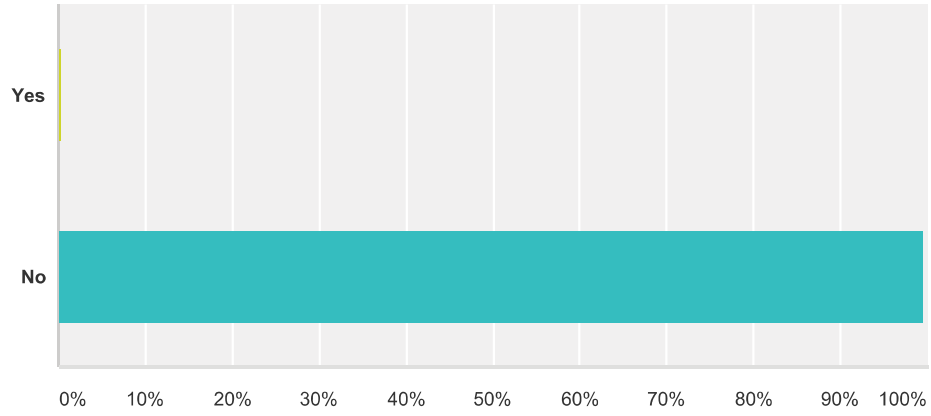
Answered: 646 Skipped: 25



Answer Choices	Responses	
Yes	**7.59%**	49
No	**74.77%**	483
Not Sure	**17.65%**	114
Total		**646**

Q16 Have you ever had problems securing homeowners or renters insurance due to risks from hazards?

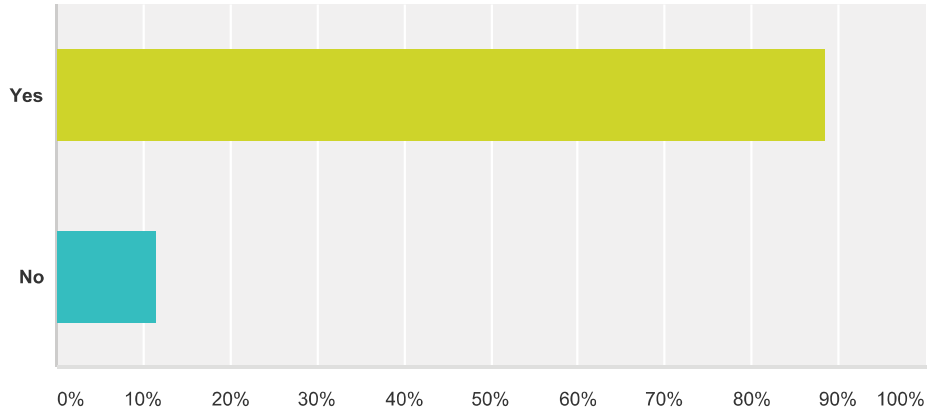
Answered: 641 Skipped: 30



Answer Choices	Responses	
Yes	**0.47%**	3
No	**99.53%**	638
Total		**641**

Q17 Do you support policies to restrict or prohibit development in designated hazard zones?

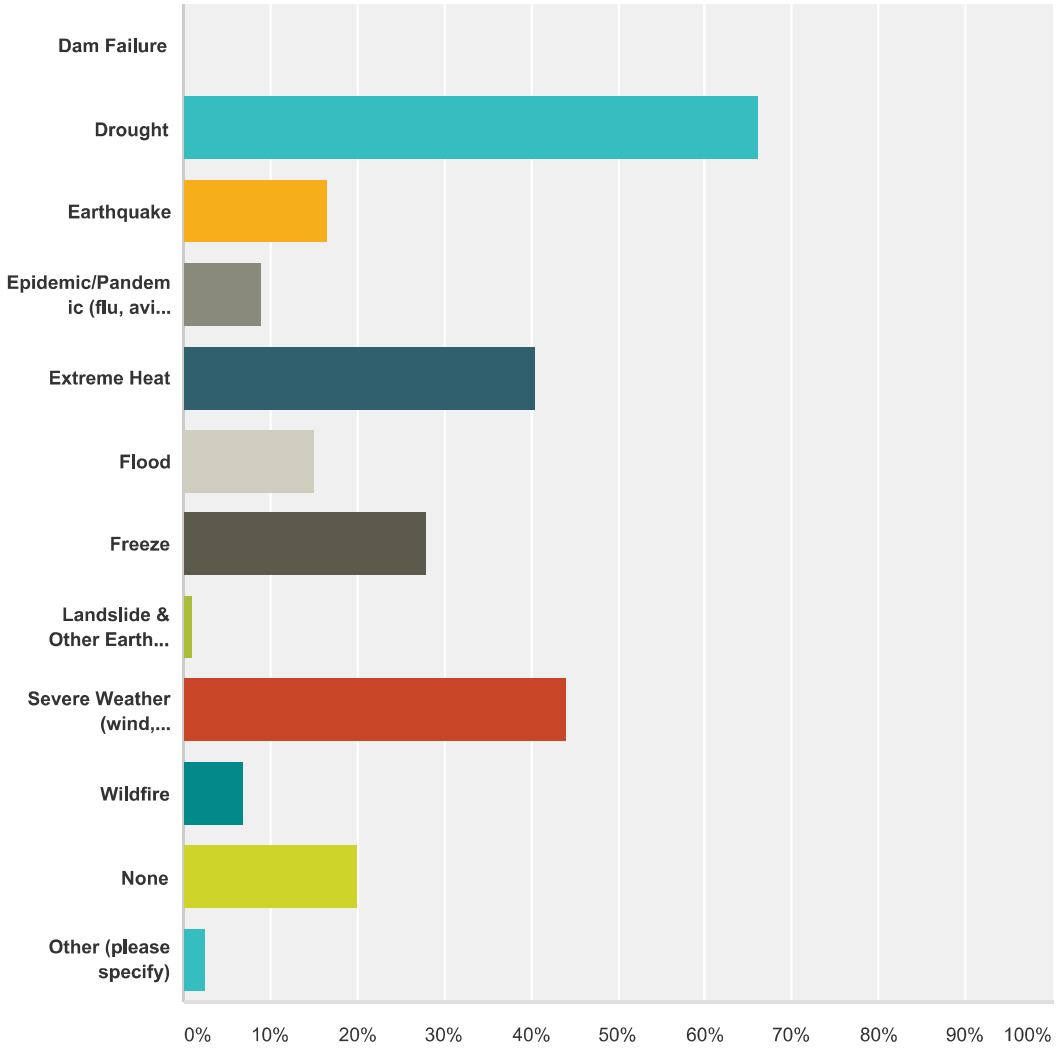
Answered: 623 Skipped: 48



Answer Choices	Responses	
Yes	**88.60%**	552
No	**11.40%**	71
Total		**623**

Q18 Which of the following natural hazard events have you or has anyone in your household experienced within the past 20 years in Roseville? (Check all that apply)

Answered: 556 Skipped: 115

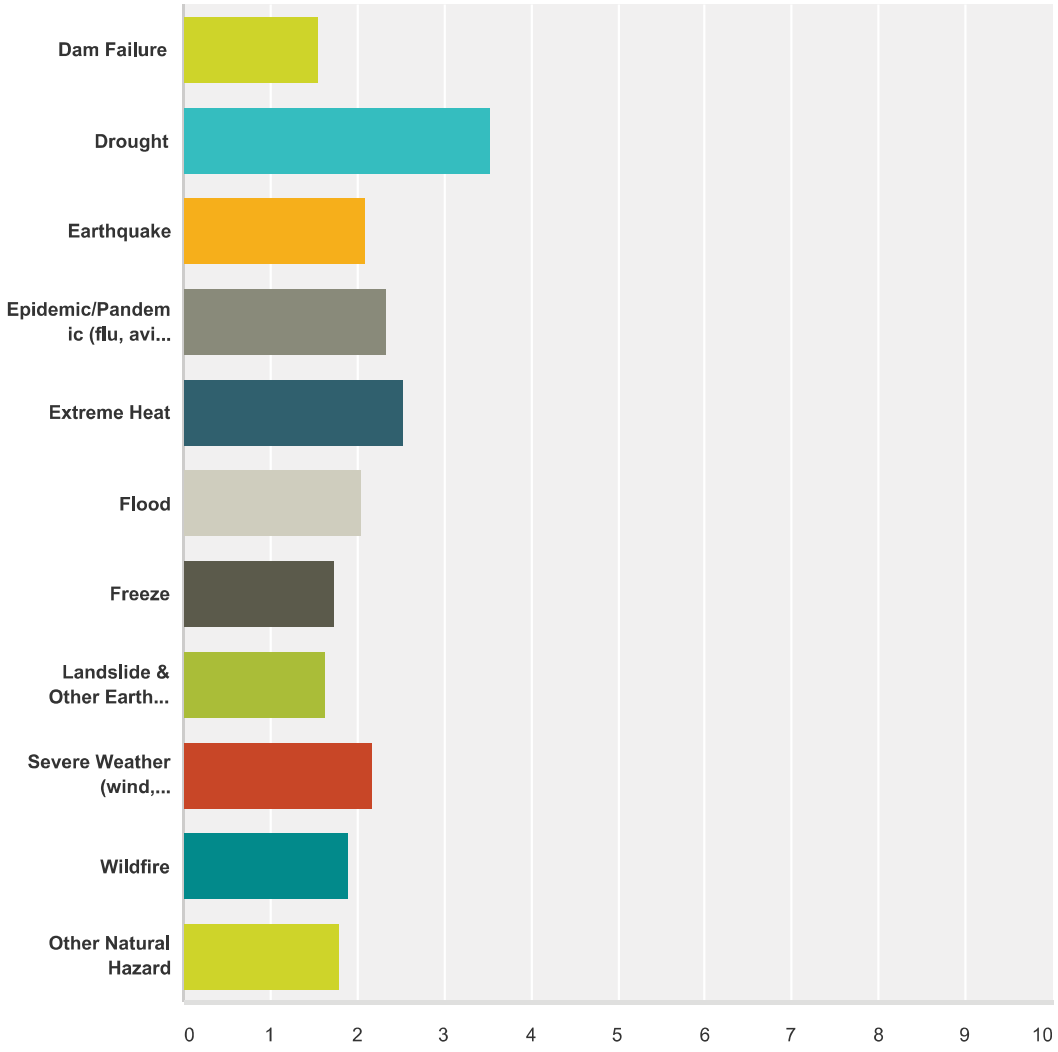


Answer Choices	Responses	
Dam Failure	0.00%	0
Drought	66.19%	368
Earthquake	16.55%	92
Epidemic/Pandemic (flu, avian flu, H1N1, West Nile)	8.99%	50
Extreme Heat	40.47%	225
Flood	15.11%	84
Freeze	27.88%	155

Landslide & Other Earth Movements (non-seismic induced landslides and earth movements;subsidence;sinkholes;geologic hazard)	**1.08%**	6
Severe Weather (wind, lightning, winter storm, etc.)	**44.06%**	245
Wildfire	**6.83%**	38
None	**19.96%**	111
Other (please specify)	**2.52%**	14
Total Respondents: 556		

Q19 How concerned are you about the following natural hazards in Roseville? (Please check one for each hazard)

Answered: 562 Skipped: 109

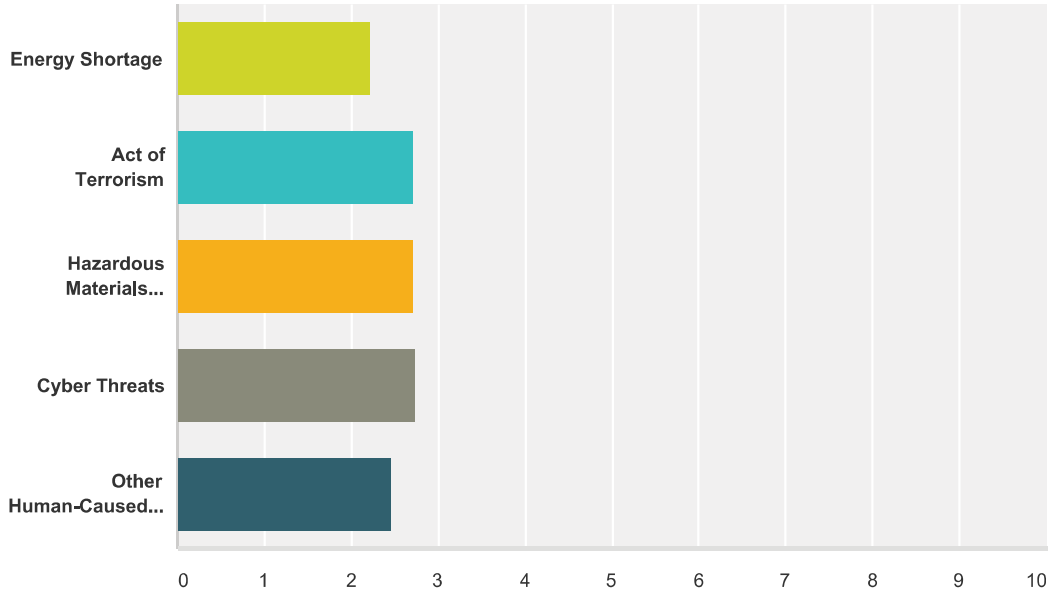


	Not concerned	Somewhat concerned	Concerned	Very concerned	Extremely concerned	Total	Weighted Average
Dam Failure	**64.76%** 351	**22.51%** 122	**8.86%** 48	**2.03%** 11	**1.85%** 10	542	1.54
Drought	**7.10%** 38	**12.15%** 65	**25.42%** 136	**32.52%** 174	**22.80%** 122	535	3.52
Earthquake	**32.15%** 172	**38.88%** 208	**20.00%** 107	**5.98%** 32	**2.99%** 16	535	2.09
Epidemic/Pandemic (flu, avian flu, H1N1, West Nile, Ebola)	**28.01%** 149	**31.58%** 168	**25.38%** 135	**8.46%** 45	**6.58%** 35	532	2.34
Extreme Heat	**24.54%** 132	**27.14%** 146	**26.02%** 140	**15.99%** 86	**6.32%** 34	538	2.52

Flood	**38.14%** 201	**32.83%** 173	**18.98%** 100	**6.07%** 32	**3.98%** 21	527	2.05
Freeze	**52.31%** 272	**29.23%** 152	**12.50%** 65	**4.04%** 21	**1.92%** 10	520	1.74
Landslide & Other Earth Movements (non-seismic induced landslides and earth movements;subsidence;sinkholes;geologic hazard)	**60.30%** 319	**25.33%** 134	**8.70%** 46	**3.21%** 17	**2.46%** 13	529	1.62
Severe Weather (wind, lightning, winter storm, etc.)	**30.78%** 165	**35.45%** 190	**22.95%** 123	**7.65%** 41	**3.17%** 17	536	2.17
Wildfire	**50.37%** 270	**25.19%** 135	**14.18%** 76	**5.22%** 28	**5.04%** 27	536	1.89
Other Natural Hazard	**53.80%** 262	**25.05%** 122	**13.76%** 67	**3.08%** 15	**4.31%** 21	487	1.79

Q20 How concerned are you with the following manmade hazards in Roseville? (Check all that apply)

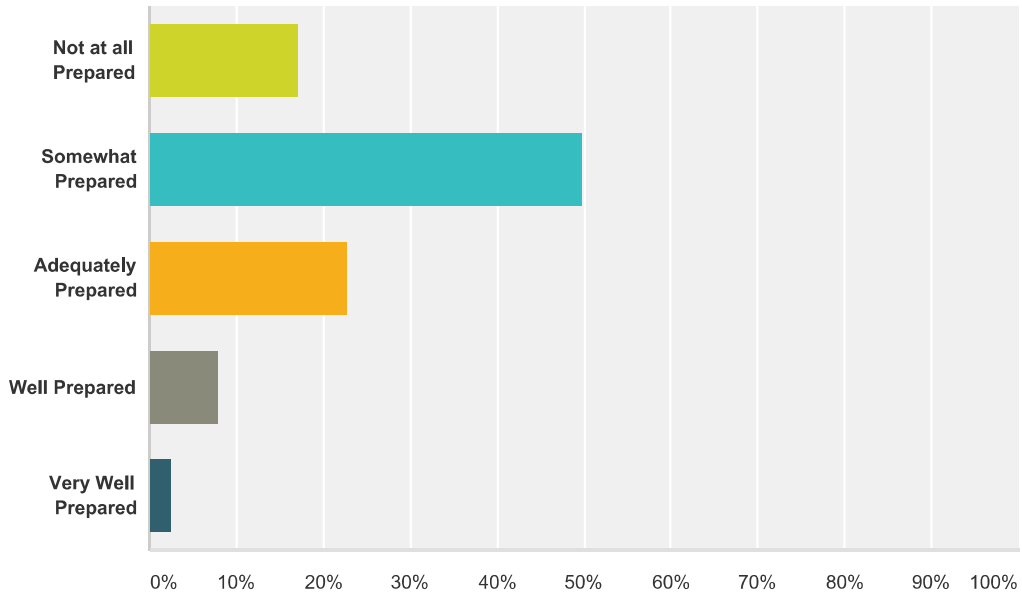
Answered: 562 Skipped: 109



	Not concerned	Somewhat concerned	Concerned	Very concerned	Extremely concerned	Total	Weighted Average
Energy Shortage	**28.30%** 150	**37.55%** 199	**22.83%** 121	**7.36%** 39	**3.96%** 21	530	2.21
Act of Terrorism	**16.76%** 90	**30.54%** 164	**26.63%** 143	**16.95%** 91	**9.12%** 49	537	2.71
Hazardous Materials Release	**15.92%** 85	**32.02%** 171	**26.97%** 144	**15.17%** 81	**9.93%** 53	534	2.71
Cyber Threats	**15.99%** 86	**29.93%** 161	**28.07%** 151	**17.47%** 94	**8.55%** 46	538	2.73
Other Human-Caused Hazard	**25.20%** 125	**29.84%** 148	**25.81%** 128	**11.49%** 57	**7.66%** 38	496	2.47

Q21 The FEMA website - Ready.gov - provides important information on how to prepare you and your family in the event of a disaster.How prepared is your household for a natural or human-caused hazard event? (Check one)

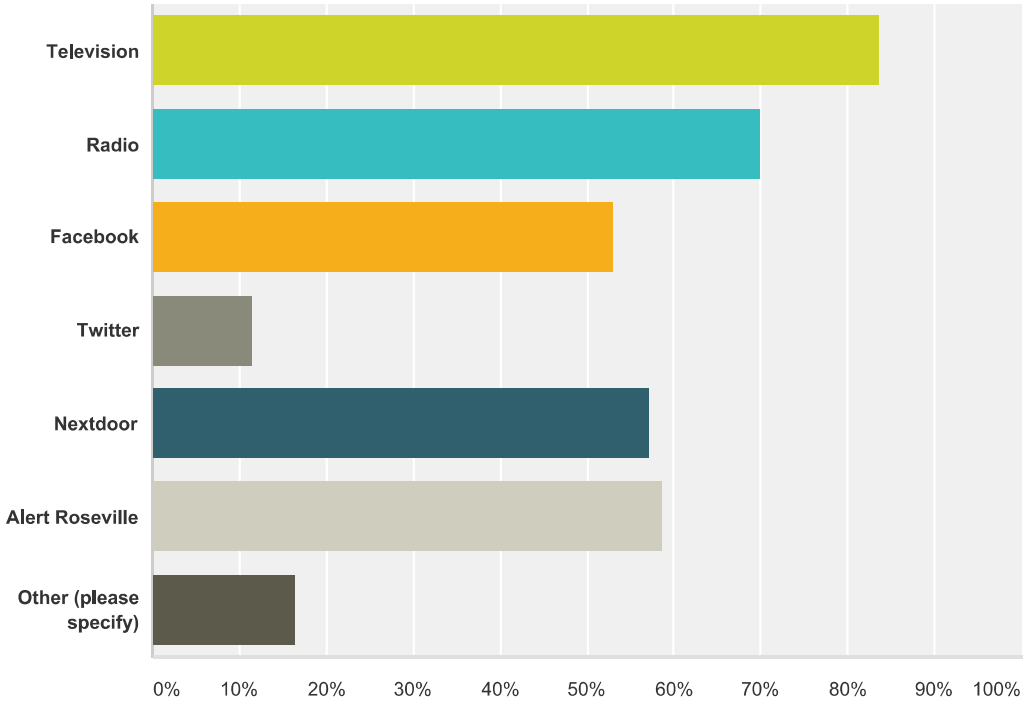
Answered: 562 Skipped: 109



Answer Choices	Responses	
Not at all Prepared	17.08%	96
Somewhat Prepared	49.82%	280
Adequately Prepared	22.78%	128
Well Prepared	7.83%	44
Very Well Prepared	2.49%	14
Total		562

Q22 How would you expect to be notified in case of an immediate threat caused by a natural or human-caused hazard.Select all that apply.

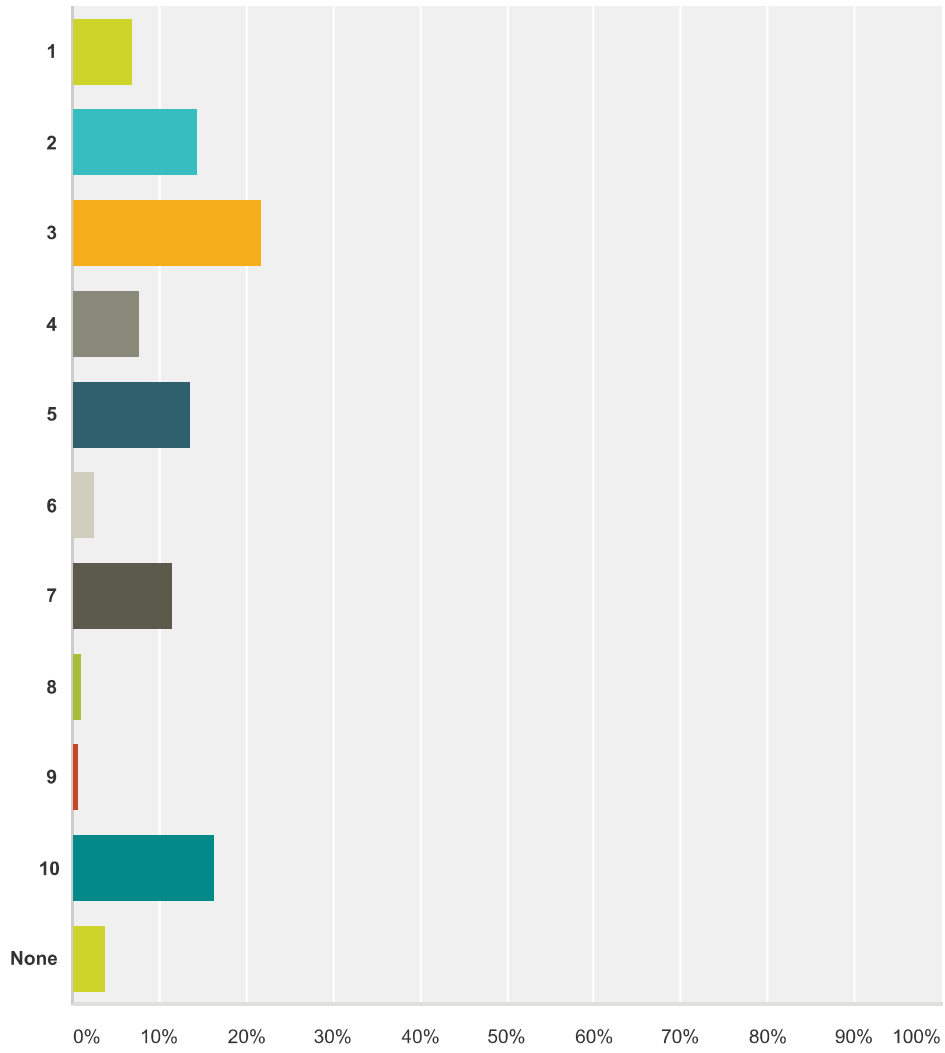
Answered: 562 Skipped: 109



Answer Choices	Responses	
Television	**83.81%**	471
Radio	**69.93%**	393
Facebook	**53.02%**	298
Twitter	**11.57%**	65
Nextdoor	**57.12%**	321
Alert Roseville	**58.72%**	330
Other (please specify)	**16.55%**	93
Total Respondents: 562		

Q23 FEMA suggests that households have at least 3 days of food, water, and vital supplies (e.g. medications) in hand in the event of a disaster. How many days of food, water, and vital supplies does your family have on hand in the event of a disaster?

Answered: 556 Skipped: 115

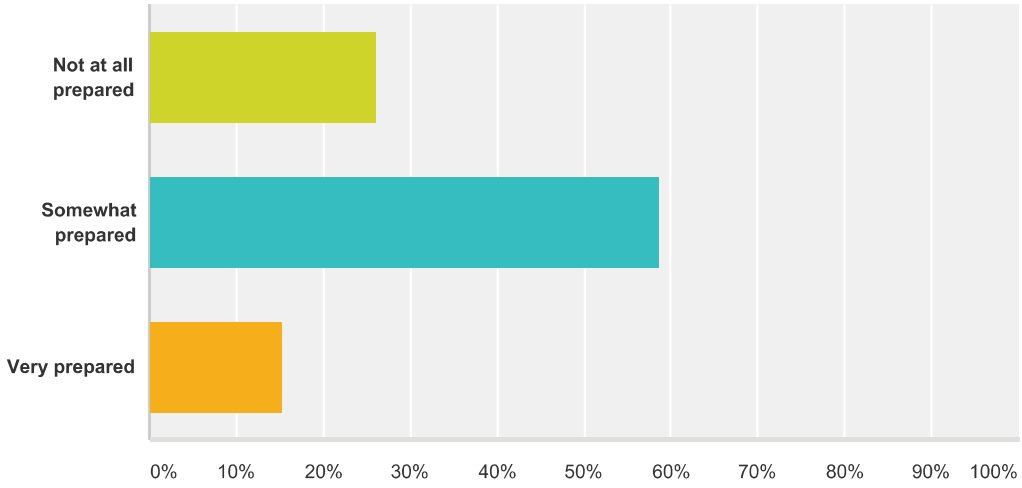


Answer Choices	Responses	
1	**6.83%**	38
2	**14.39%**	80
3	**21.76%**	121
4	**7.73%**	43
5	**13.67%**	76

6	**2.52%**	14
7	**11.51%**	64
8	**1.08%**	6
9	**0.54%**	3
10	**16.19%**	90
None	**3.78%**	21
Total		**556**

Q24 How prepared are you to get along without electricity or natural gas for one to five days?

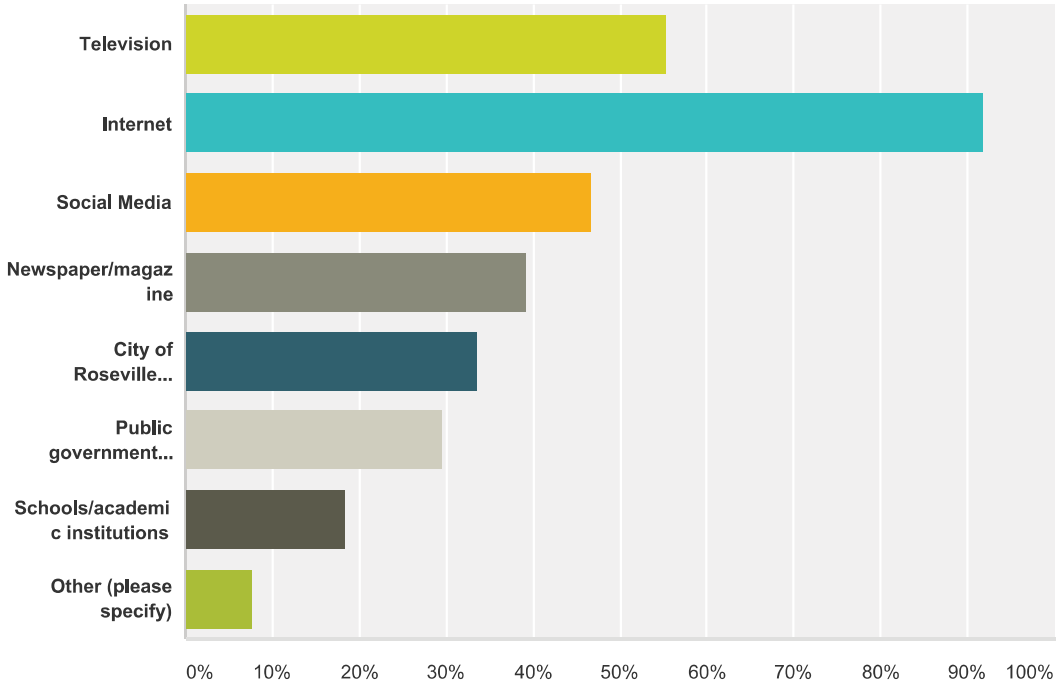
Answered: 558 Skipped: 113



Answer Choices	Responses	
Not at all prepared	**26.16%**	146
Somewhat prepared	**58.60%**	327
Very prepared	**15.23%**	85
Total		**558**

Q25 Where would you expect to find useful information to help you be prepared?Select all that apply.

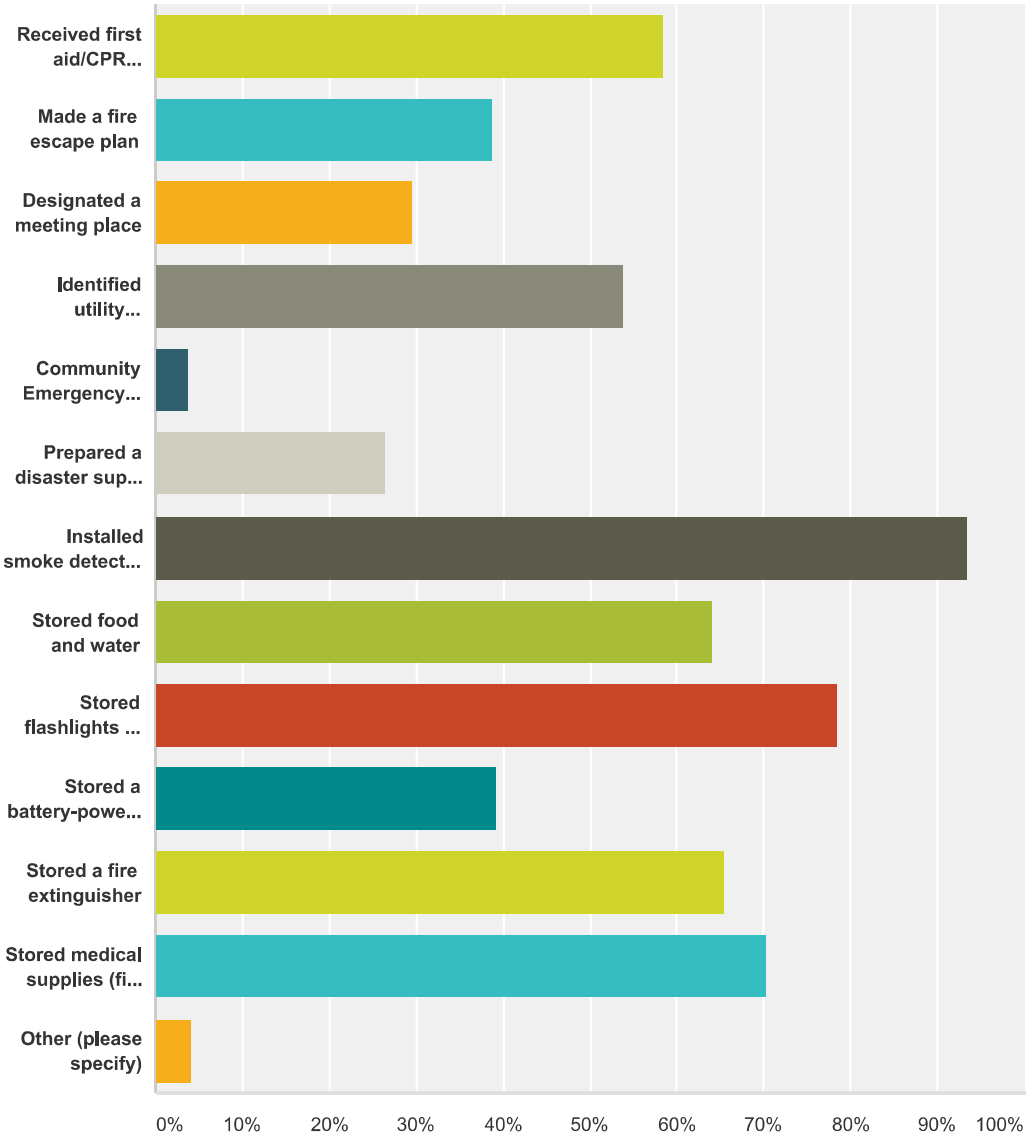
Answered: 560 Skipped: 111



Answer Choices	Responses	
Television	55.36%	310
Internet	91.79%	514
Social Media	46.79%	262
Newspaper/magazine	39.29%	220
City of Roseville Public Library	33.57%	188
Public government meetings	29.64%	166
Schools/academic institutions	18.39%	103
Other (please specify)	7.68%	43
Total Respondents: 560		

Q26 Which of the following steps has your household already undertaken to prepare for a natural or manmade disaster?Select all that apply.

Answered: 558 Skipped: 113



Answer Choices	Responses	
Received first aid/CPR training	**58.42%**	326
Made a fire escape plan	**38.89%**	217
Designated a meeting place	**29.57%**	165
Identified utility shutoffs	**53.94%**	301
Community Emergency Response Training (CERT)	**3.76%**	21

Prepared a disaster supply kit	**26.52%**	148
Installed smoke detectors on each level of the house	**93.55%**	522
Stored food and water	**64.16%**	358
Stored flashlights and batteries	**78.49%**	438
Stored a battery-powered radio	**39.25%**	219
Stored a fire extinguisher	**65.59%**	366
Stored medical supplies (first aid kit, medications)	**70.25%**	392
Other (please specify)	**4.12%**	23
Total Respondents: 558		

Q27 Please provide any additional comments you would like to share with the City of Roseville Planning Team.

Answered: 65 Skipped: 606

Q28 If you would like to receive information regarding upcoming public events and other participatory opportunities regarding hazard mitigation, please provide your email address below.

Answered: 223 Skipped: 448

From: City of Roseville <Roseville@public.govdelivery.com>
Sent: Tuesday, March 1, 2016 8:59 AM
To:
Subject: City of Roseville News - March 1, 2016





Downtown Roseville update

It will be a busy couple years for city building projects in Downtown Roseville. All of the projects are part of the Downtown Specific Plan designed through a community visioning process in 2009. The highly popular Vernon Street Town Square and roundabout at Washington Boulevard and Oak Street are examples of projects already completed in accordance with the plan.

Current projects include an office building at 316 Vernon Street, the Oak Street Parking facility, a new downtown Fire Station, three pedestrian bridges and bike trail connections through downtown.

Find out more



Leaks can run, but they can't hide! Every day during Fix a Leak Week, visit the Roseville Utility Exploration Center to learn where water-wasting leaks hide around home, and learn how to fix them. Use a dye tablet to find toilet leaks, get your hands on a variety of sprinklers, and enter for a chance to win a smart timer or other water-saving technology. Best of all, it is free.

For more information call 916-746-1550 or visit the Fix A Leak Week page.



Roseville explores creating waste into energy

Work is underway right now to develop a project that would one day help power one of the city's wastewater treatment plants or provide fleet vehicle fuel using Compressed Natural Gas (CNG). This project is in its infancy and more work is needed to see this effort become a reality. But we're hard at work behind the scenes to bring this project online within the next three to five years.

For more information



Download them now at roseville.ca.us/guide



Affordable Housing Information & Workshop

The City of Roseville Affordable Housing Program is offering down payment assistance for qualified households to purchase affordable homes at a new Lennar community in West Roseville.

The City and Lennar will host an affordable housing workshop to provide more information about the program, **5:30 p.m., Wednesday, March 9** in the Roseville City Council Chambers, 311 Vernon Street in Roseville.

Find out more.



Do you know your risk...

. . .when it comes to flood, earthquake or any natural or man made disaster here in Roseville? Do you and your family have a three day supply ...of food and water should a disaster occur?

While a range of natural and man-made disasters can affect any community, the City of Roseville is always taking steps to reduce the risk to residents and businesses. We need your input to remain prepared and ensure our community can recover as quickly as possible, should a disaster occur. Please help us by taking a few minutes to complete this community survey

---



Apply for up to $200 toward a new commuter bike

Apply for an opportunity to receive up to $200 toward a new commuter bike. Bucks for Bikes helps commuters start using an active, clean, traffic-relieving mode of travel—bicycling! **Submit your application by 5 p.m., Monday, March 21.** This is made possible by the City of Roseville and Placer County Transportation Planning Agency.

Find out more.



Superhero Storytime

We are all super heroes! Visit the Martha Riley Library on the 4th Tuesday of the month through May and we'll explore the everyday superheroes of our city. From 1-1:30 p.m., Miss Lisa will guide us through stories, songs, and activities to discover the super hero in you. Then, come explore the Utility Exploration Center from 1:30 - 2 p.m. to discover play time with special activities to help practice your superhero skills. These fun events are free.

For more information call 916-746-1550.



UPCOMING CITY MEETINGS

Meeting agendas and minutes

City Council Meeting - 7 p.m., Wednesday, March 2

Planning Commission Meeting - 7 p.m., Thursday, March 10

Parks and Recreation Commission Meeting - 7 p.m., Monday, March 7

Transportation Commission Meeting - 7 p.m., Tuesday, March 15

Public Utilities Commission Meeting - 7 p.m., Tuesday, March 22

Multi-Hazard Mitigation Plan Steering Committee Meeting - 5:30 p.m., Tuesday, March 1, Civic Center Meeting Rooms 1 & 2

Unless otherwise noted, Council and Commission meetings are held in the Roseville City Council Chambers at 311 Vernon Street. Meetings held in the City Council Chambers can be viewed live online or later on demand.

AlertRoseville

If we can't reach you, we can't alert you. Sign up now.

311 Vernon Street, Roseville, CA 95678

(916) 774-5200 | www.roseville.ca.us

Unsubscribe/Update profile

This email was sent to hdyda@roseville.ca.us using GovDelivery, on behalf of: City of Roseville · 311 Vernon St. Roseville · CA 95678

powered by govDELIVERY

From: City of Roseville <Roseville@public.govdelivery.com>
Sent: Tuesday, August 2, 2016 8:33 AM
To:
Subject: City of Roseville News - August 2, 2016





Roseville named 11th healthiest city in U.S.

Roseville is the 11th healthiest city in the United States, according to Niche.com.

The ranking provides a comprehensive assessment of the general levels of health among residents in Roseville.

This grade takes into account key indicators of personal health, such as smoking, excessive alcoholic consumption, rates of obesity, as well as the availability and proximity of fitness facilities, doctors, and mental health practitioners, in an attempt to measure an area's performance in health and fitness.

You can read more about the rankings here.



Roseville among 25 safest cities in the country

Roseville has been ranked among the 25 safest cities in the US! Niche.com ranked U.S. cities over 100,000 population for safety, based on FBI crime statistics.

Roseville Police Chief Daniel Hahn said, “It takes more a good police department to create a safe city. It also takes city leaders who put public safety first; and a community that won’t settle for anything less, and is willing to get involved to make it happen. We’re very blessed in Roseville to have all three.”

See the rankings here.



Roseville recognized as national flood protection leader

FEMA has again been recognized Roseville as the national leader in flood preparation. Roseville is the only city in the country to hold FEMA's top flood control rating. Roseville's top rating means flood insurance discounts of up to 45% for residents and businesses.

Find out more



National Night Out is tonight

National Night Out is considered America's night out against crime.

We encourage you to lock your home and connect with your neighbors at one of the 40 National Night Out community events in Roseville.

Not sure if your neighborhood is hosting an NNO party? Visit the Roseville Coalition of Neighborhood Associations website at www.RCONA.org to contact your neighborhood association.

Find out more



Talk trash with Curby

You know where trash comes from, but where does it go? Join the Utility Exploration Center **Saturday, August 27** for free family fun at Curby's Waste-a-Palooza!

Fight the unflushables in the Sewer Swim, defend against Trashville and talk trash with Curby to test your knowledge in our quiz show. Challenge yourself in the game room where you can reuse, rethink, recycle and help knock out excess waste.

Grab a water repair LEGO® City set for just $10 (while supplies last) in the activity room for a fun build-it activity!

Find out more

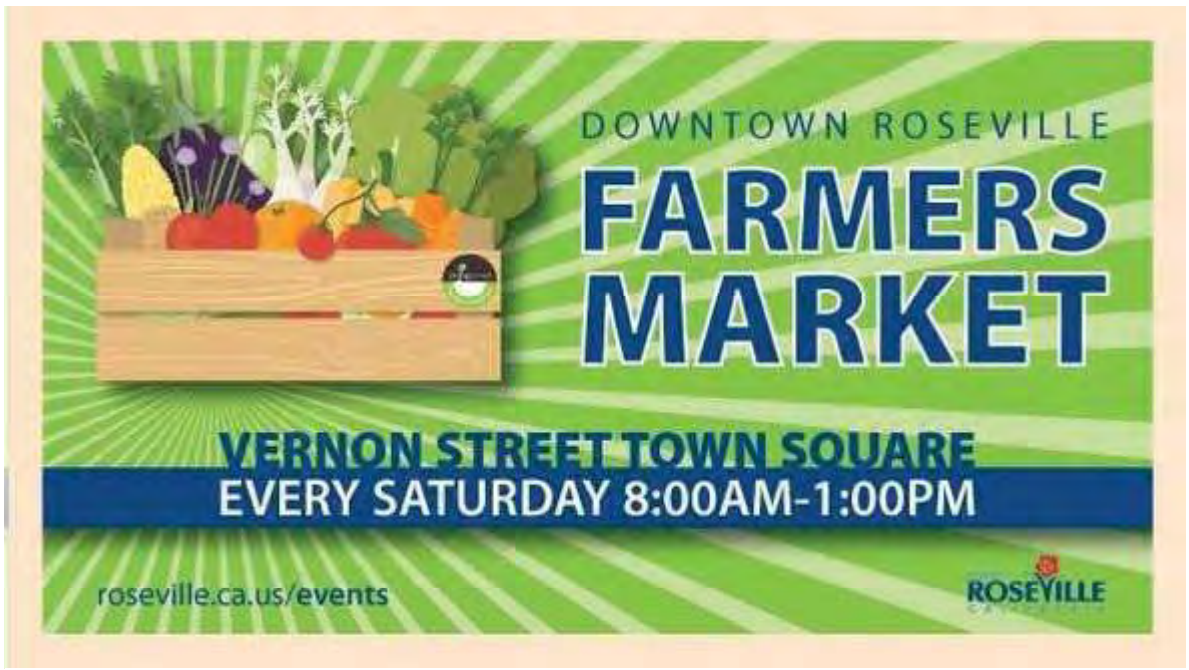


Tired of the traffic backups?

Traffic is one of the topics we hear most about from you. There is a plan to raise about $1.6 billion to fund highway projects, public transit expansion, local street maintenance and improvements including Highway 65 widening and the Highway 65 / I-80 interchange.

With other funding being more difficult to obtain, a ballot measure to increase retail sales tax by a half percent to raise funds for transportation improvements in Placer County was placed on the November 8, 2016, presidential general election ballot by the Placer County Board of Supervisors.

Find out more



Street resurfacing ahead for parts of Roseville

Resurfacing is scheduled **to begin late summer/fall** for residential streets in the Foothills/Junction and West Park neighborhoods.



Some more heavily traveled roads in Roseville will also be resurfaced this summer. The specific roads and schedule can be found here.

Regular roadway maintenance reduces the need for major costly street repairs in the future by protecting Roseville streets.

Check out this short video to learn more about how we prioritize road maintenance.



Tri County Job Fair to be held August 18

The Tri County Job Fair provides an excellent opportunity for job seekers to meet with businesses within the region and demonstrate their qualifications. This year's event will be held from **9 a.m. - noon, Thursday, August 18 at William Jessup University.**

For more information and to register

Learn about planned changes to 916 area code

The 916 area code we use in Roseville is expected to use up its available prefixes by December 2018. The California Public Utilities Commission (CPUC) will be holding a public meeting to discuss proposed changes and to get public feedback on their plan at **1 p.m., Tuesday, August 16** in the Roseville Civic Center's Meeting Rooms 1 & 2.

The CPUC is proposing adding an additional area code to the region. The proposal would allow current customers to keep their area code. Beginning in June 2018, customers requesting new phone numbers may be assigned a new area code.

Find out more

Comment on city's Draft Multi-Hazard Mitigation Plan

You are invited to review and provide comments on the 2016 City of Roseville Multi-Hazard Mitigation Plan.

This plan details the risks of both natural and manmade hazards in Roseville and includes programs and projects to help reduce the exposure of city residents and businesses should an event occur. By having a plan in place, Roseville is eligible for federal pre-disaster and post-disaster assistance.

Input on the plan can be submitted through Friday, August 19, 2016.

View the plan and find out more



UPCOMING CITY MEETINGS

Meeting agendas and minutes

City Council Meeting - 7 p.m., Wednesday, August 3

Planning Commission Meeting - 7 p.m., Thursday, August 11

Parks and Recreation Commission Meeting - September meeting canceled

Transportation Commission Meeting - August meeting canceled

Public Utilities Commission Meeting - 7 p.m., Tuesday, August 23

Unless otherwise noted, Council and Commission meetings are held in the Roseville City Council Chambers at 311 Vernon Street. Meetings held in the City Council Chambers can be viewed live online or later on demand.

AlertRoseville

If we can't reach you, we can't alert you. Sign up now.

311 Vernon Street, Roseville, CA 95678

(916) 774-5200 | www.roseville.ca.us

Unsubscribe/Update profile

This email was sent to hdyda@roseville.ca.us using GovDelivery, on behalf of: City of Roseville · 311 Vernon St. Roseville · CA 95678

powered by govDELIVERY

From: City of Roseville <Roseville@public.govdelivery.com>
Sent: Tuesday, August 16, 2016 9:18 AM
To:
Subject: City of Roseville News - August 16, 2016





Be safe heading back to school

All Roseville-area high school and elementary schools will be back in session this week. That means traffic around those schools will be congested.

Read on for a refresher course on back-to-school safety.

Walking or biking to school is a great idea. To combat the common fear that walking to school isn't safe, City of Roseville traffic engineers and the Safe Routes to School Coordinators have designated safe routes for students of all ages and abilities.

Learn about our Safe Routes to School program



Unemployment rate drops to 3.8 percent in Roseville



The unemployment rate in Roseville is in the lowest 4 percent in the state, 20th of 482 cities in California.

“The leading job sector is healthcare, and healthcare-related businesses,” said Roseville Economic Development Director Chris Robles.

“We have Kaiser, the largest employer in the city, and then Sutter is also one of our top employers. Then we have Adventist Health, which is also a significant employer in the city. Their west coast headquarters are here in Roseville.”

"A part of Roseville’s economic growth is correlated with education levels; namely a more educated work force. The local population over age 25 with a bachelor’s degree or higher was over 39 percent as of 2014 – a growth margin of 5 percent since 2010, correlating with the increase in educated workforce members and growing employment figures."

Read more in this article from the Roseville Press Tribune.





Talking traffic

Traffic is one of the topics we hear most about from you. There is a plan to raise about $1.6 billion to fund highway projects, public transit expansion, local street maintenance and improvements including Highway 65 widening and the Highway 65 / I-80 interchange.

With other funding being more difficult to obtain, a ballot measure to increase retail sales tax by a half percent to raise funds for transportation improvements in Placer County was placed on the November 8, 2016, presidential general election ballot by the Placer County Board of Supervisors.

Find out more



Woodcreek Oaks widening project workshop

We invite you to a community workshop to learn more about the Woodcreek Oaks Widening Project. The project team will be available to answer questions in an informal format.

Exhibits showing the project features and anticipated schedule will be on display.

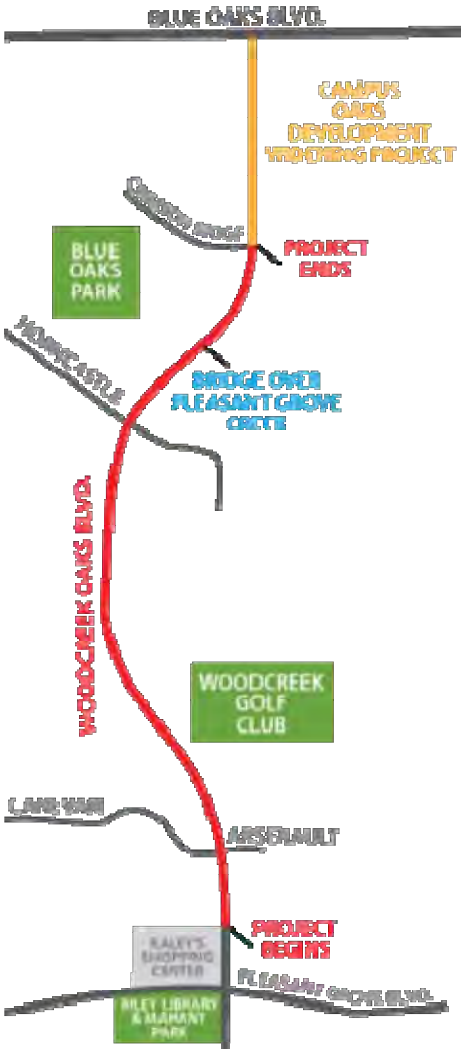
Wednesday, August 24
5 - 7 p.m.
Martha Riley Library, Reading Room 3
1501 Pleasant Grove Blvd

The proposed project will widen the segment of Woodcreek Oaks Boulevard, from Crimson Ridge way south to 600 feet north of Pleasant Grove Boulevard, into the median to a four lane road.

This project also proposes to widen the bridge over the south branch of Pleasant Grove Creek to accommodate the additional roadway.

The new Campus Oaks development will widen Woodcreek Oaks Boulevard from Blue Oaks Blvd south to Crimson Ridge Way, and is expected to be constructed by the end of 2016.

Find out more





Trail resurfacing this week

Portions of Roseville trails system will be resurfaced this week. Notices of the upcoming closures will be posted at the trail entrances. While the resurfacing is underway, barricades will mark where the trails are closed. After the resurfacing is complete and the trail has reopened to the public, striping and sweeping will be performed.

Find out more

Street resurfacing ahead for parts of Roseville

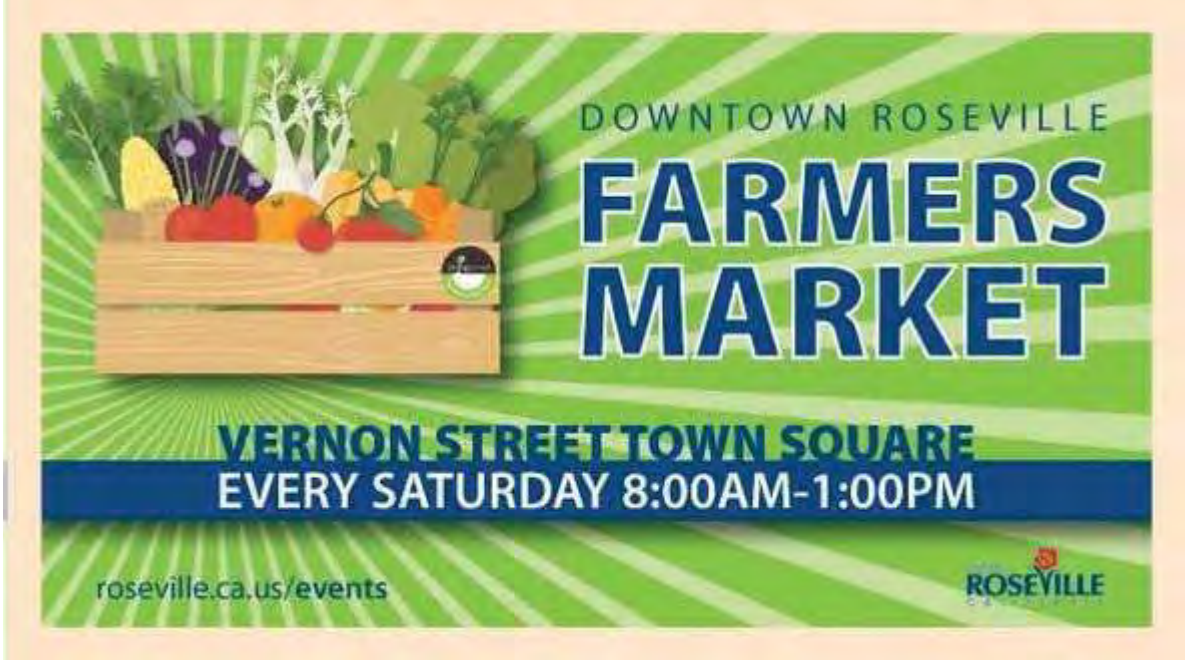


Resurfacing is scheduled **to begin late summer/fall** for residential streets in the Foothills/Junction and West Park neighborhoods.

Some more heavily traveled roads in Roseville will also be resurfaced this summer. The specific roads and schedule can be found here.

Regular roadway maintenance reduces the need for major costly street repairs in the future by protecting Roseville streets.

Check out this short video to learn more about how we prioritize road maintenance.





Tri County Job Fair to be held August 18

The Tri County Job Fair provides an excellent opportunity for job seekers to meet with businesses within the region and demonstrate their qualifications. This year's event will be held from **9 a.m. - noon, Thursday, August 18 at William Jessup University.**

For more information and to register



Comment on city's Draft Multi-Hazard Mitigation Plan

You are invited to review and provide comments on the 2016 City of Roseville Multi-Hazard Mitigation Plan.

This plan details the risks of both natural and manmade hazards in Roseville and includes programs and projects to help reduce the exposure of city residents and businesses should an event occur. By having a plan in place, Roseville is eligible for federal pre-disaster and post-disaster assistance.

Input on the plan can be submitted through Friday, August 19, 2016.

View the plan and find out more



UPCOMING CITY MEETINGS

Meeting agendas and minutes

City Council Meeting - 7 p.m., Wednesday, August 17

Planning Commission Meeting - 7 p.m., Thursday, August 25

Parks and Recreation Commission Meeting - September meeting canceled

Transportation Commission Meeting - August meeting canceled

Public Utilities Commission Meeting - 7 p.m., Tuesday, August 23

Senior Commission Workshop - 11 a.m., Tuesday, August 23 at Maidu Community Center

Unless otherwise noted, Council and Commission meetings are held in the Roseville City Council Chambers at 311 Vernon Street. Meetings held in the City Council Chambers can be viewed live online or later on demand.

AlertRoseville

If we can't reach you, we can't alert you. Sign up now.

311 Vernon Street, Roseville, CA 95678

(916) 774-5200 | www.roseville.ca.us

Unsubscribe/Update profile

This email was sent to hdyda@roseville.ca.us using GovDelivery, on behalf of: City of Roseville · 311 Vernon St. Roseville · CA 95678

powered by govDELIVERY get the word out.

Appendix B. 2015 Progress Report

Roseville Multi-Hazard Mitigation Plan
2015 PROGRESS REPORT

Reporting Period

August 2014 through July 2015

Background

Following a tradition of progressive and innovative planning, the City of Roseville City Council approved an update to the Roseville Multi-Hazard Mitigation Plan (RMHMP) on January 3, 2011. The RMHMP details the City's vision for reducing risk from all hazards, identifying resources, information, and strategies for risk reduction. In accordance with requirements of the Disaster Mitigation Act of 2000, the City completed a 10-month process to update its 2005 RMHMP in a way that provided as many tangible benefits for the City as possible from a single planning effort. These benefits are associated with grant funding eligibility and maintaining the nation's only Class 1 rating under FEMA's Community Rating System (CRS). The plan was approved by FEMA Region IX for compliance with Section 201.6, Chapter 44 of the Code of Federal Regulations on March 28, 2011. By completing this process, the City complied with the Disaster Mitigation Act and maintained eligibility for hazard mitigation grant funding opportunities afforded under the Robert T. Stafford Act. The plan is available to the public through the City of Roseville Public Library online at the following website:

https://www.roseville.ca.us/fire/preparedness/hazard_mitigation_plan.asp

Benefits of Mitigation Planning

Maintenance of this plan enables the City of Roseville to pursue hazard mitigation grant funding administered by FEMA under the Robert T Stafford Act. A FEMA-approved Hazard Mitigation Plan is a principal prerequisite for this funding. Roseville has leveraged funding from this program in the past to significantly reduce the City's risk associated with natural hazards.

Summary Overview of the Plan's Progress

The performance period for the Hazard Mitigation Plan began on March 28, 2011, with FEMA's final approval. The initial performance period for this plan is 5 years, with an update anticipated before March 2016. As of the most recent reporting period, the performance period is 82 percent complete. The Hazard Mitigation Plan identified 63 hazard mitigation initiatives to be pursued during the 5-year performance period. As of the most recent reporting period, the following progress can be reported:

- 51 out of 63 initiatives (81%) reported ongoing action toward completion.
- 10 out of 63 initiatives (16%) reported no action taken.
- 1 out of 63 initiatives (2%) was completed.
- 1 initiative was removed due to elimination of a program.

Purpose

The purpose of this report is to provide the Roseville City Council, stakeholders and citizens an annual update on implementation of the action plan identified in the RMHMP. The objective of the annual evaluation is to ensure a continuous planning process that keeps the RMHMP dynamic and responsive to the needs of the stakeholders. This report was prepared by the planning team. It was reviewed and confirmed by the RMHMP Steering Committee, in accordance with Section 7.4 of the Plan, at the Steering Committee's annual meeting on November 3, 2015. This report discusses the following:

- Natural hazard events that have occurred within the last year
- Changes in risk exposure within the planning area
- Mitigation success stories
- Review of the action plan
- Changes in capability in the planning area that could impact plan implementation
- Recommendations for changes/enhancement

The RMHMP Steering Committee

The update to the RMHMP was overseen by a steering committee appointed by the Roseville City Council and made up of stakeholders in the planning area. During the plan's development, the Steering Committee agreed that it would remain as a body to oversee the maintenance of the plan as established in Chapter 7. The Steering Committee continues to exist and function as organized in its established ground rules. At a minimum, it provides technical review and oversight on development of the annual progress report. It is anticipated the Steering Committee's role in overall plan implementation will evolve, based on the hazard mitigation needs of the city. Annual turnover in its membership is monitored via the progress report. For this reporting period, the Steering Committee membership is as indicated in Table 1.

TABLE 1
2015 STEERING COMMITTEE MEMBERS

Name	Title	Jurisdiction or Agency
Rob Jensen	Acting City Manager	City Manager's Office
Jason Rizzi	Emergency Preparedness Manager	Fire Department
Wayne Wiley	Associate Planner	Development Services Dept.
Carl Walker	Senior Engineer/Floodplain Manager	Public Works Dept.
Helen Dyda	Public Information Specialist	Communications Dept.
Grace Keller	Resident	Community Emergency Response Team
Erik Angle	Emergency Preparedness Program	Sutter Roseville Medical Center
Brenette Macintosh	Safety Officer	Consolidated Communications
Mark Lacher	Risk Manager	Consolidated Communications
Mark Smith	Resident	RCONA Treasurer
Rod Rodriguez	Senior Emergency Services Specialist	Placer County OES
Rick Stalker	Stalker & Burnett RE Group	Placer County Association of Realtors
Michael Algots	Manager - Hazardous Materials	Union Pacific Railroad

Natural Hazard Events in the Planning Area

During the reporting period, the following hazard events affected the planning area:

- Due to the continuation of drought conditions, in May 2015, the City of Roseville announced further water-use restrictions for Roseville water customers. The restrictions were placed in response to Governor Brown's Executive Order and the State Water Resources Control Board's drought emergency action requiring a 25 percent statewide water-use reduction goal. In order to meet the State's goal, City of Roseville water customers were required to reduce water consumption by 28 percent over their use in 2013. For residential customers, the most noticeable change includes watering day restrictions for outdoor irrigation. Watering days for residential turf will be limited to two days per week, Monday and Friday only, before 10 a.m. and after 8 p.m. Commercial customers will have watering days limited to Monday and Thursday.

  In addition to restricted watering days, Roseville also incorporated additional water-use reduction strategies to achieve more water savings:

  – Water waste is prohibited.

  – Washing hardscape is prohibited, unless for health and safety concerns.

  – New or expanded landscape is limited to drought tolerant trees, shrubs and ground-cover irrigated on a drip irrigation system.

  – Fountains, ponds and decorative pools must be drained (unless ponds contain fish.)

  – Covers are required for all new pools and spas.

  – Low volume drip irrigation systems that irrigate at less than two gallons per hour are exempt from day of week watering restrictions.

- December 10-12, 2014: Over a three-day period, from December 10th to December 12, 2014, The National Weather Service forecasted a major winter storm to impact Northern California. All reasonable data from the National Weather Service estimated that the City of Roseville would receive 3.6 inches of rain from the storm event. Additionally, severe winds were forecasted to be a major factor in the event. In preparation of the storm event, the City of Roseville Fire Department chose to activate a Limited Emergency Operations Center (LEOC) at the Fire Department Administrative Headquarters, located at 401 Oak Street. The LEOC was staffed for a 36-hour period. The Placer County Office of Emergency Services was also activated during the storm event.

Changes in Risk Exposure in the Planning Area

The RMHMP update addressed the probable impact of the following natural hazard events in the City of Roseville:

- Dam failure
- Drought
- Earthquake
- Flood
- Landslides
- Human-caused hazards
- Human health hazards
- Severe weather
- Wildland fire

There was an F-0 tornado occurrence during the reporting period. Damage associated with the event was minimal. The occurrence of this event should be acknowledged in future updates to the risk assessment for

this plan. There were no other events during the reporting period that would alter or change the probability of occurrence or ranking of risk for the natural hazards addressed by the RMHMP.

Mitigation Success Stories

During the current reporting period, the City had a number of mitigation success stories that reflect the City's commitment to multi-hazard mitigation and the philosophy that the City Council and staff are responsible for the good stewardship of City resources.

Deployment of Everbridge Notification System and Alert Roseville

Using a Homeland Security grant, the City, along with Placer, Sacramento, and Yolo counties, implemented the Everbridge Mass Notification system. This is a robust and popular system that is used globally. The system will be used for both emergency and non-emergency notification of the public. In preparation for the deployment, over 100 city staff members from 13 city departments were trained in its use. Special courses were designed for public safety officials, including dispatchers, fire department chief officers, and police managers.

"Alert Roseville" (aka "Opt-In") went live in August 2014. This internet site was established to help members of the public register their contact information into the Everbridge system. A significant media and outreach program was developed to advertise the importance of getting this information from the public. The "Opt-In" portal will be explained at every public education event the Fire Department attends. Currently approximately 2,050 public members are signed up in the "Opt-In" portion of Everbridge. A significant increase is anticipated with the aggressive outreach program. To make this system really effective, the City will actively pursue getting those residents with primary cell phone service signed up to the Everbridge system. This is a high priority for the City.

Emergency Operation Center Drills, Incident Activations, and Training

Establishment of the Emergency Management Team

In October 2014, the City of Roseville established the Emergency Management Team, which is a standing committee, whose mission is to plan and prioritize emergency preparedness activities, training, and facilities of the City's Emergency Management Organization. The Emergency Management is comprised of at least one member of each City department and meets monthly to:

- Develop the organizational framework for implementation of the California Standardized Emergency Management System (SEMS) and the National Incident Management System (NIMS) within the City of Roseville.
- Ensure that each City department has the resources and training to function effectively in the roles outlined in the City's Emergency Operations Plan (EOP).
- Plan and develop a minimum of two Emergency Operations Center (EOC) exercises annually.
- Develop and maintain EOC facilities that provide an effective location to conduct EOC operations.
- Develop and maintain technology resources within the EOC necessary to gather and disseminate information effectively.

Preseason Flood Coordination

On October 30, 2014, City Floodplain Management staff presented the 2014-15 Preseason Flood Coordination and Severe Weather Plan Update to the City's Emergency Management Team. The update

included information on the 2014-15 winter weather outlook from the Climate Prediction Center and an overview of the changes to the City's Flood Warning & Response Plan. The most significant change to the Flood Warning & Response Plan was the addition of a Floodwall & Levee Failure component to the Plan.

EOC Activation—Levee Failure Exercise

On May 11, 2015, City Emergency Management staff conducted a four-hour EOC activation drill. This exercise was a full activation of the Emergency Management Organization, including Department Operations Centers (DOC). The exercise centered on a levee failure scenario, which included the flooding of an assisted living facility. This exercise emphasized the need for multiple Incident Actions Plans from various City departments.

Roseville Galleria Exercise

On May 27, 2015 the Roseville and Rocklin Regional SWAT Team, Roseville Rapid Containment Team, Explosive Ordnance Disposal Team, Placer County Special Enforcement Team, FBI and Roseville Fire Department's Tactical Medics, conducted a full scale training exercise at the Roseville Galleria. This was the third straight year Roseville's Public Safety teams and the Galleria have come together for critical incident planning and response training. This year's exercise was designed to address responses to improvised explosive devices by Public Safety and Galleria personnel.

The drill required unified command for organizing and deploying resources, coordinated response to multiple threats, and the ability to establish inter-operable communications across the agencies. Each FBI Field Office across the country was required to conduct a similar drill in coordination with local resources and our city was selected by FBI-Sacramento to be the lead partner agency out of all of the cities in the Sacramento FBI Field Office which covers most of the Central Valley from Fresno up to Oregon. Our drill was the first drill conducted in the country under this training requirement and was monitored from FBI HQ in Washington DC.

MCI 2015—Countywide First Responder Exercise

On June 17, 2015 the Roseville Police and Fire Department, Rocklin Fire, South Placer Fire, American Medical Response, the National Guard, the Officer of Emergency Services and the Sutter Roseville Medical Center all participated in a regional planning and training exercise at Sutter Roseville. The exercise was centered on a mock helicopter crash. Public Safety's planning and training objectives included the development of a unified command structure as identified by the Incident Command Structure as well as planning and response to security needs on the hospital's grounds.

Terrorism Threat Assessments

On May 7, 2014 Roseville Police Department staff performed a threat assessment of Roseville Electric's Power Plant, consisting of a "real-world "vulnerability and site security test at that location with unsuspecting employees Electric personnel.

A similar terrorism threat assessment was conducted in October 2014 at the Civic Center as well as Roseville Fire Station #1. Locations for the threat assessment were expanded to include Fire Stations #2, #5, and #9. Roseville Police Department plans to conduct future assessments for Fire Stations #3 and #4 in July and August of 2015.

Community Preparedness Education

In support of Homeland Security Presidential Directive/HSPD-8, the Sutter-Roseville Medical Center (SRMC) Emergency Preparedness Program rolled out the "Emergency Preparedness and You" community education program. This program focused on how individuals can be safe and prepared when disasters

strike. A version of this program was also rolled-out to healthcare staff, to provide staff readiness and add resiliency. To date, the SRMC Emergency Preparedness Program has provided training for over two hundred students.

Reorganization of the Emergency Operations Center

The City's Emergency Preparedness Manager, working closely with the Central Services and Information Technology—GIS staff, have revised the layout of the City's Emergency Operations Center, and have included new technology to assist with the presentation and dissemination of geographic information during an EOC activation. Computers with access to GIS data and overhead projector displays have replaced the use of ineffective Plexiglas-topped tables and grease pens to supplement Planning Section briefings within the EOC. The new technology also allows for better communication between the EOC and the City's Department Operation Centers, located throughout the City.

Department of Water Resources—Flood Fight Methods Training

On March 18, 2015 State of California Department of Water Resources staff provided a one-day Flood Fight Methods training exercise for the City's Public Works—Street Maintenance and Park Maintenance—Open Space Division staff. The Flood Fight Methods training is designed to assist public agencies with the implementation of corrective temporary methods utilized while combatting flood-related problems. The training consisted of four hours of classroom presentation and an afternoon of instruction on the techniques used to construct various sandbag structures and erosion protection methods.

Sutter Roseville Medical Center (SRMC)

Sutter Roseville Medical Center (SRMC) prides itself in the quality it provides in the realm of patient care and excelling above national standards and best practice. The **SRMC Emergency Preparedness Program** is no different. Disasters strike daily all over the globe. California is no exception. For the benefit of the staff, patients, visitors and the community and with the strong support of our leadership and the Emergency Preparedness Committee, SRMC continues on the ongoing journey of Emergency Preparedness and quality best practices. In the past year, SRMC has demonstrated the following in **Mitigation Success Stories** in Emergency Preparedness:

- **Master Exercise Practitioner (MEP) Certification:** The SRMC EP Coordinator completed the national level certification from FEMA/DHS as that of **Master Exercise Practitioner (MEP)**. With this this certifies that the coordinator has obtained and demonstrated competency in high level of disaster exercise design, from Table Top; functional and Full Scale Disaster Exercise. Due to the difficulty in being accepted into this program and the challenge of the program, as of now there are only 2,300 individuals certified with MEP in the country.
- **National Level Instructor Certification:** The SRMC EP Coordinator completed the national level certification from FEMA/DHS as that of a national level **Certified Instructor**. The course is conducted in two phases: fundamental principles and applied principle. During the fundamental principles phase participants receive an overview of adult learning, task analysis, risk and hazard analysis, learning objectives and lesson plans, communication skills, instructional delivery and multimedia, testing and evaluations, and after action reviews. Then, during the applied principles phase, participants put these lessons into practice through a series of practice training sessions. With this this certifies that the coordinator has obtained and demonstrated competency and the ability to interact and instruct adult learners.
- **Disaster Education:** Sutter Roseville Medical Center (SRMC) EP Program prides itself on education. Our education program for 2015 is holding 45 courses on Emergency Preparedness and has also worked with TEEX and FEMA for bringing their courses and staff here to teach as well. The EP Program coordinator had the honor of teaching a lecture at the FEMA National Training

Center in February of 2014 and March 2015 teaching lectures at the Emergency Nurse's Association (ENA) and Association of Critical Care Nurses (AACN) conference in April 2014 and July 2015. Annually in December, SRMC hosts the EMS-a-Palooza educational event at the facility. Speakers from all aspects of emergency care, from Trauma, Burns and Pediatrics, provide presentations to not only Sutter Health staff but all of our hospitals throughout the region and our EMS community partners. The Emergency Preparedness Program Coordinator for Sutter Roseville Medical Center which provided an in-depth lecture on lecture on **Active Shooter Response for EMS and Healthcare.**

- **Disaster Exercises:** Sutter Roseville Medical Center (SRMC) held 20 Disaster exercises in the past year. These exercises are based on the identified Risks from our annual Hazard Vulnerability Assessment (HVA). Some exercises worthy of note due to their exceptional Interagency Cooperation and Participation were:
  - **2014 Ebola Response Exercise:** This tested the facility's ability to manage victims infected by the Ebola Virus Disease. This drill assisted in the designing and development of the EVD Response Training Program for SRMC.
  - **2015 Helipad Emergency Response Blackhawk Crash Exercise:** As SRMC is the Primary Receiving facility for the Air National Guard with back country rescues, SRMC held a **two-day** Full Scale Exercise which tested our ability to manage not only a surge of victims from a massive earthquake caused landslide but also a crash onto the helipad of a Medical Blackhawk Helicopter. This exercise had the participation with Roseville Fire Department, Rocklin Fire Department, Roseville Police Department and the California Air National Guard.
- **Emergency Preparedness Development- Hospital Incident Command System (HICS) Update:** The SRMC Emergency Preparedness Coordinator was selected by the California Emergency Management Authority (EMSA) to be a member of the national level committee that assisted in the development and review of the Hospital Incident Command System 2014 Updates. These updates are utilized all across the country at hospitals for incident response.
- **Emergency Preparedness Development- Hazardous Materials and Decontamination for Healthcare Facilities Course Update:** The SRMC Emergency Preparedness Coordinator was selected by the California State Training Institute (CSTI) to be a member of the committee that assisted in the development and review of the Hazardous Materials and Decontamination for Healthcare Facilities 2014 Course updates. These updates are utilized all across the country at hospitals for hazardous materials incident response. Additionally, portions of the plan from SRMC in regards to Vulnerable Populations was included in the teaching materials as **Best Practice** examples.
- **Emergency Preparedness Development- Management of Aggressive Behavior (MAB) Program and Course Update:** The SRMC Emergency Preparedness Coordinator, with Regional Safety and Security, on management and development team for the new and updated Violence in the Workplace Training Course and Policy Development and representing Sutter Health at CalOSHA Meetings. This will ensure the facility and Sutter Health is compliant with HSC 1257.8 and 1257.9 and with the new AB 1299 and drafted potential changes that were submitted to Cal OSHA related to SB 1299.
- **Community Involvement- Placer County Emergency Medical Control Committee Chair:** The SRMC Emergency Preparedness Coordinator is the co-chair of the Placer County Emergency Medical Control Committee. In this role, the chair coordinates meetings with all responders from the Placer County Region and reviews and approves policies and procedures for the region.
- **Community Involvement-City of Roseville Police and Fire Safety Fair:** The SRMC Emergency Preparedness Coordinator partnered with the City of Roseville Police Department and the city of Roseville Fire Department for their Second Annual City of Roseville Police and Fire Safety Fair. In this SRMC EP Program and SRMC had a booth on Emergency Preparedness, Safety and the medical center itself. On this day, over 500 brochures, coloring books on safety and emergency preparedness

were handed out. Also, 300 Bike Safety Lights were handed out as well. Due to our active participation, the City of Roseville Police Department donated $500.00 back to our Foundation to be used for Trauma or emergency Services.

2014 Ebola Response

Emerging Infectious diseases, such as the 2014 Ebola virus outbreak, can significantly impact the health and safety of the citizens of Roseville. With the outbreak being monitored for a potential spread to California, the Roseville Fire Department (RFD) worked cooperatively with its regional partners to develop operational procedures and to obtain the necessary equipment to respond safely if necessary. The RFD continues to be proactive with its regional partners on training, protective equipment and is prepared to respond to an Ebola outbreak, or any other emerging infectious disease.

Oil Train Response Plan

The City of Roseville is situated in a rail corridor that connects the Sierra Nevada Mountains to the San Francisco Bay. With the increased production of crude oil in North America, shipments have increased in recent years with the commodity currently traveling through the City of Roseville. The Roseville Fire Department (RFD) working with cooperating agencies throughout Placer and Nevada Counties developed an operational plan to respond to a rail emergency involving crude oil transport. The plan is maintained by the county of Placer Office of Emergency Services and is incorporated in regional training exercises.

Review of the Action Plan

This section reviews the action plan and lists the status of each initiative from the hazard mitigation plan, grouped by the agency or department responsible for its completion. The action plan matrix in Table 2 provides the following information:

- Initiative number and brief summary; initiative numbers are coded by hazard type as follows:
  - DF = dam failure
  - D = drought
  - EQ = earthquake
  - F = flood
  - HC = human-caused hazards
  - HH = human health hazards
  - LS = landslides
  - SW = severe weather
  - WF = wildland fire
  - MH = multiple hazards
- Indication of whether any action has been taken
- Current timeline
- Indication of whether the project priority has changed
- Status (complete, ongoing or no progress)
- Comments, including the following information:
  - Was any element of the initiative carried out during the reporting period?
  - If no action was completed, why?
  - Is the timeline for implementation for the initiative still appropriate?
  - If the initiative was completed, does it need to be changed or removed from the action plan?

Part 4 of the plan provides detailed descriptions of each initiative and the prioritization process.

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Central Services Department Initiatives				
Initiative #F-21—Retrofit the city's Downtown library by sealing the exterior and installing a flood door to protect against flood damage should Dry Creek overspill the existing floodwall.				
No	Long Term	No	No action was completed on this initiative during the reporting period. Priority and time line remain as assigned. Project priority should be changed to medium and time line should be cahnged to long-term pendiong the indentification of funding for this project.	No Progress
City Council Initiatives				
Initiative #HC-3—Seek to establish appropriate staffing levels of public safety personnel to address vulnerabilities identified.				
Yes	Short Term	No	The Police and Fire Chiefs meet quarterly with the City Manager to discuss staffing levels and needs based on current trends, population growth, and calls for service. The Police Department Completed a "Request for Proposals," titled, Roseville Police Department Staffing Study. This RFP requested a professional, independent firm to assess the adequacy of current staffing levels for both sworn and non-sworn staff in the police department, and a sound methodology to project future staffing. Police and City Attorney staff reviewed the submittals and conducted interviews. The PD selected Matrix Consulting to complete the Staffing Study, which was approved by the City Council in October, 2015. The study is scheduled to commence in November, 2015.	Ongoing
City Manager's Office Initiatives				
Initiative #HH-3—Collaborate with the Placer County Mosquito Abatement District to review resource protection policies that conflict with human health protection in the City of Roseville and work to resolve these policy issues				
Yes	Short Term	No	The Placer Mosquito Abatement District and Roseville Environmental Coordinator is working together to both protect open space and wetland areas while limiting the amount of habitat for mosquitoes and vectors.	Ongoing
Public Affairs & Communications Department Initiatives				
Initiative #HH-2—Support the public education efforts of the Placer County Health Department and the Placer Mosquito Abatement District				
Yes	Short Term	No	The City supports the public education efforts of the Health Department and Mosquito Abatement District through print, government access television, social media channels, and web materials. The City has also had significant assistance from the District on public outreach efforts for rodent control through presentations at neighborhood meetings. The Placer Mosquito Abatement District purchased a building in Roseville at 2021 Opportunity Drive and moved a majority of the operations to Roseville. This will enhance the availability of resources in closer proximity to Roseville residents and the mosquito-breeding areas west of Roseville.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #MH-2—Continue to maintain the hazard mitigation page on City website that provides following types of information: • The Hazard Management Plan and its progress reports • Hazard-specific information • Mitigation information by hazard, with specific emphasis on private property • Emergency response and warning information • Links to county, state, and federal related agencies				
Yes	Short Term	No	This is an on-going action. The City continues to maintain its website as specified in the plan maintenance section of the plan. The website can be viewed at: http://www.roseville.ca.us/fire/preparedness/hazard_mitigation_plan.asp	Ongoing
Development Services Department Initiatives				
Initiative #EQ-1—Perform building-specific, structural seismic vulnerability assessment of City- owned critical facilities constructed prior to 1980 (including infrastructure). Included in this assessment will be recommended mitigation alternatives that meet goals and objectives of this plan.				
No	Long Term	Yes	Major construction on any city-owned building would require an assessment of the seismic vulnerability. The City will be applying for a Planning Grant under FEMA's various Hazard Mitigation Grant programs. This initiative will be included in the scope of work for updating the risk assessment to the plan. Priority should be changed to medium while timeline should be changed to long-term	No Progress
Initiative #EQ-2—Incorporate earthquake mitigation measures for private property into existing City-sponsored outreach programs such as printed media and the City's website.				
Yes	Short Term	No	The California Building Officials (CALBO) website has consumer web pages and one in particular regarding Seismic Safety. The site will be upgraded and improved over time with more value to the average consumer regarding measures to improve earthquake safety.	Ongoing
Initiative #EQ-3—Reassess the overall vulnerability to the earthquake hazard using the best available science and technology as it becomes available. State-sponsored programs, Seismic Hazards Mapping Act, and future FEMA-sponsored initiatives are anticipated to create a wealth of knowledge regarding this hazard that did not exist during the preparation of this plan.				
Yes	Short Term	No	Council has updated the maps for the Roseville area. The Public Works Department and Building Division anticipate review and implementation of the new mapping in conjunction with the International Building Council in 2008. The seismic risk assessment of the plan was updated using FEMA's enhanced HAZUS model (MR04) during the plan update process. The 2010 California Building Code based upon the International Building Code has been adopted by the City.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #F-1—The City shall designate all areas identified as the 100-year floodplain. The boundaries of the 100-year floodplain shall be as specified in the floodplain designations section of this component of the city's general plan. Floodplain areas shall be preserved as specified in the open space and conservation element. Such preservation may include required dedication to the City. If needed, modify the City's ordinances to include floodplain use regulations consistent with the goals, policies, and implementation measures of the safety, land use, open space and conservation, and parks and recreation elements of the City's general plan.				
Yes	Long Term	No	The city continued to implement its ongoing protocols and standard for identifying, mapping, and preserving the 100 yr floodplain during this reporting period. This initiative will continue to be implemented on an on-going basis, with a high priority. To comply with the new state Urban Level of Flood Protection, the City has contracted with a qualified engineering firm to determine the 200-year water surface elevation for the City's streams and areas that could potentially be inundated with 3 feet or more of floodwater during a 200-yr storm event.	Ongoing
Initiative #F-2—Refer any development proposal that has a direct or indirect impact on flood protection to Public Works for comment. In addition, forward such proposals to other agencies as applicable, including the U.S. Army Corps of Engineers, California Central Valley Flood Protection Board, FEMA, California Department of Fish and Game, Placer County Resource Conservation District, and Placer County Flood Control District. Consider the comments of the agencies during the development review process.				
Yes	Short Term	No	The city continued to implement its ongoing protocols and standard for reviewing flooding impacts that may be caused by new developments and forward such developments to other agencies as applicable during this reporting period. This initiative will continue to be implemented on an ongoing basis, with a high priority. The PCFCD has completed a region-wide update of the Dry Creek Watershed Flood Control Plan in November 2011.	Ongoing
Initiative #F-9—Ensure that future specific plans and specific plan amendments are consistent with the goals and policies of the general plan. The specific plans shall include the designation and preservation of floodplain areas and adjacent habitat. Provisions shall be incorporated to ensure that public infrastructure, utilities, and emergency services remain functional during flood conditions. Such infrastructure and facilities include water, sewer and gas mains, telephone and electric lines, streets and bridges, hospitals, and fire and police stations. Financing mechanisms shall be explored to fund necessary flood protection improvements and maintenance. Development agreements may be used to secure implementation and funding provisions. (Specific plans have 100% cost recovery by developers).				
Yes	Long Term	No	The city continued to implement its protocols and standard for reviewing proposed public infrastructure, utilities, and other emergency services so that they would remain functional during flood during this reporting period. This initiative will continue to be implemented on an ongoing basis, with a high priority. The Sierra Vista and Creekview Specific Plans were adopted by the City. The Amoruso Ranch and Placer Ranch Specific Plans are currently begin processed. The areas designated as floodplain and/or natural resource conservation areas will be preserved as permanent open space, consistent with General Plan policy and this action item.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #F-11—Require a master drainage plan as part of the approval process for all specific plans and large development projects as determined by the Public Works director. The master drainage plan should consider cumulative regional drainage and flooding mitigation. The plan's intent is to ensure that the overall rate of runoff from a project does not exceed predevelopment levels. If necessary, this objective shall be achieved by incorporating run-off control measures to minimize peak flows and/or assistance in financing or otherwise implementing comprehensive drainage plans.				
Yes	Long Term	No	Master Drainage plans and flood studies have been prepared for the Sierra Vista and Creekview Specific Planning areas. The City is working with developers to prepare these studies for the Amoruso Ranch and Placer Ranch Specific Plans. The priority and timeline for this initiative will remain as assigned	Ongoing
Initiative #LS-2— Continue to implement policies adopted by the general plan that promote open space land uses within identified steep slope areas of Roseville. The City of Roseville Northeast Roseville Specific Plan and Stoneridge Specific Plans include the identified steep slope areas within Roseville. Both plan areas have continuing development.				
Yes	Short Term	No	The City of Roseville Northeast Roseville Specific Plan and Stoneridge Specific Plans include the identified steep slope areas within Roseville. Both plan areas have continuing development. When individual projects are submitted, for example a housing development along a ravine in the Stoneridge area, all City development departments and the Fire Department enforce the General Plan, Specific Plan, City construction standards and individual project conditions to protect the steep slope open space that is dedicated to the City as part of the final maps for the projects.	Ongoing
Initiative #MH-1—Continue to maintain Office of Emergency Services certification of all City inspectors for post-disaster damage assessment.				
Yes	Short Term	No	All building inspectors are certified by the Office of Emergency Services and have been recertified this year. The Building Division will continue to make sure staff keeps their certifications updated and that the certifications are documented per the International Accreditation requirements.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Environmental Utilities Department Initiatives				
Initiative #D-1—Perform a groundwater recharge feasibility study to determine the most cost-effective way to replenish groundwater resources within Roseville.				
Yes	Long Term	No	The City completed a program-wide Environmental Impact Report review under the California Environmental Quality Act requirements. The Environmental Impact Report was adopted by the City Council on March 21, 2012. The City received an operating permit from the State Water Quality Control Board in 2012. The City has implemented this action by injecting excess treated surface water into two existing wells in 2013 and is constructing two additional groundwater wells with partial grant funding by the California Department of Water Resources. A long term ASR operations plan is being developed. The City is also the lead agency within the Western Placer Groundwater Management Plan area.	Ongoing
Initiative #D-2—Implement aquifer storage and recovery program that uses direct injection technique in areas identified as appropriate.				
Yes	Long Term	No	EU has implemented this action by injecting treated drinking water into two wells in early 2013. Two more wells will be completed in 2014 to increase the injection capabilities, and a long term ASR operations plan is being developed.	Ongoing
Initiative #D-3—Continue to implement the Environmental Utility Department's recycled water program and seek all opportunities to expand its coverage, currently focusing on urban growth areas. The City pumps recycled water through a system of purple pipes completely separate from potable (drinking water) pipes. The City pumps the recycled water to customers such as streetscapes, golf courses and parks, where it irrigates turf and shrubs. Using recycled water for uses such as landscape irrigation reduces demand on the potable water system, creating a more reliable water supply for the entire City. Recycled water is not subject to the effects of drought.				
Yes	Short Term	No	A Water Recycling Master Plan has been developed and is being implemented. This includes expanding recycled water in the region as well as finding opportunities in the existing service areas. Recycled water is considered as a resource in all new development areas being considered.	Ongoing
Initiative #D-4—Promote active water conservation techniques and strategies to private property owners through Roseville-sponsored outreach projects such as printed media and the City's website.				
Yes	Short Term	No	Conservation efforts are an ongoing initiative of the Water Division and have been increased and accelerated in all areas due to the unprecedented drought conditions facing the state.	Ongoing
Initiative #F-19—Set back and raise the sewer ponds levees at the Dry Creek Sewer Plant so raw sewage will not enter Dry Creek.				
Yes	Short Term	No	The construction of the Dry Creek Wastewater Treatment Plan Levee Relocation Project was completed in November 2011.	Complete

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #HC-5—Address vulnerabilities identified in vulnerability assessment of water facilities performed by the Environmental Utilities Department in response to EPA initiative.				
Yes	Long Term	No	A Water System Security CIP was completed several years ago by the Environmental Utilities Department and continues to be updated as new facilities come on line. The project enhanced the physical security of water facilities with video monitoring and access control. Timeline for this initiative has been changed from long-term to on-going.	Ongoing
Initiative #SW-5—Enhance and implement strategies for debris management and removal during severe weather events.				
Yes	Short Term	No	No change in the debris management and removal strategy that adopted in 2009. The Parks and Open Space Divisions implemented an Emergency action plan for storm situations. The Open Space Division Department purchased a new bucket truck this fiscal year that aids in the removal of hazardous and storm damaged trees.	Ongoing
Information Technology Department Initiatives				
Initiative #HC-9—Protect the city's data, technology infrastructure and staff against malicious cyber-attacks and Cyber terrorism, such as but not limited to: • Identity Theft • Virus/Malware/Spyware/Spam • Network and system attacks • Web site hacking • Denial-of-service attacks				
Yes	Short Term	No	The Information Technology Department uses several strategies and technologies to combat Cyber-attacks including: • Anti-phishing capability • Internet content filtering • PCI-DSS compliance • Virus, malware, spyware and spam scanning • Perimeter firewalls report and prevent intrusions • Secure authentication • Encryption • EOC Cyber Security Incident Exercises	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #MH-7—Strive to maintain high availability of essential communication services				
Yes	Short Term	No	For the Communication and Information Systems: The city has multiple, fully functional data centers which provide redundant hardware infrastructure. In the event of an extended outage; procedures are in place to restore essential communication and information services. The city's primary radio system has redundant components throughout. In addition the Police and Fire departments have alternative and independent systems in case the primary system fails. One of the current production data centers is scheduled to be relocated at the end of the 2016 calendar year. This move will reduce the risk of flooding as it moves the critical technology infrastructure further away from the nearby creek. The City is at present, working on an enterprise wide Business Impact Analysis study. This report will look at all information systems and services to evaluate and rank the level of impact to the City. This Business Impact Analysis report will be the primary input to developing a revised, more comprehensive Disaster Recovery/Business Continuity Plan.	Ongoing
Initiative #MH-8—Secure the city's physical locations that contain technology infrastructure				
Yes	Short Term	No	Both of the cities data centers are armed with perimeter alarm systems and internal and external security cameras. Also access to these sites is restricted to a limited number of city employees. In addition, vendors and visitors will be required to sign in and be escorted.	Ongoing
Parks and Recreation Department Open Space Division Initiatives				
Initiative #F-12—Continue the Parks and Recreation Department's regular creek maintenance program within the City's creeks and floodplain areas. This program clears and removes debris that could contribute to blockage and flooding and may include the removal of silt. This is only done in areas of high risk to flood damage or where property or facilities are threatened by flooding.				
Yes	Long Term	No	The city continued to implement its ongoing protocol of inspecting and maintaining its creeks and streams during the reporting period. The Department of Fish and Wildlife executed a five-year Routine Maintenance Agreement with the City in April 2010 for work that is ongoing this summer. During the reporting period, the City of Roseville worked with the Placer County Resource Conservation District to remove Red Sesbania from stream segments within the Dry Creek basin. This initiative will continue to be implemented on an ongoing basis, with a higb priority. The City will continue to seek grant funding opportunities from FEMA and state agencies, when available, to assist in funding Arundo eradication along infested stream channels in the Dry Creek watershed.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #F-22—Continue the Tree Mitigation Fund program administered by the Open Space Division in conjunction with non-profit organizations. The planting of oak trees in the open spaces adjacent to riparian zones increases infiltration and slows storm water surges.				
Yes	Short Term	No	The Tree Mitigation program for native oak woodland restoration uses oak mitigation funds for projects in the open spaces. Over 7000 trees have been planted to date.	Ongoing
Initiative #F-23—Manage beaver dam sites for flood control protection and habitat restoration after dam removal. One primary issue is impacts to floodwater capacity of creeks. Part of the desired comprehensive approach to beaver management includes establishment of quantitative and qualitative "carrying capacity," including acre-feet of flood capacity lost. Implement a standard monitoring and reporting process to track beaver dam locations, population, and impacts. Gain regulatory approval for beaver management techniques such as biological control and habitat manipulation using the most benign options first.				
Yes	Short Term	No	The Park Maintenance—Open Space Division continues to use a Geographical Information Systems (GIS) database for tracking beaver dam locations and coordinates beaver removal per the City's Beaver Management Policy and Nuisance Abatement Ordinance.	Ongoing
Initiative #WF-2—Continue "Goat Grazing" program for removal of grassland in areas of Roseville potentially vulnerable to wildfire. Implement goat grazing in City open space and preserve areas for fire and invasive plant species management and native plant restoration.				
Yes	Short Term	No	The Fire Department and the Open Space Division continue working together to implement a goat grazing program. Approximately 400 goats have been utilized for the grazing of open space preserves. Goats provide an innovative, environmentally sensitive way to reduce fire fuel load by keeping open space vegetation under control. Projects completed in 2012-2013 include the open space area located east of Dry Creek near Lincoln Estates to Linda Creek. Grazing reduces fuel load by removing thatch and thinning woody plants and also removes non-native vegetation.	Ongoing
Initiative #MH-4—Implement an "Adopt an Open Space" program in coordination with the open space management program. Develop "adoption contracts" with neighborhoods, organizations, businesses, etc., describing the level of stewardship and the terms of the "adoption." Publicize these activities through online resource directory and other media to encourage participation.				
Yes	Long Term	No	During the reporting period, the City has implemented an "Adopt a Creek" program. The Adopt a Creek program is administered by the City's Park Maintenance—Open Space Division. The City publicizes the program at the following website: http://www.roseville.ca.us/eu/stormwater_management/public_involvement_opportunities.asp	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #MH-5—Develop and disseminate best practices information to private property owners whose land is adjacent to open space areas describing stewardship opportunities and owners' role in preserving beneficial uses of open space areas (including vernal pool grassland and creek or riparian uses). Offer classes to provide in-depth information, such as demonstration projects, techniques for ecologically friendly weed abatement and vegetation control, and creating a backyard habitat compatible with open space areas.				
No	Short Term	Yes	No actions towards the completion of this initiative were completed during the reporting period. This will continue to be a short-term initiative with a high priority pending funding.	No Progress
Initiative #MH-6—Work with the Roseville City School District, local high school districts, and non-profit organizations to promote ecology-oriented curricula and stewardship activities. Identify resource and administrative barriers that may be limiting schools' abilities to more actively participate in stewardship, and work collaboratively to identify solutions.				
No	Short Term	No	No actions towards the completion of this initiative were completed during the reporting period. This will continue to be an ongoing initiative with a medium priority pending funding.	No Progress
Police and Fire Department Initiatives				
Initiative #DF-1—Create a dam failure element for the City's emergency response plan that includes a phased warning protocol in response to the findings of the Folsom Dam Containment Dike Risk Assessment.				
Yes	Short Term	Yes	The City of Roseville and the Placer County Office of Emergency Services has obtained a grant from the California Department of Water Resources to fund revisions to the City's and County's Dam Failure Emergency Response Plan under the DWR Flood Emergency Response Project grant program. The funding will assist in creating a dam failure element in the City's Emergency Response Plan during the next year.	Ongoing
Initiative #F-20—Implement recommendation of Downtown Roseville Specific Plan to relocate the Public safety Building				
Yes	Short Term	No	The City plans to grade the parking lot and building pad for the future relocation of Fire Station #1 in 2014. The fire station will be relocated from it's current location at the intersection of Oak Street and Grant Street to the intersection of Oak Street and Lincoln Street. Building construction is planned to begin in 2015.	Ongoing
Initiative #HC-1—Commit support to Sacramento Urban Area Security Initiative; continue to seek funding from other federal sources to fund its initiatives				
Yes	Short Term	No	Roseville hosts various training courses designed to support the regional Urban Areas Security Initiative (UASI) program. The City hosts a lot of classes for the UASI and they provide us with free seats in the classes in return. The Fire Chief continues to participate on the Joint Terrorism task Force Executive Committee (JTTF). The Police Department continues to support and participate in the Joint Terrorism Task Force by having three officers identified as liaisons to the Sacramento Regional Threat Assessment Center (SacRTAC). These officers communicate with the SacRTAC and disseminate security unclassified information to Roseville officers.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #HC-2—Enhance emergency response capability of City by contingency planning for specific events based on identified vulnerabilities.				
Yes	Short Term	No	The Fire Department's Hazmat Team has completed one Type I recertification since 2006 and is currently in the process of going through another one right now. The City's Training Division has determined that all new employees who are required to have the basic and intermediate level of ICS training (ICS 100, 200, 700, 800) obtain training and certification through FEMA's Online Emergency Management Institute's Independent Study program. Certificates are provided at the completion of the courses, and maintained in the form of individual transcripts by FEMA. Audits for compliance are completed by the training division annually. Those employees required to have advanced level ICS courses (ICS 300, 400) have been identified by the City's Training Division based on NIMS requirements. ICS 300-400 training is provided annually in multiple 16-hour blocks. The FEMA exercise mandates have been meet and exceeded. In October of 2009, the H1N1 virus EOC activation was completed and included the activation of a South Placer Point of Distribution (POD) for the H1N1 virus vaccination. In May of 2010, the EOC was activated for the "MCI 2010 Homeland Security Exercise" comprising of the cities of Roseville, Rocklin and surrounding jurisdictions. In 2011, the City participated in the "Golden Guardian" full scale exercise that was hosted by California Emergency Management Agency (CalEMA). This scenario centered on a catastrophic release of Folsom Lake due to a dam failure. In 2012 the EOC staff conducted an enhanced tabletop exercise that practiced Continuity of Operations Plans (COOP). The exercise scenario included a major explosion of a natural gas main in the Civic Center area. Again in 2012, the city participated and hosted the "MCI 2012 Homeland Security Exercise" that included a major chemical release with a fast moving vapor cloud into neighboring jurisdictions. This was a full scale exercise with a complete activation of the entire EOC staff.	Ongoing
Initiative #HC-4—Prepare a site-specific vulnerability assessment of City- owned critical facilities that use the best available science and technology with regards to human-caused hazards.				
Yes	Short Term	No	Through the California Emergency Management Agency, Critical Infrastructure Protection Section and the 2008 Buffer Zone Protection Program, an assessment of the Sutter Roseville Medical Center was conducted. While SRMC is not city-owned, it is designated the City's medical provider.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #HH-1—Continue to collaborate with the Placer County Health Department to ensure the health and welfare of the community				
Yes	Short Term	No	The City Manager's Office, Fire Department, and Communications Division collaborate with the Placer County Health Department on issues that affect the health and welfare of Roseville residents and visitors.	Ongoing
Initiative #SW-4—Continue education/outreach programs to improve winter preparedness and minimize loss of life or injury.				
Yes	Short Term	No	Educational materials are included on the city's web site on an ongoing basis, as well as a weekly tip sheet sent to all local media (print/broadcast). Web content is available to any viewer with a personal computer and Internet access. Typically there is also at least one city-authored column in the Roseville Press-Tribune on this topic per year—which reaches 40,000 readers.	Ongoing
Initiative #WF-3—Enhance existing City public outreach programs to include information on fire safety, defensible spaces, and areas of concern.				
Yes	Short Term	No	The Fire Department continually evaluates the efficiency and effectiveness of its public education programs. Comparison with other accredited fire agencies reveals that our performance standards meet those of other agencies. Outreach efforts include seasonal safety messages through the media and City website. Public education programs have been reduced, with the primary focus being assembly type presentations at several elementary schools. The fire department has taken an active role in the Neighborhood Association Meetings by having the on-duty staff to attend when possible. This allows the department to update it's citizens on various services and programs, as well as allows the citizens to voice any questions or concerns they have.	Ongoing
Initiative #MH-3—Establish/maintain a post-disaster action plan to be part of the City Emergency operations plan that will include following elements: • Procedures for public information • Post-disaster damage assessment • Grant writing • Code enforcement • Redundant operations				
No	Short Term	No	No action was taken on this initiative during the reporting period. The City is still committed to completing this action in the performance period of the plan. However, the City will pursue grants to complete this task.	No Progress

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Public Works Department Initiatives				
Initiative #F-3—Continue City participation in the National Flood Insurance Program and the Community Rating System (CRS). Seek CRS classification improvements within capabilities of City programs, including adoption and administration of FEMA-approved ordinances and flood insurance rate maps (FIRM).				
Yes	Short Term	No	The City of Roseville continued to participate in the CRS program, and re-certified its participation during the reporting period. The City's CRS Class I classification became effective on October 1, 2006. Flood Insurance policy holders within the City for property owners in flood areas will receive up to a 45% premium reduction based on the classification. Roseville is the first and only CRS Class 1 community in the nation. This initiative will continue to be implemented on an ongoing basis, with a high priority. The City has maintained its Class 1 rating through the reporting period.	Ongoing
Initiative #F-4—Maintain Roseville's compliance and good standing under the National Flood Insurance program.				
Yes	Short Term	No	A Community Assistance Visit (CAV) was last performed on the City of Roseville on November 1, 2011. The CAV is the principle means by which FEMA monitors a community's NFIP compliance. This CAV found that the City was in full compliance and in is in good standing under the NFIP.	Ongoing
Initiative #F-5—Continue the City's outreach program to flood-prone property owners and the citizens of Roseville, to help make them aware of the flood threat and how best to deal with them.				
Yes	Short Term	No	This is an on-going action that is a part of the City's CRS program.	Ongoing
Initiative #F-6—Continue to pursue a regional approach to flood issues by remaining actively involved in the Placer County Flood Control District. This involvement includes cooperation in the development of a comprehensive regional database. Continue to participate in regional flooding studies, including the Auburn Creek/Coon Creek/Pleasant Grove Creek flood mitigation plan and the Dry Creek watershed flood control plan.				
Yes	Long Term	No	The City continued to be actively involved in the Placer County Flood Control District (PCFCD) and participate in regional flooding studies during this reporting period. Staff from the Floodplain Management Division attends the meetings on a monthly basis and a Councilmember serves on the District Board. The PCFCD is developing the Antelope Creek Flood Control Project, which is a regional flood control project, located within the City of Roseville. City staff will be assisting the PCFCD with the development and construction of the regional flood control project, scheduled for construction in 2015. This initiative will continue to be implemented on an ongoing basis, with a high priority.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #F-7—Continue City coordination with other agencies on issues of flood control. Coordination between the City and adjacent jurisdictions occurs through several mechanisms, including distribution of development proposals for review and comment. Continue City cooperation with federal, state, and local agencies, including the U.S. Army Corps of Engineers, California Central Valley Flood Protection Board, FEMA, California Department of Fish and Game, Placer County Resource Conservation District, and the Placer County Flood Control District.				
Yes	Short Term	No	The City continued to coordinate with other outside agencies on issues of flood control during this reporting period. The coordination typically occurs on a project-by-project basis and agencies are included in the meetings based on their particular jurisdiction or expertise. This initiative will continue to be implemented on an on-going basis, with a high priority. The City is also actively involved with the State's new Flood-Safe program.	Ongoing
Initiative #F-8—Continue to develop, implement, and expand the Flood Alert and Early Warning Program systems and integrate the systems with other local jurisdictions to form a regional warning program.				
Yes	Long Term	No	The City continues to develop, implement, and expand the Flood Alert system. New "ALERT" software was installed and the Flood Warning web site was updated. Durig the reporting period, the City and the Placer County Flood Control District applied a State Department of Water Resources Flood Emergency Response Projects grant to upgrade the Flood Alert System data transmission system to the "ALERT-2" protocol. While the grant application was not sucessful during the current grant cycle, the City and PCFCD will apply for funding in future grant cycles. This initiative will continue to be implemented on an ongoing basis with a high priority.	Ongoing
Initiative #F-10—Monitor and regularly update City flood studies, modeling, and associated land use, zoning, and other development regulations at a minimum of every 5 years or whenever information becomes available that would significantly modify previous data. New information could include new studies, change in City policy, consideration of a major development project or specific plan, or implementation of a flood control project.				
Yes	Long Term	No	The City has updated the Pleasant Grove Creek flood studies. The City also participated with the 2011 update to PCFCD's Dry Creek flood study. The studies have also determined the 200-year WSE to comply with the implementation of the Urban Level of Flood Protection criteria. The priority and timeline for this initiative will remain as assigned.	Ongoing
Initiative #F-13—Continue annual inspection and maintenance program of City storm drain systems. Review after every major storm system function and performance. This program removes debris that could contribute to blockage of the storm drain system.				
Yes	Short Term	No	The City continued to implement its ongoing protocol of inspecting and maintaining its storm drain system during the reporting period. This initiative will continue to be implemented on an ongoing basis with a high priority.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #F-14—Complete the final two phases of the Cirby/Linda/Dry Creek flood control project (Phase 1 and 2). Five of the seven phases of this project have been completed at a cost of about $18,000,000. The basis for determining viability of this project will be a benefit /cost analysis to determine if project meets federal grant eligibility requirements.				
No	Long Term	No	No actions towards the completion of this initiative were completed during the reporting period. This will continue to be a long-term initiative with a low priority pending funding.	No Progress
Initiative #F-15—Analyze alternative improvements to the Cirby/Linda/Dry Creek flood control project that may be cost effective in the flood-prone areas of Roseville: • Dry Creek from Darling Way to Riverside Avenue • Area on Dry Creek upstream of Folsom Road in the Columbia Avenue/Marilyn Avenue/Bonita Street area • Linda Creek near Champion Oaks Drive/Samoa Way/Hurst Way area • Cirby Creek in the Trimble Way/Zien Court area				
No	Long Term	No	No actions towards the completion of this initiative were completed during the reporting period. This will continue to be a long-term initiative with a low priority pending funding. The City continues to pursue opportunities to acquire flood prone properties and remove them from the floodplain as a viable alternative to structural flood control.	No Progress
Initiative #F-16—Replace the Huntington Drive/Cirby Creek culvert with a bridge to protect Queens Court/Huntington Drive area. The Public Works Department oversees this project.				
No	Long Term	Yes	The City is continuing to research grants that may be available for this project. The City has the 25% match for the project. The priority for this project has been changed to medium and the time line has been changed to long term pending the identification of funding for this project.	No Progress
Initiative #F-17—Divert the main drainage storm drain system down Crestmont Avenue to Cirby Way and then into Dry Creek so that the existing system will not exceed capacity. If system capacity is exceeded, the intersection on Cirby Way and Crestmont Avenue and nearby homes will flood during major flood events.				
Yes	Short Term	No	Funds were allocated for this initiative in the 07/08 capital improvements budget but were diverted to fix a culvert on Atlantic Street in downtown Roseville rather than replacing this culvert. A portion of the project, consisting of the 48-inch outfall into Linda Creek and the storm drain pipe crossing South Cirby Way at the intersection of Piedmont Way, was constructed in 2010. The priority and timeline for this initiative will remain as assigned. Funding was replaced with the approval of the FY 2011/12 budget.	Ongoing
Initiative #F-18—Continue to promote and sponsor programs to buy out, relocate, and flood-proof existing flood-prone structures within Roseville.				
Yes	Short Term	No	The City will continue to pursue the acquisition of additional target properties with a high priority. The City has targeted the property on Riverside Dr for grant funding under the FY-2013 HMA grant cycle. Completion of this project will be contngent upon grant award.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #LS-1—Once California Geological Survey completes soils mapping for the Roseville vicinity under the Seismic Hazards Mapping Act, reassess landslide hazard using best available data to gauge the true vulnerability to this hazard.				
No	Long Term	No	There was no mapping performed by CAGS in the Roseville vicinity under the Seismic Hazards Mapping Act during the reporting period. Time line and priority for this project will remain unchanged, pending action by CAGS.	No Progress
Roseville Electric Initiatives				
Initiative #HC-6—Maintain compliance with California Energy Commission ("CEC") license conditions for the operations of the Roseville Energy Park ("REP") with respect to Hazardous Material Management				
Yes	Short Term	No	The operation of the REP is in compliance with the CEC license conditions including the preparation of a Business Plan and a Risk Management Plan (RMP) submitted to the City's Fire Department and the CEC. In addition, a Vulnerability Assessment has been prepared and Site Security measures have been implemented to ensure that neither the REP site nor a shipment of hazardous material is the target of unauthorized access.	Ongoing
Initiative #HC-7—Maintain compliance with state and local laws and regulations for the operation of the Roseville Power Plant #2.				
Yes	Long Term	No	All operating and compliance permits are being maintained by the power generation staff. Compliance with state and local laws is an ongoing practice.	Ongoing
Initiative #HC-8—Maintain compliance with North American Electric Reliability Corporation mandatory reliability standards related to plant operation, sabotage reporting and critical infrastructure protection (cyber security.				
Yes	Short Term	No	Establishing compliance through development, implementation and adherence to policies and procedures	Ongoing
Initiative #SW-1—Continue ongoing program of conversion of overhead utilities to underground service.				
Yes	Short Term	No	This Program is no longer being implemented by the City. Action should be removed from action plan at the next update.	No Progress
Initiative #SW-2—Continue the Shade Tree Program, an energy conservation rebate program provided by Roseville Electric				
Yes	Short Term	No	Although temporarily suspended due to the drought, this ongoing program will continue upon reactivation to offer Roseville residents a rebate for trees that they select, purchase and plant at their own convenience. Rebates are limited to 6 trees per household and available to Roseville Electric customers only.	Ongoing
Initiative #SW-3—Continue ongoing line clearing and weed abatement of electrical utility facilities in order to reduce public exposure to vegetation hazards and maintain higher reliability during severe weather conditions.				
Yes	Short Term	No	This is an ongoing program of Roseville Electric to both protect the public from hazards and to maintain the reliability of electricity service to Roseville Electric's more than 56,000 customers.	Ongoing

TABLE 2. ACTION PLAN MATRIX				
Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #SW-6—Continue to operate the Roseville Energy Park to support the City's electrical requirements and maintain service continuity during severe weather events.				
Yes	Short Term	No	The Roseville Energy Park (REP), which opened in October 2007, is producing power and provides additional electric support to meet the City's electrical needs. In the event of a transmission line outage, the REP will help maintain electric service continuity. The Operations Department's Emergency Action Plan (EAP) specifically addresses severe weather operations in Section 5.9. The severe weather EAP will ensure continuity of operations while securing the safety of personnel and equipment.	Ongoing
Initiative #SW-7— Continue to operate Roseville Power Plant #2 to support the City's electrical requirements and maintain service continuity during severe weather events.				
Yes	Short Term	No	Roseville Power Plant #2 is operated from the Roseville Energy Park Control Room. The Operations Department's Emergency Action Plan (EAP) specifically addresses severe weather operations in Section 5.9. The severe weather EAP will ensure continuity of operations while securing the safety of personnel and equipment.	Ongoing

Planning Area Changes That May Impact Plan Implementation

The planning area for the City changed with the adoption of 3 new Specific plans. The impacts of these changes will be addressed at the next update to this plan.

Recommendations for Changes or Enhancements

Based on the review of this report by the RMHMP Steering Committee, the following recommendations will be noted for future updates or revisions to the plan.

- The Information Technology Department has recommended that Initiatives MH-3 and MH-7 be combined into a single initiative
- Include information on the potential impacts of the Biggerts/Waters Flood Insurance Reform Act in annual mailings to floodplain residents.
- Continue to hold a pre-rainy season meeting with all key departments and stakeholders, such as the meeting held on December 10, 2013 to review the City's Flood Warning & Response Plan.
- Continue to train with WebEOC to enhance communication with the county. Continue to offer classes prior to every EOC exercise; last year over 100 city staff received a WebEOC refresher class.
- Try to better forecast impacts on city storm drains from debris accumulations.
- Consider training in street closure in a flood scenario for street workers.

- Data from stream gauges was not a representation of actual emergencies in the field. During flooding events, field observers should be deployed to known street flooding locations, even if no gauge information indicates flooding at those locations.
- Continue to evaluate (and add as appropriate) new social media channels, which have proven essential for public and media communication in emergencies.
- The growth of recreational access to and residential units adjacent to the Pleasant Grove Creek oak forest in the Woodcreek, Crocker Ranch, and Fiddyment Farms neighborhoods increases the frequency, risk, and human impact of wildland fires. These increases may require fire and safety personnel reviews of first responder vehicle access to newly populated sections of the creek, updates of resident fire emergency notification and evacuation procedures, and creation or updates of interagency coordination procedures for resident relocation.
- Create different wording for the WebEOC initiative
- Enhance the drought hazard profile based on new information available on current drought situation in CA.
- Enhance human caused hazard profile to include discussion on cyber-terrorism.
- Create separation between natural and non-natural hazards of concern in part II of the plan

Public review notice: *The contents of this report are considered to be public knowledge and have been prepared for total public disclosure. Copies of the report have been provided to the Roseville City Council and local media outlets. The report is also posted on the City of Roseville Multi-Hazard Mitigation Plan website. Any questions or comments regarding the contents of this report should be directed to:*

Jason Rizzi
City of Roseville
311 Vernon St.
Roseville, CA 95678
(916) 774-5802
jrizzi@roseville.ca.us

Appendix C. Steering Committee Meeting Information

TETRA TECH

MEETING SUMMARY

Date of Meeting:	November 3, 2015
Subject:	1st Steering Committee (SC) meeting
Project Name:	City of Roseville Multi-Hazard Mitigation Plan –Update
In Attendance:	**Steering Committee**- Grace Keller (Chair), Rob Jensen, Jason Rizzi, Wayne Wiley, Carl Walker, Brian Jacobson (for Helen Dyda), Erik Angle, Brenette Macintosh, Mark Lacher, Rod Rodriguez, Rick Stalker, Jim Williams **Planning Team**- Rob Flaner
Not Present:	Mark Smith, Michael Algots
Summary Prepared by:	Rob Flaner- 11/17/2015
Project No.:	103S4157
Quorum- Yes or No	Yes

Item	Action

Welcome and Introductions

- Chair, Grace Keller opened the meeting with brief group introduction.
- Round table introductions by all in attendance.
- Agenda was reviewed with no request for changes.
- There were no members of the public present and no public comment received by the Committee.
- Handouts provided included: Agenda, 2015 Progress report, work-plan for the plan update, Steering Committee ground rules, table of contents from the 2011 Multi-hazard mitigation plan.

Why are you here? Purposes for planning

Rob Flaner, the City's planning consultant from Tetra Tech, Inc. provided the committee and overview of the drivers for a hazard mitigation plan, and the Steering Committee's role in the process. There are 2 principle drivers for the City having a hazard mitigation plan; the Disaster Mitigation Act of 2000 (DMA) and the Community Rating System (CRS).

- **The DMA**- Federal legislation that stipulates that communities must have an approved all hazard mitigation plan to eligible for certain federal grant programs administered by the Federal Emergency Management Agency (FEMA). The City of Roseville has leveraged many of these grant programs in the past and wanted to continue to be eligible to pursue that funding, so it developed its hazard mitigation plan.
- **The CRS**- This is a FEMA program that is part of the National Flood Insurance Program (NFIP) that rewards participating communities for exceeding the minimum requirements of the NFIP

Item	Action

by lowering the costs of flood insurance in participating communities. Communities are rated on a scale of 1-10, with class 1 being the best with up to a 45% reduction in flood insurance premiums. The City of Roseville is the nation's highest rated community, and the only CRS class 1. To achieve that designation, the City need to have a mitigation plan that met very prescriptive planning requirements

So utilizing these 2 drivers, the City developed its 1st hazard mitigation plan in 2005. That plan was updated in 2010, which is now being updated with this process. FEMA and CRS require that these plans be reviewed and updated every 5 years. Each of the planning processes were overseen bay steering committee made up of community stakeholders city officials. This plan update process will follow suit and has been scripted to meet CRS class 1 planning requirements.

2015 Annual progress report

The City has prepared a 2015 annual progress report for the 2011 Multi-hazard Mitigation plan in accordance with the plan maintenance chapter (chapter 7) of the plan. The progress report provides and overview of the plan and provides a status report of the 63 initiatives that were identified in the 2011 plan.

The performance period for the Hazard Mitigation Plan began on March 28, 2011, with FEMA's final approval. The initial performance period for this plan is 5 years, with an update anticipated before March 2016. As of the most recent reporting period, the performance period is 82 percent complete. The Hazard Mitigation Plan identified 63 hazard mitigation initiatives to be pursued during the 5-year performance period. As of the most recent reporting period, the following progress can be reported:

- 51 out of 63 initiatives (81%) reported ongoing action toward completion.
- 10 out of 63 initiatives (16%) reported no action taken.
- 1 out of 63 initiatives (2%) was completed.
- 1 initiative was removed due to elimination of a program.

The SC review the progress report, and made the following recommendations for changes before transmittal to City Council:

- Add a short write-up on the Ebola exercise conducted during the reporting period to the hazard events section.
- Add a short write-up about the City's "Oil by Rail" plan in the mitigation success story section of the plan.
- Rob was asked to provide an overview of all the recommended changes/enhancements for the plan from the prior progress reports to the SC at the next meeting.

Erik Angle will write a paragraph about the Ebola exercise

Jason Rizzi will write a paragraph about the Oil by Rail Plan

Rob Flaner will provide a summary of all the annual recommendations from the annual plans to the next meeting

Item	Action
After the discussion on the progress report, the SC approved the report as amended for transmittal to City Council (Motion – Jason Rizzi, Second – Rob Jensen). Carl Walker will present the Progress Report to Council via GIM on or before December 16th.	Carl Walker will present the Progress Report to Council via GIM on or before December 16th
2015/2016 Plan Update Work plan Rob went over the scope of work for the plan update. The handout provided to the SC was the actual contact scope of work from Tetra Tech's contract with the City. The work plan is broken down in to 6 phases: • Phase 1-Organize and review • Phase 2-Update/Enhance the Risk Assessment • Phase 3-Engage the Public • Phase 4- PPI Framework • Phase 5-Assemble the updated Plan • Phase 6- Plan Adoption	
The current plan will expire on March 28, 2016. Plan expiration is not a big issue, unless the City's current pending grant application for the acquisition of 645 Riverside Dr. is not funded prior to March 28, 2016. This grant application has been held up by FEMA due to procedural requirements. Both Rob and Carl do not believe, that plan expiration will be an issue for this grant, however, they will seek clarification for both CalOES and FEMA Region IX. There may be a need to expedite the timeline for this project based on direction received from FEMA and the State.	Rob and Carl will reach out to CalOES and FEMA region IX to determine if an expedited schedule is warranted in order to process the grant for 645 Riverside Dr.
Steering Committee Ground Rules Since Steering Committee meetings will be conducted as open public meetings, the SC will need to have established ground rules for operation during the plan update process. The ground rules confirmed by the SC for the last plan update were provided to the SC. Rob went thru each of the components of the ground rules to make sure the current SC understood their application, and to seek input for changes or enhancements. The following changes were recommended by the SC for the 2015/2016 SC ground rules: • Grace Keller was re-confirmed as Chairperson, and Wayne Wiley was confirmed as Vice-Chairperson for the next performance period of the plan. • The quorum for the SC will remain as 50% plus 1, which will be 8 members for this plan update process. • SC members will have the option to designate an alternate and these alternates will have full voting privileges when they attend a SC meeting in the place of a primary SC member. SC members wishing to designate an alternate will inform the planning team by Friday, November 20th.	SC members wishing to designate an alternate should inform planning team by Friday, November 20th, 2015.

Item	Action
• The city's standard protocol for receiving public comment at City Council meetings was incorporated in to the ground rules. • The standard meeting date/time will strive for the 1st Tuesday of each month, from 6:00 to 8:00 PM at the Roseville City offices at 311 Vernon St.	
The SC voted to approve the ground rules as amended (Motion – Rick Stalker, Second – Mark Lacher). Carl will make sure that the final ground rules are posted on the Mitigation Plan website as soon as possible.	Carl to poste the final ground rules on the mitigation plan website.
Hazards of Concern The table of contents from the last plan illustrating the hazards of concern addressed was provided to the SC as a hand out. Rob explained that local hazard mitigation plans are required to be consistent with the State Hazard Mitigation plan as far as the hazards of concern addressed by a plan. So in other words, id the State plan says that Placer County and the City of Roseville is susceptible to a certain hazard, then the Roseville and Placer County plans should assess those hazards in their individual mitigation plans. The 2011 Roseville Multi-Hazard Mitigation Plan assessed: Dam Failure, Drought, Earthquake, Flood, Human Caused hazards, Human health hazards, Landslide, severe weather, and wildfire. These hazards were consistent with the last CA State hazard Mitigation plan.	
The Steering Committee was asked to do some homework prior to the next SC meeting as follow: All to read Chapter 11-18 of the 2011 plan and answer the following questions: • Is there another hazard we need to assess? • Since California will have Climate Change (Future Conditions) as a stand-alone risk, how should we accomplish that in our plan? All to read Goal section and answer the following questions: • Are the Goals still valid? • Do we need to add any new Goals? All to review the Annual reports for the last five years.	SC members to do homework as described.
Meeting was adjourned at 8:00 PM The next Steering Committee meeting is:	

Item	Action

November 30th from 6:00 PM to 8:00 PM
Roseville City Hall
311 Vernon St., Roseville, CA 95678

TETRA TECH

MEETING SUMMARY

Date of Meeting:	November 30, 2015
Subject:	2nd Steering Committee (SC) meeting
Project Name:	City of Roseville Multi-Hazard Mitigation Plan –Update
In Attendance:	**Steering Committee**- Grace Keller (Chair), Rob Jensen, Jason Rizzi, Wayne Wiley, Carl Walker, Helen Dyda, Erik Angle, Brenette Macintosh, Mark Lacher, Rick Stalker, Jim Williams, Paul Holt, Joe Van Zant **Planning Team**- Rob Flaner
Not Present:	Mark Smith, Rod Rodriguez, Michael Algots
Summary Prepared by:	Rob Flaner- 12/14/2015
Project No.:	103S4157
Quorum- Yes or No	Yes

Item	Action

Welcome and Introductions

- Vice-Chair, Wayne Wiley opened the meeting with a brief group introduction.
- Round table introductions by all in attendance.
- Agenda was reviewed with no request for changes.
- Meeting summary for Steering Committee (SC) Meeting #1 were reviewed and approved.
- There were no members of the public present and no public comment received by the SC.
- Handouts provided included: Agenda, Meeting #1 summary, example guiding principles and mission statements, the 2012 plan Goals and Objectives, Planning area map for the 2016 plan update, recommendations for changes and enhancements from the 2015 annual progress report.
- Chair, Grace Keller assumed leadership of the meeting upon her arrival.

Progress Report Recommendations

At the last SC meeting, the committee requested to see the changes and enhancement sections from the past progress reports. Rob provided the SC a handout that summarized the notations for changes and enhancements to the plan from the 2012 through 2014 progress reports. Rob led a discussion with the SC on what recommendations for changes or enhancements should be included in the 2015 progress report. The following recommendations were requested by the SC:

Item	Action
• Create different wording for the WebEOC initiative • Enhance the drought hazard profile based on new information available on current drought situation in California. • Enhance the human-caused hazard profile to include a discussion on cyber-terrorism. • Enhance the human health hazard profile to include a discussion on Ebola. • Create separation between natural and non-natural hazards of concern in part II of the plan. Rob and Carl will finalize the 2015 progress report for posting on the City website and submittal to the City Council Carl asked the SC to review the planning area map that was provided as a handout. Carl explained to the SC that the planning area for the City has changed dramatically since the initial planning effort in 2005. The City has and will continue to grow that the direction of its General Plan and Specific Planning process. The map handout illustrated the new specific plan areas that will need an assessment in the 2016 update. **<u>Confirm the Hazards of Concern</u>** The SC was asked at the last meeting to review the 2012 Roseville HMP and the 2013 CA State Hazard Mitigation plan and come to this meeting prepared to confirm the hazards of concern to be addressed by the 2016 plan update. After discussion of their observations from this review, the SC confirmed the following hazards of concern for the 2016 plan update, inclusive of the newly identified cyber terrorism and Ebola components of human-caused and human health hazards, respectively: • Dam Failure • Drought • Earthquake • Flood • Human caused - Terrorism & Weapons of Mass Destruction - Technological - Civil Disorder - ***Cyber terrorism*** • Human Health - Influenza - Small Pox - Viral Hemorrhagic Fevers - Plague - Tularemia - Mosquito-borne Disease - Lyme Disease	Rob and Carl to final finalize the 2015 progress report for posting on the City website and submittal to City Council

Item	Action

  - Anthrax
  - Severe Acute Respiratory Syndrome
  - Extreme weather
  - ***Ebola***
- Landslide
- Severe Weather
- Wildfire-to include a discussion/profile on air quality issues

Additionally, the 2016 update will include a stand-alone chapter on climate change that will discuss qualitatively the possible impacts of climate change on each of the above hazards of concern. There will be separation created in the plan between the natural and non-natural hazards since they will be profiled and ranked differently. The risk ranking of the plan will only consider the natural hazards of concern.

Guiding Principle/ Vision/Mission Statement

A guiding principle or a mission statement for a plan is a written declaration of a plan's core purpose and focus that normally remains unchanged over time, regardless of a change to the plan's goals or objectives. Rob explained to the SC that the last 2 versions of the Roseville Hazard Mitigation plan did not identify a guiding principle or mission statement. These are not required components for DMA compliance, however, Rob explained to the SC that they are beneficial, as they provide a clear, singular message that can be the focal point for public engagement. Rob explained to the SC that he was unaware as to why the past Steering Committees chose to not identify a guiding principle, however, this SC could identify one for the 2016 update. The SC received a handout that listed several example mission statements from other planning efforts for reference and review. After reviewing the handout, Rob asked the SC if they wanted a guiding principle/ statement for the 2016 plan update. The consensus of the SC agreed on identifying a guiding principle. After discussion, the SC settled on the following guiding principle for the 2016 plan update:

Through community partnerships, establish a plan to reduce vulnerability to hazards in order to protect the health, safety, welfare, and economy of the City.

Confirm Goals

The SC received a handout that listed the 7 goals from the 2012 plan. Rob explained that the initial 2005 plan included 7 goals that were slightly enhanced during the 2012 plan update process. Rob asked the SC to review the 7 goals and identify any additions, deletions, or enhancements to the goals for the 2016 update. One change was requested by the SC. This change involved replacing "maintain, enhance, and restore" with "monitor and support" on Goal #7. The SC confirmed the following goals for the 2016 plan update:

Item	Action

G-1: Protect lives and reduce injury.

G-2: Promote hazard mitigation as an integrated policy.

G-3: Protect the continuity of local government to ensure no significant disruption of services during or due to a disaster.

G-4: Improve community emergency management preparedness, collaboration and outreach.

G-5: Minimize or reduce damage to property, including critical facilities.

G-6: Develop and implement mitigation strategies that optimize public funds in an efficient and cost-effective way.

G-7: Monitor and support the natural environment's capacity to deal with the impacts of natural hazards, taking into account the potential impacts of global climate change.

Confirm Objectives

The SC received a handout that listed the 10 objectives from the 2012 plan. Rob explained that the initial 2005 plan included 10 objectives that were slightly enhanced during the 2012 plan update process. Rob asked the SC to review the 10 objectives and identify any additions, deletions, or enhancements to the goals for the 2016 update. The SC requested minor changes to objectives # 5, 7, and 10. The SC confirmed the following objectives for the 2016 plan update:

O-1: Consider the impacts of hazards on future land uses in the City of Roseville by coordinating with other planning mechanisms such as the general plan and land-use code development.

O-2: Protect and sustain reliable local emergency operations and communication facilities during and after disasters.

O-3: Develop new or enhance existing early warning response systems and plans.

O-4: Seek to enhance emergency response capabilities through improvements to infrastructure and City programs.

O-5: Enhance the understanding of all present and future hazards that may impact the City of Roseville and the risk they pose.

O-6: Seek mitigation projects that provide the highest degree of hazard protection at the least cost.

O-7: Seek to update information on natural, environmental, and human-caused hazards, vulnerabilities, and mitigation measures by coordinating

Carl to post the final Guiding Principle, Goals and Objectives on the City HMP website

Item	Action

planning efforts and creating partnerships with appropriate local, private, county, state, and federal agencies.

O-8: Seek to implement codes, standards, and policies that will protect life and property, including natural habitat, from the impacts of hazards within the City of Roseville.

O-9: Educate the public on preparedness for and mitigation of potential impacts of hazards on the City of Roseville.

O-10: Support efforts to retrofit, purchase, or relocate structures in high hazard areas, including those known to be repetitively damaged.

Public Involvement Strategy

Discussion on this topic was tabled until the next meeting due to the lack of time.

The meeting adjourned at 8:00 PM

The next Steering Committee meeting is:

January 5th from 6:00 PM to 8:00 PM
Roseville City Hall
311 Vernon St., Roseville, CA 95678

TETRA TECH

MEETING SUMMARY

Date of Meeting:	January 5, 2016
Subject:	3rd Steering Committee (SC) meeting
Project Name:	City of Roseville Multi-Hazard Mitigation Plan –Update
In Attendance:	**Steering Committee**- Grace Keller (Chair), Jason Rizzi, Wayne Wiley, Carl Walker, Helen Dyda, Erik Angle, Brenette Macintosh, Mark Lacher, Joe Van Zant, Rick Stalker, Michael Algots, Jim Williams, Paul Holt, Dom Casey, Jamie Garret **Planning Team**- Rob Flaner, Jessica Cerutti
Not Present:	Rob Jensen, Rod Rodriguez
Summary Prepared by:	Jessica Cerutti – 01/08/16
Project No.:	103S4157
Quorum- Yes or No	Yes

Item	Action

Welcome and Introductions

- Chair Grace Keller opened the meeting with a brief group introduction.
- Round table introductions by all in attendance.
- Agenda was reviewed with no request for changes.
- Meeting summary for Steering Committee (SC) Meeting #2 were reviewed and approved.
- There were no members of the public present and no public comment received by the SC.
- Handouts provided included: Agenda, Meeting #2 summary, Critical Facilities definition, Risk Assessment Update, Copy of the City of Roseville 2010 Public Survey.

Risk Assessment Update

Rob opened the discussion on the risk assessment (RA) update by indicating little change. He said that Tetra Tech is still data mining and addressing identified data gaps.

Rob and Carl revealed that they are adjusting the RA to reflect the Preliminary Flood Insurance rate Map (PFIRM) as the best available data for this plan update. Carl explained that the updated RA for flood will use the PFIRM received from FEMA on December 28th as the basis of the flood RA instead of the current effective FIRM. Carl said that the PFIRM provides a new study on Pleasant Grove Creek and will be best suited for inclusion into the 2016 plan update for enhanced future impact assessments.

Item	Action
Public Involvement Strategy *CRS Requirements* Rob reviewed the Community Rating System (CRS) requirements for public engagement, noting that the City of Roseville is already fulfilling most requirements through inviting public participation during committee meetings and maintaining a public facing website. He stressed that such initiatives must be maintained and public engagement must continue.	
To survey or not to survey Rob presented the SC with the 2010 Roseville HMP public survey and posed the question of whether or not the survey should be updated and distributed for the 2016 initiative. He said that to truly reap the benefits of the survey, the public must be provided a minimum of 30 days to maximize participation. He stressed that distribution of the survey may not necessarily be conducive to the expedited timeline for HMP completion, noting that the current target submission to FEMA is March 2016. This led to a discussion on the ramifications of extending the target submission. Rob mentioned that the City is still able to submit a LOI with an expired plan. Additionally, he said that HMGP approval can take anywhere from 6-8 months after initial submission. Carl noted that the only project that may be affected by an extended submission of the HMP to FEMA would be the acquisition project associated with 645 Riverside. Rob added that the City should be afforded some latitude regarding this project due to the lag in progress caused by CalOES and FEMA. At this point, Carl suggested to extend the HMP process to afford ample time to maximize public participation.	SC to review the previous survey by January 8 and return comments to Jessica.
Grace noted that the Flood Control District and FEMA will be meeting during late January and recommended engaging FEMA to be put on the agenda. Jason followed up by recommending that participating in RCONA meeting may be beneficial for furthering public outreach.	Carl and Jason to introduce the Roseville HMP initiative and public survey to the County CCO meeting, if possible.
PPI Subcommittee Rob initiated a discussion regarding the next item on the agenda – the Program for Public Information (PPI). He noted that this is an option for additional CRS credit. Given the City's current outreach initiatives, Rob said that it makes sense to capture them in a formalized program. He said that the PPI would be an annex to the plan, as the process for PPI planning will extend beyond the 2016 HMP effort. Carl requested additional information regarding the PPI, after which the subcommittee will meet – tentatively at the end of January. The PPI subcommittee is tentatively identified as follows: • Carl Walker • Jason Rizzi • Helen Dyda • Jamie Garrett • Rick Stalker • Paul Holt • Michael Algots	Jessica to develop and send an overview of the PPI initiative, inclusive of requirements and considerations.

Item	Action

Confirm Critical Facilities Definition

Next, Rob reviewed the previous iterations of the critical facility definitions from the 2005 and 2010 plans. He stated that, at a minimum, the City should use the CRS standard definition. He provided additional examples for review and asked the SC for their views on the definition. The SC agreed that the standard definition should be used with some modification. The following definition was constructed and subsequently approved by the SC with a motion to approve from Joseph Van Zant and a second from Rick Stalker:

> *A structure or other improvement, public or private, that, because of its function, size, service area, or uniqueness, has the potential to cause serious bodily harm, extensive property damage, or disruption of vital socioeconomic activities if it is destroyed or damaged or if its functionality is impaired. Critical facilities may include, but is not limited to, health and safety facilities, utilities, government facilities, hazardous materials facilities, and transportation infrastructure.*

General Plan Update/New CA General Planning Law

Wayne updated the SC on current general Plan initiatives, including a discussion of SB 379. During this discussion, Wayne indicated that SB 379 will require a climate change component beginning with the first plan adopted after January 2017. As a result, the 2016 mitigation planning initiative will not be required to contain climate change, however Rob indicated that the previously discussed climate change chapter will serve as a segue into the post-2017 requirement.

Emergency Operations Plan Review

Rob indicated that the EOP review was currently underway. He stressed that an anticipated gap will include disabilities, access, and functional needs issues given the recent string of Americans with Disabilities Act lawsuits taking place around the country.

Debris Management Plan

Jessica introduced the SC to the debris management planning initiative. She provided the SC with an overview of debris management operations and stressed the need for a strong plan that follows recently updated Public Assistance Program and Policy Guide 10-point Debris Management Plan Checklist. Paul and Mike volunteered to serve on the debris management planning committee given their advanced knowledge of hazardous materials and debris management practices.

Jessica to send out the 10-point Debris Management Checklist for SC review and reference.

Jason to include Paul and Mike in the debris management planning process.

Item	Action
As a final action before meeting adjournment, Rick requested a copy of the SC contact information. The meeting adjourned at 7:47 PM The next Steering Committee meeting is: **February 2nd from 6:00 PM to 8:00 PM** **Roseville City Hall** **311 Vernon St., Roseville, CA 95678**	Carl to send Rick SC contact information

TETRA TECH

MEETING SUMMARY

Date of Meeting:	February 2, 2016
Subject:	4th Steering Committee (SC) meeting
Project Name:	City of Roseville Multi-Hazard Mitigation Plan –Update
In Attendance:	**Steering Committee**- Grace Keller (Chair), Jason Rizzi, Wayne Wiley, Carl Walker, Helen Dyda, Brenette Macintosh, Mark Lacher, Joe Van Zant, Rick Stalker, Michael Algots, Jim Williams, Paul Holt, Jaime Garret **Planning Team**- Rob Flaner, Jessica Cerutti
Not Present:	Rob Jensen, Rod Rodriguez, Erik Angle, Dom Casey
Summary Prepared by:	Jessica Cerutti – 02/08/16
Project No.:	103S4157
Quorum- Yes or No	Yes

Item	Action

Welcome and Introductions

- Chair Grace Keller opened the meeting with a brief group introduction.
- Agenda was reviewed with no request for changes.
- Meeting summary for Steering Committee (SC) Meeting #3 were reviewed and approved.
- There were no members of the public present and no public comment received by the SC.
- Handouts provided included: Agenda, Meeting #3 summary, Debris Management Plan Checklist, Risk Assessment Update, 2016 Roseville Public Questionnaire, PPI Overview, 2011 Mitigation Catalog.

Risk Assessment Update

Rob opened the discussion on the risk assessment (RA) update by thanking Carl for the receipt of additional data, including flood data that provided the missing links on the assessor's data. Rob indicated that this missing data provides a key for making the overall RA more robust.

Next, Rob mentioned that there were previous issues with the LiDAR data, stating that the data received was not based on a bare earth model. He then said that Carl was able to acquire the formatted bare earth LiDAR model that FEMA is using for the Preliminary DFRIM, which will further strengthen the RA.

Rob next stated that the RA results will be available by the next SC meeting. During the next meeting, these results will be reviewed for the earthquake, flood, and dam failure hazards with all updated inventories. He said that

Rob to provide RA results by Feb. 26th

Item	Action
review of this information is key, as it will be the primary deliverable to share with the public. Rob said that Tetra Tech will work towards getting the SC the RA data by Friday, February 26th in order to provide an opportunity for SC review prior to the next meeting. He said that this data will come from Hazus and explained that the RA used a user defined, more specific model than simply using the Hazus pre-identified data. He requested that the SC review the RA methodology from the previous plan in preparation of reviewing the 2016 RA data.	SC to review the previous plan methodology for RA in preparation of 2016 RA review.
Next, Rob talked about the hazard layers, saying that some datasets were provide by the California Geological Survey. He also spoke about the dam failure hazard, reminding the SC that this profile was originally developed during the previous planning process. He said that this hazard focused on analysis and results, but did not include specific mapping due to operational security. The SC agreed that general evacuation and inundation maps with arrows are permissible, but no specific mapping should be used that identifies definitive locations of the dam failure hazard due to security concerns.	
Public Involvement Strategy *Survey* The SC reviewed the final survey for distribution and discussed the timeline for deploying the survey in relation to the remaining timeline for the project. Jason recommended that communications should take the lead on deploying the survey through various means. Helen suggested running the survey for approximately 2 weeks. She also indicated that they would provide a follow up email and post to potential respondents before the survey is closed to remind potential participants to take the survey.	Helen and Jaime to deploy the survey via social media platforms and other channels.
Public Meeting Rob then began a discussion on the public meeting. He said that the public meeting is dependent upon the availability of RA data. Grace recommended the use of the Utility Center. Jason said that he would check with the Parks and Rec Department to find out Center availability, but recommended against late March due to Spring Break, noting that many residents will likely be out of town during this time. Helen and Jaime recommended adding an option at the end of the survey where residents could provide their email address to remain informed on upcoming public meetings.	Jessica to add email option to end of survey.
Rob requested information regarding the potential format of the public meeting. The SC agreed that an open house format would be the best. Potential booth participants could include RCONA, Union Pacific, Red Cross, CERT, and others. Jason mentioned the Saturday open houses for the fire department as a potential vehicle for a captive audience. Helen recommended the Earth Day festivities on April 16th as a possible vehicle for the public meeting. In addition, she indicated that the Food Truck Mania event would be an ideal time to advertise for the public meeting	SC will provide input regarding the Planning Team's recommendations for a tentative schedule and begin preliminary event planning in March.

Item	Action

Public Involvement - PPI

Carl started the conversation about the PPI by saying that the City would like to make the PPI more of an all hazards program that fulfills CRS requirements while simultaneously providing additional outreach considerations on other hazard issues. Jessica indicated that this is an ideal program, noting that a PPI allows for CRS credit based on topics outside of the six priority topics. She said that these additional topics can be general preparedness, all-hazards based.

Jessica then took the SC through an overview of the PPI development process. She reviewed each of the seven steps, beginning with the establishment of a PPI Committee. She noted that at the previous SC meeting, a list of tentative PPI committee members was discussed. From this list, the final committee will be selected based on CRS requirements.

Jess and Carl to discuss final PPI committee.

Jessica then discussed Step 2 of the process, drawing attention to the need to identify target areas and target audiences. She noted that this next step can only be conducted after the development of the RA which will allow the PPI committee to make a data-based determination on what specific areas to target. She reviewed the rest of the requirements of the PPI, including a reiteration on topics and annual review requirements

Alternatives Analysis

Rob next discussed the alternatives analysis, bringing the SC's attention to the previous Mitigation Catalog. Rob reminded the SC that this catalog development is part of the statutory requirement to develop a comprehensive range of alternatives considered for actions in the plan. He noted that the catalog separates actions into a personal, corporate, and governmental scale and identifies opportunities to reduce risk.

Rob mentioned that the SC did not perform a Strengths, Weaknesses, Opportunities, and Obstacles (SWOO) session during the last planning process (2011 MHMP Update) and asked the SC if they would like to conduct a SWOO session for the 2016 initiative. He reminded the SC that they last SWOO session was held nearly 10 years ago, and that some risks have changed. For example, he noted that during the initial planning process, dam risk was unknown. New RA results will provide a better understanding of the dam hazard and how they relate to SWOO.

Jason requested best practices from other jurisdictions and their SWOO results as a reference, noting that while some risks need to be reassessed as part of the catalog process, others have remained the same. Rob recommended an abbreviated SWOO session during the next SC meeting,

Item	Action

for all-hazards, but specifically recommended focusing on newly identified risks, such as dam failure and cyber threats.

Grace asked Rob to conduct a sample SWOO to give the SC an idea of what to expect during the next meeting. Rob used Health Hazards as a sample:

- Strengths
  - Active community, parks and rec, available health programs
- Weaknesses
  - Homeless population
  - Elderly population – unable to call for help, alone in houses
- Opportunities
  - Change in potential funding to establish a program
  - Identify new opportunities to reduce risk
  - Seniors First – visitors already trained, opportunity for coordination
- Obstacles
  - Limited funding
  - Organizational resources lacking

With no further comments, the meeting adjourned at 8:00 PM

The next Steering Committee meeting is:

March 1st from 5:30 PM to 8:00 PM
Roseville City Hall
311 Vernon St., Roseville, CA 95678

TETRA TECH

MEETING SUMMARY

Date of Meeting:	March 1, 2016
Subject:	5th Steering Committee (SC) meeting
Project Name:	City of Roseville Multi-Hazard Mitigation Plan –Update
In Attendance:	**Steering Committee**- Grace Keller (Chair), Jason Rizzi, Wayne Wiley, Carl Walker, Erik Angle, Helen Dyda, Brenette Macintosh, Mark Lacher, Joe Van Zant, Rick Stalker, Michael Algots, Jim Williams, Jaime Garret **Planning Team**- Rob Flaner, Jessica Cerutti
Not Present:	Rob Jensen, Rod Rodriguez, Dom Casey
Summary Prepared by:	Jessica Cerutti – 03/10/16
Project No.:	103S4157
Quorum- Yes or No	Yes

Item	Action

Welcome and Introductions

- Chair Grace Keller opened the meeting with a brief group introduction.
- Agenda was reviewed with no request for changes.
- Meeting summary for Steering Committee (SC) Meeting #4 were reviewed and approved.
- Two members of the public were presented and invited to comment at this time.
    - Both members of the public expressed interest in the planning process. On indicated an increased interest in understanding the concept of the plan, including how manmade hazard such as cyber are terrorism will be incorporated. SC members offered additional information regarding the background of hazard mitigation planning, including the emphasis on natural hazards.
- Handouts provided included: Agenda, Meeting #4 Summary, Preliminary Risk Assessment Results, and Preliminary Public Information Survey Results.

Risk Assessment Update

Rob opened the discussion on the risk assessment (RA) update by reviewing the essential terminology regarding the risk assessment data provided in the handout. He reminded the SC that FEMA is looking to quantify risk and avoided loss in monetary amounts. He reviewed the definition of assets in General Building Stock and Critical facilities. He noted that general building stock is where residents live and shop on a daily basis while critical infrastructure refers to the definition decided upon by the SC during SC Meeting #2.

Item	Action

Next, Rob reviewed the purpose of HAZUS – the program used to conduct the Roseville risk assessment. He noted that the updated risk assessment used HAZUS 5.1 and updated inventory, including new LiDAR data based on terrain and an updated value of identified assets. Additionally, Rob noted that the updated risk assessment contains new loss estimations for dam failure, earthquake, and flood. Rob said that expected changes occurred with the inclusion of better data, specifically regarding an increased floodplain due to the annexation of Sierra Vista and Creekview and new shake maps for seismic assessment.

From there, Rob explained that the actual risk ranking is based on HAZUS outputs on a level 2-user defined level. He explained that this meant that the assessment was conducted on a property-specific level instead of a general block level. Rob noted that this granular level of assessment provides increased capability for informed hazard ranking and overall mitigation planning.

Rob next reviewed the results of each hazard run, noting that the assessment is not complete for all anticipated models – particularly for landslide due to soil class discrepancies and the 10-, 50-, and 500-year flood scenarios. Rob noted that outside of flood and earthquake, the other hazards are given an estimate on potential damages in table format due to existing limitations in the HAZUS program.

Rob said that the April 16th Earth Day HAZUS work stations will rely on correct information in order to provide information to the public.

Public Involvement Strategy

Earth Day

Next, Rob reviewed the public outreach strategy, noting that Roseville's April 16th Earth Day event at Mahany Park will be the foundation for the first public meeting. He explained the format, saying that there will be two HAZUS workstations, easels displaying maps, and hard copies of the survey available for attendees to complete. Carl and Jason discussed the issues associated with displaying information related to the dam failure hazard. Carl noted that the public survey results indicated a need to provide some information on dam failure, but consideration must be made regarding the exposure of potentially sensitive information.

Carl to confirm SC participation in Earth Day activities.

Additionally, Rob requested the involvement of the SC as support staff during the Earth Day activities from 10:00am to 3:00pm. Carl requested that the SC sign up for times in which they would be available to support the initiative. The SC provided an initial schedule to Carl at this time. Carl also suggested the possibility of including a raffle giveaway to encourage participation, noting that an emergency preparedness Go-Bag would be a beneficial prize.

Rob closed the discussion on Earth Day by noting that the SC would not meet during the month of April due to the Earth Day event.

Survey Results

Item	Action
Jessica reviewed the initial survey results. She stressed that the purpose of this survey was twofold: to assess the understanding of hazards at a community level and to assess the specific concerns for the community. She drew attention to the associated handout and noted that Jaime and Helen's public outreach resulted in 653 responses. First, Jessica reviewed the respondent top choices for receiving news and information about the City, noting that email and text messaging was the top selection for information, next was the social media platform, Nextdoor, followed Facebook, and Alert Roseville. Next, Jessica noted that nearly 98% of respondents live in Roseville, and over half of the respondents work outside of Roseville. Jessica explained that this is a key factor in outreach, as families may be separated during a disaster. Jessica noted that while most respondents were aware of their location within or outside of a floodplain, approximately 40% were not sure. She described this as an indication of a need for additional outreach that can be targeted during the development of the PPI. Likewise, a large percentage (approximately 38%) indicated that they were unsure whether their residence was located in a dam failure zone or not. Jessica reviewed the assessment of the public top natural hazard threats. Drought was the top hazard threat, followed by extreme temperatures, epidemic, severe weather, earthquake, flood, wildfire, freeze and other hazards. She noted that multiple respondents cited radon as a natural hazard of concern. The SC agreed to take this information into consideration during the next LHMP update and possible include radon exposure as a future hazard of concern.	Tetra Tech to update hazard mitigation Best Practices based on SWOO results.

SWOO Session

Rob led the SC in the conduction of the SWOO Session. He began the session by explaining that the SC will focus on an overall programmatic assessment of Roseville, followed by a hazard specific assessment for the hazards of dam failure and cyber threats.

With no further comments, the meeting adjourned at 8:00 PM

The next Steering Committee meeting is:

August 2nd from 6:00 PM to 8:00PM
Roseville City Hall
311 Vernon St., Roseville, CA 95678

TETRA TECH

MEETING SUMMARY

Date of Meeting:	August 2, 2016
Subject:	6th Steering Committee (SC) meeting
Project Name:	City of Roseville Multi-Hazard Mitigation Plan –Update
In Attendance:	**Steering Committee**- Grace Keller (Chair), Jason Rizzi, Wayne Wiley, Carl Walker, Helen Dyda, Erik Angle, Brenette Macintosh, Mark Lacher, Joe Van Zant, Rick Stalker, Michael Algots, Jim Williams, **Public:** Michael Zasso **Planning Team**- Rob Flaner, Jessica Cerutti
Not Present:	Rob Jensen, Rod Rodriguez, Dom Casey, Jaime Garret
Summary Prepared by:	Jessica Cerutti – 08/17/2016
Project No.:	103S4157
Quorum- Yes or No	Yes

Item	Action

Welcome and Introductions

- Chair Grace Keller opened the meeting with a brief group introduction.
- Agenda was reviewed with no request for changes.
- Meeting summary for Steering Committee (SC) Meeting #5 were reviewed and approved.
- There were no public comment received by the SC.
- Handouts provided included: Agenda, Meeting #3 summary, Draft RMHMP.

Project Overview

Rob Flaner began the discussion by indicating that the SC Meeting 6 doubled as a public meeting to review the Draft RMHMP. Carl stated that the public review period started on July 18th and would end on August 19th with an anticipated submittal to CalOES and FEMA by August 29th. From there, Carl said that Approval Pending Adoption is expected by October 18, with a target date to present the plan before City Council on November 2nd.

From there, Rob, provided an overview of the entire process and plan. He noted that this plan is a requirement to apply for certain federal funding programs – namely mitigation programs. Rob noted that the specific process undertaken by the City was driven by Community Rating System (CRS) requirements.

Item	Action

Rob continued by explaining that the risk assessment conducted as part of this process is the hub of the mitigation wheel. He said that risk is probability multiplied by impact, and that the resulting ranking allowed the City to compare results and categorize hazards as high, medium, or low risk,

Rob next described the capability assessment. He said that the capability assessment serves a dual purpose. One purpose is to identify existing drivers and support for implementing mitigation strategies. The second purpose is to identify potential deficiencies that could be remedied as a mitigation item. He noted debris management as an example. He explained that the City identified the need for a debris management plan as a result of the previous capability assessment. As a result, a debris management plan was recommended and subsequently completed by the City.

Next, Rob described the importance of goals and objectives. He reminded the SC that this initiative is the third comprehensive update undertaken by the City. He noted that the goals and objectives from the previous plan were carried over into the 2016 plan with some minor adjustments to focus on climate change.

Finally, Carl and Wayne described the process for CEQA, namely the initial study/mitigated negative declaration designation (IS/MND). They indicated that pursuit of the IS/MND was based on the expectation that projects identified in the Plan would undergo a full CEQA review once they are initiated.

Public Involvement Strategy

During the discussion on public engagement, Jessica noted that a large part of the success of Roseville's 2016 public engagement strategy was due to the successful implementation of Nextdoor as an outreach tool. She noted that the survey received a strong response in correlation with Nextdoor releases. Carl thanked the efforts of Helen and Jaime in coordinating the public outreach efforts.

Action Items/Next Steps

- Finalize plan based on public comments
- Submit to CalOES/FEMA for Review

With no further comments, the meeting adjourned at 7:00pm

Exhibit B – City of Roseville Municipal Code 14.09

Roseville Municipal Code

Title 14 PUBLIC UTILITIES

Chapter 14.09 WATER CONSERVATION

14.09.010 Short title.

This chapter may be cited as the Water Conservation and Drought Mitigation Ordinance. (Ord. 5311 § 2, 2014; Ord. 2413 § 2, 1991.)

14.09.020 General provisions.

A. Purpose. The purpose of this chapter is to ensure compliance with all federal, state and local requirements relating to water conservation and drought mitigation for the protection of public health, safety and welfare by:

1. Reducing the per capita water consumption throughout the City of Roseville (the "city") during years of normal precipitation and during years of drought;

2. Protecting and conserving the city's supply of water during specified times of emergency and/or crisis;

3. Minimizing and/or eliminating the waste of water through voluntary compliance or punitive action, if necessary;

4. Promoting the use of drip irrigation and other low volume irrigation methods that reduce outdoor water use by applying water more efficiently than traditional irrigation methods;

5. No person shall use, or cause to be used, any city water for landscape irrigation between the hours of 10:00 a.m. and 8:00 p.m., unless the city manager, or designee provides prior written consent to a different time limitation. A waiver may be granted for turf areas if the landscape contains too many irrigation valves to complete an irrigation event within the watering window.

6. Upon city declaration of a water shortage, the city manager, or designee, may impose revised and/or additional limitations on outdoor water use, as specified in Section 14.09.040, and no person shall use, or cause to be used, city water in violation of such limitations while the water shortage remains in effect.

B. Scope. The provisions of this chapter shall apply to all customers, users and/or recipients (hereinafter "users") of the city's potable and recycled water service within the city's territorial limits.

C. Administration and Enforcement. The city manager, or designee, including, but not limited to, an enforcement officer as defined herein, shall administer, implement, and enforce the provisions of this chapter. For purposes of this chapter an "enforcement officer" means any city employee or agent of the city with the authority to enforce any provision of this chapter and the authority to make any decision on behalf of the city manager required or called for by this chapter.

D. Compliance. All provisions of this chapter are subject to the compliance procedures set forth in this chapter unless otherwise expressly stated herein.

E. Notification. The city manager, or designee, shall determine the means by which the city shall notify its water users of drought stage determinations and any applicable upgrade or downgrade of such determinations or restrictions. Notification may be achieved through mass media, newspaper, public notice, mailings, utility billings or by any combination of such notice, or by other means as determined by

the city manager, or designee. (Ord. 5491 § 1, 2015; Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.030 Definition of water waste.

Any of the following acts or omissions, whether willful or negligent, shall constitute the waste of water:

A. Causing or permitting water to leak, discharge, flow or run to waste into any gutter, sanitary sewer, watercourse or public or private storm drain, or to any adjacent property, from any tap, hose, faucet, pipe, sprinkler, pond, pool, waterway, fountain or nozzle. In the case of irrigation, "discharge," "flow" or "run to waste"

means that the earth intended to be irrigated has been saturated with water to the point that excess water flows over or through the earth to waste. In the case of washing, "discharge," "flow" or "run to waste" means that water in excess of that necessary to wash, wet or clean the dirty or dusty object, such as an automobile, sidewalk, or parking area, flows to waste.

B. Allowing water fixtures (including, but not limited to, toilets, faucets, shower heads) or heating or cooling devices to leak or run to waste.

C. Maintaining ponds, waterways, decorative basins or swimming pools without water recirculation devices.

D. Backwashing so as to discharge to waste swimming pools, decorative basins or ponds in excess of the frequency necessary to ensure the healthful condition of the water or in excess of that required by standards for professionally administered maintenance or to address structural considerations, as determined by the city manager, or designee.

E. Operation of an irrigation system that applies water to an impervious surface or that is in disrepair.

F. Use of a water hose not equipped with a control nozzle capable of completely shutting off the flow of water except when positive pressure is applied.

G. Irrigation of landscaping during rainfall or 48 hours after a measurable rain event.

H. Overfilling of any pond, pool or fountain which results in water discharging to waste. (Ord. 5491 § 2, 2015; Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 3834 § 3, 2002; Ord. 2413 § 2, 1991.)

14.09.040 Water conservation and drought stages.

The following water conservation and drought stages are hereby established:

A. Basic Water Conservation Stage ("Basic Stage"). The basic stage shall exist when the city's water supply is adequate to meet all projected demands as determined by the city manager, or designee.

B. Stage One Drought. A stage one drought shall exist when the city's water supply is adequate to meet 90 percent of projected demands as determined by the city manager, or designee. An objective of a stage one drought condition is to reduce water usage up to 10 percent. Water shortage surcharges shall be implemented as set forth in Section 14.08.095.

C. Stage Two Drought. A stage two drought shall exist when the city's water supply is adequate to meet 80 percent of projected demands as determined by the city manager, or designee. An objective of a stage two drought condition is to reduce water usage up to 20 percent. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095.

D. Stage Three Drought. A stage three drought shall exist when the city's water supply is adequate to meet 70 percent of projected demands as determined by the city manager or designee. An objective of a stage three drought condition is to reduce water usage up to 30 percent. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095.

E. Stage Four Drought. A stage four drought shall exist when the city's water supply is adequate to meet 60 percent of projected demands as determined by the city manager or designee. An objective of a stage four drought condition is to reduce water usage up to 40 percent. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095.

F. Stage Five Drought. A stage five drought shall exist when the city's water supply is adequate to meet 50 percent or less of projected demands as determined by the city manager, or designee. An objective of a stage five drought condition is to reduce water usage up to 50 percent. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095. (Ord. 5491 § 3, 2015; Ord. 5311 § 2, 2014; Ord. 4724 § 3, 2009; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.050 Determination of drought staging—Effect of well water.

In determining the water conservation and drought stage in effect, the city manager, or designee, shall take into account only surface water available and able to be delivered from the Bureau of Reclamation and the Placer County Water Agency. Well water shall not be considered. In the event that this would result in a determination of a stage three drought or higher, groundwater wells may be activated to increase the supply to a stage two drought level. However, in no case shall well water be considered as an alternative to declaration of a stage one or stage two drought. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.060 Basic stage restrictions.

During the basic water conservation stage, the following restrictions shall be in force:

Water shall be used for beneficial purposes only; all unnecessary and wasteful uses (as defined in Section 14.09.030) of water are prohibited.

A. Water shall be confined to the user's property and shall not be allowed to run off to adjoining properties, or to the roadside or to the gutter. Care shall be taken not to water past the point of saturation.

B. Free-flowing hoses for all uses are prohibited. Automatic shut-off devices shall be attached on any hose or filling apparatus in use.

C. All leaks (including irrigation systems, pipes, fixtures, pools, ponds, fountains and waterways) shall be repaired within five calendar days or less if warranted by the severity of the problem as determined in the discretion of the city manager, or designee.

D. All pools, spas, and ornamental fountains/ponds shall be equipped with a recirculation pump and shall be constructed to be leak-proof. Pool draining and refilling shall be allowed only to the extent

required for health, maintenance, or structural considerations, and must otherwise comply with all applicable federal, state and local stormwater management program requirements, including, but not limited to, the urban stormwater quality management and discharge control ordinance set forth in Chapter 14.20 of Title 14 of the City of Roseville Municipal Code.

E. Landscaping.

1. All landscaping installed in the City of Roseville shall comply with the water efficient landscape requirements adopted by resolution of the city council.

2. Irrigation of new landscaping shall be allowed on any day of the week for a period of 30 days after the new landscaping is planted, unless the city manager, or designee, provides prior written consent to extend this time period based on plant type and the season when the new landscaping is planted. After the 30 days, irrigation days and run times should be decreased to settings appropriate for an established landscape.

3. Upon city declaration of a water shortage, the city manager may impose revised and/or additional limitations on the irrigation of new landscaping, as specified in Sections 14.09.060 through 14.09.100, and no person shall use, or cause to be used, city water in violation of such limitations while the water shortage remains in effect. A waiver may be granted to irrigate during an establishment period for actively used turf areas and/or sports fields. Allowance shall also be made for irrigation testing and repairs.

F. All site reviews shall include an evaluation of using recycled water. Recycled water shall be required if economically feasible. (Ord. 5491 § 4, 2015; Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2762 § 1, 1993; Ord. 2413 § 2, 1991.)

14.09.070 Stage one drought restrictions.

During a stage one drought, the following restrictions may be required, as determined by the city manager and upon notification pursuant to Section 14.09.020(E):

A. All basic stage restrictions required by Sections 14.09.030 and 14.09.060 shall continue in place, except to the extent they are replaced by more restrictive conditions imposed by this section.

B. Residential users and non-residential users shall reduce water usage up to 10 percent.

C. Residential water users shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of November – last day of February: up to one day per week irrigation on Monday of each week, if needed.

2. 1st day of March – last day of April and 1st day of September – last day of October: up to two days per week irrigation on Monday and Friday of each week, if needed.

3. 1st day of May – last day of August: up to three days per week irrigation on Monday, Wednesday and Friday of each week, if needed.

D. Nonresidential water users (including without limitation, commercial, industrial, church, cemeteries, and publicly owned users) shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of November – last day of February: up to one day per week irrigation on Monday of each week, if needed.

2. 1st day of March – last day of April and 1st day of September – last day of October: up to two days per week irrigation on Monday and Thursday of each week, if needed.

3. 1st day of May – last day of August: up to three days per week irrigation on Monday, Thursday and Saturday of each week, if needed.

E. The limitations specified in subsections C and D shall not apply to a properly functioning low volume landscape irrigation system, the irrigation on container plants, or to the irrigation of new landscaping that is subject to the provisions of Section 14.09.060(E). Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

F. References in this section to any day of the week shall mean the period beginning at 12:00 a.m. on that day and ending 24 hours later.

G. City park sites shall, as an aggregate, reduce usage up to 10 percent.

H. Washing streets, parking lots, driveways, sidewalks or buildings, except as necessary for health or sanitary purposes or pursuant to a term or condition in a permit issued by a state or federal agency, is prohibited.

I. Water shall not be served at restaurants except by request.

J. Water shortage surcharges shall be implemented as set forth in Section 14.08.095. (Ord. 5491 § 5, 2015; Ord. 5311 § 2, 2014; Ord. 4724 § 3, 2009; Ord. 4629 § 1, 2008; Ord. 2817 § 1, 1994; Ord. 2636 § 1, 1992; Ord. 2413 § 2, 1991.)

14.09.080 Stage two drought restrictions.

During a stage two drought, the following restrictions may be required, as determined by the city manager and upon notification pursuant to Section 14.09.020(E):

A. All basic stage and stage one restrictions required by Sections 14.09.060 and 14.09.070 shall continue in place, except to the extent they are replaced by more restrictive conditions imposed by this section.

B. Residential users and non-residential landscapes shall reduce water usage up to 20 percent.

C. City park sites shall, as an aggregate, reduce usage up to 20 percent.

D. Residential water users shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of November – last day of February: up to one day per week irrigation on Monday of each week, if needed.

2. 1st day of March – last day of April and 1st day of September – last day of October: up to two days per week irrigation on Monday and Friday of each week, if needed.

3. 1st day of May – last day of August: up to three days per week irrigation on Monday, Wednesday and Friday of each week, if needed.

E. Nonresidential water users (including without limitation, commercial, industrial, church, cemeteries, and publicly owned users) shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of November – last day of February: up to one day per week irrigation on Monday of each week, if needed.

2. 1st day of March – last day of April and 1st day of September – last day of October: up to two days per week irrigation on Monday and Thursday of each week, if needed.

3. 1st day of May – last day of August: up to three days per week irrigation on Monday, Thursday and Saturday of each week, if needed.

F. The limitations specified in subsections D and E shall not apply to a properly functioning low volume landscape irrigation system, the irrigation on container plants, or to the irrigation of new landscaping that is subject to the provisions of Section 14.09.060(E). Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

G. References in this section to any day of the week shall mean the period beginning at 12:00 a.m. on that day and ending 24 hours later.

H. Washing of vehicles or boats is prohibited except:

1. When using a hose that is equipped with a control nozzle capable of completely shutting off the flow of water except when positive action or pressure to maintain the flow of water is applied; or

2. When washed in either an automatic or manual commercial car wash that recirculates its water and uses high pressure/low volume wash systems.

3. Temporary car washes, held for fundraising purposes, are encouraged to partner with an automatic commercial car wash that recirculates its water and uses high pressure/low volume wash systems. If run independently, the participants must use a hose nozzle that completely shuts off the flow of water when not in use and must comply with all applicable federal, state and local stormwater management program requirements, including, but not limited to, the urban stormwater quality management and discharge control ordinance set forth in Chapter 14.20 of Title 14 of the City of Roseville Municipal Code.

I. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095. (Ord. 5491 § 6, 2015; Ord. 5311 § 2, 2014; Ord. 4724 § 3, 2009; Ord. 4629 § 1, 2008; Ord. 2611 § 1, 1992.)

14.09.090 Stage three drought restrictions.

During a stage three drought, the following restrictions may be required, as determined by the city manager and upon notification pursuant to Section 14.09.020(E):

A. All basic stage, stage one, and stage two restrictions required by Sections 14.09.060, 14.09.070 and 14.09.080 shall continue in place, except to the extent they are replaced by more restrictive conditions imposed by this section.

B. Residential users and non-residential landscapes are to reduce water usage up to 30 percent.

C. City park sites shall, as an aggregate, reduce usage up to 30 percent.

D. Residential water users shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of September – last day of April: up to one day per week irrigation on Monday of each week, if needed.

2. 1st day of May – last day of August: up to two days per week irrigation on Monday and Friday of each week, if needed.

E. Nonresidential water users (including without limitation, commercial, industrial, church, cemeteries, and publicly owned users) shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of September – last day of April: up to one day per week irrigation on Monday of each week, if needed.

2. 1st day of May – last day of August: up to two days per week irrigation on Monday and Thursday of each week, if needed.

F. The limitations specified in subsections D and E shall not apply to a properly functioning low volume landscape irrigation system, the irrigation on container plants, or to the irrigation of new landscaping that is subject to the provisions of Section 14.09.060(E). Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

G. References in this section to any day of the week shall mean the period beginning at 12:00 a.m. on that day and ending 24 hours later.

H. New or expanded landscaping is limited to drought-tolerant trees, shrubs, and ground-cover and be irrigated using a low volume irrigation system. No new turf shall be planted, hydroseeded, or laid, unless prior written consent is received from the city manager. Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

I. Except where recycled water is used, golf courses shall reduce irrigation up to 30 percent.

J. All decorative fountains, decorative (i.e., nonswimming) pools, and decorative waterways shall be drained and made dry. Such fountains, pools, and waterways shall not be refilled until the city has returned to the basic water conservation stage. Fountains, ponds or pools that are filled with recycled water are not subject to this provision. Decorative ponds that contain fish as a feature shall be exempt from this restriction as long as the system is maintained in good working order with measures taken to reduce the volume of makeup water required for evaporative losses.

K. Except where recycled or other non-potable water is used or as otherwise provided in this subsection, use of water for dust control is prohibited. Dust control shall be augmented by hardened, temporary travel routes with materials that are accepted by the city manager, city engineer, or designee. Potable water is allowed for construction water only where and to the extent required for public health and safety reasons.

L. New swimming pools and spas may be filled after construction using customer's metered water at then existing water rates. All new pools must include a means for minimizing evaporative loss, such as a pool cover, at time of final inspection by the city. After being filled with water for the first time, all pools and spas shall be subject to the requirements of Section 14.09.060(D).

M. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095. (Ord. 5491 § 7, 2015; Ord. 5311 § 2, 2014; Ord. 4724 § 3, 2009; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.100 Stage four drought restrictions.

During a stage four drought, the following restrictions may be required, as determined by the city manager and upon notification pursuant to Section 14.09.020(E):

A. All basic stage, stage one, stage two, and stage three restrictions required by Sections 14.09.060, 14.09.070, 14.09.080 and 14.09.090 shall continue in place, except to the extent they are replaced by more restrictive conditions imposed by this section.

B. Residential customers and non-residential landscapes are to reduce water usage up to 40 percent.

C. City park sites shall, as an aggregate, reduce usage up to 40 percent.

D. Residential water users shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of September – last day of April: No irrigation allowed.

2. 1st day of May – last day of August: up to one day per week irrigation on Monday, if needed.

E. Nonresidential water users (including without limitation, commercial, industrial, church, cemeteries, and publicly owned users) shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of September – last day of April: No irrigation allowed.

2. 1st day of May – last day of August: up to one day per week irrigation on Monday of each week, if needed.

F. The limitations specified in subsections D and E shall not apply to a properly functioning low volume landscape irrigation system, the irrigation on container plants, or to the irrigation of new landscaping that is subject to the provisions of Section 14.09.060(E). Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

G. References in this section to any day of the week shall mean the period beginning at 12:00 a.m. on that day and ending 24 hours later.

H. Installation of any new landscaping is prohibited unless irrigation is provided through connection to an active recycled water system. In the case of new construction, the city's building official will issue a temporary final upon completion of the structural development of the property. When the city has returned to a stage two drought restriction, landscaping installation can be completed and a building final will become available upon inspection by the city.

I. Except where recycled water is used, golf courses shall reduce irrigation up to 40 percent.

J. Automobiles or equipment shall be washed only at commercial establishments that recycle their water or by equipment and means that separates debris and recycles wash water for continual use.

K. Existing pools shall not be emptied and refilled using city water unless required for health or safety reasons until the city has returned to a stage two drought restriction. Pools may be re-filled only to the extent necessary to replace evaporative losses.

L. No commitments shall be made to provide water service as part of any new land use entitlement (general plan, specific plan or amendments requesting new water allocations) until the city has returned to a stage two drought restriction. Currently approved specific plans with accompanying development agreements and projects or properties that have received water allocations in advance of full entitlements may be issued building permits so long as they comply with the remainder of this chapter.

M. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095. (Ord. 5491 § 8, 2015; Ord. 5311 § 2, 2014; Ord. 4724 § 3, 2009; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.110 Stage five drought restrictions.

During a stage five drought, the following restrictions may be required, as determined by the city manager and upon notification pursuant to Section 14.09.020(E):

A. All basic stage, or stage one, stage two, stage three and stage four restrictions required by Sections 14.09.060, 14.09.070, 14.09.080, 14.09.090 and 14.09.100 shall continue in place, except to the extent they are replaced by more restrictive conditions imposed by this section.

B. Residential users are to reduce water usage up to 50 percent.

C. Except where recycled water is used, water users shall reduce landscape irrigation as follows:

1. Turf shall not be irrigated.

2. Trees and shrubs may be irrigated with a properly functioning low volume landscape irrigation system or by use of a handheld hose equipped with a nozzle capable of completely shutting off the flow of water except when positive action or pressure to maintain the flow of water is applied. Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

D. Filling new or existing swimming pools and spas with city water is prohibited.

E. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095. (Ord. 5491 § 9, 2015; Ord. 5311 § 2, 2014; Ord. 4724 § 3, 2009; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.120 Determination of drought tolerance.

Where this chapter permits or prohibits acts based upon whether or not a planting, tree, shrub, or groundcover is “drought tolerant” the determination shall be made based upon Sunset’s *Western Garden Book* (most recent edition), or UC Davis Arboretum’s “All Stars” plant database (www.arboretum.ucdavis.edu). Where this chapter permits or prohibits acts based upon whether a form of

irrigation is “low volume drip irrigation” the determination shall be made by the director, or designee, whose determination shall be final. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.130 Determination of landscape water consumption reductions.

Whenever this chapter requires a reduction in consumption of water for irrigation purposes, the base year for measurement shall be the last year that the basic water conservation stage was in effect or a date specified by the Governor or state agency. If that data is not available for a property, allocations will be based on water use for similar properties. The city manager or designee may elect to base a reduction on the base year or on a landscape water consumption calculation if use was, in the city manager’s or designee’s, sole opinion, either excessive or extraordinarily low. For landscaping installed subsequent to the base year, the calculations shall be based on landscape water consumption calculations submitted with the landscape plan, or water consumption the previous year, whichever is less. (Ord. 5491 § 10, 2015; Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2817 § 1, 1994; Ord. 2413 § 2, 1991.)

14.09.140 Violations.

It is unlawful for any user and/or person to violate any provision or fail to comply with any of the requirements of this chapter. Causing, permitting, aiding, abetting or concealing a violation of any provision of this chapter shall constitute a violation of this chapter. A violation of the provisions of this chapter shall occur irrespective of the negligence or intent of the violator and a violation of or failure to comply with any of the requirements of this chapter may be charged as either an infraction or a misdemeanor in the discretion of the city attorney. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 3834 § 3, 2002; Ord. 2413 § 2, 1991.)

14.09.150 Enforcement authority.

A. Whenever the city manager, or designee (including, but not limited to, an enforcement officer), determines that a user and/or person has violated any provision of, or failed to meet a requirement of, this chapter, an administrative citation pursuant to Chapter 2.50 or a written compliance order pursuant to Chapter 2.52 may be issued to any user and/or person responsible for the violation.

B. Any compliance order issued may require without limitation any or all of the following:

1. The allocation of a particular amount of water to a given user and/or person responsible for the violation;
2. The issuance of a fine;
3. The installation of a flow restriction device;
4. The performance of monitoring, analyses, and reporting;
5. That violations shall cease and desist; and/or
6. The discontinuation of water service.

The compliance order shall set forth a deadline within which the requirements of the compliance order must be completed. Said compliance order shall further advise that, should the violator fail to comply with the compliance order within the established deadline, a hearing on the compliance order shall be set.

(Ord. 5491 § 11, 2015; Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 3034 § 3, 2002; Ord. 2817 § 1, 1994; Ord. 2413 § 2, 1991.)

14.09.160 Hearing.

If full compliance is not achieved within the time specified in the compliance order, a hearing on the compliance order shall be set pursuant to Chapter 2.52. All penalties and remedies authorized by Chapter 2.52 shall apply to violations of this chapter. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.170 Appeal.

Any user and/or person receiving a compliance order under Section 14.09.150 may appeal the determination of the director, or designee, to a hearing panel drawn from the membership of the board of appeals. The notice of appeal must be received by the city's environmental utilities department within 10 days from the date of the compliance order. Notice of hearing and hearing on the appeal will be conducted pursuant to the requirements of Chapter 2.52. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.180 Separate offense for each day.

Any user and/or person that violates any provision of this chapter shall be guilty of a separate offense for each and every day during any portion of which any such user and/or person commits, continues, permits, or causes a violation thereof, and shall be punished accordingly. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.190 Public nuisance.

In addition to the enforcement processes and penalties hereinbefore provided, any condition caused or permitted to exist in violation of any of the provisions of this chapter is a threat to public health, safety, and welfare, and is declared and deemed a nuisance, and may be summarily abated or restored by the city at the violator's expense, and/or a civil action to abate, enjoin, or otherwise compel the cessation of such nuisance may be initiated and/or taken by the city. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.200 Remedies not exclusive.

Remedies under this chapter are in addition to and do not supersede or limit any and all other remedies, civil or criminal. The remedies provided for herein shall be cumulative and not exclusive. (Ord. 5311 § 2, 2014; Ord. 4629 § 2, 2008.)

14.09.210 Judicial review.

Any decision of the hearing panel shall be final. Any user and/or person aggrieved by an order of the hearing panel may obtain review of the order in the Superior Court by filing with the Court a petition for

writ of mandate within 90 days pursuant to California Code of Civil Procedure Section 1094.6. (Ord. 5311 § 2, 2014; Ord. 4629 § 2, 2008.)

14.09.220 Chapter severable.

The provisions of this chapter are severable. The city council declares that it would have adopted the remainder of this chapter even if any of its provisions are declared unlawful or unenforceable. (Ord. 5311 § 2, 2014; Ord. 4629 § 2, 2008.)

Exhibit C – Adoption Resolution

A copy of the adoption resolution will be included in the adopted version of the Water Shortage Contingency Plan.

Appendix L – Roseville Municipal Code 14.09

Roseville Municipal Code

Title 14 PUBLIC UTILITIES

Chapter 14.09 WATER CONSERVATION

14.09.010 Short title.

This chapter may be cited as the Water Conservation and Drought Mitigation Ordinance. (Ord. 5311 § 2, 2014; Ord. 2413 § 2, 1991.)

14.09.020 General provisions.

A. Purpose. The purpose of this chapter is to ensure compliance with all federal, state and local requirements relating to water conservation and drought mitigation for the protection of public health, safety and welfare by:

1. Reducing the per capita water consumption throughout the City of Roseville (the "city") during years of normal precipitation and during years of drought;

2. Protecting and conserving the city's supply of water during specified times of emergency and/or crisis;

3. Minimizing and/or eliminating the waste of water through voluntary compliance or punitive action, if necessary;

4. Promoting the use of drip irrigation and other low volume irrigation methods that reduce outdoor water use by applying water more efficiently than traditional irrigation methods;

5. No person shall use, or cause to be used, any city water for landscape irrigation between the hours of 10:00 a.m. and 8:00 p.m., unless the city manager, or designee provides prior written consent to a different time limitation. A waiver may be granted for turf areas if the landscape contains too many irrigation valves to complete an irrigation event within the watering window.

6. Upon city declaration of a water shortage, the city manager, or designee, may impose revised and/or additional limitations on outdoor water use, as specified in Section 14.09.040, and no person shall use, or cause to be used, city water in violation of such limitations while the water shortage remains in effect.

B. Scope. The provisions of this chapter shall apply to all customers, users and/or recipients (hereinafter "users") of the city's potable and recycled water service within the city's territorial limits.

C. Administration and Enforcement. The city manager, or designee, including, but not limited to, an enforcement officer as defined herein, shall administer, implement, and enforce the provisions of this chapter. For purposes of this chapter an "enforcement officer" means any city employee or agent of the city with the authority to enforce any provision of this chapter and the authority to make any decision on behalf of the city manager required or called for by this chapter.

D. Compliance. All provisions of this chapter are subject to the compliance procedures set forth in this chapter unless otherwise expressly stated herein.

E. Notification. The city manager, or designee, shall determine the means by which the city shall notify its water users of drought stage determinations and any applicable upgrade or downgrade of such determinations or restrictions. Notification may be achieved through mass media, newspaper, public notice, mailings, utility billings or by any combination of such notice, or by other means as determined by

the city manager, or designee. (Ord. 5491 § 1, 2015; Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.030 Definition of water waste.

Any of the following acts or omissions, whether willful or negligent, shall constitute the waste of water:

A. Causing or permitting water to leak, discharge, flow or run to waste into any gutter, sanitary sewer, watercourse or public or private storm drain, or to any adjacent property, from any tap, hose, faucet, pipe, sprinkler, pond, pool, waterway, fountain or nozzle. In the case of irrigation, "discharge," "flow" or "run to waste"

means that the earth intended to be irrigated has been saturated with water to the point that excess water flows over or through the earth to waste. In the case of washing, "discharge," "flow" or "run to waste" means that water in excess of that necessary to wash, wet or clean the dirty or dusty object, such as an automobile, sidewalk, or parking area, flows to waste.

B. Allowing water fixtures (including, but not limited to, toilets, faucets, shower heads) or heating or cooling devices to leak or run to waste.

C. Maintaining ponds, waterways, decorative basins or swimming pools without water recirculation devices.

D. Backwashing so as to discharge to waste swimming pools, decorative basins or ponds in excess of the frequency necessary to ensure the healthful condition of the water or in excess of that required by standards for professionally administered maintenance or to address structural considerations, as determined by the city manager, or designee.

E. Operation of an irrigation system that applies water to an impervious surface or that is in disrepair.

F. Use of a water hose not equipped with a control nozzle capable of completely shutting off the flow of water except when positive pressure is applied.

G. Irrigation of landscaping during rainfall or 48 hours after a measurable rain event.

H. Overfilling of any pond, pool or fountain which results in water discharging to waste. (Ord. 5491 § 2, 2015; Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 3834 § 3, 2002; Ord. 2413 § 2, 1991.)

14.09.040 Water conservation and drought stages.

The following water conservation and drought stages are hereby established:

A. Basic Water Conservation Stage ("Basic Stage"). The basic stage shall exist when the city's water supply is adequate to meet all projected demands as determined by the city manager, or designee.

B. Stage One Drought. A stage one drought shall exist when the city's water supply is adequate to meet 90 percent of projected demands as determined by the city manager, or designee. An objective of a stage one drought condition is to reduce water usage up to 10 percent. Water shortage surcharges shall be implemented as set forth in Section 14.08.095.

C. Stage Two Drought. A stage two drought shall exist when the city's water supply is adequate to meet 80 percent of projected demands as determined by the city manager, or designee. An objective of a stage two drought condition is to reduce water usage up to 20 percent. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095.

D. Stage Three Drought. A stage three drought shall exist when the city's water supply is adequate to meet 70 percent of projected demands as determined by the city manager or designee. An objective of a stage three drought condition is to reduce water usage up to 30 percent. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095.

E. Stage Four Drought. A stage four drought shall exist when the city's water supply is adequate to meet 60 percent of projected demands as determined by the city manager or designee. An objective of a stage four drought condition is to reduce water usage up to 40 percent. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095.

F. Stage Five Drought. A stage five drought shall exist when the city's water supply is adequate to meet 50 percent or less of projected demands as determined by the city manager, or designee. An objective of a stage five drought condition is to reduce water usage up to 50 percent. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095. (Ord. 5491 § 3, 2015; Ord. 5311 § 2, 2014; Ord. 4724 § 3, 2009; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.050 Determination of drought staging—Effect of well water.

In determining the water conservation and drought stage in effect, the city manager, or designee, shall take into account only surface water available and able to be delivered from the Bureau of Reclamation and the Placer County Water Agency. Well water shall not be considered. In the event that this would result in a determination of a stage three drought or higher, groundwater wells may be activated to increase the supply to a stage two drought level. However, in no case shall well water be considered as an alternative to declaration of a stage one or stage two drought. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.060 Basic stage restrictions.

During the basic water conservation stage, the following restrictions shall be in force:

Water shall be used for beneficial purposes only; all unnecessary and wasteful uses (as defined in Section 14.09.030) of water are prohibited.

A. Water shall be confined to the user's property and shall not be allowed to run off to adjoining properties, or to the roadside or to the gutter. Care shall be taken not to water past the point of saturation.

B. Free-flowing hoses for all uses are prohibited. Automatic shut-off devices shall be attached on any hose or filling apparatus in use.

C. All leaks (including irrigation systems, pipes, fixtures, pools, ponds, fountains and waterways) shall be repaired within five calendar days or less if warranted by the severity of the problem as determined in the discretion of the city manager, or designee.

D. All pools, spas, and ornamental fountains/ponds shall be equipped with a recirculation pump and shall be constructed to be leak-proof. Pool draining and refilling shall be allowed only to the extent

required for health, maintenance, or structural considerations, and must otherwise comply with all applicable federal, state and local stormwater management program requirements, including, but not limited to, the urban stormwater quality management and discharge control ordinance set forth in Chapter 14.20 of Title 14 of the City of Roseville Municipal Code.

E. Landscaping.

1. All landscaping installed in the City of Roseville shall comply with the water efficient landscape requirements adopted by resolution of the city council.

2. Irrigation of new landscaping shall be allowed on any day of the week for a period of 30 days after the new landscaping is planted, unless the city manager, or designee, provides prior written consent to extend this time period based on plant type and the season when the new landscaping is planted. After the 30 days, irrigation days and run times should be decreased to settings appropriate for an established landscape.

3. Upon city declaration of a water shortage, the city manager may impose revised and/or additional limitations on the irrigation of new landscaping, as specified in Sections 14.09.060 through 14.09.100, and no person shall use, or cause to be used, city water in violation of such limitations while the water shortage remains in effect. A waiver may be granted to irrigate during an establishment period for actively used turf areas and/or sports fields. Allowance shall also be made for irrigation testing and repairs.

F. All site reviews shall include an evaluation of using recycled water. Recycled water shall be required if economically feasible. (Ord. 5491 § 4, 2015; Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2762 § 1, 1993; Ord. 2413 § 2, 1991.)

14.09.070 Stage one drought restrictions.

During a stage one drought, the following restrictions may be required, as determined by the city manager and upon notification pursuant to Section 14.09.020(E):

A. All basic stage restrictions required by Sections 14.09.030 and 14.09.060 shall continue in place, except to the extent they are replaced by more restrictive conditions imposed by this section.

B. Residential users and non-residential users shall reduce water usage up to 10 percent.

C. Residential water users shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of November – last day of February: up to one day per week irrigation on Monday of each week, if needed.

2. 1st day of March – last day of April and 1st day of September – last day of October: up to two days per week irrigation on Monday and Friday of each week, if needed.

3. 1st day of May – last day of August: up to three days per week irrigation on Monday, Wednesday and Friday of each week, if needed.

D. Nonresidential water users (including without limitation, commercial, industrial, church, cemeteries, and publicly owned users) shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of November – last day of February: up to one day per week irrigation on Monday of each week, if needed.

2. 1st day of March – last day of April and 1st day of September – last day of October: up to two days per week irrigation on Monday and Thursday of each week, if needed.

3. 1st day of May – last day of August: up to three days per week irrigation on Monday, Thursday and Saturday of each week, if needed.

E. The limitations specified in subsections C and D shall not apply to a properly functioning low volume landscape irrigation system, the irrigation on container plants, or to the irrigation of new landscaping that is subject to the provisions of Section 14.09.060(E). Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

F. References in this section to any day of the week shall mean the period beginning at 12:00 a.m. on that day and ending 24 hours later.

G. City park sites shall, as an aggregate, reduce usage up to 10 percent.

H. Washing streets, parking lots, driveways, sidewalks or buildings, except as necessary for health or sanitary purposes or pursuant to a term or condition in a permit issued by a state or federal agency, is prohibited.

I. Water shall not be served at restaurants except by request.

J. Water shortage surcharges shall be implemented as set forth in Section 14.08.095. (Ord. 5491 § 5, 2015; Ord. 5311 § 2, 2014; Ord. 4724 § 3, 2009; Ord. 4629 § 1, 2008; Ord. 2817 § 1, 1994; Ord. 2636 § 1, 1992; Ord. 2413 § 2, 1991.)

14.09.080 Stage two drought restrictions.

During a stage two drought, the following restrictions may be required, as determined by the city manager and upon notification pursuant to Section 14.09.020(E):

A. All basic stage and stage one restrictions required by Sections 14.09.060 and 14.09.070 shall continue in place, except to the extent they are replaced by more restrictive conditions imposed by this section.

B. Residential users and non-residential landscapes shall reduce water usage up to 20 percent.

C. City park sites shall, as an aggregate, reduce usage up to 20 percent.

D. Residential water users shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of November – last day of February: up to one day per week irrigation on Monday of each week, if needed.

2. 1st day of March – last day of April and 1st day of September – last day of October: up to two days per week irrigation on Monday and Friday of each week, if needed.

3. 1st day of May – last day of August: up to three days per week irrigation on Monday, Wednesday and Friday of each week, if needed.

E. Nonresidential water users (including without limitation, commercial, industrial, church, cemeteries, and publicly owned users) shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of November – last day of February: up to one day per week irrigation on Monday of each week, if needed.

2. 1st day of March – last day of April and 1st day of September – last day of October: up to two days per week irrigation on Monday and Thursday of each week, if needed.

3. 1st day of May – last day of August: up to three days per week irrigation on Monday, Thursday and Saturday of each week, if needed.

F. The limitations specified in subsections D and E shall not apply to a properly functioning low volume landscape irrigation system, the irrigation on container plants, or to the irrigation of new landscaping that is subject to the provisions of Section 14.09.060(E). Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

G. References in this section to any day of the week shall mean the period beginning at 12:00 a.m. on that day and ending 24 hours later.

H. Washing of vehicles or boats is prohibited except:

1. When using a hose that is equipped with a control nozzle capable of completely shutting off the flow of water except when positive action or pressure to maintain the flow of water is applied; or

2. When washed in either an automatic or manual commercial car wash that recirculates its water and uses high pressure/low volume wash systems.

3. Temporary car washes, held for fundraising purposes, are encouraged to partner with an automatic commercial car wash that recirculates its water and uses high pressure/low volume wash systems. If run independently, the participants must use a hose nozzle that completely shuts off the flow of water when not in use and must comply with all applicable federal, state and local stormwater management program requirements, including, but not limited to, the urban stormwater quality management and discharge control ordinance set forth in Chapter 14.20 of Title 14 of the City of Roseville Municipal Code.

I. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095. (Ord. 5491 § 6, 2015; Ord. 5311 § 2, 2014; Ord. 4724 § 3, 2009; Ord. 4629 § 1, 2008; Ord. 2611 § 1, 1992.)

14.09.090 Stage three drought restrictions.

During a stage three drought, the following restrictions may be required, as determined by the city manager and upon notification pursuant to Section 14.09.020(E):

A. All basic stage, stage one, and stage two restrictions required by Sections 14.09.060, 14.09.070 and 14.09.080 shall continue in place, except to the extent they are replaced by more restrictive conditions imposed by this section.

B. Residential users and non-residential landscapes are to reduce water usage up to 30 percent.

C. City park sites shall, as an aggregate, reduce usage up to 30 percent.

D. Residential water users shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of September – last day of April: up to one day per week irrigation on Monday of each week, if needed.

2. 1st day of May – last day of August: up to two days per week irrigation on Monday and Friday of each week, if needed.

E. Nonresidential water users (including without limitation, commercial, industrial, church, cemeteries, and publicly owned users) shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of September – last day of April: up to one day per week irrigation on Monday of each week, if needed.

2. 1st day of May – last day of August: up to two days per week irrigation on Monday and Thursday of each week, if needed.

F. The limitations specified in subsections D and E shall not apply to a properly functioning low volume landscape irrigation system, the irrigation on container plants, or to the irrigation of new landscaping that is subject to the provisions of Section 14.09.060(E). Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

G. References in this section to any day of the week shall mean the period beginning at 12:00 a.m. on that day and ending 24 hours later.

H. New or expanded landscaping is limited to drought-tolerant trees, shrubs, and ground-cover and be irrigated using a low volume irrigation system. No new turf shall be planted, hydroseeded, or laid, unless prior written consent is received from the city manager. Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

I. Except where recycled water is used, golf courses shall reduce irrigation up to 30 percent.

J. All decorative fountains, decorative (i.e., nonswimming) pools, and decorative waterways shall be drained and made dry. Such fountains, pools, and waterways shall not be refilled until the city has returned to the basic water conservation stage. Fountains, ponds or pools that are filled with recycled water are not subject to this provision. Decorative ponds that contain fish as a feature shall be exempt from this restriction as long as the system is maintained in good working order with measures taken to reduce the volume of makeup water required for evaporative losses.

K. Except where recycled or other non-potable water is used or as otherwise provided in this subsection, use of water for dust control is prohibited. Dust control shall be augmented by hardened, temporary travel routes with materials that are accepted by the city manager, city engineer, or designee. Potable water is allowed for construction water only where and to the extent required for public health and safety reasons.

L. New swimming pools and spas may be filled after construction using customer's metered water at then existing water rates. All new pools must include a means for minimizing evaporative loss, such as a pool cover, at time of final inspection by the city. After being filled with water for the first time, all pools and spas shall be subject to the requirements of Section 14.09.060(D).

M. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095. (Ord. 5491 § 7, 2015; Ord. 5311 § 2, 2014; Ord. 4724 § 3, 2009; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.100 Stage four drought restrictions.

During a stage four drought, the following restrictions may be required, as determined by the city manager and upon notification pursuant to Section 14.09.020(E):

A. All basic stage, stage one, stage two, and stage three restrictions required by Sections 14.09.060, 14.09.070, 14.09.080 and 14.09.090 shall continue in place, except to the extent they are replaced by more restrictive conditions imposed by this section.

B. Residential customers and non-residential landscapes are to reduce water usage up to 40 percent.

C. City park sites shall, as an aggregate, reduce usage up to 40 percent.

D. Residential water users shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of September – last day of April: No irrigation allowed.

2. 1st day of May – last day of August: up to one day per week irrigation on Monday, if needed.

E. Nonresidential water users (including without limitation, commercial, industrial, church, cemeteries, and publicly owned users) shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of September – last day of April: No irrigation allowed.

2. 1st day of May – last day of August: up to one day per week irrigation on Monday of each week, if needed.

F. The limitations specified in subsections D and E shall not apply to a properly functioning low volume landscape irrigation system, the irrigation on container plants, or to the irrigation of new landscaping that is subject to the provisions of Section 14.09.060(E). Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

G. References in this section to any day of the week shall mean the period beginning at 12:00 a.m. on that day and ending 24 hours later.

H. Installation of any new landscaping is prohibited unless irrigation is provided through connection to an active recycled water system. In the case of new construction, the city's building official will issue a temporary final upon completion of the structural development of the property. When the city has returned to a stage two drought restriction, landscaping installation can be completed and a building final will become available upon inspection by the city.

I. Except where recycled water is used, golf courses shall reduce irrigation up to 40 percent.

J. Automobiles or equipment shall be washed only at commercial establishments that recycle their water or by equipment and means that separates debris and recycles wash water for continual use.

K. Existing pools shall not be emptied and refilled using city water unless required for health or safety reasons until the city has returned to a stage two drought restriction. Pools may be re-filled only to the extent necessary to replace evaporative losses.

L. No commitments shall be made to provide water service as part of any new land use entitlement (general plan, specific plan or amendments requesting new water allocations) until the city has returned to a stage two drought restriction. Currently approved specific plans with accompanying development agreements and projects or properties that have received water allocations in advance of full entitlements may be issued building permits so long as they comply with the remainder of this chapter.

M. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095. (Ord. 5491 § 8, 2015; Ord. 5311 § 2, 2014; Ord. 4724 § 3, 2009; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.110 Stage five drought restrictions.

During a stage five drought, the following restrictions may be required, as determined by the city manager and upon notification pursuant to Section 14.09.020(E):

A. All basic stage, or stage one, stage two, stage three and stage four restrictions required by Sections 14.09.060, 14.09.070, 14.09.080, 14.09.090 and 14.09.100 shall continue in place, except to the extent they are replaced by more restrictive conditions imposed by this section.

B. Residential users are to reduce water usage up to 50 percent.

C. Except where recycled water is used, water users shall reduce landscape irrigation as follows:

1. Turf shall not be irrigated.

2. Trees and shrubs may be irrigated with a properly functioning low volume landscape irrigation system or by use of a handheld hose equipped with a nozzle capable of completely shutting off the flow of water except when positive action or pressure to maintain the flow of water is applied. Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

D. Filling new or existing swimming pools and spas with city water is prohibited.

E. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095. (Ord. 5491 § 9, 2015; Ord. 5311 § 2, 2014; Ord. 4724 § 3, 2009; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.120 Determination of drought tolerance.

Where this chapter permits or prohibits acts based upon whether or not a planting, tree, shrub, or groundcover is “drought tolerant” the determination shall be made based upon Sunset’s *Western Garden Book* (most recent edition), or UC Davis Arboretum’s “All Stars” plant database (www.arboretum.ucdavis.edu). Where this chapter permits or prohibits acts based upon whether a form of

irrigation is “low volume drip irrigation” the determination shall be made by the director, or designee, whose determination shall be final. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.130 Determination of landscape water consumption reductions.

Whenever this chapter requires a reduction in consumption of water for irrigation purposes, the base year for measurement shall be the last year that the basic water conservation stage was in effect or a date specified by the Governor or state agency. If that data is not available for a property, allocations will be based on water use for similar properties. The city manager or designee may elect to base a reduction on the base year or on a landscape water consumption calculation if use was, in the city manager’s or designee’s, sole opinion, either excessive or extraordinarily low. For landscaping installed subsequent to the base year, the calculations shall be based on landscape water consumption calculations submitted with the landscape plan, or water consumption the previous year, whichever is less. (Ord. 5491 § 10, 2015; Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2817 § 1, 1994; Ord. 2413 § 2, 1991.)

14.09.140 Violations.

It is unlawful for any user and/or person to violate any provision or fail to comply with any of the requirements of this chapter. Causing, permitting, aiding, abetting or concealing a violation of any provision of this chapter shall constitute a violation of this chapter. A violation of the provisions of this chapter shall occur irrespective of the negligence or intent of the violator and a violation of or failure to comply with any of the requirements of this chapter may be charged as either an infraction or a misdemeanor in the discretion of the city attorney. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 3834 § 3, 2002; Ord. 2413 § 2, 1991.)

14.09.150 Enforcement authority.

A. Whenever the city manager, or designee (including, but not limited to, an enforcement officer), determines that a user and/or person has violated any provision of, or failed to meet a requirement of, this chapter, an administrative citation pursuant to Chapter 2.50 or a written compliance order pursuant to Chapter 2.52 may be issued to any user and/or person responsible for the violation.

B. Any compliance order issued may require without limitation any or all of the following:

1. The allocation of a particular amount of water to a given user and/or person responsible for the violation;
2. The issuance of a fine;
3. The installation of a flow restriction device;
4. The performance of monitoring, analyses, and reporting;
5. That violations shall cease and desist; and/or
6. The discontinuation of water service.

The compliance order shall set forth a deadline within which the requirements of the compliance order must be completed. Said compliance order shall further advise that, should the violator fail to comply with the compliance order within the established deadline, a hearing on the compliance order shall be set.

(Ord. 5491 § 11, 2015; Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 3034 § 3, 2002; Ord. 2817 § 1, 1994; Ord. 2413 § 2, 1991.)

14.09.160 Hearing.

If full compliance is not achieved within the time specified in the compliance order, a hearing on the compliance order shall be set pursuant to Chapter 2.52. All penalties and remedies authorized by Chapter 2.52 shall apply to violations of this chapter. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.170 Appeal.

Any user and/or person receiving a compliance order under Section 14.09.150 may appeal the determination of the director, or designee, to a hearing panel drawn from the membership of the board of appeals. The notice of appeal must be received by the city's environmental utilities department within 10 days from the date of the compliance order. Notice of hearing and hearing on the appeal will be conducted pursuant to the requirements of Chapter 2.52. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.180 Separate offense for each day.

Any user and/or person that violates any provision of this chapter shall be guilty of a separate offense for each and every day during any portion of which any such user and/or person commits, continues, permits, or causes a violation thereof, and shall be punished accordingly. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.190 Public nuisance.

In addition to the enforcement processes and penalties hereinbefore provided, any condition caused or permitted to exist in violation of any of the provisions of this chapter is a threat to public health, safety, and welfare, and is declared and deemed a nuisance, and may be summarily abated or restored by the city at the violator's expense, and/or a civil action to abate, enjoin, or otherwise compel the cessation of such nuisance may be initiated and/or taken by the city. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.200 Remedies not exclusive.

Remedies under this chapter are in addition to and do not supersede or limit any and all other remedies, civil or criminal. The remedies provided for herein shall be cumulative and not exclusive. (Ord. 5311 § 2, 2014; Ord. 4629 § 2, 2008.)

14.09.210 Judicial review.

Any decision of the hearing panel shall be final. Any user and/or person aggrieved by an order of the hearing panel may obtain review of the order in the Superior Court by filing with the Court a petition for

writ of mandate within 90 days pursuant to California Code of Civil Procedure Section 1094.6. (Ord. 5311 § 2, 2014; Ord. 4629 § 2, 2008.)

14.09.220 Chapter severable.

The provisions of this chapter are severable. The city council declares that it would have adopted the remainder of this chapter even if any of its provisions are declared unlawful or unenforceable. (Ord. 5311 § 2, 2014; Ord. 4629 § 2, 2008.)

Appendix M – Roseville Municipal Code 14.08.090, 14.08.095, 14.08.100

Roseville Municipal Code

Title 14 PUBLIC UTILITIES

Chapter 14.08 WATER

14.08.090 Service charges for metered service.

There shall be due and payable the following monthly charges, upon submission of the bill by the city to the owner of the property supplied with service, for all treated water measured by meters for residential, commercial, industrial and manufacturing or other purposes:

A. Monthly Quantity Rates. Effective July 5, 2019 and July 1, 2020, the monthly quantity rates on billings shall be as follows:

	Effective 7/5/2019	Effective 7/1/2020
Potable water usage (per 100 cubic feet)	$1.30	$1.34
Recycled water usage (per 100 cubic feet)	$0.65	$0.67

B. Monthly Service Charges. Effective July 5, 2019 and July 1, 2020, the monthly service charges on billings shall be as follows:

Meter Size (inches)	Peak Flow Rate (gallons per minute)	Effective 7/5/2019	Effective 7/1/2020
Up to 3/4	30	$27.26	$28.08
1	50	$42.07	$43.34
1-1/2	100	$79.09	$81.47
2	160	$123.51	$127.22
3	350	$264.20	$272.13
4	630	$471.52	$485.67
6	1300	$967.61	$996.64
8	2800	$2,078.26	$2,140.61
10	4200	$3,114.89	$3,208.31

C. The total amount due and payable shall be the sum of the monthly service charge plus the quantity rate. The monthly service charge is due and payable regardless of whether water has been consumed. The service charge shall be the greater of the charge based on the meter size or flow rate, with the following exceptions:

1. No service charge shall be made for fire service that has backflow prevention with detector check devices approved by the environmental utilities director.

2. No service charge shall be made for recycled water utility back-up systems that are required for reliability only and have backflow prevention and metering approved by the environmental utilities director. This exclusion does not extend to systems that are regularly required as part of normal operation. The recycled water operation shall be responsible for water volumetric charges for these services and any costs associated with meter maintenance.

D. For purposes of charging for treated water measured by meters:

1. A residential account is defined as a single metered water service which serves three or less dwelling units.

2. A nonresidential account is defined as a single metered water service which serves more than three dwelling units, or serves commercial, industrial, manufacturing, irrigation or other nonresidential land uses.

E. For single-family residential services that require automatic fire protection systems pursuant to Section 16.16.120, the increased meter size will not be assessed an additional charge associated with the fire protection system requirement. Service charges shall be based on the required service size as determined by the Uniform Plumbing Code without consideration for any fire protection system required by Section 16.16.120. (Ord. 6100 § 3, 2019; Ord. 5837 § 2, 2017; Ord. 5610 § 2, 2016; Ord. 5174 § 2, 2013; Ord. 4957 § 1, 2011; Ord. 4724 § 2, 2009; Ord. 4680 § 1, 2008; Ord. 4639 § 1, 2008; Ord. 4508 § 1, 2007; Ord. 4473 § 1, 2006; Ord. 4263 § 2, 2005; Ord. 4001 § 3, 2003; Ord. 3964 § 1, 2003; Ord. 3756 § 1, 2001; Ord. 3687 § 1, 2001; Ord. 3101 § 1, 1997; Ord. 2708 § 1, 1993; Ord. 1953 § 1, 1986; Ord. 1918 § 1, 1985; Ord. 1418 § 8, 1978; Ord. 1239 § 1, 1974; prior code § 27.14.)

14.08.095 Water rate surcharge and excess water use charge.

Effective on billings as of May 1, 2009, all quantity rates identified in Section 14.08.090, but not recycled water, will be subject to the water shortage surcharges and excess water use charges identified as follows when the drought stages identified and set forth in Sections 14.09.070 through 14.09.110 are declared, provided that the city manager determines that imposition of such charges is required under the identified drought stage.

Summary of Water Shortage Rate Charges			
Stage	**Water Use Restriction**	**Water Shortage Surcharge (*1)**	**Excess Water Use Charge (*2)**
First Year of a Water Shortage			
Stage 1	10%	None	None
Stage 2	20%	15%	None
Stage 3	30%	33%	25%
Stage 4	40%	45%	50%
Stage 5	50%	60%	100%

Summary of Water Shortage Rate Charges			
Stage	**Water Use Restriction**	**Water Shortage Surcharge (*1)**	**Excess Water Use Charge (*2)**
Subsequent Year(s) of a Water Shortage			
Stage 1	10%	15%	None
Stage 2	20%	20%	25%
Stage 3	30%	40%	50%
Stage 4	40%	50%	100%
Stage 5	50%	75%	200%

Notes:
(*1) The water shortage surcharge (identified hereafter) shall be added to all quantity rates identified in Section 14.08.090 as applicable, according to drought stage.
(*2) In addition to the applicable water shortage surcharge, an excess water use charge shall be added to water rates identified in Section 14.08.090, according to drought stage.

(Ord. 5837 § 3, 2017; Ord. 5311 § 1, 2014; Ord. 4724 § 2, 2009; Ord. 3101 § 1, 1997; Ord. 2414 § 1, 1991.)

14.08.095 Water rate surcharge and excess water use charge.

Effective on billings as of May 1, 2009, all quantity rates identified in Section 14.08.090, but not recycled water, will be subject to the water shortage surcharges and excess water use charges identified as follows when the drought stages identified and set forth in Sections 14.09.070 through 14.09.110 are declared, provided that the city manager determines that imposition of such charges is required under the identified drought stage.

Summary of Water Shortage Rate Charges			
Stage	**Water Use Restriction**	**Water Shortage Surcharge (*1)**	**Excess Water Use Charge (*2)**
First Year of a Water Shortage			
Stage 1	10%	None	None
Stage 2	20%	15%	None
Stage 3	30%	33%	25%
Stage 4	40%	45%	50%
Stage 5	50%	60%	100%
Subsequent Year(s) of a Water Shortage			
Stage 1	10%	15%	None
Stage 2	20%	20%	25%
Stage 3	30%	40%	50%

Summary of Water Shortage Rate Charges			
Stage	**Water Use Restriction**	**Water Shortage Surcharge (*1)**	**Excess Water Use Charge (*2)**
Stage 4	40%	50%	100%
Stage 5	50%	75%	200%

Notes:
(*1) The water shortage surcharge (identified hereafter) shall be added to all quantity rates identified in Section 14.08.090 as applicable, according to drought stage.
(*2) In addition to the applicable water shortage surcharge, an excess water use charge shall be added to water rates identified in Section 14.08.090, according to drought stage.

(Ord. 5837 § 3, 2017; Ord. 5311 § 1, 2014; Ord. 4724 § 2, 2009; Ord. 3101 § 1, 1997; Ord. 2414 § 1, 1991.)

14.08.100 Flat water rates.

The following service charges shall apply to flat rate consumers that the environmental utilities director determines are not cost effective to assign metered rates. The environmental utilities director shall conduct a water use study for consumers whom he or she determines may not be reasonably metered, and the director shall assign such consumers to an appropriate service rate level as set forth in this section. Water service rates for flat rate residential consumers shall be due and payable on a monthly basis according to the appropriate grouping set out in this section.

Effective July 5, 2019, and July 1, 2020, the flat rates on billings shall be as follows:

Nonmetered or Flat Service Charges	**Effective 7/5/2019**	**Effective 7/1/2020**
Single-family lots under 4,900 square feet; each mobile home unit not within a park maintaining its own distribution system and service; each dwelling unit of duplexes, triplexes, fourplexes, unmetered apartments and other multiple living units; other detached living units; and offices and stores with less than peak use of 250 gallons per day	$37.38	$38.51
Single-family lots 4,901 to 8,900 square feet	$42.13	$43.40
Single-family lots 8,901 to 12,000 square feet	$45.79	$47.17
Single-family lots 12,001 to 15,000 square feet	$49.36	$50.85
Single-family lots existing before July 1, 1977, which are in excess of 15,000 square feet	$54.36	$58.16
Mobile home parks, per living unit	34.47	35.51
All those single-family lots over 15,000 square feet, created on or after July 1, 1977, shall be metered pursuant to Section 14.08.105		

(Ord. 6100 § 5, 2019; Ord. 5837 § 4, 2017; Ord. 5610 § 3, 2016; Ord. 5174 § 2, 2013; Ord. 4957 § 1, 2011; Ord. 4724 § 2, 2009; Ord. 4508 § 1, 2007; Ord. 4263 § 2, 2005; Ord. 3964 § 1, 2003; Ord. 3756, § 2, 2001; Ord. 3687 § 1, 2001; Ord. 3101 § 1, 1997; Ord. 2708 § 1, 1993; Ord. 1918 § 1, 1985; Ord. 1418 § 9, 1978; Ord. 1239 § 2, 1974; prior code § 27.15.)

Appendix N – CalWEP BMP Compliance Reports

Contact Information Update

Date	4/29/20
Water District	City of Roseville
District Address	2005 Hilltop Circle, Roseville, CA 95747
District Website	www.roseville.ca.us

Conservation Coordinator

First Name	Bobby
Last Name	Alvarez
Title	Water Conservation Administrator
Phone	(916) 746-1710
Email	balvarez@roseville.ca.us

General Manager

First Name	Sean
Last Name	Bigley
Title	Assistant Environmental Utilities Director
Phone	(916) 774-5513
Email	sbigley@roseville.ca.us

Other Contact

First Name	Jennifer
Last Name	Sbaffi
Title	Customer Service Supervisor
Phone	(916) 746-1707
Email	jsbaffi@roseville.ca.us

Gallons Per Capita Water Reduction

Reporting Year	2019
Data Year	2019

What was your GPCD the last 5 years?

Year	GPCD
2019	190.50
2018	190.90
2017	194.08
2016	177.32
2015	165.79

If not using programmatic method of water efficiency, what is your district implementing to reduce water use? Provide a brief narrative.

City of Roseville does use a programmatic method of water efficiency.

If your district's GPCD is not declining, please provide a narrative of why and what your district will be doing to accomplish water usage savings.

The City of Roseville's GPCD is declining.

Metering With Commodity Rates

Are all connections metered? ○ Yes ◉ No ○ NA

If not 100% metered, please provide a narrative of why and when your district will be fully metered.

The City of Roseville implemented a Meter Retrofit Program beginning in 2001 and concluding in 2011, whereby 99%+ of the City's service connections were retrofitted with meters, either individually or with master meters. In general, accounts were left unmetered where site plumbing issues make it challenging, if not practically impossible, to provide an individual meter to the account location at that time.

Currently, the remaining <1% of unmetered services are retrofitted as part of an ongoing

Are all metered connections billed by water usage? ◉ Yes ○ No ○ NA

If no, please provide a brief narrative of why and when your district will be billing by water usage?

Retail Conservation Pricing

Is your district billing utilizing conserving rate structure? ○ Yes ◉ No ○ NA

Website to billing rate structure	http://qcode.us/codes/roseville/

If no, please provide a brief narrative of why or when your district will be implementing a conserving rate structure.

As a component of its meter retrofit program, the City adopted conservation pricing for water on all metered accounts from 2011 through 2015. To comply with Proposition 218 requirements, a law passed in California, the City transitioned to a per-use, uniform rate billing structure in February 2016.

Water Waste Prohibition

Water Waste Ordinance (●) Yes ( ) No ( ) NA

Ordinance Website Address	http://qcode.us/codes/roseville/

Other Pertinent Links

	Title	Website
1	City of Roseville Water Efficiency Website	https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=8905954
2	City of Roseville Water Efficiency - Report Water Waste	https://roseville.maps.arcgis.com/apps/GeoForm/index.html?appid=d1a535cf27c845449697c6cf563d0469
3		
4		
5		

Brief Comments/Narrative

The City currently restricts water waste within its service area. Roseville Municipal Code Chapter 14.09, Water Conservation Ordinance, defines water waste and associated penalties of continued infractions. Per the ordinance, customers in violation are provided a series of notifications at one week intervals: first a courtesy notice, second an administrative warning, and finally a formal citation. If the situation is not remedied by the time specified in the formal citation, additional measures can be taken to force compliance. These measures include fines, water restrictions, low flow devices, or discontinued service.

Water Loss Control

Water Loss Program? (●) Yes ( ) No ( ) NA

If not using AWWA Water Audit Software, brief description of program and/or link to website.

City of Roseville uses AWWA Water Audit Software.

AWWA Water Audit Software? (●) Yes ( ) No ( ) NA

Water Audit Data Validity Score	68/100
Data Validity Level	III (51-70)
Date of Last Analysis	2018

Brief Comments/Narrative

In 2009 the City began using AWWA Water Loss software to develop an annual water loss audit. Results from the audit have helped the City identify where in the distribution process leaks are occurring. When coupled with detailed pipeline information stored in the City's asset management system, audit information helps identify leak-prone areas of the City's distribution system.

These areas are then targeted for annual visual and auditory leak detection surveys to isolate individual areas of leakage. Once isolated, the City's responses include corrosion monitoring programs, service cathodic protection and/or replacement. The City's asset management software is then updated with identified leaks, which in turn provides more information useful for prioritization of future rehabilitation programs.

Public Outreach

Briefly list/describe your Public Outreach Programs:

	Title	Website
1	News stories on main page	http://roseville.ca.us/
2	Green Living Workshops	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=15390262
3	Mulch Mayhem	http://roseville.ca.us/workspaces/One.aspx?objectId=12537136&contextId=9754960
4	Water Efficiency Rebates	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=11491211
5	EU Today newsletter	http://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=87 17422
6	Landscape makeover contest	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=8944823
7	Regional Water Authority's Water Efficiency Program	www.bewatersmart.info
8	EPA Water Sense Partner, Fix-a-Leak Week	www.epa.gov
9		
10		

Brief Comments/Narrative

See website links for additional information.

School Education Programs

Briefly list/describe your School Education Programs:

	Title	Website
1	Be Water Smart News	www.bewatersmart.info
2	Water, the Never Ending Cycle (water cycle program)	http://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=8715907
3	Hydro Heroes (1st-3rd grade program)	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=8968185
4	Water Warriors (1st-3rd grade program)	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=8968201
5	H2Own (4th-6th grade program)	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=8968181
6	Keepin' It Clean (4th-6th grade program)	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=8968188
7	Planet Protectors comic books and lesson plans for Kindergarten	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=8940700
8	Water Spots video contest for high school students	http://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=8715907
9	Living Rivers of the Sacramento Valley Program	http://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=8715907
10	Utility Exploration Center Exhibits	http://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=8715907

Brief Comments/Narrative

Utility Exploration Center interactive exhibits teaching about water efficiency; website resources and links; teacher training workshops; other educational initiatives for various school-age groups.

Planet Protectors comic books and lesson plans (pre/post activities) for our Kindergarten Program, Hydro Heroes, Water Warriors, H2Own and Keepin it Clean; Sac Bee newspaper supplement "Water, the Never Ending Cycle".

Water Spots video contest for high school students (water efficiency theme); Living Rivers of the Sacramento Valley Program (watershed, human impacts, uses).

Residential Programs

Briefly list/describe your Residential Programs:

	Title	Website
1	Cash for Grass Rebate	http://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10126299
2	Showerhead Replacement	http://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10783212
3	Faucet Aerators Replacement	http://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10783212
4	Toilet Flapper Replacement	http://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10783212
5	Water Wise Housecalls	http://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10783212
6	Weather Based Controller Rebate	http://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10126299
7	Door Hangers	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=8905954
8	Water Waste Patrols	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=8905954
9	Irrigation Efficiency Rebate	http://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10126299
10		

Are your programs effective? (●) Yes ( ) No ( ) NA

Has your district reached program participation saturation? ( ) Yes (●) No ( ) NA

Brief Comments/Narrative

The City's Water Efficiency programs reach approximately 1000 residences per year, with continued efforts to engage the community and residents in rebate programs, water efficiency education, as well as best practices of water resource management. The City continues its effort to reach residents via water efficiency rebate programs, free water wise house call services, water waste patrol and outreach.

Commercial, Institutional, and Industrial Programs

Briefly list/describe your CII Programs:

	Title	Website
1	Landscape Conversion and Irrigation Upgrade Rebate	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10126299
2	Food Service One Stop Water Efficiency Rebate	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10126299
3	Customized Rebate Program	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10126299
4	Water Wise Evaluation Interior	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10866145
5	Water Wise Evaluation Exterior	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10866145
6	Water Budget Evaluation	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10866145
7	Water Waste Patrols	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=8905954
8		

Are your programs effective? (●) Yes ( ) No ( ) NA

Has your district reached program participation saturation? ( ) Yes (●) No ( ) NA

Brief Comments/Narrative

The City continues its water efficiency efforts by engaging the commercial community with multiple programs and outreach. Our water wise evaluations are one of our most valuable water saving services.

Landscape Programs

Briefly list/describe your Landscape Programs:

	Title	Website
1	Cash for Grass Rebate	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10126299
2	Irrigation Efficiency Rebate	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10126299
3	Weather Based Irrigation Controller Rebate	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10126299
4	Green Gardening Events	https://roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=15390262
5	Water Wise Evaluation Exterior	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10866145
6	DIY Landscape Workshops	https://roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=15390262
7	Landscape Conversion and Irrigation Upgrade Rebate	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10126299
8	Water Efficient Landscape Ordinance (WELO)	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=8905954
9		
10		

Are your programs effective? (●) Yes ( ) No ( ) NA

Has your district reached program participation saturation? ( ) Yes (●) No ( ) NA

Brief Comments/Narrative

The City's Water Efficiency programs reach approximately 1000 residences and approximately 1000 commercial sites for landscape-related visits per year, with continued efforts to engage the community and residents in rebate programs, water efficiency education, as well as best practices of water resource management. The City continues its effort to reach residents and commercial customers via water efficiency rebate programs, free water wise house call services, commercial site evaluations, water waste patrol and outreach.

Contact Information Update

Date	4/1/19
Water District	City of Roseville
District Address	2005 Hilltop Circle, Roseville CA 95747
District Website	www.roseville.ca.us

Conservation Coordinator

First Name	Bobby
Last Name	Alvarez
Title	Water Conservation Administrator
Phone	(916)746-1710
Email	balvarez@roseville.ca.us

General Manager

First Name	Sean
Last Name	Bigley
Title	Acting Water Utility Manager
Phone	(916)774-5513
Email	sbigley@roseville.ca.us

Other Contact

First Name	Jennifer
Last Name	Sbaffi
Title	Acting Administrative Analyst
Phone	(916)746-1707
Email	jsbaffi@roseville.ca.us

Gallons Per Capita Water Reduction

Reporting Year	2018
Data Year	2018

What was your GPCD the last 5 years?

Year	GPCD
2018	190.9
2017	194.08
2016	177.32
2015	165.79
2014	201.45

If not using programmatic method of water efficiency, what is your district implementing to reduce water use? Provide a brief narrative.

City of Roseville Water Conservation Ordinance Chapter detailing drought stages and restriction on water use to comply with the Governor's Executive Order and State Water Resource Control Board direction. http://qcode.us/codes/roseville/

Water Efficient Landscape Ordinance (WELO): http://qcode.us/codes/roseville/

CA Green Building Code included in our standards:

http://www.roseville.ca.us/gov/development_services/building/current_code_n_design_criteria.asp

The City uses its Asset Management System to detect leak-prone areas and then schedules projects to repair sections of mainline in those areas. The City also works

If your district's GPCD is not declining, please provide a narrative of why and what your district will be doing to accomplish water usage savings.

The City of Roseville's GPCD is not currently declining. This is primarily due to the recovery from drought conditions following the 2014-2015 drought period. While GPCD numbers have been slowly increasing, the City continues efforts to educate residents on the principles and best practices of Water Efficiency and Conservation. The City is already in compliance with targets for 20% water use reduction by the year 2020 by a significant margin, in accordance with SBX7-7.

Metering With Commodity Rates

Are all connections metered? ○ Yes ◉ No ○ NA

If not 100% metered, please provide a narrative of why and when your district will be fully metered.

The City of Roseville implemented a Meter Retrofit Program beginning in 2001 and concluding in 2011, whereby 99%+ of the City's service connections were retrofitted with meters, either individually or with master meters. In general, accounts were left unmetered where site plumbing issues make it challenging, if not practically impossible, to provide an individual meter to the account location at that time.

Currently, the remaining <1% of unmetered services are retrofitted as part of an ongoing

Are all metered connections billed by water usage? ◉ Yes ○ No ○ NA

If no, please provide a brief narrative of why and when your district will be billing by water usage?

Retail Conservation Pricing

Is your district billing utilizing conserving rate structure? ○ Yes ◉ No ○ NA

Website to billing rate structure	Roseville Municipal Code Chapter 14.08.090; http://qcode.us/codes/roseville/

If no, please provide a brief narrative of why or when your district will be implementing a conserving rate structure.

As a component of its meter retrofit program, the City adopted conservation pricing for water on
all metered accounts from 2011 through 2015. To comply with Proposition 218 requirements, the
City transitioned to a per-use, uniform rate billing structure in February 2016.

Water Waste Prohibition

Water Waste Ordinance ◉ Yes ○ No ○ NA

Ordinance Website Address	http://qcode.us/codes/roseville/

Other Pertinent Links

	Title	Website
1	City of Roseville Water Efficiency Website	https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=8905954
2	City of Roseville Water Efficiency - Report Water Waste	https://roseville.maps.arcgis.com/apps/GeoForm/index.html?appid=d1a535cf27c845449697c6cf563d0469
3		
4		
5		

Brief Comments/Narrative

The City currently restricts water waste within its service area. Roseville Municipal Code Chapter 14.09, Water Conservation Ordinance, defines water waste and associated penalties of continued infractions. Per the ordinance, customers in violation are provided a series of notifications at one week intervals: first a courtesy notice, second an administrative warning, and finally a formal citation. If the situation is not remedied by the time

Water Loss Control

Water Loss Program? ◉ Yes ○ No ○ NA

If not using AWWA Water Audit Software, brief description of program and/or link to website.

AWWA Water Audit Software? ◉ Yes ○ No ○ NA

Water Audit Data Validity Score	67/100
Data Validity Level	III (51-70)
Date of Last Analysis	2017

Brief Comments/Narrative

In 2009 the City began using AWWA Water Loss software to develop an annual water loss audit. Results from the audit have helped the City identify where in the distribution process leaks are occurring. When coupled with detailed pipeline information stored in the City's asset management system, audit information helps identify leak-prone areas of the City's distribution system. These areas are then targeted for annual visual and auditory leak detection surveys to isolate individual areas of leakage. Once isolated, the City's responses include corrosion monitoring programs, service cathodic protection and/or replacement. The City's asset management software is then updated with identified leaks, which in turn provides more

Public Outreach

Briefly list/describe your Public Outreach Programs:

	Title	Website
1	News stories on main page	http://roseville.ca.us/
2	Green Living Workshops	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=15390262
3	Mulch Mayhem	http://roseville.ca.us/workspaces/One.aspx?objectId=12537136&contextId=9754960
4	Earth Day	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=11491211
5	Water Efficiency Rebates	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=11491211
6	EU Today newsletter	http://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=87 17422
7	Landscape makeover contest	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=8944823
8	Regional Water Authority's Water Efficiency Program	www.bewatersmart.info
9		
10		

Brief Comments/Narrative

School Education Programs

Briefly list/describe your School Education Programs:

	Title	Website
1	Be Water Smart News	www.bewatersmart.info
2	Water, the Never Ending Cycle (water cycle program)	http://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=87 15907
3	Hydro Heroes (1st-3rd grade program)	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=8968185
4	Water Warriors (1st-3rd grade program)	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=8968201
5	H2Own (4th-6th grade program)	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=8968181
6	Keepin' It Clean (4th-6th grade program)	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=8968188
7	Planet Protectors comic books and lesson plans for Kindergarten	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=8940700
8	Water Spots video contest for high school students	http://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=87 15907
9	Living Rivers of the Sacramento Valley Program	http://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=8715907
10	Utility Exploration Center	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=8715907

Brief Comments/Narrative

Utility Exploration Center interactive exhibits teaching about water efficiency; website resources and links; teacher training workshops

Planet Protectors comic books and lesson plans (pre/post activities) for our Kindergarten Program, Hydro Heroes, Water Warriors, H2Own and Keepin it Clean; Sac Bee newspaper supplement "Water, the Never Ending Cycle".

Water Spots video contest for high school students (water efficiency theme); Living Rivers of the Sacramento Valley Program (watershed, human impacts, uses).

Residential Programs

Briefly list/describe your Residential Programs:

	Title	Website
1	Cash for Grass Rebates	https://www.roseville.ca.us/rebates
2	Showerhead Replacements	https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10126299
3	Faucet Aerators	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=10160801
4	Landscape Water Surveys	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=10866100
5	Residential Irrigation Efficiency Housecalls	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=10160801
6	Leak Detection Surveys	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=8945467
7	WaterSense Spec Toilets Installed	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=8945467
8	Door Hangers	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=890595
9	Water Waste Patrols	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=10160801
10		

Are your programs effective? (●) Yes ( ) No ( ) NA

Has your district reached program participation saturation? ( ) Yes (●) No ( ) NA

Brief Comments/Narrative

The City's Water Efficiency programs reach approximately 1000 residences per year, with continued efforts to engage the community and residents in rebate programs, water efficiency education, as well as best practices of water resource management. Specifically, the City has reached saturation with respect to showerhead replacements and faucet aerators, with continued efforts to promote the Cash for Grass and Smart Irrigation Controller incentives.

Commercial, Institutional, and Industrial Programs

Briefly list/describe your CII Programs:

	Title	Website
1	High Efficiency Toilet Rebates	https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=8905872
2	High Efficiency Urinal Rebates	https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=8905872
3	High Efficiency Clothes Washer Rebates	https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=8905872
4	Commercial Laundry Retrofits	https://www.roseville.ca.us/cms/one.aspx?portalId=7964922&pageId=8904588
5	Car Wash Reclamation Systems	https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=8905872
6	Commercial Water Audits	http://members.questline.com/FacilityAssessment.aspx?accountID=2631
7	Green Gardening Events	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10126299
8		

Are your programs effective? (●) Yes ( ) No ( ) NA

Has your district reached program participation saturation? ( ) Yes (●) No ( ) NA

Brief Comments/Narrative

Landscape Programs

Briefly list/describe your Landscape Programs:

	Title	Website
1	Cash for Grass Rebates	https://www.roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10126299
2	Irrigation Retrofits	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10126299
3	Smart Irrigation Controllers	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10126299
4	Green Gardening Events	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10126299
5	Landscape Water Surveys	https://roseville.ca.us/cms/One.aspx?portalId=7964922&pageId=10126299
6		
7		
8		
9		
10		

Are your programs effective? (●) Yes ( ) No ( ) NA

Has your district reached program participation saturation? ( ) Yes (●) No ( ) NA

Brief Comments/Narrative

make Bobby give us good language for cool workshops

Appendix O – Adoption Resolutions and Submission

A copy of the adoption resolution will be provided in the final version of the 2020 Urban Water Management Plan.

Appendix P – DWR UWMP Checklist

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location
10608.20(e)	Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	Baselines and Targets	Chapter 5	Appendix F
10608.22	Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5 year baseline. This does not apply if the suppliers base GPCD is at or below 100.	Baselines and Targets	Section 5.7.2	Appendix F
10608.24(a)	Retail suppliers shall meet their water use target by December 31, 2020.	Baselines and Targets	Section 5.7	Appendix G
10608.24(d)(2)	If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment.	Baselines and Targets	Sections 5.2 and 5.5.7	Appendix G
10608.36	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.	Baselines and Targets	Section 5.1	NA
10608.4	Retail suppliers shall report on their progress in meeting their water use targets. The data shall be reported using a standardized form.	Baselines and Targets	Section 5.8 and App E	Appendix G
10631(e)(1)	Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years.	Demand Management Measures	Sections 9.2 and 9.3	Section 9.1
10631(e)(2)	Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program.	Demand Management Measures	Sections 9.1 and 9.3	NA
10608.26(a)	Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets.	Plan Adoption, Submittal, and Implementation	Chapter 10	Section 10.2 Section 10.3
10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.	Plan Adoption, Submittal, and Implementation	Section 10.2.1	Appendix B

10621(f)	Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.	Plan Adoption, Submittal, and Implementation	Sections 10.3.1 and 10.4	Appendix O
10635(c)	Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 60 days after the submission of the plan to DWR.	Plan Adoption, Submittal, and Implementation	Sections 8.12, 10.4	Appendix K: Exhibit C
10642	Provide supporting documentation that the urban water supplier made the plan and contingency plan available for public inspection, published notice of the public hearing, and held a public hearing about the plan and contingency plan.	Plan Adoption, Submittal, and Implementation	Sections 10.2.2, 10.3, and 10.5	Appendix B
10642	The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.	Plan Adoption, Submittal, and Implementation	Section 10.2	Appendix B
10642	Provide supporting documentation that the plan and contingency plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Section 10.3.1	Appendix O, Appendix K: Exhibit C
10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Plan Adoption, Submittal, and Implementation	Section 10.5	Appendix O
10644(a)(1)	Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption.	Plan Adoption, Submittal, and Implementation	Section 10.6	Appendix O
10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Plan Adoption, Submittal, and Implementation	Sections 10.4.1 and 10.4.2	Appendix O
10645(a)	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.5	Appendix O
10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its water shortage contingency plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.6	Appendix K: Exhibit C
10620(b)	Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.	Plan Preparation	Section 2.1	Section 2.1

10620(d)(2)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan Preparation	Section 2.5.2	Section 2.4
10642	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan.	Plan Preparation	Section 2.6	Appendix B
10630.5	Each plan shall include a simple description of the supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information.	Summary	Chapter 1	Executive Summary
10631(a)	Describe the water supplier service area.	System Description	Section 3.1	Section 3.2
10631(a)	Describe the climate of the service area of the supplier.	System Description	Section 3.3	Section 3.3
10631(a)	Provide population projections for 2025, 2030, 2035, 2040 and optionally 2045.	System Description	Section 3.4	DWR Table 3-1
10631(a)	Describe other social, economic, and demographic factors affecting the supplier's water management planning.	System Description	Section 3.4	Section 3.4.2
10631(a)	Describe the land uses within the service area.	System Description	Section 3.5	Section 3.5
10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Sections 3.4 and 5.4	DWR Table 3-1
10631(b)	Identify and quantify the existing and planned sources of water available for 2020, 2025, 2030, 2035, 2040 and optionally 2045.	System Supplies	Section 6.2.8	DWR Table 6-8 DWR Table 6-9
10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.2	DWR Table 6-1 COR Table 7-C
10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe drought.	System Supplies	Section 6.2	Section 7.2
10631(b)(2)	When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies.	System Supplies	Section 6.1	Section 6.11
10631(b)(3)	Describe measures taken to acquire and develop planned sources of water.	System Supplies	Section 6.1	Section 6.12

10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of plan authorization	System Supplies	Section 6.2.2	Section 6.3.2
10631(b)(4)(B)	Describe the groundwater basin.	System Supplies	Section 6.2.2	Section 6.3.1
10631(b)(4)(B)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump.	System Supplies	Section 6.2.2	Section 6.3.1
10631(b)(4)(B)	For unadjudicated basins, indicate whether or not the department has identified the basin as a high or medium priority. Describe efforts by the supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	System Supplies	Section 6.2.3	Section 6.3.1
10631(b)(4)(C)	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	System Supplies	Section 6.2.4	Section 6.3.3
10631(b)(4)(D)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System Supplies	Section 6.2	Section 6.12.2
10631(c)	Describe the opportunities for exchanges or transfers of water on a short-term or long- term basis.	System Supplies	Section 6.7	Section 6.10
10631(f)	Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and for a period of drought lasting 5 consecutive water years.	System Supplies	Section 6.8	Section 6.12
10631(g)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.6	Section 6.9
10631(h)	Retail suppliers will include documentation that they have provided their wholesale supplier(s) - if any - with water use projections from that source.	System Supplies	Section 2.5.1	Appendix A
10631(h)	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types.	System Supplies	Section 2.5.1	NA

10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System Supplies (Recycled Water)	Section 6.2	Section 6.5.1
10633(c)	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Section 6.2	Section 6.7
10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System Supplies (Recycled Water)	Section 6.2	Section 6.8
10633(e)	Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	System Supplies (Recycled Water)	Section 6.2	Section 6.7
10633(f)	Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System Supplies (Recycled Water)	Section 6.2	Section 6.8
10633(g)	Provide a plan for optimizing the use of recycled water in the supplier's service area.	System Supplies (Recycled Water)	Section 6.2	Section 6.8
10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Section 4.2	COR Table 4-A DWR Table 4-1, 4-2, 4-3
10631(d)(3)(A)	Report the distribution system water loss for for each of the 5 years preceding the plan update.	System Water Use	Section 4.3	COR Table 4-D DWR Table 4-4
10631(d)(3)(C)	Retail suppliers shall provide data to show the distribution loss standards were met.	System Water Use	Section 4.2	4.2.6
10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier.	System Water Use	Section 4.5	COR Table 4-G
10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water Shortage Contingency Planning	Chapter 8	Appendix K: Exhibit C
10632(a)(2)(A)	Provide the written decision-making process and other methods that the supplier will use each year to determine its water reliability.	Water Shortage Contingency Planning	Section 8.2	WSCP Table 5
10632(a)(2)(B)	Provide data and methodology to evaluate the supplier’s water reliability for the current year and one dry year pursuant to factors in the code.	Water Shortage Contingency Planning	Section 8.2	WSCP Table 5 Steps 1-8

10632(a)(3)(A)	Define six standard water shortage levels of 10, 20, 30, 40, 50 percent shortage and greater than 50 percent shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply.	Water Shortage Contingency Planning	Section 8.3	WSCP Table 4
10632(a)(3)(B)	Suppliers with an existing water shortage contingency plan that uses different water shortage levels must cross reference their categories with the six standard categories.	Water Shortage Contingency Planning	Section 8.3	WSCP Table 4
10632(a)(4)(A)	Suppliers with water shortage contingency plans that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Water Shortage Contingency Planning	Section 8.4	WSCP Section 1.5
10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water Shortage Contingency Planning	Section 8.4	WSCP Table 6
10632(a)(4)(C)	Specify locally appropriate operational changes.	Water Shortage Contingency Planning	Section 8.4	WSCP Section 1.5
10632(a)(4)(D)	Specify additional mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions are appropriate to local conditions.	Water Shortage Contingency Planning	Section 8.4	WSCP Table 6
10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Water Shortage Contingency Planning	Section 8.4	WSCP Table 6
10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Water Shortage Contingency Planning	Section 8.5	WSCP Table 5
10632(a)(5)(B) 10632(a)(5)(C)	Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications.	Water Shortage Contingency Planning	Section 8.5, 8.6	WSCP Table 5
10632(a)(7)(A)	Describe the legal authority that empowers the supplier to enforce shortage response actions.	Water Shortage Contingency Planning	Section 8.7	WSCP Section 1.2
10632(a)(7)(B)	Provide a statement that the supplier will declare a water shortage emergency Water Code Chapter 3.	Water Shortage Contingency Planning	Section 8.7	WSCP Table 5: Step 11

10632(a)(7)(C)	Provide a statement that the supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency.	Water Shortage Contingency Planning	Section 8.7	WSCP Table 2: Step 12
10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	Section 8.8	WSCP Section 1.6
10632(a)(8)(B)	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions	Water Shortage Contingency Planning	Section 8.8	WSCP Section 1.7
10632(a)(8)(C)	Describe the cost of compliance with Water Code Chapter 3.3: Excessive Residential Water Use During Drought.	Water Shortage Contingency Planning	Section 8.8	WSCP Section 1.7
10632(a)(9)	Retail suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance.	Water Shortage Contingency Planning	Section 8.9	WSCP Table 2 Step 15
10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the water shortage contingency plan to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Water Shortage Contingency Planning	Section 8.10	WSCP Table 2 Step 16
10632(b)	Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.	Water Shortage Contingency Planning	Section 8.11	WSCP Table 6
10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water Supply Reliability Assessment	Section 7.4	Section 7.2.5
10634	Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability.	Water Supply Reliability Assessment	Chapter 7	Section 7.1.2
10635(a)	Assess the water supply reliability during normal, dry, and multiple dry water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years.	Water Supply Reliability Assessment	Section 7.3	DWR Table 7.2 DWR Table 7.3 DWR Table 7.4
10635(b)	Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.	Water Supply Reliability Assessment	Section 7.3	DWR Table 7.5

10635(b)(1)	Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts 5 consecutive years.	Water Supply Reliability Assessment	Section 7.3	Section 7.2.5
10635(b)(2)	Include a determination of the reliability of each source of supply under a variety of water shortage conditions.	Water Supply Reliability Assessment	Section 7.3	COR Table 7-D
10635(b)(3)	Include a comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.	Water Supply Reliability Assessment	Section 7.3	DWR Table 7.5
10635(b)(4)	Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change condition, anticipated regulatory changes, and other locally applicable criteria.	Water Supply Reliability Assessment	Section 7.3	Section 7.2.1

COUNCIL COMMUNICATION

CC #: 1551
File #: 0800-02

Title:	Draft Water Shortage Contingency Plan – Public Hearing to Review and Receive Comments
Contact:	Trevor Joseph 916-746-1708 tjoseph@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 10.3.

RECOMMENDATION TO COUNCIL

Staff recommends City Council hold a public hearing to review and receive comments on the Draft Water Shortage Contingency Plan (WSCP). If found acceptable, as part of a separate agenda item, staff recommend City Council adopt a resolution to approve the Draft WSCP including providing authorization to staff to submit the WSCP as Chapter 8 in the 2020 Urban Water Management Plan (UWMP) as final.

As described above, the WSCP is ultimately included in Chapter 8 of the UWMP but must be presented and considered separately from the UWMP. For this reason, it is staff's recommendation that this agenda item should be considered with and presented concurrently with a public hearing to review and receive comments and consider the adoption of the Draft 2020 UWMP. Therefore, the Draft 2020 UWMP public hearing and consideration of adoption and consideration of adoption of the Draft WSCP have been placed as separate agenda items as documented in separate Council Communications (CC).

Staff recommend ordering these items as follows:

1. Public Hearing – Draft 2020 UWMP (described within a separate CC)
2. **Public Hearing – Draft WSCP (described within this CC)**
3. Adoption Hearing – Draft WSCP (described within a separate CC)
4. Adoption Hearing – Draft 2020 UWMP (described within a separate CC)

Specifically these public hearings allow for 1) community input regarding the urban retail water supplier's implementation for complying with the requirements of the California Water Code (CWC), 2) consider of the economic impacts of the urban retail water supplier's implementation plan for complying with the CWC, and 3) City provided information on their baseline values, water use targets and compliance, and implementation plan.

After the public hearing, the Draft WSCP may be adopted as prepared or as modified after the hearing or hearings.

BACKGROUND

Beginning in 1985, the California Department of Water Resources (DWR) has required water purveyors delivering water to at least 3,000 customers to prepare an UWMP and update the plan at five-year intervals. The last plan was developed and approved for 2015 and included all City boundaries as they existed at that time.

With ongoing and recent updates to the DWR Guidebook for Urban Water Suppliers, it was determined that City staff would collaborate with a consultant, Waterworks Engineers, Inc., on the development of the 2020 document update. Effort began in December 2020 with collection of significant quantity of information, continuing through a staff review process, and resulting in the proposed plan.

Following the severe drought of 2012-2016, the State of California Legislature sought to expand the water shortage contingency analysis under former law and mandated that a WSCP be adopted by suppliers. The California Water Code recognizes WSCPs as a critical tool during a drought emergency and grants that the State defer to locally adopted WSCPs, to the extent practicable.

The WSCP is the City of Roseville Water Utility's operational plan in the event of a water shortage. Water shortage would occur when available water supplies are insufficient to meet normal customer water demands. Various causes can bring about a water shortage including, population growth, climate change, drought, natural disasters, and catastrophic events.

The WSCP shall address the ten following elements:

- Water supply reliability assessment analysis
- Annual assessment procedures
- Six standard shortage stages
- Shortage response actions
- Communication protocols
- Compliance and enforcement
- Legal authorities
- Financial consequences of WSCP
- Monitoring and reporting
- WSCP refinement procedures

FISCAL IMPACT

Conservation programs are a condition of City water contracts, regional agreements, and a matter of State law with the passage of SB X7-7 in 2009. Planning continues to be done on an annual basis and is included in all rate analyses and proposed budgets.

ENVIRONMENTAL REVIEW

The proposed activity is statutorily exempt from the California Environmental Quality Act (CEQA). CEQA does not apply to the preparation and adoption of Urban Water Management plans (California Water Code §10652). The proposed plan would not affect water supplies for fish and wildlife, or expand or add water supplies, and therefore no further environmental review is

required.

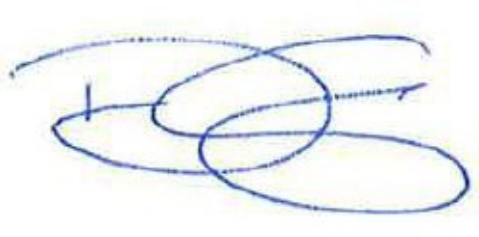
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Goal F - Invest in well-planned infrastructure and growth

Respectfully Submitted,

Trevor Joseph, Hydrogeologist

Richard Plecker, Environmental Utilities Director



_____
Dominick Casey, City Manager

ATTACHMENTS:

Description

Attachment A – Draft Water Shortage Contingency Plan



DRAFT WATER SHORTAGE CONTINGENCY PLAN

CITY OF ROSEVILLE CALIFORNIA

City of Roseville
Draft Water Shortage Contingency Plan

May 2021

Prepared by Water Works Engineers, LLC
Colleen Boak, PE
Esmeralda Diego

Checked by:
Tim Durbin, PE
Cindy Bertsch, PE

Table of Contents

Water Shortage Contingency Plan 1
1.1 Water Supply Reliability Analysis 1
1.1.1 Constraints on Water Supply 1
1.1.2 Drought Risk Assessment 2
1.1.3 Seismic Risk Analysis 4
1.2 Legal Authorities 4
1.3 Standard Water Shortage Levels 5
1.4 Annual Water Supply and Demand Assessment Procedures 5
1.5 Supply Augmentation and Operational Changes 12
1.6 Compliance and Enforcement 12
1.7 Financial Consequences 13
1.8 Plan Adoption, Submittal, and Availability 14

Tables

WSCP Table 1 Available Surface Water Supply Under Differing Hydrologic Conditions 2
WSCP Table 2 Near-Term Five-Year Drought Risk Assessment 3
WSCP Table 3 Long-Term Single and Five-Year Drought Risk Assessment 3
WSCP Table 4 Relation Between Standard Water Shortage Levels and Existing Stages 5
WSCP Table 5 Water Supply and Demand Assessment Procedure 5
WSCP Table 6 Demand Reduction Actions to be Implemented at Each Shortage Level 8
WSCP Table 7 Supply Augmentation During Stage 3 Droughts and Higher 12

Exhibits

Exhibit A – City of Roseville 2016 Multi-Hazard Mitigation Plan
Exhibit B – City of Roseville Municipal Code 14.09
Exhibit C – Adoption Resolution

Water Shortage Contingency Plan

Following the severe drought of 2012-2016, the State of California Legislature sought to expand the water shortage contingency analysis under former law and mandated that a water shortage contingency plan (WSCP) be adopted by suppliers. The California Water Code (CWC) recognizes WSCPs as a critical tool during a drought emergency and grants that the State defer to locally adopted WSCPs, to the extent practicable.

> *California Water Code Section 10632.3*
>
> *It is the intent of the Legislature that, upon proclamation by the Governor of a state of emergency under the California Emergency Services Act (Chapter 7 (commencing with Section 8550) of Division 1 of Title 2 of the Government Code) based on drought conditions, the board defer to implementation of locally adopted water shortage contingency plans to the extent practicable.*

The WSCP is the City of Roseville Water Utility's (City's) operational plan in the event of a water shortage. Water shortage would occur when available water supplies are insufficient to meet normal customer water demands. Various causes can bring about a water shortage including population growth, climate change, drought, natural disasters, and catastrophic events.

The WSCP shall address the ten following elements:

1. Water supply reliability assessment analysis
2. Annual assessment procedures
3. Six standard shortage stages
4. Shortage response actions
5. Communication protocols
6. Compliance and enforcement
7. Legal authorities
8. Financial consequences of WSCP
9. Monitoring and reporting
10. WSCP refinement procedures

1.1 Water Supply Reliability Analysis

Pursuant to 10632(a)(1) of the CWC, a near-term (5years) and long-term (20 years) water supply reliability analysis is provided herein. The water supply reliability analysis consists of a water service reliability assessment and drought risk assessment (DRA).

1.1.1 Constraints on Water Supply

Most of the City's water is surface water received from Folsom Lake. The City's existing surface water contracts with the U.S. Bureau of Reclamation (USBR), Placer County Water Agency (PCWA), and San Juan Water District (SJWD) are received through the Folsom Dam Diversion, making this a critical facility for the reliability of Roseville's surface water supply. Under normal conditions, the capacities of the Folsom Dam Diversion, Roseville Water Treatment Plant, and distribution network are sufficient to meet the City's water demands. However, the water that the City receives is subject to reductions during dry years pursuant to the Water Forum Agreement, the USBR

Operations Criteria and Plan (OCAP), and the Central Valley Project Municipal and Industrial Water Shortage Policy (CVP M&I WSP).

Although Roseville's annual water contract entitlements total 66,000-acre feet (AF), the City along with other Sacramento-area water suppliers are signatory to the January 2000 Water Forum Agreement (updated in 2015), which includes Purveyor Specific Agreements. The City's Purveyor Specific Agreement includes limitations on City surface water diversions from the American River under different hydrologic conditions. The hydrologic conditions are characterized by three categories of year type and the corresponding limitations for the City are given in WSCP Table 1.

WSCP Table 1 Available Surface Water Supply Under Differing Hydrologic Conditions

Year Type	Unimpaired Flow into Folsom Reservoir	Roseville Available Supply
Normal/ Average or Wet Year	Greater or equal to 950,000 AF	Maximum of 58,900 AF
Drier Year	Between 400,000 and 950,000 AF	Between 43,800 and 58,900 AF
Driest/ Critically Dry Year	Less than 400,000 AF	Maximum of 43,800 AF

In addition to the impacts of the contractual agreements, the reliability of surface water is also subject to physical constraints. In the event that the water level at Folsom Lake drops close to or below the intake elevation, without additional infrastructure, the City would be unable to divert water. The severe drought of 2015, which was preceded by multiple consecutive dry years, demonstrated the vulnerability of the City's surface water as the water elevation did come close to the intake elevation.

Though the City has begun the process of expanding its groundwater program, under current operations the groundwater is not a major source of water for the City. The City has 4 existing wells with aquifer storage recovery (ASR) injection capability. The City's strategy in normal years is to not pump groundwater from the wells in excess of what was injected, thus creating a bank of water for future use. If a significant drought stage is reached the City can pump additional water to augment its water supply and make up for deficits of the surface water supply. The City continues to invest in development of groundwater infrastructure to increase supply reliability in times of drought, however in any given year type, the City must make determinations of drought stage without consideration of groundwater supplies, per the terms of the municipal code. This is further discussed in Section 1.5. For the purpose of this WSCP, only the resources available to the City in determination of a drought stage are included in calculations of the surplus or shortfall for the DRA shown in WSCP Table 2 and WSCP Table 3.

1.1.2 Drought Risk Assessment

The near-term and long-term drought risk assessment was performed by comparing the unconstrained potable water demands to the water supply availability for a single dry year and 5 consecutive dry years. The near-term DRA for a five-year drought is provided in WSCP Table 2. The long-term single and five-year DRA is provided in WSCP Table 3. Note that while typical groundwater supplies are not considered in the calculations of Total Supplies shown in WSCP Table 2 and WSCP Table 3, the volume of groundwater that the City intends to use for each year type is listed separately.

WSCP Table 2 Near-Term Five-Year Drought Risk Assessment

Category	2021	2022	2023	2024	2025
Total Supplies	62,719	57,870	57,920	49,971	42,022
Total Gross Water Use	39,172	42,276	45,380	48,484	51,589
Surplus/ Shortfall absent of WSCP Action	23,547	15,593	12,540	1,487	-9,567
Total Right/ Safe Yield Groundwater Supplies	1,560	1,560	1,560	1,560	7,920
NOTES: All values are in AF. Groundwater supplies are not included in calculation of surplus/ shortfall.					

WSCP Table 3 Long-Term Single and Five-Year Drought Risk Assessment

Drought Type/ Year	Category	2025	2030	2035	2040	2045
Single Year	Total Supplies	42,022	42,435	46,293	46,293	46,293
	Total Gross Water Use	51,589	56,990	62,547	62,547	62,547
	Surplus/ Shortfall absent of WSCP Action	-9,567	-14,555	-16,254	-16,254	-16,254
	Total Right/ Safe Yield Groundwater Supplies	7,920	12,570	14,430	14,430	14,430
Year 1	Total Supplies	62,922	63,335	67,193	67,193	67,193
	Total Gross Water Use	51,589	56,990	62,547	62,547	62,547
	Surplus/ Shortfall absent of WSCP Action	11,333	6,345	4,646	4,646	4,646
	Reasonably Available Groundwater Supplies	1,560	2,720	3,350	3,350	3,350
Year 2	Total Supplies	58,022	58,435	62,293	62,293	62,293
	Total Gross Water Use	51,589	56,990	62,547	62,547	62,547
	Surplus/ Shortfall absent of WSCP Action	6,433	1,445	-254	-254	-254
	Reasonably Available Groundwater Supplies	1,560	2,720	3,350	3,350	3,350
Year 3	Total Supplies	58,022	58,435	62,293	62,293	62,293
	Total Gross Water Use	51,589	56,990	62,547	62,547	62,547
	Surplus/ Shortfall absent of WSCP Action	6,433	1,445	-254	-254	-254
	Reasonably Available Groundwater Supplies	1,560	2,720	3,350	3,350	3,350
Year 4	Total Supplies	50,022	50,435	54,293	54,293	54,293
	Total Gross Water Use	51,589	56,990	62,547	62,547	62,547
	Surplus/ Shortfall absent of WSCP Action	-1,567	-6,555	-8,254	-8,254	-8,254
	Reasonably Available Groundwater Supplies	1,560	2,720	3,350	3,350	3,350
Year 5	Total Supplies	42,022	42,435	46,293	46,293	46,293
	Total Gross Water Use	51,589	56,990	62,547	62,547	62,547
	Surplus/ Shortfall absent of WSCP Action	-9,567	-14,555	-16,254	-16,254	-16,254
	Total Right/ Safe Yield Groundwater Supplies	7,920	12,570	14,430	14,430	14,430
NOTES: All values are in AF. Groundwater supplies are not included in calculation of surplus/ shortfall.						

1.1.3 Seismic Risk Analysis

Seismic risk in California can pose a significant threat to facilities and infrastructure. The City of Roseville 2016 Multi-Hazard Mitigation Plan addresses the seismic risk at critical facilities including those dedicated to water supply and is provided in Exhibit A.

1.2 Legal Authorities

Chapter 14.09 Water Conservation of the Roseville Municipal Code (Municipal Code) also cited as Water Conservation and Drought Mitigation Ordinance (Ordinance 5311 § 2, 2014; Ordinance 2413 § 2, 1991), grants the City the authority to declare a water shortage in the City. Chapter 14.09 of the Municipal Code is provided in Exhibit B.

The purpose and scope of the Water Conservation and Drought Mitigation Ordinance as stated in the Municipal Code is provided below:

14.09.020 General provisions

A. Purpose. The purpose of this chapter is to ensure compliance with all federal, state and local requirements relating to water conservation and drought mitigation for the protection of public health, safety and welfare by:

1. Reducing the per capita water consumption throughout the City of Roseville (the "city") during years of normal precipitation and during years of drought;

2. Protecting and conserving the city's supply of water during specified times of emergency and/or crisis;

3. Minimizing and/or eliminating the waste of water through voluntary compliance or punitive action, if necessary;

4. Promoting the use of drip irrigation and other low volume irrigation methods that reduce outdoor water use by applying water more efficiently than traditional irrigation methods;

5. No person shall use, or cause to be used any city water for landscape irrigation between the hours of 10:00 a.m. and 8:00 p.m., unless the city manager, or designee provides prior written consent to a different time limitation. A waiver may be granted for turf areas if the landscape contains too many irrigation valves to complete an irrigation event within the watering window.

6. Upon city declaration of a water shortage, the city manager, or designee, may impose revised and/or additional limitations on outdoor water use, as specified in Section 14.09.040, and no person shall use, or cause to be used, city water in violation of such limitations while the water shortage remains in effect.

B. Scope. The provisions of this chapter shall apply to all customers, users and/or recipients (hereinafter "users") of the city's potable and recycled water service within the city's territorial limits.

The City's development and adoption of the WSCP upholds 14.09.020 General Provisions of the Municipal Code by ensuring compliance with state requirements.

All components of the WSCP comply with Chapter 14.09 of the Municipal Code. Any actions to be taken under the WSCP not explicitly stated in Chapter 14.09 of the Municipal Code are a further refinement of the existing ordinance.

1.3 Standard Water Shortage Levels

The California Water Code Section 10632(a)(3) defines six standard water shortage levels. Standardization of water shortage levels provide a consistent regional and statewide approach to characterizing and conveying the severity of a water shortage. However, Chapter 14.09 of the City's Municipal Code defines water shortage stages that are different from those listed in CWC. Pursuant to 10632(a)(3)(B), the six standard water shortage levels are related to the existing shortage stages in the Municipal Code in WSCP Table 4.

WSCP Table 4 Relation Between Standard Water Shortage Levels and Existing Stages

CWC Shortage Level Description	CWC Shortage Level	Municipal Code Shortage Stage	Municipal Code Water Conservation and Drought Stage Description
Up to 10%	1	Basic Stage	City's water supply is adequate to meet all projected demands
		Stage One Drought	City's water supply is adequate to meet 90% of projected demands
Up to 20%	2	Stage Two Drought	City's water supply is adequate to meet 80% of projected demands
Up to 30%	3	Stage Three Drought	City's water supply is adequate to meet 70% of projected demands
Up to 40%	4	Stage Four Drought	City's water supply is adequate to meet 60% of projected demands
Up to 50%	5	Stage Five Drought	City's water supply is adequate to meet 50% or less of projected demands
Greater than 50%	6		

1.4 Annual Water Supply and Demand Assessment Procedures

Pursuant to CWC 10632.1, all water suppliers are required to conduct an annual water supply and demand assessment on or before July 1 of each year beginning in 2022. If the supplier receives imported water from the State Water Project or the U.S. Bureau of Reclamation (USBR) they shall submit the report within 14 days of receiving final allocations or by July 1 of each year, whichever is later. The steps for conducting the Annual Water Supply and Demands Assessment are outlined in WSCP Table 5.

WSCP Table 5 Water Supply and Demand Assessment Procedure

Step	Description	Timeframe	Participants
Step 1	Request water utility data from all departments.	Jan 1 - Jan 31	Water Conservation Administrator
Step 2	Coordinate with Planning Division for any significant planned developments and project those water demands.	Jan 15 - Jan 31	Water Conservation Administrator Planning Division
Step 3	Compile water utility data into Water Utility Reporting Master spreadsheet.	Feb 1 - Feb 14	Water Conservation Administrator
Step 4	Calculate total projected unconstrained water demands for current year.	Feb 15-Feb 28	Senior Engineer – Water Utility

Step 5	Identify any constraints on facilities or infrastructure that could impact the supply of water such as planned maintenance that would take facilities offline or known damage to facilities/ infrastructure.	Feb 15-Feb 28	Hydrogeologist Senior Engineer – Water Utility Water Distribution Superintendent Water Treatment Plant Chief Operator
Step 6	Commence preparation of Annual Water Shortage Assessment Report.	March-April	Water Conservation Administrator Senior Engineer – Water Utility
Step 7	Receive final allotments from USBR for current year.	April	EU Assistant Director-Water Utility
Step 8	Subtract current year projected water demand from final allotment volume to determine shortage percentage and volume.	2 Days after notification from USBR	Senior Engineer – Water Utility
Step 9	If a shortage is identified Environmental Utilities (EU) Department is to hold an internal meeting to inform participants that a water shortage for the current year is anticipated and the extent of that shortage. Review the WSCP and Chapter 14.09 of the Roseville Municipal Code. Identify any concerns from the group regarding the ability to carry out the actions described in the WSCP and Chapter 14.09 of the Municipal Code. Assign an individual or group, among the participants, the responsibility of resolving the concern.	Within 7 days of notification from USBR	EU Director EU Assistant Director – Water Utility Hydrogeologist Water Distribution Super Intendent Water Treatment Plant Chief Operator Senior Engineer – Water Utility Water Conservation Administrator Additional participants as needed
Step 10	Inform City Manager of water shortage emergency condition.	Within 14 days of notification from USBR	City Manager EU Director EU Assistant Director – Water Utility Additional participants as needed
Step 11	Finalize and submit Annual Water Shortage Assessment Report to DWR.	By July 1 or 14 days after receiving final allocations	EU Assistant Director – Water Utility Water Conservation Administrator Senior Engineer – Water Utility
Step 11	The City Manager shall inform City Council of the water shortage emergency condition and the "Drought stage," under which the emergency falls. City Council shall declare a water shortage emergency condition to prevail within the area served by the City of Roseville Water Utility.	Within 28 days of notification from USBR	City Manager City Council Public Information Officer
Step 12	The City of Roseville shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency.	Within 28 days of notification from USBR	City Manager City Council Public Information Officer

Step 13	The public, interested parties, and local, regional, and state governments shall be noticed of the water shortage emergency condition and of all water shortage response actions triggered by the emergency declaration. Pursuant to Municipal Code Section 14.09.020(E), the City Manager, or assigned designee, shall be responsible for determining the means by which water users shall be notified. Possible means for notification include mass media, newspaper, public notice, mailings, utility billings, or by any combination of such notice.	Beginning 2 business days after declaration of emergency condition and continuing for as long as the emergency condition persists.	Water Conservation Administrator Senior Engineer – Water Utility Public Information Officer
Step 14	The appropriate Water Shortage Response Actions for the drought stage, outlined in WSCP Table 6 and 7, will be carried out by the public and water utility. The City will enforce compliance in accordance with Roseville Municipal Code 14.09.	Duration of emergency condition	EU – Water Utility Water Users City Manager or designee
Step 15	Track customer water use at a minimum on a monthly basis. Ensure that total gross water use for that month, or more frequent tracking period, is reduced by the necessary percentage when compared to that same tracking period of the last normal supply year.	Duration of emergency condition	Water Conservation Administrator Senior Engineer – Water Utility
Step 16	If the needed water use reduction percentage is not met for any month determine which additional strategies or actions would result in the needed reduction.	Upon determination of insufficient water use reduction	EU Director EU Assistant Director – Water Utility Hydrogeologist Senior Engineer – Water Utility Water Conservation Administrator Additional participants as needed
Step 17	The EU Department management shall propose to the City Manager additional shortage response actions and whether or not those actions would require the WSCP and Chapter 14.09 of the Roseville Municipal Code to be changed.	Upon determination of insufficient water use reduction	City Manager EU Director EU Assistant Director – Water Utility Additional participants as needed
Step 18	If deemed necessary, the City Manager and City Council will revise the WSCP and Chapter 14.09 of the Roseville Municipal Code, observing all required procedures with such adoption.	Upon determination of insufficient water use reduction	City Manager City Council Additional participants as needed
NOTES: It is the intent of the WSCP that the Water Conservation Administrator and Water Utility Senior Engineer shall jointly be responsible for ensuring that the steps of this plan are carried out by noticing the necessary parties for data requests and facilitating meetings.			

WSCP Table 6 Demand Reduction Actions to be Implemented at Each Shortage Level

Standard Shortage Level	Roseville Municipal Code Stage	Demand Reduction Actions	Estimated Percent Reduction	Section of Water Conservation and Drought Mitigation Ordinance corresponding to Demand Reduction Action *Explanations provided as needed*	Penalty, Charge, or Other Enforcement?
1	Basic	Landscape - Restrict or prohibit runoff from landscape irrigation	0%	14.09.030(A)	Yes
1	Basic	Landscape - Limit landscape irrigation to specific times	0%	14.09.020(A)(1); No person shall use, or cause to be used, any city water for landscape irrigation between the hours of 10:00 a.m. and 8:00 p.m., unless the city manager, or designee provides prior written consent to a different time limitation. A waiver may be granted for turf areas if the landscape contains too many irrigation valves to complete an irrigation event within the watering window.	Yes
1	Basic	Landscape - Limit landscape irrigation to specific days	0%	14.09.060(E)(2); Irrigation of new landscaping shall be allowed on any day of the week for a period of 30 days after the new landscaping is planted, unless the city manager, or designee, provides prior written consent to extend this time period based on plant type and the season when the new landscaping is planted. After the 30 days, irrigation days and run times should be decreased to settings appropriate for an established landscape.	Yes
1	Basic	Landscape - Prohibit certain types of landscape irrigation	0%	14.09.030(E); Prohibit operation of an irrigation system that applies water to an impervious surface or that is in disrepair.	Yes
1	Basic	Landscape - Other landscape restriction or prohibition	0%	14.09.030(G); Prohibit irrigation of landscaping during rainfall or 48 hours after a measurable rain event.	Yes
1	Basic	Landscape - Other landscape restriction or prohibition	0%	14.090.060(E)(1); All landscaping installed in the City of Roseville shall comply with the water efficient landscape requirements adopted by resolution of the city council.	Yes
1	Basic	Other water feature or swimming pool restriction	0%	14.09.030(C); Prohibit maintaining ponds, waterways, decorative basins, or swimming pools without water recirculation devices.	Yes
1	Basic	Other water feature or swimming pool restriction	0%	14.09.030(D); Prohibit backwashing so as to discharge to waste swimming pools, decorative basins or ponds in excess of the frequency necessary to ensure the healthful condition of the water or in excess of that required by standards for professionally administered maintenance or to address structural considerations, as determined by the city manager, or designee.	Yes
1	Basic	Other water feature or swimming pool restriction	0%	14.09.030(H); Prohibit overfilling of any pond, pool or fountain which results in water discharging to waste.	Yes

1	Basic	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	0%	14.09.060(C)	Yes
1	Basic	Other - Require automatic shut off hoses	0%	14.09.060(B); Free-flowing hoses for all uses are prohibited. Automatic shut-off devices shall be attached on any hose or filling apparatus in use.	Yes
1	Basic	Other	0%	14.09.030(B); Prohibit water fixtures (including, but not limited to, toilets, faucets, shower heads) or heating or cooling devices to leak or run to waste.	Yes
1	Basic	Other	0%	14.09.030(A); Prohibit water use for washing in excess of that necessary to wash, wet or clean the dirty or dusty object, such as an automobile, sidewalk, or parking area, flows to waste.	Yes
1	Basic	Other	0%	14.09.060(A); Water shall be confined to the user's property and shall not be allowed to run off to adjoining properties, or to the roadside or to the gutter. Care shall be taken not to water past the point of saturation.	Yes
1	Basic	Other	0%	14.09.060(F); All site reviews shall include an evaluation of using recycled water. Recycled water shall be required if economically feasible.	Yes
1	Stage 1	Landscape - Limit landscape irrigation to specific days	1%	14.09.070(C) and 14.09.070(D); Residential and non-residential water users shall be permitted to irrigate with city water according to the schedule provided in 14.09.070(C) and 14.09.070(D), respectively.	Yes
1	Stage 1	Landscape - Other landscape restriction or prohibition	1%	14.09.070(G); City park sites shall, as an aggregate, reduce usage up to 10 percent.	Yes
1	Stage 1	CII - Restaurants may only serve water upon request	1%	14.09.070(I)	Yes
1	Stage 1	Other - Prohibit use of potable water for washing hard surfaces	1%	14.09.070(H); Washing streets, parking lots, driveways, sidewalks or buildings, except as necessary for health or sanitary purposes or pursuant to a term or condition in a permit issued by a state or federal agency, is prohibited.	Yes
1	Stage 1	Other	10%	14.09.070(B); Residential users and non-residential users shall reduce water usage up to 10 percent.	Yes
2	Stage 2	Landscape - Other landscape restriction or prohibition	1%	14.09.070(C); City park sites shall, as an aggregate, reduce usage up to 20 percent.	Yes
2	Stage 2	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	1%	14.09.080(H)	Yes
2	Stage 2	Other	10-18%	14.09.080(B); Residential users and non-residential landscapes shall reduce water usage up to 20 percent.	Yes

3	Stage 3	Landscape - Limit landscape irrigation to specific days	1%	14.09.090(D) and 14.09.090(E); Residential and non-residential water users shall be permitted to irrigate with city water according to the schedule provided in 14.09.090(D) and 14.09.090(E), respectively.	Yes
3	Stage 3	Landscape - Other landscape restriction or prohibition	1%	14.09.090(C); City park sites shall, as an aggregate, reduce usage up to 30 percent.	Yes
3	Stage 3	Landscape - Other landscape restriction or prohibition	1%	14.09.090(H); New or expanded landscaping is limited to drought-tolerant trees, shrubs, and groundcover and be irrigated using a low volume irrigation system. No new turf shall be planted, hydroseeded, or laid, unless prior written consent is received from the city manager. Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.	Yes
3	Stage 3	Water Features - Restrict water use for decorative water features, such as fountains	1%	14.09.090(I)	Yes
3	Stage 3	Pools - Allow filling of swimming pools only when an appropriate cover is in place.	1%	14.09.090(L)	Yes
3	Stage 3	Other - Prohibit use of potable water for construction and dust control	1%	14.09.090(K)	Yes
3	Stage 3	Other	1%	14.09.090(I); Except where recycled water is used, golf courses shall reduce irrigation up to 30 percent.	Yes
3	Stage 3	Other	18-27%	14.09.090(B). Residential users and non-residential landscapes are to reduce water usage up to 30 percent.	Yes
4	Stage 4	Landscape - Limit landscape irrigation to specific days	2%	14.09.100(D) and 14.09.100(E); Residential and non-residential water users shall be permitted to irrigate with city water according to the schedule provided in 14.09.100(D) and 14.09.100(E), respectively.	Yes
4	Stage 4	Landscape - Other landscape restriction or prohibition	1%	14.09.100(C); City park sites shall, as an aggregate, reduce usage up to 40 percent.	Yes
4	Stage 4	Landscape - Other landscape restriction or prohibition	1%	14.09.100(H); Installation of any new landscaping is prohibited unless irrigation is provided through connection to an active recycled water system. In the case of new construction, the city's building official will issue a temporary final upon completion of the structural development of the property. When the city has returned to a stage two drought restriction, landscaping installation can be completed, and a building final will become available upon inspection by the city.	Yes

4	Stage 4	Other water feature or swimming pool restriction	1%	14.09.100(K); Existing pools shall not be emptied and refilled using city water unless required for health or safety reasons until the city has returned to a stage two drought restriction. Pools may be re-filled only to the extent necessary to replace evaporative losses.	Yes
4	Stage 4	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	1%	14.09.100(J); Automobiles or equipment shall be washed only at commercial establishments that recycle their water or by equipment and means that separates debris and recycles wash water for continual use.	Yes
4	Stage 4	Other	1%	14.09.100(I); Except where recycled water is used, golf courses shall reduce irrigation up to 40 percent.	Yes
4	Stage 4	Other	0%	14.09.100(L); No commitments shall be made to provide water service as part of any new land use entitlement (general plan, specific plan or amendments requesting new water allocations) until the city has returned to a stage two drought restriction. Currently approved specific plans with accompanying development agreements and projects or properties that have received water allocations in advance of full entitlements may be issued building permits so long as they comply with the remainder of this chapter.	Yes
4	Stage 4	Other	27-35%	14.09.100(B); Residential users and non-residential landscapes are to reduce water usage up to 40 percent.	Yes
5 & 6	Stage 5	Landscape - Other landscape restriction or prohibition	5%	14.09.110(C); Except where recycled water is used, water users shall reduce landscape irrigation as follows: 1. Turf shall not be irrigated. 2. Trees and shrubs may be irrigated with a properly functioning low volume landscape irrigation system or by use of a handheld hose equipped with a nozzle capable of completely shutting off the flow of water except when positive action or pressure to maintain the flow of water is applied. Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.	Yes
5 & 6	Stage 5	Other water feature or swimming pool restriction	1%	14.09.110(D); Filling new or existing swimming pools and spas with city water is prohibited.	Yes
5 & 6	Stage 5	Other	33%	14.09.110(B); Residential users are to reduce water usage up to 50 percent.	Yes
NOTES: For each successive drought level all preceding restrictions shall continue in place, except to the extent they are replaced by more restrictive conditions.					

1.5 Supply Augmentation and Operational Changes

Under normal operational conditions the City's groundwater strategy is to not pump well water in excess of the potable water that is injected annually. At this time, the City's injection volume of groundwater is planned to exceed extraction volume over time, as the groundwater program is still in development. The positive difference between the injection and extraction volume is the net volume of water that the City places into long-term storage or makes available for other users. Per Section 14.09.050 of the Municipal Code, when determining drought staging, the City cannot consider the effect of well water reducing the need for conservation until a stage three drought level is reached. Specifically, the code mentions that well water cannot be considered as an alternative to declaration of a stage one or stage two drought level. The City may choose to operationalize groundwater infrastructure in any year type based on water supply conditions and/or operations and maintenance strategies for infrastructure, however this shall not be determined to reduce or alleviate the appropriate drought stage given hydrologic conditions and surface water allocations for that year. The percent reduction that could result from this supply augmentation action for the different stages is provided in WSCP Table 7. Note that there are no supply augmentation actions for drought stages 1 and 2.in accordance with the provisions of the Municipal code.

WSCP Table 7 Supply Augmentation During Stage 3 Droughts and Higher

Standard Shortage Level	Roseville Municipal Code Stage	Supply Augmentation Methods and Other Actions by Water Supplier	Percent Reduction	Additional Explanation
3	3	Stored Emergency Supply	0-10%	Groundwater Pumped
4	4	Stored Emergency Supply	0-20%	Groundwater Pumped
5 & 6	5	Stored Emergency Supply	0-30%	Groundwater Pumped

The water utility would need to adjust its operations to support a drought stage that would prompt increased reliance on well water. Tasks for operations may include more frequent maintenance of well pumps and chemical injection pumps, monitoring of ground water level, and filter backwashing.

1.6 Compliance and Enforcement

The Water Conservation and Drought Mitigation ordinance grants the City the authority to enforce compliance with the water use limitations outlined in WSCP Table 6. The sections of the Water Conservation and Drought Mitigation Ordinance, detailing compliance and enforcement authority and measures are provided below.

14.09.020 General provisions

C. Administration and Enforcement. The city manager, or designee, including, but not limited to, an enforcement officer as defined herein, shall administer, implement, and enforce the provisions of this chapter. For purposes of this chapter an "enforcement officer" means any city employee or agent of the city with the authority to enforce any provision of this chapter and the authority to make any decision on behalf of the city manager required or called for by this chapter.

D. Compliance. All provisions of this chapter are subject to the compliance procedures set forth in this chapter unless otherwise expressly stated herein.

14.09.140 Violations

It is Unlawful for any user and/or person to violate any provision or fail to comply with any of the requirements of this chapter. Causing, permitting, aiding, abetting or concealing a violation of any provision of this chapter shall constitute a violation of this chapter. A violation of the provisions of this chapter shall occur irrespective of the negligence or intent of the violator and a violation of or failure to comply with any of the requirements of this chapter may be charged as either an infraction or a misdemeanor in the discretion of the city attorney. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 3834 § 3, 2002; Ord. 2413 § 2, 1991.)

14.09.150 Enforcement authority

A. Whenever the city manager, or designee (including, but not limited to, an enforcement officer), determines that a user and/or person has violated any provision of, or failed to meet a requirement of, this chapter, an administrative citation pursuant to Chapter 2.50 or a written compliance order pursuant to Chapter 2.52 may be issued to any user and/or person responsible for the violation.

B. Any compliance order issued may require without limitation any or all of the following:

1. The allocation of a particular amount of water to a given user and/or person responsible for the violation;
2. The issuance of a fine;
3. The installation of a flow restriction device;
4. The performance of monitoring, analyses, and reporting;
5. That violations shall cease and desist; and/or
6. The discontinuance of water service

The compliance order shall set forth a deadline within which the requirements of the compliance order must be completed. Said compliance order shall further advise that, should the violator fail to comply with the compliance order within the established deadline, a hearing on the compliance order shall be set. (Ord. 5491 § 11, 2015; Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 3034 § 3, 2002; Ord. 2817 § 1, 1994; Ord. 2413 § 2, 1991.)

14.090.180 Separate offense for each day.

Any user and/or person that violates any provision of this chapter shall be guilty of a separate offense for each and every day during any portion of which any user and/or person commits, continues, permits, or causes a violation thereof, and shall be punished accordingly. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

1.7 Financial Consequences

During times of an emergency condition, the City is expected to see significant revenue reduction as a result of demand reduction actions lowering total gross water use. Additionally, enforcement of demand reduction actions, which could include investigating water waste complaints, follow ups to check for compliance, administering warnings or fines, and installation of flow restriction devices, would incur additional expenses that would not be present during non-emergency conditions.

Revenue loss percentage for each drought stage is anticipated to be approximately equal to the demand reduction percentage for each respective shortage level. Enforcement expenses will vary based on customer compliance and drought stage. For instance, at the onset of demand reduction action implementation, resources needed for enforcement may be high as customers adjust to altering their use or compliance from customers could vary seasonally with customers finding it more difficult to comply during warmer months.

The City plans to mitigate the financial consequences associated with water shortage response actions primarily through their recently adopted water rate structure, which allows for adequate reserves to accommodate reductions in revenue and increases in cost due to drought. If the water shortage rate charges are insufficient to make up for the loss in revenue, the City will use financial reserves to mitigate remaining financial consequences.

1.8 Plan Adoption, Submittal, and Availability

The Water Shortage Contingency Plan will be included as an appendix in the 2020 Urban Water Management Plan (UWMP) and will be introduced and discussed with the public and City Council in the same meetings but as separate agenda items. The WSCP is intended to be a stand-alone document and as such will be adopted by the City independently of the UWMP. The WSCP may be updated as needed between the regular 5-year updates of the UWMP and no required WSCP update shall necessitate an update of the UWMP.

The City has encouraged community and public interest involvement in the WSCP using public meetings and web-based communication. A public meeting will be held on June 16, 2021 and will provide an opportunity for the general public to ask questions and raise concerns regarding the WSCP. Prior to the public hearing the draft WSCP was made available for public inspection on the City's website: www.roseville.ca.us/WSCP/.

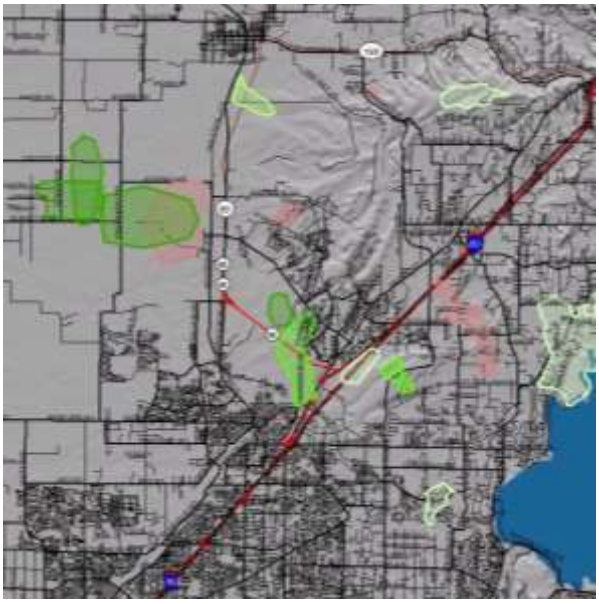
The WSCP will be presented to City Council on June 16, 2021 for adoption. Copies of the adoption resolutions will be provided as Exhibit C. A copy of this WSCP will be submitted to DWR within 30 days of adoption and by July 1, 2021. The adopted WSCP will be submitted electronically to DWR. A CD or hardcopy of the adopted WSCP will also be submitted to the California State Library. No later than 30 days after submittal to DWR, copies of the adopted WSCP will be available for public review at the City's public offices. An electronic copy of this plan will also be available for review and download on the City's website: www.roseville.ca.us/WSCP/.

Exhibit A – City of Roseville 2016 Multi-Hazard Mitigation Plan

CITY OF ROSEVILLE CALIFORNIA

2016 Multi-Hazard Mitigation Plan



TETRA TECH

September 2016

CONTENTS

Executive Summary xvi
Plan Update xvi
Plan Update Methodology xvii
Phase 1—Organize Resources xvii
Phases 2 —Update the Risk Assessment xviii
Phase 3—Engage the Public xviii
Phase 4—Assemble the Updated Plan xviii
Phase 5—Plan Adoption/Implementation xviii
Mitigation Guiding Principle, Goals, and Objectives xix
Guiding Principle xix
Goals xix
Objectives xix
Mitigation Action Plan xx
Implementation xx
1. Introduction to Hazard Mitigation Planning 1-1
1.1 Why Prepare This Plan? 1-1
1.1.1 The Big Picture 1-1
1.1.2 Roseville's Response to the DMA 1-1
1.2 Who Will Benefit From This Plan? 1-2
1.3 Contents of This Plan 1-2
2. Plan Update—What Has Changed 2-1
2.1 The Previous Plan 2-1
2.2 Mitigation Success Stories 2-1
2.3 Why Update? 2-2
2.3.1 Federal Eligibility 2-2
2.3.2 Changes in Development 2-2
2.4 The Updated Plan—What Is Different? 2-2
3. Plan Update Approach 3-1
3.1 Planning Resource Organization 3-1
3.1.1 Internal Funding 3-1
3.1.2 Formation of the Planning Team 3-1
3.1.3 The Steering Committee 3-2
3.1.4 Coordination with Other Agencies 3-2
3.1.5 Review of Existing Programs 3-3
3.2 Risk Assessment Update 3-4
3.3 Public Involvement 3-4
3.3.1 Strategy 3-4
3.3.2 Public Involvement Results 3-7
3.4 Assemble the Updated Plan 3-9
3.5 Plan Development Chronology/Milestones 3-10
4. City of Roseville Profile 4-1
4.1 Geographic Profile 4-1
4.2 Historical Overview 4-3

4.2.1 Pre-Development 4-3
4.2.2 Founding of the Community 4-3
4.2.3 Post-Incorporation Development 4-3
4.2.4 Current Conditions 4-4
4.3 Major Past Hazard Events 4-4
4.4 Physical Setting 4-4
4.4.1 Geology 4-4
4.4.2 Soils 4-4
4.4.3 Climate 4-5
4.5 Development Profile 4-5
4.5.1 Land Use Policies 4-5
4.5.2 Residential Development 4-8
4.5.3 Non-Residential Development 4-8
4.5.4 Critical Facilities and Infrastructure 4-10
4.5.5 Future Trends in Development 4-14
4.6 Open Space and Habitat 4-14
4.6.1 Grasslands 4-14
4.6.2 Oak Woodlands and Riparian Areas 4-14
4.6.3 Seasonal Wetlands 4-15
4.6.4 Sensitive Species 4-15
4.7 Demographics 4-16
4.7.1 Population Trends 4-16
4.7.2 Age Distribution 4-17
4.7.3 Race, Ethnicity and Language 4-19
4.7.4 Individuals with Disabilities and Others with Access and Functional Needs 4-20
4.8 Economy 4-20
4.8.1 Income 4-20
4.8.2 Industry, Businesses and Institutions 4-21
4.8.3 Employment Trends and Occupations 4-22
4.9 Laws and Ordinances 4-23
4.9.1 Federal 4-23
4.9.2 State 4-28
4.9.3 City Plans and Programs 4-32
4.10 Capability Assessment 4-36

5. Identified Hazards of Concern and Risk Assessment Methodology 5-1

5.1 Identified Hazards of Concern 5-1
5.2 Methodology 5-2
5.3 Risk Assessment Tools 5-2
5.3.1 Dam Failure, Earthquake and Flood—Hazus-MH 5-2
5.3.2 Landslide, Severe Weather, and Wildfire 5-3
5.3.3 Drought 5-3
5.3.4 Climate Change 5-4
5.3.5 Health Hazards and Human-Caused Hazards 5-4
5.4 Mapping 5-4
5.4.1 Building and Cost Data 5-4
5.4.2 Hazus-MH Data Inputs 5-4
5.4.3 Other Local Hazard Data 5-5
5.4.4 Data Source Summary 5-5
5.4.5 Limitations 5-5

6. Climate Change Considerations for Hazard Mitigation 6-1
6.1 California Senate Bill No. 379 6-1
6.2 What is Climate Change? 6-2
6.3 How Climate Change Affects Hazard Mitigation 6-3
6.4 Current Indications of Climate Change 6-3
6.5 Projected Future Impacts 6-4
6.5.1 Precipitation 6-4
6.5.2 Temperature 6-5
6.5.3 Snow Pack 6-5
6.5.4 Wildfire 6-5
6.6 Responses to Climate Change 6-6
6.6.1 Mitigation and Adaptation 6-6
6.6.2 Ecosystem-Based Adaptation 6-6
6.6.3 City of Roseville Sustainability Efforts 6-6
6.7 Climate Change Impacts on Hazards 6-7
6.7.1 Drought 6-7
6.7.2 Earthquake 6-8
6.7.3 Flood 6-8
6.7.4 Landslide 6-9
6.7.5 Severe Weather 6-10
6.7.6 Wildfire 6-11
7. Dam Failure 7-1
7.1 General Background 7-1
7.1.1 Causes of Dam Failure 7-1
7.1.2 Regulatory Oversight 7-2
7.2 Hazard Profile 7-3
7.2.1 Past Events 7-3
7.2.2 Location 7-4
7.2.3 Frequency 7-4
7.2.4 Severity 7-4
7.2.5 Warning Time 7-4
7.2.6 Folsom Dam Containment Dike Failure Risk Assessment 7-5
7.3 Secondary Hazards 7-6
7.4 Exposure 7-8
7.4.1 Population 7-8
7.4.2 Property 7-8
7.4.3 Critical Facilities 7-8
7.4.4 Environment 7-8
7.5 Vulnerability 7-9
7.5.1 Population 7-9
7.5.2 Property 7-9
7.5.3 Critical Facilities 7-9
7.5.4 Environment 7-10
7.6 Future Trends in Development 7-10
7.7 Review of Existing Ordinances, Programs and Plans 7-10
7.8 Scenario 7-10
7.9 Issues 7-11
8. Drought 8-1

8.1 General Background 8-1
8.1.1 Water Supply Strategy 8-1
8.1.2 Water Supply Infrastructure 8-2
8.1.3 The Water Forum 8-3
8.1.4 Local Water Contracts—Definition of Drought 8-3
8.2 Hazard Profile 8-4
8.2.1 Past Events 8-4
8.2.2 Location 8-5
8.2.3 Frequency 8-9
8.2.4 Severity 8-9
8.2.5 Warning Time 8-9
8.3 Secondary Hazards 8-10
8.4 Exposure 8-10
8.5 Vulnerability 8-10
8.5.1 Population 8-10
8.5.2 Property 8-10
8.5.3 Critical Facilities 8-10
8.5.4 Environment 8-11
8.5.5 Economic Impact 8-11
8.6 Future Trends in Development 8-11
8.7 Review of Existing Ordinances, Programs and Plans 8-12
8.8 Scenario 8-13
8.9 Issues 8-13

9. Earthquake 9-1

9.1 General Background 9-1
9.1.1 Damage from Earthquakes 9-1
9.1.2 Earthquake Classifications 9-1
9.1.3 Ground Motion 9-3
9.1.4 Effect of Soil Types 9-3
9.2 Hazard Profile 9-4
9.2.1 Past Events 9-4
9.2.2 Location 9-5
9.2.3 Frequency 9-12
9.2.4 Severity 9-12
9.2.5 Warning Time 9-12
9.3 Secondary Hazards 9-13
9.4 Exposure 9-13
9.4.1 Population 9-13
9.4.2 Property 9-13
9.4.3 Critical Facilities 9-13
9.4.4 Environment 9-14
9.5 Vulnerability 9-15
9.5.1 Population 9-15
9.5.2 Property 9-15
9.5.3 Critical Facilities 9-18
9.5.4 Environment 9-18
9.6 Future Trends in Development 9-19
9.7 Review of Existing Ordinances, Programs and Plans 9-19
9.7.1 International Building Codes 9-19

9.7.2 Improvement Standards 9-20
9.7.3 Geotechnical Studies 9-20
9.8 Scenario 9-20
9.9 Issues 9-20

10. Flooding 10-1

10.1 General Background 10-1
10.1.1 Measuring Floods and Floodplains 10-1
10.1.2 Effects of Human Activities 10-1
10.1.3 Floodplain Ecosystems 10-1
10.1.4 Federal Flood Programs 10-2
10.2 Hazard Profile 10-3
10.2.1 Flooding Types 10-3
10.2.2 Past Events 10-4
10.2.3 Location 10-7
10.2.4 Frequency 10-8
10.2.5 Severity 10-10
10.2.6 Warning Time 10-10
10.3 Secondary Hazards 10-12
10.4 Exposure 10-12
10.4.1 Population 10-12
10.4.2 Property 10-12
10.4.3 Critical Facilities and Infrastructure 10-14
10.4.4 Environment 10-15
10.5 Vulnerability 10-15
10.5.1 Population 10-15
10.5.2 Property 10-16
10.5.3 Critical Facilities and Infrastructure 10-19
10.5.4 Environment 10-19
10.6 Future Trends in Development 10-19
10.7 Review of Existing Ordinances, Programs, and Plans 10-21
10.7.1 Structural Mitigation 10-21
10.7.2 Non-Structural Mitigation 10-22
10.7.3 Regulations 10-22
10.7.4 Stormwater Management 10-26
10.7.5 Outreach and Public Education 10-28
10.8 Scenario 10-28
10.9 Issues 10-28

11. Landslide 11-1

11.1 General Background 11-1
11.1.1 Landslide Types 11-1
11.1.2 Landslide Modeling 11-3
11.2 Hazard Profile 11-3
11.2.1 Past Events 11-3
11.2.2 Location 11-3
11.2.3 Frequency 11-4
11.2.4 Severity 11-4
11.2.5 Warning Time 11-6
11.3 Secondary Hazards 11-6

11.4 Exposure 11-6
11.4.1 Population 11-6
11.4.2 Property 11-6
11.4.3 Critical Facilities and Infrastructure 11-7
11.4.4 Environment 11-7
11.5 Vulnerability 11-7
11.5.1 Population 11-7
11.5.2 Property 11-8
11.5.3 Critical Facilities and Infrastructure 11-8
11.5.4 Environment 11-8
11.6 Future Trends in Development 11-8
11.7 Review of Existing Ordinances, Programs, and Plans 11-8
11.8 Scenario 11-10
11.9 Issues 11-10

12. Severe Weather 12-1

12.1 General Background 12-1
12.1.1 Tornadoes 12-2
12.1.2 Windstorms 12-2
12.1.3 Fog 12-5
12.1.4 Heavy Rains, Thunderstorms and Lightning 12-6
12.1.5 Ice and Freezing Rain 12-7
12.2 Hazard Profile 12-7
12.2.1 Past Events 12-7
12.2.2 Location 12-7
12.2.3 Frequency 12-7
12.2.4 Severity 12-9
12.2.5 Warning Time 12-9
12.3 Secondary Hazards 12-9
12.4 Exposure 12-9
12.4.1 Population 12-9
12.4.2 Property 12-9
12.4.3 Critical Facilities and Infrastructure 12-9
12.4.4 Environment 12-10
12.5 Vulnerability 12-10
12.5.1 Population 12-10
12.5.2 Property 12-10
12.5.3 Critical Facilities and Infrastructure 12-11
12.5.4 Environment 12-11
12.6 Future Trends in Development 12-11
12.7 Review of Existing Ordinances, Programs, and Policies 12-11
12.8 Scenario 12-11
12.9 Issues 12-12

13. Wildfire 13-1

13.1 General Background 13-1
13.1.1 Contributing Factors 13-1
13.1.2 Local Conditions Related to Wildfire Hazard 13-1
13.2 Hazard Profile 13-3
13.2.1 Past Events 13-3

13.2.2 Location 13-4
13.2.3 Frequency 13-8
13.2.4 Severity 13-9
13.2.5 Warning Time 13-11
13.3 Secondary Hazards 13-11
13.4 Exposure 13-11
13.4.1 Population 13-11
13.4.2 Property 13-11
13.4.3 Critical Facilities and Infrastructure 13-11
13.4.4 Environment 13-12
13.5 Vulnerability 13-12
13.5.1 Population 13-12
13.5.2 Property 13-13
13.5.3 Critical Facilities and Infrastructure 13-13
13.6 Future Trends in Development 13-13
13.7 Review of Existing Programs, Plans and Ordinances 13-14
13.7.1 Fire Prevention Programs and Standards 13-14
13.7.2 Adopted Service Levels for Response Time 13-15
13.7.3 Annual Monitoring of Fire Department Service Levels 13-16
13.7.4 Personnel Training 13-17
13.7.5 Fire Investigation 13-17
13.7.6 Comprehensive Emergency Medical Services 13-18
13.7.7 Accreditation Recommendation 13-17
13.8 Scenario 13-18
13.9 Issues 13-19

14. Human Health Hazards 14-1

14.1 General Background 14-1
14.1.1 Influenza 14-1
14.1.2 Smallpox 14-3
14.1.3 Viral Hemorrhagic Fevers 14-3
14.1.4 Plague 14-5
14.1.5 Tick-Borne Disease 14-5
14.1.6 Mosquito-Borne Disease 14-7
14.1.7 Anthrax 14-10
14.1.8 Severe Acute Respiratory Syndrome 14-10
14.1.9 Extreme Weather 14-11
14.2 Hazard Profile 14-12
14.2.1 Past Events 14-13
14.2.2 Location 14-13
14.2.3 Frequency 14-14
14.2.4 Severity 14-14
14.3 Secondary Hazards 14-14
14.4 Exposure and Vulnerability 14-14
14.4.1 Population 14-14
14.4.2 Property 14-15
14.4.3 Critical Facilities and Infrastructure 14-15
14.4.4 Environment 14-15
14.4.5 Economy 14-15
14.5 Future Trends in Development 14-15

14.6 Review of Existing Ordinances, Programs and Plans 14-15
14.6.1 Hospital Expansions to Care for Growing Populations 14-15
14.6.2 Memorandums of Agreement 14-16
14.6.3 Integrated Emergency Response 14-17
14.7 Scenario 14-17
14.8 Issues 14-17

15. Human-Caused Hazards 15-1

15.1 General Background 15-1
15.1.1 Man-Made Hazards 15-2
15.1.2 Technological Hazards 15-7
15.1.3 Civil Disorder 15-10
15.2 Hazard Profile 15-10
15.2.1 Past Events 15-10
15.2.2 Location 15-16
15.2.3 Frequency 15-20
15.2.4 Severity 15-20
15.2.5 Warning Time 15-21
15.3 Secondary Hazards 15-21
15.4 Exposure 15-21
15.4.1 Population 15-22
15.4.2 Property 15-23
15.4.3 Critical Facilities and Infrastructure 15-23
15.4.4 Environment 15-24
15.5 Vulnerability 15-25
15.5.1 Population 15-25
15.5.2 Property 15-25
15.5.3 Critical Facilities and Infrastructure 15-25
15.5.4 Environment 15-25
15.5.5 Economic impacts 15-25
15.6 Future Trends in Development 15-26
15.7 Review of Existing Ordinances, Programs, and Plans 15-26
15.7.1 City of Roseville Emergency Response Plan 15-26
15.7.2 City of Roseville Terrorism Contingency Plan 15-26
15.7.3 City of Roseville Hazardous Materials Contingency Plan 15-27
15.7.4 State of California Certified Unified Program Agency 15-27
15.7.5 Roseville Police Department 15-28
15.7.6 Roseville Public Safety Communications 15-28
15.7.7 Roseville Fire Department 15-28
15.8 Scenario 15-31
15.9 Issues 15-31

16. Planning Area Risk Ranking 16-1

16.1 Probability of Occurrence 16-1
16.2 Impact 16-1
16.3 Risk Rating and Ranking 16-3

17. Guiding Principle, Goals and Objectives 17-1

17.1 Guiding Principle 17-1
17.2 Goals 17-1

17.3 Objectives 17-2

18. Mitigation Alternatives 18-1

19. Action Plan and Implementation 19-1

19.1 Hazard Mitigation Action Plan 19-1
19.1.1 Benefit-Cost Review 19-7
19.1.2 Action Plan Prioritization 19-8
19.1.3 Analysis of Mitigation Actions 19-8
19.2 Adoption 19-8
19.3 Plan Maintenance Strategy 19-13
19.3.1 Plan Implementation 19-14
19.3.2 Steering Committee 19-14
19.3.3 Annual Progress Report 19-15
19.3.4 Plan Update 19-15
19.3.5 Continuing Public Involvement 19-16
19.3.6 Incorporation into Other Planning Mechanisms 19-16

References

Glossary

Appendices

Appendix A. Public Outreach Materials
Appendix B. 2015 Progress Report
Appendix C. Steering Committee Participation Documentation

Tables

Table 2-1. Plan Changes Crosswalk 2-3
Table 3-1. Steering Committee Members 3-2
Table 3-2. Summary of Public Meetings 3-7
Table 3-3. Plan Development Chronology/Milestones 3-11
Table 4-1. Presidential Major Disaster, Emergency, and Fire Management Assistance Declarations 4-5
Table 4-2. Roseville Climate 4-6
Table 4-3. Non-Residential Land Uses 4-9
Table 4-4. Non-Residential Development Profile as of July 2016 4-10
Table 4-5. Planning Area Critical Facilities 4-10
Table 4-6. Planning Area Critical Infrastructure 4-10
Table 4-7. General Plan Projections of Residential Units and Population by Specific Plan Area 4-18
Table 4-8. Status of Non-Institutionalized Population with Disabilities 4-20
Table 4-9. Population Under the Poverty Level 4-21
Table 4-10. Legal and Regulatory Capability 4-37
Table 4-11. Administrative and Technical Capability 4-39
Table 4-12. Fiscal Capability 4-39
Table 4-13. National Flood Insurance Program Compliance 4-40

Table 4-14. Education and Outreach 4-40
Table 4-15. Community Classifications 4-41
Table 5-1. Hazus-MH Model Data Documentation 5-6
Table 7-1. Dams in Placer and Sacramento Counties With Potential to impact Roseville 7-4
Table 7-2. Hazard Potential Classification 7-5
Table 7-3. Value of Property Exposed to Dam Failure 7-8
Table 7-4. Critical Facilities in Dam Failure Inundation Areas in Roseville 7-8
Table 7-5. Loss Estimates for Dam Failure 7-9
Table 8-1. City of Roseville Water Supply Contracts and Resources 8-2
Table 8-2. Dry Year Flows into Folsom Lake 8-3
Table 8-3. Water Supply Reliability by 2040 8-11
Table 8-4. City of Roseville Past, Current, and Projected Water Use 8-12
Table 9-1. Richter Magnitude Scale 9-2
Table 9-2. Moment Magnitude Scale 9-2
Table 9-3. Mercalli Scale and Peak Ground Acceleration Comparison 9-3
Table 9-4. NEHRP Soil Classification System 9-4
Table 9-5. Recent Earthquakes Magnitude 5.0 or Larger Within 100-mile radius 9-4
Table 9-6. Critical Facilities Exposed to the Earthquake Hazard 9-13
Table 9-7. Critical Infrastructure Exposed to the Earthquake Hazard 9-13
Table 9-8. Age of Structures in the City of Roseville 9-16
Table 9-9. Building Type 9-16
Table 9-10. Damage Probability (Vulnerability) of Critical Facilities from a 100-Year Earthquake Event 9-18
Table 9-11. Damage Probability (Vulnerability) of Critical Facilities from the Great Valley 3 Scenario 9-18
Table 9-12. Functionality of Critical Facilities, 100-Year Earthquake 9-19
Table 9-13. Functionality of Critical Facilities, Great Valley 3 Scenario 9-19
Table 10-1. Reported Damage from Major Flooding in Roseville (1973 to 2009) 10-4
Table 10-2. Observed Characteristics of Flooding 10-10
Table 10-3. Structures Within the SFHA and the Roseville Regulatory Floodplain 10-12
Table 10-4. Value of Exposed Buildings Within the FEMA SFHA 10-13
Table 10-5. Value of Exposed Buildings Within the Roseville Regulatory Floodplain 10-13
Table 10-6. Critical Facilities in Flood Area 10-14
Table 10-7. Critical Infrastructure in Flood Areas 10-14
Table 10-8. Flood Insurance Statistics for the City of Roseville 10-16
Table 10-9. Estimated Flood Loss for the 10-Year Flood Event (Preliminary FIRM) 10-17
Table 10-10. Estimated Flood Loss for the 100-Year and 500-Year Flood Events (Preliminary FIRM) 10-18
Table 10-11. Estimated Flood Loss for the Regulatory Floodplain 10-18
Table 11-1. Loss Estimates for Buildings Vulnerable to High Landslide Hazard 11-8
Table 11-2. Loss Estimates for Buildings Vulnerable to Moderate Landslide Risk Hazard 11-8
Table 12-1. Monthly Wind Records for Sacramento, California 12-5
Table 12-2. Monthly Dense Fog Occurrence 12-6
Table 12-3. Frequency of Thunderstorms in Sacramento, California, 1948 – 2008 12-6
Table 12-4. Severe Weather Events in Placer County since 1958 (NOAA 2015) 12-8
Table 12-5. Loss Potential for Roseville Buildings Vulnerable to Severe Weather Hazard 12-10
Table 13-1. Wildfire Incident Counts—2011 to 2015 13-8
Table 13-2. Critical Facilities and Infrastructure Adjacent to Potential Wildfire Areas 13-12
Table 13-3. Potential Loss Estimates for the Wildfire Hazard 13-13
Table 15-1. Event Profiles for Terrorism 15-3
Table 15-2. Common Mechanisms for Cyber Attacks 15-6
Table 15-3. Accidents Responded to by McClellan Fire Department, 1950-1980s 15-11

Table 15-4. Traffic Accident Counts—2009 to 2014 15-16
Table 15-7. Criticality Factors 15-21
Table 15-8. Vulnerability Criteria 15-22
Table 15-9. Residential Dwelling Units in the City of Roseville as of 2012 15-23
Table 16-1. Probability of Hazards 16-1
Table 16-2. Impact on People from Hazards 16-2
Table 16-3. Impact on Property from Hazards 16-3
Table 16-4. Impact on Economy from Hazards 16-3
Table 16-5. Hazard Risk Rating 16-3
Table 16-6. Hazard Risk Ranking 16-4
Table 17-1. Objectives for 2011 Multi-Hazard Mitigation Plan 17-2
Table 18-1. Alternatives to Mitigate the Dam Failure Hazard 18-2
Table 18-2. Alternatives to Mitigate the Drought Hazard 18-3
Table 18-3. Alternatives to Mitigate the Earthquake Hazard 18-4
Table 18-4. Alternatives to Mitigate the Flooding Hazard 18-5
Table 18-5. Alternatives to Mitigate the Landslide Hazard 18-6
Table 18-6. Alternatives to Mitigate the Severe Weather Hazard 18-7
Table 18-7. Alternatives to Mitigate the Wildfire Hazard 18-8
Table 18-8. Alternatives to Mitigate Health Hazards 18-9
Table 18-9. Alternatives to Mitigate Human-Cause Hazards 18-9
Table 19-1. Action Plan 19-2
Table 19-2. Prioritization of Mitigation Actions 19-9
Table 19-3. Analysis of Mitigation Actions 19-11

Figures

Figure 3-1. Hazard Mitigation Booth 3-6
Figure 3-2. City of Roseville Earth Day Festival 3-6
Figure 3-3. Hazus-MH Work Station 3-6
Figure 3-4. Sample Printout from Work Station 3-6
Figure 3-5. Twitter Survey Announcement 3-8
Figure 3-6. Facebook Survey Announcement 3-8
Figure 3-7. Nextdoor Survey Announcement 3-8
Figure 3-8. Sample Page from Hazard Mitigation Plan Website 3-9

Figure 4-1. Roseville Planning Area 4-2
Figure 4-2. Total Land Use Allocation in Roseville 4-7
Figure 4-3. Critical Facilities in the Planning Area 4-11
Figure 4-4. Critical Infrastructure in the Planning Area—Transportation 4-12
Figure 4-5. Critical Infrastructure in the Planning Area—Utilities 4-13
Figure 4-6. Placer County and Roseville Population Growth 4-17
Figure 4-7. Planning Area Age Distribution 4-18
Figure 4-8. Planning Area Race Distribution 4-19
Figure 4-9. Industry in the Planning Area 4-21
Figure 4-10. California and Roseville Unemployment Rate (U.S. Census, 2009 – 2014) 4-22
Figure 4-11. Occupations in the Planning Area 4-23

Figure 6-1. Global Carbon Dioxide Concentrations Over Time 6-2

Figure 6-2. Observed and Projected Average Temperatures in the Roseville Area 6-5
Figure 6-3. Projected Future Fire Risk in Placer County Relative to 2010 Levels 6-5

Figure 7-1. Folsom Dam and Folsom Lake on the American River, Looking Northeast 7-6
Figure 7-2. Folsom Dam Containment Dike Failure Flow Direction and Evacuation Routes 7-7

Figure 8-1. Palmer Crop Moisture Index for Week Ending January 30, 2016 8-6
Figure 8-2. Palmer Z Index Short-Term Drought Conditions (December 2015) 8-6
Figure 8-3. Palmer Drought Severity Index (December 2015) 8-7
Figure 8-4. Palmer Hydrological Drought Index Long-Term Hydrologic Conditions (December 2015) 8-8
Figure 8-5. 24-Month Standardized Precipitation Index (January 2013 – December 2015) 8-8

Figure 9-1. Location of Recent Earthquakes in Roseville Vicinity 9-5
Figure 9-2. 100-Year Probabilistic PGA 9-8
Figure 9-3. Concord-Green Valley Fault Scenario PGA 9-9
Figure 9-4. Great Valley 3 Fault Scenario PGA 9-10
Figure 9-5. National Earthquake Hazard Reduction Program Soil Classification 9-11
Figure 9-6. Age of Construction of Structures in Roseville 9-17

Figure 10-1. CRS Communities by Class as of May 1, 2016 10-3
Figure 10-2. Dry Creek Flooding, January 1995 10-6
Figure 10-3. Business Flooding, February 1998 10-7
Figure 10-4. Floodplains 10-9
Figure 10-5. Example of Stream Gauge Graphic Display 10-11
Figure 10-6. Repetitive Loss Area 10-20
Figure 10-7. Floodplain Designation Cross-Sections for Infill Areas 10-23
Figure 10-8. Floodplain Designation Cross-Sections for Areas Other Than Infill Areas 10-23
Figure 10-9. Updated Floodplain Mapping 10-26

Figure 11-1. Deep Seated Slide 11-2
Figure 11-2. Shallow Colluvial Slide 11-2
Figure 11-3. Bench Slide 11-2
Figure 11-4. Large Slide 11-2
Figure 11-5. Typical Debris Avalanche Scar and Track 11-2
Figure 11-6. Roseville Area Landslide Hazard Map 11-5

Figure 12-1. Roseville Regional Surface Elevation 12-1
Figure 12-2. Potential Impact and Damage from a Tornado 12-3
Figure 12-3. Tornado Risk Areas in the Coterminous United States 12-4

Figure 13-1. CAL FIRE FRAP Map for Placer County 13-5
Figure 13-2. View of Ravine, Tree Canopy and Stoneridge Development 13-6
Figure 13-3. Stoneridge Specific Plan Wildfire Threat Areas 13-8
Figure 13-4. Fire Hazard Severity Zones in the Planning Area 13-10
Figure 13-5. City of Roseville Fire Training Center 13-17

Figure 14-1. Areas with Confirmed H5N1 2003-2013 14-2
Figure 14-2. 2014 Distribution of Ebola Virus Outbreaks in Humans and Animals 14-4
Figure 14-3. California 2014 *Yersinia Pestis* Results in Tested Mammals by County 14-6

Figure 15-1. Pop-Up Message Indicating Ransomware Infection 15-6
Figure 15-2. February 12, 2006 Aircraft Crash into Residence 15-12
Figure 15-3. October 21, 2010 Arson Fire at Galleria Mall 15-13
Figure 15-4. 1973 Roseville Rail Yard Disaster 15-14

Figure 15-5. 1997 Bomb Discovery 15-15
Figure 15-6. The J.R. Davis Yard in Roseville, the Largest Train Yard West of the Mississippi..... 15-17
Figure 15-7. Roseville Truck Routes with High Potential for Hazardous Materials Incidents 15-18
Figure 15-8. Kinder Morgan National Pipeline Map 15-19
Figure 15-9. Roseville Civic Center..... 15-24

Figure 19-1. Resolution Adopting the Roseville Hazard Mitigation Plan..... 19-12

ACKNOWLEDGMENTS

City of Roseville

Rob Jensen, City Manager
Wayne Wiley, Associate Planner
Jason Rizzi, Roseville Fire Department
Carl Walker, Senior Civil Engineer
Helen Dyda, Marketing & Communications Analyst

Consultants

Rob Flaner, CFM, Lead Project Planner, Tetra Tech, Inc.
Carol Baumann, Hazus/GIS lead, Tetra Tech, Inc.
Jessica Cerutti, CFM, Planner, Tetra Tech, Inc.
Stephen Veith, GIS Analyst, Tetra Tech, Inc.

Stakeholders

Erik Angle, Sutter Roseville Medical Center
Michael Algots, Union Pacific Railroad
Rick Stalker, Placer County Association of Realtors

Special Acknowledgments

The development of this Plan would not have been possible without the dedication and commitment to this process by the Roseville Hazard Mitigation Plan Steering Committee. The dedication of this volunteer committee to allocate their time to this process is greatly appreciated. Also, the citizens of Roseville are commended for their participation in the outreach strategy identified by the Steering Committee. This outreach success will set the course to the successful implementation of this Plan during its next performance period.

- Grace Keller
- Wayne Wiley
- Rob Jensen
- Jason Rizzi
- Carl Walker
- Helen Dyda
- Erik Angle
- Brenette Macintosh
- Mark Lacher
- Jaime Garrett
- Joseph Van Zant
- Rod Rodriguez
- Rick Stalker
- Michael Algots
- Jim Williams

EXECUTIVE SUMMARY

The Disaster Mitigation Act (DMA; Public Law 106-390) is the latest federal legislation enacted to encourage and promote proactive, pre-disaster planning as a condition of receiving financial assistance under the Robert T. Stafford Act. The DMA emphasizes planning for disasters before they occur. Under the DMA, a pre-disaster hazard mitigation program and new requirements for the national post-disaster hazard mitigation grant program were established.

The DMA encourages state and local authorities to work together on pre-disaster planning and it promotes sustainability as a strategy for disaster resistance. The intent is three-fold:

- To gather hazard, vulnerability, and mitigation information at the local level for use in state-level planning
- To ensure that state and local hazard mitigation planning is coordinated to the greatest extent practical
- To ensure that local jurisdictions are made aware of the hazards and vulnerabilities within their jurisdiction and to develop strategies to reduce those vulnerabilities.

This process ensures that mitigation actions are based on sound planning processes that account for the risks and capabilities of California communities. "Sustainable hazard mitigation" includes the sound management of natural resources, local economic and social resiliency, and the recognition that hazards and mitigation must be understood in the largest possible social and economic context. The enhanced planning network called for by the DMA helps local governments articulate accurate needs for mitigation, resulting in faster allocation of funding and more cost-effective risk reduction projects.

Using this initiative as a foundation for proactive planning, the City of Roseville has developed and maintained a hazard mitigation plan in an effort to reduce future loss of life and property resulting from disasters. It is impossible to predict exactly when and where disasters will occur or the extent to which they will impact the City. However, with careful planning and collaboration among public agencies, stakeholders, and citizens, it is possible to minimize losses that can occur from disasters.

Hazard mitigation is a way to reduce or alleviate the loss of life, personal injury, and property damage that can result from a disaster through long- and short-term strategies. It involves strategies such as planning, policy changes, programs, projects, and other activities that can mitigate the impacts of hazards on the City of Roseville. The responsibility for hazard mitigation lies with many, including private property owners; business and industry; and local, state, and federal government.

PLAN UPDATE

Federal regulations stipulate that hazard mitigation plans must describe the method and schedule for monitoring, evaluating, and updating the Plan. Prescribing an update schedule establishes an opportunity to reevaluate recommendations, monitor the impacts of actions that have been accomplished, and determine if there is a need to change the focus of mitigation strategies. DMA compliance is contingent on meeting the plan update requirement. A jurisdiction covered by a plan that has expired is not able to pursue elements of federal funding afforded under the Robert T. Stafford Act for which a current hazard mitigation plan is a prerequisite. The California Office of

Emergency Services (Cal OES) reviews all local hazard mitigation plans in accordance with DMA 2000 regulations and coordinates with local jurisdictions to ensure compliance with state requirements and the Code of Federal Regulations (Title 44 Section 201.6). Once Cal OES planning staff find the local hazard mitigation plan to be approvable, the Plan is forwarded to mitigation planning staff at Region IX of the Federal Emergency Management Agency (FEMA). FEMA performs final review and designates compliant plans as "approved pending adoption."

The City of Roseville used the plan update process to comprehensively revise its initial hazard mitigation plan, which was adopted in 2005. Due to the success of the initial plan, no major changes were made to the plan's approach and function. The subsequent 2011 Plan was enhanced using recent best available data and technology, especially in the risk assessment. For this 2016 planning effort, the enhanced format of the 2011 Plan has been retained in order to ensure the consistency of discussion points on each hazard of concern and address required elements for plan updates. The Plan update followed the same basic planning process as was followed under the initial effort and subsequent update. A Steering Committee was once again the critical component in the process. The Steering Committee consisted of 14 members of the community representing the public, private industry, and government. The Steering Committee met six times between November 2015 and August 2016 to provide recommendations and support throughout the planning process.

PLAN UPDATE METHODOLOGY

Development of the hazard mitigation plan included five phases:

- Phase 1—Organize resources
- Phase 2—Update the risk assessment
- Phase 3—Engage the public
- Phase 4—Assemble the updated Plan
- Phase 5—Plan adoption

Phase 1—Organize Resources

The City hired Tetra Tech, Inc. as a consultant to assist with development and implementation of the 2016 Plan. The Tetra Tech project manager assumed the role of the lead project planner and reported directly to a City project manager. Once the technical assistance was secured, a planning team was formed to lead the planning effort. The Steering Committee that oversaw the development of the initial plan remained intact during the initial performance period of the Plan and then provided oversight for the 2016 Plan. For the update process, some new members were added and some previous members left the committee. The planning team facilitated each Steering Committee meeting, which addressed a set of objectives based on the work plan established for the update. The Steering Committee met six times from November 2015 through August 2016. Coordination with other local, state and federal agencies involved in hazard mitigation in the region helped to ensure consistency with other ongoing efforts.

One of the Steering Committee's first action items was to review the State of California Hazard Mitigation Plan, the Roseville 2011 Hazard Mitigation Plan and all of the progress reports completed since the 2011 Plan. The Steering Committee identified hazards listed in the state plan to which Roseville is susceptible, in order to determine if there was a need to expand the scope of the risk assessment. Each annual progress report for the initial plan contains a section that recommends changes or enhancements to the Plan or plan development process. These reports effectively completed a key step of the plan update process before the update process began—identifying needs for changes or enhancements.

Phase 2 —Update the Risk Assessment

Federal planning guidance specifies comprehensive updates to the risk assessment portion of local hazard mitigation plans if there have been new technical data pertaining to a hazard developed by a creditable source since the Plan's previous development. Updated risk assessment efforts for the 2016 Plan included the following:

- The latest version of the Federal Emergency Management Agency's Hazus-MH risk assessment software was used to enhance the risk assessments for flood, dam failure and earthquake.
- All hazards of concern were updated with new relevant data.
- The Hazus default general building stock was updated using current address point, building footprint, parcel and tax assessor data.

Phase 3—Engage the Public

The Steering Committee drafted a comprehensive public involvement strategy for this update using multiple media sources. This strategy was built upon the Steering Committee's previous public engagement strategy and enhanced with social media and non-traditional outreach initiatives not regularly employed during the previous planning processes. The planning team identified stakeholders to target through the multi-disciplinary public involvement strategy.

Phase 4—Assemble the Updated Plan

The base format of the 2011 Plan was maintained in the 2016 Plan. However, enhancements were made to include the following components:

- The update describes the process used to review and analyze each section of the Plan.
- The update provides a discussion on how the public was kept apprised of the Plan's actions during the initial performance period.
- The update describes the need for changes to the risk assessment and what changes were made from the previous update.
- The update describes changes to risk exposure due to either of the following:
  - Successful mitigation projects
  - Changes in land use due to annexation or new development.
- The update describes changes to the action plan and the reasons for them.
- The update identifies completed, deleted, or deferred actions or activities from the previously approved plan as a benchmark for progress in the form of the 2015 Progress Report located in Appendix B. It also includes in its evaluation and prioritization new mitigation actions identified since the previous plan

Phase 5—Plan Adoption/Implementation

This Plan details a formal process for implementing and maintaining the Plan so that it remains an active and relevant document. The plan maintenance process includes a schedule for monitoring and evaluating the Plan's progress annually and producing a plan revision every five years. This process seeks to keep a steering body that meets the criteria of the original steering committee intact to perform this annual review. This phase includes strategies for continued public involvement and incorporation of the recommendations of this Plan into other planning mechanisms of the City, such as the comprehensive plan, capital improvement plan, building code, and development design guidelines.

MITIGATION GUIDING PRINCIPLE, GOALS, AND OBJECTIVES

Guiding Principle

The following guiding principle was identified for this hazard mitigation plan:

> Through community partnerships, establish a plan to reduce vulnerability to hazards in order to protect the health, safety, welfare, and economy of the City.

Goals

The Steering Committee established the following goals for the Plan update:

- G-1: Protect lives and reduce injury.
- G-2: Promote hazard mitigation as an integrated policy.
- G-3: Protect the continuity of local government to ensure no significant disruption of services during or due to a disaster.
- G-4: Improve community emergency management preparedness, collaboration and outreach.
- G-5: Minimize or reduce damage to property, including critical facilities.
- G-6: Develop and implement mitigation strategies that optimize public funds in an efficient and cost-effective way.
- G-7: Monitor and support the natural environment's capacity to deal with the impacts of natural hazards, taking into account the potential impacts of global climate change.

Objectives

Plan objectives were developed via a facilitated exercise that focused on finding objectives that meet multiple goals. During this exercise, Steering Committee members were requested to review the 2011 objectives in addition to newly proposed objectives. The selected objectives are listed in Table ES-1.

Table ES-1. Objectives for 2016 Multi-Hazard Mitigation Plan

Objective Number	Objective Statement	Goals for which it can be applied
O-1	Consider the impacts of hazards on future land uses in the City of Roseville by coordinating with other planning mechanisms such as the General Plan and land-use code development.	1, 2, 5, 7
O-2	Protect and sustain reliable local emergency operations and communication facilities during and after disasters.	1, 3, 4
O-3	Develop new or enhance existing early warning response systems and plans.	1, 3, 4, 5
O-4	Seek to enhance emergency response capabilities through improvements to infrastructure and City programs.	1, 4, 5
O-5	Enhance the understanding of all present and future hazards that impact the City of Roseville and the risk they pose.	1, 3, 4, 5, 7
O-6	Seek mitigation projects that provide the highest degree of hazard protection at the least cost.	1, 5, 6
O-7	Seek to update information on natural, environmental, and human-caused hazards, vulnerabilities, and mitigation measures by coordinating planning efforts and creating partnerships with appropriate local, private, county, state, and federal agencies.	1, 2, 3, 4, 5, 7
O-8	Seek to implement codes, standards, and policies that will protect life and property, including natural habitat, from the impacts of hazards within the City of Roseville.	1, 2, 3, 5, 6
O-9	Educate the public on preparedness for and mitigation of potential impacts of hazards on the City of Roseville.	1, 2, 4
O-10	Support efforts to retrofit, purchase, or relocate structures in high hazard areas, including those known to be repetitively damaged.	3, 5, 6

MITIGATION ACTION PLAN

The hazard mitigation action plan is a key element of this Plan. It is through the implementation of this action plan that the City of Roseville can strive to become disaster-resilient through sustainable hazard mitigation. This action plan includes an assessment of the capabilities of the City to implement hazard mitigation actions, a review of alternatives, a prioritization schedule, and a mitigation strategy matrix that identifies the following:

- Description of recommended actions
- Hazards addressed
- Objectives addressed
- Lead implementation agency (or agencies)
- Estimated benefits
- Estimated costs
- Timeframe for implementation
- Funding sources

For the purposes of this document, mitigation actions are defined as activities designed to reduce or eliminate losses resulting from the impacts of natural hazards of concern. Table ES-2 summarizes the hazard mitigation actions identified by this Plan update.

IMPLEMENTATION

Full implementation of the recommendations of this Plan will require time and resources. This Plan reflects an adaptive management approach in that specific recommendations and plan review protocols are provided to evaluate changes in vulnerability and action plan prioritization after the Plan is adopted. Funding resources are always evolving, as are requirements under state or federal mandates, and the true measure of the Plan's success will be its ability to adapt to the ever-changing climate of hazard mitigation.

Roseville has a long-standing tradition of progressive, proactive response to issues that may impact its citizens. This tradition is reflected in the development of this Plan. The Roseville City Council will assume responsibility for adopting the recommendations of this Plan and committing City resources toward its implementation. The City's track record in the mitigation of hazards impacting its citizens is exemplary. The framework established by this Plan will help maintain this tradition in that it identifies a strategy to maximize the potential for implementation based on available and potential resources. It commits the City to pursue actions when the benefits of a project exceed its costs. Most important, the City developed this Plan with extensive public input, which sets the stage for acceptance of the actions recommended for implementation in this Plan.

Table ES-2. Hazard Mitigation Action Plan Matrix

Action Number and Description	Timeframe
DAM FAILURE	
DF-1—Create a dam failure element for the City's emergency response plan that includes a phased warning protocol in response to the findings of the Folsom Dam Containment Dike Risk Assessment.	Short-term
DROUGHT	
D-1—Perform a groundwater recharge feasibility study to determine the most cost-effective way to replenish groundwater resources within Roseville.	Ongoing
D-2—Implement aquifer storage and recovery program that uses direct injection technique in areas identified as appropriate.	Ongoing
D-3—Continue to implement the Environmental Utility Department's recycled water program and seek all opportunities to expand its coverage, focusing first on the Sunset Industrial area. The City pumps recycled water through a system of purple pipes completely separate from potable (drinking water) pipes. The City pumps the recycled water to customers such as streetscapes, golf courses and parks, where it irrigates turf and shrubs. Using recycled water for uses such as landscape irrigation reduces demand on the potable water system, creating a more reliable water supply for the entire City. Recycled water is not subject to the effects of drought.	Ongoing
D-4—Promote active water conservation techniques and strategies to private property owners through Roseville-sponsored outreach projects such as printed media and the City's website.	Ongoing
EARTHQUAKE	
EQ-1—Perform building-specific, structural seismic vulnerability assessment of City-owned critical facilities constructed prior to 1980 (including infrastructure). Included in this assessment will be recommended mitigation alternatives that meet goals and objectives of this Plan.	Short-term; Ongoing
EQ-2—Incorporate earthquake mitigation measures for private property into existing City-sponsored outreach programs such as printed media and the City's website.	Short-term
EQ-3—Reassess the overall vulnerability to the earthquake hazard using the best available science and technology as it becomes available. State-sponsored programs, Seismic Hazards Mapping Act, and future FEMA-sponsored initiatives are anticipated to create a wealth of knowledge regarding this hazard that did not exist during the preparation of this Plan update	Short-term; Ongoing
FLOOD	
F-1—The City shall designate all areas identified as the 100-year floodplain. The boundaries of the 100-year floodplain shall be as specified in the floodplain designations section of this component of the City's general plan. Floodplain areas shall be preserved as specified in the open space and conservation element. Such preservation may include required dedication to the City. If needed, modify the City's ordinances to include floodplain use regulations consistent with the goals, policies, and implementation measures of the safety, land use, open space and conservation, and parks and recreation elements of the City's general plan.	Ongoing
F-2—Refer any development proposal that has a direct or indirect impact on flood protection to Public Works for comment. In addition, forward such proposals to other agencies as applicable, including the U.S. Army Corps of Engineers, California Reclamation Board, FEMA, California Department of Fish and Wildlife, Placer County Resource Conservation District, and Placer County Flood Control District. Consider the comments of the agencies during the development review process.	Ongoing
F 3—Continue City participation in the National Flood Insurance Program and the Community Rating System (CRS). Maintain the City's current CRS status as the nation's only Class 1 CRS community.	Ongoing
F 4—Maintain Roseville's compliance and good standing under the National Flood Insurance program	Ongoing
F 5—Continue the City's outreach program to flood-prone property owners and the citizens of Roseville to program is to help make them aware of the flood threat and how best to deal with them.	Ongoing
F 6—Continue to pursue a regional approach to flood issues by remaining actively involved in the Placer Co Flood Control District. This involvement includes cooperation in the development of a comprehensive regional database. Continue to participate in regional flooding studies, including the Auburn Creek/Coon Creek/Pleasant Grove Creek flood mitigation plan and the Dry Creek watershed flood control plan.	Ongoing

Action Number and Description	Timeframe
F 7—Continue City coordination with other agencies on issues of flood control. Coordination between the City and adjacent jurisdictions occurs through several mechanisms, including distribution of development proposals for review and comment. Continue City cooperation with federal, state, and local agencies, including the U.S. Army Corps of Engineers, California Reclamation Board, FEMA, California Department of Fish and Wildlife, Placer County Resource Conservation District, and Placer County Flood Control District.	Ongoing
F 8—Continue to develop, implement, and expand the Flood Alert and Early Warning Program systems and integrate the systems with other local jurisdictions to form a regional warning program.	Ongoing
F 9—Ensure that future specific plans and specific plan amendments are consistent with the goals and policies of the general plan. The specific plans shall include the designation and preservation of floodplain areas and adjacent habitat. Provisions shall be incorporated to ensure that public infrastructure, utilities, and emergency services remain functional during flood conditions. Such infrastructure and facilities include water, sewer and gas mains, telephone and electric lines, streets and bridges, hospitals, and fire and police stations. Financing mechanisms shall be explored to fund necessary flood protection improvements and maintenance. Development agreements may be used to secure implementation and funding provisions. (Specific plans have 100% cost recovery by developers).	Short -term
F 10—Monitor and regularly update City flood studies, modeling, and associated land use, zoning, and other development regulations at a minimum of every 5 years or whenever information becomes available that would significantly modify previous data. New information could include new studies, change in City policy, consideration of a major development project or specific plan, or implementation of a flood control project.	Short-term; Ongoing
F 11-Require a master drainage plan as part of the approval process for all specific plans and large development projects as determined by the Public Works director. The master drainage plan should consider cumulative regional drainage and flooding mitigation. The plan's intent is to ensure that the overall rate of runoff from a project does not exceed predevelopment levels. If necessary, this objective shall be achieved by incorporating run-off control measures to minimize peak flows and/or assistance in financing or otherwise implementing comprehensive drainage plans.	Short-term
F-12—Continue the Department of Parks, Recreation and Libraries' regular creek maintenance program within the City's creeks and floodplain areas. This program clears and removes debris that could contribute to blockage and flooding and may include the removal of silt. This is only done in areas of high risk to flood damage or where property or facilities are threatened by flooding.	Ongoing
F 13—Continue annual inspection and maintenance program of City storm drain systems. Review after every major storm system function and performance. This program removes debris that could contribute to blockage of the storm drain system.	Ongoing
F 14—Complete the final two phases of the Cirby/Linda/Dry Creek flood control project (Phase 1 and 2). Five of the seven phases of this project have been completed at a cost of about $18,000,000. The basis for determining viability of this project will be a benefit /cost analysis to determine if project meets federal grant eligibility requirements.	Long-term
F 15—Analyze alternative improvements to the Cirby/Linda/Dry Creek flood control project that may be cost effective in the flood-prone areas of Roseville: • Dry Creek from Darling Way to Riverside Avenue • Area on Dry Creek upstream of Folsom Road in the Columbia Avenue/Marilyn Avenue/Bonita Street area • Linda Creek near Samoa Way/Hurst Way area • Cirby Creek in the Trimble Way/Zien Court area	Long –term; depends on funding
F 16—Replace the Huntington Drive/Cirby Creek culvert with a bridge to protect Queens Court/Huntington Drive area. This project is overseen by Public Works department.	Long-term; depends on funding
F 17—Divert the main drainage storm drain system down Crestmont Avenue to Cirby Way and then into Dry Creek so that the existing system will not exceed capacity. If system capacity is exceeded, the intersection on Cirby Way and Crestmont Avenue and nearby homes will flood during major flood events.	Short-term
F 18—Continue to promote and sponsor programs to buy out, relocate, and flood-proof existing flood-prone structures within Roseville.	Long-term; depends on funding
F-19—Implement recommendation of Downtown Roseville Specific Plan to relocate the Public safety Building.	Long-term
F-20—Retrofit the City's Downtown library by sealing the exterior and installing a flood door to protect against flood damage should Dry Creek overspill the existing floodwall.	Short-term; Ongoing

Action Number and Description	Timeframe
F-21—Continue the Tree Mitigation Fund program administered by the Open Space Division in conjunction with non-profit organizations. The planting of oak trees in the open spaces adjacent to riparian zones increases infiltration and slows storm water surges.	Ongoing
F-22—Manage beaver dam sites for flood control protection and habitat restoration after dam removal. One primary issue is impacts to floodwater capacity of creeks. Part of the desired comprehensive approach to beaver management includes establishment of quantitative and qualitative "carrying capacity," including acre-feet of flood capacity lost. Implement a standard monitoring and reporting process to track beaver dam locations, population, and impacts. Gain regulatory approval for beaver management techniques such as biological control and habitat manipulation using the most benign options first.	Ongoing
F-23 – Develop the City's multi-use, multi-benefit stormwater retention project within the Pleasant Grove Creek Watershed, the Reason Farms Stormwater Retention Project.	Long-term
LANDSLIDE	
LS-1—Once California Geological Survey completes soils mapping for the Roseville vicinity under the Seismic Hazards Mapping Act, reassess landslide hazard using best available data to gauge the true vulnerability to this hazard.	Long-term
LS-2—Continue to implement policies adopted by the general plan that promote open space land uses within identified steep slope areas of Roseville. The City of Roseville Northeast Roseville Specific Plan and Stoneridge Specific Plans include the identified steep slope areas within Roseville. Both Plan Areas have continuing development. When individual projects are submitted,	Ongoing
SEVERE WEATHER	
SW-1—Continue the Shade Tree Program, an energy conservation rebate program provided by Roseville Electric	Ongoing
SW-2—Continue ongoing line clearing and weed abatement of electrical utilities to reduce exposure to severe weather hazards.	Ongoing
SW-3—Continue education/outreach programs to improve winter preparedness and minimize loss of life or injury.	Short-term, ongoing
SW-4—Enhance and implement strategies for debris management and removal during severe weather events.	Ongoing
SW 5-Continue to operate the Roseville Energy Park to support the City's electrical requirements and maintain service continuity during severe weather events.	Ongoing
SW 6-Take over ownership and operation of the Roseville Combustion Turbines from Northern CA Power Agency to support the City's electrical requirements and maintain service continuity during severe weather events.	Ongoing
WILDFIRE	
WF-1—Continue "Goat Grazing" program for removal of grassland in areas of Roseville potentially vulnerable to wildfire. Implement goat grazing in City open space and preserve areas for fire and invasive plant species management and native plant restoration.	Ongoing
WF-2—Enhance existing City public outreach programs to include information on fire safety, defensible spaces, and areas of concern.	Short-term; Ongoing
MULTIPLE HAZARDS	
MH-1—Continue to maintain Cal OES certification of all City inspectors for post-disaster damage assessment.	Ongoing
MH-2—Continue to maintain the hazard mitigation page on City website that provides following types of information: • The Hazard Management Plan and its progress reports • Hazard-specific information • Mitigation information by hazard, with specific emphasis on private property • Emergency response and warning information • Links to county, state, and federal related agencies	Ongoing

Action Number and Description	Timeframe
MH-3—Establish/maintain a post-disaster action plan to be part of the City Emergency operations plan that will include following elements: • Procedures for public information • Post-disaster damage assessment • Grant writing • Code enforcement • Redundant operations	Ongoing
MH-4—Implement an "Adopt an Open Space" program in coordination with the open space management program. Develop "adoption contracts" with neighborhoods, organizations, businesses, etc., describing the level of stewardship and the terms of the "adoption." Publicize these activities through online resource directory and other media to encourage participation.	Long--term
MH-5—Develop and disseminate best practices information to private property owners whose land is adjacent to open space areas describing stewardship opportunities and owners' role in preserving beneficial uses of open space areas (including vernal pool grassland and creek or riparian uses). Offer classes to provide in-depth information, such as demonstration projects, techniques for ecologically friendly weed abatement and vegetation control, and creating a backyard habitat compatible with open space areas.	Short-term; Ongoing
MH-6—Work with the Roseville City School District, local high school districts, and non-profit organizations to promote ecology-oriented curricula and stewardship activities. Identify resource and administrative barriers that may be limiting schools' abilities to more actively participate in stewardship, and work collaboratively to identify solutions.	Short-term; Ongoing
MH 7—Strive to maintain high availability of essential communication services	Ongoing
MH 8-Secure the City's physical locations that contain technology infrastructure	Ongoing
HUMAN-CAUSED	
HC 1-Commit support to initiatives within the Sacramento-Roseville-Arden-Arcade Metropolitan Statistical Area; continue to seek funding from other federal sources to fund its initiatives	Short-term
HC-2—Enhance emergency response capability of City by contingency planning for specific events based on identified vulnerabilities.	Short-term, ongoing
HC-3— Seek to establish appropriate staffing levels of public safety personnel to address vulnerabilities identified through an incremental targeted study that provides immediate needs as well as anticipated needs in 1 year, 5 years, and 10 years.	Short Term; depends on funding
HC-4—Prepare a site-specific vulnerability assessment of City-owned critical facilities that use the best available science and technology with regards human-caused hazards.	Long-term
HC-5—Address vulnerabilities identified in vulnerability assessment of water facilities performed by Environmental Utilities Department in response to EPA initiative.	Long-term
HC 6-Maintain compliance with California Energy Commission license conditions for the operations of the Roseville Energy Park with respect to Hazardous Material Management	Ongoing
HC 7-Establish and maintain compliance with state and local laws and regulations for the operation of the Roseville Combustion Turbines upon transfer of ownership from Northern CA Power Agency to City.	Ongoing
HC-8-Maintain compliance with North American Electric Reliability Corporation mandatory reliability standards related to plant operation, sabotage reporting and critical infrastructure protection (cyber security.	Ongoing
HC 9—Protect the City's data, technology infrastructure and staff against Cyber terrorism such as but not limited to: • Identity Theft • Virus/Malware/Ransomware/Spyware/Spam/Phishing • Network and system attacks • Web site hacking	Short Term; depends on funding
HC-10: Improve evacuation transportation routes within the City of Roseville by removing traffic constrictions.	Long-term
HUMAN HEALTH	
HH-1—Continue to collaborate with the Placer County Health Department to ensure the health and welfare of the community	Ongoing

Action Number and Description	Timeframe
HH-2—Support the public education efforts of the Placer County Health Department and the Placer Mosquito Abatement District	Ongoing
HH-3—Collaborate with the Placer County Mosquito Abatement District to review resource protection policies that conflict with human health protection in the City of Roseville and work to resolve these policy issues	Short-term; Ongoing

Part 1. Planning Process and Community Profile

1. INTRODUCTION TO HAZARD MITIGATION PLANNING

1.1 WHY PREPARE THIS PLAN?

1.1.1 The Big Picture

Hazard mitigation is defined as any action taken to reduce or alleviate the loss of life, personal injury, and property damage that can result from a disaster. It involves long- and short-term actions implemented before, during and after disasters. Hazard mitigation activities include planning efforts, policy changes, programs, studies, improvement projects, and other steps to reduce the impacts of hazards.

For many years, federal disaster funding focused on relief and recovery after disasters occurred, with limited funding for hazard mitigation planning in advance. The Disaster Mitigation Act (DMA; Public Law 106-390), passed in 2000, shifted the federal emphasis toward planning for disasters before they occur. The DMA requires state and local governments to develop hazard mitigation plans as a condition for federal disaster grant assistance. Regulations developed to fulfill the DMA's requirements are included in Title 44 of the Code of Federal Regulations (44 CFR).

The responsibility for hazard mitigation lies with many, including private property owners, commercial interests, and local, state and federal governments. The DMA encourages cooperation among state and local authorities in pre-disaster planning. The enhanced planning network called for by the DMA helps local governments articulate accurate needs for mitigation, resulting in faster allocation of funding and more cost-effective risk-reduction projects.

The DMA also promotes sustainability in hazard mitigation. To be sustainable, hazard mitigation needs to incorporate sound management of natural resources and address hazards and mitigation in the largest possible social and economic context.

1.1.2 Roseville's Response to the DMA

Roseville has a long-standing reputation as a national leader in risk reduction through proactive mitigation. This reputation has been built through innovative planning and a commitment to protecting its citizens from the impacts of natural disasters. Embracing the goals of the DMA, Roseville created an initial hazard mitigation plan that became a model nationally and has been touted by the Federal Emergency Management Agency (FEMA) as a "mitigation success story." The *City of Roseville Hazard Mitigation Plan* was adopted by the Roseville City Council on July 20, 2005, and was formally approved by FEMA Region IX on August 10, 2005. The initial plan was developed with the following objectives:

- Meet or exceed program requirements specified under the DMA, thereby enabling the City of Roseville to continue using federal grant funding to reduce risk through mitigation.
- Meet not only state and federal requirements but also the needs of the City (this Plan addresses human-caused hazards, which are not required to be addressed under the DMA).
- Develop the Plan according to FEMA's Community Rating System (CRS) guidelines so that Roseville can meet requirements to become the nation's first CRS Class 1 community.

- Create a risk assessment that focuses on the City of Roseville hazards of concern.
- Coordinate existing plans and programs so that high-priority actions and projects to mitigate possible disaster impacts are funded and implemented.

The initial plan was developed according to the requirements of 44 CFR, qualifying the City to pursue funding under the Robert T. Stafford Act. The City has achieved numerous objectives identified in the Plan. Local hazard mitigation plans must be regularly updated to comply with the DMA. The City responded to this requirement with a plan update process that resulted in the 2011 Multi-Hazard Mitigation Plan, and now this 2016 Multi-Hazard Mitigation Plan.

This hazard mitigation plan update identifies resources, information, and strategies for reducing risk from natural hazards. Elements and strategies in the Plan were selected because they meet a program requirement and because they best meet the needs City residents. The Plan will help guide and coordinate mitigation activities throughout the planning area. It also will meet the planning requirements of the CRS, allowing the City of Roseville to maintain its CRS Class 1 rating.

1.2 WHO WILL BENEFIT FROM THIS PLAN?

All residents and businesses of the City of Roseville are the ultimate beneficiaries of this hazard mitigation plan update. The Plan reduces risk for those who live in, work in, and visit the City. It provides a viable planning framework for all foreseeable natural hazards. Participation in development of the Plan by key stakeholders helped ensure that outcomes will be mutually beneficial. The Plan's goals and recommendations can lay groundwork for the development and implementation of local mitigation activities and partnerships.

1.3 CONTENTS OF THIS PLAN

This hazard mitigation plan is organized into three primary parts:

- Part 1—Planning Process and Community Profile
- Part 2—Risk Assessment
- Part 3—Mitigation Strategy.

Each part includes elements required under federal guidelines. DMA compliance requirements are cited at the beginning of subsections as appropriate to illustrate compliance.

The following appendices provided at the end of the Plan include information or explanations to support the main content of the Plan:

- Appendix A—Public outreach information used in preparation of this update
- Appendix B—The 2015 Progress Report.

2. PLAN UPDATE—WHAT HAS CHANGED

2.1 THE PREVIOUS PLAN

Several factors initiated the first hazard mitigation planning effort for the City of Roseville:

- The Roseville area has significant exposure to numerous natural hazards that have caused millions of dollars in past damage.
- Limited local resources make it difficult to be pre-emptive in risk reduction actions. Being able to leverage federal financial assistance is paramount to successful hazard mitigation in the area.
- The City wanted to be proactive in its preparedness for natural hazards.

With these factors in mind, the City of Roseville committed to the preparation of its initial plan by attaining grant funding for the effort and then securing technical assistance to complete a planning process that complied with all requirements. Five years later, the City followed a similar process to update the Plan.

Due to the success of the 2005 effort, no major changes were made to the Plan's approach and function during the 2011 planning process. The 2011 update enhanced the 2005 effort but remained consistent on discussion points for each hazard of concern. The 2011 Plan format changed to address required elements for plan updates. A major addition to the 2011 Plan, per recommendations from FEMA Region IX, was the inclusion of dam failure as a hazard of concern.

The 2011 Plan update followed a phased approach to planning per FEMA's July 2008 *Local Hazard Mitigation Planning Guidance*.

2.2 MITIGATION SUCCESS STORIES

One of the principal objectives of the initial plan was to create a plan that would help the City achieve the highest possible rating under FEMA's Community Rating System (CRS) program. The CRS program has stringent requirements for Classes 4 or better, and especially for Class 1. Several of these requirements are related to planning, and the initial plan was developed to meet these requirements. The Insurance Services Office (ISO), which performs classification reviews for the CRS, determined that the initial plan met the Class 1 requirements. In December 2005, the City was verified with sufficient credit to become the nation's first and only CRS Class 1 community. This classification went into effect on October 1, 2006, and was confirmed again during the re-verification process in 2008, and most recently in 2014. As of the writing of this Plan, the City of Roseville maintains its status as the nation's only CRS Class 1 community.

Detailed accounts of other successful mitigation actions completed by the City during each reporting period are included in the progress reports on the previous hazard mitigation plan, including the 2015 Progress Report contained in Appendix B of this Plan.

2.3 WHY UPDATE?

2.3.1 Federal Eligibility

Under 44 CFR, hazard mitigation plans must present a schedule for monitoring, evaluating, and updating the Plan. This provides an opportunity to reevaluate recommendations, monitor the impacts of actions that have been accomplished, and determine if there is a need to change the focus of mitigation strategies. A jurisdiction covered by a plan that has expired is not able to pursue elements of federal funding under the Robert T. Stafford Act for which a current hazard mitigation plan is a prerequisite.

2.3.2 Changes in Development

Hazard mitigation plan updates must be revised to reflect changes in development within the planning area during the previous performance period of the Plan (44 CFR Section 201.6(d)(3)). The Plan must describe changes in development in hazard-prone areas that increased or decreased vulnerability since the last plan was approved. If no changes in development impacted the jurisdiction's overall vulnerability, then plan updates may validate the information in the previously approved plan. The intent of this requirement is to ensure that the mitigation strategy continues to address the risk and vulnerability of existing and potential development and takes into consideration possible future conditions that could impact vulnerability.

The Roseville planning area experienced a 31-percent increase in population between 2003 and 2013, an average annual growth rate of 3.1 percent per year (Placer County Office of Economic Development, 2014). The City has adopted a comprehensive plan that governs land-use decisions and policy-making, as well as a building code and specialty ordinances based on state and federal mandates. This Plan update assumes that some new development triggered by the increase in population occurred in hazard areas. Because all such new development would have been regulated pursuant to local programs and codes, it is assumed that vulnerability did not increase even if exposure did.

2.4 THE UPDATED PLAN—WHAT IS DIFFERENT?

The updated Plan differs from the initial plan in a variety of ways:

- **Climate Change Impacts**—The most recent version of the California hazard mitigation plan noted specific hazards that are created or augmented by the environmental impacts of climate change. Additionally, the recent passage of Senate Bill 379 brings the effects of climate change into focus as it relates to mitigation and general planning. As a result, instead of briefly reviewing the impact of climate change in each individual hazard profile, this 2016 Plan update dedicates a comprehensive chapter to the issue of climate change and its effects on the state-identified climate-related hazards.
- **Drought Chapter Enhancements**—Enhancements to the drought Chapter were made to reflect current, historic drought conditions of the stat, region, and city. This information was supplemented with new information provided by the City's 2015 Urban Water Management Plan (UWMP) update.
- **Public Engagement Enhancements through Social Media** —Social media platforms not available during the previous planning initiative were used to enhance public outreach capabilities.
- **Planning Area Changes**—The City adopted 3 new Specific Plans since the previous plan update. As such, all development and demographic information will include data pertaining to these new Specific Plan Areas of Sierra Vista, Creekview, and Amaruso Ranch.
- **Separation of Natural from Non-natural Hazards**—In an effort to draw distinction from the natural hazards from the non-natural hazards, the non-natural hazards (Human Caused and Human Health Hazards) are placed after the natural hazards instead of listed alphabetically with the natural hazards.

- **Human-Caused Hazards**—The human-caused hazards noted in the 2011 effort were updated for the 2016 Plan. These human-caused hazards were moved within the document to after the natural hazards due to the difference in assessing risk. Cyber threat was included as a new human-caused hazard, due to the increase in connectivity, technological advances, and emergence of "hacktivist" groups.
- **Human Health Hazards**—The human health hazards noted in the 2011 effort were updated for the 2016 Plan. These human health hazards were moved within the document to after the natural hazards due to the difference in assessing risk. Ebola was included as a new human health hazard due to the 2014 West Africa Ebola outbreak that threatened the United States, though that threat never fully materialized. Zika virus is included in the discussion, as well.
- **Additional Demographic Information**—Additional demographic data are included—beyond age and disability/access and function need—addressing Roseville's industry, business and institutional footprint. Employment trends and occupations are included to develop a fuller understanding of the population of Roseville.
- **Disabilities, Access and Functional Need Language Revision**—The entire Plan was updated to reflect appropriate references when discussing individuals with disabilities and others with access and functional needs. This includes person-first language and references to individuals instead of the more general term of populations.
- **Guiding Principle**—A guiding principle for the hazard mitigation plan was developed. The goals and objectives of the Plan support the guiding principle.

Table 2-1 indicates the major changes between the 2011 and 2016 plans as they relate to 44 CFR planning requirements.

Table 2-1. Plan Changes Crosswalk

44 CFR Requirement	Previous Plan (2011)	Updated Plan (2016)
§201.6(b): In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include: • **An opportunity for the public to comment on the Plan during the drafting stage and prior to Plan approval;** • **An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and** • **Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.**	The plan development process deployed under this update was similar to the 2005 Plan. Chapters 1, 2, and 3 describe the planning process for the 2011 updated Plan.	The plan development process deployed under this update was similar to the 2011 Plan; however, additional public outreach initiatives were conducted through new social media platforms. Chapters 1, 2, and 3 describe the planning process for the 2016 updated Plan.

44 CFR Requirement	Previous Plan (2011)	Updated Plan (2016)
§201.6(c)(2): The Plan shall include a risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.	Chapters 6 through 15 presents a risk assessment of eight hazards of concern: Climate change, dam failure, drought, earthquake, flood, landslide, severe weather, and wildfire. These hazards are profiled as they impact Roseville. Additionally, human-caused and health hazards were qualitatively assessed to develop a more complete picture of the hazards facing the county.	The 2016 Plan presents a risk assessment of the same hazards as the 2011 Plan—in Chapters 6 through 16. Each hazard was updated with new occurrence information from 2011 through 2015 where applicable, and a new comprehensive risk assessment was conducted using updated building stock, demographics, and land use information.
§201.6(c)(2)(i): [The risk assessment shall include a] description of the … location and extent of all natural hazards that can affect the jurisdiction. The Plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.	Chapters 6 through 15 presents a risk assessment of each hazard of concern. Each chapter includes the following components: • Hazard profile-including maps of extent and location, historical occurrences, frequency, severity and warning time. • Secondary hazards • Climate change impacts • Exposure of people, property, critical facilities and environment. • Vulnerability of people, property, critical facilities and environment. • Future trends in development • Scenarios • Issues	The 2016 Plan presents a risk assessment of the same hazards as the 2011 Plan—from Chapters 6 through 16. Each hazard was updated with new occurrence information from 2011 through 2015 where applicable, and a new comprehensive risk assessment was conducted using updated building stock, demographics, and land use information. Climate change impacts were omitted from the individual hazards of concern, as the new climate change chapter provides a more detailed and comprehensive overview of climate change impacts for identified hazards.
§201.6(c)(2)(ii): [The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i). This description shall include an overall summary of each hazard and its impact on the community	Vulnerability was assessed for all hazards of concern. The Hazus-MH computer model was used for the dam failure, earthquake and flood hazards. These were Level 2 user-defined analyses using City data. Site-specific data on City-identified critical facilities was entered into the Hazus model. Hazus outputs were generated for other hazards by applying an estimated damage function to an asset inventory was extracted from Hazus-MH.	Vulnerability was again assessed for all hazards of concern using the Hazus-MH computer model for dam failure, earthquake, and flood hazards. Level 2 analysis was again conducted for these hazards. Site-specific data on City-identified critical facilities was entered into the Hazus model. Hazus outputs were generated for other hazards by applying an estimated damage function to an asset inventory extracted from Hazus-MH. All assets were updated using current available data.
§201.6(c)(2)(ii): [The risk assessment] must also address National Flood Insurance Program insured structures that have been repetitively damaged floods	The Plan includes a comprehensive analysis of repetitive loss areas that includes an inventory of the number and types of structures in the repetitive loss area. Repetitive loss areas are delineated, causes of repetitive flooding are cited, and these areas are reflected on maps	The Plan includes a comprehensive analysis of repetitive loss areas that includes an inventory of the number and types of structures in the repetitive loss area. Repetitive loss areas are delineated, causes of repetitive flooding are cited, and these areas are reflected on maps.

44 CFR Requirement	Previous Plan (2011)	Updated Plan (2016)
§201.6(c)(2)(ii)(A): The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard area.	A complete inventory of the numbers and types of buildings exposed was generated for each hazard of concern. The Steering Committee defined "critical facilities" for the planning area, and these were inventoried by exposure. Each hazard chapter provides a discussion on future development trends.	Building inventory was updated and the Steering Committee revised the critical facilities definition to reflect 2016 priorities. Each hazard chapter again provides a discussion on future development trends.
§201.6(c)(2)(ii)(B): [The plan should describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) and a description of the methodology used to prepare the estimate.	Loss estimations in terms of dollar loss were generated for all hazards of concern. These were generated by Hazus-MH for the dam failure, earthquake and flood hazards. For the other hazards, loss estimates were generated by applying a regionally relevant damage function to the exposed inventory. In all cases, a damage function was applied to an asset inventory. The asset inventory was the same for all hazards and was generated in Hazus.	Loss estimates were recalculated using new data and the new asset inventory.
§201.6(c)(2)(ii)(C): [The plan should describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.	There is a discussion on future development trends as they pertain to each hazard of concern. This discussion looks predominantly at the existing land use and the current regulatory environment that dictates this land use.	The Plan contains a discussion on development trends from the previous planning period, through future trends anticipated in the next five years as they pertain to each hazard.
§201.6(c)(3): The plan shall include a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.	The Plan contains a guiding principal, goals, objectives and actions. The actions strive to meet multiple objectives. The objectives are broad and overarching; each meets multiple goals and stands alone as a component of the Plan. The City of Roseville completed a capability assessment that looks at its regulatory, technical and financial capabilities.	The Steering Committee reviewed the 2011 guiding principle, goals, objectives, and actions and made minor adjustments to reflect 2016 priorities. The City of Roseville updated its capability assessment to reflect regulatory revisions and new initiatives.
§201.6(c)(3)(i): [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.	The Steering Committee identified a guiding principal, goals and objectives.	The Steering Committee reviewed the 2011 guiding principle, goals, objectives, and actions and made minor adjustments to reflect 2016 priorities.
§201.6(c)(3)(ii): [The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.	Chapter 18 includes a hazard mitigation catalog that was developed through a facilitated process. This catalog identifies actions that manipulate the hazard, reduce exposure to the hazard, reduce vulnerability, or increase mitigation capability. The catalog further segregates actions by scale of implementation. A table in the action plan section analyzes each action by mitigation type to illustrate the range of actions selected.	The hazard mitigation catalog developed in 2011 was enhanced with results of the 2016 planning effort focusing on updated program capabilities and the dam failure and cyber threat hazards.
§201.6(c)(3)(ii): [The mitigation strategy] must also address the jurisdiction's participation in the National Flood Insurance Program, and continued compliance with the program's requirements, as appropriate.	The City of Roseville has identified an action stating its commitment to maintain compliance and good standing under the National Flood Insurance Program. Additionally, the City identified multiple actions to maintain its Class 1 standing under the CRS program.	The City of Roseville has identified an action stating its commitment to maintain compliance and good standing under the National Flood Insurance Program. Additionally, the City identified multiple actions to maintain its Class 1 standing under the CRS program.

44 CFR Requirement	Previous Plan (2011)	Updated Plan (2016)
§201.6(c)(3)(iii): [The mitigation strategy shall describe] how the actions identified in Section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.	Each recommended initiative is prioritized using a qualitative methodology that looked at the objectives the project will meet, the timeline for completion, how the project will be funded, the impact of the project, the benefits of the project and the costs of the project. This prioritization scheme is detailed in Chapter 19.	The updated Plan uses the same qualitative approach to prioritization as used for the 2011 Plan.
§201.6(c)(4)(i): [The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.	Chapter 7 details a plan maintenance strategy	Chapter 19 retains the plan maintenance strategy developed in 2011.
§201.6(c)(4)(ii): [The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.	Chapter 7 details recommendations for incorporating the Plan into other planning mechanisms such as: • General plan • Emergency response plan • Capital improvement programs • Municipal code • Stormwater Master Plan This chapter additionally discusses current and future integration opportunities.	Recommendations are provided for incorporating the Plan into other planning mechanisms. This update additionally discusses current and future integration opportunities.
§201.6(c)(4)(iii): [The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.	Chapter 7 details a comprehensive strategy for continuing public involvement.	A comprehensive strategy is provided for continuing public involvement with additional information regarding social media.
§201.6(c)(5): [The local hazard mitigation plan shall include] documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, County Commission, Tribal Council).	Chapter 6 contains the resolution for adoption of this Plan.	The implementation chapter for this update contains the resolution of adoption.

3. PLAN UPDATE APPROACH

Local governments are required to review and revise their hazard mitigation plans and resubmit them for approval within five years in order to remain eligible for mitigation project grant funding (44 CFR §201.6(d)(3)). FEMA's July 2008 *Local Hazard Mitigation Planning Guidance* outlines five phases for updates:

- Phase 1—Organize resources
- Phase 2—Update the risk assessment
- Phase 3—Engage the public
- Phase 4—Assemble the updated Plan
- Phase 5—Plan adoption/implementation.

Phases 1 through 4 are discussed in the following sections. The elements of Phase 5 are described in Chapter 19.

3.1 PLANNING RESOURCE ORGANIZATION

The first phase of planning was to organize needed resources. This phase had the following primary objectives:

- Secure grant funding
- Form a planning team
- Confirm political support for the process
- Establish a steering committee
- Coordinate with other agencies
- Review existing programs.

3.1.1 Internal Funding

The planning effort was made possible through local funds for the City of Roseville.

3.1.2 Formation of the Planning Team

The City hired Tetra Tech, Inc. as a consultant to assist with the 2016 Plan update. The Tetra Tech project manager acted as lead project planner, reporting directly to a City project manager. Once the technical assistance was secured, a planning team made up of the following members was formed to lead the planning effort:

- Rob Jensen (Roseville City Manager's Office)—City Manager, project oversight
- Carl Walker (City of Roseville Department of Public Works)—Floodplain management
- Jason Rizzi (City of Roseville Fire Department)—Emergency preparedness
- Wayne Wiley (City of Roseville Development Services Department)-City planning lead
- Rob Flaner (Tetra Tech)—Lead project planner
- Carol Baumann (Tetra Tech)—Hazus-MH/GIS lead
- Jessica Cerutti (Tetra Tech)—Hazard Identification and profiling
- Dan Portman (Tetra Tech)—Lead editor.

3.1.3 The Steering Committee

Hazard mitigation planning is one of the best ways to enhance collaboration and gain support among the parties whose interests might be affected by hazard losses. By working together, a broad range of stakeholders can identify and create partnerships that pool resources to achieve a common vision for the community. The Steering Committee that oversaw development of the initial plan remained intact during the performance period of that plan and subsequently provided oversight for the 2011 Plan. For this 2016 update process, some new members were added and some previous members left the committee. Table 3-1 lists the 2016 Steering Committee members.

Table 3-1. Steering Committee Members

Name	Title	Jurisdiction/Agency
Grace Keller[a]	Citizen	Community Emergency Response Team
Wayne Wiley[b]	Associate Planner	The City of Roseville Development Services
Rob Jensen	City Manager	The City of Roseville City Manager's Office
Jason Rizzi	Emergency Preparedness Manager	City of Roseville Fire Department
Carl Walker	Senior Civil Engineer	The City of Roseville Public Works
Helen Dyda	Public Information Specialist	City of Roseville Communications
Jaime Garrett	Fire Department Public Information Officer	City of Roseville Fire Department
Erik Angle	Emergency Preparedness Manager	Sutter Roseville Medical Center
Brenette Macintosh	Safety Officer	Consolidated Communications
Mark Lacher	Risk Manager	Consolidated Communications
Jim Williams	Citizen	Meadow Oaks Neighborhood Association
Joseph Van Zant	Citizen/Hazardous Materials Consultant	Roseville Coalition of Neighborhood Associations
Rod Rodriguez	Senior Emergency Services Specialist	Placer County Office of Emergency Services
Rick Stalker	Stalker & Burnett RE Group	Placer County Association of Realtors
Michael Algots	Manager, Hazardous Materials	Union Pacific Railroad

a. Steering Committee Chairperson
b. Steering Committee Vice Chairperson

Leadership roles and ground rules were reconfirmed during the Steering Committee's initial meeting for the plan update on November 3, 2015. The Steering Committee agreed to meet on the first Tuesday of every month as needed throughout the course of the 2016 Plan's development. The planning team facilitated each Steering Committee meeting, which addressed a set of objectives based on the work plan established for the update. The Steering Committee met six times from November 2015 through June 2016. Meeting agendas, minutes and attendance logs are available for review. All Steering Committee meetings were open to the public, and agendas and meeting minutes were posted to the internet.

3.1.4 Coordination with Other Agencies

Coordination with other local, state and federal agencies involved in hazard mitigation in the region helped to ensure consistency with other ongoing efforts. 44 CFR requires that opportunities for involvement in the planning process be provided to neighboring communities, local and regional agencies involved in hazard mitigation, agencies with authority to regulate development, businesses, academia, and other interests (Section 201.6.b.2). Agency coordination was accomplished as follows:

- **Steering Committee Involvement**—Agency representatives were invited to participate on the Steering Committee.

- **Coordination with Placer County**—Placer County had recently finished updating its multi-jurisdictional hazard mitigation plan and was invited to join the Steering Committee. County staff were able to provide insight into lessons learned through the County's update process. The County's involvement also allowed for integration between the two plan updates.
- **Agency Notification**—The following agencies were invited to participate in the process and were kept apprised of plan development milestones:

  - FEMA Region IX
  - California Governor's Office of Emergency Services (Cal OES)
  - California Department of Water Resources
  - Placer County Office of Emergency Services
  - Placer County Flood Control District
  - Placer County Office of Education
  - Sacramento County Department of Water Resources
  - City of Rocklin
  - City of Citrus Heights
  - Roseville City School District
  - Eureka School District
  - Dry Creek School District
  - Center School Districts
  - Roseville Joint Union High School District
  - U.S. Bureau of Reclamation

  All of these agencies received meeting announcements, meeting agendas, and meeting minutes by e-mail throughout the plan development process. This approach proved to be beneficial when these agencies supported the effort by attending meetings or providing feedback on issues. All of these agencies were also informed about the plan update web page for up-to-date information.

- **Pre-Adoption Review**—All the agencies listed above were provided means to review and comment on the mitigation action plan for the 2016 Plan. The predominant means for this review was through the project web page. Each agency was sent an e-mail informing them that draft portions of the update were available for review. In addition, the complete draft plan was sent for a pre-adoption review to FEMA Region IX, the ISO, and the Placer County Office of Emergency Services. No immediate comments were received from these agencies during the pre-adoption public review period.

3.1.5 Review of Existing Programs

Hazard mitigation planning must include review and incorporation, if appropriate, of existing plans, studies, reports and technical information (44 CFR Section 201.6.b(3)). Chapter 4 of this Plan provides a review of laws and ordinances in effect within the planning area that can affect hazard mitigation actions, as well as an assessment of the City's regulatory, technical and financial capabilities to implement hazard mitigation actions.

Of particular interest for the plan update effort are the City of Roseville General Plan, the City of Roseville Emergency Response Plan (an emergency support function-based plan that directs emergency response actions in the planning area), and the State of California 2013 Enhanced Hazard Mitigation Plan.

One of the Steering Committee's first action items was to review the State of California Enhanced Hazard Mitigation Plan and all of the progress reports completed during the performance period for the initial plan. The Steering Committee identified hazards listed in the state plan to which the Roseville area is susceptible, in order to determine if there was a need to expand the scope of the risk assessment. The committee also reviewed the goals, objectives and strategies of the state plan in order to select goals, objectives, and actions for the City's Plan that are consistent with those of the state.

Each annual progress report for the initial plan contains a section that recommends changes or enhancements to the Plan or plan development process. These reports effectively completed a key step of the plan update process before the update process began—identifying needs for changes or enhancements.

3.2 RISK ASSESSMENT UPDATE

Local hazard mitigation plans must provide sufficient hazard and risk information to identify and prioritize appropriate actions to reduce hazard-related losses. This includes detailed descriptions of all the hazards that could affect the jurisdiction, along with an analysis of the jurisdiction's vulnerability to those hazards. The update of the risk assessment is typically the most involved part of the plan update process.

FEMA planning guidance specifies comprehensive updates to the risk assessment portion of local hazard mitigation plans if there have been new technical data pertaining to a hazard developed by a creditable source since the plan's initial development or previously completed update. Updated risk assessment efforts for the 2016 Plan included the following:

- The latest version (2.2) of FEMA's Hazus-MH risk assessment software was used to enhance the risk assessments for the flood, dam and earthquake hazards.
- All hazards of concern were updated with new relevant data.
- The Hazus default general building stock was updated using current address point, building footprint, parcel and tax assessor data.

A detailed description of the methodology deployed in the update of the risk assessment is provided in Chapter 5.

3.3 PUBLIC INVOLVEMENT

Broad public participation in the planning process helps ensure that diverse points of view about the planning area's needs are considered and addressed. The public must have opportunities to comment on disaster mitigation plans during the drafting stages and prior to plan approval (44 CFR, Section 201.6(b)(1)). The Community Rating System expands on these requirements by making CRS credits available for optional public involvement activities.

3.3.1 Strategy

The Steering Committee drafted a comprehensive public involvement strategy for this update using multiple media sources. This strategy was built upon the Steering Committee's perception of what was effective during development of the update, in addition to the use of social media as a major message distribution vehicle. The planning team identified stakeholders to target through the multi-disciplinary public involvement strategy. The strategy for involving the public in the development of the Plan emphasized the following elements:

- Include members of the public on the Steering Committee.
- As was done for the previous update, use a survey to reassess the public's perception of risk and support of hazard mitigation and to get direction on alternatives.
- Hold public meetings to describe the plan update process and progress and to collect input from a wide range of the public.
- Develop a unified message for distribution on social media platforms.
- Attempt to reach as many citizens in the planning area as possible through the use of multiple media, including websites and brochures.

Steering Committee

Eleven of the fourteen members of the Steering Committee live or work in the City of Roseville. This body has provided a mechanism for continuing public involvement in the maintenance of the Plan by meeting annually to monitor the progress of the plan implementation and creating annual progress reports. The ongoing participation of some members from the time that the initial plan was developed provided a valuable historical perspective for

the committee during the update process. All Steering Committee meetings were open to the public and advertised on the City's hazard mitigation plan website. The Steering Committee met six times during the course of the plan update process. One of the meetings was attended by two members of the public. Steering Committee documentation can be found in Appendix C.

Survey

The Steering Committee elected to use a survey for the update process to collect new information from the public about household preparedness for hazards, the level of knowledge about tools and techniques for reducing loss from hazards, and areas of public concern about hazards.

The Steering Committee reviewed the previous survey and requested a simplification of the process to keep residents engaged while ensuring the collection of useful information. The survey asked 26 quantifiable questions and provided opportunities for written comment. The final survey used some of the same questions asked on the initial survey, which helped to show whether citizens' perception of risk and vulnerability has changed over the last five years. The survey also revised some questions to support the plan update process and fulfill the Steering Committee's request for simplification.

The web-based survey tool "Survey Monkey" was used to set up and deploy the survey. The survey was made available to all citizens of Roseville via a web-link posted on the City's website, advertised via press releases, sent via e-mail to community residents, and linked through various forms of social media, including Nextdoor, a geographically based social media website. Over 670 surveys were completed during the course of the plan update process. These results were distributed to the Steering Committee during the strengths, weaknesses, obstacles and opportunities session to inform the Steering Committee of public concerns and opportunities for new public engagement strategies. Multiple survey respondents indicated concern about radon, which the Steering Committee will consider adding as a hazard of concern during the next plan update. The survey and a summary of its findings are provided in Appendix A.

Public Meetings

Participation in a well-attended community event was used as the vehicle to introduce the plan update process, to share the results of the revised risk assessment, and to gauge the public's perception of risk. A final public hearing was held at the end of the process to provide the public an opportunity to comment on the draft Plan.

Community Event Participation—Public Meeting

A public meeting was held as part of the City of Roseville's Earth Day celebration on Saturday, April 16, 2016 from 10 a.m. to 3 p.m. at the Utility Exploration Center, 1501 Pleasant Grove Boulevard (see Figure 3-1 through Figure 3-4). The public meeting was an open-house-format meeting, allowing citizens to come and go as they pleased during the meeting time frame.

The principal objective of the meeting was to share the results of the revised risk assessment with the public, then gage their perception of risk by having them complete a survey. Multiple members of the Steering Committee and planning team were present to speak with residents and answer questions about the process and their risk. Hazus-MH work stations were set up, allowing citizens to see information on their property, including exposure and damage estimates for earthquake and flood events. The 20 property owners who elected to receive a risk assessment were provided printouts of this information for their properties. This tool was highly effective in illustrating risk to the public. This Earth Day event was well attended, with thousands in attendance. During this event, the planning team recorded direct contact and discussion regarding the Plan with 50 event attendees. One resident, a local veterinarian, requested additional information to share with her clients which was later provided to her in electronic form by the City.



Figure 3-1. Hazard Mitigation Booth



Figure 3-2. City of Roseville Earth Day Festival



Figure 3-3. Hazus-MH Work Station

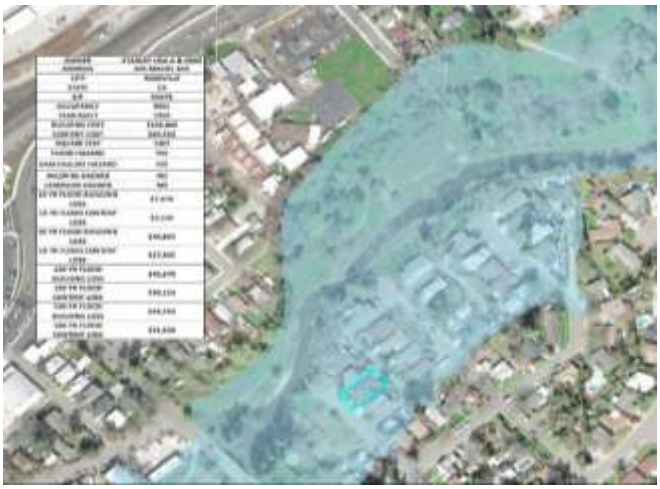


Figure 3-4. Sample Printout from Work Station

Public Comment Period

Once the draft updated Plan was assembled, a comment period for public input was open from August 2, 2016 through August 19, 2016. The public comment period was advertised via the City website, a press-release, and through the use of social media. A public comment link was established on the City's Hazard Mitigation Plan website. During this public comment period, the City received one comment from the public on the Draft Plan regarding the dam failure chapter. This comment requested additional information regarding exposure and vulnerability to the hazard. The City of Roseville decided to address the comment directly with the individual with no change to the plan for dam facility operational security and safety. A copy of the exchange is available upon request.

Use of Media

Press Releases

Press releases were distributed over the course of the 2016 Plan's development as key milestones were achieved and prior to each public meeting.

Social Media

Social media was identified by the Steering Committee as an appropriate method for spreading public messages. The Steering Committee decided to use multiple platforms to reach a variety of audiences:

- Twitter is a messaging platform that allows users to send brief messages to followers (Figure 3-5).
- Facebook is a social network that connects friends, businesses, and governments. The City of Roseville shared messages on its Public Safety Facebook page, allowing other government pages to share (Figure 3-6).
- Nextdoor is a neighborhood social network launched in 2013. On this platform, users must be confirmed members of a community. Once verified, neighbors can receive community updates from local government, share or sell unused goods, or coordinate community events. The City's public information specialists regularly used Nextdoor to engage Roseville's neighborhoods (Figure 3-7).

Internet

The City used its web-based capabilities to keep the public apprised of the plan update process. Upon completion of the initial Plan, a permanent hazard mitigation plan website was established on the Roseville website (see Figure 3-8):

www.roseville.ca.us/HazardPlan

This page can be accessed from the City's home page using the site's search engine. This page housed all pertinent information on the hazard mitigation plan, its progress, and its implementation status. This site has proven to be a highly effective measure for ongoing public access to the Plan. The update scope of work was posted on the website during the update process, along with announcements of all key milestones of the plan update development. Steering Committee meeting announcements, agendas and meeting minutes were also made available on the site. This website also was the principal means of disseminating the survey for the 2016 Plan.

3.3.2 Public Involvement Results

The public involvement strategy used for the plan update introduced the concept of mitigation to the public and provided the Steering Committee with feedback to use in developing the Plan. All citizens of Roseville were provided ample opportunities to provide comment during all phases of this plan update process. Details of attendance and comments received from the public meeting are provided in Appendix A and summarized in Table 3-2. Detailed analysis of the survey findings from the 671 electronically submitted surveys is presented in Appendix A.

Table 3-2. Summary of Public Meetings

Date	Location	Number of Citizens in Attendance	Number of Contacts Made
April 16, 2016	City of Roseville Earth Day	5,000	Over 50
August 2, 2016	Steering Committee Meeting – Public Draft	1	1



Figure 3-5. Twitter Survey Announcement



Figure 3-6. Facebook Survey Announcement

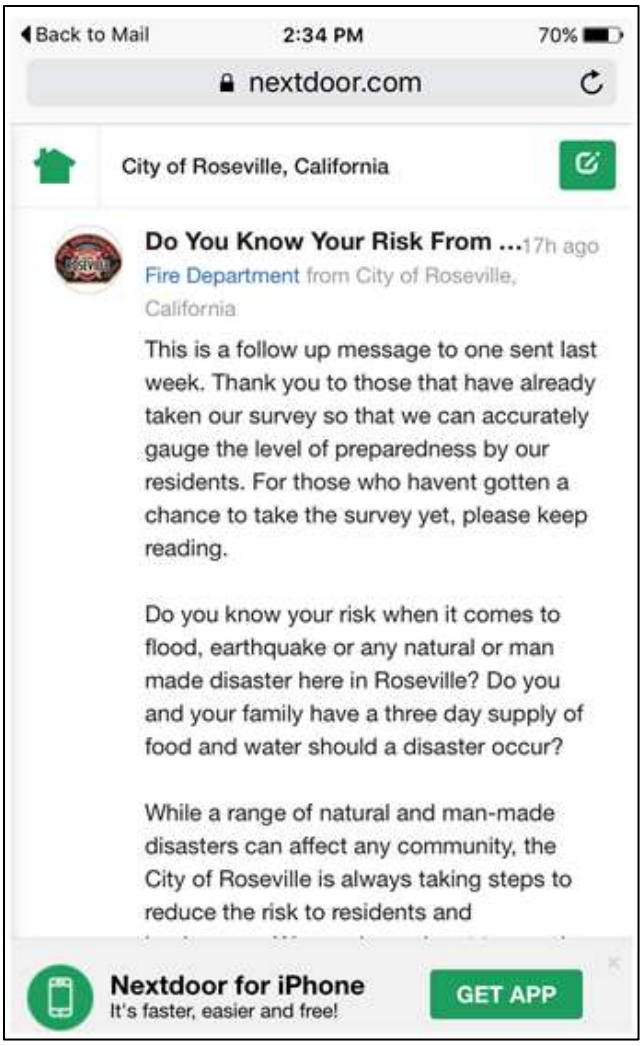


Figure 3-7. Nextdoor Survey Announcement

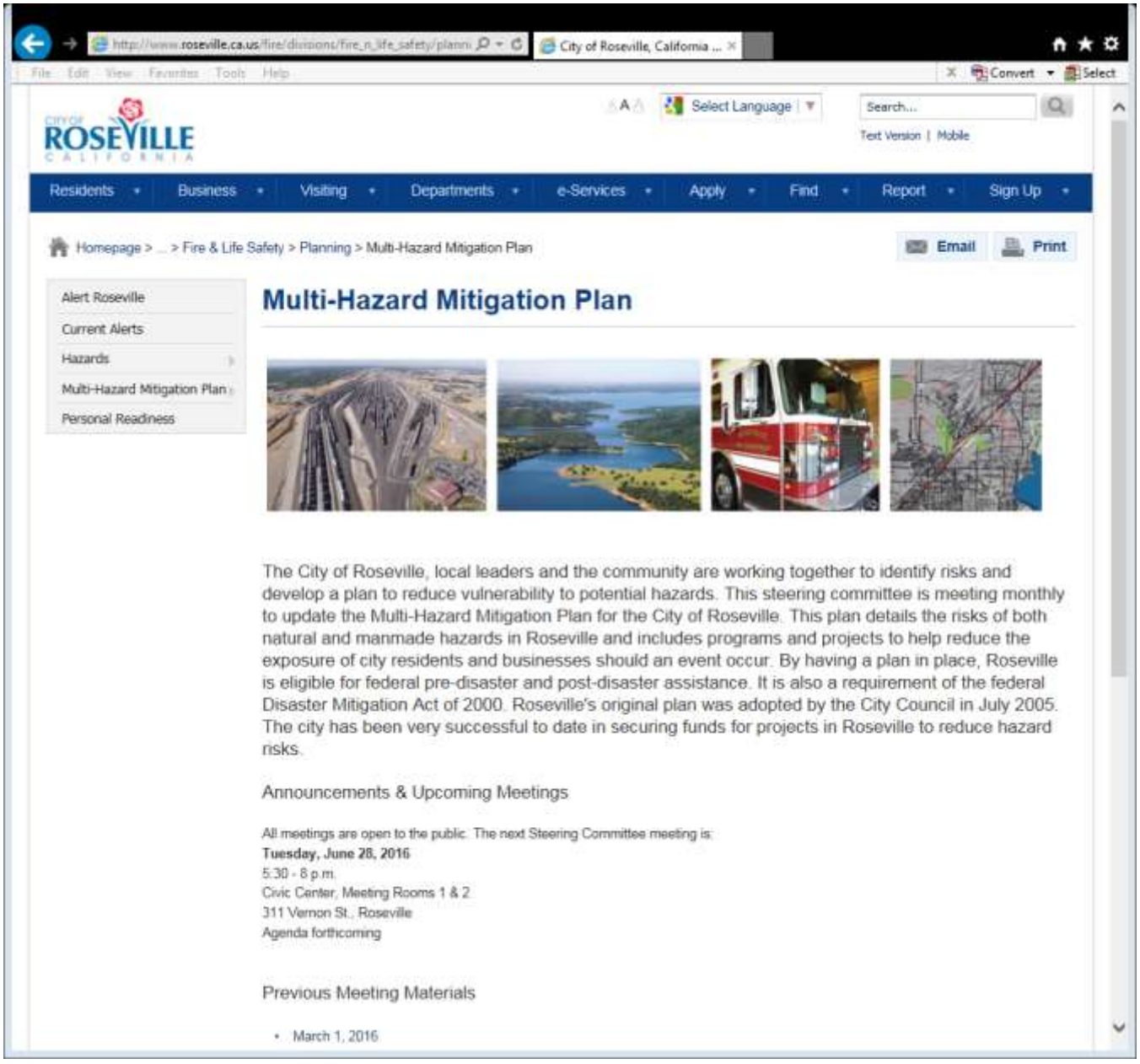


Figure 3-8. Sample Page from Hazard Mitigation Plan Website

3.4 ASSEMBLE THE UPDATED PLAN

The base format of the 2011 Plan was retained for the 2016 Plan. Enhancements were made to include the following components:

- The 2016 update provides a discussion on new mediums used to keep the public apprised of the Plan's actions during the project performance period.
- The 2016 update describes the need for changes to the risk assessment and what changes were made in comparison to the previous plan update.
- The update describes changes to risk exposure due to either of the following:

  - Successful mitigation projects
  - Changes in land use due to annexation or new development.

- The 2016 update describes changes to the action plan and the reasons for them.
- The 2016 update identifies completed, deleted, or deferred actions or activities from the previously approved plan as a benchmark for progress.
- The 2016 Plan includes in its evaluation and prioritization new mitigation actions identified since the previous plan update.
- To be compliant with California Senate Bill 379, the 2016 hazard mitigation plan includes linkage with the City's General Plan. The bill requires the update to include a set of goals, policies, and objectives based on a vulnerability assessment, identification of the risks that climate change poses to the local jurisdiction and the geographic areas at risk from climate change impacts, and specified information from federal, state, regional, and local agencies.

3.5 PLAN DEVELOPMENT CHRONOLOGY/MILESTONES

Table 3-3 summarizes important milestones in the plan update process.

Table 3-3. Plan Development Chronology/Milestones

Date	Event	Description	Attendance
2014			
9/23	CRS re-verification visit	City undergoes its re-verification visit as the nation's only CRS Class 1 community. The Class 1 is re-verified by this process.	N/A
2015			
10/18	Selection of Tetra Tech as plan facilitation consultant through sole source contract	Technical assistance secured	N/A
11/3	1st Steering Committee meeting	Reconfirm Steering Committee organization/ground rules Review the plan update work plan Risk assessment update Review progress reports and state plan	13
11/30	2nd Steering Committee meeting	Progress Report Recommendations Hazards of Concern Confirmation Guiding Principle/Vision/Mission Statement Confirm Goals and Objectives Public Involvement Strategy	14
2016			
1/5	3rd Steering Committee Meeting	Risk Assessment Update Public Involvement Strategy Critical Facilities Definition General Plan Update Emergency Operations Plan Review Debris Management Plan	17
2/2	4th Steering Committee Meeting	Risk Assessment Update Public Involvement Strategy, Survey Finalization Public Involvement, PPI Alternatives Analysis	15
2/8	Survey Deployment	The public survey was deployed via multiple platforms including City websites, Facebook, Nextdoor, Twitter, and public announcement.	N/A
3/1	5th Steering Committee meeting	Risk assessment update Public Involvement Strategy Update, Public Meeting (Strengths, weaknesses, obstacles and opportunities)	16
4/16	Public information open house—Roseville Earth Day	Public open house held at the Roseville Earth Day Festival at Mahany Park outside of the Roseville Utility Exploration Center, 1501 Pleasant Grove Boulevard, Roseville from 10:00 AM to 4:00 PM. Risk assessment data shared with the public as well as distribution of hazard specific information.	50
8/2	6th Steering Committee meeting/Public Review Meeting	Review the public draft and launch the public comment period for the 2016 Plan	13
8/19	Public Comment Period Ends	Draft Plan posted on Hazard Mitigation Plan website. Press release advertising public comment period	N/A
9/01	Plan review	Plan sent to Cal OES and ISO for review and approval pending adoption (APA)	N/A
TBD	Final public meeting and Plan adoption	APA Plan presented to City Council for adoption. The public was provided opportunity to provide comment prior to formal adoption.	##
TBD	CRS approval	Plan was approved by ISO for CRS credit at ___ points	N/A
TBD	Final approval	FEMA granted final approval of the adopted plan	N/A

4. CITY OF ROSEVILLE PROFILE

4.1 GEOGRAPHIC PROFILE

The City of Roseville lies to the west of the foothills of the Sierra Nevada Range, about 16 miles northeast of downtown Sacramento. It is the largest city in Placer County and has experienced considerable residential and commercial growth in the past two decades.

The focus of this Hazard Mitigation Plan is the primary planning area defined in the *City of Roseville General Plan 2035*. The planning area includes 43.39 square miles of incorporated lands and an additional 796 acres making up the City's sphere of influence, as shown in Figure 4-1. It is divided into smaller areas called "Specific Plan Areas" for which more detailed individual plans have been developed to implement the General Plan. The City of Roseville is unusual in that 14 specific plans have been adopted. These Plan Areas contain detailed design guidelines and development agreements to guide development and ensure that development is funded and built as planned.

Roseville is largely urbanized. The greatest area of undeveloped property is in the western portion of the City, which includes the remainder of the developing West Roseville Specific Plan, as well as planned specific Plan Areas including Sierra Vista, Creekview and Amoruso Ranch. The incorporated area and sphere of influence are the primary focus of General Plan policies, but "secondary planning areas" also bear relationship to Roseville planning efforts, depending on the planning issue. For example:

- For the issue of air quality, the secondary planning area includes the City and all areas outside the City that are within the associated Sacramento Valley air basin.
- For flood protection, the secondary planning area encompasses the complete drainage basins of surface waters that flow through Roseville.
- Other secondary planning areas encompass varying boundaries beyond the primary planning area for issues such as solid waste, recycling, transportation and wastewater treatment.

The City's area is characterized by gently sloping terrain with areas of steep ravines in the northeast, and relatively flat valley on the western portion of the City. It is segmented by topographical and physical features, including streams, natural parkways, open space, Interstate 80 and Highway 65, the Union Pacific railroad, and industrial facilities. Traffic is directed around several of these topographical features by bridges and an underpass. These limitations may create traffic congestion and delay emergency response. Heavy traffic congestion at peak commute times on the City's major roadways acts as a barrier to timely response for emergency services. In the event of an accident or other emergency at one of the key intersections between a road and a stream, freeway, or railway, sections of the City could be isolated or have response time slowed.

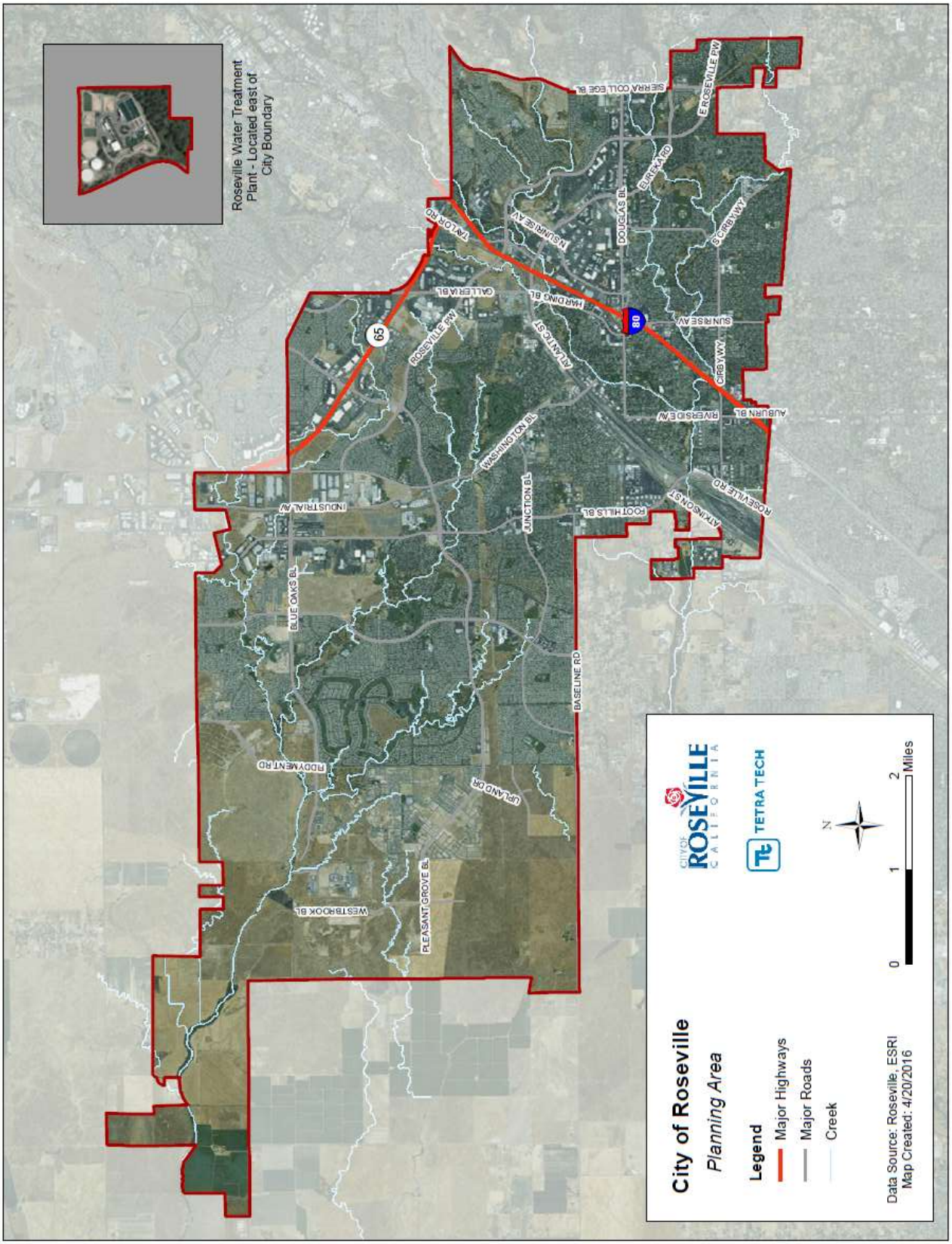


Figure 4-1. Roseville Planning Area

4.2 HISTORICAL OVERVIEW

4.2.1 Pre-Development

The Placer County region was first inhabited by the Maidu Indians, whose territory extended from the Sacramento River Valley to the Sierra Nevada Range. The Southern Maidu occupied the American River basin, along with the Bear and Yuba River basins in the area now recognized as the City of Roseville. An abundance of plants and animals supported the Maidu tribes' large population. Evidence of the Maidu communities still exists along the banks of Strap Ravine and Dry Creek.

4.2.2 Founding of the Community

Fur trapping expeditions came to the area in the early 1800s, and James Marshall discovered gold in the region in 1848. Some of the miners who came in search of gold became the area's first pioneers, taking up farming along the fertile creeks. Eventually, disease, gold miners and early settlers killed or forcibly removed the Maidu from their traditional lands. By 1864, track-laying crews from the Central Pacific Railroad had pushed eastward from Sacramento building the western half of the nation's first transcontinental railroad line. At the site of today's Roseville, the rails of the Central Pacific intersected with those of the California Central, a small line which then linked the towns of Folsom and Lincoln. The place where the two lines joined was labeled on railroad maps as "The Junction." The small freight and passenger center called Roseville developed around the junction.

For many years, Roseville remained a small railroad shipping point of about 250 inhabitants, centered on the train depot and a few small businesses and houses lining the two principal streets, Atlantic and Pacific. This changed between 1906 and 1908, when railroad roundhouse and repair facilities were moved to Roseville from nearby Rocklin. By 1908, the population increased to 2,000. New subdivisions were laid out to accommodate newcomers, many of whom moved from Rocklin. The business district expanded along Lincoln, Main, Church, and Vernon Streets. A chamber of commerce was organized to provide municipal services such as water, electricity, police and fire protection. In April 1909, the town incorporated and began to grow until it became Placer County's largest city.

4.2.3 Post-Incorporation Development

Railroad expansion continued, and local businesses grew as well. In the 1920s, the Pacific Fruit Express ice plant was the world's largest artificial ice plant. Also by the 1920s, the Southern Pacific Railroad boasted the largest freight marshaling yards west of the Mississippi River at Roseville. By the start of the Great Depression in 1929, Roseville's population had risen to 6,425.

During World War II, thousands of troop and munitions trains made their way through Roseville. The City continued to boom as a railroad center into the post-war years, but by the 1950s it faced competition from airlines and interstate trucking. The introduction of jet aircraft and the construction of Interstate 80 through Roseville caused the once-booming passenger train service to decline abruptly. The local depot was closed in 1972 and razed the following year. The Pacific Fruit Express ice plant closed in 1974, rendered obsolete by the introduction of self-refrigerating shipping options.

Completion of Roseville Community Hospital in 1952, the Folsom Dam in 1955, and the Roseville Freeway (Interstate 80) in 1956 gradually shifted the population away from downtown Roseville to what would become known as East Roseville. Roseville Square, the town's first shopping complex, was completed in 1961. Today, Roseville has more than 28 million square feet of commercial, office, and industrial floor space, and is ranked 10th statewide in total taxable retail sales.

In 1964, Roseville was selected as one of Look magazine's All America Cities. Roseville experienced a population surge in the 1980s as developers built up its broad expanses of cheap open land with easy transportation access. As the population expanded, so did the need for water, electrical, sewage, police, fire protection, recreational and educational services.

4.2.4 Current Conditions

The City has continued to grow outward. An expansive industrial zone lies north of Roseville adjacent to Highway 65, along with numerous corporate headquarters along Douglas Boulevard and the Johnson Ranch Road area. Although Roseville is no longer just a railroad town, the railroad remains a major factor in the local economy, and Roseville is still one of the principal railroad centers of the West. Passenger service was reintroduced in 1987 and a new intermodal depot facility was completed.

Today Roseville is an emerging urban center with a mix of residential and employment uses. The center of the City is typified by the downtown and small lot, single-family residences, while newer commercial and office development and larger suburban-type residences characterize the edges of town. As of January 2016, the California Department of Finance estimated the City's population to be 134,073—a 61-percent increase since 2000. It is anticipated that Roseville, along with the remainder of the South Placer/Sacramento Region, will continue to be the focus of significant development. Currently, the focus of new development is along the eastern, western, and northern portions of the community.

4.3 MAJOR PAST HAZARD EVENTS

Presidential disaster declarations are typically issued for hazard events that cause more damage than state and local governments can handle without assistance from the federal government, although no specific dollar loss threshold has been established for these declarations. A presidential disaster declaration puts federal recovery programs into motion to help disaster victims, businesses and public entities. Some of the programs are matched by state programs. Table 4-1 lists the presidential major disasters and other federal declarations since 1950 that have affected Placer County, according to Placer County's Multi-Hazard Mitigation Plan, Cal OES, and FEMA.

Review of these events helps identify targets for risk reduction and ways to increase a community's capability to avoid large-scale events in the future. Many natural hazard events do not trigger federal disaster declaration protocol but have significant impacts on their communities. These events are also important to consider in establishing recurrence intervals for hazards of concern.

4.4 PHYSICAL SETTING

4.4.1 Geology

Roseville is within the Great Valley and Sierra Nevada geomorphic provinces of California. Located on the east side of the Sacramento Valley, Roseville's geology consists of water deposited (alluvial) sediments from the erosion of the Sierra Nevada mountain range.

4.4.2 Soils

Soils in Roseville include some Quaternary (less than 1.8 million years old) sands, sandstones and mudstones, some Upper Tertiary (1.8 to 24 million years old) sandstones, mudstones and limestone, some Lower Tertiary (24 to 64 million years old) mudstones and sandstones, and Franciscan melange and serpentinite. These soils tends to be very dense or in some areas, soft rock. Some Quaternary muds, sands, gravels, silts and mud are located along 100-year floodplains. Soils in Roseville also include mehrten lava flow, which restricts permeability.

Table 4-1. Presidential Major Disaster, Emergency, and Fire Management Assistance Declarations

Type of Event	FEMA Disaster #	Date
Flooding	DR-47	12/23/1955
Flooding	DR-82	4/4/1958
Flooding	DR-138	10/24/1962
Late Winter Storms/Flooding	DR-145	2/7/1963
Late Winter Storms/Flooding	DR-183	12/28/1964
1969 Storms	DR-253	1/26/1969
Winter storms	DR-682	2/9/1983
Spring Storms/Flooding	DR-758	2/18/1986
Severe Winter Storms	DR-1044	1/10/1995
Late Winter Storms	DR-1046	1/13/1995
Winter Storms/Flooding	DR-1155	1/4/1997
Sierra Fire	FM-2463	9/19/2002
Stevens Fire	FM-2541	8/8/2004
Hurricane Katrina Evacuations: Economic	EM-3248	9/13/2005
Severe Rainstorms, Flooding, Landslides, and Mudslides	DR-1628	2/3/2006
Severe Storms, Flooding, Landslides, and Mudslides	DR-1646	6/5/2006
Wildfire	FM-2786	9/1/2008
Wildfire	FM-2832	8/31/2009

Source: FEMA, Placer County Multi-Hazard Mitigation Plan, 2016

4.4.3 Climate

Roseville and the northern Central Valley have a Mediterranean climate with warm, dry days and cool nights during the summer, when the average temperature is 93ºF during the day and 57ºF at night. In 2001, the California Energy Commission developed climate zones based on energy use, temperature, and other factors and created representative temperature data for each zone. Roseville is located in Zone 11: Red Bluff. As a whole, Zone 11 experiences sharply defined seasons with summers consisting of almost constant sunshine and dry air and winters with piercing winds and thick ground fog.

Table 4-2 presents a summary of annual climate conditions. Precipitation from May through October is rare, with most of the rainfall in the Greater Sacramento area, including Roseville, occurring between November and April. Prevailing winds in the summer can be light to gusty from the south. In the late summer and early fall, several wind events typically occur, with northerly winds that cause critical fire weather conditions in the City and surrounding areas.

4.5 DEVELOPMENT PROFILE

4.5.1 Land Use Policies

In addition to a considerable jump in residential growth, Roseville has experienced considerable growth in commercial and industrial development. Based on growth projections and current land use allocations in the General Plan, the City has sufficient development potential through 2035 for both residential and commercial uses. Typically residential land uses will be built out well before complete buildout of nonresidential land could occur, anticipated after 2050.

Table 4-2. Roseville Climate

	Average High Temperature (°F)	Average Low Temperature (°F)	Record High Temperature (°F)	Record Low Temperature (°F)	Total Inches of Precipitation
January	54	39	73	17	4.5
February	61	42	78	19	4.5
March	65	45	86	26	4.3
April	72	47	106	60	1.8
May	80	52	112	35	0.5
June	89	57	115	43	0.3
July	95	61	115	50	0.1
August	94	60	114	45	0.1
September	89	58	108	46	0.5
October	79	53	102	32	1.3
November	64	45	86	26	3.5
December	55	39	74	16	3.4
Annual Average or Total	**77**	**51**	**100**	**36**	**24.8**

Source: The Weather Channel

Numerous factors will influence growth throughout the South Placer County/Sacramento region:

- General economic conditions of the state
- Federal and state budget issues and cutbacks
- Competition from other growth areas
- Perceptions about the quality of life
- Housing costs and availability
- Employment opportunities
- Infrastructure and resource availability.

Management of the City's growth is guided by the Land Use Element of Roseville's General Plan, which consists of a land use map and land use policies. The overall goal of the Land Use Element is to promote a balanced and innovative land use pattern that retains and enhances the distinct character and identity of Roseville. It is organized into the following six components:

- **Existing Conditions and Projections—**Provides a description of the planning area, an existing land use inventory, and future projections.
- **Land Use Designations, Definitions and Standards—**Identifies and defines the City's land use categories, incorporating general use, development, intensity, siting, and compatibility standards.
- **Community Form—**Provides goals and policies to define and direct the future form and pattern of the City. Issues addressed include community character; relationship to transit and pedestrian uses; air quality; downtown and neighborhoods; jobs and housing; economic development; community involvement; and inter-jurisdictional coordination.
- **Community Design—**Includes goals and policies that address aesthetics and function; the integration of the built and natural environment; and community character. Emphasis is on the development of a design framework that reflects the City's goal of high quality, community-wide design.
- **Growth Management—**Focuses on the proactive management of growth in the community. Included is the identification of performance standards to regulate potential future growth areas. Policies addressing annexations and expansion of the City's sphere of influence are also included.

- **Relationship to Specific Plans—**Discusses the interrelationship between the General Plan and the City's Specific Plans.

The land use map included in the Land Use Element generally shows the City's existing and planned land use mix and pattern. The total land use allocation at buildout is shown in Figure 4-2. The land use map reflects only those policies that can be graphically shown. Land use decision-making is guided not only by the land use map but also by the goals, policies and implementation measures in the Land Use Element.

Source: City of Roseville, General Plan, 2015

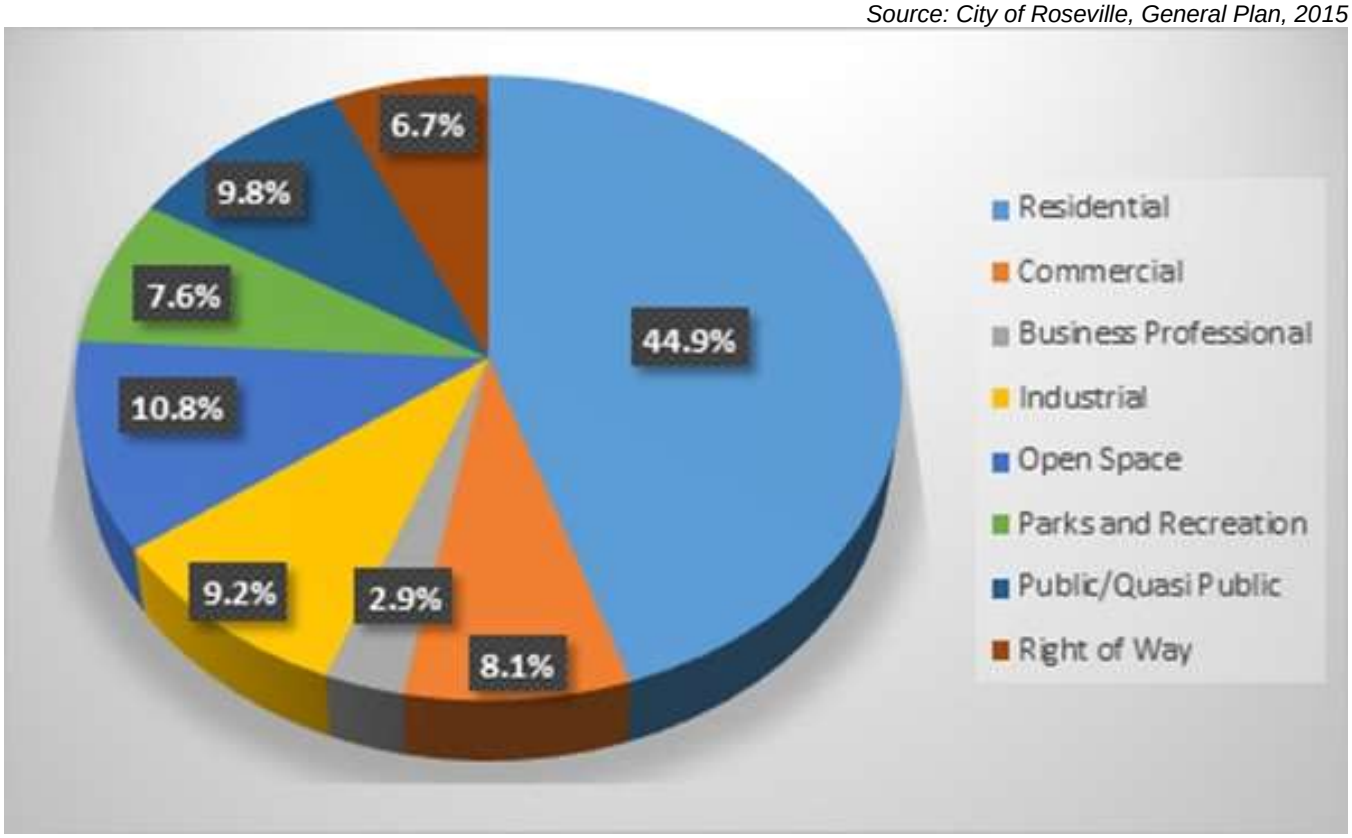


Figure 4-2. Total Land Use Allocation in Roseville

The City's land use policies are built upon underlying principles that were established based on input the City received from its residents and the Growth Management Committee established in 2005. These principles have impacted the overall policy direction and land use pattern in the City of Roseville. They include the following:

- Promote and enhance Roseville's unique character and identity.
- Distinguish Roseville from adjacent communities through the quality of development and design, and the level of public services and facilities provided.
- Protect and enhance Old Town/ Downtown and the City's established neighborhoods.
- Promote new development as an integrated and connected part of the City's land use pattern.
- Provide a variety of housing types and opportunities, including those for all income groups.
- Create a balanced land use pattern with an appropriate mix of uses to accommodate resident employment, service, and social needs within the community.
- Promote a land use pattern that provides a high level of open space and recreational amenities and is sensitive to the natural environment.

- Create a land use mix and pattern that accommodates and promotes alternative transportation modes for ease of access and improved air quality.
- Proactively manage and plan for growth.
- Ensure that new development is fiscally neutral, and does not impact existing residents.

State, regional and local growth projections indicate that Roseville and the South Placer County/Sacramento region will continue to draw residential and employment growth. Much of this attraction can be attributed to desirable location and access, availability of an educated and skilled workforce, land costs and overall quality of life. Local and regional economic conditions will drive the local growth potential, and existing land use allocations may require modification in the near future.

4.5.2 Residential Development

The Land Use Element of the General Plan identifies three primary residential land uses:

- **Low-Density Residential**—The low-density residential land use category is for development of the single-family dwelling units that make up the majority of Roseville's housing supply. The lower densities are assigned to lands that require flexibility to accommodate development constraints (e.g., slopes, trees, etc.). Typically, low-density residential lands should require minimal grading or disturbance of natural features.
- **Medium-Density Residential**—The medium-density residential land use category is for small-lot single-family detached dwelling units and attached patio homes, half-plexes, townhouses, condominiums, and mobile home parks. This residential land use accommodates a variety of housing types and designs, and is often used as a transition or buffer between higher intensity land uses and low-density residential land use. It may also be applied as a transition between higher volume roadways and lower density residential uses.
- **High-Density Residential**—The high-density residential land use category is normally developed with multiple-story apartment or condominium structures containing multiple attached dwelling units. The broad range of densities in this category yields a variety of design options. In some areas, this land use category may be combined with commercial uses to form a mixed-use development where higher densities are desirable and beneficial.

According to the State Department of Finance, there are 51,590 housing units in the City. Single-family detached homes made up over 75 percent of the housing stock as of January 2016. Multi-family homes made up 24 percent, and mobile homes accounted for less than 1 percent. Residential construction valuation reached $208,581,000 in 2015. The Building Division reported that $19,111,000 in new construction was completed during the 2015 – 2016 fiscal year. The Placer County Association of Realtors provided statistics indicating that the median purchase price of single-family houses and condominiums in Roseville rose approximately 9 percent between May 2015 and May 2016, from $391,500 to $425,000 and $168,500 to $178,300, respectively. As indicated by the increase in housing prices, the demand for single-family homes continues and available land for single-family homes is ample.

4.5.3 Non-Residential Development

Roseville's non-residential land use designations include areas designated for commercial, office, industrial uses, special areas, and combining districts. Special designations include Central Business District, Public and Quasi-Public uses, Parks and Recreation, Open Space, and Urban Reserve. Like the residential designations, each non-residential designation includes a purpose statement, primary and secondary uses, and development standards, including a floor area ratio. Unlike the specific secondary uses listed for residential designations, which are intended to be subordinate and may be permitted only to support neighborhood convenience, the non-residential land use designations permit secondary land uses that are supportive and complementary of the primary uses, not

necessarily subordinate. Typically, the size of secondary uses is limited and therefore does not warrant a separate land use designation. Table 4-3 summarizes the non-residential land uses. A summary of non-residential development in Roseville is given in Table 4-4.

Table 4-3. Non-Residential Land Uses

Land Use	Purpose
Neighborhood Commercial	The neighborhood commercial land use designation is intended to provide basic commercial services for the convenience of surrounding neighborhoods within walking distance of major residential areas.
Community Commercial	The community commercial land use designation is distinguished from the neighborhood commercial designation by providing a broader range of goods and services to an expanded service area.
Regional Commercial	The regional commercial land use designation is intended to accommodate larger shopping centers and commercial activities where uses provide goods and services to a citywide and regional service area.
Business Professional	The business professional land use designation provides areas for small and large office uses, including uses supportive of offices.
Light Industrial	The light industrial land use designation is applied to lands reserved for office, industrial, and research and development uses that generate very limited noise, vibration, odor, dust, smoke, light, or other pollutants, and are either integrated or compatible with surrounding uses.
General Industrial	The general industrial land use designation is intended to provide areas for industrial uses that tend to generate noise, vibration, odor, dust, smoke, light, and an aesthetic appearance not compatible with residential and other sensitive receptors. The intent of this category is to provide a place for industrial uses within the City that is properly buffered from other uses.
Central Business District	The Central Business District is a distinct land use category that acknowledges land use patterns of significantly greater intensities and traditional mixed uses of retail, office, and apartment. The district is limited in its application to Central Roseville, the West Roseville Village Center, and areas of greater urban intensity.
Open Space	The open space land use designation is used to preserve and protect public and private lands that are significant due to wildlife habitat, natural features, or flood hazard. Within new development areas, the 100-year floodplain boundaries will be designated as Open Space. In addition, sensitive or unique natural features, including, but not limited to, wetlands, vernal pools, and oak woodlands, are to be designated as open space as part of specific plans and other major development review processes.
Public/Quasi-Public	The public/quasi-public land use designation is used to establish areas for education, religious assembly, governmental offices, municipal corporation yards, and water treatment plants.
Urban Reserve	The urban reserve land use designation is applied to lands that are anticipated to receive urban land entitlements, but at the present time are constrained by growth management policies, availability of services or other limitations.
Park/ Recreation	The park and recreation designation is used to identify public parks in Roseville
Floodplain	The floodplain designation identifies lands that are within the 100-year floodplain boundaries as defined in the Safety Element of the General Plan. Development of lands with a floodplain land use designation is strictly regulated by the City of Roseville. In areas with existing development, the floodplain designation is an overlay or combining land use. As part of a specific plan, the land use designation may be combined with an open space or parks designation, if found consistent with the policies of the Safety Element.
Study Area	The study area land use designation is used as a combining land use to identify future General Plan or neighborhood study areas. This combining designation may be applied to any area where the City believes that additional land use analysis and amendment of the General Plan may be desirable to resolve specific neighborhood or land use issues.
Village Center	The Village Center land use designation is intended allow for a mix and density of land uses common to a traditional downtown, urban setting. It allows for flexibility and deviation from the standards and permitted uses contained in the primary land use designation for which it is combined.
Transfer Station	The transfer station land use designation is intended to preserve and protect industrial areas suitable for a solid waste transfer station.

Table 4-4. Non-Residential Development Profile as of July 2016

Activity/Use	Total Developed Building Area (square feet)	Total Area Zoned for Use (acres)
Commercial	11,249,499	2,249
Office	8,080,479	802.69
Industrial	8,997,392	2,369
Public/Quasi Public	2,037,310	2,702

4.5.4 Critical Facilities and Infrastructure

Critical and essential facilities and infrastructure are those that are critical to the health and welfare of the population. These become especially important after a hazard event. The Steering Committee created the following definition specific to Roseville, regarding which facilities are considered critical:

> *A structure or other improvement, public or private, that, because of its function, size, service area, or uniqueness, has the potential to cause serious bodily harm, extensive property damage, or disruption of vital socioeconomic activities if it is destroyed or damaged or if its functionality is impaired. Critical facilities may include, but are not limited to, health and safety facilities, utilities, government facilities, hazardous materials facilities, and transportation infrastructure.*

The location of critical facilities and infrastructure in the planning area is shown on Figure 4-3 through Figure 4-5. Due to the sensitivity of this information, a detailed list of facilities is not provided. The list is on file with the City of Roseville. Table 4-5 and Table 4-6 provide summaries of the general types of critical facilities and infrastructure, respectively.

Table 4-5. Planning Area Critical Facilities

Facility Type	Number in Planning Area
Medical and Health	2
Government Functions	27
Protective Functions	10
Schools	49
Hazmat	6
Other Critical Functions	78
Total	**172**

Table 4-6. Planning Area Critical Infrastructure

Facility Type	Number in Planning Area
Bridges	68
Water Supply	11
Wastewater	23
Power	18
Communications	98
Other	6
Total	**224**

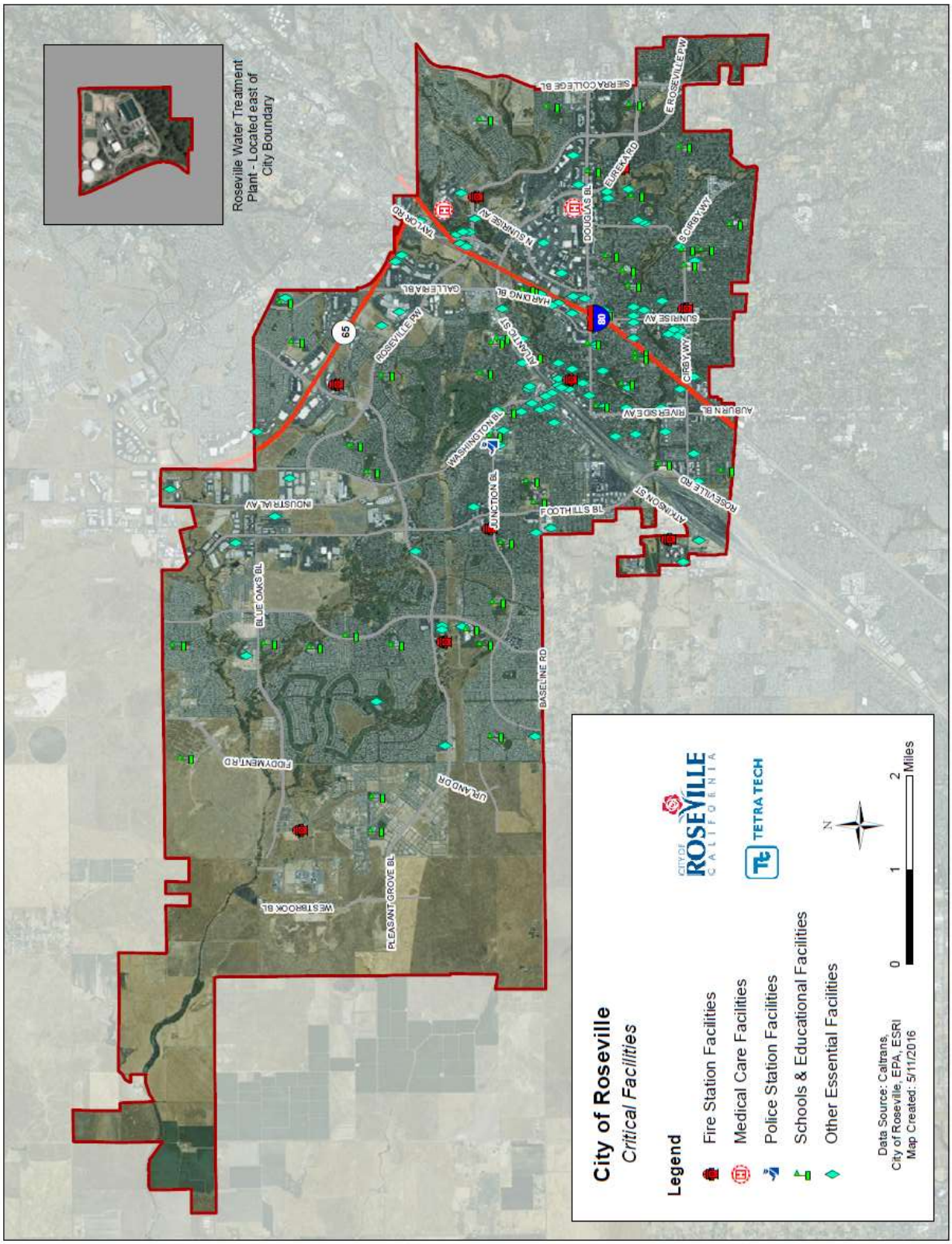


Figure 4-3. Critical Facilities in the Planning Area

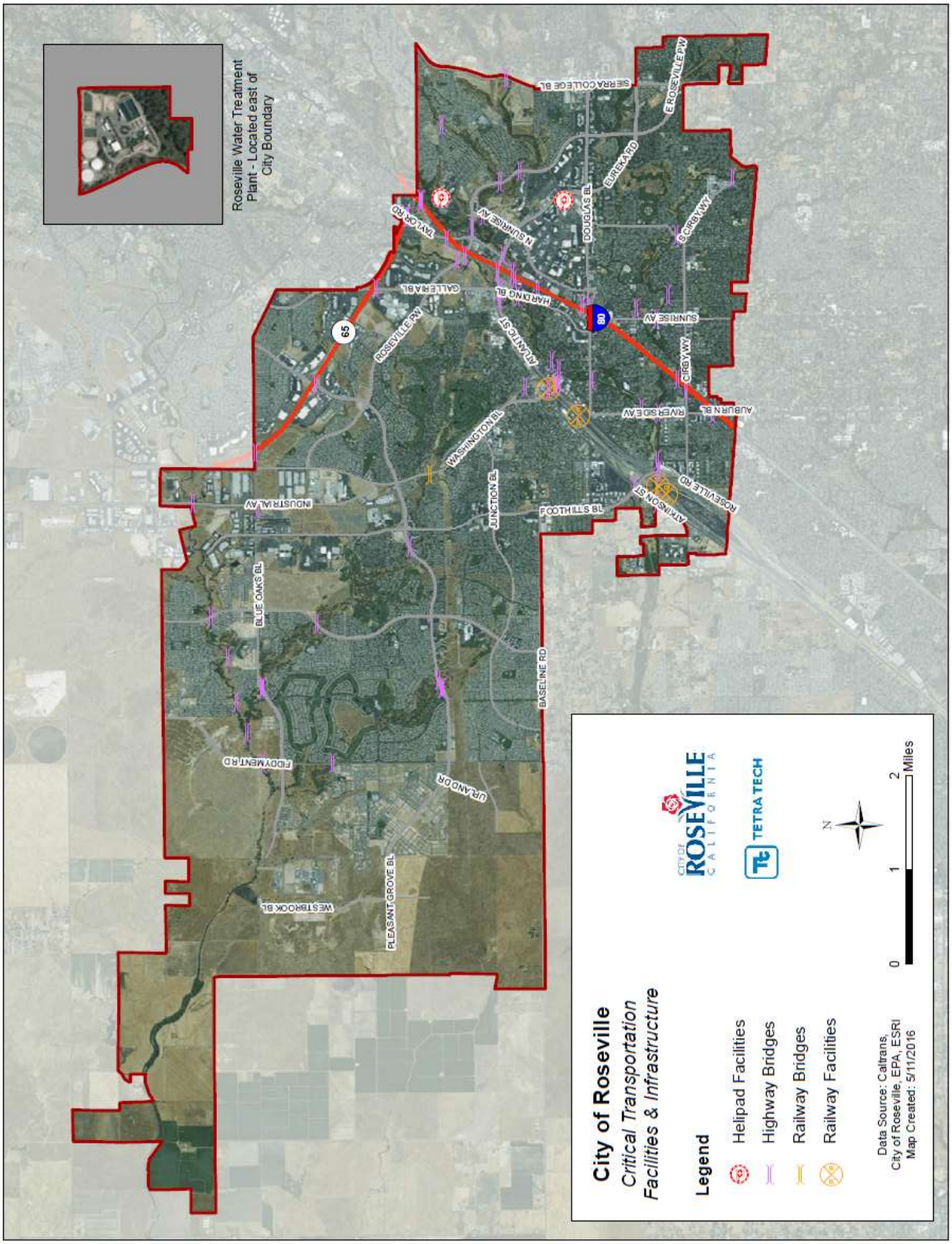


Figure 4-4. Critical Infrastructure in the Planning Area—Transportation

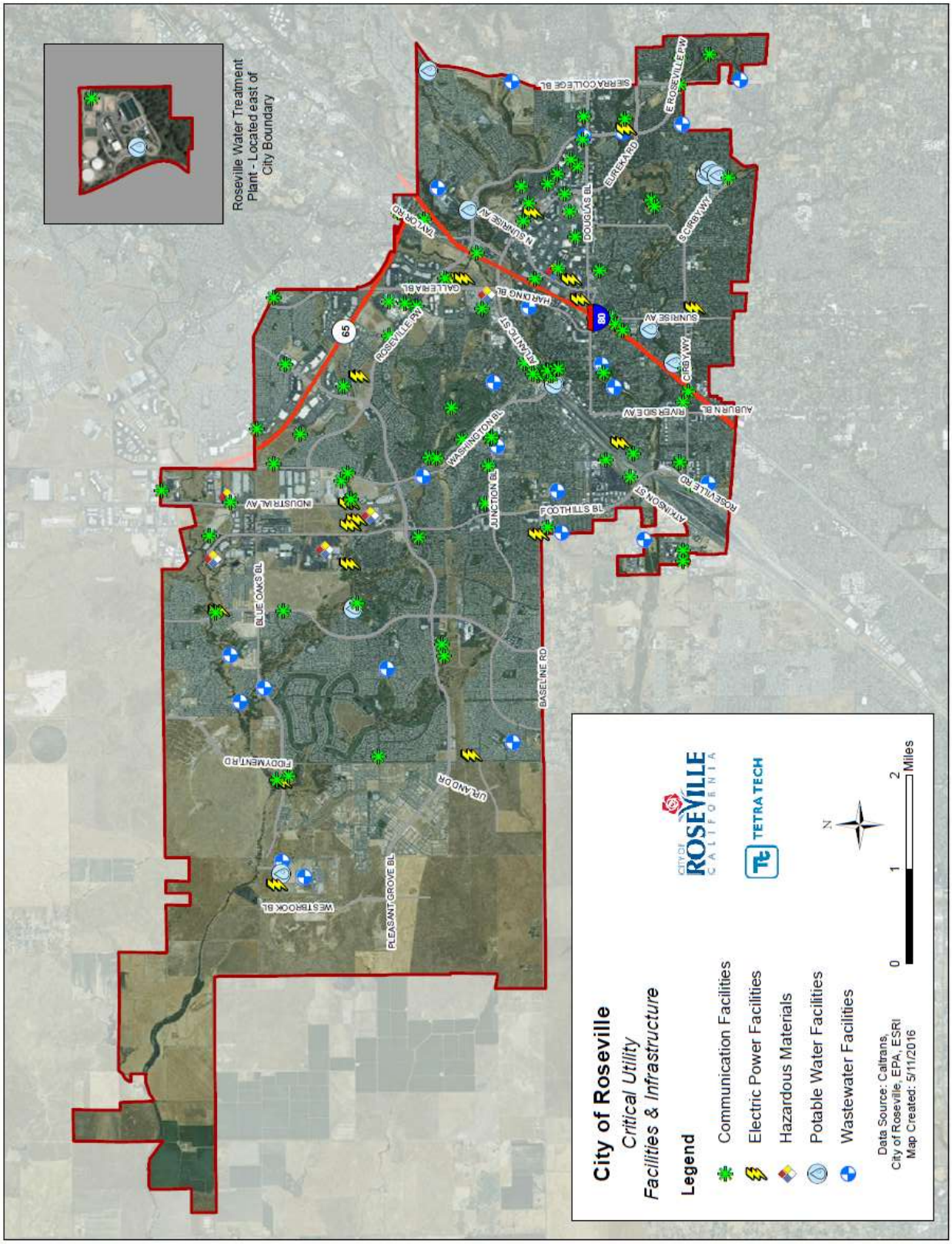


Figure 4-5. Critical Infrastructure in the Planning Area—Utilities

4.5.5 Future Trends in Development

The Roseville General Plan and associated specific area plans govern land use decision and policy-making. Decisions on land use will be governed by these programs. This Plan will work together with these programs to support wise land use in the future by providing vital information on the risk associated with natural hazards in the planning area. The City of Roseville will incorporate by reference the updated Hazard Mitigation Plan in the Safety Element of its General Plan. In addition to proactively planning for the implementation of Senate Bill (SB) 379 upon the next plan update process (see Section 4.9 for a discussion of this state law), this incorporation will ensure that all future trends in development can be established with the benefits of the information on risk and vulnerability to natural hazards identified in this Plan.

4.6 OPEN SPACE AND HABITAT

The City recognizes that open space land is limited and that valuable resources must be conserved wherever possible. For many, the City's open space setting is a highly valued natural resource. Given the strong interrelationship between open space and conservation issues, the City of Roseville has chosen to address these issues in a single element of its General Plan: the Open Space and Conservation Element. Vegetation and wildlife resources and corridors are an important component of the overall open space system and have been the historical focus of preservation efforts in Roseville. If future generations are to enjoy and benefit from the resources available to the present generation, these finite and fragile resources must be preserved and managed.

The vegetation and wildlife resources of Roseville can be broadly classified by habitat type—grasslands, oak woodlands, riparian areas, and seasonal wetlands—as discussed below. Whenever possible, the focus of preservation efforts is multipurpose. It is therefore preferred, for example, to preserve woodlands, grasslands, and wetlands in combined rather than separate and unconnected settings.

4.6.1 Grasslands

Relatively small amounts of self-sustaining grasslands remain in the northern and western undeveloped edges of Roseville. Less extensive areas of grassland are present in smaller undeveloped areas scattered throughout the City. Before Spanish and later settlers arrived in the Central Valley, the grasslands contained native species. The effects of grazing and clearing of large tracts for agriculture resulted in the decline of native species. Today, most of the grasslands in the region contain non-native species. These areas do, however, provide important habitat for birds and other wildlife.

4.6.2 Oak Woodlands and Riparian Areas

Oak woodlands are generally present near the City's major stream channels. The microclimates and alluvial soils in the woodlands provide ideal conditions for deep-rooting shrubs and trees. Most woodland areas are relatively open, with little shrub growth.

Riparian areas support a much wider biological diversity. Situated along and within the City's creeks and watercourses, riparian corridors are a source of food and water and provide cover, nesting sites, and migration and dispersal corridors for wildlife. Riparian areas are also important in flood protection and improve air and water quality through natural filtering.

Oak woodland and riparian areas are City resources not only because of the diversity of species they support but also because they provide natural open space and aesthetic value. The City's creek systems are described in detail in the groundwater recharge and water quality component of the Open Space and Conservation Element. The City regulates the protection of native oak trees through the Tree Preservation Ordinance, which includes standards that limit disturbance within protected zones of oaks and emphasizes avoidance of tree removal. Where avoidance

is not feasible and tree removal is authorized by the City, mitigation is required on an inch-for-inch basis. The Tree Preservation Ordinance is a valuable tool in protecting Roseville's oak trees and habitats. A creek and riparian management and restoration plan is being developed that will provide standards for riparian area management and enhancement. Additionally, the City maintains an overarching management plan for upholding the City's requirements in maintaining open space.

4.6.3 Seasonal Wetlands

Many of the wetland areas in Roseville are seasonal and therefore receive, retain, and transport water only during the wet season. Wetlands are subject to the regulations of the U.S. Army Corps of Engineers under the provisions of Section 404 of the Clean Water Act. Two primary types of seasonal wetlands are present in the City: intermittent drainage and vernal pool wetlands.

Intermittent drainage wetlands typically consist of channels 1 to 10 feet wide that flow over a variety of substrata. Most are wet only during winter and transport runoff. They are typically dry during summer, with scattered ponds, but they may contain water from adjacent urban runoff.

Vernal pools represent a significant seasonal wetland resource in Roseville. Although relatively abundant in Roseville and the Sacramento/Placer County region, they are considered rare statewide for their limited natural occurrence and distribution and for the unique native plant and animal species they support. Found in valley grassland areas, vernal pools are typically small, shallow, hardpan-floored depressions that fill with water during the winter wet season, gradually drying by late spring or early summer. Several plant species occur only in association with these special habitats, which has triggered concern about their inventory and preservation. Two types of vernal pools are present in the Roseville area:

- Northern volcanic mud flow vernal pools occur in shallow depressions on Mehrten mud flow formations where the slope is generally less than 2 percent.
- Northern hardpan pools generally occur on the Inks or Cometa soil series at the lower basin portions of creek floodplains. During the wet season, the pools provide special habitat for unique plant and animal species whose germination, growth, and reproductive cycles coincide with the availability of collected water. Individual pools vary significantly in the length of time they remain wet and in the diversity of plant species present.

4.6.4 Sensitive Species

The California Department of Fish and Wildlife maintains the California Natural Diversity Data Base, which includes known locations of state and federally listed endangered, rare, and threatened plant and animal species, including species considered by the scientific community to be deserving of such listing.

The sensitive plant species that may be present in Roseville are primarily associated with vernal pool environments and include the following: Bogg's Lakehedge Hyssop (*Gratiola heterosepala*), Dwarf Downingia *(Downingia humilis*), and Vernal Pool Brodiaca (*Dichelostemma lacunavernalis*). Bogg's Lake Hyssop is listed as endangered by the state and California Native Plant Society. Dwarf Downingia and Vernal Pool Brodiaca are both included on the California Native Plant Society "watch list" and have sufficiently limited distribution to warrant continued monitoring. Vernal pools in the City may also contain federally listed, endangered vernal pool tadpole shrimp (*Lepidurus packardi*) and federally listed threatened vernal pool fairy shrimp (*Branchinecta lynchi*).

Anadromous chinook salmon (*Oncorhynchus tshawytscha*) and Central Valley steelhead (*Oncorhynchus mykiss*) are known to be present seasonally in Dry Creek and its upper tributaries. Steelhead is listed by the U.S. Fish and Wildlife Service as a threatened species under the Endangered Species Act. Chinook salmon within the Central Valley Fall/Late Fall Run are listed as a candidate species. In addition to the federal and state classified rare or

endangered wildlife species known to inhabit Roseville, favorable habitats for other listed species are present in the area. Other special status species potentially present in Roseville include Cooper's Hawk, Swainson's Hawk, Valley Elderberry, Longhorn Beetle, Sanford's Arrowhead, and the Northwestern Pond Turtle. Bald eagles have been sighted near Folsom Lake, and the American peregrine falcon is present in the Sacramento Valley. All of these species thrive in the riparian habitats of floodplain environments.

Preservation of habitat for sensitive species benefits from the City of Roseville's Open Space Preserve Overarching Management Plan, as described in Section 4.9.3.

4.7 DEMOGRAPHICS

Some populations are at greater risk from hazard events because of decreased resources or physical abilities. Elderly people, for example, may be more likely to require additional assistance. Research has shown that people living near or below the poverty line, the elderly (especially older single men), individuals with disabilities, individuals with access and functional needs, women, children, ethnic minorities and renters all experience, to some degree, more severe effects from disasters than the general population. These vulnerable populations may vary from the general population in risk perception, living conditions, access to information before, during and after a hazard event, capabilities during an event, and access to resources for post-disaster recovery. Indicators of vulnerability often overlap spatially and often in the geographically most vulnerable locations. Detailed spatial analysis to locate areas where there are higher concentrations of vulnerable community members would help to extend focused public outreach and education to these most vulnerable citizens.

4.7.1 Population Trends

According to the California Department of Finance, Roseville's estimated population for 2015 was 134,073 and the estimated daytime population, which includes those coming into Roseville to work, shop, and do business, was 145,000. Roseville is the 45th largest of California's 482 cities. The City has been striving to accommodate growth while retaining and enhancing its distinct character.

The full-time population increased by 38,223 from 2000 to 2010, a 31.9-percent increase (see Figure 4-6). The 2010 population was more than four times that of 1982, when the City had 26,127 residents. The 2.6-percent growth rate from 2009 to 2010 was comparable to average annual growth rates of the past decade. This rate exceeded annual growth rates for Placer County (1.7 percent) and California (1.0 percent) for the same time period.

Between 2010 and the end of 2015, Roseville experienced an estimated 10.9 percent increase in population—averaging 2.2 percent per year. This trend indicates that the population of Roseville will continue to grow through the end of the decade, albeit more slowly than the population boom experienced between 2000 and 2010.

The average household size in Roseville is 2.61 persons, according to U.S. Census Bureau American Community Survey estimates for 2010-2014. This household average may vary by land use and location in the City. For example, the 3,814 age-restricted low-density residential units in the Del Webb and West Roseville planning areas have an estimated average household size of 1.8.

The General Plan's estimates of when Roseville will achieve buildout (the maximum development allowed by zoning) vary based on the methodology used. Under all scenarios, however, Roseville and the Placer County/Sacramento Metropolitan region are expected to remain attractive to both residential and commercial development. As growth rates continue to climb in the region, the City of Roseville has captured an increasing share of that growth. Considerable recent growth in Roseville is attributed to the annexation of the Sierra Vista Specific Plan Area of 2,064 acres and the Creekview Specific Plan of 500 acres in 2012.

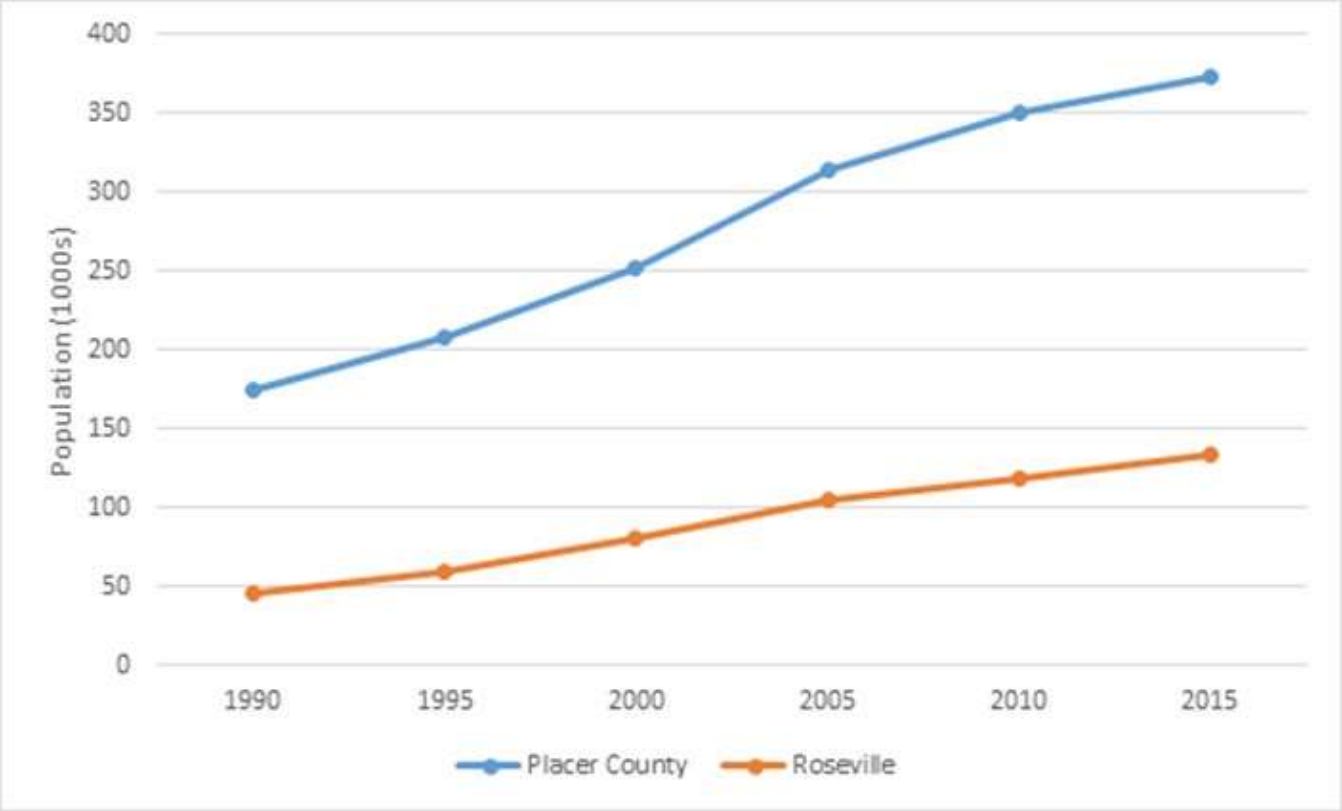


Figure 4-6. Placer County and Roseville Population Growth

Additionally, the City is in the process of annexing the 694-acre Amoruso Ranch Specific Plan, located on the northwest boundary of the City. Through buildout, these western specific Plan Areas are projected to experience the highest increase in population. The overall population, when all residential property is developed, is projected to be over 185,000. Table 4-7 shows the General Plan's population forecasts by Specific Plan Area.

4.7.2 Age Distribution

The vulnerability of elderly citizens can vary significantly based on health, age, and economic security. However, as a group, the elderly are more apt to lack the physical and economic resources necessary for response to hazard events and are more likely to suffer health-related consequences making recovery slower. They are more likely to be vision, hearing, and/or mobility impaired, and more likely to experience mental impairment.

Additionally, the elderly are more likely to live in assisted-living facilities where emergency preparedness occurs at the discretion of facility operators. These facilities are typically identified as "critical facilities" by emergency managers because they require extra notice to implement evacuation. Elderly residents living in their own homes may have more difficulty evacuating their homes and could be stranded in dangerous situations. This population group is more likely to need special medical attention, which may not be readily available during natural disasters due to isolation caused by the event. Specific planning attention for the elderly is an important consideration given the current aging of the American population.

Children under 14 are particularly vulnerable to disaster events because of their young age and dependence on others for basic necessities. Very young children may additionally be vulnerable to injury or sickness; this vulnerability can be worsened during a natural disaster because they may not understand the measures that need to be taken to protect themselves from hazards.

Table 4-7. General Plan Projections of Residential Units and Population by Specific Plan Area

	Dwelling Units			Population		
Specific Plan Area	2016	2035	Buildout	2016	2035	Buildout
Infill	15,409	16,349	16,349	40,217	42,671	42,671
Southeast Roseville	3,047	3,163	3,163	7,953	8,255	8,255
Northeast Roseville	933	1,514	1,514	2,435	3,952	3,952
Northwest Roseville	8,941	9,068	9,068	23,336	23,667	23,667
North Central Roseville	4,247	4,487	4,711	11,085	11,711	12,296
North Industrial	1,043	1,043	1,043	2,722	2,722	2,722
Del Webb	3,210	3,210	3,210	5,895	5,859	5,895
Highland Reserve North	1,669	1,669	1,669	4,356	4,356	4,356
North Roseville	4,887	6,072	6,072	12,755	15,848	15,848
Stoneridge	2,446	2,861	2,861	6,384	7,467	7,467
West Roseville	2,899	10,478	10,478	6,996	26,651	26,651
Riverside Gateway	204	456	456	532	1,190	1,190
Downtown	255	638	2,272	666	1,665	5,930
Sierra Vista	0	5,905	8,679	0	15,412	22,652
Creekview	0	2,011	2,011	0	5,249	5,249
Amoruso Ranch	0	2,827	2,827	0	7,379	7,379
Total	**49,190**	**71,751**	**76,383**	**125,332**	**184,054**	**196,180**

According to the 2010-2014 U.S. Census American Community Survey estimates, 14.3 percent of Roseville's population is 65 or older, 21.1 percent of the population is under the age of 14 and the median age is 37.5. Figure 4-7 shows the age distribution for Roseville.

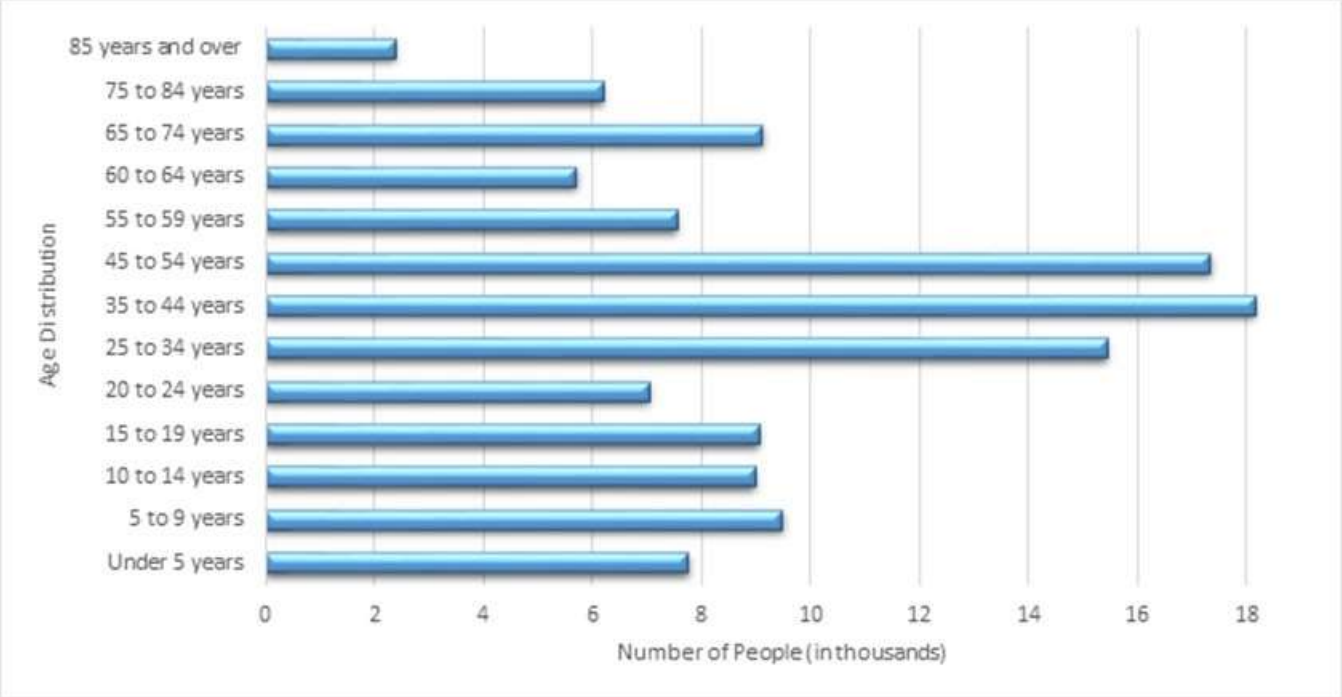


Figure 4-7. Planning Area Age Distribution

4.7.3 Race, Ethnicity and Language

Many disaster researchers have focused on the increased vulnerability that ethnic minorities experience in the United States. Research shows that minorities are less likely to be involved in pre-disaster planning and experience higher mortality rates during a disaster event. Post-disaster recovery can be ineffective and is often characterized by cultural insensitivity. Since higher proportions of ethnic minorities live below the poverty line than the majority white population, poverty can compound vulnerability.

According to the U.S. Census, Roseville's racial composition is predominately white, at about 80 percent of the City population. The largest minority population in Roseville is Hispanic, followed by Asian. Figure 4-8 shows the racial distribution of Roseville.

About 12 percent of Roseville's population is foreign-born, with the majority born in Latin America, according to 2014 U.S. Census estimates. Other than English, the most commonly spoken language in the City is Spanish. In the U.S. Census estimates, 5.6 percent of the City's residents reported speaking English "less than very well." Of the foreign born population, 38.5 percent speak English "less than very well." This has important implications for emergency managers, who must get crucial information out to all members of the population before, during and after emergency events.

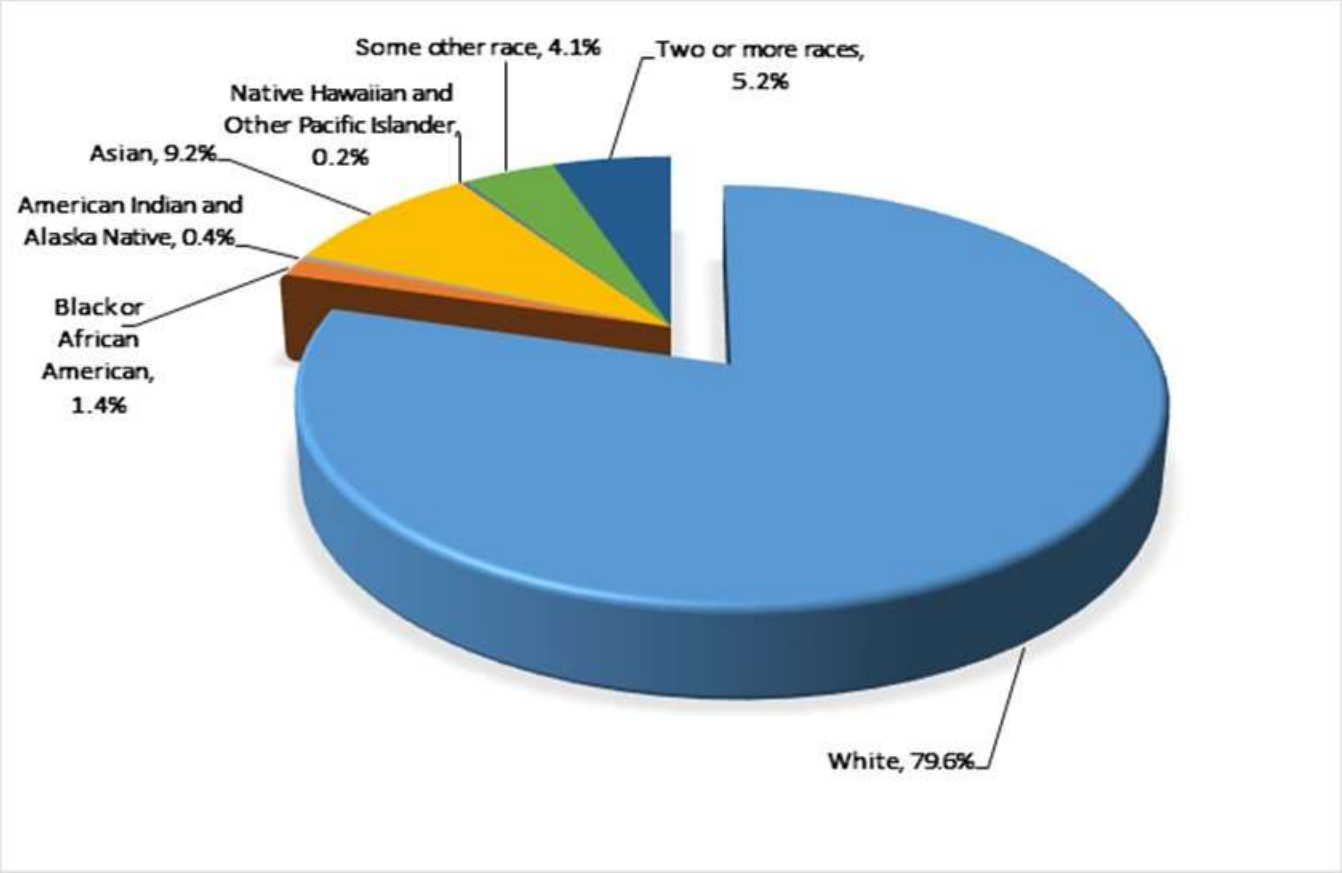


Figure 4-8. Planning Area Race Distribution

4.7.4 Individuals with Disabilities and Others with Access and Functional Needs

Individuals with disabilities and others with access and functional needs have a special stake in emergency planning because they are more likely to have difficulty responding to a hazard event than the general population. According to the 2010 U.S. Census, 12.3 percent of the U.S. noninstitutionalized population lives with a disability. As individuals with disabilities and others with access and functional needs are increasingly integrated into society, relatively large segments of the population may require assistance during the first 72 hours post-disaster, the period generally reserved for self-help.

Disabilities and access/functional needs can vary greatly in severity and permanence, making these individuals difficult to define and track. There is no "typical" disability or need, which can complicate disaster-planning processes that attempt to incorporate them. Furthermore, disabilities and access/functional needs are likely to be compounded with other vulnerabilities, such as age, economic disadvantage and ethnicity, all of which mean that housing is more likely to be substandard.

While the City of Roseville's percentage of individuals with disabilities and others with access and functional needs does not differ much from that of the state as a whole, the overall numbers are significant and warrant attention from planners and emergency managers (see Table 4-8). According to 2014 U.S. Census data, 10.3 percent of the City's population over the age of 5 has a disability.

Table 4-8. Status of Non-Institutionalized Population with Disabilities

Age	Individuals with Disabilities and Others with Access and Functional Needs	% of Age Group Population
5-17 years	1,065	4.7
18-64 years	5,038	7.2
65+ years	5,979	34.9

4.8 ECONOMY

4.8.1 Income

In the United States, individual households are expected to use some private resources to prepare for, respond to and recover from disasters. This means that households living in poverty are automatically disadvantaged when confronting hazards. Additionally, the poor typically occupy more poorly built and inadequately maintained housing. Mobile or modular homes, for example, are more susceptible to damage in earthquakes and floods than other types of housing. In urban areas, the poor often live in older houses and apartment complexes, which are more likely to be made of un-reinforced masonry, a building type that is particularly susceptible to damage during earthquakes. Furthermore, residents below the poverty level are less likely to have insurance to compensate for losses incurred from natural disasters. This means that residents below the poverty level have a great deal to lose during an event and are the least prepared to deal with potential losses. The events following Hurricane Katrina in 2005 illustrated that personal household economics significantly impact people's decisions on evacuation. Individuals who cannot afford gas for their cars will likely decide not to evacuate.

Based on U.S. Census American Community Survey estimates for 2014, per capita income in Roseville was $34,6514, and the median household income was $76,712. Table 4-9 compares the income and poverty estimates at the city, county, and state level. About 8.6 percent of Roseville residents are below the poverty level (meaning they spend more than a third of income on an economy food budget); this includes 10.2 percent of those under the age of 18 and 7.4 percent of those 65 or older.

Table 4-9. Population Under the Poverty Level

	Median Household Income	Percent of Total Population Below Poverty Level	Percent of Children (18 and Under) Below Poverty Level	Percent of Elderly (65 and Older) Below Poverty Level
City of Roseville	$76,712	8.6	10.2	7.4
Placer County	$73,747	8.9	11.2	6.8
California	$61,489	16.4	22.7	10.2

4.8.2 Industry, Businesses and Institutions

The planning area's economy is strongly based in the educational/healthcare/social service industry (22 percent), followed by the retail trade and professional/scientific industries. Information, wholesale trade, and agriculture make up the smallest sources of the local economy, with less than 1 percent of local economy driven by agriculture. Figure 4-9 shows the breakdown of industry types in the planning area.

The planning area benefits from a variety of business activity. Major businesses include Kaiser Permanente, Union Pacific Railroad, Adventist Health and Sutter Roseville Medical Center.

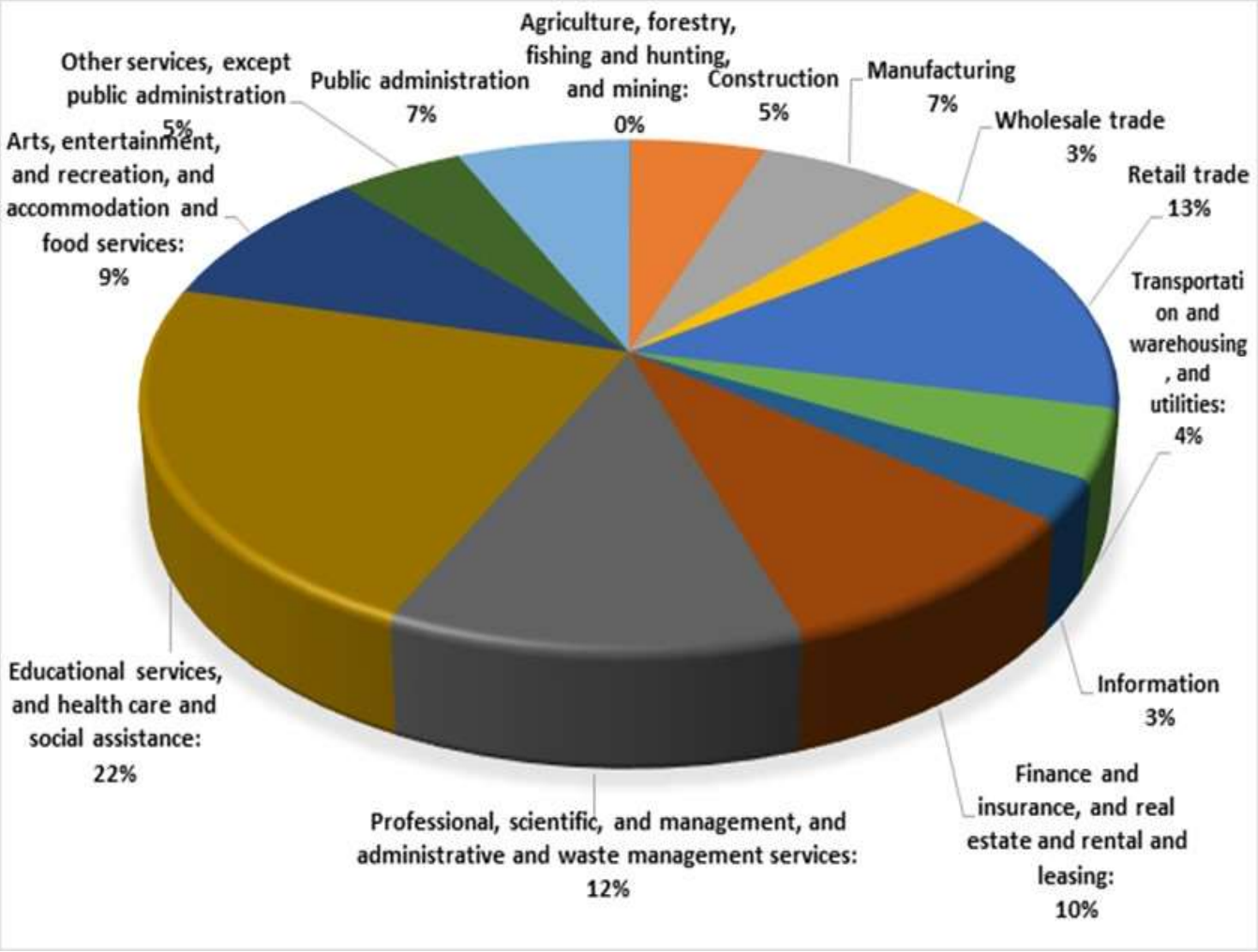


Figure 4-9. Industry in the Planning Area

4.8.3 Employment Trends and Occupations

According to the American Community Survey, about 48.4 percent of the planning area's population is in the labor force. Of the working-age population group (ages 20 – 64), 88.5 percent of men and 75.6 percent of women are in the labor force. Figure 4-10 compares California's and Roseville's unemployment trends from 2009 through 2014. Roseville's unemployment rate was lowest in 2009, at 5.9 percent. Unemployment rates significantly dropped from 9.5 percent to 8.3 percent between 2013 and 2014.

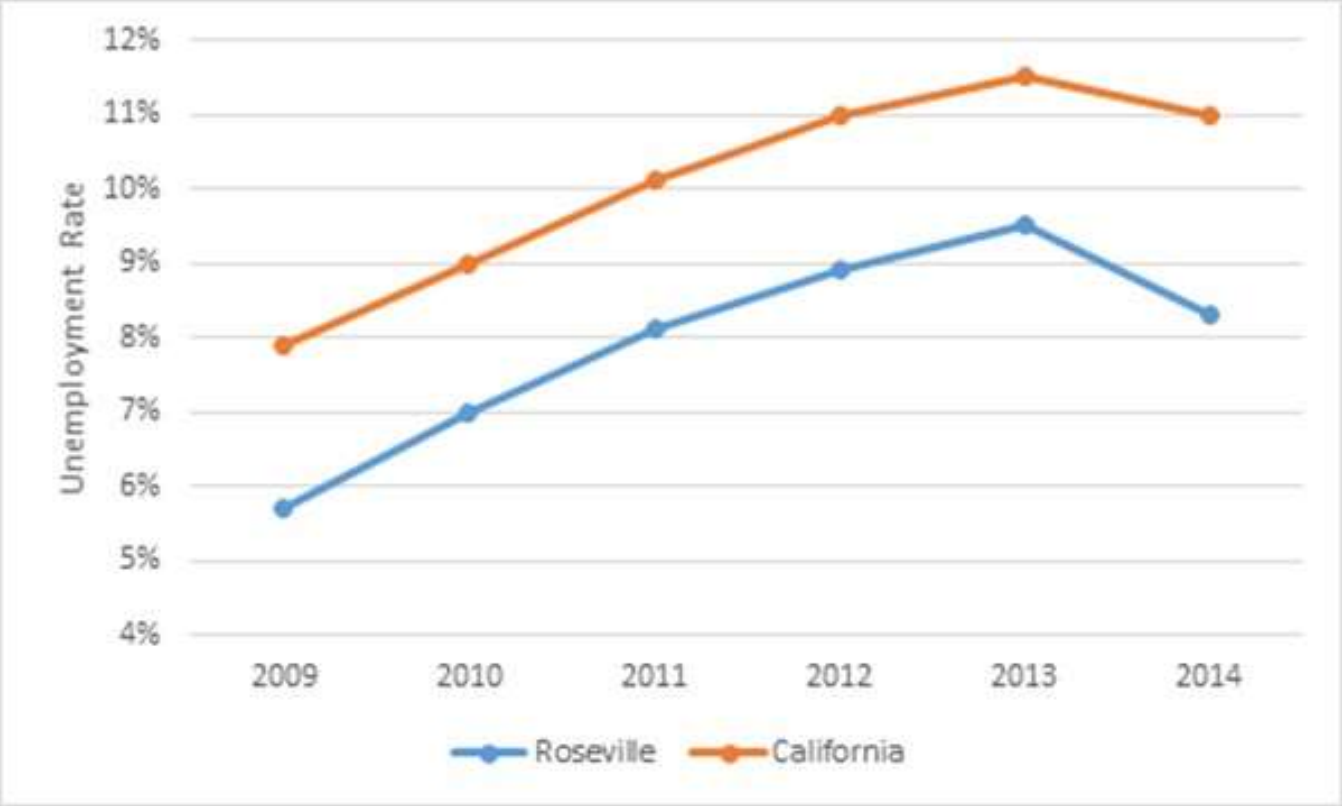


Figure 4-10. California and Roseville Unemployment Rate (U.S. Census, 2009 – 2014)

Management, business, science and arts occupations and sales and office occupations make up 72 percent of the jobs in the planning area (see Figure 4-11). Service occupations make up 16 percent of the local working population.

As of October 2014, the largest employer is Kaiser Permanente, with 3,231 employees, followed by Hewlett-Packard, which employs 2,132. Other major employers include the following:

- Sutter-Roseville Medical Group
- Roseville Joint Union High School District
- Union Pacific Railroad Company
- Adventist Health System West
- Roseville City School District
- City of Roseville
- Wal-Mart Superstore (PG Blvd)
- LB Construction, Inc.

The U.S. Census estimates that over 79.6 percent of workers in the planning area commute alone (by car, truck or van) to work, and mean travel time to work is 26.1 minutes (the state average is 27.6 minutes).

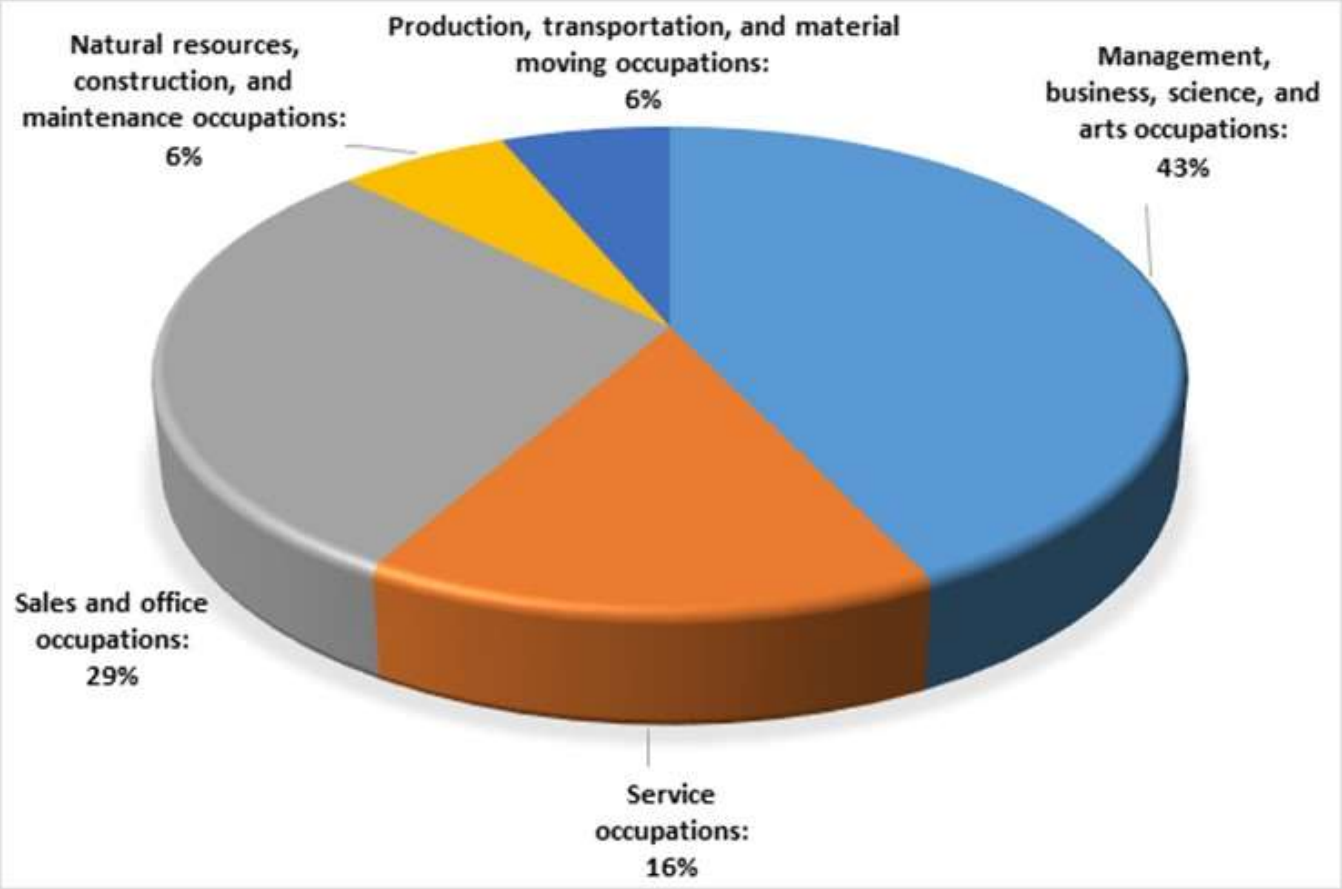


Figure 4-11. Occupations in the Planning Area

4.9 LAWS AND ORDINANCES

Existing laws, ordinances and plans at the federal, state and local level can support or impact hazard mitigation actions identified in this Plan. Hazard mitigation plans are required by 44 CFR to include a review and incorporation, if appropriate, of existing plans, studies, reports, and technical information as part of the planning process (Section 201.6.b(3)). The following federal, state, and local laws described below were reviewed to inform this plan update process. Not all laws and ordinances reviewed during this process are relevant to the immediate process of plan development. In such instances, the City will assure compliance, where relevant, upon implementation of programs that overlap with the requirements of the following programs at project implementation.

4.9.1 Federal

Disaster Mitigation Act of 2000

The DMA is the latest federal legislation addressing hazard mitigation planning. It reinforces the importance of mitigation planning and emphasizes planning for disasters before they occur. It specifically addresses planning at the local level, requiring plans to be in place before Hazard Mitigation Grant Program funds are available to communities. The 2016 Plan is designed to meet the requirements of the DMA.

Endangered Species Act

The Endangered Species Act (ESA) was enacted in 1973 to conserve species that are facing depletion or extinction and the ecosystems that support them. The act sets forth a process for determining which species are threatened and endangered and requires the conservation of the critical habitat in which those species live. The ESA provides broad protection for species of fish, wildlife and plants that are listed as threatened or endangered. Provisions are made for listing species, as well as for recovery plans and the designation of critical habitat for listed species. The ESA outlines procedures for federal agencies to follow when taking actions that may jeopardize listed species and contains exceptions and exemptions. It is the enabling legislation for the Convention on International Trade in Endangered Species of Wild Fauna and Flora. Criminal and civil penalties are provided for violations of the ESA and the Convention.

The purposes of the ESA are to provide a means of conserving the ecosystems upon which endangered and threatened species depend; to provide a program for conserving those species; and to take steps necessary to achieve the purposes of international treaties and conventions. The policy of Congress is that federal agencies must seek to conserve endangered and threatened species and use their authorities in furtherance of the ESA's purposes. The ESA defines three fundamental terms:

- **Endangered** means that a species of fish, animal or plant is "in danger of extinction throughout all or a significant portion of its range." (For salmon and other vertebrate species, this may include subspecies and distinct population segments.)
- **Threatened** means that a species "is likely to become endangered within the foreseeable future." Regulations for a threatened species may be less restrictive than if it were endangered.
- **Critical habitat** means "specific geographical areas that are…essential for the conservation and management of a listed species, whether occupied by the species or not."

Five sections of the ESA are of critical importance to understanding it:

- **Section 4: Listing of a Species**—The National Oceanic and Atmospheric Administration Fisheries Service (NOAA Fisheries) is responsible for listing marine species; the U.S. Fish and Wildlife Service is responsible for listing terrestrial and freshwater aquatic species. The agencies may initiate reviews for listings, or citizens may petition for them. A listing must be made "solely on the basis of the best scientific and commercial data available." After a listing has been proposed, agencies receive comment and conduct further scientific reviews for 12 to 18 months, after which they must decide if the listing is warranted. Economic impacts cannot be considered in this decision, but it may include an evaluation of the adequacy of local and state protections. Critical habitat for the species may be designated at the time of listing.
- **Section 7: Consultation**—Even when a listing has only been proposed, all federal agencies must ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed species or adversely modify its critical habitat. This includes private and public actions that require a federal permit. Once a final listing is made, non-federal actions are subject to the same review, termed a "consultation." If the listing agency finds that an action will "take" a species, it must propose mitigations or "reasonable and prudent" alternatives to the action; if the proponent rejects these, the action cannot proceed.
- **Section 9: Prohibition of Take—**It is unlawful to "take" an endangered species, including killing or injuring it or modifying its habitat in a way that interferes with essential behavioral patterns, including breeding, feeding or sheltering.
- **Section 10: Permitted Take**—Through voluntary agreements with the federal government that provide protections to an endangered species, a non-federal applicant may commit a take that would otherwise be prohibited as long as it is incidental to an otherwise lawful activity (such as developing land or building a road). These agreements often take the form of a "Habitat Conservation Plan."

- **Section 11: Citizen Lawsuits**—Civil actions initiated by any citizen can require the listing agency to enforce the ESA's prohibition of taking or to meet the requirements of the consultation process

The Clean Water Act

The Clean Water Act (CWA) is the cornerstone of surface water quality protection in the United States. (The Act does not deal directly with groundwater or with water quantity issues.) The statute employs a variety of regulatory and non-regulatory tools to sharply reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff. These tools are employed to achieve the broader goal of restoring and maintaining the chemical, physical, and biological integrity of the nation's waters so that they can support "the protection and propagation of fish, shellfish and wildlife and recreation in and on the water."

Evolution of CWA programs over the last decade has included a shift from a program-by-program, source-by-source, pollutant-by-pollutant approach to more holistic watershed-based strategies. Under the watershed approach, equal emphasis is placed on protecting healthy waters and restoring impaired ones. A full array of issues are addressed, not just those subject to CWA regulatory authority. Involvement of stakeholder groups in the development and implementation of strategies for achieving and maintaining state water quality and other environmental goals is another hallmark of this approach.

National Flood Insurance Program

The National Flood Insurance Program (NFIP) provides federally backed flood insurance in exchange for communities enacting and enforcing floodplain regulations. Since its inception in 1968, the NFIP has been successful in requiring new buildings to be protected from probable damage by 100-year flood events. Requirements for participation in this program are stipulated in Parts 59 through 79 of 44 CFR. At the time of the preparation of this Plan, the City is in good standing with the requirements of the NFIP. Participation and good-standing under NFIP are prerequisites for funding eligibility under the Robert T. Stafford Act.

National Incident Management System

The National Incident Management System (NIMS) is a systematic approach for government, nongovernmental organizations, and the private sector to work together to manage incidents involving hazards. The NIMS provides a flexible but standardized set of incident management practices. Incidents typically begin and end locally, and they are managed at the lowest possible geographical, organizational, and jurisdictional level. In some cases, success depends on the involvement of multiple jurisdictions, levels of government, functional agencies, and emergency responder disciplines. These cases necessitate coordination across a spectrum of organizations. Communities using NIMS follow a comprehensive national approach that improves the effectiveness of emergency management and response personnel across the full spectrum of potential hazards (including natural hazards, terrorist activities, and other human-caused disasters) regardless of size or complexity.

Americans with Disabilities Act and Amendments

The Americans with Disabilities Act (ADA) seeks to prevent discrimination against people with disabilities in employment, transportation, public accommodation, communications, and government activities. Title II of the ADA deals with compliance with the Act in emergency management and disaster-related programs, services, and activities. It applies to state and local governments as well as third parties, including religious entities and private nonprofit organizations.

The ADA has implications for sheltering requirements and public notifications. During an emergency alert, officials must use a combination of warning methods to ensure that all residents have all necessary information. Those with hearing impairments may not hear radio, television, sirens, or other audible alerts, while those with visual impairments may not see flashing lights or visual alerts. Two technical documents issued for shelter

operators address physical accessibility needs of people with disabilities as well as medical needs and service animals.

The ADA intersects with disaster preparedness programs in regards to transportation, social services, temporary housing, and rebuilding. Persons with disabilities may require additional assistance in evacuation and transit (e.g., vehicles with wheelchair lifts or paratransit buses). Evacuation and other response plans should address the unique needs of residents. Local governments may be interested in implementing a special-needs registry to identify the home addresses, contact information, and needs for residents who may require more assistance.

Civil Rights Act of 1964

The Civil Rights Act of 1964 prohibits discrimination based on race, color, religion, sex or nation origin and requires equal access to public places and employment. The Act is relevant to emergency management and hazard mitigation in that it prohibits local governments from favoring the needs of one population group over another. Local government and emergency response must ensure the continued safety and well-being of all residents equally, to the extent possible.

Rural Development Program

The mission of the U.S. Department of Agriculture (USDA) Rural Development Program is to help improve the economy and quality of life in rural America. The program provides project financing and technical assistance to help rural communities provide the infrastructure needed by rural businesses, community facilities, and households. The program addresses rural America's need for basic services, such as clean running water, sewage and waste disposal, electricity, and modern telecommunications and broadband. Loans and competitive grants are offered for various community and economic development projects and programs, such as the development of essential community facilities including fire stations (USDA, 2015b).

Community Development Block Grant Disaster Resilience Program

In response to disasters, Congress may appropriate additional funding for the U.S. Department of Housing and Urban Development Community Development Block Grant programs to be distributed as Disaster Recovery grants (CDBG-DR). These grants can be used to rebuild affected areas and provide seed money to start the recovery process. CDBG-DR assistance may fund a broad range of recovery activities, helping communities and neighborhoods that otherwise might not recover due to limited resources. CDBG-DR grants often supplement disaster programs of the Federal Emergency Management Agency, the Small Business Administration, and the U.S. Army Corps of Engineers. Housing and Urban Development generally awards noncompetitive, nonrecurring CDBG-DR grants by a formula that considers disaster recovery needs unmet by other federal disaster assistance programs. To be eligible for CDBG-DR funds, projects must meet the following criteria:

- Address a disaster-related impact (direct or indirect) in a presidentially declared county for the covered disaster
- Be a CDBG-eligible activity (according to regulations and waivers)
- Meet a national objective.

Incorporating preparedness and mitigation into these actions is encouraged, as the goal is to rebuild in ways that are safer and stronger.

Emergency Watershed Program

The USDA Natural Resources Conservation Service (NRCS) administers the Emergency Watershed Protection (EWP) Program, which responds to emergencies created by natural disasters. Eligibility for assistance is not dependent on a national emergency declaration. The program is designed to help people and conserve natural

resources by relieving imminent hazards to life and property caused by floods, fires, wind-storms, and other natural occurrences. EWP is an emergency recovery program. Financial and technical assistance are available for the following activities (Natural Resources Conservation Service, 2016):

- Remove debris from stream channels, road culverts, and bridges
- Reshape and protect eroded banks
- Correct damaged drainage facilities
- Establish cover on critically eroding lands
- Repair levees and structures
- Repair conservation practices.

Presidential Executive Orders 11988 and 13690

Executive Order 11988 requires federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of flood plains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. In accomplishing this objective, "each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by flood plains in carrying out its responsibilities" for the following actions:

- Acquiring, managing, and disposing of federal lands and facilities
- Providing federally-undertaken, financed, or assisted construction and improvements
- Conducting federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulation, and licensing activities (FEMA, 1982).

Executive Order 13690 amends and expands Executive Order 11988, acknowledging that the impacts of flooding are anticipated to increase over time due to the effects of climate change and other threats. It mandates a Federal Flood Risk Management Standard, which is a flexible framework to increase resilience against flooding and help preserve the natural values of floodplains. This standard expands management of flood issues from the current base flood level to a higher vertical elevation and corresponding horizontal floodplain to address current and future flood risk and ensure that projects funded with taxpayer dollars last as long as intended (Office of the Press Secretary, 2015).

Presidential Executive Orders 11990

Executive Order 11990 requires federal agencies to provide leadership and take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands. The requirements apply to the following activities (National Archives, 2016):

- Acquiring, managing, and disposing of federal lands and facilities
- Providing federally undertaken, financed, or assisted construction and improvements
- Conducting federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulation, and licensing.

Emergency Relief for Federally Owned Roads Program

The U.S. Forest Service's Emergency Relief for Federally Owned Roads Program was established to assist federal agencies with repair or reconstruction of tribal transportation facilities, federal lands transportation facilities, and other federally owned roads that are open to public travel and have suffered serious damage by a natural disaster over a wide area or by a catastrophic failure. The program funds both emergency and permanent repairs (Office of Federal Lands Highway, 2016).

4.9.2 State

California General Planning Law

California state law requires that every county and city prepare and adopt a comprehensive long-range plan to serve as a guide for community development. The general plan expresses the community's goals, visions, and policies relative to future land uses, both public and private. The general plan is mandated and prescribed by state law (Cal. Gov. Code §65300 et seq.), and forms the basis for most local government land use decision-making.

The plan must consist of an integrated and internally consistent set of goals, policies, and implementation measures. In addition, the plan must focus on issues of the greatest concern to the community and be written in a clear and concise manner. City actions, such as those relating to land use allocations, annexations, zoning, subdivision and design review, redevelopment, and capital improvements, must be consistent with the plan.

California Environmental Quality Act

The California Environmental Quality Act (CEQA) was passed in 1970, shortly after the federal government passed the National Environmental Policy Act, to institute a statewide policy of environmental protection. CEQA requires state and local agencies in California to follow a protocol of analysis and public disclosure of the potential environmental impacts of development projects. CEQA makes environmental protection a mandatory part of every California state and local agency's decision making process.

CEQA establishes a statewide environmental policy and mandates actions all state and local agencies must take to advance the policy. For any project under CEQA's jurisdiction with potentially significant environmental impacts, agencies must identify mitigation measures and alternatives by preparing an environmental impact report and may approve only projects with no feasible mitigation measures or environmentally superior alternatives.

The Roseville City Council certified a mitigated negative declaration (MND) for the initial City of Roseville hazard plan on July 20, 2005. The MND evaluated potential environmental effects associated with adoption and implementation of the initial hazard plan. It was circulated for a 20-day public review and comment period (per CEQA Guidelines Section 15073(a)), and no comments were received.

Under CEQA guidelines (Section 15164), an addendum to an adopted MND shall be prepared if only minor technical changes or additions are necessary and none of the conditions have occurred calling for the preparation of a new negative declaration or Environmental Impact Report (as described in CEQA Section 15162). The addendum need not be circulated for public review; however, an addendum is to be considered by the decision-making body prior to making a decision on the project.

The City has determined that the 2016 Plan required a new Initial Study/Mitigated Negative Declaration (IS/MND).The public comment period for the IS/MND ran concurrently with the public comment period for the plan update. During this time, no comments were received on the IS/MND. The results of this study were presented to the Council for consideration prior to their consideration of the revised Plan.

AB 52: Addition of Tribal Cultural Resources CEQA

This bill adds "tribal cultural resources" to the categories of cultural resources in CEQA, which had formerly been limited to historic, archeological, and paleontological resources. Recognizing that tribes may have expertise with regard to their tribal history and practices, AB 52 requires lead agencies to provide notice to tribes that are traditionally and culturally affiliated with the geographic area of a proposed project if they have requested notice of projects proposed within that area. If the tribe requests consultation within 30 days upon receipt of the notice, the lead agency must consult with the tribe.

In accordance with AB 52, in July 2016 the City of Roseville provided certified mail notification of the proposed hazard mitigation plan update to tribes that requested such notification. The City's notice included a summary project description, a location map and request for written response should the tribe desire formal AB 52 consultation on tribal cultural resources. Many of the hazard mitigation alternatives and selected actions contained in Chapter 19 are ongoing City activities and programs, some of which were previously subject to CEQA and do not require further CEQA compliance for continued implementation. However future action plan items that still require Council approval would also require future project-level CEQA compliance and therefore an additional opportunity for AB 52 consultation prior to implementation.

AB 162: Flood Planning, Chapter 369, Statutes of 2007

This California State Assembly bill passed in 2007 requires cities and counties to address flood-related matters in the land use, conservation, and safety and housing elements of their general plans. The land use element must identify and annually review the areas covered by the general plan that are subject to flooding as identified in floodplain mapping by either FEMA or the state Department of Water Resources (DWR). Upon the next revision of the housing element on or after January 1, 2009, the conservation element of the general plan must identify rivers, creeks, streams, flood corridors, riparian habitat, and land that may accommodate floodwater for the purposes of groundwater recharge and stormwater management. The safety element must identify information regarding flood hazards including:

- Flood hazard zones
- Maps published by FEMA, DWR, the U.S. Army Corps of Engineers, the Central Valley Flood Protection Board, Cal OES, etc.
- Historical data on flooding
- Existing and planned development in flood hazard zones.

The general plan must establish goals, policies and objectives to protect from unreasonable flooding risks including:

- Avoiding or minimizing the risks of flooding new development
- Evaluating whether new development should be located in flood hazard zones
- Identifying construction methods to minimize damage.

AB 162 establishes goals, policies and objectives to protect from unreasonable flooding risks. It establishes procedures for the determination of available land suitable for urban development, which may exclude lands where FEMA or DWR has determined that the flood management infrastructure is not adequate to avoid the risk of flooding.

AB 2140: General Plans: Safety Element, Chapter 739, Statutes of 2006

This bill provides that the state may allow for more than 75 percent of public assistance funding under the California Disaster Assistance Act only if the local agency is in a jurisdiction that has adopted a local hazard mitigation plan as part of the safety element of its general plan. The local hazard mitigation plan needs to include elements specified in this legislation. In addition this bill requires Cal OES to give federal mitigation funding preference to cities and counties that have adopted local hazard mitigation plan. The intent of the bill is to encourage cities and counties to create and adopt hazard mitigation plans. The City of Roseville linked the Roseville Hazard Mitigation Plan to the Safety Element of the General Plan by City Council resolution on May 10, 2010. The 2016 Roseville Hazard Mitigation Plan will continue to link to the Roseville General Plan.

AB 70: Flood Liability, Chapter 367, Statutes of 2007

This bill provides that a city or county may be required to contribute a fair and reasonable share to compensate for property damage caused by a flood to the extent that it has increased the state's exposure to liability for property damage by unreasonably approving new development in a previously undeveloped area that is protected by a state flood control project, unless the city or county meets specified requirements.

AB 32: The California Global Warming Solutions Act

This bill addresses greenhouse gas emissions. It identifies the following potential adverse impacts of global warming:

> "… the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems."

AB 32 establishes a state goal of reducing greenhouse gas emissions to 1990 levels by 2020 (a reduction of approximately 25 percent from forecast emission levels) with further reductions to follow. The law requires the state Air Resources Board to do the following:

- Establish a program to track and report greenhouse gas emissions.
- Approve a scoping plan for achieving the maximum technologically feasible and cost-effective reductions from sources of greenhouse gas emissions.
- Adopt early reduction measures to begin moving forward.
- Adopt, implement and enforce regulations—including market mechanisms such as "cap and-trade" programs—to ensure that the required reductions occur.

The Air Resources Board recently adopted a statewide greenhouse gas emissions limit and an emissions inventory, along with requirements to measure, track, and report greenhouse gas emissions by the industries it determined to be significant sources of greenhouse gas emissions.

Senate Bill 97

Senate Bill 97, enacted in 2007, amended the California Environmental Quality Act (CEQA) to clearly establish that greenhouse gas emissions and the effects of greenhouse gas emissions are appropriate subjects for CEQA analysis. It directed the Governor's Office of Planning and Research to develop draft CEQA guidelines for the mitigation of greenhouse gas emissions or their effects by July 1, 2009 and directed the California Natural Resources Agency to certify and adopt the CEQA Guidelines by January 1, 2010.

Senate Bill 5: Central Valley Flood Protection Act of 2008

The fundamental change imposed through this legislation was the directive for local agencies to revise their general plans no later than July 2, 2015 to address flood risk for affected land use decisions based on an Urban Level of Flood Protection. The legislation also requires local agencies to revise their zoning codes to reflect this new standard within one year following the adoption of their revised general plans. In areas not subject to the Urban Level of Flood Protection standards, the 100-year floodplain standards will continue to apply.

Senate Bill 1241: General Plans: Safety Element—Fire Hazard Impacts

In 2012, Senate Bill 1241 passed requiring that all future general plans address fire risk in state responsibility areas and very high fire hazard severity zones in their safety element. In addition, the bill requires cities and

counties to make certain findings regarding available fire protection and suppression services before approving a tentative map or parcel map.

Senate Bill 379: General Plans: Safety Element—Climate Adaptation

Senate Bill 379 builds upon the flood planning inclusions into the safety and housing elements and the hazard mitigation planning safety element inclusions in general plans outlined in AB 162 and AB 2140, respectively. SB 379 focuses on a new requirement that cities and counties include climate adaptation and resiliency strategies in the safety element of their general plans beginning January 1, 2017. In addition, this bill requires general plans to include a set of goals, policies and objectives, and specified implementation measures based on the conclusions drawn from climate adaptation research and recommendations. In anticipation of the implementation of this bill in 2017, the 2016 Hazard Mitigation Plan includes relevant information regarding climate adaptation and resiliency strategies for incorporation into the Roseville General Plan through existing linkage resulting from AB 2140.

California State Building Code

California Code of Regulations Title 24 (CCR Title 24), also known as the California Building Standards Code, is a compilation of building standards from three sources:

- Building standards that have been adopted by state agencies without change from building standards contained in national model codes
- Building standards that have been adopted and adapted from the national model code standards to meet California conditions
- Building standards authorized by the California legislature that constitute extensive additions not covered by the model codes adopted to address particular California concerns.

The state Building Standards Commission is authorized by California Building Standards Law (Health and Safety Code Sections 18901 through 18949.6) to administer the processes related to the adoption, approval, publication, and implementation of California's building codes. These building codes serve as the basis for the design and construction of buildings in California. The national model code standards adopted into Title 24 apply to all occupancies in California except for modifications adopted by state agencies and local governing bodies. Since 1989, the Building Standards Commission has published new editions of Title 24 every three years.

On January 1, 2014, California Building Code Accessibility Standards found in Chapter 11B incorporated the 2010 Americans with Disabilities Act (ADA) Standards as the model accessibility code for California. The purpose for this incorporation was to ensure consistency with federal guidelines. As a result of this incorporation, the California standards will fully implement and include 2010 ADA Standards within the California Building Code while maintaining enhanced levels of accessibility already provided by existing California accessibility regulations.

Standardized Emergency Management System

CCR Title 19 establishes the Standardized Emergency Management System (SEMS) to standardize the response to emergencies involving multiple jurisdictions. SEMS is intended to be flexible and adaptable to the needs of all emergency responders in California. It requires emergency response agencies to use basic principles and components of emergency management. Local governments must use SEMS by December 1, 1996 in order to be eligible for state funding of response-related personnel costs under CCR Title 19 (Sections 2920, 2925 and 2930). Individual agencies' roles and responsibilities contained in existing laws or the state emergency plan are not superseded by these regulations.

California State Hazard Mitigation Plan

Under the DMA, California must adopt a federally approved state multi-hazard mitigation plan in order to be eligible for certain disaster assistance and mitigation funding. The intent of the California State Hazard Mitigation Plan is to reduce or prevent injury and damage from hazards in the state through the following:

- Documenting statewide hazard mitigation planning in California
- Describing strategies and priorities for future mitigation activities
- Facilitating the integration of local and tribal hazard mitigation planning activities into statewide efforts
- Meeting state and federal statutory and regulatory requirements.

The plan is an annex to the State Emergency Plan. It identifies past and present mitigation activities, current policies and programs, and mitigation strategies for the future. It also establishes hazard mitigation goals and objectives. The plan will be reviewed and updated annually to reflect changing conditions and new information, especially information on local planning activities.

Governor's Executive Order S-13-08

Governor's Executive Order S-13-08 enhances the state's management of climate impacts from sea level rise, increased temperatures, shifting precipitation and extreme weather events. It required the following key actions:

- Initiate California's first statewide climate change adaptation strategy to assess expected climate change impacts, identify where California is most vulnerable, and recommend adaptation policies by early 2009. This effort will improve coordination within state government so that better planning can more effectively address climate impacts on human health, the environment, the state's water supply and the economy.
- Request that the National Academy of Science establish an expert panel to report on sea level rise impacts in California, to inform state planning and development efforts.
- Issue interim guidance to state agencies for how to plan for sea level rise in designated coastal and floodplain areas for new projects.
- Initiate a report on critical infrastructure projects vulnerable to sea level rise.

4.9.3 City Plans and Programs

General Plan

The City of Roseville General Plan 2035 was developed concurrently with the mitigation planning effort. Roseville proactively addresses problems through the General Plan, which includes a Safety Element designed to address hazards. The 2016 General Plan and the 2016 Hazard Mitigation Plan will work together to achieve the goal of hazard risk reduction. Many of the action items identified in this 2016 Plan are recommendations of the General Plan. Updating the General Plan will serve as a trigger for future updates of the hazard mitigation plan.

Purpose

The General Plan is a long-term policy guide for the City's physical, economic, and environmental growth. City actions, such as those relating to land use allocations, annexations, zoning, subdivision, design review, redevelopment and capital improvements, must be consistent with the General Plan. The General Plan emphasizes performance policies or standards that define levels of service and other less tangible factors that the City is seeking to achieve. It also designates land use categories for the entire City. Land use category definitions in the General Plan include information on general uses, development, intensity, siting and compatibility standards. The General Plan serves these purposes:

- It enables the Roseville City Council and Planning Commission to establish long-range development policies.
- It provides a basis for judging whether private development proposals and public projects are in harmony with the policies.
- It guides public agencies and private developers in designing projects consistent with City policies.

The General Plan is designed to be:

- **Long-range**—Most development decisions have effects lasting more than 20 years. In order to create a useful context for development decisions, the General Plan looks toward 2035 and beyond.
- **Comprehensive**—The General Plan provides direction to coordinate all major components of the community's physical development.
- **General**—The General Plan's purpose is to serve as a framework for detailed public and private development proposals. It establishes requirements for additional planning studies that must be completed before modifying land-use allocations.

Contents

Two primary components constitute the City of Roseville General Plan:

- The General Plan document, which presents goals, policies, and implementation measures
- The land use map, which graphically represents the City's existing and planned land use mix and pattern.

The General Plan document is organized into nine elements. The state-mandated elements are land use, circulation, open space and conservation, safety, housing, and noise. The optional elements are air quality, parks and recreation, and public facilities. Each element includes a brief setting and outlook section describing existing conditions and critical issues for the topic area, followed by goals, policies and implementation measures. The goals state the overall desired conditions that the City would like to achieve. The policies indicate an action or direction that the City must take as a step toward achieving the goals. The implementation measures include precise actions to achieve the stated policies. The general content of each element is as follows:

- **Land Use Element** discusses existing and projected land-use conditions, land-use designations and standards, community form, community design, and growth management. The goals and policies are intended to promote a balanced land-use pattern that supports innovative land-use approaches and retains and enhances the distinct character and identity of Roseville.
- **Circulation Element** identifies the general locations and extent of existing and proposed roadways, highways, railroads, and transit routes. The element identifies policies and programs to reduce traffic congestion, promote alternative forms of transportation, and provide safe travel throughout the City.
- **Air Quality and Climate Change Element** integrates related land-use, transportation and circulation, transit, and energy issues. The policies and implementation measures are intended to improve air quality and encourage cooperation among the jurisdictions involved in regional air quality efforts.
- **Open Space and Conservation Element** provides for the conservation, development, and use of natural resources; details plans and measures for the preservation of open space; and provides for outdoor recreation, public health and safety. It is the overall goal of the element to preserve a comprehensive interconnected system of open space encompassing preservation and enhancement of natural habitat areas for the use and enjoyment of the community.
- **Parks and Recreation Element** provides goals and policies for both traditional "active" park lands and non-traditional "open space recreational" park lands. It specifies standards and conditions as guidelines for planning parks and recreation facilities, including size, type, and location.
- **Public Facilities Element** identifies facility and service needs of the community and performance standards to ensure that desired service levels are maintained. Discussed under this element are civic

facilities, libraries, schools, electric and privately owned utilities, water and wastewater systems, solid waste and recycling, water and energy conservation, and the extension of City services. Emphasis is placed on the fair-share contribution of new development toward the provision of services and facilities.

- **Safety Element** establishes standards and plans for the protection of the community from a variety of hazards, including earthquakes, flooding, crime, fire, hazardous materials, and electromagnetic fields.
- **Noise Element** establishes standards for transportation and fixed noise sources to protect the health and welfare of the community.
- **Housing Element** identifies the existing and projected housing needs and establishes goals, policies, and implementation measures for the preservation, improvement and development of housing to meet the needs of all economic sectors of the community.

Specific Plans

Roseville's specific plans are comprehensive planning documents that guide the development of defined geographic areas. Specific plans typically include more detailed information than the General Plan about land use, traffic circulation, affordable housing programs, resource management strategies, development standards and a comprehensive infrastructure plan. Specific plans currently exist for the Amoruso Ranch, Creekview, Del Webb, Downtown, Highland Reserve North, North Central Roseville, Northeast Roseville, North Industrial, North Roseville, Northwest Roseville, Riverside Gateway, Sierra Vista, Southeast Roseville, Stoneridge, West Roseville, and the Infill Area. All of these specific plans were adopted by the City Council after extensive review by City staff, commissions and the public. Specific plans contain detailed regulations, conditions, programs and design criteria unique to specific areas of the City and serve to implement the General Plan. Each specific plan includes a menu of strategies.

Development Agreements

California planning law authorizes cities and developers to enter into contracts to lock in regulations and policies governing a property. Development agreements benefit the City and its residents by detailing the developer's responsibilities for public improvements and infrastructure, such as street lights and roads. Development agreements also give developers the certainty they need to develop their property. With the obligations of both the City and the developer detailed and in writing, the project is able to move ahead smoothly with few obstacles.

Community Design Guidelines

Community design guidelines identify the City's expectations for planning, designing and reviewing development proposals in Roseville. They establish standards for high quality development and design. The community design guidelines provide design professionals, property owners, commissioners, staff, and residents with a clear and common understanding of the City's expectations for the planning, design, and review of development proposals in Roseville. They also increase the community's awareness and appreciation of design considerations.

Open Space Preserve Overarching Management Plan

In August 2011, the City of Roseville adopted an Open Space Preserve Overarching Management Plan (OSPOMP), which provides a City-wide approach to open space management, maintenance, and monitoring of the City's open space preserves. The OSPOMP also provides the same approach for the management and maintenance of open space areas outside of a preserve areas. Prior to adoption of the OSPOMP, the City managed, monitored, and provided reports to the U.S. Army Corps of Engineers for over 30 individual preserve management plans regulated by natural resource agencies, with various requirements for management and monitoring that had evolved in comprehensiveness and complexity since the 1990s. Adoption of the OSPOMP eliminates the need for additional management plans when new open space is dedicated through the development process or habitat conservation efforts.

Urban Water Management Plan

The City of Roseville Urban Water Management Plan assumes an important role in water supply planning and management. Current drought conditions have resulted in unprecedented State mandates for water conservation, and the 2015 UWMP serves as the primary compliance document for interim water use targets required by the Water Conservation Act of 2009. The primary objective of the UWMP is to provide a framework for long term water supply planning and document how urban water suppliers carry out long term resource planning responsibilities.

The 2015 UWMP describes City water system, historical and projected use, water supply sources, and a comparison of projected water supply to water demands during normal, single-dry, and multiple dry years in 5 year increments from 2020 to 2040.

Emergency Operations Plan

The City of Roseville Emergency Operations Plan (EOP) establishes an emergency management organization and assigns functions and tasks consistent with California's Standardized Emergency Management System. It provides for the integration and coordination of planning efforts of multiple jurisdictions. This plan was reviewed and approved by representatives from each City of Roseville department, local special districts with emergency services responsibilities in the City, and the Placer County Office of Emergency Services. The content is based on guidance approved and provided by the State of California and FEMA. The EOP provides direction on how to respond to an emergency from the initial onset, through an extended response, and into the recovery process.

A key element of the update process for this hazard mitigation plan was the simultaneous review of the EOP. The Steering Committee remained informed of major review findings of the EOP with an eye toward integration with key components of the hazard mitigation plan. Updates to the EOP will continue to coincide with the future updates of the multi-hazard mitigation plan.

4.9.4 Incorporation of Information into the 2016 Planning Process

Pursuant to 44 CFR §201.6(b)(3), the City of Roseville specifically reviewed certain plans and programs for inclusion into this update for the purpose of planning consistency among documents. The full capability assessment includes these reviewed plans, as well as additional regulatory, administrative, fiscal, and NFIP compliance information. Relevant information from reviewed plans, studies, reports, and technical information incorporated into the mitigation plan includes:

- **State Hazard Mitigation Plan** – The State Hazard Mitigation Plan was reviewed for recent updates on state-wide hazard events and hazard information.

- **Placer County Hazard Mitigation Plan** – The Placer County Hazard Mitigation Plan was reviewed for planning consistency and augmented hazard event history for hazards that extend beyond Roseville city limits, such as drought and severe weather.
- **General Plan and Specific Plans** – General Plan demographics and land use was cross referenced for inclusion into this Plan as part of the overall community profile. Additionally, area vulnerabilities identified in Specific Plan Areas were included as part of the vulnerability and risk assessment for wildfire, landslide, and flood. The General Plan and Specific Plans were also included as part of the capability inventory for the City's capability assessment.
- **Urban Water Management Plan** – the information provided in the City's UWMP provided the main resource for illustrating the historical and current conditions for the drought chapter. The UWMP was also included as part of the capability inventory for the City's capability assessment.
- **Open Space Preserve Overarching Management Plan** – This plan was reviewed in reference to the open space policies regarding the City's floodplain management program and the flood chapter of this Plan.
- **Emergency Operations Plan** – The EOP was reviewed to augment hazard information as it relates to response to the assessed natural hazards. Additionally, the EOP underwent a gap analysis review in coordination with the Plan development so as to identify further consistency opportunities among documents. The EOP was also included as part of the capability inventory for the City's capability assessment.
- **Additional Resources and Technical Information** – A complete listing of technical reports, research materials, and articles used during development of this Plan is found in the References section.

4.10 CAPABILITY ASSESSMENT

The planning team performed an inventory and analysis of existing authorities and capabilities called a "capability assessment." A capability assessment creates an inventory of an agency's mission, programs and policies, and evaluates its capacity to carry them out. An assessment of legal and regulatory capabilities is presented in Table 4-10. An assessment of administrative and technical capabilities is presented in Table 4-11. An assessment of fiscal capabilities is presented in Table 4-12. Information on National Flood Insurance Program compliance is presented in Table 4-13. An assessment of education and outreach capabilities is presented in Table 4-14. Classifications under various community mitigation programs are presented in Table 4-15.

Table 4-10. Legal and Regulatory Capability

	Local Authority	State or Federal Prohibitions	Other Jurisdiction Authority	State Mandated
Codes, Ordinances & Requirements				
Building Code	Y	NA	N	Y
Comments: *The 2013 California Building Standards Code was adopted by the City of Roseville and incorporated by reference into the City of Roseville Municipal Code.*				
Zoning Code	Y	NA	N	N
Comments: *RMC, Title 19*				
Subdivisions	Y	NA	N	Y
Comments: *RMC, Title 18*				
Stormwater Management	Y	NA	N	Y
Comments: *RMC, Chapter 14.20*				
Post-Disaster Recovery	N	NA	N	N
Comments: *None at this time.*				
Real Estate Disclosure	N	NA	Y	N
Comments: *California Civil Code 1102 governs real estate and various disclosure laws. It does not mandate disclosure at the local government level but does require local governments to make known information on natural hazards available to the real estate community.*				
Growth Management	Y	NA	N	Y
Comments: *Growth management strategies are incorporated into the Land Use Element of the General Plan.*				
Site Plan Review	Y	NA	N	N
Comments: *The Zoning Ordinance (RMC 19.74.010.(C)) requires a design review permit for all new construction except single-family and two-family residences. Site design, building architecture, landscape design, and lighting are reviewed through the design review permit. Design review permits are reviewed and approved by the City's Design Committee or Planning Commission.*				
Flood Damage Prevention	Y	N/A	Y	Y
Comments: *The Roseville Zoning Ordinance incorporates combining or overlay of districts to regulate floodplain development, open space preservation, and other sensitive habitat. The Flood Damage Prevention Ordinance (RMC 9.80) regulates development in special flood hazard areas. Outside agencies with jurisdiction over sensitive habitats include the U.S. Army Corps of Engineers and California Department of Fish and Wildlife.*				
Public Health and Safety	Y	NA	N	N
Comments: *RMC, Title 9 includes multiple public health and safety regulations.*				
Environmental Protection	N	NA	N	N
Comments: *None at this time.*				
Planning Documents				
General or Comprehensive Plan	Y	NA	N	Y
Is the plan equipped to provide linkage to this mitigation plan? *Yes*				
Comments: *The City's General Plan was most recently updated in 2016 and is implemented through 14 specific plans (Amoruso Ranch, Sierra Vista, Creekview, Downtown, Riverside Gateway, Southeast Roseville, Northeast Roseville, Northwest Roseville, North Central Roseville, North Roseville, Highland Reserve North, Stoneridge, Del Webb, and West Roseville) and one other planning area (North Industrial).*				
Capital Improvement Plan	Y	NA	N	N
What types of capital facilities does the plan address? Roads, water, and sewer				
How often is the plan updated? Every 2-3 Years.				
Comments: *6-year CIP*				

	Local Authority	State or Federal Prohibitions	Other Jurisdiction Authority	State Mandated
Floodplain or Basin Plan	Y	NA	N	N
Comments: *RMC 9.80 and Safety Element of the General Plan*				
Stormwater Plan	Y	NA	Y	Y
Comments: *City of Roseville 2004 Stormwater Management Plan. The plan is required by the State of California as part of the federal National Pollution Discharge Elimination System program. Outside jurisdictional authority is through the State Water Resources Control Board and Regional Water Quality Control Board (Central Valley Region).*				
Habitat Conservation Plan	N	NA	N	N
Comments: *There are no Habitat Conservation Plans within the City. However, preserve areas have been established as a condition of Section 404 permits and biological opinions of the U.S. Fish and Wildlife Service and are regulated through the City's Overarching Open Space Preserve Management Plan approved by the U.S. Fish and Wildlife Service and U.S. Army Corps of Engineers. The Open Space and Conservation Element of the City's General Plan also contains policies relative to habitat conservation.*				
Economic Development Plan	Y	NA	N	N
Comments: *Current economic development strategy was adopted by the City Council on May 23, 2012. This document will guide the City for efforts related to business attraction, retention, expansion and creation.*				
Shoreline Management Plan	Y	NA	N	Y
Comments: *This is not applicable to Roseville. Shoreline management plans are applicable to coastal communities and are incorporated into local coastal plans reviewed and approved by the California Coastal Commission.*				
Community Wildfire Protection Plan	N	NA	Y	Y
Comments:				
Response/Recovery Planning				
Comprehensive Emergency Management Plan	Y	NA	N	Y
Comments: *The City of Roseville emergency operations plan was adopted by the City Council on July 21, 2004 (Resolution #04-301) and previously updated in conjunction with the 2011 hazard mitigation plan update. The EOP was subsequently reviewed parallel to the 2016 hazard mitigation plan update. The plan is mandated by the California Office of Emergency Services.*				
Threat & Hazard Identification & Risk Assessment	N	NA	N	N
Comments:				
Terrorism Plan	Y	NA	N	N
Comments: *Terrorism Contingency Plan, 2004*				
Hazard Mitigation Plan	Y	N	N	N
Comments: *The Roseville Multi-Hazard Mitigation Plan was adopted on January 19, 2011. The City received formal approval by FEMA on March 28, 2011.*				
Post-Disaster Recovery Plan	N	NA	N	N
Comments:				
Continuity of Operations Plan	Y (partial)	NA	N	N
Comments: *The EOP contains a general overview of continuity of government and continuity of operations guidelines. The City does not have a stand-alone plan for continuity of government or continuity of operations.*				
Public Health Plan	N	NA	N	N
Comments:				

Table 4-11. Administrative and Technical Capability

Staff/ Personnel Resources	Available (Y or N)	Department or Agency (Positions)
1. Planners or engineers with knowledge of land development and land management practices	Y	Departments of Development Services, Public Works, Environmental Utilities, Electric, and Parks, Recreation & Libraries (Planners, Engineers, Landscape Architect)
2. Engineers or professionals trained in construction practices related to buildings and/or infrastructure	Y	Public Works, Development Services Department- Engineering Division (Engineering Inspectors); Building Inspection Division (Building Inspectors); Environmental Utilities Department (Engineers and Inspectors for Water/Sewer/Storm water), Parks, Recreation & Libraries (Park Development)
3. Planners or engineers with an understanding of natural hazards	Y	Development Services Department (Planners, Engineering); Public Works (Engineers); Environmental Utilities (Engineers)
4. Floodplain manager	Y	Public Works, Floodplain Management Division (Engineer)
5. Surveyors	N	No licensed surveyors on City staff. City can and has contracted for survey work on as-needed basis.
6. Personnel skilled or trained in GIS Applications	Y	Development Services Department (Business Services Technicians); Public Works (Engineering Assistants); Fire Department (GIS Analysts); Environmental Utilities Department (Mapping Manager); Information Technology Division (GIS Manager)
7. Scientist familiar with local natural hazards	N	
8. Emergency manager	Y	Fire Department (Emergency Preparedness Manager)
9. Grant writers	Y	City Manager's Office (Government Relations Manager)
10. Staff with expertise or training in benefit/cost analysis	Y	Finance Department (administration and budget); City Manager's Office (Economic Development Team); Public Works; Environmental Utilities Department; Electric Department

Table 4-12. Fiscal Capability

Financial Resources	Accessible or Eligible to Use (Y or N)
1. Community Development Block Grants	Y
2. Capital Improvements Project Funding	Y
3. Authority to Levy Taxes for Specific Purposes	Y
4. User Fees For Water, Sewer, Gas or Electric Service	Y
5. Impact Fees for Buyers or Developers of New Development/Homes	Y
6. Incur Debt through General Obligation Bonds	Y
7. Incur Debt through Special Tax Bonds	Y
8. Incur Debt through Private Activity Bonds	N
9. Could Withhold Public Expenditures in Hazard-Prone Areas	N
10. State-Sponsored Grant Programs	Y
11. Other	NA

Table 4-13. National Flood Insurance Program Compliance

Compliance Issue	Local Response
What local department is responsible for floodplain management?	City of Roseville Public Works
Who is your floodplain administrator? (department/position)	Public Works/Senior Civil Engineer
Are any certified floodplain managers on staff in your jurisdiction?	Yes
What is the date of adoption of your flood damage prevention ordinance?	2006
When was the most recent Community Assistance Visit or Community Assistance Contact?	September 10, 2014.
Does your jurisdiction have any outstanding National Flood Insurance Program compliance violations that need to be addressed?	No
Do your flood hazard maps adequately address the flood risk within your jurisdiction?	Yes
Does your floodplain management staff need any assistance or training to support its floodplain management program?	The City's floodplain management is staff is always seeking ways to expand its nationally recognized subject matter expertise in the field of floodplain management.
• **If so, what type of assistance/training is needed? .....**	For this planning performance period, the training will focus on fundamental changes to the NFIP and CRS driven by flood insurance reform.
Does your jurisdiction participate in the Community Rating System?	Yes

Table 4-14. Education and Outreach

Criteria	Response
Do you have a Public Information Officer or Communications Office?	Yes – multiple communications specialists in multiple departments. The Public Works and Fire communications specialists are heavily involved in developing and distributing mitigation-specific information.
Do you have personnel skilled or trained in website development?	Yes
Do you have hazard mitigation information available on your website?	Yes
• **If yes, please briefly describe.**	Fire Department City website contains the maintained mitigation webpage. This page includes information on the Plan, meetings, and progress reports
Do you utilize social media for hazard mitigation education and outreach?	Yes
• **If yes, please briefly describe.**	Facebook, Twitter, Nextdoor
Do you have any citizen boards or commissions that address issues related to hazard mitigation?	Yes – the Roseville Coalition of Neighborhood Associations is an active neighborhood association that participated in the 2016 Plan Steering Committee.
Do you have any other programs already in place that could be used to communicate hazard-related information?	Yes
• **If yes, please briefly describe.**	Email distribution lists, annual events (e.g. Earth Day), Neighborhood Fire Station Tours
Do you have any established warning systems for hazard events?	Yes – Alert Roseville

Table 4-15. Community Classifications

	Participating?	Classification	Date Classified
Community Rating System	Yes	1	10/01/06
Building Code Effectiveness Grading Schedule	Yes	2/2	11/28/2011
Public Protection	Yes	2	May 2015
Storm Ready	Yes	Blue	N/A
Firewise	No	N/A	N/A

Part 2. Risk Assessment

5. IDENTIFIED HAZARDS OF CONCERN AND RISK ASSESSMENT METHODOLOGY

Risk assessment is the process of measuring the potential loss of life, personal injury, economic injury, and property damage resulting from natural hazards. It allows emergency management personnel to establish early response priorities by identifying potential hazards and vulnerable assets. The process focuses on the following elements:

- **Hazard identification**—Use all available information to determine what types of disasters may affect a jurisdiction, how often they can occur, and their potential severity.
- **Vulnerability identification**—Determine the impact of natural hazard events on the people, property, environment, economy and lands of the region.
- **Cost evaluation**—Estimate the cost of potential damage or cost that can be avoided by mitigation.

The risk assessment for this hazard mitigation plan update evaluates the risk of natural hazards prevalent in the planning area and meets requirements of the DMA (44 CFR, Section 201.6(c)(2)).

5.1 IDENTIFIED HAZARDS OF CONCERN

The Steering Committee considered the full range of natural and human-caused hazards that could impact the area, and then identified and ranked the hazards that present the greatest concern. The selection of hazards of concern was based on the following criteria:

- The California State Hazard Mitigation Plan identified Placer County as being susceptible to the hazard.
- Historical occurrence of the hazard within the City of Roseville has caused fatalities, injury, or property damage.
- There is local knowledge and perception that the hazard could significantly impact the planning area, regardless of past occurrence.

Based on review of all available resources, the following hazards of concern were identified for the 2016 Plan:

- Climate change
- Dam failure
- Drought
- Earthquake
- Flooding
- Landslide
- Severe weather
- Wildfire
- Health hazards
- Human-caused hazards.

The Steering Committee did not omit any hazard commonly recognized to affect the City of Roseville.

5.2 METHODOLOGY

The risk assessments in Chapters 6 through 15 describe the risks associated with each identified hazard of concern. Each chapter describes the hazard, the planning area's vulnerabilities, and probable event scenarios. The following steps were used to define the risk of each hazard:

- **Identify and profile each hazard**—The following information is given for each hazard:
  - Geographic areas most affected by the hazard
  - Event frequency estimates
  - Severity estimates
  - Warning time likely to be available for response.
- **Determine exposure to each hazard**—Exposure was determined by overlaying hazard maps with an inventory of structures, facilities, and systems to determine which of them are within the area affected by the hazard.
- **Assess the vulnerability of exposed facilities**—Vulnerability of exposed structures and infrastructure was determined by interpreting the probability of occurrence of each event and assessing structures, facilities, and systems that are exposed to each hazard. Tools such as geographic information systems (GIS) and FEMA's hazard-modeling program called Hazus-MH were used to perform this assessment for the flood, dam failure and earthquake hazards. Outputs similar to those from Hazus-MH were generated for other hazards, using maps generated by the Hazus program.

5.3 RISK ASSESSMENT TOOLS

5.3.1 Dam Failure, Earthquake and Flood—Hazus-MH

Overview

In 1997, FEMA developed the standardized Hazards U.S., or Hazus, model to estimate losses caused by earthquakes and identify areas that face the highest risk and potential for loss. Hazus was later expanded into a multi-hazard methodology, Hazus-MH, with new models for estimating potential losses from hurricanes and floods.

Hazus-MH is a GIS-based software program used to support risk assessments, mitigation planning, and emergency planning and response. It provides a wide range of inventory data, such as demographics, building stock, critical facility, transportation and utility lifeline, and multiple models to estimate potential losses from natural disasters. The program maps and displays hazard data and the results of damage and economic loss estimates for buildings and infrastructure. Its advantages include the following:

- Provides a consistent methodology for assessing risk across geographic and political entities.
- Provides a way to save data so that it can readily be updated as population, inventory, and other factors change and as mitigation planning efforts evolve.
- Facilitates the review of mitigation plans because it helps to ensure that FEMA methodologies are incorporated.
- Supports grant applications by calculating benefits using FEMA definitions and terminology.
- Produces hazard data and loss estimates that can be used in communication with local stakeholders.
- Is administered by the local government and can be used to manage and update a hazard mitigation plan throughout its implementation.

Levels of Detail for Evaluation

Hazus-MH provides default data for inventory, vulnerability and hazards; this default data can be supplemented with local data to provide a more refined analysis. The model can carry out three levels of analysis, depending on the format and level of detail of information about the planning area:

- **Level 1**—All of the information needed to produce an estimate of losses is included in the software's default data. This data is derived from national databases and describes in general terms the characteristic parameters of the planning area.
- **Level 2**—More accurate estimates of losses require more detailed information about the planning area. To produce Level 2 estimates of losses, detailed information is required about local geology, hydrology, hydraulics and building inventory, as well as data about utilities and critical facilities. This information is needed in a GIS format.
- **Level 3**—This level of analysis generates the most accurate estimate of losses. It requires detailed engineering and geotechnical information to customize it for the planning area.

Application for This Plan

The following hazards were evaluated using Hazus-MH:

- **Flood**—A Level 2, user-defined analysis was performed for general building stock in flood zones and for critical facilities and infrastructure. Preliminary planning area flood mapping was used to delineate flood hazard areas and estimate potential losses from the 10-, 100- and 500-year flood events. To estimate damage that would result from a flood, Hazus uses pre-defined relationships between flood depth at a structure and resulting damage, with damage given as a percent of total replacement value. Curves defining these relationships have been developed for damage to structures and for damage to typical contents within a structure. By inputting flood depth data and known property replacement cost values, dollar-value estimates of damage were generated.
- **Dam Failure**—A Level 2 analysis was run for Folsom Dam using the flood methodology described above.
- **Earthquake**—A Level 2 analysis was performed to assess earthquake exposure and vulnerability for two scenario events and one probabilistic event:
    - A Magnitude-6.8 event on the Concord-Green Valley Fault with an epicenter 56 miles southwest of Roseville
    - A Magnitude-7.1 event on the Great Valley Fault with an epicenter 58 miles west northwest of Roseville
    - The standard Hazus-MH 100-year probabilistic event.

5.3.2 Landslide, Severe Weather, and Wildfire

For most of the hazards of concern, historical data was not adequate to model future losses. However, areas and inventory susceptible to some of the hazards of concern were mapped, and exposure was evaluated. For other hazards, a qualitative analysis was conducted using the best available data and professional judgment.

5.3.3 Drought

The risk assessment methodologies used for the 2016 Plan focus on damage to structures. Because drought does not impact structures, the risk assessment for drought was more limited and qualitative than the assessment for the other hazards of concern.

5.3.4 Climate Change

Climate change was addressed to different standards than the above natural hazards for the following reasons:

- Specific data needed to assess risk, such as maps of extent and location and applied damage functions, are not readily available for climate change.
- Standardized climate change models based on greenhouse gas emissions do not currently exist, resulting in a high variation of scenarios that result in differing projections. Until a standardized model is identified, climate change assessment will remain subjective.

5.3.5 Health Hazards and Human-Caused Hazards

The non-natural hazards of concern were assessed to different standards than the natural hazards for the following reasons:

- The assessment of non-natural hazards is optional under federal hazard mitigation planning requirements (44 CFR Section 201.6).
- The data needed to assess risk, such as maps of extent and location and applied damage functions, are not readily available for these types of hazards.
- A key element of risk is the probability of occurrence. Probabilities are usually assigned based on past historical occurrences. While human-caused and human health hazards have had significant impacts on our nation as a whole, they have not impacted regions of the country uniformly as do natural hazard events. The lack of record of past occurrences within a planning area makes it difficult to assign probability of occurrence.

5.4 MAPPING

A review of national, state and county databases was performed to locate available spatially based data relevant to this planning effort. Maps were produced using GIS software to show the spatial extent and location of identified hazards when such data was available. These maps are included in the hazard profile chapters of this document. Information regarding the data sources and methodologies employed in these mapping efforts is provided in the sections below.

5.4.1 Building and Cost Data

Replacement cost values and detailed structure information derived from parcel and tax assessor data provided by the City of Roseville were loaded into Hazus-MH. When available, an updated inventory was used in place of the Hazus-MH defaults for critical facilities and infrastructure.

Replacement cost is the cost to replace the entire structure with one of equal quality and utility. Replacement cost is based on industry-standard cost-estimation models published in *RS Means Square Foot Costs* (RS Means, 2015). It is calculated using the RS Means square foot cost for a structure, which is based on the Hazus-MH occupancy class (e.g., multi-family residential, commercial retail trade), multiplied by the square footage of the structure from the tax assessor data. For single-family residential, the construction class and number of stories also factor into determining the square foot costs.

5.4.2 Hazus-MH Data Inputs

The following hazard data were used for the Hazus-MH Level 2 analysis conducted for the risk assessment:

- **Flood**—The preliminary Digital Flood Insurance Rate Map (DFIRM) for the planning area – dated December 28, 2015 – was used to delineate flood hazard areas and estimate potential losses from the

100-year, 500-year and 10-year flood events. Using the DFIRM floodplain boundaries and base flood elevation information, and the Central Valley Flood Delineation Project 3-foot digital elevation model data, flood depth grids were generated and integrated into the Hazus-MH model.

- **Dam Failure**—Inundation area data from the Folsom Dam Containment Dike Failure Risk Assessment Project, provided by the City of Roseville, and the 3-foot digital elevation model were used to develop depth grids that were integrated into the Hazus-MH model.
- **Earthquake**—Earthquake shake maps and probabilistic data prepared by the U.S. Geological Survey (USGS) were used for the analysis of this hazard. A National Earthquake Hazard Reduction Program (NEHRP) soils map from the California Department of Conservation was also integrated into the Hazus-MH model.

5.4.3 Other Local Hazard Data

Locally relevant information on hazards was gathered from a variety of sources. Frequency and severity indicators include past events and the expert opinions of geologists, emergency management specialists and others. Data sources for specific hazards were as follows:

- **Landslide**—A dataset for landslide probability was created by intersecting slope data with NEHRP soils data. Three landslide probability classifications were created: high (greater than 30 percent slope, D soils), moderate (15 to 30 percent slope, D type soils), and low (0 to 15 percent slope, D type soils). The slope data were generated from the 3-foot digital elevation model. The NEHRP soils data were provided by the California Department of Conservation.
- **Severe Storm**—No GIS format severe storm area data were identified for the City of Roseville.
- **Wildfire**—California Department of Forestry and Fire Protection (CAL FIRE) fire severity data was downloaded from the CAL FIRE website.

5.4.4 Data Source Summary

Table 5-1 summarizes the data sources used for the risk assessment for this project.

5.4.5 Limitations

Loss estimates, exposure assessments and hazard-specific vulnerability evaluations rely on the best available data and methodologies. Uncertainties are inherent in any loss estimation methodology and arise in part from incomplete scientific knowledge concerning hazards and their effects on the built environment. Uncertainties also result from the following:

- Approximations and simplifications necessary to conduct a study
- Incomplete or outdated inventory, demographic, or economic parameter data
- The unique nature, geographic extent and severity of each hazard
- Mitigation measures already employed
- The amount of advance notice residents have to prepare for a specific hazard event.

These factors can result in a range of uncertainty in loss estimates, possibly by a factor of two or more. Therefore, exposure and loss estimates are approximate. These results do not predict precise results and should be used only to understand relative risk. Over the long term, the City of Roseville will collect additional data to assist in estimating potential losses associated with other hazards.

Table 5-1. Hazus-MH Model Data Documentation

Data	Source	Date	Format
Property parcel data	City of Roseville	2016	Digital (GIS) format
Address points	City of Roseville	2016	Digital (GIS) format
Building footprints	City of Roseville	2016	Digital (GIS) format
Building information[a]	City of Roseville	2016	Digital (GIS) format
Building replacement cost	RS Means	2015	Printed. Updated RS Means values
Population data	Hazus-MH v2.2	2010	Digital (GIS and tabular) format
Flood hazard data	FEMA	2015	Digital (GIS) format
First floor elevation data	City of Roseville	2011	Digital (tabular) format
Earthquake shake maps	USGS Earthquake Hazards Program website	2012	Digital (GIS) format
NEHRP Soils	California Department of Conservation	2008	Digital (GIS) format
Dam inundation area	City of Roseville	2010	Digital (GIS) format
Landslide	Tetra Tech Inc.	2016	Digital (GIS) format
Wildfire	CAL FIRE	2008	Digital (GIS) format
Digital Elevation Model	City of Roseville	2015	Digital (GIS) format
CRITICAL FACILITIES AND ASSETS			
Landmarks[b]	City of Roseville	2015	Digital (GIS) format
State and local bridges	Caltrans	2015	Digital (GIS) forma
Rail facilities	Caltrans	2015	Digital (GIS) format
Telecommunications facilities	City or Roseville	2015	Digital (GIS) format
Consolidated communications facilities	Consolidated Communications (from 2011 Hazard Mitigation Plan)	2011	Digital (GIS) format
Hazardous material facilities	U.S. EPA Toxic Release Inventory	2016	Digital (GIS) format
Potable water facilities	City of Roseville	2015	Digital (GIS) format
Sewer facilities	City of Roseville	2015	Digital (GIS) format

a. Building information includes area, occupancy, date of construction, and stories
b. Landmarks include fire stations, police stations, schools, medical care facilities, helipads, rail facilities, electric power facilities, potable water facilities, sewer facilities, and various government facilities

6. CLIMATE CHANGE CONSIDERATIONS FOR HAZARD MITIGATION

6.1 CALIFORNIA SENATE BILL NO. 379

California Senate Bill 379, adopted October 8, 2015, requires that local hazard mitigation plans adopted on or after January 1, 2017 include all of the following:

- A vulnerability assessment that identifies the risks that climate change poses to the local jurisdiction and the geographic areas at risk from climate change impacts, including but not limited to flood and fire hazards. Information available from federal, state, regional and local agencies should be used in the development of this assessment, including the following:
  - Information from the Internet-based Cal-Adapt tool
  - Information from the most recent version of the California Adaptation Planning Guide
  - Information from local agencies on the types of assets, resources, and populations that will be sensitive to various climate change exposures
  - Information from local agencies on their current ability to deal with the impacts of climate change
  - Historical data on natural events and hazards, including locally prepared maps of areas subject to previous risk, areas that are vulnerable, and sites that have been repeatedly damaged
  - Existing and planned development in identified at-risk areas, including structures, roads, utilities, and essential public facilities
  - Federal, state, regional, and local agencies with responsibility for the protection of public health and safety and the environment, including special districts and local offices of emergency services
- A set of adaptation and resilience goals, policies, and objectives based on the available information
- A set of feasible implementation measures designed to carry out the goals, policies, and objectives including, but not limited to, all of the following:
  - Feasible ways to avoid or minimize climate change impacts associated with new uses of land
  - Siting new essential public facilities outside of at-risk areas when feasible (including, but not limited to, hospitals and health care facilities, emergency shelters, emergency command centers, and emergency communications facilities) or, if these facilities are located in at-risk areas, using construction or other methods to minimize damage
  - The designation of adequate and feasible infrastructure in an at-risk area
  - Guidelines for working cooperatively with relevant local, regional, state, and federal agencies.
  - The identification of natural infrastructure that may be used in adaptation projects, where feasible. Where feasible, the plan shall use existing natural features and ecosystem processes or restore natural features and ecosystem processes, when developing alternatives for consideration.

At the time of the development of this hazard mitigation plan, guidelines and resources are still being developed to assist local governments in meeting the intent of Senate Bill No. 379. Information in this chapter addresses the issues presented and the intent of the requirements using the best currently available information. It focuses on the

vulnerability assessment of climate change as it relates to the natural hazards of concern selected by the steering committee. Goals, policies, objectives and implementation measures for climate change are incorporated into this Plan's overall mitigation goals, objectives, and actions presented in Part 3.

6.2 WHAT IS CLIMATE CHANGE?

Climate, consisting of patterns of temperature, precipitation, humidity, wind and seasons, plays a fundamental role in shaping natural ecosystems and the human economies and cultures that depend on them. "Climate change" refers to changes over a long period of time. Worldwide, average temperatures have increased 1.4ºF since 1880 (NASA, 2015). Although this change may seem small, it can lead to large changes in climate and weather.

The warming trend and its related impacts are caused by increasing concentrations of carbon dioxide and other greenhouse gases in the earth's atmosphere. Greenhouse gases are gases that trap heat in the atmosphere, resulting in a warming effect. Carbon dioxide is the most commonly known greenhouse gas; however, methane, nitrous oxide and fluorinated gases also contribute to warming. Emissions of these gases come from a variety of sources, such as the combustion of fossil fuels, agricultural production, changes in land use and volcanic eruptions. According to the U.S. Environmental Protection Agency (EPA), carbon dioxide concentrations measured about 280 parts per million (ppm) before the industrial era began in the late 1700s and have risen 43 percent since then, reaching 399 ppm in 2014 (see Figure 6-1). Scientists are able to place this rise in carbon dioxide in a longer historical context through the measurement of carbon dioxide in ice cores. According to these records, carbon dioxide concentrations in the atmosphere are the highest that they have been in 800,000 years (NASA, 2016).

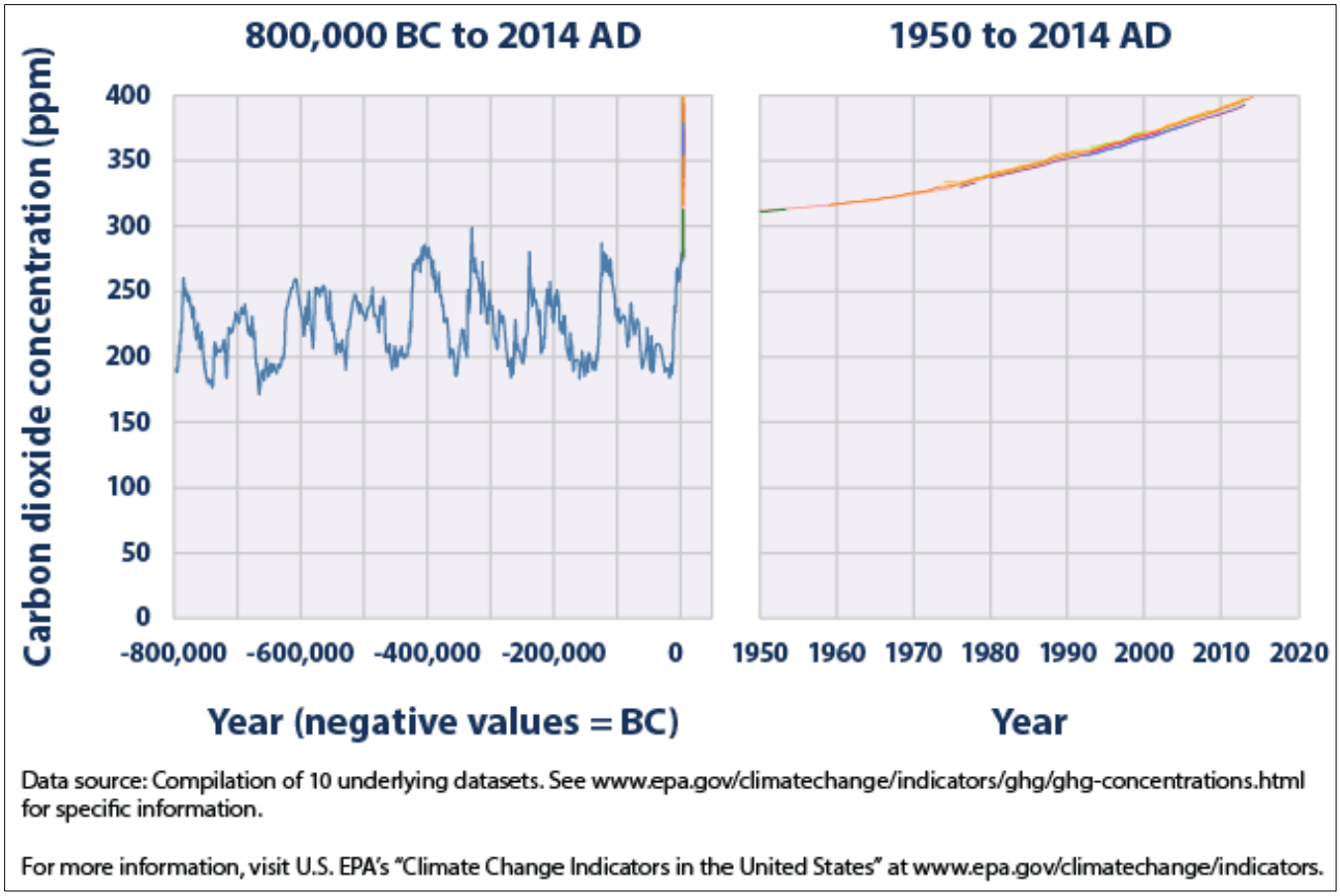


Figure 6-1. Global Carbon Dioxide Concentrations Over Time

According to NASA, most of this trend is very likely human-induced, and the rate of change has not been matched in the past 1,300 years (NASA, 2016). There is broad scientific consensus (97 percent of scientists) that climate-warming trends are very likely due to human activities (NASA, 2016). Unless emissions of greenhouse gases are substantially reduced, this warming trend and its associated impacts are expected to continue.

Climate change will affect the people, property, economy and ecosystems of the City of Roseville in a variety of ways. Climate change impacts are most frequently associated with negative consequences, such as increased flood vulnerability or increased heat-related illnesses and other public health concerns; however, other changes may present opportunities. The most important effect for the development of this Plan is that climate change will have a measurable impact on the occurrence and severity of natural hazards.

6.3 HOW CLIMATE CHANGE AFFECTS HAZARD MITIGATION

An essential aspect of hazard mitigation is predicting the likelihood of hazard events in a planning area. Typically, predictions are based on statistical projections from records of past events. This approach assumes that the likelihood of hazard events remains essentially unchanged over time. Thus, averages based on the past frequencies of, for example, floods are used to estimate future frequencies: if a river has flooded an average of once every 5 years for the past 100 years, then it can be expected to continue to flood an average of once every 5 years.

For hazards that are affected by climate conditions, the assumption that future behavior will be equivalent to past behavior is not valid if climate conditions are changing. As flooding is generally associated with precipitation frequency and quantity, for example, the frequency of flooding will not remain constant if broad precipitation patterns change over time. The risks of, landslide, severe storms, extreme heat and wildfire are all affected by climate patterns as well. For this reason, an understanding of climate change is pertinent to efforts to mitigate natural hazards. Information about how climate patterns are changing provides insight on the reliability of future hazard projections used in mitigation analysis. This chapter summarizes current understandings about climate change in order to provide a context for the recommendation and implementation of hazard mitigation measures.

6.4 CURRENT INDICATIONS OF CLIMATE CHANGE

The major scientific agencies of the United States and the world—including the National Aeronautics and Space Administration (NASA), the National Oceanic and Atmospheric Administration (NOAA) and the Intergovernmental Panel of Climate Change (IPCC)—agree that climate change is occurring. Multiple temperature records from all over the world have shown a warming trend, and the IPCC has stated that the warming of the climate system is unequivocal (IPCC, 2014). Of the 10 warmest years in the 134-year record, all but one (1998) occurred since 2000, and 2015 was the warmest year on record (NASA, 2016).

Rising global temperatures have been accompanied by other changes in weather and climate. Many places have experienced changes in rainfall resulting in more intense rain, as well as more frequent and severe heat waves (IPCC, 2014). The planet's oceans and glaciers have also experienced changes: oceans are warming and becoming more acidic, ice caps are melting, and sea levels are rising (NASA, 2016). Global sea level has risen 6.7 inches, on average, in the last 100 years (NASA, 2016). This has already put some coastal homes, beaches, roads, bridges, and wildlife at risk (USGCRP, 2009).

NASA currently maintains information on the vital signs of the planet and has identified the following trends as of the time of the development of this Plan (NASA, 2016):

- Carbon Dioxide—Increasing trend, currently at 403.28 parts per million
- Global Temperature—Increasing trend, increase of 1.4ºF since 1880
- Arctic Ice Minimum—Decreasing trend, 13.4 percent per decade

- Land Ice—Decreasing trend, 287.0 billion metric tons per year
- Sea Level—Increasing trend, 3.4 mm per year.

6.5 PROJECTED FUTURE IMPACTS

Climate change projections contain inherent uncertainty because they are dependent on future greenhouse gas emission scenarios. Different climate change models may assume different scenarios, resulting in differing projections. Generally, the uncertainty is addressed by developing projections for a range of scenarios: in low-emissions scenarios, greenhouse gas emissions are assumed to be reduced substantially from current levels; in high-emissions scenarios, they are assumed to increase or continue at current levels. Despite these uncertainties, climate change projections present valuable information to help guide decision-making for the future.

The Third National Climate Assessment Report for the United States indicates that impacts resulting from climate change will continue through the 21st century and beyond. Although not all changes are understood at this time and the impacts of those changes will depend on global emissions of greenhouse gases and sensitivity in human and natural systems, the following impacts are expected in the United States (NASA, 2016):

- Temperatures will continue to rise
- Growing seasons will lengthen
- Precipitation patterns will change
- Droughts and heat waves will increase
- Hurricanes will become stronger and more intense
- Sea level will rise 1 to 4 feet by 2100
- The Arctic may become ice free.

The California Climate Adaptation Planning Guide outlines the following climate change impact concerns for the North Sierra Region communities (Cal EMA et al., 2012):

- Increased temperature
- Decreased precipitation
- Reduced snowpack
- Reduced tourism
- Ecosystem change
- Sensitive species stress
- Increased wildfire.

Cal-Adapt, a publicly available resource, offers information on how climate change might impact local communities. It presents visualization tools that present the most current data available whenever possible. The following sections summarize projections by Cal-Adapt for the Roseville area's local climate.

6.5.1 Precipitation

According to Cal-Adapt, precipitation projections for California remain uncertain. Models show differing impacts from slightly wetter winters to slightly drier winters, with potential for a 10- to 20-percent decrease in total annual precipitation (Cal-Adapt, 2016). Changes in precipitation patterns, coupled with warmer temperatures, may lead to significant changes in hydrology. In high-emissions scenarios, more precipitation may fall as rain rather than snow, and snow may melt earlier in the season, impacting the timing of stream flow changes and floods (Cal-Adapt, 2016).

6.5.2 Temperature

The historical average (1961-1990) temperature in the Roseville area is 61.7ºF. By 2090, the average temperature in the City is expected to increase above this baseline in the low- and high-emissions scenarios by 3.8ºF and 6.5ºF, respectively, as shown in Figure 6-2.

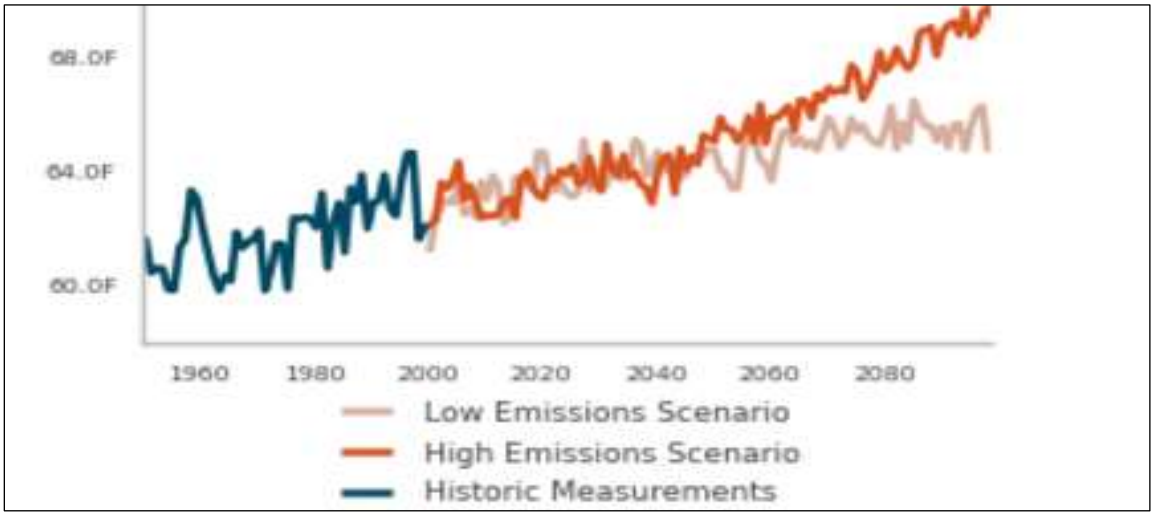


Figure 6-2. Observed and Projected Average Temperatures in the Roseville Area

6.5.3 Snow Pack

While there are no snow-water equivalency measurements for the Roseville area, Cal-Adapt indicates that some parts of California should expect snow pack levels to be reduced by up to 25 inches from the baseline (1961-1990) by 2090.

6.5.4 Wildfire

Wildfire risk is expected to change in the coming decades. Under the high-emissions scenario, the fire risk in Placer County may increase by 1.86 times the current risk by 2085, while the risk may be 1.31 times the current risk for the low-emissions scenario (see Figure 6-3).

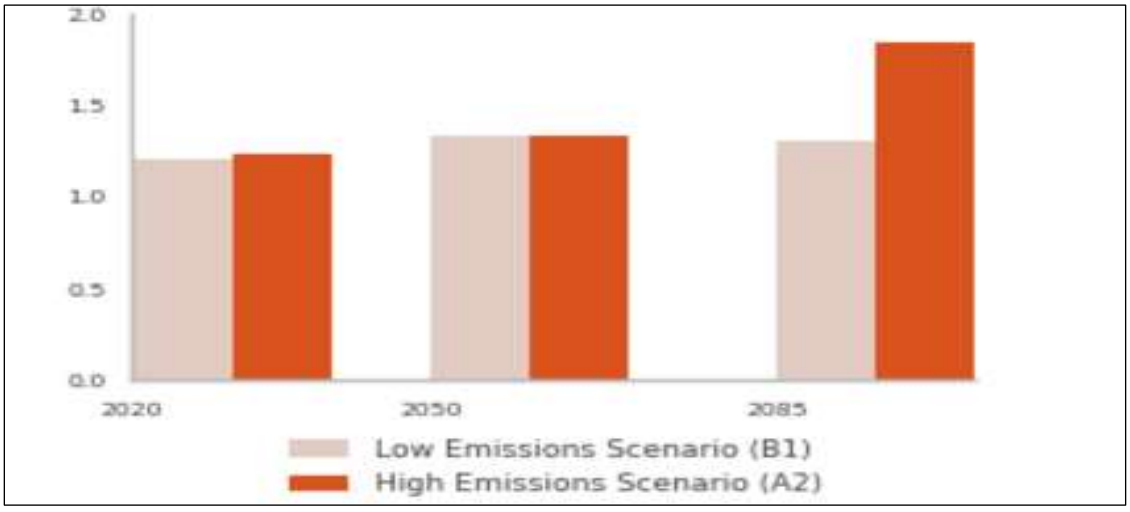


Figure 6-3. Projected Future Fire Risk in Placer County Relative to 2010 Levels

6.6 RESPONSES TO CLIMATE CHANGE

Communities and governments worldwide are working to address, evaluate and prepare for climate changes that are likely to impact communities in coming decades. Societies across the world are facing the need to adapt to changing conditions associated with natural disasters and climate change. Farmers are altering crops and agricultural methods to deal with changing rainfall and rising temperature; architects and engineers are redesigning buildings; planners are looking at managing water supplies to deal with droughts or flooding.

6.6.1 Mitigation and Adaptation

Generally, climate change discussions encompass two separate but inter-related considerations: mitigation and adaptation. The term "mitigation" can be confusing, because it's meaning changes across disciplines:

- Mitigation in climate change discussions is defined as "a human intervention to reduce the impact on the climate system." It includes strategies to reduce greenhouse gas sources and emissions and enhance greenhouse gas sinks (EPA, 2013).
- Mitigation in emergency management is typically defined as the effort to reduce loss of life and property by lessening the impact of disasters (FEMA, 2016a).
- Mitigation in restoration ecology and related fields generally refers to policies, programs or actions that are intended to reduce or to offset the negative impacts of human activities on natural systems. Generally, mitigation can be understood as avoiding, minimizing, rectifying, reducing or eliminating, or compensating for known impacts (U.S. DOT, n.d.).

In this chapter, mitigation is used as defined by the climate change community. In the other chapters of this Plan, mitigation is primarily used in an emergency management context.

Adaptation is defined by the IPCC as adjusting to actual or expected climate and its effects. It includes efforts to moderate or avoid harm to human systems or take advantage of beneficial opportunities. It also includes human intervention to help natural systems adjust to expected climate change (IPCC, 2014).

Mitigation and adaptation are related, as the world's ability to mitigate greenhouse gas emissions will affect the degree of adaptation that will be necessary. Some initiatives and actions can both reduce greenhouse gas emissions and support adaptation to likely future conditions.

6.6.2 Ecosystem-Based Adaptation

Ecosystem-based adaptation is the use of biodiversity and ecosystem services as part of an overall strategy to help people adapt to the adverse effects of climate change. This includes the sustainable management, conservation and restoration of specific ecosystems that provide key services. Most ecosystems show a remarkable ability to adapt to change and to buffer surrounding areas from the impacts of change. Forests can bind soils and hold large volumes of water during times of plenty, releasing it through the year; floodplains can absorb vast volumes of water during peak flows; coastal ecosystems can hold out against storms, attenuating waves and reducing erosion. Other ecosystem services—such as food provision, timber, materials, medicines and recreation—can provide a buffer to societies in the face of changing conditions.

6.6.3 City of Roseville Sustainability Efforts

The City of Roseville has taken steps to reduce the impacts of climate change through greenhouse gas mitigation and community sustainability efforts:

- The City of Roseville's general plan highlights existing policies and programs that either reduce greenhouse gas emissions or assist in protecting residents from the potential adverse impacts of climate change (City of Roseville, 2016).
- In 2009, the City Council adopted the City-operations Climate Action Plan, which set a greenhouse gas emission reduction goal of 22.8 percent (City of Roseville, n.d.).
- In 2010 the Community-wide Sustainability Action Plan was developed, recommending 11 steps to reach the greenhouse gas emission targets. (City of Roseville, 2010a).

6.7 CLIMATE CHANGE IMPACTS ON HAZARDS

The following sections provide information on how each identified hazard of concern for this planning process may be impacted by climate change. They describe how these impacts may alter current exposure and vulnerability to these hazards of the people, property, critical facilities and environment in the City of Roseville. Detailed hazard profiles and risk assessment information on each hazard of concern are presented in Chapters 7 through 15.

6.7.1 Drought

Impacts on Hazard

The long-term effects of climate change on regional water resources are unknown, but global water resources are already experiencing the following stresses without climate change:

- Growing populations
- Increased competition for available water
- Poor water quality
- Environmental claims
- Uncertain reserved water rights
- Groundwater overdraft
- Aging urban water infrastructure.

With a warmer climate, droughts could become more frequent, more severe, and longer-lasting. According to the National Climate Assessment Report, higher surface temperatures caused by global warming increase the potential for drought. Evaporation and the higher rate at which plants lose moisture through their leaves both increase with temperature. Unless higher evapotranspiration rates are matched by increases in precipitation, areas become more dry, promoting drought conditions (Globalchange.gov, 2014).

Because expected changes in precipitation patterns are still uncertain, the potential impacts and likelihood of drought are uncertain. California DWR has already noted the impact of climate change on statewide water resources by charting changes in snowpack, sea level, and river flow. As temperatures rise and more precipitation comes in the form of rain instead of snow, these changes will likely continue or grow even more significant. DWR estimates that the Sierra Nevada snowpack, which supplies water for the City of Roseville and other parts of the state, will experience a 48- to 65-percent loss by the end of the century, based on historical April 1 averages (CA DWR 2016). Increasing temperatures may also increase net evaporation from reservoirs by 15 to 37 percent (CA DWR 2013).

Population

Population exposure and vulnerability to drought are unlikely to increase as a result of climate change. While greater numbers of people may need to engage in behavior change, such as water saving efforts, significant life or health impacts are unlikely.

Property

Property exposure and vulnerability may increase as a result of increased drought resulting from climate change, although this would most likely occur in non-structural property such as landscaping. It is unlikely that structure exposure or vulnerability would increase as a direct result of drought, although secondary impacts of drought, such as wildfire, may increase and threaten structures.

Critical Facilities

Critical facility exposure and vulnerability are unlikely to increase as a result of increased drought resulting from climate change; however, critical facility operators may need to alter standard management practices and actively manage resources, particularly in water-related service sectors.

Environment

The vulnerability of the environment may increase as a result of increased drought resulting from climate change. Ecosystems and biodiversity in the Roseville area are already under stress from development and water diversion. Prolonged or more frequent drought resulting from climate change may further stress the ecosystems in the region, which include many special status species (Cal EMA et al., 2012).

6.7.2 Earthquake

Impacts on Hazard

The impacts of global climate change on earthquake probability are unknown. Some scientists say that melting glaciers could induce tectonic activity. As ice melts and water runs off, tremendous amounts of weight are shifted on the earth's crust. As newly freed crust returns to its original, pre-glacier shape, it could cause seismic plates to slip and stimulate volcanic activity, according to research into prehistoric earthquakes and volcanic activity. NASA and USGS scientists found that retreating glaciers in southern Alaska may be opening the way for future earthquakes (NASA, 2004).

Secondary impacts of earthquakes could be magnified by climate change. Soils saturated by repetitive storms or heavy precipitation could experience liquefaction or an increased propensity for slides during seismic activity due to the increased saturation. Dams storing increased volumes of water due to changes in the hydrograph could fail during seismic events.

Population, Property, Critical Facilities and the Environment

Because impacts of climate change on the earthquake hazard are not well understood, increases in exposure and vulnerability of the local resources are not able to be determined.

6.7.3 Flood

Impacts on Hazard

Use of historical hydrologic data has long been the standard of practice for designing and operating water supply and flood protection projects. For example, historical data are used for flood forecasting models and to forecast snowmelt runoff for water supply. This method of forecasting assumes that the climate of the future will be similar to that of the period of historical record. However, the hydrologic record cannot be used to predict changes in frequency and severity of extreme climate events such as floods. Going forward, model calibration or statistical relation development must happen more frequently, new forecast-based tools must be developed, and a standard of practice that explicitly considers climate change must be adopted. Climate change is already impacting water resources, and resource managers have observed the following:

- Historical hydrologic patterns can no longer be solely relied upon to forecast the water future.
- Precipitation and runoff patterns are changing, increasing the uncertainty for water supply and quality, flood management and ecosystem functions.
- Extreme climatic events will become more frequent, necessitating improvement in flood protection, drought preparedness and emergency response.

The amount of snow is critical for water supply and environmental needs, but so is the timing of snowmelt runoff into rivers and streams. Rising snowlines caused by climate change will allow more mountain areas, such as the Sierra Nevada watersheds, to contribute to peak storm runoff. High frequency flood events (e.g. 10-year floods) in particular will likely increase with a changing climate. Along with reductions in the amount of the snowpack and accelerated snowmelt, scientists project greater storm intensity, resulting in more direct runoff and flooding. Changes in watershed vegetation and soil moisture conditions will likewise change runoff and recharge patterns. As stream flows and velocities change, erosion patterns will also change, altering channel shapes and depths, possibly increasing sedimentation behind dams, and affecting habitat and water quality. With potential increases in the frequency and intensity of wildfires due to climate change, there is potential for more floods following fire, which increase sediment loads and water quality impacts.

As hydrology changes, what is currently considered a 1-percent-annual-chance (100-year) flood may strike more often, leaving many communities at greater risk. Planners will need to factor a new level of safety into the design, operation, and regulation of flood protection facilities such as dams, bypass channels and levees, as well as the design of local sewers and storm drains.

Population and Property

Population and property exposure and vulnerability may increase as a result of climate change impacts on the flood hazard. Runoff patterns may change, resulting in flooding in areas where it has not previously occurred.

Critical Facilities

Critical facility exposure and vulnerability may increase as a result of climate change impacts on the flood hazard. Runoff patterns may change, resulting in risk to facilities that have not historically been at risk from flooding. Additionally, changes in the management and design of flood protection critical facilities may be needed as additional stress is placed on these systems.

Environment

The exposure and vulnerability of the environment may increase as a result of climate change impacts on the flood hazard. Changes in the timing and frequency of flood events may have broader ecosystem impacts that alter the ability of already stressed species to survive.

6.7.4 Landslide

Impacts on Hazard

Climate change may impact storm patterns, increasing the probability of more frequent, intense storms with varying duration. Increase in global temperature is likely to affect the snowpack and its ability to hold and store water. Warming temperatures also could increase the occurrence and duration of droughts, which would increase the probability of wildfire, reducing the vegetation that helps to support steep slopes. All of these factors would increase the probability for landslide occurrences.

Population and Property

Population and property exposure and vulnerability would be unlikely to increase as a result of climate change impacts on the landslide hazard. Landslide events may occur more frequently, but the extent and location should be contained within mapped hazard areas.

Critical Facilities

Critical facility exposure and vulnerability would be unlikely to increase as a result of climate change impacts on the landslide hazard; however, critical facility owners and operators may experience more frequent disruption to service provision as a result of landslide hazards. For example, transportation systems may experience more frequent delays if slides blocking these systems occur more frequently.

Environment

Exposure and vulnerability of the environment would be unlikely to increase as a result of climate change, but more frequent slides in riverine systems may impact water quality and have negative impacts on already stressed species.

6.7.5 Severe Weather

Impacts on Hazard

Climate change presents a challenge for risk management associated with severe weather. The frequency of severe weather events has increased steadily over the last century. The number of weather-related disasters during the 1990s was four times that of the 1950s, and cost 14 times as much in economic losses. Historical data shows that the probability of severe weather events increases in a warmer climate.

An increase in average surface temperatures can also lead to more intense heat waves that can be exacerbated in urbanized areas by what is known as urban heat island effect. Evidence suggests that heat waves are already increasing, especially in western states. According to information on Cal-Adapt, extreme heat days in Roseville (103ºF is the extreme heat day threshold) are likely to increase from a historical average for four days annually. This increase would be coupled with an increase in heat waves and warm nights (67ºF threshold).

Population and Property

For the most part, population and property exposure and vulnerability would be unlikely to substantially increase as a direct result of climate change impacts on the severe weather hazard. Severe weather events may occur more frequently. Disproportionately impacted populations such as the elderly or disadvantaged communities that have substandard living arrangements (homeless populations, etc.) would have a potential for increased exposure and vulnerability from severe weather. Secondary impacts, such as the extent of localized flooding, may increase, thus impacting greater numbers of people and structures.

Critical Facilities

Critical facility exposure and vulnerability would be unlikely to increase as a result of climate change impacts on the severe weather hazard; however, critical facility owners and operators may experience more frequent disruption to service provision. For example, more frequent and intense storms may cause more frequent disruptions in power service.

Environment

Exposure and vulnerability of the environment would be unlikely to increase as a result of climate change impacts on the severe weather hazard; however, more frequent storms and heat events and more intense rainfall may place additional stressors on already stressed systems.

6.7.6 Wildfire

Impacts on Hazard

Wildfire is determined by climate variability, local topography, and human intervention. Climate change has the potential to affect multiple elements of the wildfire system: fire behavior, ignitions, fire management, and vegetation fuels. Hot dry spells create the highest fire risk. Increased temperatures may intensify wildfire danger by warming and drying out vegetation. Additionally, changes in climate patterns may impact the distribution and perseverance of insect outbreaks that create dead trees (increase fuel). When climate alters fuel loads and fuel moisture, forest susceptibility to wildfires changes. Climate change also may increase winds that spread fires. Faster fires are harder to contain, and thus are more likely to expand into residential neighborhoods.

Population, Property and Critical Facilities

According to the Cal-Adapt projections, wildfire risk in the areas surrounding the City of Roseville is expected to increase by 2085. Larger, more frequent fires may impact people, property and critical facilities by increasing the risk of ignition from nearby fire sources. Additionally, secondary impacts such as air quality issues may increase.

Environment

It is possible that the exposure and vulnerability of the environment will be impacted by impacts on wildfire risk from climate change. Natural fire regimes may change, resulting in more frequent or higher intensity burns. These impacts may alter the composition of the ecosystems in areas in and around Roseville.

7. DAM FAILURE

7.1 GENERAL BACKGROUND

7.1.1 Causes of Dam Failure

Dam failures can be catastrophic to human life and property downstream. Dam failures in the United States typically occur in one of four primary ways:

- Overtopping of the primary dam structure, which accounts for 34 percent of all dam failures, can occur due to inadequate spillway design, settlement of the dam crest, blockage of spillways, and other factors.
- Foundation defects due to differential settlement, slides, slope instability, uplift pressures, and foundation seepage can also cause dam failure. These account for 30 percent of all dam failures.
- Failure due to piping and seepage accounts for 20 percent of all failures. These are caused by internal erosion due to piping and seepage, erosion along hydraulic structures such as spillways, erosion due to animal burrows, and cracks in the dam structure.
- Failure due to problems with conduits and valves, typically caused by the piping of embankment material into conduits through joints or cracks, constitutes 10 percent of all failures.

The remaining 6 percent are due to other miscellaneous causes. Many of the historical dam failures in the United States have been secondary results of other disasters. The prominent causes are earthquakes, landslides, extreme storms, massive snowmelt, equipment malfunction, structural damage and foundation failures.

The most likely disaster-related causes of dam failure in Placer County and the Roseville vicinity are earthquakes, excessive rainfall, and landslides. Poor construction, lack of maintenance and repair, and deficient operational procedures are preventable or correctable by a program of regular inspections. Terrorism and vandalism are serious concerns that all operators of public facilities must plan for; these threats are under continuous review by public safety agencies.

DEFINITIONS

Dam—Any artificial barrier, together with appurtenant works, that does or may impound or divert water, and that either (a) is 25 feet or more in height from the natural bed of the stream or watercourse at the downstream toe of the barrier (or from the lowest elevation of the outside limit of the barrier if it is not across a stream channel or watercourse) to the maximum possible water storage elevation; or (b) has an impounding capacity of 50 acre-feet or more. (CA Water Code, Division 3.)

Dam Failure—An uncontrolled release of impounded water due to structural deficiencies in dam.

Emergency Action Plan—A formal document that identifies potential emergency conditions at a dam and specifies actions to be followed to minimize property damage and loss of life. The plan specifies actions the dam owner should take to alleviate problems at a dam. It contains procedures and information to assist the dam owner in issuing early warning and notification messages to responsible downstream emergency management authorities of the emergency situation. It also contains inundation maps to show emergency management authorities the critical areas for action in case of an emergency. (FEMA 2013)

High Hazard Dam—Dams where failure or improper operation will probably cause loss of human life. (FEMA 2004)

Significant Hazard Dam—Dams where failure or improper operation will result in no probable loss of human life but can cause economic loss, environmental damage or disruption of lifeline facilities, or can impact other concerns. Significant hazard dams are often located in rural or agricultural areas but could be located in areas with population and significant infrastructure. (FEMA 2004)

7.1.2 Regulatory Oversight

The potential for catastrophic flooding due to dam failures led to passage of the National Dam Safety Act (Public Law 92-367). The National Dam Safety Program requires a periodic engineering analysis of every major dam in the country. The goal of this FEMA-monitored effort is to identify and mitigate the risk of dam failure so as to protect the lives and property of the public.

National Dam Safety Act

The potential for catastrophic flooding due to dam failures led to passage of the National Dam Safety Act (Public Law 92-367). The National Dam Safety Program requires a periodic engineering analysis of every major dam in the country. The goal of this FEMA-monitored effort is to identify and mitigate the risk of dam failure so as to protect the lives and property of the public. The National Dam Safety Program is a partnership between the states, federal agencies, and other stakeholders that encourages individual and community responsibility for dam safety. Under FEMA's leadership, state assistance funds have allowed all participating states to improve their programs through increased inspections, emergency action planning, and the purchase of needed equipment. FEMA has also expanded existing training programs and initiated new ones. Grant assistance from FEMA provides support for improvement of dam safety programs that regulate most of the dams in the United States (FEMA 2015).

California Division of Safety of Dams

California's Division of Safety of Dams (a division of the Department of Water Resources) monitors dam safety at the state level. When a new dam is proposed, Division engineers and geologists inspect the site and the subsurface. Upon submittal of an application, the Division reviews the plans and specifications prepared by the owner to ensure that the dam is designed to meet minimum requirements and that the design is appropriate for the known geologic conditions. After approval of the application, the Division inspects all aspects of the construction to ensure that the work is done in accordance with the approved plans and specifications. After construction, the Division inspects each dam on an annual basis to ensure that it is performing as intended and is not developing problems. Roughly a third of these inspections include in-depth instrumentation reviews. The Division periodically reviews the stability of dams and their major appurtenances in light of improved design approaches and requirements, as well as new findings regarding earthquake hazards and hydrologic estimates in California (CA DWR, 2016a).

U.S. Army Corps of Engineers Dam Safety Program

The U.S. Army Corps of Engineers is responsible for safety inspections of some federal and non-federal dams in the United States that meet the size and storage limitations specified in the National Dam Safety Act. The Corps has inventoried dams; surveyed each state and federal agency's capabilities, practices and regulations regarding design, construction, operation and maintenance of the dams; and developed guidelines for inspection and evaluation of dam safety (U.S. Army Corps of Engineers, 2011).

Federal Energy Regulatory Commission Dam Safety Program

The Federal Energy Regulatory Commission (FERC) has the largest dam safety program in the United States. The FERC cooperates with a large number of federal and state agencies to ensure and promote dam safety and, more recently, homeland security. Approximately 3,000 dams that are part of regulated hydroelectric projects are in the FERC program. Two-thirds of these dams are more than 50 years old. As dams age, concern about their safety and integrity grows, and oversight and a regular inspection program are extremely important. FERC staff inspects hydroelectric projects on an unscheduled basis to investigate the following:

- Potential dam safety problems
- Complaints about constructing and operating a project

- Safety concerns related to natural disasters
- Issues concerning compliance with the terms and conditions of a license.

Every five years, an independent consulting engineer, approved by the FERC, must inspect and evaluate projects with dams higher than 32.8 feet, or with a total storage capacity of more than 2,000 acre-feet.

FERC staff monitors and evaluates seismic research in geographic areas such as California where there are concerns about possible seismic activity. This information is applied in investigating and performing structural analyses of hydroelectric projects in these areas. FERC staff also evaluates the effects of potential and actual large floods on the safety of dams. During and following floods, FERC staff visits dams and licensed projects, determines the extent of damage, if any, and directs any necessary studies or remedial measures the licensee must undertake. The FERC publication *Engineering Guidelines for the Evaluation of Hydropower Projects* guides the FERC engineering staff and licensees in evaluating dam safety. The publication is frequently revised to reflect current information and methodologies.

The FERC requires licensees to prepare emergency action plans and conducts training sessions on how to develop and test these plans. The plans outline an early warning system if there is an actual or potential sudden release of water from a dam due to failure or accident. The plans include operational procedures that may be used, such as reducing reservoir levels and reducing downstream flows, as well as procedures for notifying affected residents and agencies responsible for emergency management. These plans are frequently updated and tested to ensure that everyone knows what to do in emergency situations.

7.2 HAZARD PROFILE

7.2.1 Past Events

According to the Placer County Multi-Hazard Mitigation Plan, there have been five dam failures in Placer County (none are known to have impacted the Roseville planning area):

- **Hell Hole Dam Failure**—In 1964, construction of the Hell Hole Dam was underway and the contractor had stopped operations for the winter. A major storm event in December caused the Hell Hole Reservoir to fill, and since the dam was not completed, it failed, sending a considerable amount of water toward Auburn. The water washed out a bridge on Highway 49 over the American River at the confluence of the North and Middle Forks and flooded a quarry. Due to the way the construction contract was worded, the contractor had to rebuild the dam at his own expense. As a result, Placer County incurred no costs related to this event. No claims for damage were filed against the Placer County Water Agency (PCWA) by either the quarry owner or the state.
- **1986 Auburn Coffer Dam Failure**—As a result of area flooding, the Coffer Dam at Auburn breached and partially washed away. The U.S. Bureau of Reclamation had designed the Coffer Dam for a controlled failure by building a soft earthen plug into the dam for this purpose. It appears the dam failed as designed.
- **August 2004 Ralston Dam Release Gate Break—**A broken release gate on Ralston Dam in the Middle Fork of the American River prompted the National Weather Service to issue a flash flood warning in Placer County. According to the PCWA, the gate near the Ralston Powerhouse malfunctioned, and the sudden release of water from Ralston Reservoir south of Auburn sent a wall of water 3 to 4 feet high down the river. The volume of water released was 800 to 1,000 acre-feet. Sheriff's deputies and California Highway Patrol officers alerted campers in the Auburn State Recreation Area to move to higher ground. The CHP monitored the muddy water as it approached Highway 49. There were no reports of injuries or damage along the river, which is popular with rafters, kayakers and residents during summer.

- **August 2009 Cottonwood Dam**—A privately owned and constructed dam on Miners Ravine in the Hidden Valley Estates subdivision (the Auburn Folsom Road and Twin Rocks Road area of Granite Bay), failed and leached flows and sediment into Miners Ravine. NOAA Fisheries quickly became involved because of the impacts on critical fish species. A temporary fix—a notch in the concrete portion of the dam—was approved and made while the homeowners association and interested agencies determined next steps. A dam removal project with creek restoration is now being proposed.
- **January 2016 Folsom Dam**—Seepage occurred at the Folsom cofferdam during final construction of the new Folsom Dam Auxiliary Spillway on January 20, 2016. The seepage was in the spillway basin. At no time was there a threat of a dam failure.

7.2.2 Location

According to the California Division of Safety of Dams, as of 2014 there are 45 dams in Placer County. Of these, the western levees along Folsom Lake, which is a reservoir lined by a series of containment dikes, have the potential to significantly impact the City of Roseville in the event of a failure. Another dam, the Miners Ravine Detention Facility located near Roseville's eastern boundary, has the potential to adversely impact Roseville should it fail. Table 7-1 provides summary information about these two facilities.

Table 7-1. Dams in Placer and Sacramento Counties With Potential to impact Roseville

Name	Hazard Class[a]	Water Course	Owner	Year Built	Dam Type	Crest Length (feet)	Height (feet)	Storage Capacity (acre-feet)	Drainage area (sq. mi.)
Folsom	1A	American River	US Bureau of Reclamation	1956	Gravity	102,000	275	975,000	1,885
Miners Ravine Detention Facility	1B	Dry Creek	Placer County Flood & Water Conservation District	2007	Earthen	2000	22.5	120	14

a. Downstream Hazard Class 1A: > 300 lives at risk, 1B: 31 to 300 lives at risk, 1C: 7 to 30 lives at risk

7.2.3 Frequency

Dam failure events are infrequent and usually coincide with the events that cause them, such as earthquakes, landslides and excessive rainfall and snowmelt. There is a "residual risk" associated with dams; residual risk is the risk that remains after safeguards have been implemented. For dams, the residual risk is associated with events beyond those that the facility was designed to withstand. However, the probability of occurrence of any type of dam failure event is considered to be low in today's regulatory and dam safety oversight environment.

7.2.4 Severity

Dam failure can be catastrophic to all life and property downstream. The U.S. Army Corps of Engineers developed the classification system shown in Table 7-2 for the hazard potential of dam failures.

7.2.5 Warning Time

Warning time for dam failure varies depending on the cause of the failure. In events of extreme precipitation or massive snowmelt, evacuations can be planned with sufficient time. In the event of a structural failure due to earthquake, it is possible that there would be no warning time.

Table 7-2. Hazard Potential Classification

Hazard Category[a]	Direct Loss of Life[b]	Lifeline Losses[c]	Property Losses[d]	Environmental Losses[e]
Low	None (rural location, no permanent structures for human habitation)	No disruption of services (cosmetic or rapidly repairable damage)	Private agricultural lands, equipment, and isolated buildings	Minimal incremental damage
Significant	Rural location, only transient or day-use facilities	Disruption of essential facilities and access	Major public and private facilities	Major mitigation required
High	Certain (one or more) extensive residential, commercial, or industrial development	Disruption of essential facilities and access	Extensive public and private facilities	Extensive mitigation cost or impossible to mitigate

a. Categories are assigned to overall projects, not individual structures at a project.
b. Loss of life potential based on inundation mapping of area downstream of the project. Analyses of loss of life potential should take into account the population at risk, time of flood wave travel, and warning time.
c. Indirect threats to life caused by the interruption of lifeline services due to project failure or operational disruption; for example, loss of critical medical facilities or access to them.
d. Damage to project facilities and downstream property and indirect impact due to loss of project services, such as impact due to loss of a dam and navigation pool, or impact due to loss of water or power supply.
e. Environmental impact downstream caused by the incremental flood wave produced by the project failure, beyond what would normally be expected for the magnitude flood event under which the failure occurs.

Source: U.S. Army Corps of Engineers, 1995

A dam's structural type also affects warning time. Earthen dams do not tend to fail completely or instantaneously. Once a breach is initiated, discharging water erodes the breach until either the reservoir water is depleted or the breach resists further erosion. Concrete gravity dams also tend to have a partial breach as one or more monolith sections formed during dam construction are forced apart by the escaping water. The time for breach formation ranges from a few minutes to a few hours (U.S. Army Corps of Engineers, 2011).

The City has established protocols for flood warning and response to imminent dam failure in the flood warning portion of its adopted emergency operations plan.

7.2.6 Folsom Dam Containment Dike Failure Risk Assessment

During the 2005 review of the initial Roseville Hazard Mitigation Plan, FEMA Region IX plan reviewers indicated that there was sufficient risk of dam failure of the western dikes on Folsom Lake (see Figure 7-1) to warrant treating dam failure as a stand-alone hazard in the City's next hazard mitigation plan update. Six dikes, increasing in size and numeric designation (from 1 to 6) from north to south, fill gaps along the western edge of Folsom Lake.

Because there was insufficient data to assess risk to the standards established for the other hazards in the hazard mitigation plan, the City developed a comprehensive, scenario-based risk assessment of the western dikes on the Folsom Dam complex during the 2011 Plan update. Detailed inundation modeling and mapping performed as part of this assessment are available to inform the City's preparedness and response to a dam breach of the Folsom Lake containment dike system. The maps are not presented in this Plan for security purposes. Figure 7-2 shows mapping that has been created by the City to inform citizens of the direction of flow and possible routes for evacuation during a dam failure event.

Source: United States Army Corps of Engineers, Michael Nevins [Public domain], via Wikimedia Commons

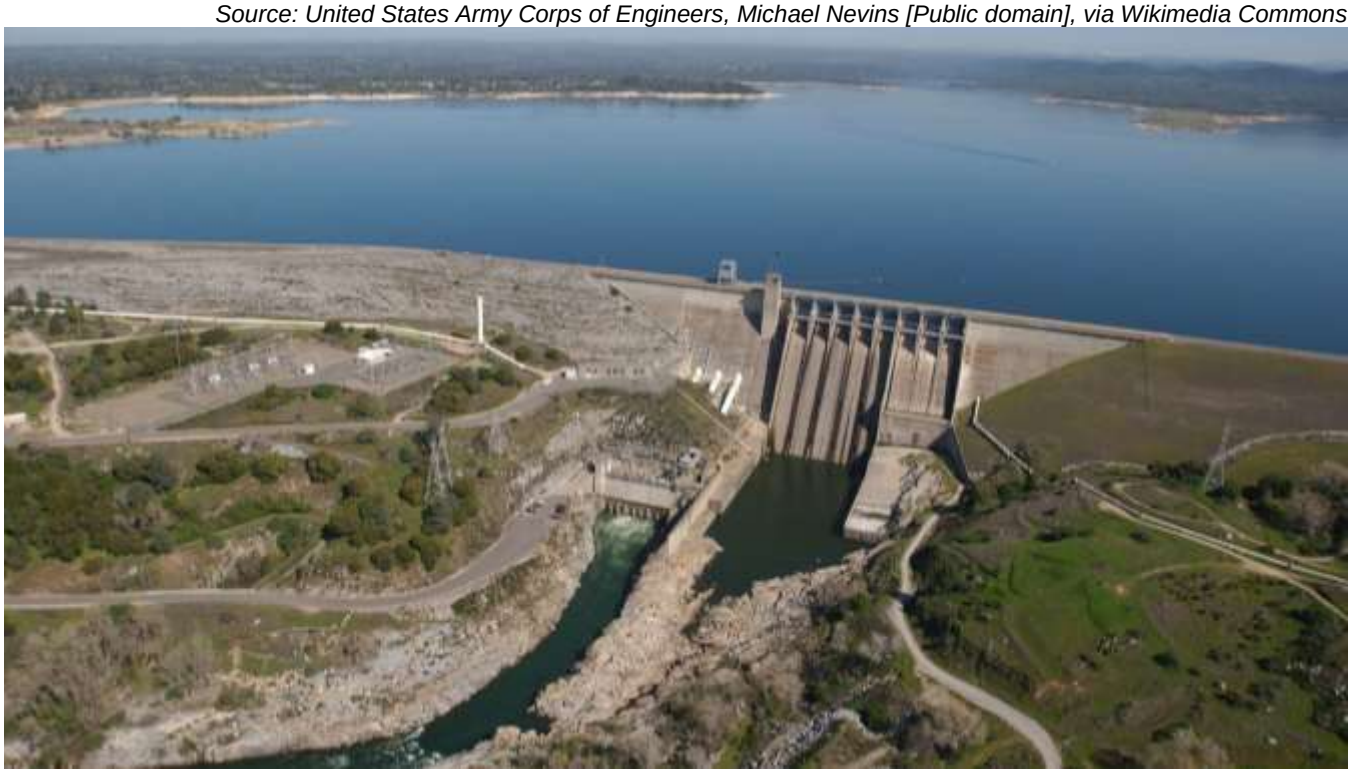


Figure 7-1. Folsom Dam and Folsom Lake on the American River, Looking Northeast

The study provided inundation mapping to determine the probable impact of flooding in Roseville if any of the western dikes were to fail. It addressed the relative risk of failure of each dike based on the frequency with which the dikes impound water, the potential for overtopping, the recent and in-progress work to upgrade the dikes to reduce the risk of failure due to piping, and a new reservoir spillway that is under construction. Models were prepared to simulate dike failures and resulting inundation. These simulations provide the basis for inundation area mapping and other emergency management tools such as maps that illustrate the time from failure to flooding.

The northernmost dikes are relatively low height embankments above the normal operating range of the lake. Though the occurrence of inundation due to dam failure is based on extremely remote conditions, failure of these facilities has the potential to cause significant property damage and loss of life in the City. The degree of impact would be affected by the water level of the lake at the time of failure, which could be just above the top of the dikes in the case of failure by overtopping. The study mapped the maximum depth of flooding and the timing of the flood wave from the time of failure for various scenarios. The study found that flood depths could reach as much as 58 feet in parts of the City.

7.3 SECONDARY HAZARDS

Dam failure can cause severe downstream flooding depending on the magnitude of the failure. Other potential secondary hazards of dam failure include landslides around the reservoir perimeter, bank erosion on the rivers, and destruction of downstream habitat.

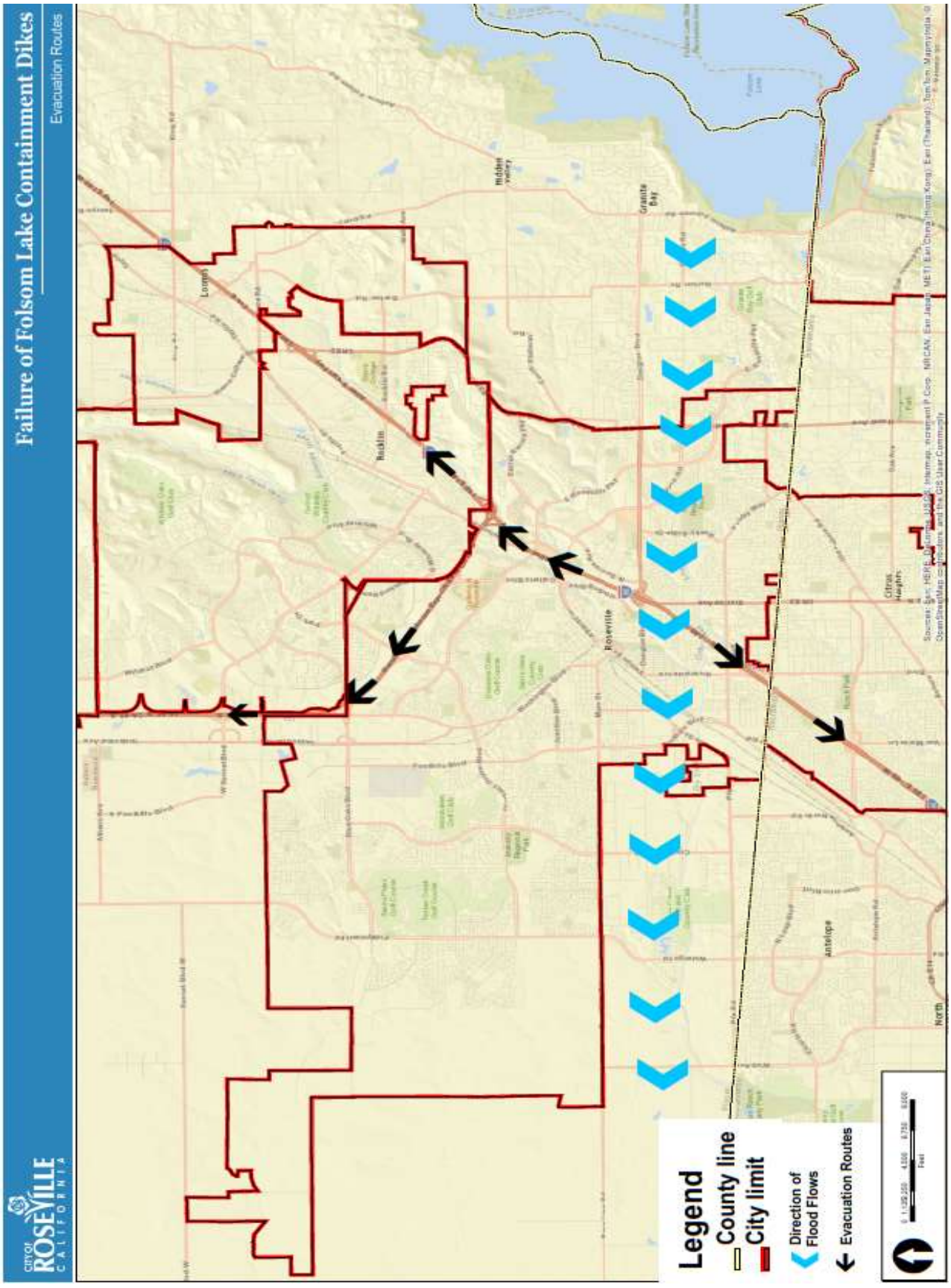


Figure 7-2. Folsom Dam Containment Dike Failure Flow Direction and Evacuation Routes

7.4 EXPOSURE

The flood module of HAZUS-MH was used for a Level 2 assessment of dam failure risk exposure and vulnerability for facilities in Roseville with sufficient data to support modeling. HAZUS-MH uses census data at the block level and FEMA floodplain data, which has a level of accuracy acceptable for planning purposes. Where possible, the HAZUS-MH data for this risk assessment was enhanced using GIS data from county, state and federal sources. The exposure and vulnerability analyses focused on inundation data from the Folsom Dam Containment Dike Failure Risk Assessment.

7.4.1 Population

All populations located in a dam failure inundation zone would be exposed to the risk of a dam failure. The estimated population living in the Folsom Dam failure inundation area is 55,858, or 43.4 percent of the City's population.

7.4.2 Property

The HAZUS-MH model estimated that there are 20,303 structures within the Folsom Dam failure inundation areas. It is estimated that 18,746 or 92 percent, of these structures are residential. The value of exposed buildings in the planning area was generated using HAZUS-MH and is summarized in Table 7-3. This methodology estimated $11 billion worth of building-and-contents exposure to Folsom Dam failure inundation, representing 37.1 percent of the total assessed value of the planning area.

Table 7-3. Value of Property Exposed to Dam Failure

Type	Number of Buildings Exposed	Value Exposed			% of Total Assessed Value
		Building	Contents	Total	
Residential	18,746	$4,877,113,351	$2,438,892,264	$7,316,005,614	39.13%
Commercial	1,017	$1,197,859,838	$1,253,661,717	$2,451,521,555	29.63%
Industrial	260	$210,792,151	$239,393,311	$450,185,463	38.79%
Religion	53	$86,626,396	$86,626,396	$173,252,792	69.13%
Government	18	$19,135,549	$19,135,549	$38,271,098	22.66%
Education	209	$284,707,447	$284,707,447	$569,414,895	52.17%
Total	**20,303**	**$6,676,234,732**	**$4,322,416,685**	**$10,998,651,417**	**37.11%**

7.4.3 Critical Facilities

GIS analysis was used to determine the number of critical facilities in the mapped dam failure inundation areas. As Table 7-4 shows, 96 of the planning area's critical facilities (55.8 percent) are in the inundation areas.

Table 7-4. Critical Facilities in Dam Failure Inundation Areas in Roseville

Medical & Health Services	Government Function	Protective Function	Schools	Hazmat	Other Critical Function	**Total**
0	17	8	25	0	46	**96**

7.4.4 Environment

Reservoirs held behind dams affect many ecological aspects of a river. River topography and dynamics depend on a wide range of flows, but rivers below dams often experience long periods of very stable flow conditions or saw-

tooth flow patterns caused by releases followed by no releases. Water releases from a reservoir, including those exiting a turbine, usually contain very little suspended sediment; this can lead to scouring of river beds and loss of riverbanks.

The environment would be exposed to a number of risks in the event of dam failure. The inundation could introduce many foreign elements into local waterways. This could result in destruction of downstream habitat and could have detrimental effects on many species of animals, especially endangered species such as salmon.

7.5 VULNERABILITY

7.5.1 Population

Vulnerable populations are all populations downstream from dam failures that are incapable of escaping the area within the allowable time frame. This population includes the elderly and young who may be unable to get themselves out of the inundation area. The vulnerable population also includes those who would not have adequate warning from a television or radio emergency warning system. The potential for loss of life is affected by the capacity and number of evacuation routes available to populations living in areas of potential inundation.

7.5.2 Property

Vulnerable properties are those closest to the dam failure inundation area. These properties would experience the largest, most destructive surge of water. Low-lying areas are also vulnerable since they are where the dam waters would collect. Transportation routes are vulnerable to dam failure inundation and have the potential to be wiped out, creating isolation issues. This includes all roads, railroads and bridges in the path of the dam failure inundation. Those that are most vulnerable are those that are already in poor condition and would not be able to withstand a large water surge. Utilities such as overhead power lines, cable and phone lines could also be vulnerable. Loss of these utilities could create additional isolation issues for the inundation areas.

It is estimated that there could be up to $4.46 billion of loss from a dam failure affecting the planning area. This represents 40.5 percent of the total exposure within the inundation area, or 15.0 percent of the total assessed value of the planning area. Table 7-5 summarizes the loss estimates for dam failure.

Table 7-5. Loss Estimates for Dam Failure

	Value Exposed			% of
	Building Loss	Contents Loss	**Total Loss**	Total Assessed Value
Residential	$1,550,424,727	$933,258,844	$2,483,683,571	13.28%
Commercial	$456,285,740	$844,987,114	$1,301,272,854	15.73%
Industrial	$84,633,925	$203,408,629	$288,042,554	24.82%
Religion	$34,364,944	$72,524,654	$106,889,598	42.65%
Government	$11,072,696	$16,609,362	$27,682,057	16.39%
Education	$82,091,723	$166,677,363	$248,769,086	22.79%
Total	**$2,218,873,754**	**$2,237,465,967**	**$4,456,339,721**	**15.03%**

7.5.3 Critical Facilities

HAZUS estimated that critical facilities would receive an average of 40 percent damage to the structure and an average 70 percent damage to the contents during a dam failure event. The estimated functional down-time to restore these facilities to 100 percent of their functionality is 700 days.

7.5.4 Environment

The environment would be vulnerable to a number of risks in the event of dam failure. The inundation could introduce foreign elements into local waterways, resulting in destruction of downstream habitat and detrimental effects on many species of animals, especially endangered species such as coho salmon. The extent of the vulnerability of the environment is the same as the exposure of the environment.

7.6 FUTURE TRENDS IN DEVELOPMENT

All land use decision-making is guided by the goals, policies and implementation measures contained in the Land Use Element of Roseville's General Plan. The Safety Element of the General Plan establishes standards and plans for the protection of the community from hazards. Dam failure is currently not addressed as a stand-alone hazard in the Safety Element, but flooding is. The City has established comprehensive policies regarding sound land use in identified flood hazard areas. Most of the areas vulnerable to the more severe impacts from the bank-full Folsom Dam failure scenario intersect the City's flood hazard areas. Flood-related policies in the General Plan will help to reduce the risk associated with the dam failure hazard for all future development within the City.

The dam failure risk exposure with in the planning area increased by 22% at an increase in value of over $2 billion dollars. This increase in risk exposure can be attributed to the vast extent and location of the dam failure hazard, and a population growth rate of 14.5% over the performance period of the prior plan. The planning area also saw in increase in assessed valuation of real property of over 34%. This increase in value can be attributed to the continued economic recovery from the 2008 economic down turn that had a significant impact on the State of California as well as the City of Roseville. Any increase in asset value will increase risk quotient when risk is being measured by looking at assets exposed as is with this plan.

While the exposure went up within the dam failure inundation area, the loss estimation from Hazus decreased by over 28%. This decrease in vulnerability could be attributed to 2 factors. The first factor is that the new construction that has occurred during the performance period for the plan was built to high code standards that reduce the risk. While the City of Roseville does not have specific standards adopted specifically for the dam failure inundation area, their adopted improvements standards applied city-wide do include several higher standards that would reduce flood risk within a dam failure inundation area. The second factor could be due to the increased accuracy of the Hazus model. For this update, the digital elevation model used in Hazus was developed using LiDAR data available to the City. The accuracy of the Digital Elevation Model (DEM) for this update should be cons9dered more accurate than the DEM from the last update. It is logical to assume that both of these factors plan a role in the reduced vulnerability for the planning area.

7.7 REVIEW OF EXISTING ORDINANCES, PROGRAMS AND PLANS

Since most of the dam failure inundation areas overlay the regulated floodplain within the planning area, ordinances and programs in Chapter 4 are applicable to this hazard. The extent of dam failure inundation as well as the estimated flood depths significantly exceed those projected for flooding. Future revisions to the flood programs may want to consider the potential impacts of dam failure in their scope, even though the statistical probability of such an event is low.

7.8 SCENARIO

According to the 2011Folsom Dam Containment Dike Failure Risk Assessment Project, the worst-case scenario would be a bank-full failure of Dikes 4, 5 and 6 due to overtopping. Overtopping flows may quickly erode the top and downstream portions of the dikes, causing failure. Therefore, there is a possibility of simultaneous failure due to overtopping. However, the likelihood of reservoir inflows that could cause overtopping is extremely low. The

completion of the new Folsom Dam spillway in early 2016 decreased the likelihood even further. Failure from piping could occur at any water surface elevation within the reservoir.

An earthquake within the region could lead to liquefaction of soils around the dams. This could occur without warning during any time of the day. A human-caused failure such as a terrorist attack also could trigger a catastrophic failure of a dam that impacts the planning area.

7.9 ISSUES

The most significant issue associated with dam failure involves the properties and populations in the inundation zones. Flooding as a result of a dam failure would significantly impact these areas. There is often limited warning time for dam failure. These events are frequently associated with other natural hazard events such as earthquakes, landslides or severe weather, which limits their predictability and compounds the hazard. Another significant issue is the loss of the City's primary potable water supply source if the dam were to fail (not overtop). The City would have to rely on significant water demand reductions, interties with other water agencies not dependent on Folsom and groundwater wells to provide some level of water supply to the community. Other important issues associated with dam failure include the following:

- Federally regulated dams have an adequate level of oversight and sophistication in the development of emergency action plans for public notification in the unlikely event of failure. However, the protocol for notification of downstream citizens of imminent failure needs to be tied to local emergency response planning.
- Mapping for federally regulated dams is already required and available; however, mapping that estimates inundation depths is needed for dams that are not federally regulated, in order to better assess the risk associated with failure of these facilities.
- Most dam failure mapping required at federal levels requires determination of the probable maximum flood. While the probable maximum flood represents a worst-case scenario, it is generally the event with the lowest probability of occurrence. For dams that are not federally regulated, mapping of failure scenarios that are less extreme than the probable maximum flood but have a higher probability of occurrence can be valuable to downstream community officials and emergency managers. This type of mapping can illustrate areas potentially impacted by more frequent events to support emergency response and preparedness actions.
- The concept of residual risk associated with structural flood control projects should be considered in the design of capital projects and the application of land use regulations.
- Addressing security concerns and the need to inform the public of the risk associated with dam failure is a challenge for public officials.

8. DROUGHT

8.1 GENERAL BACKGROUND

Most of California's precipitation comes from storms moving across the Pacific Ocean. The path followed by the storms is determined by the position of an atmospheric high pressure belt that normally shifts southward during the winter, allowing low-pressure systems to move into the state. On average, 75 percent of California's annual precipitation occurs between November and March, with 50 percent occurring between December and February. If a persistent Pacific high-pressure zone takes hold over California mid-winter, there is a tendency for the water year to be dry.

DEFINITIONS

Drought—The cumulative impacts of several dry years on water users. It can include deficiencies in surface and subsurface water supplies and generally impacts health, well being, and quality of life.

Hydrological Drought—Deficiencies in surface and subsurface water supplies.

A typical water year produces about 100 inches of rainfall over the North Coast, 50 inches of precipitation (combination of rain and snow) over the Northern Sierra, 18 inches in the Sacramento area, and 15 inches in the Los Angeles area. In extremely dry years, these annual totals can fall to as little as half, or even one-third of these amounts.

Rain and snowfall in the American River watershed eventually flow into Folsom Lake, a reservoir within the U.S. Central Valley Project. These flows directly affect water availability for Roseville water users. The City of Roseville owns the Roseville water system and water treatment plant and has negotiated contracts with the U.S. Bureau of Reclamation, the Placer County Water Agency (PCWA), and the San Juan Water District (SJWD) to ensure that water needs are met for existing and future growth.

Roseville is largely urbanized with little agricultural interests remaining. Lack of sufficient water supply would affect residents and businesses that rely on water for their daily household, employee, and industrial needs.

8.1.1 Water Supply Strategy

The water supply strategy for the City of Roseville uses a comprehensive approach to ensure water reliability for customers. The City has a diverse set of water supply options—including surface water contracts, recycled water, and groundwater wells—to ensure that even following a period of dry years, a combination of available water supplies and water conservation measures will meet the community's water needs. The City has contracts for surface water with three agencies (see Table 8-1):

- The primary water contract is with the U.S. Bureau of Reclamation (USBR) for 32,000 acre-feet per year of surface water from Folsom Lake.
- The City also has a contract with PCWA for 30,000 acre-feet of water from PCWA's American River Middle Fork Project. The City has a long-term agreement with the USBR to wheel PCWA water supplies through Folsom Reservoir for delivery to the City's water treatment plant.

Table 8-1. City of Roseville Water Supply Contracts and Resources

Source	Contract Amount (acre-feet per year) [a]	Supply Projections [b]				
		2020	2025	2030	2035	2040
U.S. Bureau of Reclamation	32,000	32,000	32,000	32,000	32,000	32,000
San Juan Water District	4,000	4,000	4,000	4,000	4,000	4,000
Placer County Water Agency		20,000	30,000	30,000	30,000	30,000
Treated Water (Additional Future Purchase)	N/A	0	0	1,500	1,500	1,500
Exercised	10,000					
Two additional options	20,000					
Placer County Water Agency Total	***30,000***					
Recycled Water	N/A	*4,421*	*4,791*	*5,259*	*5,643*	*5,958*
Total	**66,000**	**60,421**	**70,791**	**72,759**	**73,143**	**73,458**

a. N/A = Not Applicable based on future contract or existing recycled resources
b. Based on reasonable available volume.

- The third source of surface water for the City of Roseville is an additional 4,000 acre-feet of PCWA water transferred through SJWD. SJWD is a water district in Sacramento and Placer Counties that draws water from Folsom Lake. SJWD also wholesales water to Citrus Heights Water District, Fair Oaks Water District and Orangevale Water Company in Sacramento County. The City of Roseville has entered into a reallocation agreement with SJWD for this 4,000 acre-feet per year, which is a normal-year water supply only—it is not available for use during drought conditions.
- With the approval of the Amoruso Ranch Specific Plan, the City is pursuing an additional contract through PCWA, through its planned Ophir Water Treatment Plant facility. This new source and supply of water will not be dependent on Folsom Lake deliveries and will increase water reliability citywide. It is not subject to cutbacks during dry or driest years, and is estimated to provide 1,500 acre-feet of additional supply once the plant is on line.
- The City maintains six groundwater wells for emergency and dry-year supply, with plans to install 10 more in coming years as new development progresses. All wells are equipped for aquifer storage and recovery.

8.1.2 Water Supply Infrastructure

The City of Roseville Water Treatment Plant is on Barton Road east of Roseville. Constructed in 1971, the plant treats water from Folsom Lake to Environmental Protection Agency (EPA) domestic drinking water standards. The City owns a water system network consisting of water mains ranging from 4 to 66 inches in diameter. The system is designed to deliver an adequate supply of water throughout the community at an acceptable pressure level for domestic and fire flow purposes. A booster pump station near East Roseville Parkway and North Sunrise Boulevard is designed to provide sufficient water pressure to the higher elevations of the City and to fill and manage reservoirs in the system. Some areas within the Roseville city limits are served by PCWA, SJWD, or the City of Citrus Heights where topography and facility locations make it beneficial to do so.

The City maintains the capability to supplement its water supply in drought conditions with groundwater wells. These wells are planned to be used primarily to offset surface water cutbacks in times of drought or other emergencies. The City's groundwater wells are equipped to implement aquifer storage and recovery, in which potable water can be injected into the underground aquifers in wet years and recovered in dry years for public use. In addition, the City operates a recycled water system to lessen the use of potable water for irrigating landscaped areas.

8.1.3 The Water Forum

The Water Forum is a group of business and agricultural leaders, citizens groups, environmentalists, water managers, and local governments originally formed in Sacramento County. Water managers in Placer and El Dorado Counties joined the group in 1995. The City of Roseville is a member of the Water Forum and a signatory to the January 2000 Water Forum Agreement. The agreement provides a framework for how future surface water and groundwater supplies will be used in the region through 2040.

Although Roseville's water contract entitlements total 66,000 acre-feet per year, the City's diversions from the American River are limited by the Water Forum Agreement. In normal/wet years, the City has agreed to limit diversions from the American River to 58,900 acre-feet per year. In driest years (also called critically dry years), the maximum diversion from the American River is 39,800 acre-feet. In drier years, the City may divert between 39,800 and 54,900 acre-feet, depending on the unimpaired flow into Folsom Lake.

During the drier and driest years, the City agreed to have PCWA release an additional 20,000 acre-feet per year of water down the American River on the City's behalf through re-operation of PCWA's American River Middle Fork Project. This is not part of the City's contracted supply of 66,000 acre-feet per year. The intent of Middle Fork Project re-operational releases during drier and driest years is to mitigate environmental impacts resulting from increased diversions above 1995 baseline levels.

Roseville's water supply contracts, in combination with future planned supply sources, base level conservation measures, and groundwater resources, ensure that the City is well positioned to meet projected water needs.

8.1.4 Local Water Contracts—Definition of Drought

Roseville's drought levels are defined by the 2000 Water Forum agreement. The definition is based on the type of hydrologic year for inflow to Folsom Lake, as defined by 70 years of hydrologic data into the lake. The hydrological year types are as follows:

- **Baseline**—Baseline means the maximum amount of water that suppliers diverted from the American River in any one year through 1995 or, in certain instances, other amounts specified in a Purveyor Specific Agreement. For the City of Roseville, the baseline amount is 19,800 acre-feet per year.
- **Normal/Wet Years**—When the projected unimpaired flow into Folsom Reservoir is greater than or equal to 950,000 acre-feet
- **Drier Years**—When the projected unimpaired flow into Folsom Reservoir is between 400,00 acre-feet and 950,000 acre-feet
- **Driest Years**—When the projected unimpaired flow into Folsom Reservoir is less than 400,000 acre-feet.

Dry years over the 85-year hydrologic record are listed in Table 8-2, excluding the driest years. The driest years for American River flows in the Folsom Lake vicinity were 1924, with 379,000 acre-feet of unimpaired inflow to Folsom Lake, 1977, with 332,000 acre-feet, and 2015, with 321,000 acre-feet.

Table 8-2. Dry Year Flows into Folsom Lake

Year	Unimpaired Inflow to Folsom Lake (acre-feet)	Year	Unimpaired Inflow to Folsom Lake (acre-feet)
1931	571,000	1987	705,000
1934	690,000	1988	545,000
1939	873,000	1990	873,000
1959	872,000	1992	631,000
1961	854,000	1994	649,000
1976	518,000	2013	778,000
1981	881,000	2014	682,000

8.2 HAZARD PROFILE

Droughts originate from a deficiency of precipitation resulting from an unusual weather pattern. If the weather pattern lasts a short time (a few weeks or a couple months), the drought is considered short-term. If the weather pattern becomes entrenched and the precipitation deficits last for several months or years, the drought is considered long-term. It is possible for a region to experience a long-term pattern that produces drought, and to have short-term changes that result in wet spells within the long-term pattern. Likewise, it is possible for a long-term wet pattern to be interrupted by weather spells that result in short-term drought. Droughts typically occur after two or three years of below-average rainfall for the period from November to March.

8.2.1 Past Events

State of California

The California Department of Water Resources has state hydrologic data back to the early 1900s (http://watersupplyconditions.water.ca.gov). The hydrologic data show multi-year droughts from 1912 to 1913, 1918 to 1920 and 1922 to 1924. Since then, three prolonged periods of drought occurred in California:

- **1929 to 1934 Drought**—The 1929 to 1934 drought established the criteria for designing the supply and yield of many large Northern California reservoirs. The Sacramento Valley runoff was 55 percent of average for the time period from 1901 to 1996, with only 9.8 million acre-feet received.
- **1975 to 1977 Drought**—California had one of its most severe droughts due to lack of rainfall during the winters of 1976 and 1977. 1977 was the driest period on record in California, with the previous winter recorded as the fourth driest in California's hydrological history. The cumulative impact led to widespread water shortages and severe water conservation measures throughout the state. Only 37 percent of the average Sacramento Valley runoff was received, with just 6.6 million acre-feet recorded. Over $2.6 billion in crop damage was recorded in 31 counties. A federal disaster declaration was declared in Placer County and surrounding counties.
- **1987 to 1992 Drought**—California received precipitation well below average levels for four consecutive years. While the Central Coast was most affected by the lack of rainfall and low runoff, the Sierra Nevada range in Northern California and Central Valley counties including Placer County were also affected. During this drought, only 56 percent of average runoff for the Sacramento Valley was received, totaling just 10 million acre-feet. By February 1991, all 58 counties in California were suffering from drought conditions. Urban areas as well as rural and agricultural areas were impacted.
- **2012 to 2016 (Ongoing) Drought**—California's current drought has set several records for the state:
  - The period from 2012 to 2014 ranked as the driest three consecutive years for statewide precipitation.
  - 2014 set new climate records for statewide average temperatures and for record-low water allocations in the State Water Project and federal Central Valley Project.
  - 2013 set minimum annual precipitation records for many communities.

  On January 17, 2014 the governor declared a state of emergency for drought throughout California. This declaration followed release of a report that stated that California had had the least amount of rainfall in its 163-year history. Californians were asked to voluntarily reduce their water consumption by 20 percent. Drought conditions worsened into 2015. On April 1, 2015, following the lowest snowpack ever recorded, the governor announced actions to save water, increase enforcement to prevent wasteful water use, streamline the state's drought response, and invest in new technologies to make California more drought-resilient. The governor directed the State Water Resources Control Board to implement mandatory water reductions in cities and towns across California to reduce water usage by 25 percent on average. The City of Roseville was assigned a 28-percent water conservation target by the State Water Resources Control

Board. The City exceed its water conservation goal. Total impacts of the drought cannot be determined until after its conclusion.

Placer County

The following additional drought impacts have affected Placer County:

- **1977**—A federal disaster declaration was made as a result of a drought affecting Placer and surrounding counties. The PCWA declared a water shortage and restricted water use for both irrigation and treated water users. The restrictions included a 50-percent reduction in water usage by customers and rate increases. This shortage lasted until January 1978 when the PCWA terminated its restrictions.
- **1988**—Again the PCWA declared a water emergency. All customers had their water use reduced by 25 percent, and rates were again increased for excessive usage. The countywide emergency prohibited washing of sidewalks, driveways, parking lots and other hard surfaces, restricted the washing of vehicles, airplanes, and trailers to 3 gallons of water, prohibited fire hydrant flushing and drills, prohibited filling of pools, and prohibited new agricultural land irrigation.
- **1991—**Raw water customers had their water usage reduced by 50 percent annually and by 25 percent seasonally. Treated water users were given most of the same restrictions and prohibitions as in 1988. Due to a very late storm season, the emergency was lifted by April 1991.
- **2008—**The Governor of California declared a drought on June 4, 2008. In July 2009, PCWA reported the implementation of normal ongoing conservation measures.
- **2014—**On February 6, 2014, PCWA adopted a resolution declaring a water shortage emergency. This is the most recent declaration from PCWA. It was rescinded in February 2016.

Roseville Drought History

Roseville's drought history parallels the water shortages for the State of California and Placer County. The Roseville City Council has declared official drought alerts three times:

- From April 1991 to March 1993 when Stage 2 drought water restrictions were in effect and enforced through full-time water patrols
- In May 2008 when the City of Roseville's Environmental Utilities Department activated a Stage 1 drought alert
- In 2014, when the City enacted a Stage 3 drought alert asking residents to reduce water demand by 28 percent compared to 2013 water use.

In response to the 2014 drought, the City of Roseville took a proactive approach to water conservation. The City enacted water waste patrols, limited watering for residential and non-residential customers to specific days of the week depending on the time of year, and enacted funding for utility support. With a 2015 reduction target of 278 gallons per capital per day, Roseville's conservation efforts resulted in an actual accomplishment of 165 gallons per capital per day, far exceeding goals and expectations (Roseville, 2015a).

8.2.2 Location

The National Oceanic and Atmospheric Administration (NOAA) has developed several indices to measure drought impacts and severity and to map their extent and locations:

- The ***Palmer Crop Moisture Index*** measures short-term drought on a weekly scale and is used to quantify drought's impacts on agriculture during the growing season. Figure 8-1 shows this index for the week ending January 30, 2016.
- The ***Palmer Z Index*** measures short-term drought on a monthly scale. Figure 8-2 shows this index for December 2015.

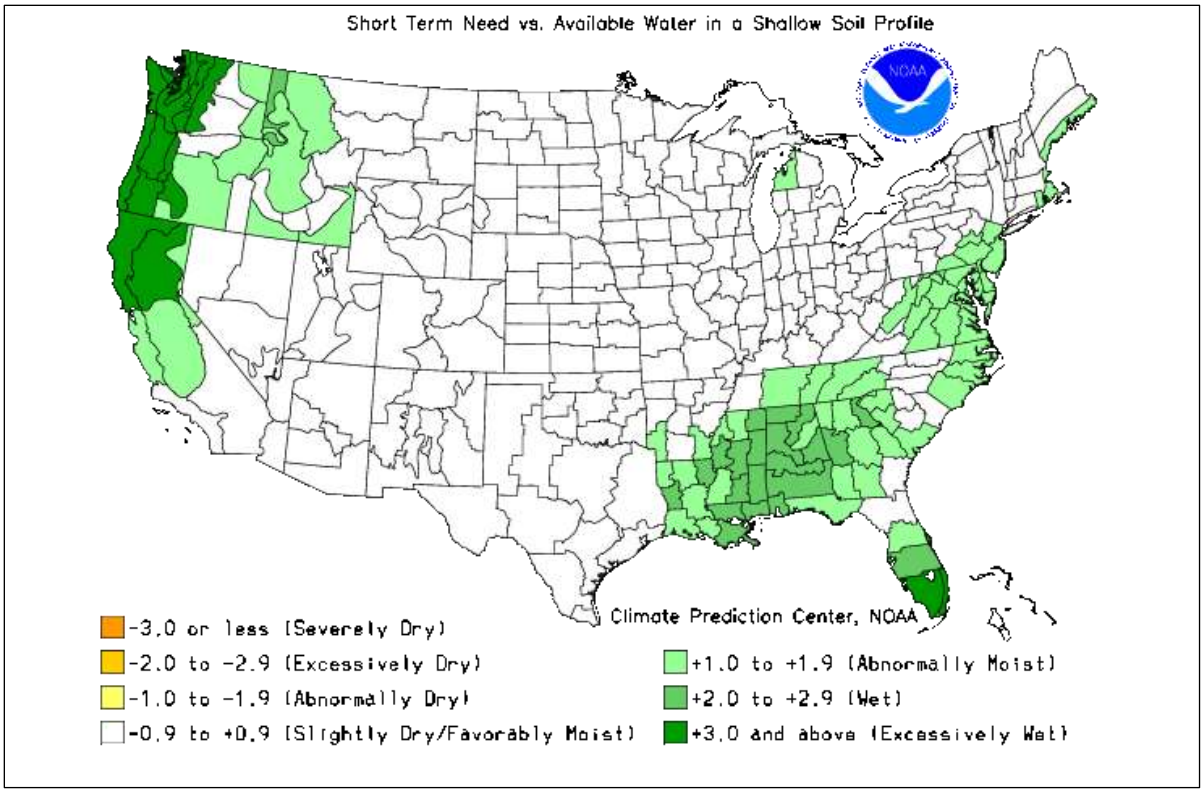


Figure 8-1. Palmer Crop Moisture Index for Week Ending January 30, 2016

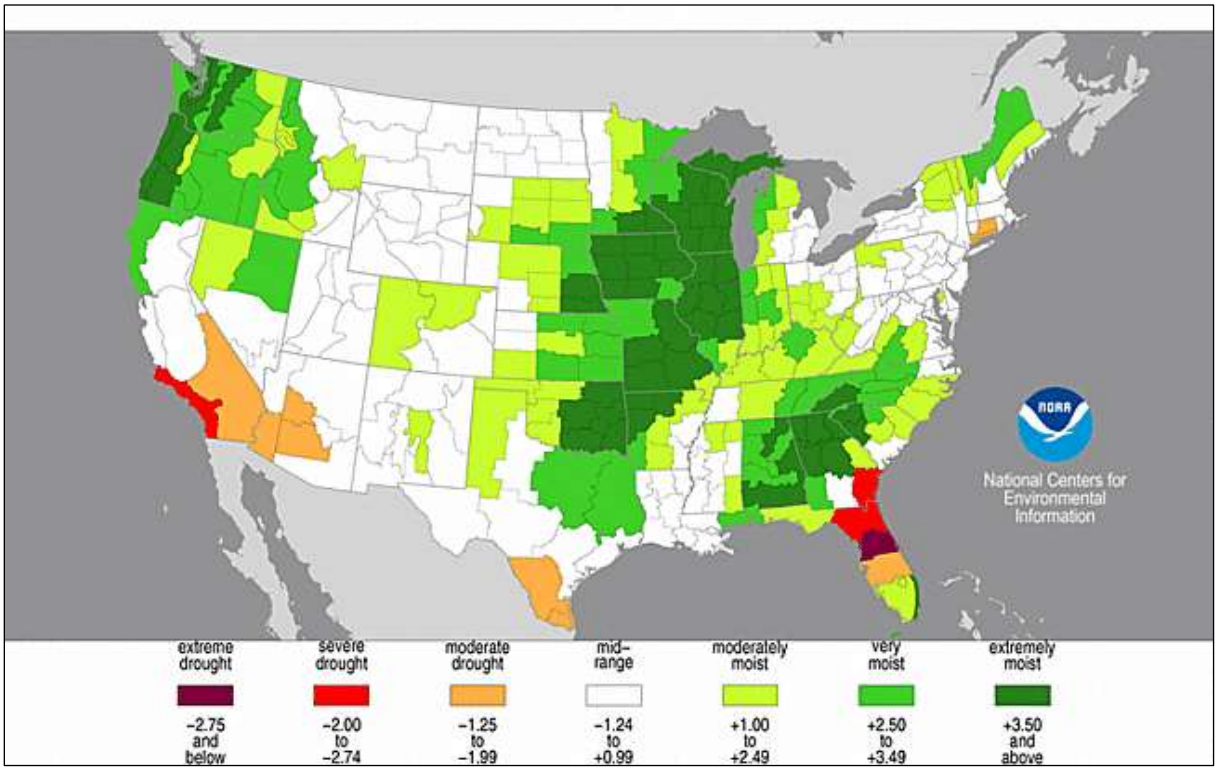


Figure 8-2. Palmer Z Index Short-Term Drought Conditions (December 2015)

- The ***Palmer Drought Index*** measures the duration and intensity of long-term drought-inducing circulation patterns. Long-term drought is cumulative, so the intensity of drought during a given month is dependent on the current weather patterns plus the cumulative patterns of previous months. Weather patterns can change quickly from a long-term drought pattern to a long-term wet pattern, and the Palmer Drought Index can respond fairly rapidly. Figure 8-3 shows this index for January 2016.
- The hydrological impacts of drought (e.g., reservoir levels, groundwater levels, etc.) take longer to develop and it takes longer to recover from them. The ***Palmer Hydrological Drought Index***, another long-term index, was developed to quantify hydrological effects. The Palmer Hydrological Drought Index responds more slowly to changing conditions than the Palmer Drought Index. Figure 8-4 shows this index for January 2013.
- While the Palmer indices consider precipitation, evapotranspiration and runoff, the ***Standardized Precipitation Index*** considers only precipitation. In the Standardized Precipitation Index, an index of zero indicates the median precipitation amount; the index is negative for drought and positive for wet conditions. The Standardized Precipitation Index is computed for time scales ranging from one month to 24 months. Figure 8-5 shows the 24-month Standardized Precipitation Index map for February 2011 through January 2013.

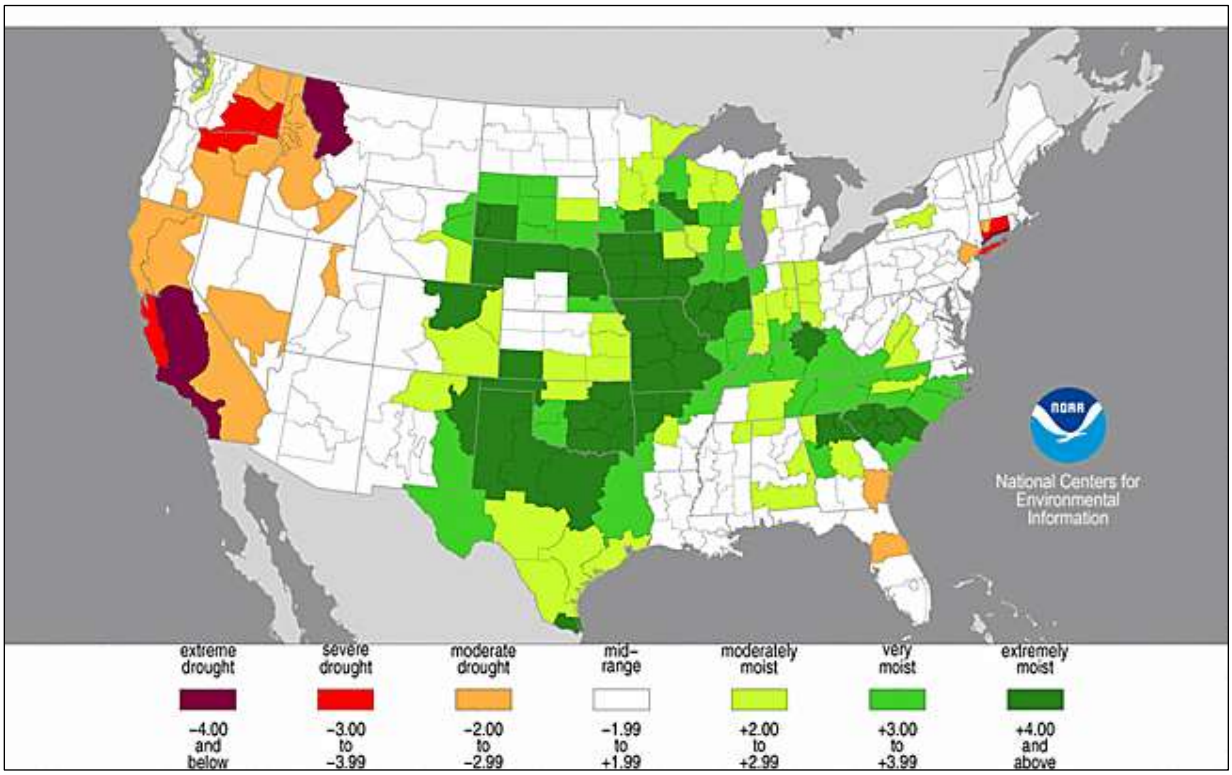


Figure 8-3. Palmer Drought Severity Index (December 2015)

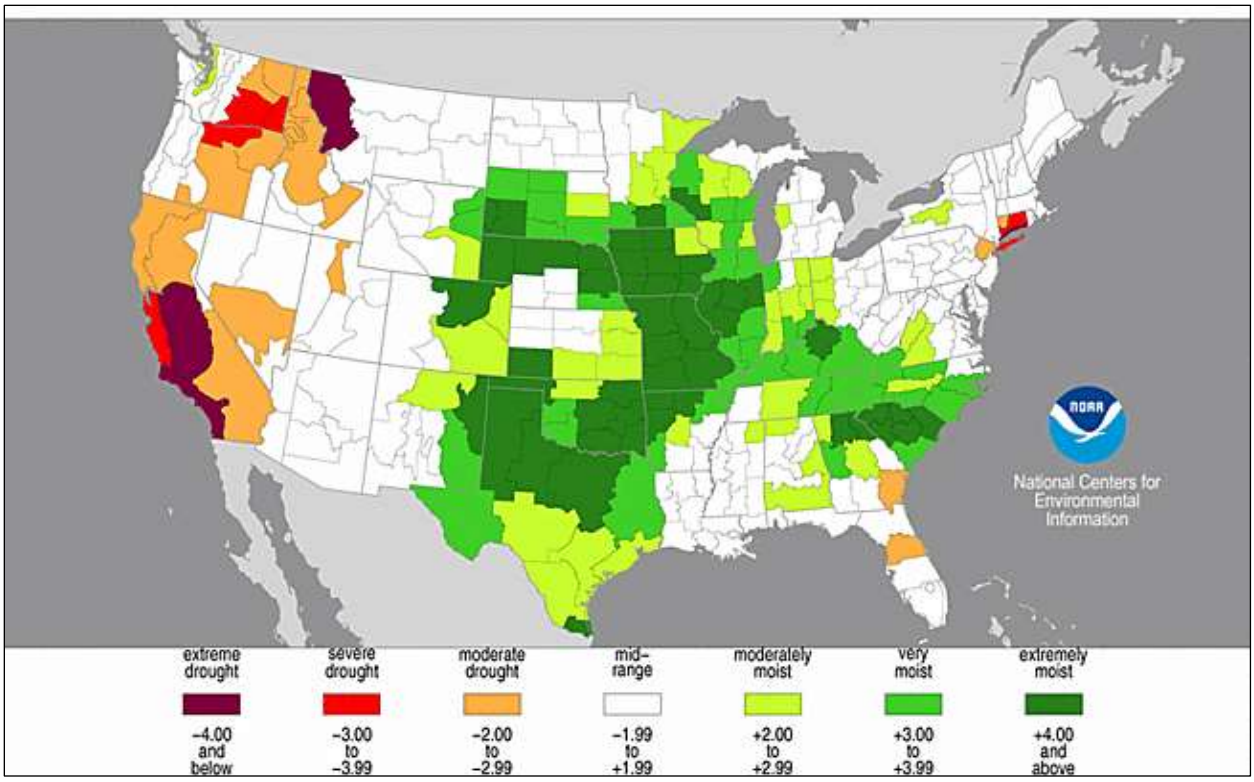


Figure 8-4. Palmer Hydrological Drought Index Long-Term Hydrologic Conditions (December 2015)

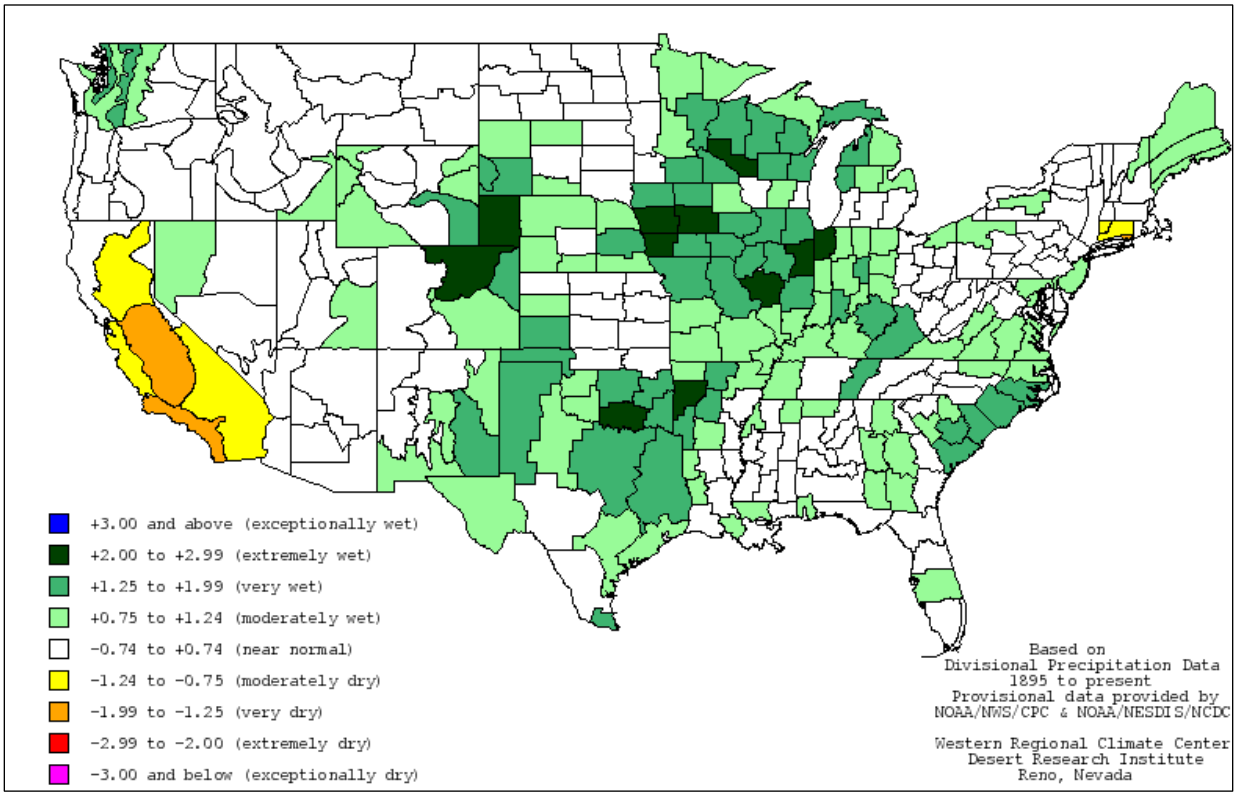


Figure 8-5. 24-Month Standardized Precipitation Index (January 2013 – December 2015)

8.2.3 Frequency

Historical drought data for the Placer County region indicate that, in the 88 years from 1929 through 2016, four multi-year droughts have spanned a total of 20 years. This averages to a five-year drought every 22 years, or a 22 percent chance of a drought in any given year.

8.2.4 Severity

Drought can have a widespread impact on the environment and the economy, although it typically does not result in loss of life or damage to property, as do other natural disasters. Nationwide, the impacts of drought occur primarily in the agriculture, transportation, recreation and tourism, forestry, and energy sectors. Social and environmental impacts are also significant, although it is difficult to put a precise cost on these impacts. The National Drought Mitigation Center uses three categories to describe likely drought impacts:

- Water supply—Drought threatens supplies of water for irrigated crops and for communities.
- Fire hazard—Drought increases the threat of wildfires from dry conditions in forest and rangelands.

The severity of a drought depends on the degree of moisture deficiency, the duration, and the size and location of the affected area. The longer the duration of the drought and the larger the area impacted, the more severe the potential impacts. When measuring the severity of droughts, analysts typically look at economic impacts. All people could pay more for water if utilities increase their rates due to shortages. Other water- or electricity-dependent industries are commonly forced to shut down all or a portion of their facilities, resulting in further layoffs. A drought can harm recreational companies that use water (e.g., swimming pools, water parks, and river rafting companies) as well as landscape and nursery businesses.

Drought generally does not affect groundwater sources as quickly as surface water supplies, but groundwater supplies generally take longer to recover. Reduced precipitation during a drought means that groundwater supplies are not replenished at a normal rate. This can lead to a reduction in groundwater levels and problems such as reduced pumping capacity or wells going dry. Shallow wells are more susceptible than deep wells. Reduced replenishment of groundwater affects streams. Much of the flow in streams comes from groundwater, especially during the summer when there is less precipitation and after snowmelt ends. Reduced groundwater levels mean that even less water will enter streams when steam flows are lowest.

8.2.5 Warning Time

Droughts are climatic patterns that occur over long periods of time. Only generalized warning can take place due to the numerous variables that scientists have not pieced together well enough to make accurate and precise predictions.

Empirical studies conducted over the past century have shown that meteorological drought is never the result of a single cause. It is the result of many causes, often synergistic in nature; these include global weather patterns that produce persistent, upper-level high-pressure systems along the West Coast with warm, dry air resulting in less precipitation.

Scientists at this time do not know how to predict drought more than a month in advance for most locations. Predicting drought depends on the ability to forecast precipitation and temperature. Anomalies of precipitation and temperature may last from several months to several decades. How long they last depends on interactions between the atmosphere and the oceans, soil moisture and land surface processes, topography, internal dynamics, and the accumulated influence of weather systems on the global scale.

8.3 SECONDARY HAZARDS

The secondary hazard most commonly associated with drought is wildfire. A prolonged lack of precipitation dries out vegetation, which becomes increasingly susceptible to ignition as the duration of the drought extends. Millions of board feet of timber have been lost, and in many cases erosion occurred, which caused serious damage to aquatic life, irrigation, and power production by heavy silting of streams, reservoirs, and rivers.

Drought also is often accompanied by extreme heat, exposing people to the risk of sunstroke, heat cramps and heat exhaustion. Pets and livestock are also vulnerable to heat-related injuries.

8.4 EXPOSURE

All people, property and environments within the City of Roseville would be exposed to some degree to the impacts of moderate to extreme drought conditions.

8.5 VULNERABILITY

Based on hydrologic data for the American River, there is a probability that rainfall will be insufficient once every 17 years to supply Folsom Lake and guarantee the City of Roseville its existing contract amounts. In these years, the City by agreement is required to find alternate sources of supply.

Having the flexibility to use both the USBR and PCWA contractual supplies during a drier year or driest year enables the City to provide a reliable surface water supply for municipal and industrial uses. Any shortages can easily be compensated for by water use reductions through conservation (implementation of drought stages as outlined in the Roseville Municipal Code). By incorporating emergency groundwater reserves into the water supply strategy, the City's reliability is increased further still.

The City's 2015 Urban Water Management Plan outlines the potable water supply reliability for normal and dry years, as well as for a three-year drought. Water would be supplied by the American River through Folsom Lake, with conservation measures and groundwater reserves implemented as needed. Roseville's recycled water utility is expected to provide an offset to demand for irrigation supply, thereby reducing the demand for potable water. A summary of the water supply reliability until 2040 for multiple dry water years is provided in Table 8-3.

8.5.1 Population

The City of Roseville, regional water purveyors, members of the Water Forum, and the USBR have spent considerable time and effort to protect life, safety and health should several consecutive dry years occur. Provisions and measures have been taken to analyze and account for anticipated water shortages. The City has the ability to minimize any impacts on residents and water consumers in Roseville. No significant life or health impacts are anticipated as a result of drought in Roseville.

8.5.2 Property

No structures will be directly affected by drought conditions in Roseville, though some structures may become vulnerable to wildfires, which are more likely following years of drought.

8.5.3 Critical Facilities

Critical facilities as defined for this Plan will continue to be operational during a drought. Critical facility elements such as landscaping may not be maintained due to limited resources, but the risk to the City's critical facilities inventory will be largely aesthetic. These aesthetic impacts are not considered significant.

Table 8-3. Water Supply Reliability by 2040

	Normal Water Year	Single Dry Water Year	Multiple Dry Water Years		
			Year 1	Year 2	Year 3
Surface Water (acre-feet)	60,400[a]	39,500[b]	52,894[b]	55,500	46,926[c]
Groundwater (acre-feet)	0	6569	0	0	0
Recycled Water (acre-feet)	4,838	4,838	4,838	4,838	4,838
Projected Demand (acre-feet)	50,907[d]	50,907[d]	50,907 [d]	50,907 [d]	50,907 [d]
Surplus or (Deficit) (acre-feet)[e]	4,655	0	6,826	8,931	857

a. Although additional water is under contract, surface water supplies are available based on Water Forum agreement diversion commitments. This projection includes anticipated PCWA supply from the future Ophir Water Treatment Plant project.
b. Although contracts are in place for normal water year supplies of 67,500 acre-feet, the supply shown is consistent with Water Forum agreement diversion limits and the limitation that 4,000 acre-feet of SJWD supplies are only available for use in normal years.
c. Surface supply reduction is consistent with Water Forum supply agreement anticipating worst case shortage (driest years).
d. No conservation measures are assumed for any year type.
e. Assume full use of available recycled water to offset potable demand for landscape irrigation.

Source: Roseville, 2015a

8.5.4 Environment

Environmental losses are the result of damage to plants, animals, habitat, and air and water quality; wildfires; degradation of landscape; loss of biodiversity; and soil erosion. Some of the effects are short-term and conditions quickly return to normal following the end of the drought. Other environmental effects linger for some time or may even become permanent. Wildlife habitat, for example, may be degraded through the loss of wetlands, lakes, and vegetation. However, many species will eventually recover from this temporary aberration. The degradation of landscape quality, including increased soil erosion, may lead to a more permanent loss of biological productivity. Although environmental losses are difficult to quantify, growing public awareness and concern for environmental quality has forced public officials to focus greater attention and resources on these effects.

8.5.5 Economic Impact

Economic impact will be largely associated with industries that use water or depend on water for their business. For example, landscaping businesses were affected in the droughts of the past as the demand for service significantly declined because landscaping was not watered. The City's Environmental Utilities Department, through the water conservation programs, works to ensure that businesses that rely on water receive allotments to continue operating.

There is always the possibility of some financial exposure for the City as a result of drought conditions. The Environmental Utilities Department plans proactively for this possibility in order to mitigate these impacts to the greatest extent possible.

8.6 FUTURE TRENDS IN DEVELOPMENT

Table 8-4 lists past, current, and projected water use from 2010 to 2040. Water use projections for 2020 through 2040 are based on land use-based water demand projections documented in the City's General Plan.

The general building stock within the planning area increased by 17.7% with an increase in valuation from $21.967 billion to $29.641 billion (34.9%). This increase in valuation of the planning area was impacted by the areas recovery from the economic downturn of 2008. Since the entire planning area would be considered susceptible to drought, it would be perceived that there was an increase in drought exposure over the performance

period of the 2011 plan. However, since droughts typically do not kill or injure people or damage structures, there would be no increase in vulnerability to drought from this increased exposure.

Table 8-4. City of Roseville Past, Current, and Projected Water Use

	Water Use (acre-feet/year)						
	2010	2015	2020	2025	2030	2035	2040
Single family residential	15,836	11,680	21,262	22,425	23,862	25,254	26,365
Multi-Family residential	2,196	1,464	2,399	2,530	2,692	2,849	2,974
Commercial	2,042	1,930	3,402	3,588	3,818	4,041	4,219
Industrial	891	934	1,699	1,792	1,907	2,018	2,107
Institutional and Governmental	667	561	1,001	1,056	1,123	1,189	1,241
Landscape	5,534	4,152	7,559	7,973	8,483	8,978	9,373
Losses[a]	1,195	2,160	3,732	3,936	4,189	4,433	4,628
Total	**28,361**	**22,881**	**41,054**	**43,300**	**46,074**	**48,762**	**50,907**

a. Losses include unbilled/unmetered losses for 2010 and 2015
Source: Roseville, 2015a

8.7 REVIEW OF EXISTING ORDINANCES, PROGRAMS AND PLANS

Since California's 1975 to 1977 drought, Roseville has had a policy of no water waste supported by City ordinances. The City adopted a "No Waste" ordinance in 1989 and updated the Water Conservation Ordinance (Roseville Municipal Code Chapter 14.09—Water Conservation) to include drought mitigation measures in April 1991. The ordinance provides conservation measures for shortages in water supply due to drought. Drought mitigation is achieved through a tiered approach that is based on the surface water available to Roseville. As water supplies decrease, additional restrictions are imposed. Conservation measures (water use restrictions) have been established to address conditions from adequate water supplies to conditions in which surface water supplies are capable of meeting only 50 percent of Roseville's water needs.

A significant portion of Roseville's water is used for landscape irrigation. Landscape irrigation also accounts for a large portion of water wasted in Roseville. Conservation patrols are used to enforce City ordinances restricting water waste. These patrols generally consist of existing service workers that identify and document water waste during daily travels or when responding to complaints. Evening calls are made in response to resident complaints.

In times of reduced water availability, higher drought stages are implemented. In summer 1991, Roseville hired temporary employees to serve as the first dedicated water patrol. This patrol supplemented existing service crew coverage and provided 24-hour-per-day capability. These patrols led to the issuance of over 500 water waste citations that greatly decreased water wasted through malfunctioning irrigation systems and/or excessive watering. In response to the current drought, Roseville instituted these water patrols once more.

Roseville has a number of programs and policies that are implemented as early as possible to reduce water use in the event of a prolonged water shortage. As a USBR contractor, Roseville is required to develop and maintain a water conservation plan consistent with the requirements of the Central Valley Project Improvement Act of 1992. In addition, Roseville is a member and signatory to the American River Water Forum, which also includes requirements for water conservation programs.

To proactively promote water conservation and to be prepared in the event of a water shortage, the City implements demand management (conservation) measures, is developing supplemental water supplies, and has a water shortage contingency plan. These are summarized in the City of Roseville 2010 Urban Water Management Plan Update and detailed in the work programs for the Environmental Utilities Department Water Division.

Given recent legislation and state oversight of the City's water conservation efforts, the Roseville City Council adopted a revised Water Efficient Landscape Ordinance on March 16, 2016. The revised ordinance, effective on April 16, 2016, responds to state legislation mandating stricter requirements for reducing landscape irrigation, water consumption and waste. The revised ordinance addresses the objectives of the Department of Water Resources model ordinance by incorporating the new water efficient landscape requirements into Chapter 14.18 of the Roseville Municipal Code.

8.8 SCENARIO

An extreme multi-year drought can impact the region with little warning. Combinations of low precipitation and unusually high temperatures could occur over several consecutive years. Intensified by such conditions, extreme wildfires could break out throughout Placer County, increasing the need for water. Surrounding communities, also in drought conditions, could increase their demand for water supplies relied upon in the City of Roseville, causing social and political conflicts. If such conditions persisted for several years, the economy of Placer County and Roseville could experience setbacks, especially in water dependent industries.

8.9 ISSUES

The planning team has identified the following drought-related issues:

- Identification and development of alternative water supplies
- Utilization of groundwater recharge techniques to stabilize the groundwater supply
- The probability of increased drought frequencies and durations due to climate change
- The promotion of active water conservation even during non-drought periods.

9. EARTHQUAKE

9.1 GENERAL BACKGROUND

California is seismically active because of movement of the North American Plate, on which everything east of the San Andreas Fault sits, and the Pacific Plate, which includes coast communities west of the fault. The Pacific Plate is constantly moving northwest past the North American Plate, at a relative rate of movement of about 2 inches per year (SHMP 2013). The movement of the tectonic plates creates stress released as energy that moves through the earth as waves called earthquakes.

DEFINITIONS

Earthquake—The shaking of the ground caused by an abrupt shift of rock along a fracture in the earth or a contact zone between tectonic plates. Earthquakes are typically measured in both magnitude and intensity.

Liquefaction—A condition in which water-saturated sands, silts or gravelly soils are shaken so violently that the individual grains lose contact with one another and "float" freely in the water, turning the ground into a pudding-like liquid.

9.1.1 Damage from Earthquakes

Earthquakes can last from a few seconds to over 5 minutes; they may also occur as a series of tremors over a period of several days. The actual movement of the ground in an earthquake is seldom the direct cause of injury or death. Casualties generally result from falling objects and debris, because the shocks shake, damage or demolish buildings and other structures. Disruption of communications, electrical power supplies and gas, sewer and water lines should be expected. Earthquakes may trigger fires, dam failures, landslides or releases of hazardous material, compounding their disastrous effects.

9.1.2 Earthquake Classifications

Earthquakes are typically classified in one of two ways: By the amount of energy released, measured as magnitude; or by the impact on people and structures, measured as intensity.

- Magnitude represents the amount of seismic energy released at the hypocenter of the earthquake. It is based on the amplitude of the earthquake waves recorded on instruments. Magnitude is thus represented by a single, instrumentally determined value.
- Intensity represents the observed effects of ground shaking at any specified location. The intensity of earthquake shaking lessens with distance from the earthquake epicenter. Tabulated peak ground accelerations for a listed "maximum credible earthquake" are a measure of how a site will be affected by seismic events on distant faults.

Magnitude

An earthquake's magnitude is a measure of the energy released at the source of the earthquake. It is commonly expressed by ratings on either of two scales (Michigan Tech University 2016):

- The Richter scale measures magnitude of earthquakes based on the amplitude of the largest energy wave released by the earthquake. Richter scale readings are suitable for smaller earthquakes; however, because

it is a logarithmic scale, the scale does not distinguish clearly the magnitude of large earthquakes above a certain level. Table 9-1 presents the Richter scale magnitudes and corresponding earthquake effects.

- A more commonly used magnitude scale today is the moment magnitude (M_w) scale, with classifications as shown in Table 9-2. The moment magnitude scale is based on the total moment release of the earthquake (the product of the distance a fault moved and the force required to move it). Moment magnitude roughly matches the Richter scale but provides more accuracy for larger magnitude earthquakes.

Table 9-1. Richter Magnitude Scale

Richter Magnitude	Earthquake Effects
2.5 or less	Usually not felt, but can be recorded by seismograph
2.5 to 5.4	Often felt, but causes only minor damage
5.5 to 6.0	Slight damage to buildings and other structures
6.1 to 6.9	May cause a lot of damage in very populated areas
7.0 to 7.9	Major earthquake; serious damage
8.0 or greater	Great earthquake; can totally destroy communities near the epicenter

Source: Michigan Tech University n.d.

Table 9-2. Moment Magnitude Scale

Magnitude Class	Magnitude Range
Great	$M_w \geq 8$
Major	M_w =7.0 - 7.9
Strong	M_w =6.0 - 6.9
Moderate	M_w =5.0 - 5.9
Light	M_w =4.0 - 4.9
Minor	M_w =3.0 - 3.9
Micro	M_w =< 3

Intensity

Currently the most commonly used intensity scale is the modified Mercalli intensity scale, with ratings defined as follows (USGS, 1989):

I. Not felt except by a very few under especially favorable conditions
II. Felt only by a few persons at rest, especially on upper floors of buildings.
III. Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it is an earthquake. Standing cars may rock slightly. Vibrations similar to the passing of a truck.
IV. Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like a heavy truck striking building. Standing cars rocked noticeably.
V. Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI. Felt by all; many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII. Damage negligible in buildings of good design and construction; slight in well-built ordinary structures; considerable in poorly built or badly designed structures. Some chimneys broken.

VIII. Damage slight in specially designed structures; considerable damage in ordinary buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.

IX. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.

X. Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

XI. Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.

XII. Damage total. Lines of sight and level are distorted. Objects thrown into the air.

9.1.3 Ground Motion

Earthquake hazard assessment is also based on expected ground motion. This involves determining the annual probability that certain ground motion accelerations will be exceeded, then summing the annual probabilities over the time period of interest. The most commonly mapped ground motion parameters are the horizontal and vertical peak ground accelerations (PGA) for a given soil or rock type. Instruments called accelerographs record levels of ground motion due to earthquakes at stations throughout a region. These readings are recorded by state and federal agencies that monitor and predict seismic activity.

Maps of PGA values form the basis of seismic zone maps that are included in building codes such as the International Building Code. Building codes that include seismic provisions specify the horizontal force due to lateral acceleration that a building should be able to withstand during an earthquake. PGA values are directly related to these lateral forces that could damage "short period structures" (e.g. single-family dwellings). Longer period response components determine the lateral forces that damage larger structures with longer natural periods (apartment buildings, factories, high-rises, bridges). Table 9-3 lists damage potential and perceived shaking by PGA factors, compared to the Mercalli scale.

Table 9-3. Mercalli Scale and Peak Ground Acceleration Comparison

Modified Mercalli Scale	Perceived Shaking	Potential Structure Damage		Estimated PGA[a] (%g)
		Resistant Buildings	Vulnerable Buildings	
I	Not Felt	None	None	<0.17%
II-III	Weak	None	None	0.17% - 1.4%
IV	Light	None	None	1.4% - 3.9%
V	Moderate	Very Light	Light	3.9% - 9.2%
VI	Strong	Light	Moderate	9.2% - 18%
VII	Very Strong	Moderate	Moderate/Heavy	18% - 34%
VIII	Severe	Moderate/Heavy	Heavy	34% - 65%
IX	Violent	Heavy	Very Heavy	65% - 124%
X - XII	Extreme	Very Heavy	Very Heavy	>124%

a. PGA measured in percent of g, where g is the acceleration of gravity

Sources: USGS, 2008; USGS, 2010

9.1.4 Effect of Soil Types

The impact of an earthquake on structures and infrastructure is largely a function of ground shaking, distance from the source of the quake, and liquefaction, a secondary effect of an earthquake in which soils lose their shear strength and flow or behave as liquid, thereby damaging structures that derive their support from the soil. Liquefaction generally occurs in soft, unconsolidated sedimentary soils. A program called the National Earthquake Hazard Reduction Program (NEHRP) creates maps based on soil characteristics to help identify

locations subject to liquefaction. Table 9-4 summarizes NEHRP soil classifications. NEHRP Soils B and C typically can sustain ground shaking without much effect, dependent on the earthquake magnitude. The areas that are commonly most affected by ground shaking have NEHRP Soils D, E and F. In general, these areas are also most susceptible to liquefaction.

Table 9-4. NEHRP Soil Classification System

NEHRP Soil Type	Description	Mean Shear Velocity to 30 m (m/s)
A	Hard Rock	1,500
B	Firm to Hard Rock	760-1,500
C	Dense Soil/Soft Rock	360-760
D	Stiff Soil	180-360
E	Soft Clays	< 180
F	Special Study Soils (liquefiable soils, sensitive clays, organic soils, soft clays >36 m thick)	

9.2 HAZARD PROFILE

9.2.1 Past Events

The last seismic event recorded in the Roseville vicinity measuring at least 4.0 on the Richter scale occurred between Placerville and Roseville in 1908 on a north-south fault line between Folsom and Auburn. No significant seismic events in the Roseville vicinity have been recorded since then. Significant recent earthquakes in California include the 1906 earthquake in San Francisco, the 1971 San Fernando Earthquake, the 1989 Loma Prieta Earthquake, and the 1994 Northridge earthquake. Table 9-5 lists recent earthquakes with a magnitude of 5.0 or greater within a 100-mile radius of Roseville. Figure 9-1 shows the location of the most recent four events in relation to Roseville.

Table 9-5. Recent Earthquakes Magnitude 5.0 or Larger Within 100-mile radius

Date	Magnitude	Epicenter Location
8/24/2014	6.0	6 miles southwest of Napa, CA
5/24/2013	5.7	12 miles southeast of Chester, CA
4/26/2008	5.1	6 miles west of Reno, NV
10/31/2007	5.6	10 miles northeast of San Jose, CA
8/10/2001	5.5	9 miles west of Portola, CA
9/3/2000	5.17	8 miles northwest of Napa, CA
10/30/1998	5.35	4 miles south-southeast of Truckee, CA
12/28/1995	5.33	7 miles east-northeast of Markleeville, CA
12/23/1995	5.08	8 miles east of Markleeville, CA
9/12/1994	5.95	7 miles north-northeast of Markleeville, CA
9/12/1994	5.12	7 miles north-northeast of Markleeville, CA
3/31/1986	5.70	12 miles east-northeast of Milpitas, CA

Source: Earthquake Catalogs, Northern California Earthquake Data Center, USGS

Source: NCEDC, 2014; Google Earth

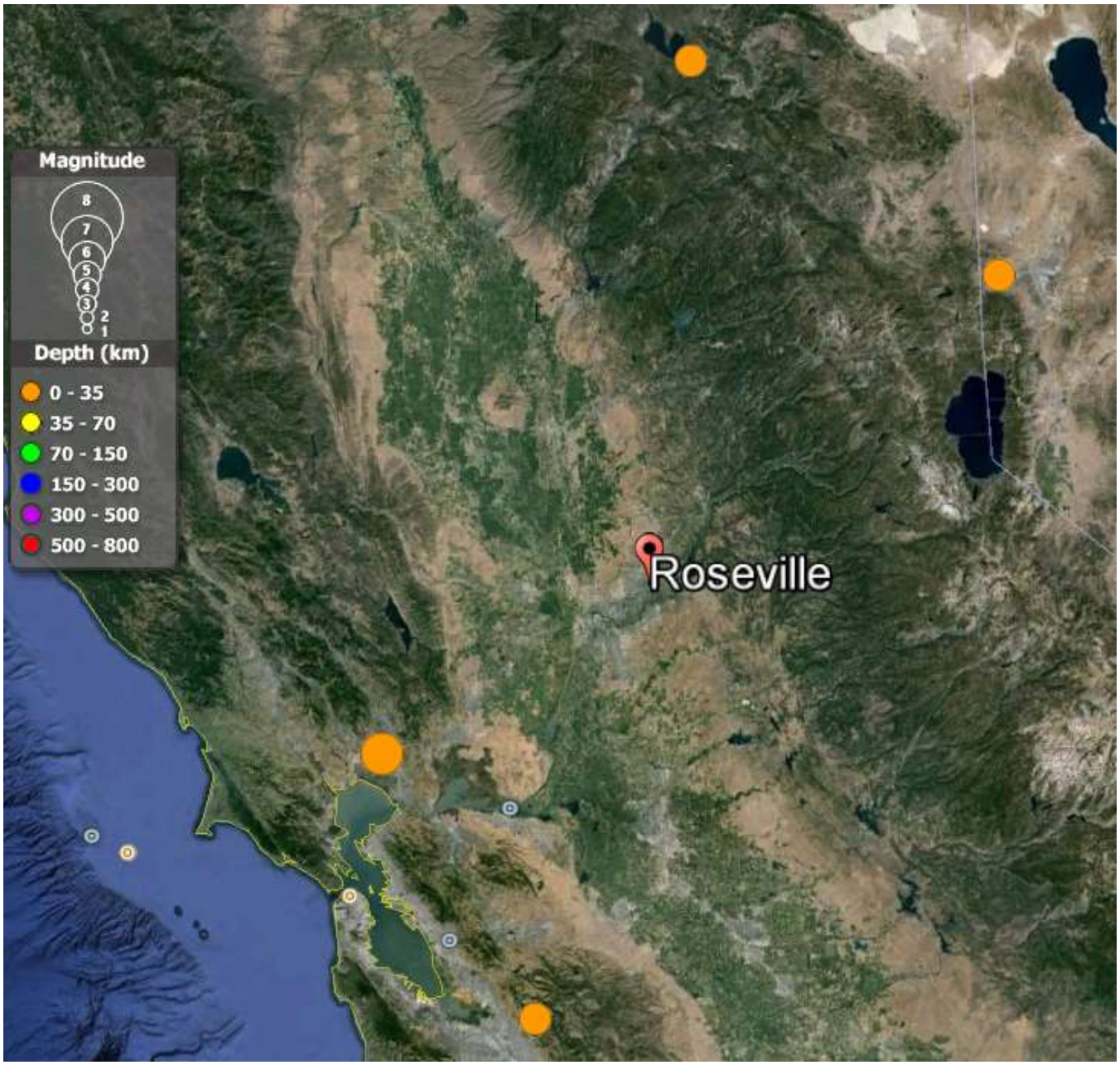


Figure 9-1. Location of Recent Earthquakes in Roseville Vicinity

9.2.2 Location

A direct relationship exists between a fault's length and location and its ability to generate damaging ground motion at a given site. Small, local faults produce lower magnitude quakes, but ground shaking can be strong and damage can be significant in areas close to the fault. Large regional faults can generate earthquakes of great magnitudes but, because of their distance and depth, they may result in only moderate shaking in an area. The City of Roseville is in a region of moderate seismicity between the seismically active Coast Ranges and the historically seismic Foothills Fault Zone in the Sierra Nevada. The primary seismic hazard for the City is potential ground shaking from distant large faults.

East of Roseville

The Great Valley Fault Zone is the geomorphic boundary of the Coast Ranges and the Central Valley. It is underlain by a 300-mile long seismically active fold-and-thrust belt that has been the source of recent earthquakes, such as the 1983 Magnitude-6.5 Coalinga and the 1985 Magnitude-6.1 Kettleman Hills earthquakes. Nearly the entire thrust system is concealed (Krazan & Associates, 2011). The Great Valley fault system consists of 14 segments, named numerically based on location along the fault system from north (1) to south (14).

The Foothill Fault Zone, a complex series of northwest trending-faults that are related to the Sierra Nevada uplift, runs from about Oroville in the north to east of Fresno in the south. This was the source of Oroville's 1975 earthquake and an event in the 1940s. Subsequent research of these events led to the identification and naming of the zone. Earthquakes on fault segments in the zone could be a source of ground shaking in Placer County.

The closest potentially active faults in the near vicinity of Roseville are the Bear Mountain and Melones Faults. The closest recently active fault in the western Sierra Nevada foothills is the Cleveland Hills Fault, about 36 miles northwest of Auburn.

Eastern Placer County borders the Basin and Range geological province, which includes most of Nevada and western Utah. This area is riddled with active faults that form the boundary between each basin or valley and the neighboring mountain range.

The Lake Tahoe Basin is seismically active with earthquakes greater than 7.0 that have occurred beneath Lake Tahoe. According to the Placer County Multi-Hazard Mitigation Plan, a series of small earthquakes also occurred in late 2003 and early 2004 due to volcanic magma (molten rock) moving 20 miles below the Sierra Nevada Mountains. The earthquakes reflect the movement of the Sierra Nevada range to the northwest at a rate of about half an inch per year.

West of Roseville

Tectonic stresses associated with the North American-Pacific Plate boundary can generate damaging earthquakes along faults 30 to 100 miles west of Placer County. Both the San Andreas fault (source of the estimated 8.0-Richter magnitude San Francisco earthquake that caused damage in Sacramento in 1906) and the closer Hayward fault have the potential for experiencing major to great events. Another potential earthquake source is the Midland Fault Zone on the western side of the Sacramento Valley. This was the source of the 1892 Vacaville-Winters earthquake.

The Petrolia (coastal Humboldt County) earthquake increased concern about how amplified long-period motions from much closer major events, such as on the San Andreas Fault or the Hayward Fault, might reach damaging levels and affect Sacramento.

Other potential earthquake sources are the faults associated with the western edge of the Central Valley, recently defined as the Coast Range Central Valley Boundary Thrust Fault System. Various documents define portions of this little known system as the Midland Fault Zone or the Dunnigan Hills fault, where the 1892 Vacaville-Winters earthquake occurred. A southern part of the system may have been the source of the 1983 Coalinga earthquake.

Inactive Faults

Active faults are those that have experienced displacement in historical time. However, inactive faults, for which no such displacements have been recorded, also have the potential to reactivate or experience displacement along a branch sometime in the future. An example of a fault zone that has been reactivated is the Foothills Fault Zone. The zone was considered inactive until evidence of an earthquake (approximately 1.6 million years ago) was found near Spenceville, California. Then, in 1975, an earthquake occurred on another branch of the zone near Oroville, California (now known as the Cleveland Hills Fault). The State Division of Mines and Geology

indicates that increased earthquake activity throughout California may cause tectonic movement along currently inactive fault systems.

No active faults are known to exist in Placer County. The following inactive faults have been identified within the city limits:

- The Volcano Hill fault extends northwest from Volcano Hill for a distance of 1 mile, terminating near Eureka Road. No activity has been recorded along this fault; therefore, it is considered inactive.
- Identified in 1973, the Linda Creek fault is located along Linda Creek in Roseville and Sacramento County. No activity has been recorded along this fault.
- The Willows Fault and Stockton Fault are in the Roseville vicinity and are considered inactive as displacement occurred greater than 1.8 million years ago.
- An unnamed fault extends east to west between Folsom Lake and the City of Rocklin. Segments of the fault are concealed and therefore unmapped. However, the east/west alignment suggests that the fault could connect to the Bear Mountain Fault, branches of which are located beneath Folsom Lake. The Bear Mountain Fault is a fault that could be undergoing reactivation as a result of continental tectonic activity. However, no evidence has been identified along the unnamed fault alignment of such reactivation.

Maps of Earthquake Impact in Roseville

A probabilistic seismic hazard map shows the hazard from earthquakes that seismologists agree could occur. It is probabilistic in the sense that the analysis takes into consideration the uncertainties in the size and location of earthquakes and the resulting ground motions that can affect a particular site. The maps are expressed in terms of probability of exceeding a certain ground motion, such as the 10-percent probability of exceedance in 50 years. This level of ground shaking has been used for designing buildings in high seismic areas. Figure 9-2 shows the estimated ground motion for a 100-year probabilistic earthquake.

Earthquake scenarios describe the expected ground motions and effects of specific hypothetical large earthquakes for a region. Maps of these scenarios can be used to support all phases of emergency management. Two such scenarios were evaluated for this Plan:

- A Magnitude-6.8 event on the Concord-Green Valley Fault with an epicenter 56 miles southwest of Roseville near Vallejo, California (see Figure 9-3)
- A Magnitude-7.1 event on the Great Valley Fault with an epicenter 58 miles west northwest of Roseville (see Figure 9-4)

NEHRP Soil Maps

NEHRP soil types define locations that will be significantly impacted by an earthquake. NEHRP Soils B and C typically can sustain low-magnitude ground shaking without much effect. Areas with NEHRP Soils D, E and F are most commonly affected by ground shaking. Figure 9-5 shows NEHRP soil classifications in the county.

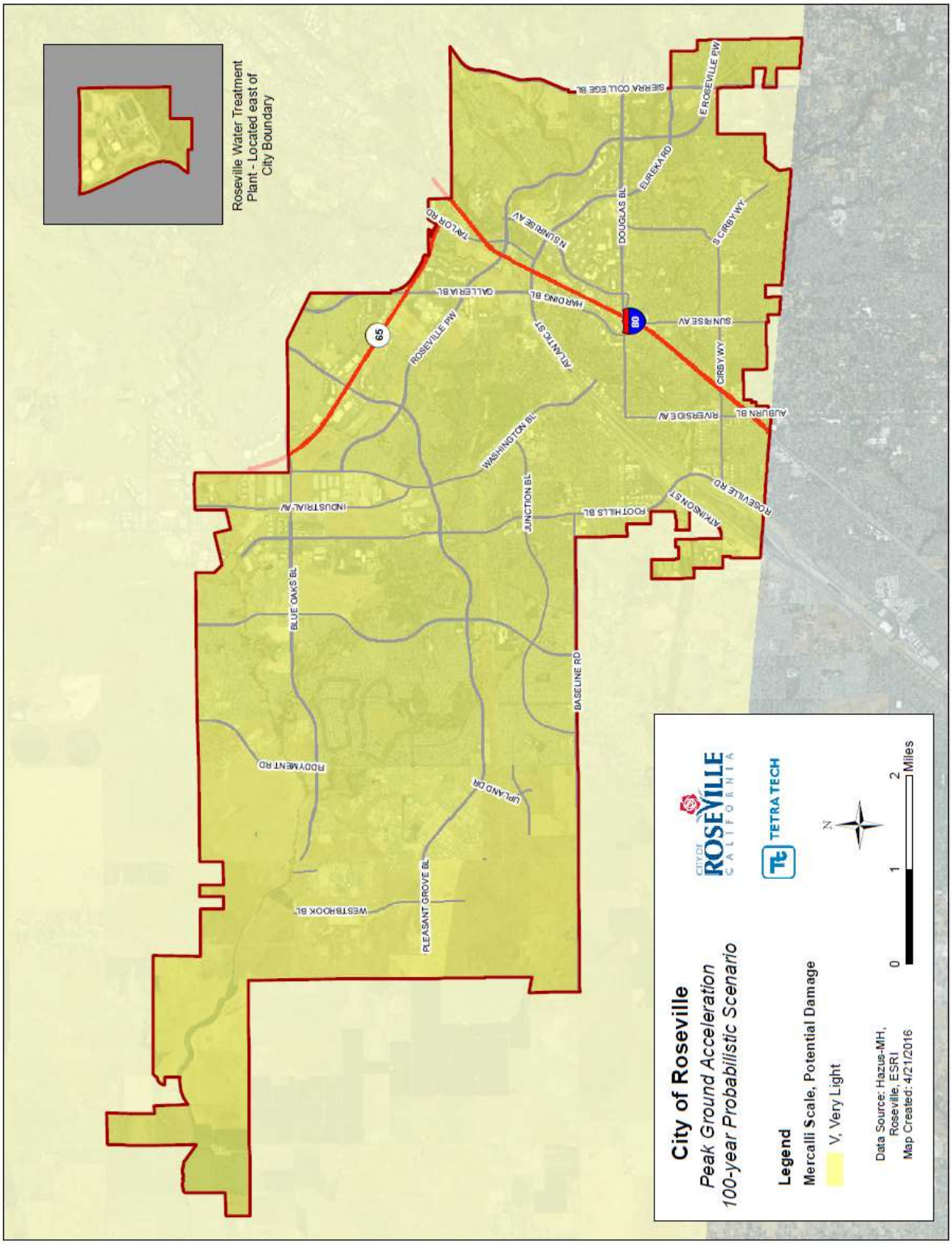


Figure 9-2. 100-Year Probabilistic PGA

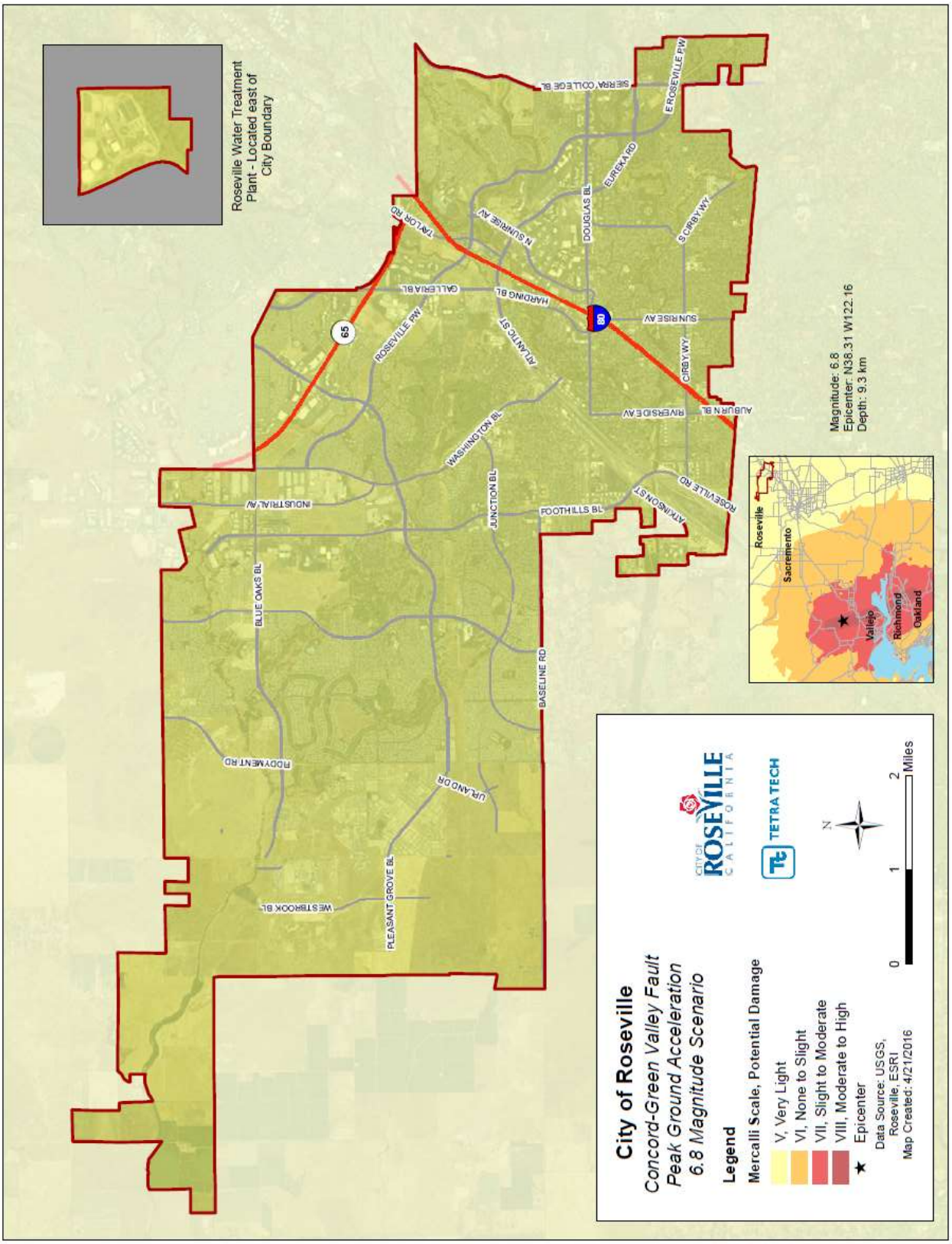


Figure 9-3. Concord-Green Valley Fault Scenario PGA

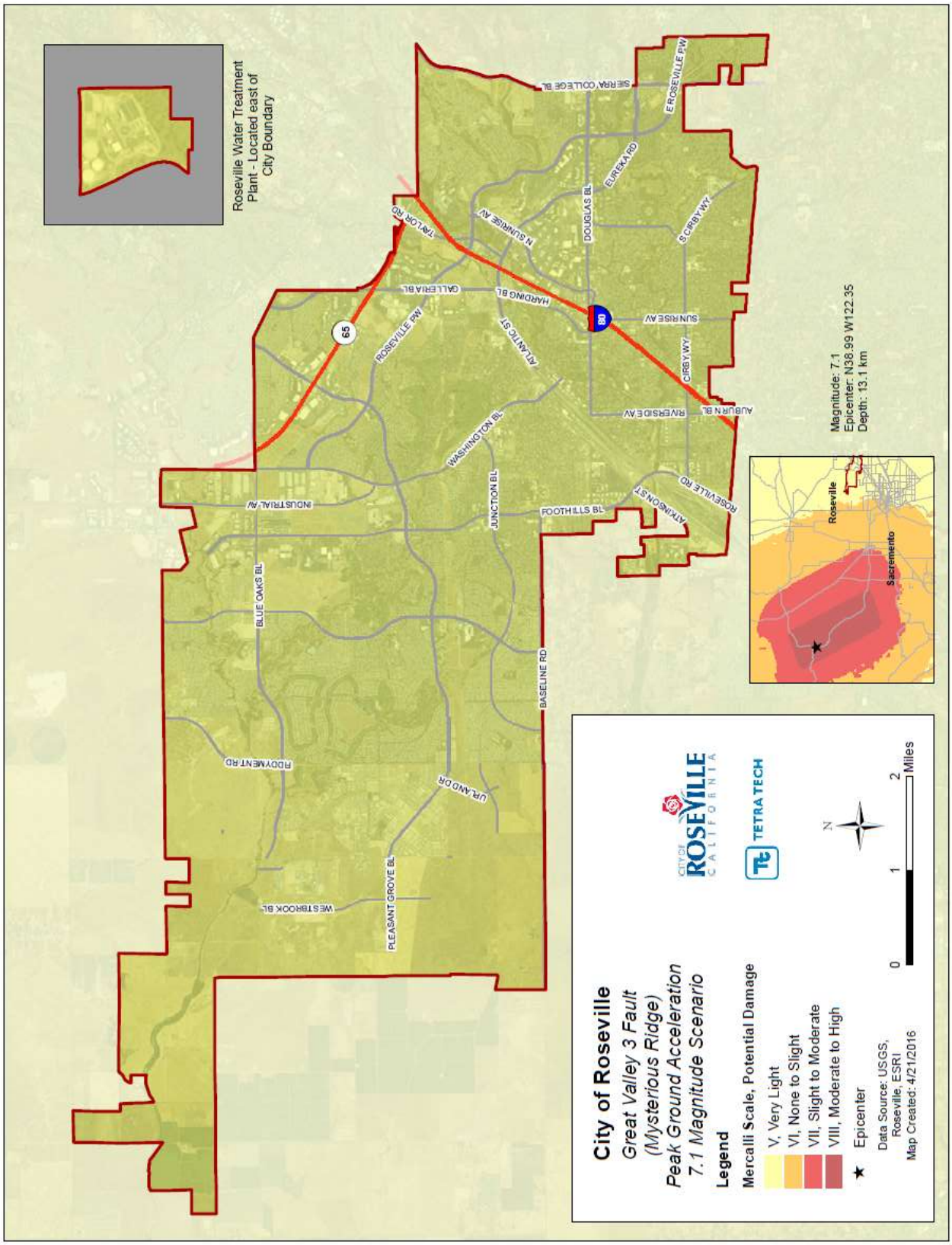


Figure 9-4. Great Valley 3 Fault Scenario PGA

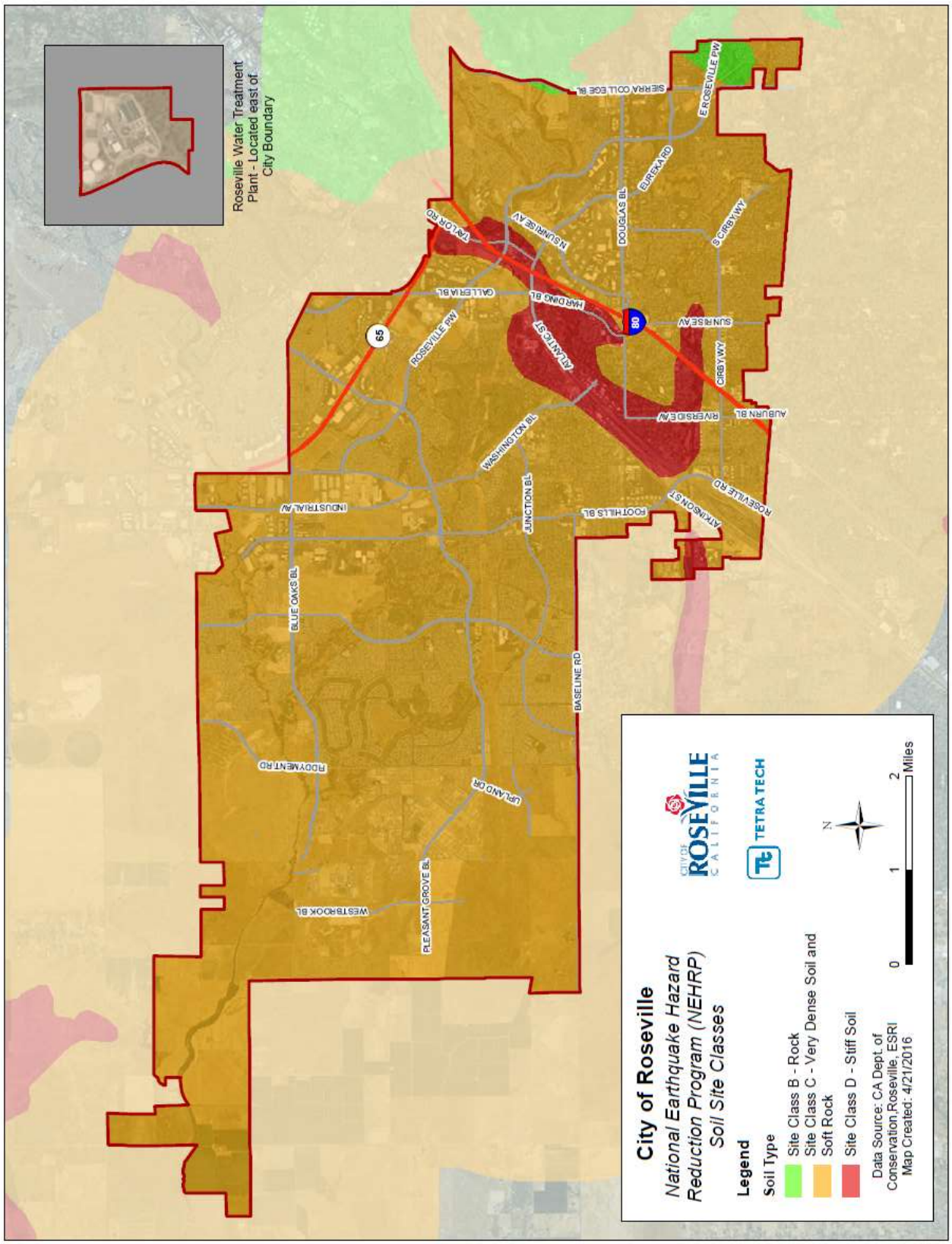


Figure 9-5. National Earthquake Hazard Reduction Program Soil Classification

9.2.3 Frequency

California experiences hundreds of earthquakes each year, most with minimal damage and magnitudes below 3.0 on the Richter Scale. Earthquakes that cause moderate damage to structures occur several times a year. According to the USGS, a strong earthquake measuring greater than 5.0 on the Richter Scale occurs every two to three years and major earthquakes of more than 7.0 on the Richter Scale occur once a decade. Both the San Andreas Fault and the closer Hayward Fault have the potential for experiencing major to great events. The State Hazard Mitigation Plan indicates that in the next 30 years in California there is over a 99-percent probability of a magnitude 6.7 earthquake and a 94-percent probability of a magnitude 7.0 earthquake.

9.2.4 Severity

Placer County and Roseville are identified as a low-severity zone. While there are several faults with the potential for large-magnitude earthquakes in the vicinity, the distance between those faults and the City of Roseville would result in very low, peak-ground accelerations in the City. The biggest contributor to potential intensity of shaking in Roseville is the Foothills Fault Zone.

Liquefaction

Liquefaction of loose sandy soil with a high water content during an earthquake undermines the ground's ability to solidly support building structures. Foundations supported on liquefiable soils can lose their ability to support load, and can experience settlement on the order of several inches or more. Differential settlement can cause significant damage to buildings, lifelines, and transportation structures, with partial or total collapse.

The City of Roseville is not specifically addressed in currently available State Division of Mines and Geology liquefaction risk data. No determination has been made as to whether liquefaction potential exists in Roseville. Based on project-specific analysis that has been done for many of Roseville's development projects, liquefaction has not been identified as a significant problem in Roseville.

The prevailing water table in the vicinity of Roseville is approximately 80 feet below grade. Without water to saturate the soil, liquefaction is not possible. The liquefaction potential in Roseville is, therefore, considered to be very low. The most likely location for liquefaction would be along the City's creek beds. The City's policy of protecting floodplain areas has avoided development in many of the most susceptible areas.

Ground Failure

Roseville's geographic location, soil conditions, and surface terrain combine to minimize risk of major damage from landslides, subsidence (gradual shrinking of the earth's surface due to underground resource extraction), or other geologic hazards resulting from seismic activity and related natural forces.

Slopes

Roseville is located on relatively level terrain, with slopes that gradually increases to the north and east. Recent development in the Stoneridge Specific Plan and Northeast Roseville Specific Plan is adjacent to ravine areas and developed property would be more susceptible in the event of seismic activity due to steep slopes in some areas.

9.2.5 Warning Time

There is no current reliable way to predict the day or month that an earthquake will occur at any given location. Research is being done with warning systems that use the low energy waves that precede major earthquakes. These potential warning systems would give approximately 40 seconds notice that a major earthquake is about to occur. The warning time is very short but it could allow for someone to get under a desk, step away from a hazardous material they are working with or shut down a computer system.

9.3 SECONDARY HAZARDS

Earthquakes can cause large and sometimes disastrous landslides and mudslides. River valleys are vulnerable to slope failure, often as a result of loss of cohesion in clay-rich soils. When soil liquefaction occurs, building and road foundations can lose load-bearing strength and may sink quicksand-like into what was previously solid ground. Unless properly secured, hazardous materials can be released during earthquakes, causing significant damage to the environment and people. Earthen dams and levees are highly susceptible to seismic events and the impacts of their eventual failures can be considered secondary earthquake hazards.

The City of Roseville faces potential social impacts in the wake of mass evacuations should a large seismic event occur in the San Francisco Bay area. As the first major metropolitan city along Interstate 80 east of Sacramento, the City's services and infrastructure could be strained as evacuating populations seek shelter close to home. Evacuees could need shelter for long periods, depending on the magnitude of the event. This could significantly tax hospitals, schools and services in the City, causing significant economic impacts.

9.4 EXPOSURE

9.4.1 Population

All of the population of Roseville, both residents and visitors, would be directly or indirectly exposed to the potential impacts of an earthquake.

9.4.2 Property

All structures within Roseville are exposed to the potential impacts of an earthquake.

9.4.3 Critical Facilities

Since the entire planning area has exposure to the earthquake hazard, all critical facilities and infrastructure components are exposed to the earthquake hazard, as summarized in Table 9-6 and Table 9-7.

Table 9-6. Critical Facilities Exposed to the Earthquake Hazard

Facility Type	Number in Planning Area
Medical and Health	2
Government Functions	27
Protective Functions	10
Schools	49
Hazmat	6
Other Critical Functions	78
Total	**172**

Table 9-7. Critical Infrastructure Exposed to the Earthquake Hazard

Facility Type	Number in Planning Area
Bridges	68
Water Supply	11
Wastewater	23
Power	18
Communications	98
Other	6
Total	**224**

The City's Water Treatment Plant on Barton Road is the only critical facility located near an identified local inactive fault. All other City facilities are within Roseville and are not located near an inactive local fault. However, all are considered to be exposed to the same earthquake risk as the general building stock.

Most of the City's critical facilities have been built since the Uniform Building Code (UBC) was amended to include provisions for seismic safety. For example, the two major hospitals—Sutter Roseville Medical Center and Kaiser Permanente—were both constructed in the 1990s, as were the Roseville Police Department and Roseville Civic Center. The movement of the California Building Code to the International Building Code standard in 2013 has upheld seismic standards previously established by the UBC.

Critical industrial facilities are of concern because of potential hazardous materials spills or the potential for critical employment centers to continue operating. Many forms of hazardous materials are present in Roseville at private businesses, in permanent storage locations, along the Union Pacific Railroad, and on Interstate 80 and Highway 65.

Hazardous Materials

Hazardous material releases from fixed facilities and transportation-related releases can occur during an earthquake event. Roseville's location at the junction of two major rail lines with two freeways increases the potential for a hazardous materials event should a major earthquake occur. Facilities holding hazardous materials are of particular concern because of possible isolation of surrounding populations.

Roads

Roads have the potential to be significantly damaged during an earthquake. Access to major roads is crucial to life and safety after a disaster event as well as to response and recovery operations.

Bridges

Earthquake events can significantly impact bridges, which often provide the only access to some neighborhoods. Since soft soil regions generally follow floodplain boundaries, bridges that cross water courses are considered vulnerable. Since most of the City's bridges provide access across water courses, most are at least somewhat vulnerable to earthquakes. Key factors in the degree of vulnerability are the facility's age and type of construction, which indicate the standards to which the facility was built.

Water and Sewer Infrastructure

Water and sewer infrastructure would likely suffer considerable damage in the event of an earthquake. This is hard to analyze due to the amount of infrastructure and the fact that water and sewer infrastructure are usually linear easements. Without further analysis of individual system components, it should be assumed that these systems are exposed to breakage and failure.

9.4.4 Environment

Environmental problems as a result of an earthquake can be numerous. Secondary hazards will likely have some of the most damaging effects on the environment. Earthquake-induced landslides in landslide prone areas can significantly impact surrounding habitat. It is also possible for streams to be rerouted after an earthquake. This can change the water quality, possibly damaging habitat and feeding areas. There is a possibility of streams fed by groundwater wells drying up because of changes in underlying geology.

9.5 VULNERABILITY

The data in this section was generated using the HAZUS-MH program for earthquakes. Once the location and size of a hypothetical earthquake are identified, HAZUS-MH estimates the intensity of the ground shaking, the number of buildings damaged, the number of casualties, the amount of damage to transportation systems and utilities, the number of people displaced from their homes, and the estimated cost of repair and clean up.

Although Roseville is in California and has three faults documented in the City's General Plan, the seismic hazard is not considered to be a serious risk to life or property. Studies have not identified the Sierra Foothills, including Placer County, as a likely location for a significant seismic event. Roseville is fortunate in that more than three-quarters of the development in the City has occurred in the past two decades and all applicable seismic building codes have been enforced through the planning and development process.

9.5.1 Population

The measurable impact of earthquake on loss of life is minimal in Roseville and has not been estimated for this Plan. The life-safety exposure to earthquake in Roseville is low and would most likely occur in buildings as a result of damage to structures. To prevent damage to structures that could lead to loss of life, the City has a strict code enforcement policy to prevent improper alterations to original buildings. The City has funded façade grants to renovate older commercial structures, and has established an infill development team to work with property owners to upgrade and add value to older properties.

The City encourages residents to be prepared through public education and training via the Roseville Fire Department and local non-profits. Local employers such as Union Pacific, Sutter Roseville Medical Center, Kaiser Hospital, HP and NEC maintain emergency response plans that include earthquake preparedness and response training to protect life and property. Earthquake preparedness and response training prepares employees to continue service to the community in the event of a seismic event.

The vulnerable populations are those living in economically disadvantaged households, those over 65 and those under 16.

9.5.2 Property

Loss Potential

An earthquake would cause property damage in a small percentage of the City's buildings built prior to 1933 and structures such as manufactured homes and older homes that have not been well maintained. Loss estimates for the planning area were generated for the 100-year earthquake event as well as the Concord-Green Valley Fault scenario event and the Great Valley 3 Fault scenario event, through a Level 2 analysis using HAZUS-MH. A summary of results is as follows:

- For a 100-year earthquake, the estimated damage potential is $43.37 million, or 0.15 percent of the total assessed value for the planning area.
- For a 6.8-magnitude event on the Concord-Green Valley Fault, the estimated damage potential is $1.7 million, or 0.01 percent of the total assessed value for the planning area.
- For a 7.1-magnitude event on the Great Valley 3 Fault, the estimated damage potential is $21.3 million, or 0.07 percent of the total assessed value for the planning area.

Age of Structures

The City of Roseville is a relatively new community, with most of its development occurring since 1976. The California Multi-Hazard Mitigation Plan identifies significant milestones in building and seismic code

requirements that affect the structural integrity of development in California. Table 9-8 lists the City's structures by the time period in which they were built, based on age-of-structure data from the City's land inventory database. The number of structures is approximate and is based on best available data currently entered into Roseville and Placer County databases. The number of structures does not reflect the number of total housing units, as many multi-family units and attached housing units are reported as one structure.

Table 9-8. Age of Structures in the City of Roseville

Time Period	Number of Structures in Roseville	Significance of Time Period
Pre-1933	540	Before 1933, there were no explicit requirements for earthquakes in building codes. State law did not require local governments to have building officials or issue building permits.
1933-1940	608	In 1940, the first strong motion recording was made in El Centro.
1941-1960	2,526	In 1960, the Structural Engineers Association of California reached the first statewide consensus on recommended earthquake provisions and published the guidelines.
1961-1975	3,029	In 1975, significant improvements were made to lateral force requirements that were then enforced throughout the state.
1976-1994	12,932	In 1994, the Uniform Building Code was amended to include provisions for seismic safety.
1994 to present	26,423	Seismic code is currently enforced.
Total	**46,058**	

Just over 57 percent of the City's structures were constructed since the UBC was amended in 1994 to include seismic safety provisions. Approximately 1 percent of the City's structures were built before 1933 when there were no building permits, inspections, or seismic standards. Figure 9-6 shows the distribution of structures across the City by age.

Construction Materials

The type of construction is a factor in a building's ability to withstand shaking and liquefaction should an earthquake occur. Developers in Roseville have built primarily wood frame structures. The tallest building in Roseville is currently three stories. HAZUS-MH generated the percentages of each building type in Roseville as shown in Table 9-9.

Table 9-9. Building Type

Building Type	Percent of Total
Wood	96.67%
Reinforced Masonry	<1%
Manufactured Homes	<1%
Concrete	1.2%
Un-reinforced Masonry	<1%
Steel	<1%
Total	**100%**

Sources: HAZUS – MH (Occupancy Class Data)

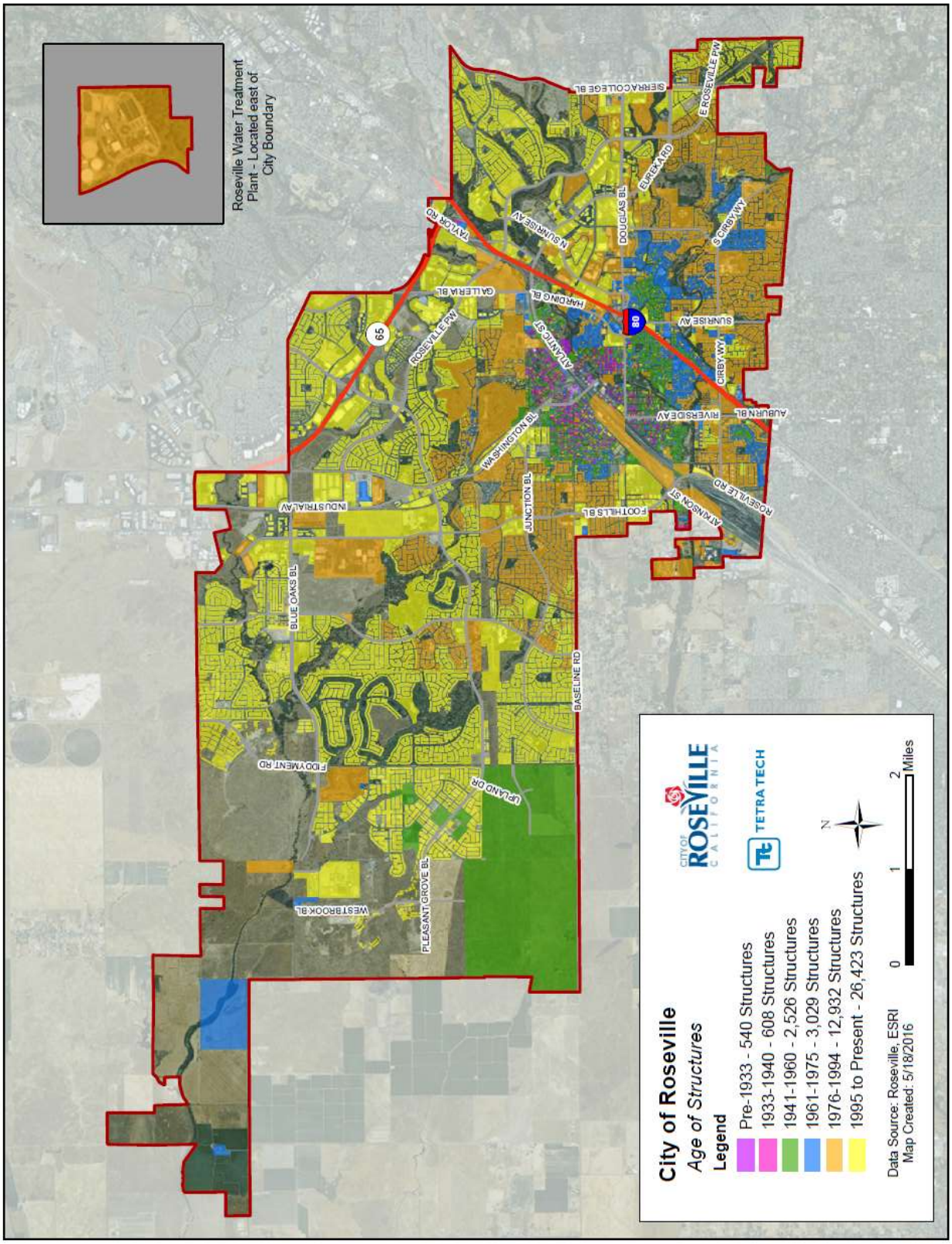


Figure 9-6. Age of Construction of Structures in Roseville

9.5.3 Critical Facilities

Roseville's utilities all have funded rehabilitation programs that identify and replace worn infrastructure to ensure continuous service. The latest technologies, including computerized alarms, video inspections, and mapping of all of the City's water, wastewater, recycled water and electric systems, would identify damaged sections in the event of a seismic event. Private utilities in Roseville also use modern technology to monitor their infrastructure in Roseville and respond quickly to service interruptions.

Level of Damage

The inventory of critical facilities was entered into HAZUS-MH to determine the vulnerability of these facilities to earthquake damage. Critical facilities were categorized into the following levels of damage probability: no damage, slight damage, moderate damage, extensive damage, or complete damage. HAZUS-MH calculated the probability of damage under each of these categories for the 100-year event and the Great Valley 3 Fault Scenario. The results are summarized in Table 9-10 and Table 9-11. The impact on critical facilities for the Concord-Green Valley Fault scenario was not run due to the limited impacts of this event identified by the general building stock analysis.

Table 9-10. Damage Probability (Vulnerability) of Critical Facilities from a 100-Year Earthquake Event

Category	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage
Medical and Health	99.8	0.2	0	0	0
Government Functions	93.4	5.0	1.5	0.1	0
Protective Functions	97.4	2.4	0.2	0	0
Schools	97.3	2.5	0.2	0	0
Other Critical Functions	95.4	4.0	0.6	0	0
Average	**96.7**	**2.8**	**0.5**	**0**	**0**

Table 9-11. Damage Probability (Vulnerability) of Critical Facilities from the Great Valley 3 Scenario

Category	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage
Medical and Health	100	0	0	0	0
Government Functions	99.3	0.7	0	0	0
Protective Functions	99.7	0.3	0	0	0
Schools	99.8	0.2	0	0	0
Other Critical Functions	99.6	0.4	0	0	0
Average	**99.7**	**0.3**	**0**	**0**	**0**

Time to Return to Functionality

HAZUS-MH estimates the expected time required to restore critical facilities to full functional use, in the form of percent probability of being functional at specified time increments post-event: 1, 3, 7, 14, 30 and 90 days after the event occurs. For example, HAZUS-MH may estimate that a facility has 5-percent chance of being fully functional at Day 3, and a 95-percent chance of being fully functional at Day 90. The functionality analysis was performed for all critical facilities and infrastructure components in the planning area for both the 100-year event and the Great Valley 3 Scenario. Results are summarized in Table 9-12 and Table 9-13.

9.5.4 Environment

The environment vulnerable to earthquake hazard is the same as the environment exposed to the hazard.

Table 9-12. Functionality of Critical Facilities, 100-Year Earthquake

Planning Unit	# of Critical Facilities	Probability of Being Fully Functional (%)					
		at Day 1	at Day 3	at Day 7	at Day 14	at Day 30	at Day 90
Medical and Health	2	99.7	99.7	99.9	99.9	99.9	99.9
Government Functions	27	93.4	93.6	98.3	98.3	99.8	99.9
Protective Functions	10	97.3	97.3	99.7	99.8	99.9	99.9
Schools	49	97.2	97.2	99.7	99.8	99.9	99.9
Other Critical functions	78	95.3	95.5	99.3	99.3	99.9	99.9
Total/Average	**166**	**96.6**	**96.7**	**99.4**	**99.4**	**99.9**	**99.9**

Table 9-13. Functionality of Critical Facilities, Great Valley 3 Scenario

Planning Unit	# of Critical Facilities	Probability of Being Fully Functional (%)					
		at Day 1	at Day 3	at Day 7	at Day 14	at Day 30	at Day 90
Medical and Health	2	100	100	100	100	100	100
Government Functions	27	99.2	99.2	99.9	99.9	99.9	99.9
Protective Functions	10	99.7	99.7	99.9	99.9	99.9	99.9
Schools	49	99.8	99.8	99.9	99.9	99.9	99.9
Other Critical functions	78	99.5	99.5	99.9	99.9	99.9	99.9
Total/Average	**166**	**99.6**	**99.6**	**99.9**	**99.9**	**99.9**	**99.9**

9.6 FUTURE TRENDS IN DEVELOPMENT

The general building stock within the planning area increased by 17.7% with an increase in valuation from $21.967 billion to $29.641 billion (34.9%). This increase in valuation of the planning area was impacted by the areas recovery from the economic downturn of 2008. Since the entire planning area would be considered susceptible to earthquake, there was an increase in earthquake exposure over the performance period of the 2011 plan. However, the vulnerability of this new exposure should be considered to be low due to the application of strong seismic building code standards that are contained within the International Building Code.

Roseville is expected to grow considerably in the next 10 years. The moderate potential for earthquake in Roseville is not likely to lessen or prohibit development in the City.

The City's development departments will strictly enforce all seismic building codes and design standards to prevent loss of life and property due to earthquake. Public education, cooperation with the development community, and individual preparedness are essential as Roseville welcomes thousands of new residents and hundreds of new businesses to the City each year.

9.7 REVIEW OF EXISTING ORDINANCES, PROGRAMS AND PLANS

9.7.1 International Building Codes

The State of California provides minimum standards for structural design and site development through the California Building Standards Code (California Code of Regulations (CCR), Title 24). The California Building Code (CBC) is based on the International Building Code (IBC), which is widely used throughout the United States and has been modified for California conditions with numerous more detailed and stringent regulations.

Chapter 18 of the IBC/CBC regulates the excavation of foundations and retaining walls and regulates grading activities, including drainage and erosion control, and construction on expansive soils (soils that expand when

water is added, and shrink when they dry out). Specific minimum seismic safety and structural design requirements are set forth in Chapter 16 of the IBC/CBC. The IBC/CBC requires a site-specific geotechnical study to address seismic issues and identifies seismic factors that must be considered in structural design.

The following uniform codes have been adopted in Chapter 16 of the Roseville Zoning Ordinance to ensure that buildings are designed and sited properly to protect against seismic and unstable soil conditions: CBC (2013), California Plumbing Code (2013), California Green Building Standards (2013), and the California Mechanical Code (2013).

To reduce the risk of seismic-related safety hazards and structural damage to pipelines, roads, and residential homes to an acceptable level, the City of Roseville conditions of approval for development projects require that at the time of tentative map approval, construction be in accordance with the IBC and local building standards, as administered by the Roseville Building Division. Regular monitoring and enforcement through the building permit and plan check process ensures that new development and construction meet all seismic and geologic safety standards, reducing the risk of building damage.

9.7.2 Improvement Standards

The City of Roseville Improvement Standards require the development of a grading plan, an erosion and sedimentation control plan, and mitigation monitoring requirements to reduce the exposure of people and structures to seismic hazards.

9.7.3 Geotechnical Studies

The City of Roseville requires the preparation of site-specific geotechnical studies as part of the building permit process. The technical information that must be compiled for these studies, which address both seismic hazards and soil conditions, is specified in Chapters 16 and 18 of the CBC. The studies provide recommendations to address slope and foundation instability, stream bank protection, and slope evaluation, as well an evaluation of expansive soils and differential settlement. Implementation of recommendations minimizes impacts associated with the exposure of people and structures to seismic hazards, the development of structures on expansive soils, grading that increases slope instability, increased erosion along stream channels, and soil erosion from grading.

9.8 SCENARIO

Inactive faults in the region could significantly impact the City of Roseville should they reactivate, but modeling such impact is difficult due to the lack of data. The direct earthquake risk in Roseville is considered to be low to moderate, but indirect impacts from a significant event in the region could be significant. The City would most likely experience impacts from a large seismic event in the Bay Area. As a large metropolitan center with easy access to transportation corridors, the City would likely become a major evacuation center in response to such an event. This could significantly tax City resources.

9.9 ISSUES

Important issues associated with an earthquake in Roseville include but are not limited to the following:

- Planning is required for mass evacuations into the City of Roseville.
- There is enough older building stock in the City featuring un-reinforced masonry construction to warrant structural and non-structural mitigation.
- There is a need for better comprehensive soils data to better identify the probable earthquake risks in the City.

- A large seismic event in the Sacramento Region could trigger a dam failure on Folsom Lake, causing significant impacts.
- The perceived lack of risk can lead to complacency. Earthquakes provide a significant risk to all populations in California, whether the impacts are direct or indirect.
- There is still much to learn about the impacts of climate change on seismic activity.

10. FLOODING

10.1 GENERAL BACKGROUND

A floodplain is the area adjacent to a river, creek or lake that becomes inundated during a flood. Floodplains may be broad, as when a river crosses an extensive flat landscape, or narrow, as when a river is confined in a canyon.

10.1.1 Measuring Floods and Floodplains

The frequency and severity of flooding are measured using a discharge probability, which represents the probability that a certain discharge level will be equaled or exceeded in a given year. Discharge is the volume of water flowing in a stream or river and over its banks during a given time. Flood studies use historical records to determine the probability of occurrence for different discharge levels. The flood frequency equals 100 divided by the discharge probability. For example, the 100-year discharge has a 1 percent chance of being equaled or exceeded in any given year. The "annual flood" is the greatest flood event expected to occur in a typical year.

The extent of flooding associated with a 1-percent annual probability of occurrence (the base flood or 100-year flood) is commonly used as the regulatory boundary. This boundary is also referred to as the special flood hazard area (SFHA). Many communities have maps that show the extent and likely depth of flooding for the base flood. The base flood elevation is computed using discharge probabilities. The corresponding water-surface elevations describe the exact elevation of water that will result from a given discharge level, which is one of the most important factors used in estimating the potential flood damage in a given area.

10.1.2 Effects of Human Activities

Throughout history, humans have developed settlements in floodplains to take advantage of the benefits of being near the water bodies, but such settlements have always been susceptible to damage from flooding. Human activities concentrate in floodplains for a number of reasons: water is readily available; land is fertile; transportation by water is easily accessible; and land is flatter and easier to develop. But human activity in floodplains frequently interferes with natural processes. It can affect the distribution and timing of drainage, thereby increasing flood problems. Human development creates local flooding problems by altering or confining drainage channels. This increases flood potential in two ways: it reduces the stream's capacity to contain flows, and it increases flow rates or velocities downstream during all stages of a flood event.

10.1.3 Floodplain Ecosystems

Floodplains can support ecosystems that are rich in biological quantity and diversity. Wetting of the floodplain soil releases a surge of nutrients: those left over from the last flood, and those that result from the rapid decomposition of organic matter that has accumulated since then. Microscopic organisms thrive and larger species enter a rapid breeding cycle. Opportunistic feeders—particularly birds—move in to take advantage. The production of nutrients peaks and falls away quickly, but the surge of new growth endures for some time. This makes floodplains particularly valuable for agriculture. Riparian zone species have significant differences from those outside of floodplains. For instance, riparian trees tend to be very tolerant of root disturbance and tend to be very quick-growing compared to non-riparian trees.

10.1.4 Federal Flood Programs

National Flood Insurance Program

The NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in participating communities. For most communities participating in the NFIP, FEMA has prepared a detailed Flood Insurance Study. The study presents water surface elevations for floods of various magnitudes, including the 1-percent annual chance flood and the 0.2-percent annual chance flood (the 500-year flood). Base flood elevations and the boundaries of the 100- and 500-year floodplains are shown on Flood Insurance Rate Maps (FIRMs).

Roseville entered the NFIP on December 15, 1983. The date of the City's current effective FIRM is November 21, 2001. As a participant in the NFIP, the City must, at a minimum, regulate development in its floodplain areas in accordance with NFIP criteria. Before a permit to build in a floodplain area is issued, the City must ensure that two basic criteria are met:

- All new buildings and developments undergoing substantial improvements must, at a minimum, be elevated to protect against damage by the 100-year flood.
- New floodplain development must not worsen existing flood problems or increase damage to other properties.

Properties constructed after a FIRM has been adopted are eligible for reduced flood insurance rates. Such structures are less vulnerable to flooding since they were constructed after regulations and codes were adopted to decrease vulnerability. Properties built before the FIRM was adopted may be more vulnerable to flooding and related damage because they do not meet code or are located in hazardous areas. The first FIRMs for Roseville were available at the end of 1983. According to Placer County Assessor records, 131 of the 154 structures located in the City's regulated floodplain were constructed prior to January 1984 and are therefore considered pre-FIRM under the NFIP. The number of post-FIRM structures in the regulatory floodplain is extremely low because of the City's proactive floodplain management policy of not allowing new development in the floodplain.

The Community Rating System

The Community Rating System (CRS) is a voluntary incentive program within the NFIP. The CRS encourages floodplain management activities that exceed the minimum NFIP requirements (FEMA 2002). Flood insurance premium rates are discounted to reflect the reduced flood risk resulting from community actions meeting the following three goals of the CRS:

- Reduce flood losses.
- Facilitate accurate insurance rating.
- Promote awareness of flood insurance.

For participating communities, flood insurance premium rates are discounted in increments of 5 percent. For example, a Class 1 community would receive a 45 percent premium discount, and a Class 9 community would receive a 5 percent discount. (Class 10 communities are those that do not participate in the CRS; they receive no discount.) The CRS classes for local communities are based on 18 creditable activities in the following categories:

- Public Information
- Mapping and Regulations
- Flood Damage Reduction
- Flood Preparedness

Figure 10-1 shows the nationwide number of CRS communities by class as of May 1, 2016, when there were 1,391 communities receiving flood insurance premium discounts under the CRS program. Although insurance

premium discounts are one benefit of participation in the CRS, more important benefits result from activities that save lives and reduce property damage. Communities participating in the CRS represent a significant portion of the nation's flood risk as evidenced by the fact that over 68 percent of the NFIP's policy base is located in these communities. Communities receiving premium discounts through the CRS range from small to large and represent a broad mixture of flood risks, including both coastal and riverine flood risks.

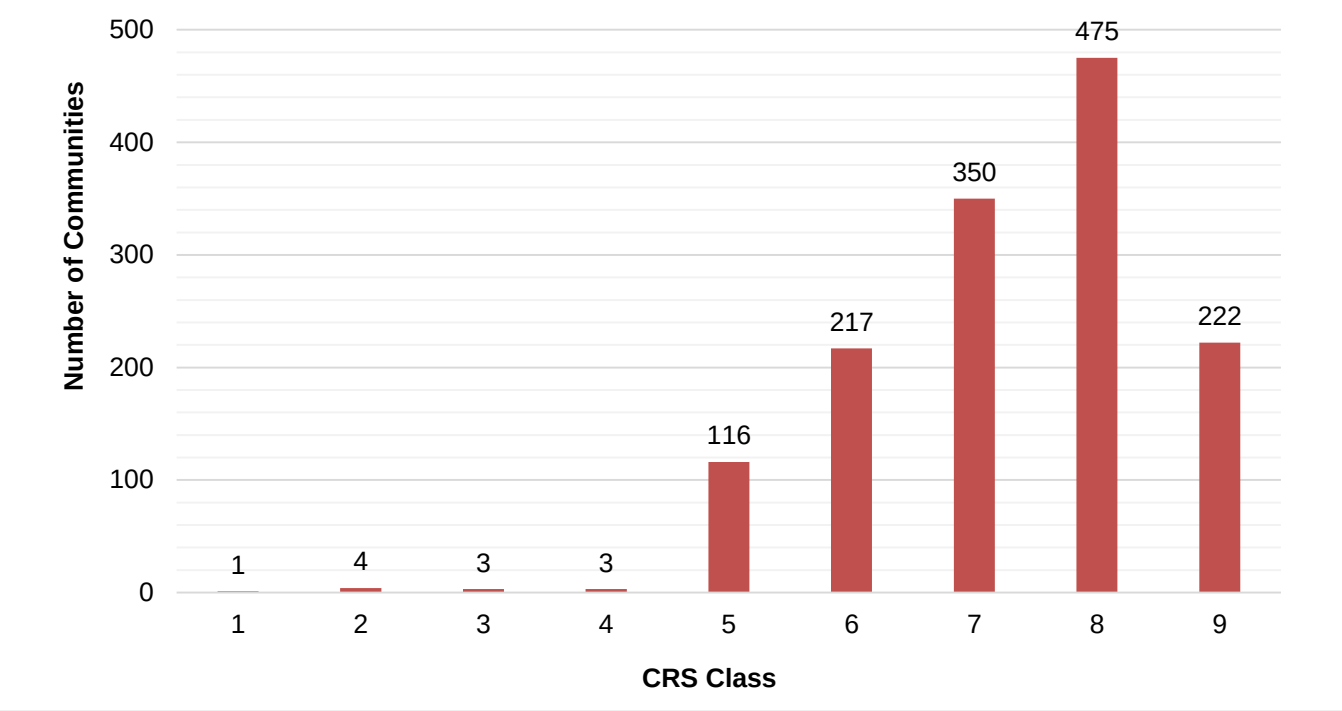


Figure 10-1. CRS Communities by Class as of May 1, 2016

The City of Roseville participated as a pilot-test community during CRS development in the late 1980s. The City began its official participation in the CRS program in 1991 and became the nation's first and only Class 1 community on October 1, 2006. This classification provides flood insurance policy holders in Roseville up to a 45-percent reduction in flood insurance premiums and represents an annual savings of $101,858 in flood insurance premiums; an average of $172 per year for each policy in force.

10.2 HAZARD PROFILE

10.2.1 Flooding Types

Flooding in Roseville is typically caused by high-intensity storms of relatively short duration (1 to 3 hours) concentrated on a stream reach with already saturated soil. In Roseville, two types of flooding typically occur:

- Flash floods that occur suddenly after a brief but intense and concentrated downpour. They move rapidly, end suddenly, and can occur in areas not generally associated with flooding (such as subdivisions not adjacent to a water body and areas serviced by underground drainage systems). Although the duration of these events is usually brief, the damage they cause can be severe. Flash floods cannot be predicted accurately and happen whenever there are heavy storms.

- Riverine floods, which are described in terms of their extent (including the horizontal area affected and the vertical depth of floodwater) and the related probability of occurrence (expressed as the percentage chance that a flood of a specific extent will occur in any given year).

Some localized flooding not associated with creek or stream overflow occurs in Roseville when rainfall runoff volumes exceed the design capacity of drainage facilities or when there are no drainage facilities to control flows. The City has attempted to address this type of flooding with regulations that require an "overland release" of stormwater generated at a site to a recognized stormwater facility. The City also requires mitigation of any increase in runoff generated from new development. However, some developments and facilities in the City were put in place before these policies were adopted.

10.2.2 Past Events

Correspondence from the 1930s between the U.S. Army Corps of Engineers and the City of Roseville indicated a need for establishing flood control measures along Dry, Cirby, and Linda Creeks. The flood of February 1986 was the largest flood on record at its time. This flood caused substantial property damage and was considered to be a 70- to 100-year event, depending on location. In January 1995, the City was subject to flooding that exceeded the 1986 flood event in most streams in Roseville, and that flood is now considered to be the flood of record.

Based on data from the National Climactic Data Center and the University of South Carolina's Spatial Hazard Events and Losses Database for the United States, 16 major flood events were reported in Placer County between January 1950 and December 2009, with an estimated $49,115,460 in property damage. Table 10-1 shows the estimated damage from flooding in Placer County that impacted Roseville from 1973 to 2009.

Table 10-1. Reported Damage from Major Flooding in Roseville (1973 to 2009)

Date	Reported Damage (not adjusted for inflation)
January 1973	$86,207
March 1983	Not Available
February 1986	$5,000,000 (Roseville only)
January 1995	$8,000,000 Total ($4.4 million structural)
January 26,1997	$43,600 (structural)
February 1998	$20,000 (structural)
December 17, 2005	$2,000,000 (county-wide)

Significant flood events impacting the City of Roseville are discussed below with respect to damage, frequency, injuries and fatalities. Unreported injury or illness may be associated with each event. In addition to the events discussed below, flooding occurred during other storms in 1950, 1952 and 1963. However, little information is available to define the extent and impacts of these flooding events.

December 1955

Flooding occurred primarily along Dry Creek. Homes in the Douglas Boulevard area were surrounded by floodwater, and one family was evacuated. Douglas Boulevard was impassable, and pavement was damaged. Royer Park was inundated, and floodwater extended across Park Drive. No injuries or fatalities were reported.

April 1958

This flood, which continued for at least 12 hours, was the second largest event on record at the time. Flooding was most severe on Sunrise Avenue in the southeast portion of the City, on Douglas Boulevard, in the Royer Park area, and on Riverside Avenue at Dry Creek. Agricultural damage occurred along Dry Creek immediately west of

the City. Many homes and businesses were surrounded by floodwater. Several families were evacuated by boat from homes in the Columbia Street and Douglas Boulevard areas. At Royer Park, floodwater covered the ball field and extended across Park Drive. Part of the sewage treatment plant was flooded, but the plant remained operational. No injuries or fatalities were reported.

October 1962

This flood was considered the flood of record at the time. Over 9 inches of rain fell. Creeks overflowed their banks throughout the City, but the areas most affected were along Linda Creek in the Sierra Gardens Subdivision and along Dry Creek. A number of families were evacuated from their homes on Lee Way and Douglas Boulevard. Royer Park was completely inundated for a time, and one deer in the zoo was drowned before animals could be evacuated. Other flood losses in the park included bank erosion, destruction of fencing, damage to a footbridge, and damage to a recreation building and the park office. Restoration of the park required two weeks. Water mains were damaged in the Cresthaven and Atlantic Street areas. The Dry Creek Bridge on Riverside Avenue and the Antelope Creek Bridge on Atlantic Street were damaged. No injuries or fatalities were reported.

December 1964

During this flood event, the fire and police departments evacuated four families when floodwater from Linda Creek surrounded their homes on Champion Oaks Drive and Lee Way. Dry Creek overflowed its banks in several locations, and flood-borne debris was removed in an effort to keep the stream flowing at Booth Road and the Southern Pacific railroad tracks. Floodwater at this location was deep enough to submerge a car stalled in the underpass. Stream-bank erosion occurred along the east bank of Dry Creek behind the Campfire Girls lodge on Sutter Avenue. No injuries or fatalities were reported.

January 1969

A series of downpours beginning on January 16, 1969 caused flooding along Dry Creek, affecting Royer Park, the Champion Oaks area, and the intersection of Cirby Way and Old Auburn Road. Rising water from Linda Creek crested at the doorsteps of five homes along Champion Oaks Drive. City crews prepared to load belongings into vehicles if floodwater entered the homes. A second storm during the week of January 25, caused rising water in Linda Creek that led to the evacuation of five homes on Champion Oaks Drive. Dry Creek Bridge on Douglas Boulevard at Royer Park was closed when Dry Creek washed out fill placed by City crews in response to an earlier washout. No injuries or fatalities were reported.

January 1970

Heavy rains and severe winds caused flooding in Roseville and throughout northern California. High water levels were reported on Champion Oaks Way, Subway Road, and Royer Park. No injuries or fatalities were reported.

January 1973

Heavy rain and high winds impacted northern California border during the week of January 16, 1973. City crews kept watch on Linda Creek at Champion Oaks Drive and closed Subway Road because of flooding. Royer Park flooded after Dry Creek overflowed its banks. No injuries or fatalities were reported.

March 1983

This flood damaged approximately 25 residences along Linda and Cirby Creeks. Portions of Royer Park and areas in the Sierra Lakes Mobile Home Park were inundated. Dry Creek overflowed the Darling Way and Riverside Avenue bridges and flooded six businesses along Riverside Avenue. No injuries or fatalities were reported.

February 1986

This flood caused widespread damage in most of the Dry Creek basin. Nearly all bridges and culverts were overtopped, with 30 sustaining embankment damage. The crossing at Rocky Ridge Drive washed out. Two bridges over Dry Creek were damaged, and street cave-ins occurred at a number of locations. Approximately 209 homes along Dry, Linda, and Cirby Creeks reported flood damage, with water levels up to 5 feet above finished floor levels. The Roseville City Library was closed due to flooding. Floodwaters reached the foundation of the Public Safety Building but did not cause any damage. One fatality associated with this flood event was reported.

January 1995

The January 1995 flood event (Figure 10-2) exceeded the flood event of 1986 on Cirby and Linda Creeks. This event is now considered the flood of record for Dry Creek based on flood heights. The flood was calculated to be a 100-year event. This flood resulted in 358 structures in the Dry Creek Basin being inundated by floodwaters. No injuries or fatalities were reported.



Figure 10-2. Dry Creek Flooding, January 1995

January 1997

Flood events in 1997 were some of the most severe on record for the region. An isolated storm event typical for the Roseville area occurred on soils saturated from repetitive storm events, causing a flash flood. This flooding resulted in 21 structures being inundated with floodwater. The impact of this event was significantly reduced by the partially completed Cirby, Linda, and Dry Creek flood control project. No injuries or fatalities were reported.

February 1998

A small flood occurred on February 3, 1998, resulting in eight structures being inundated by floodwater in the Dry Creek Basin (Figure 10-3). This event was caused by an isolated storm event centered over the basin. No injuries or fatalities were reported.



Figure 10-3. Business Flooding, February 1998

10.2.3 Location

Primary Flood Sources

Upstream flows generated in Placer County enter the City of Roseville's creeks and tributaries from the east and north. Picking up additional stormwater runoff, the creek systems flow west-southwest through Roseville. These flows continue to move west-southwest, passing through Placer, Sacramento, and Sutter Counties to their ultimate destination, the Sacramento and American Rivers.

Roseville is located in portions of two major drainage basins: the Pleasant Grove Creek Basin and the Dry Creek Basin. Pleasant Grove Creek and its tributaries drain most of the western and central areas of the City, and the Dry Creek Basin and its tributaries drain the rest of the City.

The Dry Creek system has year-round flow in its major water courses, and the Pleasant Grove system is intermittent, with only seasonal flow. Since 1950, there have been no reports of structural flood damage along Pleasant Grove Creek. Due to the City's floodplain management policies, no structures in the Pleasant Grove Creek Basin are presently subject to flooding. The focus of flood hazard management is the Dry Creek Basin.

Seven creeks and streams that drain the 80-square-mile Upper Dry Creek Basin pass through and join within the city limits of Roseville. Three of these creeks have primary flooding impacts on the City: Cirby, Dry, and Linda Creeks.

Regulatory Floodplain

The science available at the time that most of the City of Roseville was developed did not accurately project flood heights that could occur from typical rainfall events in the region. Development therefore occurred in areas needed for stormwater conveyance, with insufficient levels of flood protection. Development now exists in low-lying areas adjacent to creek or stream systems needed to convey the over-bank flooding that can occur during storm events.

The City eventually modeled flooding using the best available hydrologic and hydraulic science to better reflect actual rainfall events that can impact the City. This modeling generated a projection of flood heights and areas of inundation that is well supported by conditions observed during the 1986 flood. The City has since used this information to create and enhance its floodplain management program to minimize flood risk to all new developments. Based on the detailed modeling, the City identified a regulatory floodplain that exceeds the SFHA mapped by FEMA. Figure 10-4 shows FEMA's mapped floodplain and the City's regulatory floodplain, as authorized by the Roseville City Code. The City has mapped and regulates 2,372 acres as floodplain, which includes the 1,529 acres of floodplain identified by FEMA on the current effective FIRM for the City. The regulatory floodplain is the area susceptible to risk from flooding based on City-approved studies. These areas are based on detailed hydrologic and hydraulic floodplain modeling that meets or exceeds FEMA criteria for mapping and modeling floodplains. The flood event used to delineate these boundaries is referred to as "the regulatory flood" to differentiate it from the "base flood" used by FEMA.

In many portions of the City, the Nolte Future Floodplain has been used to designate floodplain boundaries. The Nolte Future Floodplain defines floodway and floodway fringe boundaries within the floodplain. The floodway fringe is an area along the boundary of the floodplain that, if totally obstructed, would not result in more than a 1-foot rise in the water surface elevation. The floodway constitutes the remainder of the floodplain area and is typically where floodwaters have the most velocity.

10.2.4 Frequency

Flood magnitude measurements reflect statistical averages only; it is possible for two or more rare floods (with a 100-year or higher recurrence interval) to occur within a short time period. Assigning recurrence intervals to historical floods on different streams can help indicate the intensity of a storm over a large area. For example, the 1995 flood event was determined to be a 100-year flood on Dry Creek and a 50-year flood on Linda Creek.

Recent history has shown that Roseville can expect an average of one episode of minor river flooding each winter. Recent flooding resulting in property damage has occurred about every 3 to 5 years since 1950, except for the period from 1973 to 1981, when no significant flooding occurred. The frequency of flood events that cause significant damage has decreased significantly over the past 10 years due to City efforts to mitigate flood risk. Exposure to events that could cause significant flooding can be expected every 5 to 10 years. Additionally, the City can expect what is often referred to as "nuisance" flooding annually in the historic core due to urban drainage issues.

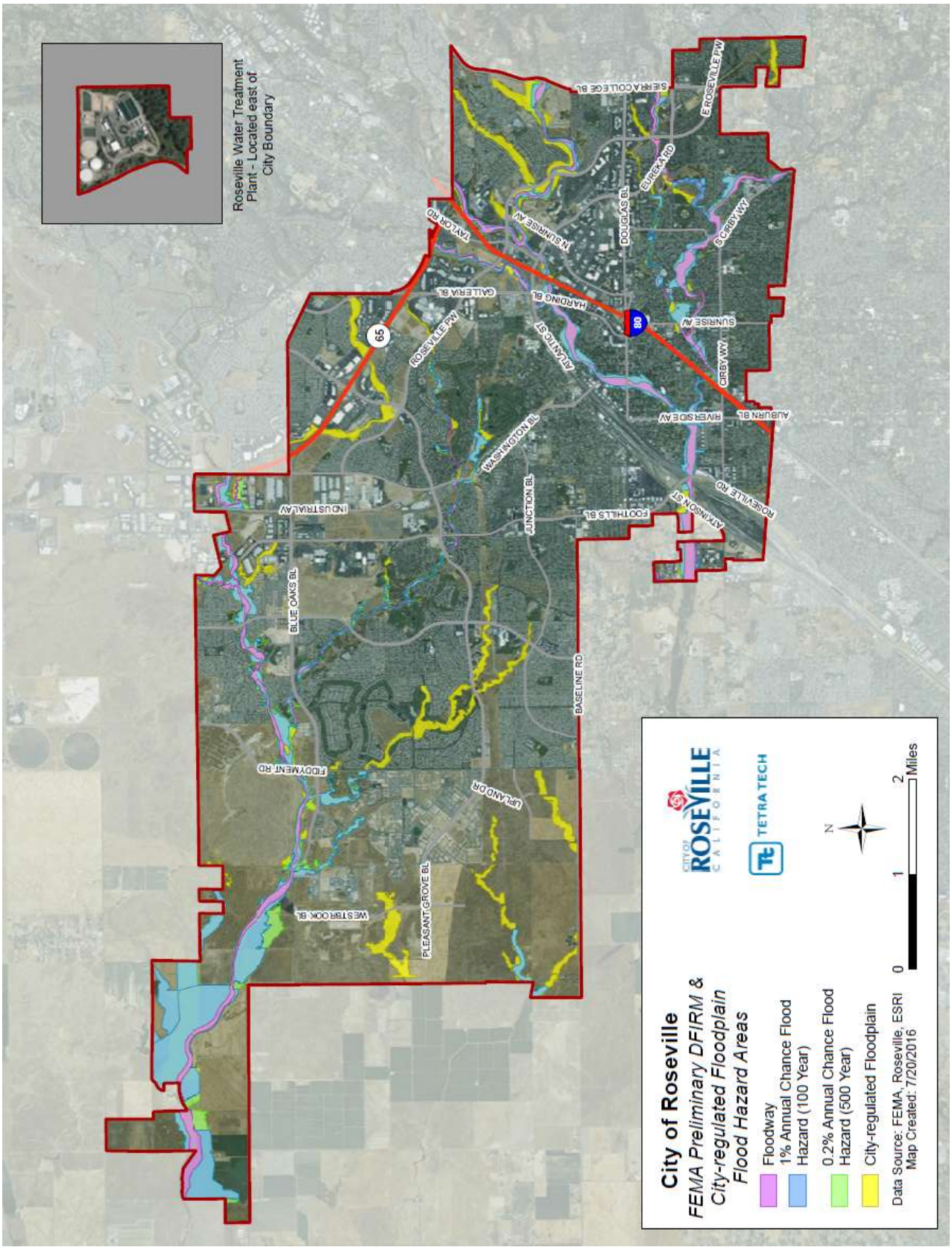


Figure 10-4. Floodplains

10.2.5 Severity

Table 10-2 shows observed flooding characteristics for the Pleasant Grove and Dry Creek basins, based on measurements made during past flood events.

Table 10-2. Observed Characteristics of Flooding

	Pleasant Grove Creek Basin	Dry Creek Basin
Approximate Base Flood Velocity (feet/second)[a]	0.5 to 8.0	2.0 to 14.0
Flow Rate (cubic feet per second)[b]	1,100 to 5,000	900 to 15,000
Base Flood Elevation (feet, National Geodetic Vertical Datum)		
Downstream limit	89.7	79.7
Upstream limit	150.0	210.0
Approximate Depth of Overbank Flooding (feet above existing grade)	0 to 2	0 to 3
Approximate Warning Time (hours)	3	3

a. Higher velocities were observed in the channel; lower velocities were observed in the overbank area
b. 1 cubic foot is about 7.5 gallons

The City recently completed five phases of the seven-phase "Cirby-Linda-Dry Creek Flood Control Project." The purpose of this project is to reduce stormwater backup at constrictions and increase the overall capacity of the floodplain during storm conditions. Project structures were designed to provide 1 foot of freeboard above the projected 500-year flood elevation. This project significantly reduced the flood risk exposure for this area, but did not eliminate it.

10.2.6 Warning Time

Due to the extended precipitation needed to cause serious flooding, it is unusual for a flood to occur without warning. Flash flooding can be less predictable, but hazard areas can be warned in advanced of potential flash flooding. Typical warning times for Roseville range from 1 to 3 hours. The City's flood warning system has four ways to warn the public of potential flooding:

- A comprehensive graphical display of stream levels, broadcast on Channel 14 or 73, with the status of the warning
- The "Stream Level" link on the City of Roseville home web page (www.roseville.ca.us)
- An automatic telephone dialing system to problem areas
- Flooding status broadcasted on radio station 530 AM.

Numerous stream flow and rain gauges form the City's stream monitoring system for the Upper Dry Creek Drainage Basin. These stations are placed at strategic locations throughout the drainage basin. For example, one is mounted on the floodwall just upstream from the pedestrian bridge that crosses between Tina Way and Marlin Drive and another is on Dry Creek at the Vernon Street Bridge. Each station transmits information via radio antenna to a central computer. Stream level information from five of the most critical stream level gauges is broadcasted on cable Channel 14/73 and on the City's web page during significant storm events. City staff uses this information in deciding whether to advise residents to evacuate. The goal is to provide up to 3 hours of advance warning. The continuously changing variables of precipitation, stream levels, and forecasts have a major effect on meeting this goal. The display shown on Channel 14/73 consists of a set of basic graphics shown in 15-second intervals:

- The first, which is shown only once for every complete cycle, is a City of Roseville map that includes major roadways (Vernon Street, Douglas Boulevard, Cirby Way, etc.), the three major streams (Dry Creek, Linda Creek, and Cirby Creek) and the five stream level gauge locations. Residents living in a

designated floodplain can determine which of the five stream gauges best represents their neighborhood. Once this is established, it is important to focus on how the streams are reacting to the weather conditions.

- Following this display, a more specific map identifies a single stream gauge's location in relation to nearby roadways and streams.
- Transmitted information from the gauges is presented in visual formats that include the current stream depth and the stream depth over the past six hours.

The stream level graph is divided into four colored categories of flood depth stages (see Figure 10-5):

- Blue (Normal Stage)—Stream level conditions are normal and safe.
- Green (Advisory Stage)—City staff is continuously monitoring creek levels and weather conditions. Residents should be closely watching for further information about flooding in their area.
- Yellow (Warning Stage)—There is a possibility of flooding in this area. Necessary precautions need to be taken to secure personal property and safety.
- Red (Critical Stage)—Flooding appears imminent in this area. Residents should evacuate their homes.

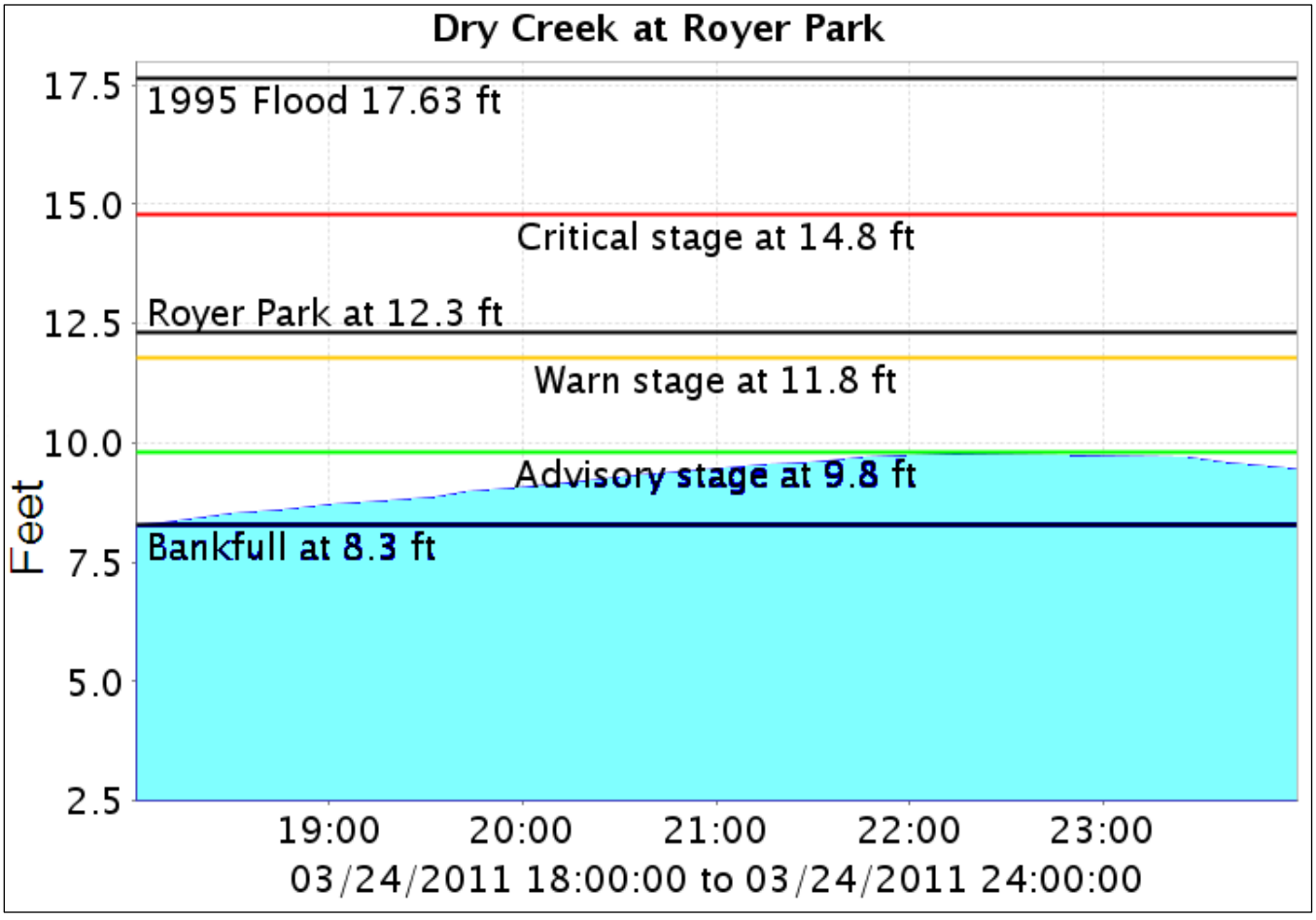


Figure 10-5. Example of Stream Gauge Graphic Display

The numeric values of the stream depths associated with the flood depth stages are shown on the vertical bar graph for all five of the stream level gauges, and reference stream levels are identified for each gauge. For example, the stream level during the 1995 flood is marked for each location. Also identified are other reference

points such as roadway surface, bridge and/or top of berm levels. This enables viewers to identify and understand the present stage of the stream in relation to known benchmarks.

The City of Roseville also has an automated telephone dialing system. During significant storm events, this system is used to phone residents and businesses in the floodplain and provide recorded messages containing important information. The message to be played will depend on the flood threat in the area at that time.

10.3 SECONDARY HAZARDS

The most significant secondary hazard for flooding in Roseville is bank erosion. The dangers of bank erosion often are greater than those of flooding. Flooding is responsible for landslides when high flows over-saturate soils on steep slopes, causing them to fail. Hazardous materials spills are also a secondary hazard of flooding if storage tanks rupture and spill into streams, rivers or drainage sewers.

10.4 EXPOSURE

The Level 2 HAZUS-MH protocol was used to assess the risk and vulnerability to flooding in the planning area. HAZUS-MH uses census data at the block level, FEMA floodplain data, and GIS data for the City's regulatory floodplain. Where possible, the HAZUS-MH data for this risk assessment was enhanced using GIS data from the City and from county, state and federal sources. The following sections describe risk exposure and vulnerability of the general building stock, critical facilities and infrastructure, land use, and environment within the City's mapped regulatory floodplain.

10.4.1 Population

Estimates of the population living in the floodplain in the planning area were generated by analyzing census blocks that intersect with the City's regulatory floodplain. Census blocks do not follow the same boundaries as the floodplain. Therefore, the methodology used to generate these estimates counted census block groups whose centers are in the floodplain or where the majority of the population most likely lives in or near the floodplain. HAZUS-MH estimated the number of buildings within the floodplain in each block, and then estimated the total population by multiplying the number of residential structures by the City average of 2.54 persons per household. Using this approach, the exposed population within the regulatory floodplain was estimated to be 330 (0.25 percent of the total City population). This is only slightly greater than the estimated 322 people exposed in the SFHA.

10.4.2 Property

Structures in the Floodplain

Table 10-3 summarizes the number and type of structures in the floodplain, as calculated from the Level 2 HAZUS-MH analysis. There are 210 structures in the City of Roseville regulatory floodplain. This represents less than 1 percent of the total structures in the City. It includes the 200 buildings identified within FEMA's SFHA.

Table 10-3. Structures Within the SFHA and the Roseville Regulatory Floodplain

	# of Structures in Mapped Floodplain						
	Residential	Commercial	Industrial	Religion	Government	Education	Total
FEMA-Preliminary Mapped SFHA	157	34	7	1	0	1	**200**
Roseville Regulatory Floodplain	156	38	11	2	2	1	210

Exposed Value

The value of exposed buildings within the City's regulated floodplain area and the SFHA was generated using HAZUS-MH and is summarized in Table 10-4 and Table 10-5. This methodology estimated $289 million worth of building-and-contents exposure, representing 0.97 percent of the total building-and-contents value in the City.

Table 10-4. Value of Exposed Buildings Within the FEMA SFHA

	Value of Exposed Property in the Mapped Floodplain			% of Total Value in the City
	Buildings	Contents	**Total**	
Residential	$24,700,000	$12,400,000	$37,000,000	0.2%
Commercial	$75,600,000	$77,000,000	$152,600,000	1.8%
Industrial	$2,400,000	$2,600,000	$5,000,000	0.4%
Religion	$0	$0	$0	0.00%
Government	$0	$0	$0	0.00%
Education	$1,200,000	$1,200,000	$2,500,000	0.2%
Total	**$103,900,000**	**$93,200,000**	**$197,100,000**	**0.7%**

Table 10-5. Value of Exposed Buildings Within the Roseville Regulatory Floodplain

	Value of Exposed Property in the Mapped Floodplain			% of Total Value in the City
	Buildings	Contents	**Total**	
Residential	$39,719,211	$19,859,606	$59,578,817	0.32%
Commercial	$84,278,680	$87,860,805	$172,139,485	2.08%
Industrial	$24,855,494	$25,109,167	$49,964,662	4.30%
Religion	$1,337,875	$1,337,875	$2,675,749	1.07%
Government	$1,032,368	$1,032,368	$2,064,736	1.22%
Education	$1,231,683	$1,231,683	$2,463,365	0.23%
Total	$152,455,311	$136,431,504	$288,886,814	0.97%

Land Use in the Floodplain

To preserve the natural and beneficial functions of open space resource areas adjacent to the floodplain areas of Roseville, the City has adopted policies under the Open Space and Conservation Element of its General Plan that include the following:

- Preserve and rehabilitate continuous riparian corridors and adjacent habitat along the City's creeks and waterways.
- Require dedication of the 100-year floodplain or comparable mechanism to protect habitat and wildlife values in perpetuity.
- Restrict development within the 200-year floodplain subject to the State of California Urban Level of Flood Protection Criteria.
- Require preservation of contiguous areas outside the 100-year floodplain as merited by special resources or circumstances, which may include, but are not limited to, sensitive wildlife or vegetation, wetland habitat, oak woodland areas, grassland connections in association with other habitat areas, slope or topographical considerations, recreation opportunities, and maintenance access requirements.
- Limit recreation activities within the 100-year floodplain and require additional setback areas for trails and other recreation uses so that natural resource areas are not adversely impacted.
- Provide protection and enhancement of fishery resources, including continued coordination with the California Department of Fish and Wildlife to release water to Linda Creek.

Because of these policies, a large portion of the floodplains within Roseville is held for open space use, much of it in a natural or beneficial state. Currently, 1,491.4 acres (97 percent) of the regulatory floodplain within Roseville is designated for open space use, as defined in the Open Space and Conservation Element of the General Plan.

10.4.3 Critical Facilities and Infrastructure

Flooding poses numerous risks to critical facilities and infrastructure:

- Roads or railroads that are blocked or damaged can prevent access throughout the area and can isolate residents and emergency service providers needing to get to vulnerable populations or to make repairs.
- Bridges washed out or blocked by floods or debris from floods also can cause isolation.
- Creek or river floodwaters can back up drainage systems, causing localized flooding.
- Culverts can be blocked by debris from flood events, also causing localized urban flooding.
- Floodwaters can get into drinking water supplies, causing contamination.
- Sewer systems can be backed up, causing waste to spill into homes, neighborhoods, rivers and streams.
- Underground utilities can also be damaged.

The inventory of critical facilities in Roseville's SFHA and regulatory floodplain is shown in Table 10-6 and Table 10-7.

Table 10-6. Critical Facilities in Flood Area

	Critical Facilities within the SFHA	Critical Facilities within the City of Roseville Regulated Floodplain
Medical & Health Services	0	0
Government Function	0	0
Protective Function	0	0
Schools	0	0
Societal Function	2	2
Hazmat	0	0
Other Critical Function	17	1
Total	**19**	**3**

Table 10-7. Critical Infrastructure in Flood Areas

	Critical Infrastructure within the SFHA	Critical Infrastructure within the City of Roseville Regulated Floodplain
Water Supply	0	4
Wastewater	5	4
Power	0	0
Fuel Storage	0	0
Communications	1	2
Bridges	11	27
Total	**17**	**18**

The City of Roseville has determined that the following major roadways and stream crossings (bridges or culverts) would be impassable during a 100-year flood event:

- Dry Creek Road Crossings
- Cirby Creek Road Crossings

  - Vernon Street
  - Riverside Avenue
  - Darling Way
  - Douglas Boulevard
  - Folsom Road
- Linda Creek Road Crossings
  - Rocky Ridge Drive
  - Champion Oaks Drive
  - Sierra College Boulevard
  - Sunrise Avenue
  - Coloma Way
  - Oakridge Road
  - Sierra Gardens Drive
  - Huntington Drive
- Miners Ravine
  - Sierra College Boulevard

10.4.4 Environment

Flooding is a natural event, and floodplains provide many natural and beneficial functions. Nonetheless, with human development factored in, flooding can impact the environment in negative ways:

- Migrating fish can wash into roads or over dikes into flooded fields, with no possibility of escape.
- Pollution from roads, such as oil, and hazardous materials can wash into rivers and streams.
- Pollutants carried by floodwaters can settle onto normally dry soils, polluting them for agricultural uses.
- Human development, such as bridge abutments and levees, and logjams from timber harvesting can increase streambank erosion, causing rivers and streams to migrate into non-natural courses.

With much of Roseville's regulatory floodplain zoned for open space use, the City has taken significant steps to preserve the natural and beneficial functions of the floodplain, while at the same time reducing the risk exposure to the built environment. Still, all vegetation and wildlife resources and corridors in the floodplain open space system—grasslands, oak woodlands, riparian areas, and seasonal wetlands—are exposed to the flood risk.

10.5 VULNERABILITY

10.5.1 Population

Flooding can be a deadly hazard. Roads running through low-lying areas prone to sudden and frequent flooding are a serious threat. Motorists often attempt to drive through barricaded or flooded roadways. Because as little as 18 to 24 inches of water moving across a roadway can carry away most vehicles, floods can present significant potential safety risks. The second largest potential for injuries from flooding results from people walking or playing in or near flooded areas. Generally, floods kill people in one of two situations: when people ignore basic safety precautions (such as evacuations and warnings), and when a flash flood hits an area with no warning.

Although it is possible to analyze life and safety impacts resulting from the flood hazard, injuries and casualties were not estimated for this hazard. One flood-related fatality in Roseville has been recorded, but the flood hazard is not generally considered to pose a serious risk to life in this area, for the following reasons:

- Flooding in Roseville tends to be rapid in terms of the rise and fall of floodwaters. Because of the City's geographical location in the watershed, floods tend to come and go quickly as they move toward their drainage endpoints, thereby decreasing the threat that people become trapped by floodwaters.
- The City has made it a priority to warn and educate its citizens on the dangers and impacts of flooding. The City implements public outreach programs that provide information on flood warnings, property protection, flood safety, and flood insurance. The City also has developed a comprehensive flood warning program that can deliver real-time data to citizens and emergency management personnel through cable

television and the Internet. The program can provide a warning up to 3 hours before a flood event occurs in the 100-year floodplain. The City's approach has resulted in an educated and well-informed constituency.

The June 2004 City of Roseville Emergency Operations Plan, most recently updated in 2010, directs the City of Roseville Emergency Management Organization, coordinates the actions of emergency operations center staff, establishes operational priorities, ensures development and implementation of strategies to meet the needs of the emergency, works with local elected officials on issues related to emergency response and recovery, identifies procedures for evacuation, communicates with the media, coordinates response with outside agencies, and ensures the safety of responders. The Emergency Operations Plan follows California's Standardized Emergency Management System (SEMS) format (see Section 4.9.2).

Regarding health concerns, one of Roseville's sewage treatment facilities is located on the downstream end of Dry Creek. This facility is located above the 100-year floodplain but has overflow ponds within the floodplain. When plant influent loads exceed the plant capacity, untreated sewage is discharged to the overflow ponds. If this scenario occurred simultaneously with a 100-year flood, floodwaters could be contaminated. This situation has not occurred during past flood events, and its probability of occurrence is low. Therefore, its potential impacts on health were not estimated as part of this assessment.

10.5.2 Property

Flood Insurance

Flood insurance statistics help identify vulnerability by showing where there is claim activity, where there is a high rate of flood insurance in force, and where flooding may be occurring in areas not identified as flood-prone. Table 10-8 lists flood insurance statistics for the City of Roseville. The total of $9.9 million paid on 292 claims through July 31, 2010 represents an average of $33,923 per claim.

Table 10-8. Flood Insurance Statistics for the City of Roseville

Date of Entry Initial FIRM Effective Date	December 15, 1983
Current FIRM Effective Date	November 21, 2001
Number of flood insurance policies in force as of 3/31/2016	591
Total annual premium	$311,643
Average policy cost	$527 (national average = $412)
Total insurance coverage	$176,339,200
Total claims filed (1978 to 11/30/2009)	292
Value of claims paid	$9,905,478
Average claim paid	$33,923
Number of flood insurance policies in force within the SFHA	111
X Standard/AR/A99 policies	18
Preferred Risk Policies	462

Flood insurance statistics relevant to reducing flood hazard are as follows:

- Approximately 76 percent of the insurable structures in the SFHA are currently covered by a flood insurance policy. This is well above the national average. According to a study conducted for the NFIP, about 49 percent of single-family homes in special flood hazard areas nationwide are covered by flood insurance.
- 81.2 percent of the current policies in force are for properties outside the SFHA.

- The high percentage of policies outside the SFHA is probably due to the impact of the Cirby-Linda-Dry Creek Flood Control Project and resulting remapping.

Flood Loss Potential of Structures

The HAZUS-MH program calculates losses to structures from flooding by looking at depth of flooding and type of structure. Using historical flood insurance claim data, HAZUS-MH estimates the percentage of damage to structures and their contents by applying established damage functions to an inventory. This inventory comes pre-loaded within the HAZUS-MH model and is based on data from the U.S. Census, state databases, the U.S. Highway Administration, and other sources. Default values can be overridden with locally generated data if available. For this analysis, local data on facilities was used to assess flood risk in the City of Roseville. The City has created a flood inventory database of site-specific information for each property in the regulatory floodplain. This database includes information for the following basic categories:

- Buildings in the regulatory floodplain
- Building use
- Building area
- Building value
- Permit history
- Flood loss history
- Regulatory flood elevation
- Base flood elevation
- Pre- and post-FIRM structures
- Elevation of lowest adjacent grade
- Finished floor elevation

The HAZUS-MH analysis is summarized in Table 10-9 through Table 10-11. It is estimated that there would be up to $2.16 million of flood loss from a 10-year flood event. This represents less than 0.01 percent of the total assessed value of the City. It is estimated that there would be up to $7.04 million of flood loss from a 100-year flood event. This represents 3.6 percent of the total value exposed to the flood hazard in the regulatory floodplain and 0.02 percent of the total assessed value of the City. It is estimated that there would be $7.14 million of flood loss from a 500-year flood event, representing 3.4 percent of the total value exposed to the flood hazard in the regulatory floodplain and 0.02 percent of the total assessed value for the City.

Table 10-9. Estimated Flood Loss for the 10-Year Flood Event (Preliminary FIRM)

	Estimated Flood Loss			% of Total
	Buildings	Contents	**Total**	Assessed Value
Residential	$1,275,990	$609,637	$1,885,627	<0.01%
Commercial	$70,143	$172,585	$242,727	<0.01%
Industrial	$16,759	$21,065	$37,825	<0.01%
Agricultural	$0	$0	$0	0.00%
Religion	$0	$0	$0	0.00%
Government	$0	$0	$0	0.00%
Education	$0	$0	$0	0.00%
Total	**$1,362,892**	**$803,287**	**$2,166,179**	**<0.01%**

Table 10-10. Estimated Flood Loss for the 100-Year and 500-Year Flood Events (Preliminary FIRM)

	Estimated Flood Loss						% of Total Assessed Value	
	Buildings		Contents		**Total**			
	100-year	500-year	100-year	500-year	**100-year**	**500-year**	100-year	500-year
Residential	$2,253,989	$2,253,989	$1,257,030	$1,257,030	$3,511,019	$3,511,019	0.02%	0.02%
Commercial	$686,896	$704,051	$2,366,376	$2,452,152	$3,053,271	$3,156,203	0.04%	0.04%
Industrial	$107,228	$107,228	$375,139	$375,139	$482,368	$482,368	0.04%	0.04%
Agricultural	$0	$0	$0	$0	$0	$0	0.00%	0.00%
Religion	$0	$0	$0	$0	$0	$0	0.00%	0.00%
Government	$0	$0	$0	$0	$0	$0	0.00%	0.00%
Education	$0	$0	$0	$0	$0	$0	0.00%	0.00%
Total	**$3,048,113**	**$3,065,269**	**$3,998,545**	**$4,084,321**	**$7,046,658**	**$7,149,590**	**0.02%**	**0.02%**

Table 10-11. Estimated Flood Loss for the Regulatory Floodplain

	Estimated Flood Loss			% of Total Assessed Value
	Buildings	Contents	**Total**	
Residential	$2,096,568	$944,975	$3,041,544	0.02%
Commercial	$1,322,410	$3,044,262	$4,366,672	0.05%
Industrial	$87,710	$254,384	$342,094	0.03%
Agricultural	$33,023	$240,436	$273,459	0.11%
Religion	$1,603	$9,617	$11,220	0.01%
Government	$0	$0	$0	0.00%
Education	$3,541,314	$4,493,675	$8,034,988	0.03%
Total	**$2,096,568**	**$944,975**	**$3,041,544**	**0.02%**

Repetitive Loss

Several federal government programs encourage communities to identify and mitigate "repetitive loss" properties. Nationwide, repetitive loss properties make up only 1 to 2 percent of the flood insurance policies currently in force, yet they account for 40 percent of the flood insurance claim payments. A report on repetitive loss structures by the National Wildlife Federation found that 20 percent of these structures are listed as outside the 100-year floodplain. In 1998, FEMA reported that the NFIP's 75,000 repetitive loss structures had already cost $2.8 billion in flood insurance payments.

FEMA identifies repetitive loss structures based on flood insurance payments. A repetitive loss area is the portion of the floodplain where numerous buildings have been subject to repetitive flooding. The purpose of identifying repetitive loss areas is to identify structures that are subject to the same risk but are not on FEMA's list because a flood insurance policy was not in force at the time of loss.

The list of repetitive loss properties maintained by FEMA identifies one commerical repetitive loss property within the City's regulatory floodplain. When Roseville first began its participation in the CRS program in 1991, the list of repetitive loss properties totaled 27 locations. Since then, flood protection and mitigation projects (including purchase and relocation of structures) have occurred at 23 repetitive loss locations and all 23 locations are no longer subject to repetitive flood losses. This represents an 85 percent reduction in exposure of insured properties to repetitive flood losses. This reduction is a prime example of how the City of Roseville's proactive flood mitigation practices have decreased the exposure of its citizens to the flood hazard, reduced the number of repetitive loss properties, and minimized reliance on post-disaster assistance provided by the federal government and the nation's taxpayers.

Figure 10-6 shows the location of Roseville's single remaining repetitive loss area. The City is required to address its repetitive loss area as a condition of its participation in the CRS program. This hazard mitigation plan meets this CRS requirement.

10.5.3 Critical Facilities and Infrastructure

HAZUS-MH was used to estimate the flood loss potential of critical facilities exposed to the flood risk. The model uses depth/damage function curves to estimate the percent of damage to a building and its contents and correlates that with an estimate of functional downtime (the time it will take to restore a facility to 100 percent of its functionality). The findings were as follows:

- On average, critical facilities would receive 5 percent damage to the structure and 19 percent damage to the contents during a 100-year flood event, and the estimated time to restore these facilities to full functionality would be 90 days.
- On average, critical facilities would receive 8 percent damage to the structure and 31 percent damage to the contents during a 500-year flood event, and the estimated time to restore these facilities to full functionality would be 160 days.

Six critical facilities are exposed and vulnerable to flooding in Roseville. A detailed vulnerability analysis of all critical facilities is on file with appropriate City staff and will not be published for public review. Of these six critical facilities, two have sufficient vulnerability to flooding to warrant mitigation strategies. Flood protection has been provided to the two churches identified, although it is not 100-year flood protection. The estimated depth of flooding for these two facilities is minimal and there have been no reports of flood damage. The County courthouse has been elevated to above the 100-year flood level. Mitigation strategies outlined in this Plan will mitigate the impact of flooding on the remaining facilities, including retrofitting the floodwall that protects the library and public safety building.

Of Roseville's two wastewater treatment plants, only the Dry Creek Plant is partially located in the floodplain. The storm sewer system is separate from the sanitary sewer system, so the sanitary sewers are not significantly affected by storm events.

10.5.4 Environment

The environment vulnerable to the flood hazard is the same as the environment exposed to the hazard. While flood events have historically caused significant damage to the environment, estimating damage can be difficult. Loss estimation platforms such as HAZUS-MH are not currently equipped to measure environmental impacts of flood hazards. The best gauge of vulnerability of the environment would be a review of damage from past flood events. Loss data that segregates damage to the environment were not available at the time of this Plan. Capturing this data from future events could be beneficial in measuring the vulnerability of the environment for future updates to this Plan.

10.6 FUTURE TRENDS IN DEVELOPMENT

Increased urbanization of western Placer County within the Pleasant Grove and Dry Creek Basins has resulted in the potential for increased flooding problems in Roseville. Land development typically results in increased hard surfaces and decreased vegetation, conditions that limit infiltration opportunities and, without adequate mitigation, can increase stormwater runoff rates and volumes and decrease the time required to reach peak discharge.

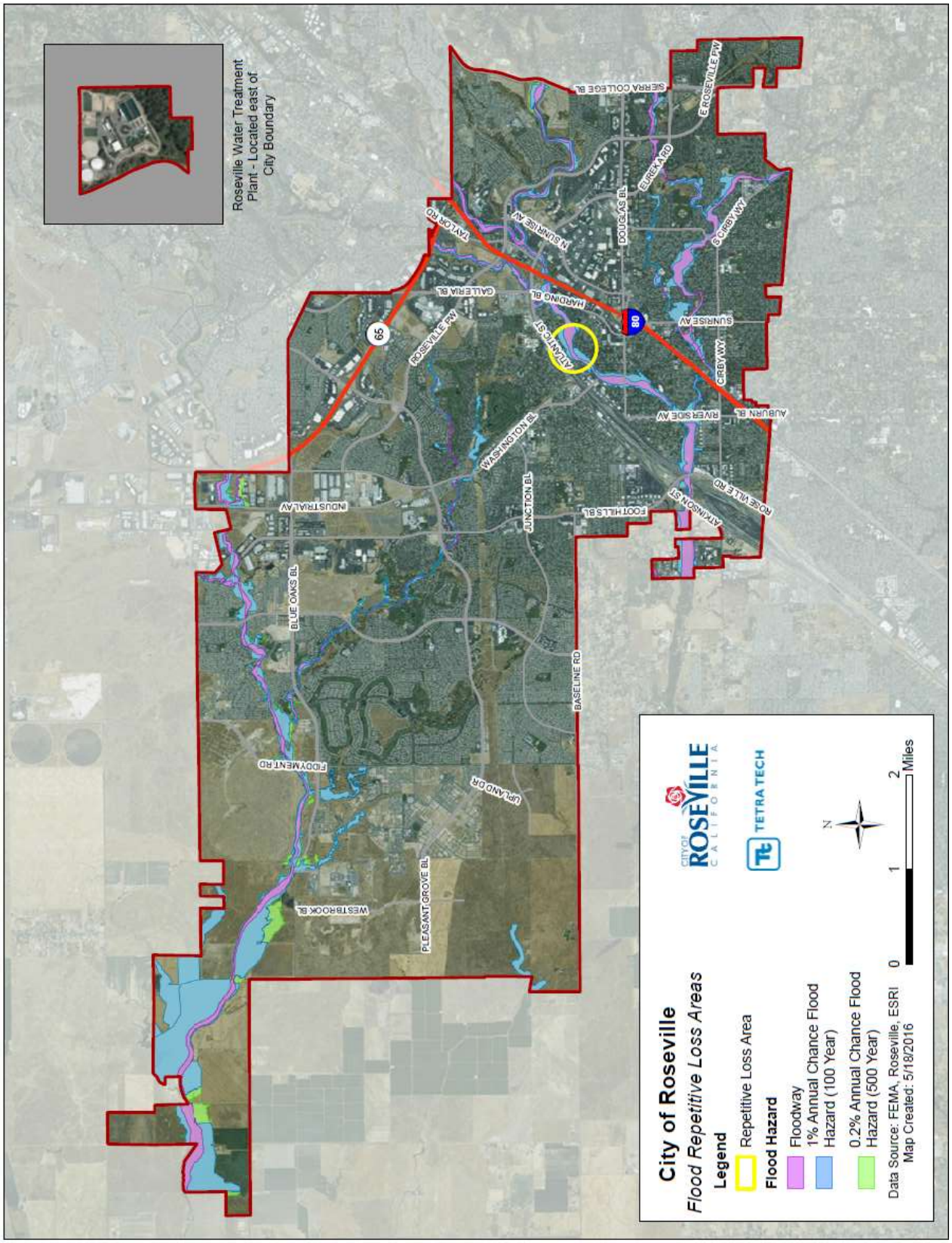


Figure 10-6. Repetitive Loss Area

Recognizing that typical growth patterns in California would impact and exacerbate the flood hazard problem, the City of Roseville took an aggressive, proactive approach to managing its floodplains through the development of its General Plan in 1992. Land-use categories are defined in the General Plan, with information on general uses, development, intensity, siting, and compatibility standards in relation to the flood hazard. City actions, such as land-use allocation, annexations, zoning, subdivision and design review, redevelopment and capital improvements, must be consistent with the General Plan.

Only three parcels in Roseville's regulatory floodplain are in the current buildable lands inventory. These parcels were all created before the City's flood-protection policies were enacted. Any new development on these parcels would be subject to strict regulations.

Because of policies, activities and mitigation measures in place in Roseville, it can be concluded that future land development trends will not impact or be impacted by flooding in Roseville as long as existing policies remain in force.

10.7 REVIEW OF EXISTING ORDINANCES, PROGRAMS, AND PLANS

The City of Roseville has a long-standing policy to proactively manage its floodplains. Under the guidance of the General Plan and its Safety Element, Roseville has been able to decrease the exposure of its citizens to flooding with a comprehensive approach that includes the following measures:

- Structural mitigation (flood control)
- Non-structural mitigation (elevation or acquisition)
- Regulations
- Stormwater management
- Flood warning
- Outreach and public education.

This section discusses each element except flood warning, which is discussed in Section 10.2.6).

10.7.1 Structural Mitigation

The following major flood control improvements have been accomplished by the City of Roseville since the January 1995 flood event:

- **Tina Way/Elisa Way Area—**Completed in 1996 at the cost of $3 million (100 percent City-funded), this project included channel excavation and construction of berms and floodwalls. The project removed 40 structures from the floodplain. Based on the pre-project location and construction of these structures, the entire area would have flooded during the 1997 flood if the improvements had not been implemented.
- **Riverside Avenue/Vernon Street Area—**Completed in 1996 at the cost of $2 million (90 percent funded by the Union Pacific Railroad and 10 percent funded by the City), the construction project included replacing culverts with a new bridge over Dry Creek. The net effect of this project lowered flood elevations for the reach by 5 to 7 feet and removed 150 structures from the floodplain.
- **Sunrise Avenue/Oakridge Drive and Champion Oaks Areas—**Completed in 2001 at the cost of $16.1 million ($8.7 million from FEMA and $7.4 million from the City), this project replaced culverts with a new bridge over Linda Creek at Sunrise Avenue. Twin 9-foot-diameter bypass pipes were installed in the Oakridge Drive area. The project included channel excavation and berm and floodwall construction. The project removed 233 structures from the floodplain; 44 structures remained in the floodplain, but these structures were less likely to be flooded. Features included maintaining a channel in

as natural a state as possible; planting over 500 oak trees; assigning biologists, ornithologists, and arborists to minimize environmental impacts; and monitoring fish passage and plantings for 5 years.

The City has spent more than $22 million on flood mitigation since the January 1995 flood event and has eliminated 445 flood-prone structures from the floodplain.

10.7.2 Non-Structural Mitigation

Structural mitigation projects reduced the flood exposure of property by 91 percent. Roseville offered mitigation through acquisition or home elevation to the remaining 9 percent of properties exposed to flooding. Completed in 2001 at the cost of $1 million (50 percent funded by FEMA, 40 percent funded by the property owners, and 10 percent funded by the City), the project included elevating 27 homes and acquiring (buying out) 4 homes. This effort resulted in 22 flood-prone homes with post-project floor levels higher than the floodplain level.

10.7.3 Regulations

The City of Roseville regulates its floodplain areas through land use, zoning, and other development restrictions, including a policy that prohibits most development within the 100-year floodplain area. Development in floodplain areas in Roseville is restricted by the following:

- 2035 General Plan, Safety Element, Flood Protection Component
- Improvement Standards
- Flood Damage Prevention Ordinance (Roseville Municipal Code [RMC] Chapter 9.80)
- Zoning Ordinance (RMC Chapter 19.18)
- State of California Urban Level of Flood Protection Legislation.

2035 General Plan, Safety Element, Flood Protection Component

The Safety Element of Roseville's General Plan sets forth goals and policies to address community safety concerns. The flood protection component identifies nine policies and 12 measures to achieve the following goals:

- Minimize the potential for loss of life and property due to flooding.
- Pursue flood control solutions that are cost-effective and minimize environmental impacts.

The policies and implementation measures are incorporated into the City's area-specific plans and are legally enforceable. Key to the City's flood-protection effort is the clear definition and application of floodplain boundaries. The flood protection component of the Safety Element establishes policies prohibiting new development in an identified floodplain or requiring an appropriate level of flood protection in design and construction for any development that does occur in the floodplain:

- **Infill Areas**—No development is permitted in the future floodway. Development may be permitted within the future floodway fringe. In accordance with the Nolte Future Floodplain definition, such development is limited to areas within the assumed cumulative 1-foot rise in water surface elevation, if it can be demonstrated that the development will not impact flood levels (see Figure 10-7).
- **Remainder of the City (specific plans and north industrial area)**—No development is permitted within the future floodplain (floodway and floodway fringe). Exceptions may be considered by the City on a case-by-case basis if encroachment is limited to only the future floodway fringe and would not result in any off-site increase in the water surface elevation (see Figure 10-8).

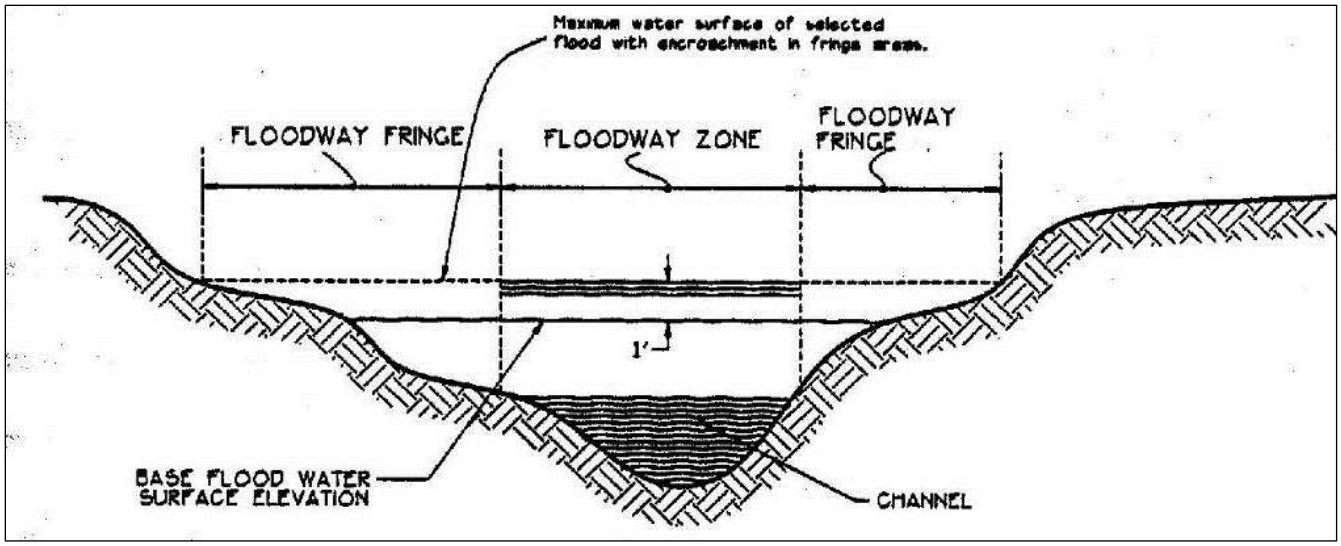


Figure 10-7. Floodplain Designation Cross-Sections for Infill Areas

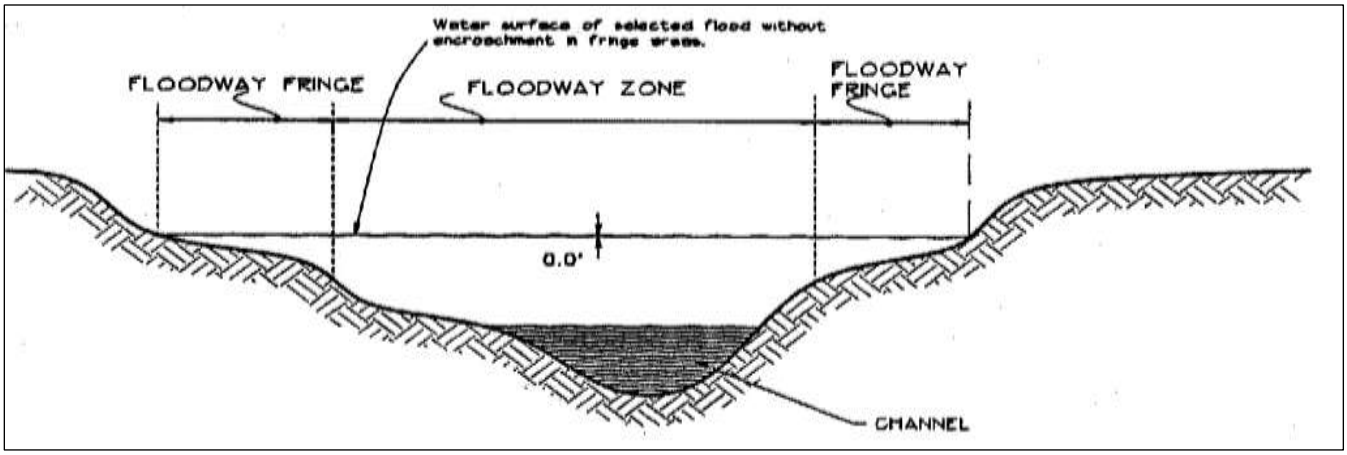


Figure 10-8. Floodplain Designation Cross-Sections for Areas Other Than Infill Areas

The City is committed to exploring environmentally sensitive flood control solutions, so this component is intended to be used in combination with the goals, policies, and implementation measures contained in the Open Space and Conservation Element of the General Plan. Emphasis is placed on protecting floodplain areas and on pursuing regional cooperation on flooding issues.

Improvement Standards

Roseville's improvement standards provide minimum standards for the following:

- Improvements dedicated to the public and accepted by the City for maintenance or operation
- Certain private works
- Improvements to be installed within existing rights-of-way and easements.

Improvement standards provide coordinated development of required facilities used by and for the protection of the public. They apply to, regulate, and guide preparation of traffic impact studies and the design and preparation of plans for construction of streets, highways, alleys, drainage systems, sewage systems, traffic signals, site access structures, water supply facilities and related public improvements. The standards also set guidelines for private

works that involve drainage, grading, tree removal, and related improvements. Section 10 of the improvement standards deals with drainage as follows:

- Requires residential lots developed in and adjacent to a designated floodplain to have a pad elevation a minimum of 2 feet above the regulatory flood elevation.
- Establishes stormwater management provisions that require mitigation of the increase in runoff generated by new development.
- Establishes provisions that require the building pads of structures built outside the regulatory floodplain to be a minimum of 1 foot above the 100-year water surface elevation for the site, assuming total blockage of drainage facilities.

Flood Damage Prevention Ordinance (RMC Chapter 9.80)

The flood damage prevention ordinance provides regulatory provisions for the floodplains of Roseville and is a requirement for participation in the NFIP. Chapter 9.80 of the RMC meets the NFIP requirements (44 CFR, Section 60.3) and includes the following standards that exceed those requirements:

- Adoption of a regulatory floodplain that includes areas not mapped by FEMA for application
- Requirement for elevation to 2 feet above the regulatory flood elevation for all structures within the flood hazard area
- Provisions to track substantial improvements to structures over a period of 10 years.

Zoning Ordinance (RMC Chapter 19.18)

Updated in September 2010, the zoning ordinance implements the City's general and specific plans and establishes regulations governing the use, placement, spacing and size of land and buildings. The zoning ordinance describes permits available through the Planning Division, when permits are needed, and the process for obtaining permits. This ordinance includes policy that prohibits most development within the 100-year floodplain. Exceptions to this policy exist primarily within the infill area and for the maintenance of essential services. Where encroachments may be permitted, improvements are required to minimize cumulative upstream and downstream effects.

The zoning ordinance identifies floodway and floodway fringe zoning districts. The floodway zoning district is not synonymous with FEMA's defined floodway. Development is generally prohibited in the floodway zone, with some level of development allowed in the floodway fringe zones with restrictions. The floodway fringe and floodway zone boundaries are based on previous hydraulic modeling conducted by the U.S. Army Corps of Engineers. The floodplain boundaries have changed over time since this modeling, but the zone district boundaries have not changed. The zone boundaries are updated on a parcel-by-parcel basis at a landowner's request using best available data.

State of California Urban Level of Flood Protection Legislation

The Central Valley Flood Protection Act of 2008 (SB 5) and its subsequent amendments (SB 1278, AB 1965 and AB 1259) include requirements and standards for flood protection that relate to land use planning. The legislation defines the Urban Level of Flood Protection (ULOP) as the level of protection necessary to withstand flooding that has a 1-in-200 (0.5-percent) chance of occurring in any given year (also referred to as the 200-year flood). This legislation directed local agencies to revise their general plans no later than July 2, 2015 to address flood risk for affected land use decisions based on an ULOP. It also required local agencies to revise their zoning codes to reflect the new standard within one year after the adoption of their revised general plans. In areas not subject to the ULOP standards, the 100-year floodplain standards will continue to apply.

The legislation defines five locational criteria that determine whether the ULOP applies. All areas of the City of Roseville meet two of the criteria (the City is an urban area of more than 10,000 people and the City is within the Sacramento-San Joaquin Valley), but only certain areas of the City meet the remaining three criteria:

- Areas mapped as either a special hazard area or an area of moderate hazard on FEMA's official (i.e., effective) Flood Insurance Rate Map
- Areas with a potential flood depth above 3 feet from sources other than localized conditions
- Areas within a watershed with a contributing area of more than 10 square miles.

As required by SB 5 as amended, the City of Roseville will implement the following:

- Updating the General Plan to define the City's regulatory floodplain as the combination of the City's mapped 100-year floodplain, the ULOP floodplain, and the FEMA floodplain.
- Amendment of the Land Use Element to include a reference to the Safety Element map identifying existing and planned development areas within the regulated floodplain as defined above.
- Amendment of the Open Space and Conservation Element setting and background to reflect the current regulatory environment.
- Amendment of the Safety Element to identify and revise flood hazard information and policies which protect communities from flooding risks as follows:

    - Revise the setting, outlook, and floodplain designations portions of the flood protection section to reflect the updated regulatory environment and to identify sources of floodplain mapping and hazard data.
    - Revise the floodplain designation policy and the implementation measures sections to include definitions and floodplain development regulations and implementation for the ULOP floodplain.
    - Provide new floodplain maps showing the extent of the FEMA 100-year, City's regulatory 100-year, and ULOP floodplains.

As required by adopted State law, the various City regulations requiring preservation of the floodplain and elevation of structures above the floodplain will include the ULOP floodplain, which is shown on Figure 10-9. After the modeling analysis was completed by the City, staff examined the data to determine the effect on land uses. Both the ULOP and the 100-year floodplains along Pleasant Grove Creek are almost entirely contained within existing or planned open space and recreation areas. This is generally because these areas of Roseville were planned or developed relatively recently in the City's history, and in compliance with the City's current General Plan goals and objectives restricting development in the floodplain.

The areas where the ULOP floodplain extends into residential or commercial areas are older areas of the City along Dry Creek, where development was planned and implemented prior to Roseville's initial participation in the NFIP in 1983 and prior to adoption of the City's current General Plan. These infill areas are already affected by the FEMA 100-year floodplain, and a few areas will now also be affected by the ULOP.

According to the City's GIS database, 4 of 11 vacant parcels affected by the ULOP are privately owned. The remaining 7 parcels are City-owned. In the future, any new habitable structure along streams affected by the ULOP floodplain will need to be elevated slightly higher (less than 1 foot) than would have been required prior to the legislation. For existing structures, additional elevation would only be required if the owner undertook a "substantial improvement" to the structure (defined within the City's Flood Damage Prevention Ordinance as any work in a 10-year period that is worth 50 percent or more of the value of the structure).

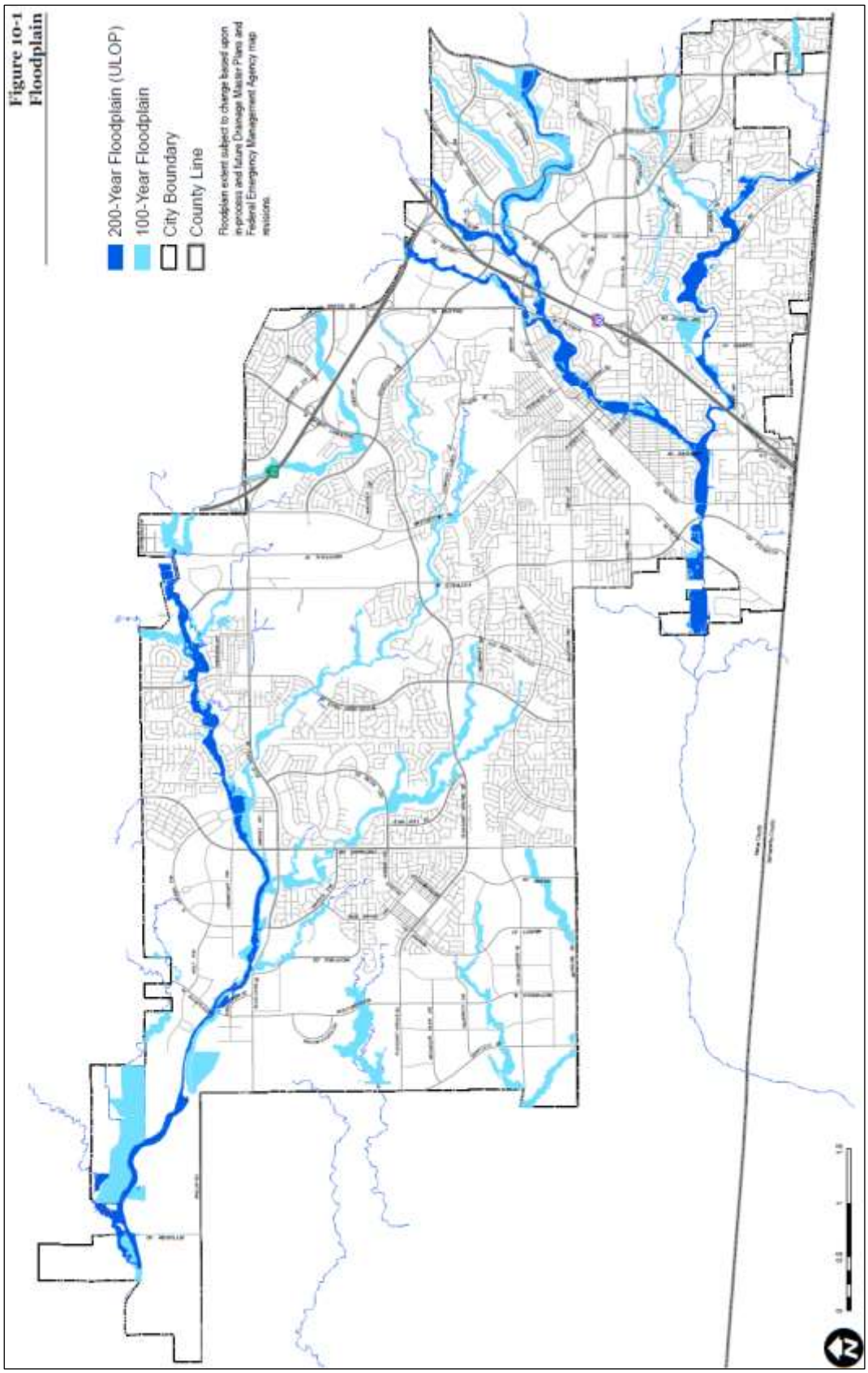


Figure 10-9. Updated Floodplain Mapping

10.7.4 Stormwater Management

Stormwater management in the City of Roseville is accomplished through a multi-tiered approach. The City uses a combination of regional development impact studies, sub-regional impact studies, the City of Roseville improvement standards, the City of Roseville grading ordinance, and the Placer County stormwater management manual. All of these tools manage the City's stormwater system at different levels. The Roseville General Plan is the principal planning document that lays out goals for managing the flooding hazard. Each update to the General Plan reviews these goals to determine their effectiveness in managing watershed characteristics. Regional master planning, sub-regional master planning, and project drainage design are discussed below.

Regional Master Planning

City ordinances establish developer fees to pay for mitigation projects that will reduce development impacts on flooding on major streams in the Dry Creek and Pleasant Grove Creek basins. Regional master planning for each basin has been conducted through the Placer County Flood Control District (PCFCD). Seven communities, including the City of Roseville, are members of this district.

The Dry Creek and Pleasant Grove Creek basins each have a detailed hydrology report that calculates the 5-, 10-, 50-, and 100-year storm frequencies based on total buildout of the basin:

- **Dry Creek Basin Report—**The *Final Report for the Dry Creek Flood Control Plan*, adopted by the Roseville City Council in April 1992, was co-sponsored, supported, and approved by the PCFCD and the Sacramento County flood control agency that oversees floodplains downstream of Placer County.
- **Pleasant Grove Creek Basin Report—**Pleasant Grove Creek Basin hydrology is included in the *Cross Canal Study*. Pleasant Grove Creek is one of several major streams that flow to a reclamation district canal; overflow is stored behind levees during Sacramento River flooding. Except for the PCFCD, this report was supported, sponsored, and approved by all agencies within the basin, in particular Sutter County and State Reclamation Board Districts 1001 and 1000.

Each report defines development impacts on the basin and specifies mitigation procedures and improvements to developers' mitigation. Both reports indicate a strategy for mitigation of floods resulting from new development on a regional scale. The reports indicate that most of Roseville is in the part of the watershed where detention is not recommended. These studies have been submitted to FEMA for approval, and FEMA is currently using the hydrology and hydraulics information provided in the reports to update FIRMs for the region.

Sub-Regional Master Planning

The City requires each sub-region to develop a master plan and mitigation strategy in a specific plan. Specific plans currently exist for Amoruso Ranch, Creekview, Del Webb, Downtown, Highland Reserve North, North Central Roseville, Northeast Roseville, North Industrial, North Roseville, Northwest Roseville, Riverside Gateway, Sierra Vista, Southeast Roseville, Stoneridge, West Roseville, and the Infill Area. Before zoning and development rights are issued for these newly developing areas, a detailed hydrology and hydraulic study dealing with that sub-region's concerns is required, in order to examine local drainage problems, define flood levels based on total buildout of the watershed, and set aside floodplain areas as open space. Floodplains are defined on swales with drainage areas greater than 300 acres. The City of Roseville and PCFCD review and approve each specific plan.

Major drainage infrastructure in the specific plans is designed as part of the infrastructure of the sub-regions and is constructed prior to development in the area; this eliminates the need for on-site detention requirements because regional detention, if required, is built into the infrastructure for the entire specific plan and not on a project-by-project basis. This approach allows for more control of the design and easier maintenance of the facility. In

addition, in newly developing areas, hydraulic requirements used to define floodplains assume well-vegetated swales and creeks, which reduces the need to provide constant cleaning of these streams by maintenance crews.

Project Drainage Design

As each project in the specific plan is developed, the City requires the project to meet drainage improvement standards. The standards require storm drain systems that support more than one parcel to be dedicated to the City for maintenance or that project owners maintain the system. In both cases, the storm drain system is reviewed by the City's Public Works Department to meet the same hydraulic standards. Project owners must demonstrate that in the case of total system failure, surface water would be able to exit the project area without causing damage. For example, if drain inlets are not maintained on a commercial site and water ponds, surface water should be able to discharge into the public drainage system without entering any on- or off-site buildings. This requirement eliminates the need for the City to monitor private storm drain systems to verify that they are adequately maintained.

10.7.5 Outreach and Public Education

The City of Roseville makes a concerted effort to educate and inform its citizens on the impacts of flooding and how to prepare for flooding impacts. The ongoing outreach and public education program uses multiple media:

- Floodplain information is published in "Roseville Reflections," a City-sponsored newsletter sent to all citizens.
- Flood information is published on the City's website and includes real-time flood warning and flood threat recognition information. The website is www.roseville.ca.us/flood/alert/floodalert.html.
- On-line surveying is used to identify public perception of flood risk and support of mitigation.
- An informational brochure, "Weathering the Storm," is available to the public.
- Literature on flood warning, property protection, and flood safety is mailed annually to Roseville residents.

10.8 SCENARIO

The City of Roseville has made great strides to reduce the risk from flooding. Events like those that caused past flooding will continue to occur, but impacts will be significantly less than in the past. Intense isolated rainstorms over the region will cause creeks and streams to overflow their banks, causing road closures and power outages. However, structure damage to personal property will be limited to the few properties that have exposure to significant depths of flooding. Flash flooding caused by rainfall runoff exceeding the capacity of stormwater systems will also continue to occur. However, potential personal property damage will be limited to structures constructed prior to building and stormwater standards adopted by the City to remediate these impacts.

10.9 ISSUES

Important issues associated with flood hazard in Roseville include but are not limited to the following:

- The boundaries of the 100-year floodplain could be as specified in the floodplain designations section of the flood-protection component of the City's General Plan. Floodplain areas shall be preserved as specified in the Open Space and Conservation Element. Preservation may include required dedication to the City. If needed, the City's ordinances can be modified to include floodplain use regulations consistent with the goals, policies, and implementation measures of the Safety Element, Land Use Element, Open Space and Conservation Element, and Parks and Recreation Element of the City's General Plan. This effort would be overseen by the Planning Division and would require no special funding.

- The development, implementation, and expansion of the Flood Alert and Early Warning Program systems should be continued, and the systems should be integrated with other local jurisdictions to form a regional warning program. This effort is overseen by the Public Works Department. Annual funding is provided through the City's general fund and is about $100,000 per year.
- By remaining actively involved in the PCFCD, the City of Roseville should continue to pursue a regional approach to flood issues. Involvement includes cooperation in the development of a comprehensive regional database. Regional drainage planning and design for all individual developments in the Placer County Flood Control District should be encouraged to address cumulative flooding impacts. The City should also continue to participate in regional flooding studies, including the Auburn Creek/Coon Creek/Pleasant Grove Creek flood mitigation plan and the Dry Creek Basin flood control plan. Efforts would be overseen by the Public Works Department. Annual funding for membership to the PCFCD is currently provided by the City's General Fund and is about $90,000 per year.
- The City should continue coordination with other agencies on issues of flood control. Coordination between the City and adjacent jurisdictions occurs through several mechanisms, including the distribution of development proposals for review and comment. The City should also continue its cooperation with federal, state, and local agencies, including the U.S. Army Corps of Engineers, California Reclamation Board, FEMA, California Department of Fish and Wildlife, Placer County Resource Conservation District, and PCFCD. This effort would be overseen by the Community Development Department, Planning Division, and Public Works Department as appropriate and should not require special funding.
- The final two phases of the Cirby-Linda-Dry Creek Flood Control Project should be completed. Five of the seven phases of this project have been completed at a cost of about $18,000,000. This project is overseen by the Public Works Department. The cost for the last two phases would be about $3,000,000. Funding could be from City, state, federal, or private developer sources.
- Alternative improvements to the Cirby-Linda-Dry Creek Flood Control Project could be analyzed. These improvements may be cost-effective in the following flood-prone areas of Roseville:

  - Dry Creek from Darling Way to Riverside Avenue
  - The area on Dry Creek upstream of Folsom Road in the Columbia Avenue, Marilyn Avenue, Bonita Street area
  - The Linda Creek area near Champion Oaks Drive, Samoa Way, and Hurst Way
  - Cirby Creek in the Trimble Way and Zien Court area.

- The existing wood flood wall along Dry Creek that is protecting the City's Main Library and Public Safety Building could be replaced. The wood wall allows floodwater to leak through, and constant pumping is required. This effort would be overseen by the Public Works Department and cost about $300,000. Funding could be from City, state, federal, private developer, property owner sources.
- How will the potential impacts of climate change impact flood conditions in the City of Roseville?

11. LANDSLIDE

11.1 GENERAL BACKGROUND

According to the U.S. Geological Survey (USGS), the term landslide includes a wide range of ground movement, such as rock falls, deep failure of slopes, and shallow debris flows. Although gravity acting on an over-steepened slope is the primary reason for a landslide, there are other contributing factors (USGS, n.d.).

Landslides and mudslides can be initiated by storms, earthquakes, fires, volcanic eruptions or human modification of the land. They can move rapidly down slopes or through channels, and can strike with little or no warning at avalanche speeds.

Landslides can pose a serious hazard to properties on or below hillsides. When landslides occur—in response to such changes as increased water content, earthquake shaking, addition of load, or removal of downslope support—they deform and tilt the ground surface. The result can be destruction of foundations, offset of roads, breaking of underground pipes, or overriding of downslope property and structures.

DEFINITIONS

Landslide—The movement of masses of loosened rock and soil down a hillside or slope. Slope failures occur when the strength of the soils forming the slope is exceeded by the pressure, such as weight or saturation, acting upon them.

Mass Movement—A collective term for landslides and mudslides.

Mudslide (or Debris Flow)—A river of rock, earth, organic matter and other materials saturated with water. Mudslides develop in the soil overlying bedrock on sloping surfaces when water rapidly accumulates in the ground, such as during heavy rainfall or rapid snowmelt. Water pressure in the pore spaces of the material increases to the point that the internal strength of the soil is drastically weakened. The soil's reduced resistance can then easily be overcome by gravity, changing the earth into a flowing river of mud or "slurry."

11.1.1 Landslide Types

Landslides are commonly categorized by the type of initial ground failure. Common types of slides are shown on Figure 11-1 through Figure 11-4 (Ecology 2014). The most common is the shallow colluvial slide, occurring particularly in response to intense, short-duration storms. The largest and most destructive are deep-seated slides, although they are less common than other types.

Mudslides (or debris flows) are rivers of rock, earth, organic matter and other soil materials saturated with water. They develop in the soil overlying bedrock on sloping surfaces when water rapidly accumulates in the ground, such as during heavy rainfall or rapid snowmelt. Water pressure in the pore spaces of the material increases to the point that the internal strength of the soil is drastically weakened. The soil's reduced resistance can then easily be overcome by gravity, changing the earth into a flowing river of mud.

A debris avalanche (Figure 11-5) is a fast-moving debris flow that travels faster than about 10 miles per hour (mph). Speeds in excess of 20 mph are not uncommon, and speeds in excess of 100 mph, although rare, can occur. The slurry can travel miles from its source, growing as it descends, picking up trees, boulders, cars, and anything else in its path. Although these slides behave as fluids, they pack many times the hydraulic force of water due to the mass of material included in them. They can be among the most destructive events in nature.

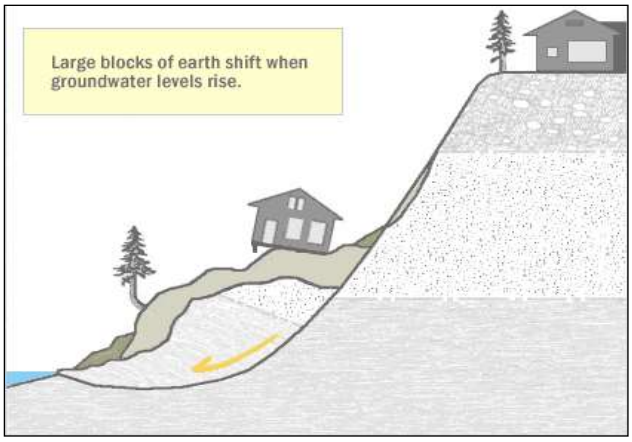


Figure 11-1. Deep Seated Slide

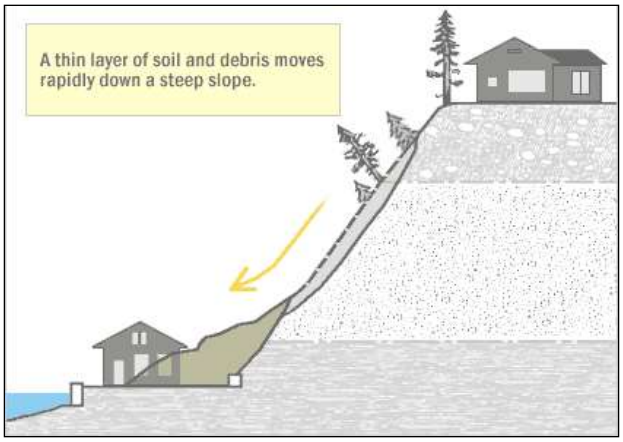


Figure 11-2. Shallow Colluvial Slide

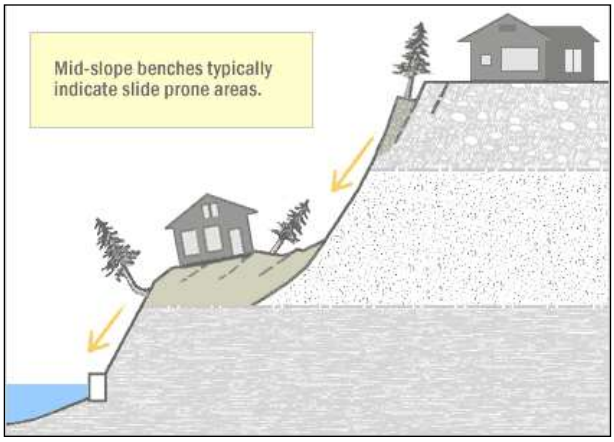


Figure 11-3. Bench Slide

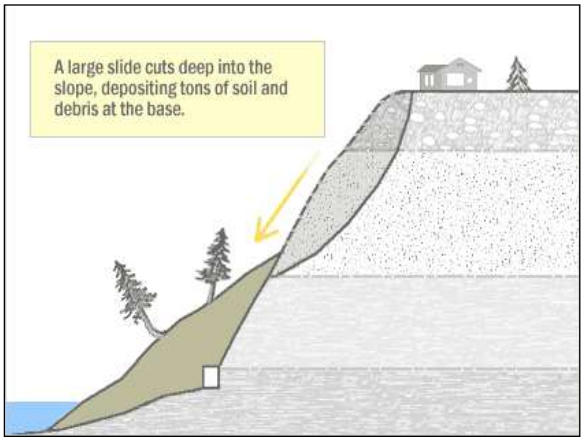


Figure 11-4. Large Slide

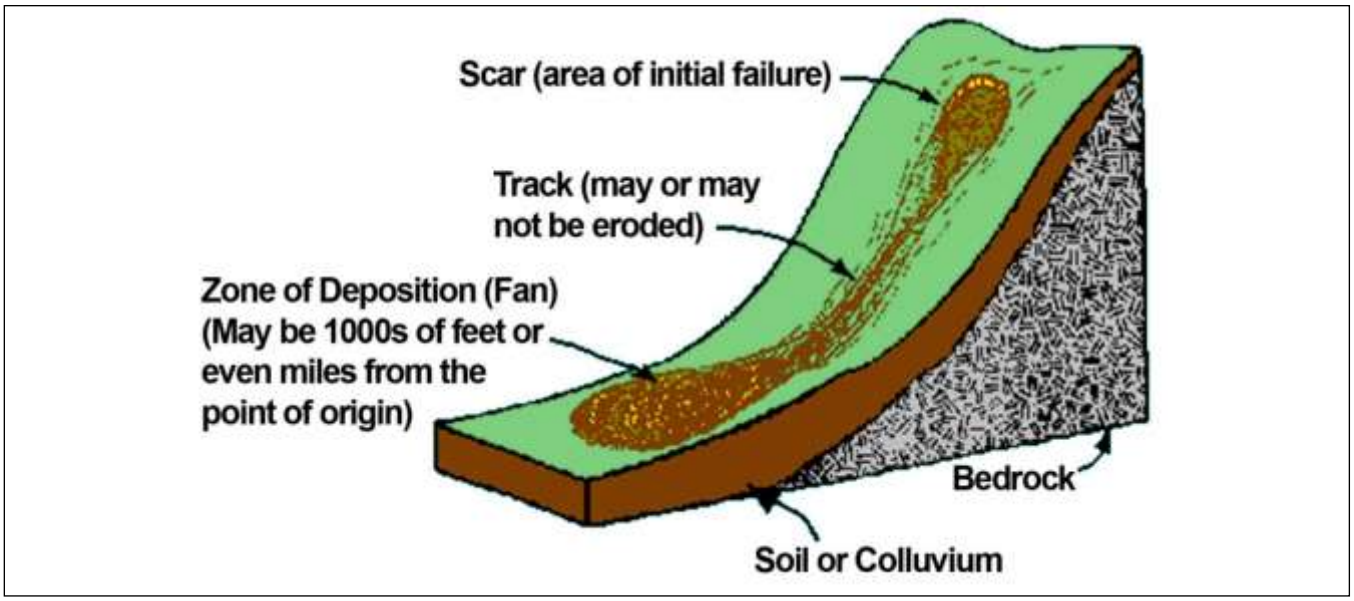


Figure 11-5. Typical Debris Avalanche Scar and Track

Landslides also include the following:

- Rock Falls—blocks of rock that fall away from a bedrock unit without a rotational component
- Rock Topples—blocks of rock that fall away from a bedrock unit with a rotational component
- Rotational Slumps—blocks of fine-grained sediment that rotate and move down slope
- Transitional Slides—sediments that move along a flat surface without a rotational component
- Earth Flows—fine-grained sediments that flow downhill and typically form a fan structure
- Creep—a slow-moving landslide often only noticed through crooked trees and disturbed structures
- Block Slides—blocks of rock that slide along a slip plane as a unit down a slope

11.1.2 Landslide Modeling

Two characteristics are essential to conducting an accurate risk assessment of the landslide hazard:

- The type of initial ground failure that occurs, as described above
- The post-failure movement of the loosened material ("run-out"), including travel distance and velocity.

All current landslide models—those in practical applications and those more recently developed—use simplified hypothetical descriptions of mass movement to simulate the complex behavior of actual flow. The models attempt to reproduce the general features of the moving mass of material through measurable factors, such as base shear, that define a system and determine its behavior. Due to the lack of experimental data and the limited current knowledge about the behavior of the moving flows, landslide models use simplified parameters to account for complex aspects that may not be defined. These simplified parameters are not related to specific physical processes that can be directly measured, and there is a great deal of uncertainty in their definition. Some, but not all, models provide estimates of the level of uncertainty associated with the modeling approach.

Run-out modeling is complicated because the movement of materials may change over the course of a landslide event, depending on the initial composition, the extent of saturation by water, the ground shape of the path traveled and whether there is additional material incorporated during the event (Savage and Hutter 1991; Rickenmann & Weber 2000; Iverson 2004).

11.2 HAZARD PROFILE

11.2.1 Past Events

There is little or no record of landslides occurring in Roseville that caused damage to property. Three notable landslide events have been recorded in Placer County, according to the Placer County Hazard Mitigation Plan. These events occurred in the eastern portion of the county, which is significantly different from Roseville in geologic terms. Therefore, no parallel can be drawn from these events for Roseville.

11.2.2 Location

Landslide hazard areas are areas where characteristics such as the following indicate a landslide risk:

- A slope greater than 15 percent
- A history of landslide activity during the last 10,000 years
- Stream or wave activity that has caused erosion or cut into a bank to cause the surrounding land to be unstable
- The presence of an alluvial fan, which indicates vulnerability to the flow of debris or sediments
- The presence of impermeable soils, such as silt or clay, mixed with granular soils such as sand and gravel.

The California Landslide Hazard Identification Act directs the State Geologist to identify and map hazardous landslide areas for use by municipalities in planning and decision-making on grading and building permits. Three factors that characterize landslide hazard areas include significant slope, weak rocks, and heavy rains. This program focuses on urban areas and growth areas that exhibit these characteristics.

Roseville and the surrounding Sacramento region are not identified as areas prone to landslide hazards. The City's geographic location, soil conditions, and surface terrain combine to minimize risk of major damage from landslides, subsidence (gradual shrinking of the earth's surface due to underground resource extraction), or other geologic hazards resulting from seismic activity and related natural forces. Therefore, the region has not been included as a part of the state's study program. The USGS, in its identification of geologic hazard areas and their susceptibility and rate of incidence, has classified Placer County and the Roseville vicinity as a low rate of incidence, with less than 1.5 percent of the area susceptible to landslides.

Little scientific analysis is available about landslide hazards in Roseville. Assessment of the risk from this hazard is based on past occurrences, observed conditions, and guidance from state and federal agencies. However, with slopes steeper than 15 percent and the frequent occurrence of multiple intense storms that can saturate the soil, there is an exposure to landslides. Future risk assessment of landslides could be enhanced with better data specific to the hazard.

While Roseville is located on relatively level terrain, the slope gradually increases to the east and north. The most significant slopes are along creeks and ravines. The soil in ravine areas is a Mehrten soil typically associated with post-volcanic activity. It is very dense and not considered to be erosion prone.

Areas with slopes greater than 15 percent in the Stoneridge Specific Plan Area exhibit characteristics of potential landslide hazard areas. Landsliding in these areas has likely occurred numerous times in the past, as evidenced by past deposits exposed in erosion gullies. The timeframe for these past occurrences is probably over the last several hundred years, if not thousands.

Due to the lack of available data on this hazard, the extent and location of the hazard has been estimated with an emphasis on steepness of slopes. Figure 11-6 shows the estimated landslide hazard areas in Roseville, based on slopes of 15 to 30 percent (moderate risk) and 30 percent and higher (high risk). The map represents a general assessment of citywide exposure; it does not apply on a site-specific basis and should be used with caution.

11.2.3 Frequency

Landslides are often triggered by other natural hazards such as earthquakes, heavy rain, floods or wildfires, so the frequency of landslides is related to the frequency of these other hazards. In the Roseville vicinity, landslides are most likely to occur during and after major storms. Due to the soil types in the steep slope areas of Roseville and the lack of historical occurrence of significant landslide events, the frequency of occurrence of landslide events in Roseville is considered to be low.

11.2.4 Severity

Landslides destroy property and infrastructure and can take the lives of people. Slope failures in the United States result in an average of 25 lives lost per year and an annual cost of about $1.5 billion. Due to the lack of exposure to this hazard in Roseville, the severity of the impacts of landslides on the people, property and economy of Roseville is considered to be low.

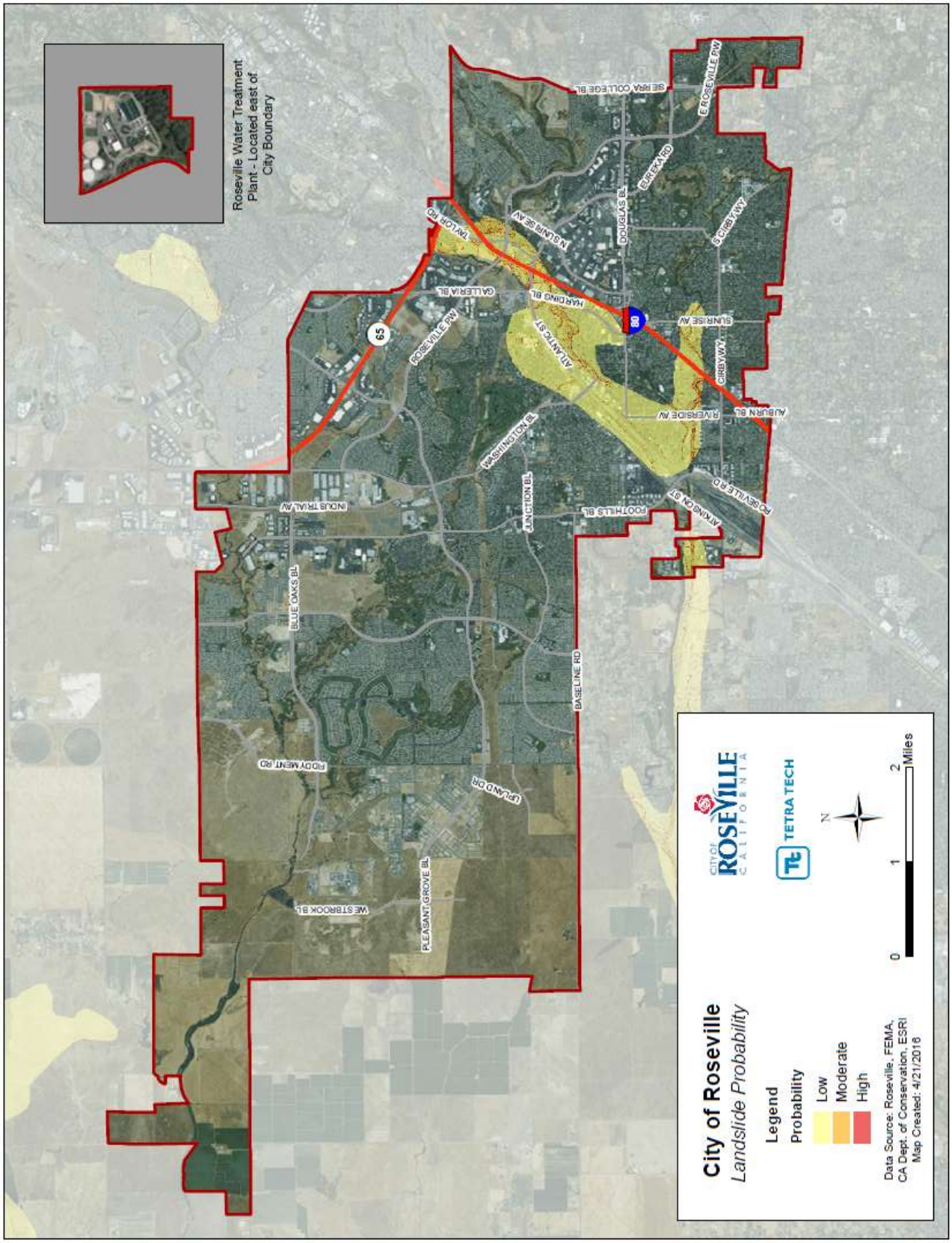


Figure 11-6. Roseville Area Landslide Hazard Map

11.2.5 Warning Time

Mass movements can occur suddenly or slowly. Some methods used to monitor mass movements can provide an idea of the type of movement and the amount of time prior to failure. It is also possible to determine what areas are at risk during general time periods. Assessing the geology, vegetation, and amount of predicted precipitation for an area can help in these predictions. However, there is no practical warning system for individual landslides. Correlations can be made based on soil type, slope and rainfall amount. No known correlations have been made for the Roseville planning area. The current procedure is to monitor situations on a case-by-case basis, and respond after an event has occurred. Generally accepted warning signs for landslide activity include the following:

- Springs, seeps, or saturated ground in areas that have not typically been wet before
- New cracks or unusual bulges in the ground, street pavements or sidewalks
- Soil moving away from foundations
- Ancillary structures such as decks and patios tilting and/or moving relative to the main house
- Tilting or cracking of concrete floors and foundations
- Broken water lines and other underground utilities
- Leaning telephone poles, trees, retaining walls or fences
- Offset fence lines
- Sunken or down-dropped road beds
- Rapid increase in creek water levels, possibly accompanied by increased turbidity (soil content)
- Sudden decrease in creek water levels though rain is still falling or just recently stopped
- Sticking doors and windows, and visible open spaces indicating jambs and frames out of plumb
- Unusual sounds, such as trees cracking or boulders knocking together
- A faint rumbling sound that increases in volume as a landslide nears.

11.3 SECONDARY HAZARDS

Landslides can cause several types of secondary effects, such as blocking access to roads, which can isolate residents and businesses and delay emergency response or commercial, public and private transportation. This could result in economic losses for businesses. Other potential problems resulting from landslides are power and communication failures. Utility poles on slopes can be knocked over, resulting in losses to power and communication lines. Landslides also have the potential of destabilizing the foundation of structures, which may result in monetary loss for residents. They also can damage rivers or streams, potentially harming water quality, fisheries and spawning habitat.

11.4 EXPOSURE

Figure 11-6 was used to estimate the exposure of population and structures to the landslide hazard.

11.4.1 Population

Using the percent of residential buildings exposed, multiplied by the estimated per-household population in 2014, it is estimated that there are 36 persons living in households exposed to the high landslide risk hazard and 140 persons exposed to the moderate landslide risk hazard. This represents 0.03 percent and 0.11 percent of the total population of the City, respectively.

11.4.2 Property

An estimated 12 structures are exposed to high landslide risk and 57 structures to moderate landslide risk. These high landslide risk structures have a total replacement cost value of $3,691,741, or 0.01 percent of the total

replacement cost value of the City. The moderate landslide risk structures have a total value of $49,714,043, or 0.17 percent of the total value of the City. These are residential, commercial and educational structures. These results are based on a spatial GIS exercise identifying all structure locations that intersect the high and moderate risk hazard zones.

11.4.3 Critical Facilities and Infrastructure

Facilities

An analysis of critical facilities inventory to determine exposure to the landslide hazard determined that two of the City's critical facilities are exposed to the landslide hazard.

Infrastructure

Roads and Bridges

A significant amount of infrastructure (roads, bridges and utilities) can be exposed to mass movements. Access to major roads is crucial to life-safety after a disaster event and can help to provide resilience during response and recovery operations. Landslides have the potential to block roads, causing isolation of all or part of the City. Roadway blockages caused by landslides can create traffic problems resulting in delays for emergency vehicles and public and private transportation. This could result in economic losses for businesses.

Landslide events can significantly impact bridges. They can knock out bridge abutments or significantly weaken the soil supporting a bridge, obstructing the bridge or making it hazardous for use. Bridges in areas of high landslide risk often provide the only ingress and egress to large areas and in some cases to isolated areas. None of the City bridges are considered to have exposure to the landslide hazard. However, bridges outside the City within the County are susceptible to landslides. Damage to one of these facilities could close off an access route to the City. These facilities have not been inventoried for this assessment.

Power Lines

Other potential problems resulting from landslides are power and communication failures creating problems for vulnerable populations or businesses and potential loss of life in emergency situations. Power lines are generally elevated above steep slopes, but the towers supporting them can be subject to landslides. A landslide could cause the soil underneath a tower to fail, causing it to collapse, and ripping down the lines. An inventory of these types of facilities was not available for this assessment.

11.4.4 Environment

Environmental problems as a result of mass movements can be numerous. Landslides fall into streams and significantly impact fish and wildlife habitat, as well as affecting water quality.

11.5 VULNERABILITY

11.5.1 Population

Due to the nature of census block group data, it is difficult to determine demographics of populations vulnerable to mass movements. In general, all persons exposed to landslides hazards are considered to be vulnerable.

11.5.2 Property

Loss estimates for the landslide hazard are not based on modeling using damage functions, because no such damage functions have been generated. Instead, loss estimates were developed representing 10 percent, 30 percent and 50 percent of the assessed value of exposed structures. This allows emergency managers to evaluate a range of potential economic impacts based on an estimate of the percent of damage to the building stock. Damage in excess of 50 percent is considered to be substantial by most building codes and typically requires total reconstruction of the structure. Table 11-1 and Table 11-2 list loss estimates to the general building stock in moderate and high landslide hazard areas.

Table 11-1. Loss Estimates for Buildings Vulnerable to High Landslide Hazard

Building Count	Assessed Value	10% Damage	30% Damage	50% Damage
12	$3,691,741	$369,174	$1,107,522	$1,845,871

Table 11-2. Loss Estimates for Buildings Vulnerable to Moderate Landslide Risk Hazard

Building Count	Replacement Cost	10% Damage	30% Damage	50% Damage
57	$49,714,043	$4,971,404	$14,914,212	$24,857,022

11.5.3 Critical Facilities and Infrastructure

Two identified critical facilities are exposed to the landslide hazard, based on the best available data. Several types of infrastructure are exposed to mass movements, including transportation, water and sewer and power infrastructure. At this time, all infrastructure and transportation corridors identified as exposed to the landslide hazard are considered vulnerable until more information becomes available.

11.5.4 Environment

The environment vulnerable to landslide hazard is the same as the environment exposed to the hazard.

11.6 FUTURE TRENDS IN DEVELOPMENT

The areas that are most vulnerable to the landslide hazard make up a small portion of the City of Roseville. Because these ravine areas in the southeastern portion of the City are considered to be non-developable and the probability of occurrence of this type of hazard is low due to the soil type in this region, this hazard should have little or no impact on future development and redevelopment trends. The City's current land use policies should also ensure that no future development or re-development would be impacted by this hazard.

The landslide risk exposure with in the planning did not increase over the performance period of the 2011 Plan. The value of the properties exposed to steep slope hazards increased by 12% which can be attributed to normal appreciation in property values observed for the Roseville planning area. Since there are currently no nationally recognized damage functions for landslide risk modeling, a comparative analysis of vulnerability was not performed. However, since there was no increase in risk exposure, the increase in vulnerability should coincide with the increase in value of the assets at risk.

11.7 REVIEW OF EXISTING ORDINANCES, PROGRAMS, AND PLANS

Since 1975, state law has required that a safety element be included as part of all general plans. In 1984, the state consolidated the safety and seismic elements into one element that includes seismic safety, geologic hazards, fire safety, and flooding. The seismic and geologic hazards component includes goals and policies to protect the

City's residents from danger associated with active faults, liquefaction, ground failure (landslides), and steep slopes.

The Safety Element of the Roseville General Plan includes components that address geologic hazards such as landslides. While the potential for geologic hazards such as landslides in Roseville is not high, the soil and geologic characteristics of the City continue to play an important role in determining safety procedures. Current policies and ordinances reflect the City's ongoing obligations to protect lives and property and include ongoing monitoring of seismic activity and periodic updating of plans for emergency events. Continued implementation of these polices and enforcement of City ordinances and General Plan policies will ensure that efforts are maximized for protecting the safety of Roseville's citizens from potential geologic safety hazards. The following policies identified in the Seismic and Geologic component of the Safety Element will mitigate the potential exposure to geologic hazards within Roseville:

- Continue to mitigate the potential impacts of geologic hazards through building plan review.
- Minimize soil erosion and sedimentation by maintaining compatible land uses, suitable to the existing environment.
- Develop appropriate building designs and implement appropriate construction techniques to decrease the impact of a landslide.
- Create and adopt slope development standards prior to or as part of the planning process for any area identified as having significant slope.
- Require contour grading, where feasible, and re-vegetation to mitigate the appearance of engineered slopes and to control erosion.

These policies are implemented through existing, ongoing programs that include the following:

- **California Building Code**—Through the Building Division of the Development Services Department, continue to enforce and keep abreast of the most recent updates to the CBC that include construction standards for seismic and geologic safety.
- **Development Review Process**—Refer any development proposal that may be impacted by grading, soil, or geologic issues to the Public Works Department. Consider the comments of the Public Works Department in the development review process. The environmental review for projects shall include a full inventory of potential grading impacts and any potential soil or geologic concerns, assessment of potential project impacts, and identification of mitigation and monitoring measures. Issues relating to slopes, liquefaction, ground failure and erosion shall be addressed. Project design, grading, and building construction techniques shall be used to minimize impacts. Sites that are determined to have significant slope shall be identified, and appropriate design restrictions shall be implemented to avoid the risk of erosion or landslide. Graded slopes shall be limited to 2:1 where feasible. Slopes that are less than 2:1 should be encouraged. The use of retaining walls or stepped building designs should be pursued as an alternative to high or steep slopes where feasible and desirable.
- **Grading Ordinance**—Enforce and regularly evaluate the Grading Ordinance. The Grading Ordinance includes standards for project construction and erosion control. This ordinance requires prompt re-vegetation of disturbed areas, avoidance of grading activities during wet weather, avoidance of disturbance in drainage ways, and other erosion control measures.
- **Specific Plans**—Ensure that specific plans are consistent with the goals and policies of the General Plan. Specific plans shall identify potential geologic, soil, and seismic hazards in the planning area and shall include measures to reduce the risk of such hazards. Proposed specific plans shall identify criteria for development on steep slope areas, as applicable, in order to ensure public safety and minimize environmental and aesthetic impacts.

- **Land Use Designation**—In areas where potentially significant soil and erosion impacts are identified, the City should consider open space or other appropriate land use designations, as specified in the Land Use Element, to minimize potential impacts.

11.8 SCENARIO

Due to the lack of significant exposure to this hazard, a scenario where a landslide would have a significant impact on the City of Roseville is currently unlikely. Mass movements are becoming more of a concern as development moves outside of city centers and into areas less developed in terms of infrastructure. Major mass movements in Placer County and areas surrounding Roseville occur as a result of soil conditions that have been affected by severe storms, groundwater or human development activities. After heavy rains, soils become saturated with water. As water seeps downward through upper soils that may consist of permeable sands and gravels and accumulates on impermeable silt, it will cause weakness and destabilization in the slope. As rains continue, the groundwater table rises, adding to the weakening of the slope. Gravity, poor drainage, a rising groundwater table and poor soil exacerbate hazardous conditions.

Roseville's most likely risk exposure to landslides is as a secondary risk associated with an earthquake or wildfire. The ground shaking that could occur during an earthquake could trigger landslides in the steep slope areas. This scenario could be further enhanced should an earthquake occur during a time when the soils are saturated due to repeated storm events. After a wildfire, the landscape becomes denatured and unable to absorb the impacts of repeated intense rainfall. This can cause the soil to become saturated and vulnerable to sliding.

11.9 ISSUES

Important issues associated with landslide hazards in Roseville include but are not limited to the following:

- The data and science regarding the mapping and assessment of landslide hazards is constantly evolving. As new data and science become available, assessments of landslide risk should be re-evaluated.
- The impact of climate change on landslides is uncertain. If climate change impacts atmospheric conditions, the exposure to landslide risks in Roseville could increase.

12. SEVERE WEATHER

12.1 GENERAL BACKGROUND

Most of the federal and state disaster declarations for the Roseville area and Placer County are related to severe weather conditions. Severe weather conditions vary greatly from the western portion of Placer County to the eastern portion, primarily due to variation in topography and elevation across the county. Heavy rainfall and snowfall result when humid air masses blow in from the ocean and move up the mountain ranges. Moist air, traveling inland on prevailing westerly winds, pushes up against the Sierra Nevada mountains, which wrings moisture out of the air as it rises, cools and condenses.

Roseville's location in the western, low-lying portion of the county helps explain why, at well below the 4,000 foot snowfall region, the City avoids the harshest of winter conditions that occur in eastern Placer County. Figure 12-1 shows Roseville's elevation of approximately 165 feet above sea level. Although the climate of Roseville is relatively mild, with an average of 257 sunny days each year, the City is near the foothills of the Sierra Nevada range and can experience severe weather resulting from rapid changes in topography.

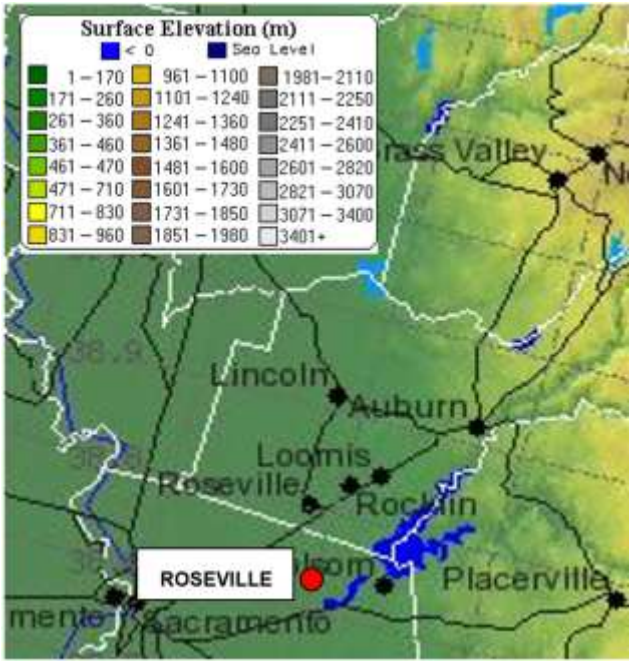


Figure 12-1. Roseville Regional Surface Elevation

DEFINITIONS

Thunderstorm—Typically 15 miles in diameter and lasting about 30 minutes, thunderstorms are underrated hazards. Lightning, which occurs with all thunderstorms, is a serious threat to human life. Heavy rains over a small area in a short time can lead to flash flooding. Strong winds, hail and tornadoes are also dangers associated with thunderstorms.

Tornado—Tornadoes are funnel clouds of varying sizes that generate winds more than 300 miles per hour. A tornado is formed by the turbulent mixing of layers of air with contrasting temperature, moisture, density and wind flow. The mixing layers of air account for most of the tornadoes occurring in April, May and June, when cold, dry air meets warm, moister air moving up from the south. They can affect an area up to a mile wide, with a path of varying length. Tornadoes can come from lines of cumulonimbus clouds or from a single storm cloud. They are measured using the Fujita Scale ranging from F0 to F6.

Windstorm—A storm featuring violent winds. Southwesterly winds are associated with strong storms moving onto the coast from the Pacific Ocean. Southern winds parallel to the coastal mountains are the strongest and most destructive winds. Windstorms tend to damage ridgelines that face into the winds.

12.1.1 Tornadoes

A tornado is a violently rotating column of air extending between, and in contact with, a cloud and the surface of the earth. Tornadoes are often (but not always) visible as a funnel cloud. On a local-scale, tornadoes are the most intense of all atmospheric circulations and wind can reach destructive speeds of more than 300 mph. A tornado's vortex is typically a few hundred meters in diameter, and damage paths can be up to 1 mile wide and 50 miles long. Figure 12-2, adapted from FEMA, illustrates the potential impacts and damage from tornadoes of different magnitude. Tornadoes can occur throughout the year at any time of day but are most frequent in the spring during the late afternoon. As shown in Figure 12-3, California has a relatively low risk compared to states in the Midwestern and Southern U.S.

12.1.2 Windstorms

Windstorms are generally short-duration events involving straight-line winds or gusts of over 50 mph, strong enough to cause property damage. Windstorms are especially dangerous in areas with significant tree stands and areas with exposed property, poorly constructed buildings, mobile homes (manufactured housing units), major infrastructure, and above-ground utility lines. A windstorm can topple trees and power lines, cause damage to residential, commercial and critical facilities, and leave tons of debris in its wake. There are seven types of damaging winds:

- **Straight-line winds—**Any thunderstorm wind that is not associated with rotation; this term is used mainly to differentiate from tornado winds. Most thunderstorms produce some straight-line winds as a result of outflow generated by the thunderstorm downdraft.
- **Downdrafts—**A small-scale column of air that rapidly sinks toward the ground.
- **Downbursts—**A strong downdraft with horizontal dimensions larger than 2.5 miles resulting in an outward burst or damaging winds on or near the ground. Downburst winds may begin as a microburst and spread out over a wider area, sometimes producing damage similar to a strong tornado. Although usually associated with thunderstorms, downbursts can occur with showers too weak to produce thunder.
- **Microbursts—**A small concentrated downburst that produces an outward burst of damaging winds at the surface. Microbursts are generally less than 2.5 miles across and short-lived, lasting only 5 to 10 minutes, with maximum wind speeds up to 168 mph. There are two kinds of microbursts: wet and dry. A wet microburst is accompanied by heavy precipitation at the surface. Dry microbursts, common in places like the high plains and the intermountain west, occur with little or no precipitation reaching the ground.
- **Gust front—**A gust front is the leading edge of rain-cooled air that clashes with warmer thunderstorm inflow. Gust fronts are characterized by a wind shift, temperature drop, and gusty winds out ahead of a thunderstorm. Sometimes the winds push up air above them, forming a shelf cloud or detached roll cloud.
- **Derecho—**A derecho is a widespread thunderstorm wind caused when new thunderstorms form along the leading edge of an outflow boundary (the boundary formed by horizontal spreading of thunderstorm-cooled air). The word "derecho" is of Spanish origin and means "straight ahead." Thunderstorms feed on the boundary and continue to reproduce. Derechos typically occur in summer when complexes of thunderstorms form over plains, producing heavy rain and severe wind. The damaging winds can last a long time and cover a large area.
- **Bow Echo—**A bow echo is a linear wind front bent outward in a bow shape. Damaging straight-line winds often occur near the center of a bow echo. Bow echoes can be 200 miles long, last for several hours, and produce extensive wind damage at the ground.

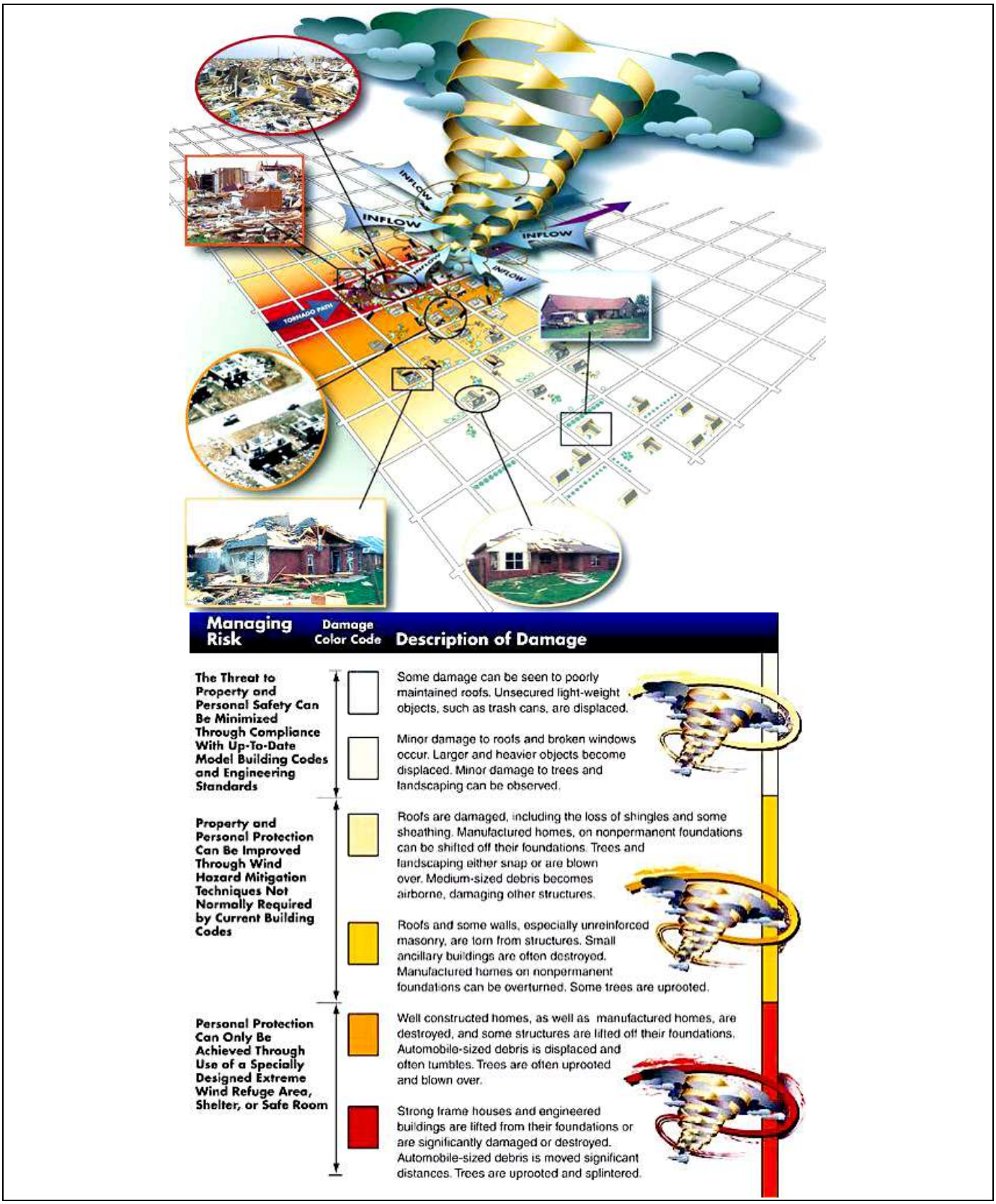


Figure 12-2. Potential Impact and Damage from a Tornado

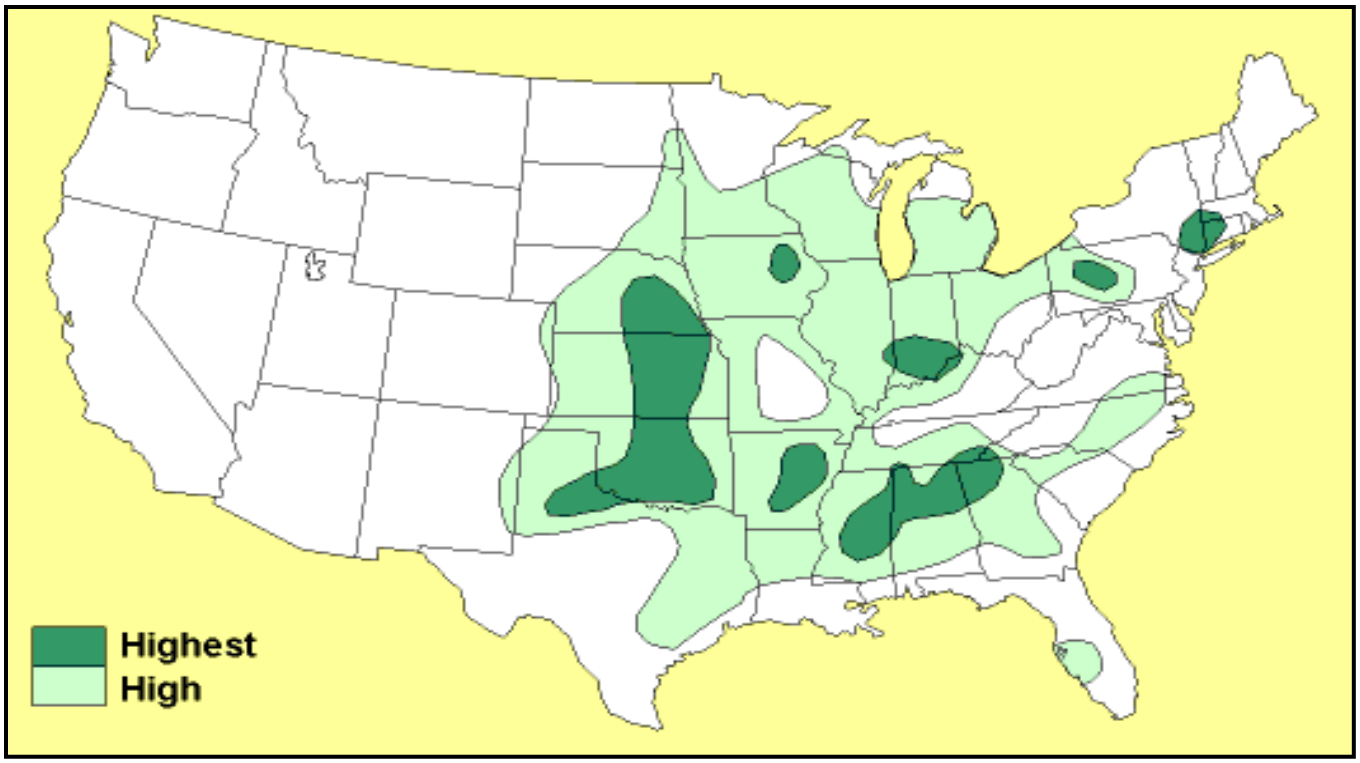


Figure 12-3. Tornado Risk Areas in the Coterminous United States

Windstorms can result in collapsed or damaged buildings, damaged or blocked roads and bridges, damaged traffic signals, streetlights and parks, and other damage. Wind speeds as low as 32 mph can cause structural damage, and winds of 100 mph can actually destroy wood-frame structures (Seattle Office of Emergency Management 2014). High winds can also cause direct losses to buildings, people, and vital equipment. There are direct consequences to the local economy resulting from windstorms related to both physical damage and interrupted services.

Wind pressure can create a direct and frontal assault on a structure, pushing walls, doors, and windows inward. Conversely, passing winds can create lift and suction forces that act to pull building components and surfaces outward. As positive and negative forces impact a building's doors, windows and walls, the result can be roof or building component failures and considerable structural damage. The effects of winds are magnified in the upper levels of multi-story structures.

Debris carried along by extreme winds can contribute directly to loss of life and indirectly to the failure of protective building envelopes. Falling trees and branches can damage buildings, power lines, and other property and infrastructure. Tree limbs breaking in winds of only 45 mph can be thrown over 75 feet, so overhead power lines can be damaged even in relatively minor windstorm events. During wet winters, saturated soils cause trees to become less stable and more vulnerable to uprooting from high winds. Utility lines brought down by summer thunderstorms have also been known to cause fires, which start in dry roadside vegetation. Electric power lines falling down to the pavement create the possibility of lethal electric shock.

Downed trees and power lines, and damaged property also can be major hindrances to emergency response and disaster recovery. Emergency response operations can be complicated when roads are blocked or when power supplies are interrupted. Industry and commerce can suffer losses from interruptions in electric service and from extended road closures.

Windstorms in Placer County are more probable during the fall through early spring. Because of the shape and orientation of the Sacramento Valley, prevailing winds are southerly. When atmospheric conditions are favorable, usually in conjunction with a significant storm tracking along the coast, these winds may combine and become strong enough to cause property damage and personal injury. The most significant windstorm in Northern California was the Columbus Day storm of 1962. Significant damage occurred along the coast and in the far northern part of the Sacramento Valley. Because Roseville lies far enough south in the valley, windstorms such as those during the 1962 Columbus Day Storm, typically do not intensify to damaging levels. It is rare for southwesterly winds flowing parallel to the Sierra Nevada Mountains to reach sustained gusts above 60 mph in the valley floor. The predicted wind speed given in wind warnings issued by the National Weather Service is for a one-minute average; gusts may be 25 to 30 percent higher.

Site-specific data on windstorms in Roseville are incomplete. Regionally, a few windstorm events have resulted in significant damage. The impacts of these events were felt to the north and east of Roseville. There have been a couple of instances of unusual wind bursts that resulted in some property damage. December 1993 saw a downburst of wind that did significant damage to a sound wall that was under construction. Another event occurred on January 1, 1995, when a wind gust through northwest Roseville snapped several power poles. Table 12-1 shows monthly wind records for Sacramento.

Table 12-1. Monthly Wind Records for Sacramento, California

Month	Year of Record	Fastest Wind Speed (miles per hour)	Month	Year of Record	Fastest Wind Speed (miles per hour)
January	1954	60	July	1956	36
February	1938	58	August	1954	38
March	1952	66	September	1965	42
April	1955	45	October	1950	68
May	1912	40	November	1953	70
June	1950	47	December	1952	70

Source: Masters-Bevan 2001.

12.1.3 Fog

Fog is a cloud near the ground that forms when air close to the ground can no longer hold all the moisture it contains. This occurs either when air is cooled to its dew point or the amount of moisture in the air increases. Heavy fog is hazardous because it can restrict surface visibility. Severe fog incidents can close roads, cause vehicle accidents, cause airport delays, and impair the effectiveness of emergency response. Financial losses associated with transportation delays caused by fog have not been calculated in the United States, but they are known to be substantial. Fog can occur almost anywhere during any season and is classified based on how it forms, which is related to where it forms. Certain seasons are more likely to have foggy days or nights based on a number of factors, including topography.

In Placer County, heavy fog occurs mostly during the midwinter. A low-lying, early morning “tule fog” can occur anytime during the wet, cold season. Tule fog or radiation (ground) fog is common on clear nights with little or no wind. It is caused by the rapid cooling of the Earth and corresponding drop in air temperature to the dew point. This type of fog is known as “valley fog” when it persists throughout the day and is thick. Table 12-2 summarizes dense fog events in the southern Sacramento valley. Given the nature of fog in the Roseville area, future severe or dense fog events are expected to happen on an annual basis, but are not expected to occur frequently.

Table 12-2. Monthly Dense Fog Occurrence

Month	Year of Record	Mean Number of Days	Maximum Number of Days
January	1961	9.9	23
February	1963[a]	5.3	13
March	1986	1.7	6
October	1962	1.4	11
November	1982	5.3	11
December	1989*	9.5	22
Annual	1962	33.8	64

a. Also occurred in previous years.
Source: Masters-Bevan 2001.

12.1.4 Heavy Rains, Thunderstorms and Lightning

Severe weather in the City of Roseville generally includes heavy rains and is periodically accompanied by strong winds, lightning, or hail. Heavy rains coupled with low temperatures or other severe weather conditions can result in increases in traffic accidents, disruptions in transportation, commerce, government, and education. Severe weather incidents can also cause utility outages due to falling trees or other debris, as well as injuries.

Roseville's Mediterranean type of climate is typified by nearly 90 percent of the annual precipitation occurring during a window of about 16 weeks. The most severe storms occur during the late fall to early spring. The climate pattern, coupled with the onshore flow of warm, moist Pacific air during the winter, can generate severe and prolonged periods of heavy rain.

Roseville experiences heavy rains every year. Some of these events may include thunderstorms. Thunderstorms are typically few in number and are more likely to appear in spring or late fall. Table 12-3 shows the average and record occurrence of thunderstorms in Sacramento between 1948 and 2008.

Table 12-3. Frequency of Thunderstorms in Sacramento, California, 1948 – 2008

Month	Year of Record	Number of Days with Thunderstorms	
		Average	Maximum
January	1970	0.4	3
February	1970	0.5	4
March	1992	0.8	4
April	1983	0.7	3
May	1967	0.3	3
June	1956	0.2	2
July	1989	0.2	2
August	1991[a]	0.2	2
September	1989[a]	0.5	2
October	1989[a]	0.3	2
November	1979*	0.3	3
December	1970	0.2	2
Annual	**1970**	**4.7**	**10**

a. Also occurred in previous years between January 1948 and December 2000.
Source: Masters-Bevan 2008.

NOAA classifies a thunderstorm as a storm with lightning and thunder produced by cumulonimbus clouds, usually producing gusty winds, heavy rain, and sometimes hail. Thunderstorms are usually short in duration (seldom more than 2 hours). Heavy rains associated with thunderstorms can lead to flash flooding during the wet or dry season.

According to the American Meteorological Society *Glossary of Meteorology*, thunderstorms are reported as light, medium, or heavy according to the following characteristics:

- Nature of the lightning and thunder
- Type and intensity of the precipitation, if any
- Speed and gustiness of the wind
- Appearance of the clouds
- Effect on surface temperature.

Lightning is an electrical discharge that results from the buildup of positive and negative charges within a thunderstorm. When the buildup becomes strong enough, lightning appears as a "bolt." This flash of light usually occurs within the clouds or between the clouds and the ground. A bolt of lightning reaches temperatures approaching 50,000ºF instantaneously. The rapid heating and cooling of air near the lightning causes thunder. Lightning is a major threat during a thunderstorm. In the United States, between 75 and 100 Americans are killed by lightning each year.

12.1.5 Ice and Freezing Rain

Ice and freezing rain are not part of the climate pattern in southern Sacramento valley. Periods have occurred where the daily minimum temperature has been at or below 32°F for several days. Yet the low temperatures reflect diurnal variations with clear skies, not part of a synoptic feature generating any precipitation. The bitterest cold snap on record, occurring December 9 to 15, 1935, was ended by the onset of a Pacific storm bringing warmer air. Although ice storms and freezing rains are a significant natural hazard, the extremely remote possibility of their occurrence in Roseville precludes any further discussion in this analysis.

12.2 HAZARD PROFILE

12.2.1 Past Events

Table 12-4 summarizes past severe weather events in Roseville and Placer County as recorded by the National Oceanic and Atmospheric Administration since 1958.

12.2.2 Location

Severe weather events have the potential to happen anywhere in Placer County. Communities in low-lying areas next to streams or lakes are more susceptible to flooding. Mountainous regions experience heavier snowfall and a greater risk of road closures. Wind events are most damaging to areas that are heavily wooded.

12.2.3 Frequency

The planning area can expect to experience exposure to some type of severe weather event at least annually.

Table 12-4. Severe Weather Events in Placer County since 1958 (NOAA 2015)

Location	Date	Type	Magnitude	Deaths or Injuries	Property Damage
Placer County	01/13/1957	Tornado	F0	0	0
Placer County	04/22/1967	Hail	0.00 Inches	0	0
Placer County	10/15/1972	Tornado	F0	0	0
Placer County	03/03/1983	Tornado	F0	0	0
Placer County	03/22/1983	Tornado	F1	0	$250,000
Placer County	04/23/1990	Tornado	F0	0	$2,500
Placer County	12/30/1992	Hail	0.50 inches	0	0
Description: *Severe thunderstorms produced golf ball-sized hail. Damage occurred at several auto dealers in Roseville.*					
Roseville	12/22/1996	Thunder Storm/Wind	0	0	0
Description: *Downburst winds snapped five 75-foot-high power poles into several pieces.*					
Roseville	01/22/1997	Flash Flood	0	0	0
Description: *Heavy rains on saturated soil caused flooding on Dry Creek and Linda Creek, damaging 21 homes.*					
Roseville	01/26/1997	Flash Flood	0	0	0
Description: *Heavy rain caused flooding on Dry Creek and Linda Creek, damaging 21 buildings.*					
Placer County	01/12/1998	Heavy Rain	N/A	0	0
Description: *Heavy rains caused widespread but minor flooding across the Sacramento Valley and nearby foothills.*					
Placer County	01/18/1998	Heavy Rain	N/A	2	0
Description: *A Pacific storm brought brief but heavy rain to the Sacramento Valley and surrounding foothills. 27,000 customers lost power at some time during the storm. Two teens were drowned when their car flipped into a flooded ditch near Loomis.*					
Roseville	01/22/2000	Heavy Rain	N/A	0	0
Description: *Rainfall totaling 5.43 inches fell in just over 48 hours.*					
Roseville	02/11/2000	Heavy Rain	N/A	0	$10,000
Description: *Heavy rain that persisted for nearly 72 hours was responsible for the closure of Granite Bay High School. The school lost power and phone service. Local businesses were affected by the flooding and closed as well.*					
Placer County	12/17/2005	Heavy Rain	N/A	0	0
Description: A series of storms brought heavy rainfall to Northern California. Five-day rainfall for Roseville was 2.99 inches.					
Placer County	01/01/2006	Severe Storm/Flood	N/A	0	$2,000,000
Description: *Storms brought heavy rain, mudslides, flooding, and high winds to Northern California. Levee overtopping, breaching, and river flooding occurred along numerous rivers, creeks, and streams. Several urban areas had significant street flooding. The Sacramento weir was opened for the first time since 1997. Airports were closed due to high winds and major road closures resulted from flooding and mudslides. Interstate 80 between Sacramento and Reno, NV, was closed for more than a day due to a mudslide, as were both directions of U.S. Highway 50 between Sacramento and South Lake Tahoe. Place County was among the counties declared in need of federal disaster assistance.*					
Placer County	07/25/2013	Hail	N/A	0	0
Description: *Strong to severe thunderstorms affected the Sierra and northeast California.*					
Roseville	03/36/2014	Tornado	EF0	0	0
Description: *EF0 tornado began in a field southwest of Roseville, but did not cause damage until it reached the Pleasant Grove Blvd housing developments in West Roseville. The winds were estimated to be 75 to 85 mph. Several windows were blown out from houses, 25 to 30 feet of fence was blown down, projectile damage to stucco occurred. The tornado lasted 5 to 10 minutes.*					
Roseville	05/14/2015	Heavy Rain	N/A	0	0
Description: *Thunderstorms brought local heavy rain and minor flooding. Unusually late winter snow fell in the Sierra, causing travel delays and chain controls over passes. Funnel clouds were reported with thunderstorms, but no touchdowns were confirmed. Street flooding was reported at Martin Road and East Roseville Parkway from a thunderstorm.*					

12.2.4 Severity

Severe weather disaster declarations for Placer County, as shown in Table 12-4, are often related to heavy rains, thunderstorms, and freezing temperatures. The most common problems associated with severe storms are immobility and loss of utilities. Fatalities are uncommon, but can occur. Roads may become impassable due to flooding, downed trees, or a landslide. Power lines may be downed due to high winds, and services such as water or phone may not be able to operate without power. Lightning can cause severe damage and injury. Windstorms have been known to cause damage to utilities.

Tornadoes are potentially the most dangerous of local storms, but they are not common in the Roseville vicinity. If a major tornado were to strike a populated area such as Roseville, damage could be widespread. Businesses could be forced to close for an extended period or permanently, fatalities could be high, many people could be homeless for an extended period, and routine services such as telephone or power could be disrupted. Buildings may be damaged or destroyed. Compared with other states, California ranks 32nd for frequency of tornadoes, last for number of deaths, 36th for injuries, and 31st for cost of damage. California ranks 44th for the frequency of tornados per square mile.

12.2.5 Warning Time

A meteorologist can often predict the likelihood of a severe storm. This can give several days of warning time. However, meteorologists cannot predict the exact time of onset or the severity of the storm. Some storms come on more quickly and have only a few hours of warning time.

12.3 SECONDARY HAZARDS

The most significant secondary hazards associated with severe weather are floods, falling and downed trees, landslides and downed power lines. Rapidly melting mountain snow combined with heavy rain can overwhelm natural and man-made drainage systems, causing overflow and property destruction. Landslides occur when the soil on slopes becomes oversaturated and fails.

12.4 EXPOSURE

12.4.1 Population

A lack of data separating severe weather damage from flooding and landslide damage prevented a detailed analysis for exposure and vulnerability. However, it can be assumed that the entire Roseville planning area is exposed to severe weather events. Certain areas are more exposed due to geographic location and localized weather patterns. Populations living at higher elevations with large stands of trees or power lines may be more susceptible to wind damage and black out, while populations living in low lying areas are at risk for flooding.

12.4.2 Property

All structures within Roseville are exposed to the potential impacts of severe weather.

12.4.3 Critical Facilities and Infrastructure

All critical facilities exposed to flooding are also likely exposed to severe weather. Additional facilities on higher ground may also be exposed to wind damage or damage from falling trees. The most common problem associated with severe weather is the loss of utilities. Downed power lines can cause blackouts, leaving large areas isolated. Phone, water and sewer systems may not function. Roads may become impassable due to ice or snow or from a secondary hazard such as landslides.

12.4.4 Environment

Severe storm events can drastically affect the physical environment, changing natural landscapes. Natural habitats such as streams and trees risk major damage and destruction during a severe storm. Prolonged rains can saturate soils and lead to slope failure. Flooding caused by severe weather can cause stream channel migration.

12.5 VULNERABILITY

There are currently no loss estimation tools with uniform damage functions for severe weather events. This can be attributed to the variety of impacts that severe weather events generate. Also, the severity of severe weather events varies by location. Since secondary effects of severe weather events include flooding, landslides or even wildfires in drier climates, the vulnerability assessments under those hazards can provide emergency managers a gage of the economic impact of severe weather events. For this section, the vulnerability to severe weather events is discussed qualitatively. Where possible, damage estimates are made using reasonable assumptions and best available data.

12.5.1 Population

Particularly vulnerable populations are the elderly, low income or linguistically isolated populations, people with life-threatening illnesses, and residents living in areas that are isolated from major roads. Power outages can be life threatening to those dependent on electricity for life support. These populations face isolation and exposure during severe weather events and could suffer more secondary effects of the hazard.

12.5.2 Property

All property is vulnerable during severe weather events, but structures in poor condition or constructed to low building code standards risk the most damage. The frequency and degree of damage will depend on specific locations. Those in higher elevations and on ridges may be more prone to wind damage. Those that are located under or near overhead lines or near large trees may be damaged in the event of a collapse.

Estimates of potential loss for the severe weather hazard are not based on damage functions, because no such damage functions have been generated. Instead, estimates were developed representing 10 percent, 30 percent and 50 percent of the assessed value of exposed structures. This allows emergency managers to select a range of potential economic impact based on an estimate of the percent of damage to the general building stock. Damage in excess of 50 percent is considered to be substantial by most building codes and typically requires total reconstruction of the structure. Table 12-5 lists the potential loss estimates to the general building stock.

Table 12-5. Loss Potential for Roseville Buildings Vulnerable to Severe Weather Hazard

	Building Count	Assessed Value	10% Damage	30% Damage	50% Damage
Residential	43,163	$18,695,442,494	$1,869,544,249	$5,608,632,748	$9,347,721,247
Commercial	1,811	$8,274,963,659	$827,496,366	$2,482,489,098	$4,137,481,830
Industrial	475	$1,160,642,905	$116,064,290	$348,192,871	$580,321,452
Agricultural	1	$28,530	$2,853	$8,559	$14,265
Religion	71	$250,600,927	$25,060,093	$75,180,278	$125,300,463
Government	92	$168,856,266	$16,885,627	$50,656,880	$84,428,133
Education	445	$1,091,399,472	$109,139,947	$327,419,842	$545,699,736
Total	**46,058**	**$29,641,934,254**	**$2,964,193,425**	**$8,892,580,276**	**$14,820,967,127**

12.5.3 Critical Facilities and Infrastructure

Incapacity and loss of roads are the primary transportation failures, most of which are associated with secondary hazards. Landslides that block roads are caused by heavy prolonged rains. High winds can cause significant damage to trees and power lines, with obstructing debris blocking roads, incapacitating transportation, isolating population, and disrupting ingress and egress. Of particular concern are roads providing access to isolated areas and to the elderly.

Prolonged obstruction of major routes due to landslides, debris, or floodwaters can disrupt the shipment of goods and other commerce. Large and prolonged storms can have negative economic impacts for an entire region.

Severe windstorms and downed trees or power lines can create serious impacts on power and above-ground communication lines. Broken power and communication lines would result in isolation because some residents would be unable to call for assistance.

12.5.4 Environment

The environment vulnerable to the severe weather hazard is the same as the environment exposed to the hazard.

12.6 FUTURE TRENDS IN DEVELOPMENT

The general building stock within the planning area increased by 17.7% with an increase in valuation from $21.967 billion to $29.641 billion (34.9%). This increase in valuation of the planning area was impacted by the areas recovery from the economic downturn of 2008. Since the entire planning area would be considered susceptible to earthquake, there was an increase in earthquake exposure over the performance period of the 2011 plan. However, the vulnerability of this new exposure should be considered to be low due to the application of strong building code standards that are contained within the International Building Code.

Many of the impacts associated with severe weather hazards can be addressed through proactive planning and the use of best available information in making land use decisions. Roseville has and will achieve this goal through the implementation of its General Plan. The General Plan serves as a long-term policy guide for the physical, economic, and environmental growth of the City. It includes a statement of the community's vision of its ultimate physical growth. Implementation of the General Plan, along with other programs such as Building Code enforcement, public information and early warning, will help Roseville to manage the probable impacts of severe weather hazards as the City grows in the future.

12.7 REVIEW OF EXISTING ORDINANCES, PROGRAMS, AND POLICIES

Roseville implements numerous programs and policies that can impact severe whether hazards. Like most programs and policies sited in this Plan, these are tied to the City's general plan. Maintenance of these existing programs is included in the action plan for this hazard mitigation plan.

12.8 SCENARIO

A worst-case event would involve prolonged high winds during an extreme rainstorm. Such an event would have both short-term and long-term effects. Initially, schools and roads would be closed due to flooding, downed tree obstructions, and downed power lines. Power outages would be common throughout the City. Some subdivisions in the City could experience limitations on ingress and egress. Continuing rains could produce flooding, overtopped culverts with ponded water on roads, and landslides on steep slopes. Flooding and landslides could further obstruct roads and bridges, further isolating residents.

12.9 ISSUES

In general, every household and resident in the City is likely to be exposed to severe weather, but some are more likely than others to experience isolation as a result. Those residing in higher elevations with limited transportation routes may have the greatest vulnerability to isolation from storms. Another group at risk is the portion of the population that is over the age of 65.

13. WILDFIRE

13.1 GENERAL BACKGROUND

13.1.1 Contributing Factors

A wildfire is any uncontrolled fire occurring on undeveloped land that requires fire suppression. Wildfires can be ignited by lightning or by human activity such as smoking, campfires, equipment use, and arson. The potential for wildfire is primarily influenced by the following factors:

- Fuel, which may include living and dead vegetation on the ground, along the surface as brush and small trees, and above the ground in tree canopies.
- Topography, which includes both slope and elevation.
- Air conditions, including temperature, relative humidity, wind speed and direction, cloud cover, precipitation amount and duration, and the stability of the atmosphere.

DEFINITIONS

Wildland-Urban Interface Area—An area susceptible to wildfires where wildland vegetation and urban or suburban development occur together. Examples include dispersed rural housing in forested areas.

Wildfire—A fire that causes uncontrolled destruction of forests, brush, field crops, grasslands, and real and personal property in non-urban areas.

How a fire behaves primarily depends on the following:

- Fuel—Lighter fuels such as grasses, leaves and needles quickly expel moisture and burn rapidly, while heavier fuels such as tree branches, logs and trunks take longer to warm and ignite. Trees killed or defoliated by forest insects and diseases are more susceptible to wildfire.
- Weather—Strong, dry winds produce extreme fire conditions. Such winds generally reach peak velocities during the night and early morning hours.
- Thunderstorm activity—The thunderstorm season typically begins in June with wet storms, and turns dry with little or no precipitation reaching the ground as the season progresses into July and August.
- Terrain—The topography of a region influences the amount and moisture of fuel; the impact of weather conditions such as temperature and wind; potential barriers to fire spread, such as highways and lakes; and elevation and slope of land forms (fire spreads more easily uphill than downhill).
- Time of Day—A fire's peak burning period generally is between 1 p.m. and 6 p.m.

Short-term loss caused by a wildfire can include the destruction of timber, wildlife habitat, scenic vistas, and watersheds. Long-term effects include smaller timber harvests, reduced access to affected recreational areas, and destruction of cultural and economic resources and community infrastructure. Vulnerability to flooding increases due to the destruction of watersheds. The potential for significant damage to life and property exists in areas designated as "wildland-urban interface areas," where development is adjacent to densely vegetated areas.

13.1.2 Local Conditions Related to Wildfire Hazard

Vegetation

The vegetation in Roseville can be broadly classified in three categories:

- There are large tracts of self-sustaining grasslands in the northern and western undeveloped edges of Roseville. Less extensive areas of grassland can be found in smaller, undeveloped areas scattered throughout the City. Most of the grasslands are non-native, following the effects of grazing and clearing for agricultural uses.
- Oak woodland, riparian and creek areas are found in proximity to Roseville's major stream channels where microclimates and alluvial soils provide ideal conditions for the deeper rooting shrubs and trees found in these habitats. Most woodland areas are relatively open, with little shrub growth.
- Seasonal wetlands in Roseville include intermittent drainages and vernal pools. Intermittent drainages are wet only in winter and dry during the summer, with scattered ponds; they may contain water from adjacent urban runoff. Vernal pools represent a significant seasonal wetland resource in Roseville.

Undeveloped Areas

The U.S. Army Corps of Engineers has required developers in Roseville to preserve areas of vernal pools that are dedicated to the City and maintained in perpetuity. These areas are to be left undisturbed and are typically open grassy areas during the hot summer months when the vernal pools are dry.

Preservation of open space, wetlands, natural parkways, riparian corridors along the City's watersheds, vernal pools and endangered species habitat have added to the inventory of vegetation susceptible to wildfire. The City of Roseville has 2,600 acres of dedicated open space within the city limits. Nearly 740 acres will be added on dedication of properties in the West Roseville Specific Plan. The City recently acquired the Reason Farms property in unincorporated Placer County, which will be the site for a retention basin projected to have water only eight days per year. The property will be preserved in perpetuity as open space with passive recreational uses planned, including biking, hiking, camping, and boating on a man-made lake. The Roseville Fire Department will assume fire protection duties for this significant piece of open space at a future date.

Fire-Fighting and Fire Prevention

Federal, state, county, city, and private agencies provide fire protection and firefighting services in California. Wildfires usually are extinguished while smaller than 1 acre, but they can spread to more than 100,000 acres and may require thousands of firefighters and several months to extinguish.

Roseville Fire Protection Services

The Roseville Fire Department is a fully functional agency that primarily provides fire suppression and emergency medical services for the urban environment of the City. The department operates eight stations. The department has eight paramedic engine companies, with a minimum staffing of three, two paramedic truck companies with a minimum staffing of four, and one battalion chief. The department also operates a hazardous materials response unit (cross-staffed the truck company); five grass/wildland units, and one technical rescue unit (cross-staffed by engine companies). The department maintains four reserve engines and one reserve truck.

Regional Services

Regional fire protection is provided by municipal fire departments and those assigned to specially designated lands outside city boundaries. The Placer County Fire Department provides fire protection to much of Placer County including west of the Roseville city limits. The South Placer Fire District serves unincorporated Placer County east of Roseville. The City of Rocklin Fire Department provides services within the City of Rocklin to the north and east of Roseville. The Sacramento Metropolitan Fire District provides fire protection to the City of Citrus Heights and the unincorporated Sacramento County areas to the south of Roseville.

State of California

The California Department of Forestry and Fire Protection (CAL FIRE) is charged with both assessing the threat of fire in California and suppressing fires on state and federal lands, while providing mutual aid if needed to communities that do not include public lands. The California Fire Plan formalizes much of the work that has been done to assess the threat of wildfire statewide. CAL FIRE's Fire and Resource Assessment Program (FRAP) assesses the amount and extent of California's forests and rangelands, analyzes their conditions and identifies alternative management and policy guidelines.

Firewise Communities

The national Firewise Communities program is a multi-agency effort involving homeowners, community leaders, planners, developers, and others to protect people, property and natural resources from the risk of wildfire before a fire starts. The program emphasizes community responsibility for planning a safe community and effective emergency response, and individual responsibility for safer home construction and design, landscaping and maintenance. Firewise Communities is directed and sponsored by the National Wildfire Coordinating Group, a consortium of organizations and federal agencies responsible for wildfire management in the U.S.

13.2 HAZARD PROFILE

13.2.1 Past Events

Fire history shows multiple wildfires in or near Roseville since the 1950s:

- In the 1950s, one fire occurred just east of the current location of Interstate 80 on the Roseville/Rocklin border, including parts of the Stoneridge area. A second fire occurred south of Douglas Boulevard where Roseville Parkway is now located.
- In the 1970s, a significant fire occurred in undeveloped grasslands along what is now Galleria Boulevard and Harding Boulevard in north central Roseville. Another fire occurred just outside the city limits on both sides of Cavitt-Stallman in the Loomis area.
- In the 1980s, five wildfires were mapped, including one in the grasslands of the North Central Roseville Specific Plan just north of Highway 65, where Pleasant Grove Boulevard is now located. Three grassland fires occurred west of Roseville, one just west of Fiddyment Road and two west of Fiddyment Road and south of Athens Road. A major fire occurred in 1983 where Baseline Road and Country Club Drive now intersect. The fire scorched 1,500 acres north past the current Blue Oaks Boulevard, stopping at Pleasant Grove Creek. The area is now developed with urban uses.
- The 2002 Sierra Fire in Loomis and Granite Bay was the largest in recent history near Roseville. The fire charred 900 acres of grass, brush and oaks in the area between Interstate 80 and Cavitt-Stallman Road. The fire destroyed six structures and threatened two schools. One hundred homes were evacuated, and more than 1,000 homes in both communities were threatened.
- On May 17, 2016, a grass fire broke out near Highway 65 north of Roseville. The fire, located at Athens Avenue and Industrial Boulevard, south of Lincoln in Placer County stretched to 169 acres.

Statewide, California experiences frequent significant wildfires. Most recently, the following two fires occurred:

- The 2003 Cedar fire in San Diego County burned 273,246 acres, destroyed 2,820 structures and directly resulted in 15 deaths. The fire was caused by human ignition.
- The 2015 Valley Fire in Lake County is considered the third worst fire in history, based on the number of structures damaged or destroyed. The fire consumed 75,781 acres and killed four people.

CAL FIRE maintains a website (http://www.calfire.ca.gov/general/firemaps/) with interactive maps that detail the fire history in California since 2011.

13.2.2 Location

State

CAL FIRE also developed an estimate of fire risk in designated wildland-urban interface areas, based on a variety of factors affecting fire frequency and fire behavior. The results are combined into a single assessment called fire threat. A significant fire threat is found throughout California, with 48 percent of the state's wildland area ranked as high, very high or extremely high. About 37 percent of the state has a moderate fire threat. Large areas of high threat are found in Southern California, the central coast, the lower elevations of the Sierra Nevada and much of the interior of northern California. Much of the fire threat is near densely populated areas and new development.

Regional

Wildfire safety is an increasing concern in the western Sierra foothills and valley as development continues in rural areas while grasslands and open space border urban areas. The potential for wildfire and urban wildfire is always present, with fire conditions from a combination of hot weather, an accumulation of vegetation, and low moisture content typically present in the warm fire season within the Central Valley and Sierra Nevada foothills. Wildfire risk in Placer County is primarily in the wildland-urban interface areas. A majority of Placer County is deemed to be a high or very high fire threat risk based on analysis by CAL FIRE, as shown on Figure 13-1. These are areas with dense vegetation, increasing elevation, and steep slopes in the foothills and the mountains of the Sierra Nevada Mountain Range.

CAL FIRE's FRAP website (http://frap.cdf.ca.gov/) includes maps of the communities most at risk for wildfire that are within 1.5 miles of a high or very high wildfire threat on federal or non-federal lands. The threat is based on the FRAP fuels and hazard data. The map identifies seven communities in Placer County not adjacent to federal lands that are at risk for wildfire, including the City of Roseville and communities adjacent to or within the Tahoe National Forest.

Local

The City of Roseville does not include any designated wildland-urban interface areas. A significant portion of the area around the City is developed. State maps show that the City has a moderate fire threat. While the City rarely has critical fire weather conditions, a combination of dry grasslands, the topography in northeast Roseville, and hot temperatures with limited rainfall could result in a risk of wildfire on occasion. The following are the most likely wildfire hazards in Roseville:

- Grassland fires on undeveloped properties in the West Roseville Specific Plan Area or west or north of Roseville
- Fires in northeast Roseville where significant slopes are adjacent to ravines and residential development
- Fires in open space and preserve areas within the developed sections of Roseville.

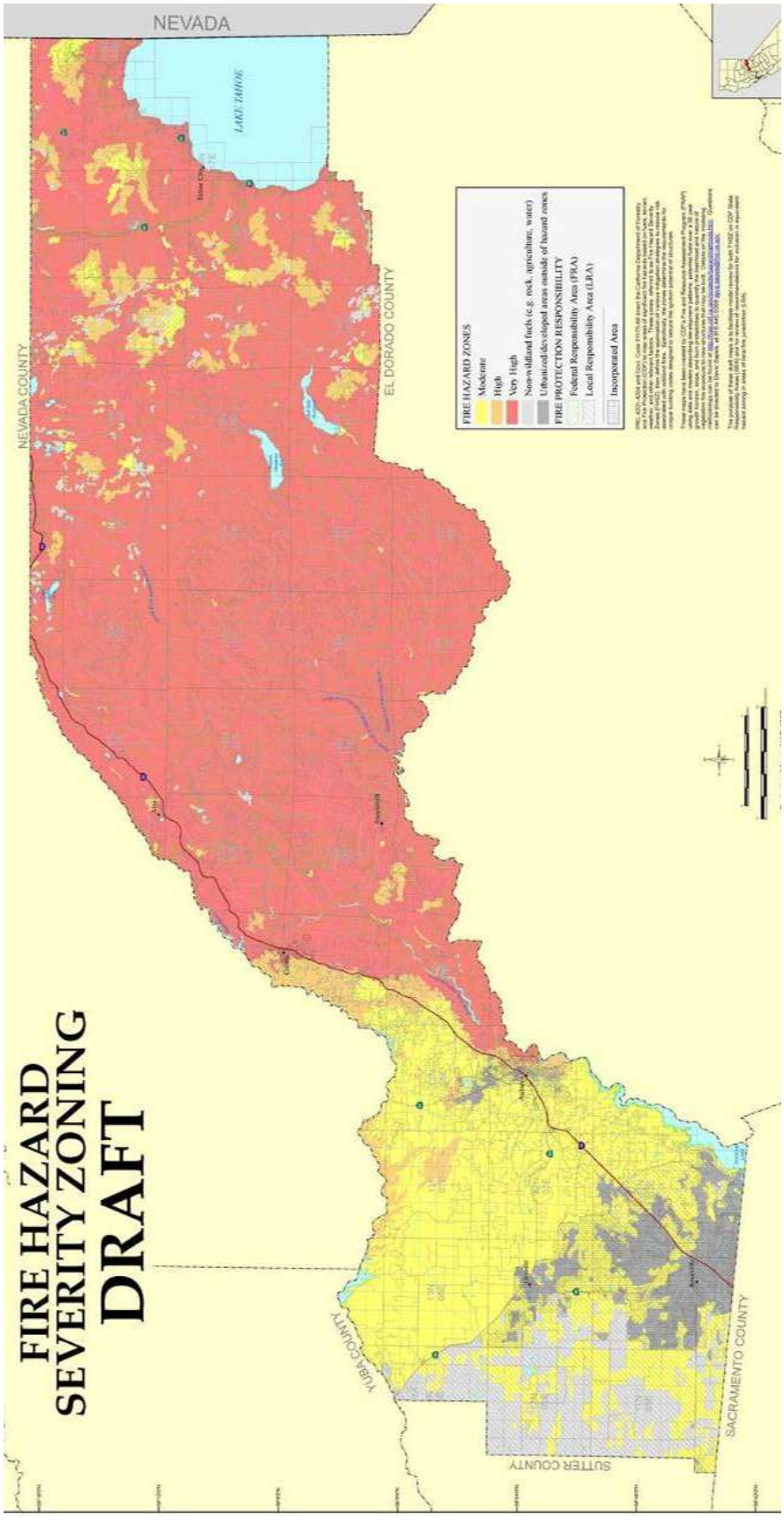


Figure 13-1. CAL FIRE FRAP Map for Placer County

Grassland Fires

Prior to August 2004, Roseville's northwestern boundary was Fiddyment Road. Since the annexation of 3,200 acres in West Roseville, the City now includes a significant amount of undeveloped non-native annual grassland with some riparian and oak woodland along Pleasant Grove Creek and Kaseberg Creek. The property to the west of Roseville along this border is also non-native annual grassland. The 2004 West Roseville Specific Plan Open Space Preserve Operations and Management Plan has provisions for reducing fire hazard if the preserve becomes a fire hazard. The preserve manager will work with the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service and the Roseville Fire Department to decide the best way to reduce the hazard. Fire breaks are allowed within the 50-foot buffer around the preserve. Fire breaks in other locations would require U.S. Army Corps of Engineers and U.S. Fish and Wildlife Service approval.

The Sierra Vista Specific Plan Area, annexed in January 2012, consists of largely nonnative, annual grasslands. The Sierra Vista Specific Plan Area will develop as urban uses, but will also contain 267 acres of preserve areas. A 50-foot wide open space buffer area is maintained at the perimeter of all open space preserves for fuel modification and fire management, among other uses. The Roseville Fire Department's Fire Station #5 serves as the primary responding area for this area.

Ravine Fires

The Stoneridge Specific Plan includes 1,089 acres of land that will include 2,882 dwelling units, along with office and commercial uses, schools, parks, and open space. Approximately 252 acres will be set aside as open space with an extensive network of bike trails. The main ingress and egress to the area is Secret Ravine Parkway, which will link Sierra College Boulevard with East Roseville Parkway. The ravines also border the Northeast Roseville Specific Plan Area, which is largely developed, with some construction continuing along the ravine edges.

The key topographic features in Stoneridge are the three ravines: Secret Ravine, False Ravine, and Miners Ravine. The creek at the base of Miner's Ravine flows year-round. The elevation of the property is among the highest in the City, ranging from 225 feet to 375 feet above sea level. Slopes in Miner's Ravine range from a 5-percent grade to a 26-percent grade.

Vegetation in the Stoneridge Specific Plan Area is primarily annual grasslands, oak woodlands, and oak riparian landscapes (see Figure 13-2). Annual grasses with scattered downed trees and limbs cover the ground. The overstory includes scattered oaks and a few other broad leaf trees. The riparian vegetation includes Blue Oak, Valley Oak and Interior Live Oak, along with willows, cottonwood, and ash trees. The vegetation on the plateaus between the three main ravines is primarily annual grasses. The ravines do not have a continuous fuel ladder from the ground vegetation to the overstory trees.



Figure 13-2. View of Ravine, Tree Canopy and Stoneridge Development

The 1999 Stoneridge Specific Plan Wildfire Safety Plan outlined the following risks resulting from development of the Plan Area (see Figure 13-3):

- Fire in the grass of the open space area was identified as the most serious wildfire threat for the Stoneridge Specific Plan. Extensive grass fuels in the open space areas will quickly ignite and fire will spread rapidly, especially in summer. The plan cites a fire history that has demonstrated that grass and other light fuels are a threat to fire risk for other vegetation types as well as people.
- Wildfire rate of spread can increase with steep slopes. The three ravines in the project area have moderate slopes that can cause a fast rate of wildfire spread.
- Risk of fire starts will increase with development. The greatest risk from fire ignitions will be in the open space areas as use of these areas by future residents and other members of the public increases. Bike trails, for example, will make open space areas more accessible than when the Plan Area was undeveloped.
- Initial work by the developer to reduce the amount of fuel in the area must be maintained over the long-term to keep fire risk in check.
- Home design and siting often do not adequately mitigate wildfire risk. Measures specific to development within the Plan Area have been adopted by the City and are being enforced at the building permit stage. Owners will be required to maintain a clearing of flammable vegetation around the structures, use only fire resistant materials for roofs and fences, and ensure adequate water for fire suppression.

The Stoneridge Wildfire Safety Plan outlines short and long-term mitigation measures to prevent or minimize the impact of wildfire in this area of Roseville. These are included in the mitigation section of this 2016 Plan.

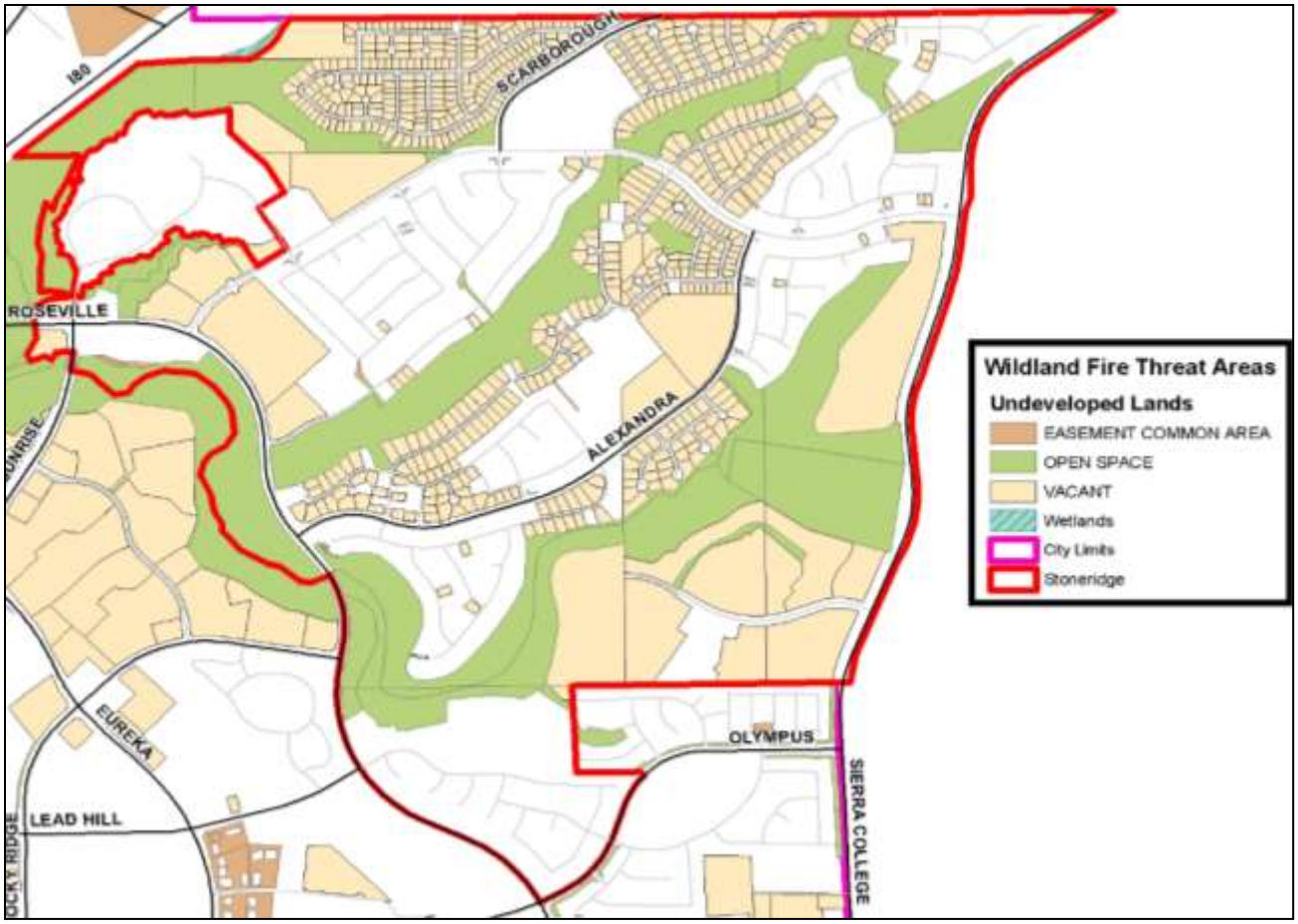


Figure 13-3. Stoneridge Specific Plan Wildfire Threat Areas

Open Space Fires

The City is adding new open space areas through dedication as part of the specific plan process. This will result in construction of new developments immediately adjacent to open space areas, which poses moderate risk to such developments. The Fire Department reviews these during the planning process, and fire safety provisions are accounted for in Specific Plan design guidelines and development agreements.

13.2.3 Frequency

The Roseville Fire Department maintains a database of every incident type responded to by Roseville fire personnel. Wildfires are tracked in four categories: natural or vegetation fire; forest, woods, or wildfire; brush or brush and grass fire; and grass fire. Table 13-1 provides the number of wildfire incidents recorded from 2011 to 2015. Placer County has had nearly 150 significant wildfires since 1908. In California, vegetation fires occur daily. Most are controlled and contained early, with limited damage.

Table 13-1. Wildfire Incident Counts—2011 to 2015

Incident Type	2011	2012	2013	2014	2015
Cultivated vegetation, crop fire	**–**	**1**	**3**	**3**	**2**
Cultivated trees or nursery stock fire	–	–	–	2	1
Cultivated vegetation, crop fire, other	–	1	3	1	1
Fire in mobile property used as fixed structure	**1**	**–**	**1**	**–**	**–**

Fire in mobile home used as fixed residence	–	–	1	–	–
Fire in portable building, fixed location	1	–	–	–	–
Natural Vegetation Fire	**47**	**54**	**70**	**62**	**53**
Brush, or brush and grass mixture fire	11	16	20	14	29
Forest, woods or wildland fire	–	1	2	1	–
Grass fire	24	23	26	29	18
Natural vegetation fire, other	12	14	22	18	6
Outside Rubbish Fire	**67**	**61**	**92**	**70**	**76**
Dumpster or other outside trash receptacle fire	16	8	9	12	17
Outside rubbish fire, other	18	19	39	34	27
Outside rubbish, trash or waste fire	32	34	44	23	32
Outside stationary compactor/compacted trash fire	1	–	–	1	–
Total	115	116	166	135	131

Source: City of Roseville Fire Department Incident Type Count Reports 2010-2015

13.2.4 Severity

Wildfires have never resulted in loss of life in Roseville, though some property damage has resulted from wildfire incidents, including some fences on occasion. CAL FIRE maps areas of significant fire hazard based on fuel, terrain, weather, and other relevant factors. The mapped fire hazard severity zones define the application of mitigation strategies to reduce risk associated with wildfires. Figure 13-4 shows fire hazard severity zones for the Roseville planning area. The City's wildfire hazard is rated as moderate. While the City is also a Community at Risk from Wildfire as designated on the State of California map, the Roseville Fire Department assessment in the General Plan concurs that wildfires in open space areas represent a moderate hazard. Most fires of this type are small and localized. The open space areas are typically easily accessible for fire suppression apparatus, and the response time is such that fires are suppressed rapidly.

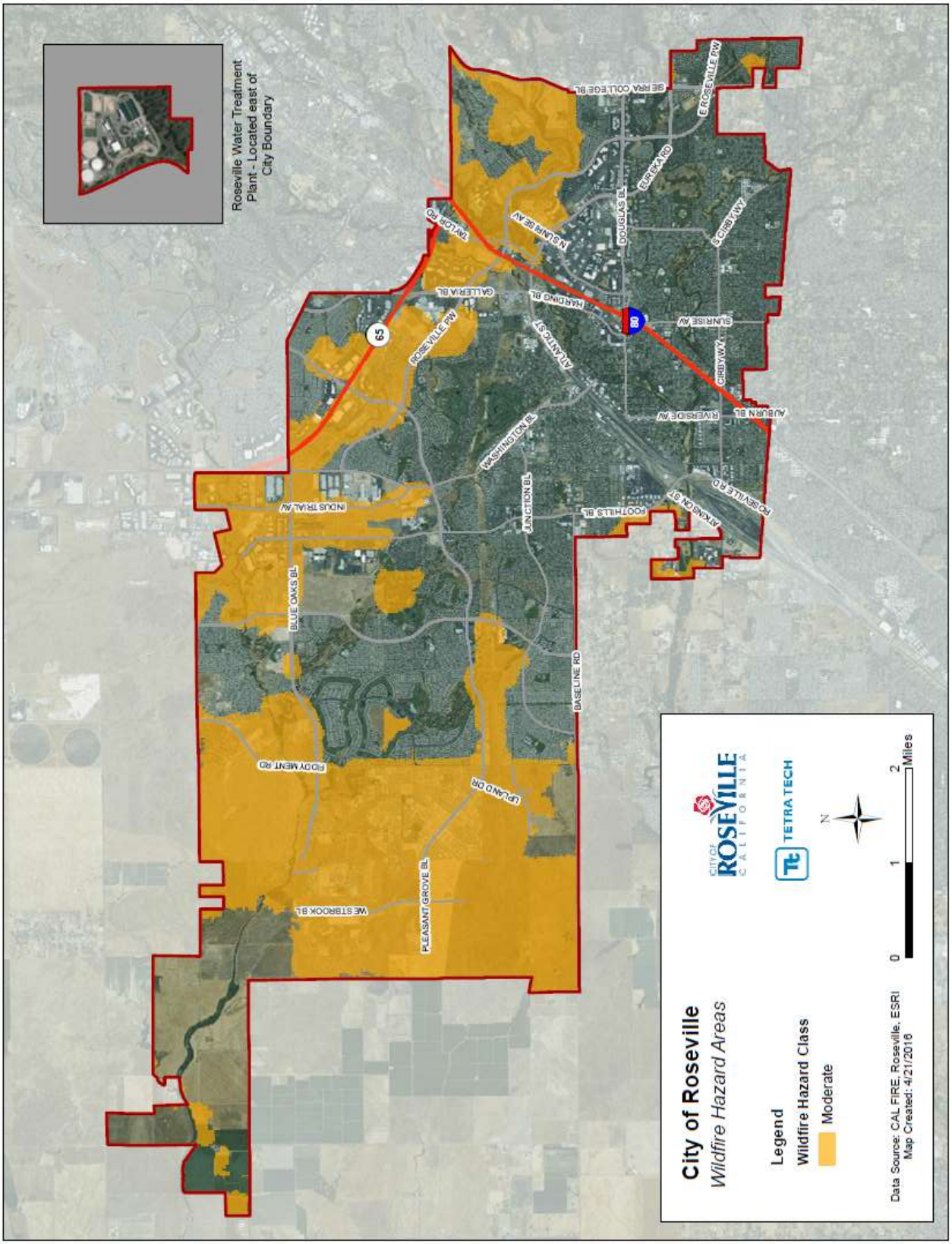


Figure 13-4. Fire Hazard Severity Zones in the Planning Area

13.2.5 Warning Time

Wildfires are typically caused intentionally or accidentally by humans. There is no way to predict when one might break out. Dry seasons and droughts greatly increase fire likelihood. If a fire breaks out and spreads rapidly, residents may need to evacuate within days or even hours. Once a fire has started, fire alerting is reasonably rapid in most cases. The spread of cellular and two-way radio communications has contributed to a significant improvement in warning time.

Since fireworks often cause brush fires, extra diligence can be taken around the Fourth of July when the use of fireworks is highest. Dry lightning may also trigger wildfires, so special attention can be paid during weather events that may trigger wildfires. Reliable National Weather Service lightning warnings are available on average 24 to 48 hours prior to a significant electrical storm. National Weather Service fire weather forecasts for the country (http://www.spc.noaa.gov/products/fire_wx) are monitored by local fire departments, including the City of Roseville Fire Department, to assess the risk for wildfire at any given time and enhance preparedness.

13.3 SECONDARY HAZARDS

Wildfires can generate a range of secondary effects, which in some cases may cause more widespread and prolonged damage than the fire itself. Fires can cause direct economic losses in the reduction of harvestable timber and indirect economic losses in reduced tourism. Wildfires cause the contamination of reservoirs, destroy transmission lines and contribute to flooding. They strip slopes of vegetation, exposing them to greater amounts of runoff. This in turn can weaken soils and cause major landslides several years after the wildfire. Most wildfires burn hot and for long durations that can bake soils, especially those high in clay content, thus increasing the imperviousness of the ground. This increases runoff generated by storm events, increasing the chance of flooding.

13.4 EXPOSURE

13.4.1 Population

Population could not be examined by fire hazard severity zone because census block group areas do not coincide with the fire risk areas. However, the planning team was able to create a population estimate using the structure count of buildings located within the highest-risk fire hazard severity zone for Roseville (moderate), and applying the census value for persons per household for Roseville (2.54). Using this approach, it is estimated that the population living within the moderate fire hazard severity zones is 29,178. This represents 22.7 percent of the total population for the City.

13.4.2 Property

Using the base mapping created to support the HAZUS-MH analyses, the planning team determined that there are 10,338 structures within the moderate fire hazard severity zones within the planning area, with the predominant use being residential. The total assessed value of these structures and their contents is $7.76 billion. This represents 26.2 percent of the total assessed value for the City.

13.4.3 Critical Facilities and Infrastructure

Critical facilities are public and private structures where vital community functions are conducted. If the facility is damaged or destroyed by wildfire, there could be severe consequences to public health and safety. The Roseville Fire Department, all first responders and mutual aid agencies would work to protect those facilities in areas where wildfire is a potential. Table 13-2 provides a list of critical facilities that are in potential wildfire areas.

Table 13-2. Critical Facilities and Infrastructure Adjacent to Potential Wildfire Areas

Facility Type	Number
Communications Facilities	29
Utilities	16
Fire Stations	4
Hazardous Materials Facilities	2
Bridges	21
Medical	1
Government	4
Religious	2
Schools	5

13.4.4 Environment

It can take decades or even centuries for ecosystems to recover from a wildfire, which can cause severe environmental impacts:

- **Damaged Fisheries**—Critical trout, salmon and steelhead fisheries can suffer from increased water temperatures, sedimentation, and changes in water quality.
- **Soil Erosion**—The protective covering provided by foliage and dead organic matter is removed, leaving the soil fully exposed to wind and water erosion. Accelerated soil erosion occurs, causing landslides and threatening aquatic habitats.
- **Spread of Invasive Plant Species**—Non-native woody plant species frequently invade burned areas. When weeds become established, they can dominate the plant cover over broad landscapes and become difficult and costly to control.
- **Disease and Insect Infestations**—Unless diseased or insect-infested trees are swiftly removed, infestations and disease can spread to healthy forests and private lands. Timely active management actions are needed to remove diseased or infested trees.
- **Destroyed Endangered Species Habitat**—Catastrophic fires can have devastating consequences for endangered species. For instance, the Biscuit Fire in Oregon destroyed 125,000 to 150,000 acres of spotted owl habitat.
- **Soil Sterilization**—Topsoil exposed to extreme heat can become water repellant, and soil nutrients may be lost. Some fires burn so hot that they can sterilize the soil.

13.5 VULNERABILITY

Structures, above-ground infrastructure, critical facilities and natural environments are all vulnerable to the wildfire hazard. There is currently no validated damage function available to support wildfire mitigation planning. Except as discussed in this section, vulnerable populations, property, infrastructure and environment are assumed to be the same as described in the section on exposure.

13.5.1 Population

There are no recorded incidents of loss of life from wildfires in Roseville, and the risk from wildfire has been deemed moderate by the State and the Roseville Fire Department. Given the immediate response times to reported fires, the likelihood of injuries and casualties is minimal; therefore, injuries and casualties were not estimated for the wildfire hazard.

Air pollution from wildfires can be a severe health hazard, especially for sensitive populations, including children, the elderly and those with respiratory and cardiovascular diseases. Smoke generated by wildfire consists of visible and invisible emissions that contain particulate matter (soot, tar and minerals), gases (carbon monoxide, carbon dioxide, nitrogen oxides), and toxics (formaldehyde, benzene). Emissions from wildfires depend on the type of fuel, the moisture content of the fuel, the efficiency of combustion, and the weather. Public health impacts associated with wildfire include difficulty in breathing, odor, and reduction in visibility.

Wildfire may also threaten the health and safety of those fighting the fires. First responders are exposed to the dangers from the initial incident and after-effects from smoke inhalation and heat stroke.

13.5.2 Property

Loss estimations for the wildfire hazard are not based on modeling utilizing damage functions, because no such damage functions have been generated. Instead, loss estimates were developed representing 10 percent, 30 percent and 50 percent of the assessed value of exposed structures. This allows emergency managers to select a range of economic impact based on an estimate of the percent of damage to the general building stock. Damage in excess of 50 percent is considered to be substantial by most building codes and typically requires total reconstruction of the structure. Table 13-3 lists the loss estimates for the exposed building stock.

Table 13-3. Potential Loss Estimates for the Wildfire Hazard

	Building Count	Assessed Value	10% Damage	30% Damage	50% Damage
Residential	9,792	$4,811,813,630	$481,181,363	$1,443,544,089	$2,405,906,815
Commercial	322	$2,309,864,426	$230,986,443	$692,959,328	$1,154,932,213
Industrial	108	$365,734,419	$36,573,442	$109,720,326	$182,867,209
Agricultural	0	$0	$0	$0	$0
Religion	5	$33,408,645	$3,340,865	$10,022,594	$16,704,323
Government	52	$79,624,825	$7,962,482	$23,887,447	$39,812,412
Education	59	$175,116,040	$17,511,604	$52,534,812	$87,558,020
Total	**10,338**	**$7,775,561,985**	**$777,556,198**	**$2,332,668,595**	**$3,887,780,992**

13.5.3 Critical Facilities and Infrastructure

Critical facilities of wood frame construction are especially vulnerable during wildfire events. A detailed vulnerability analysis for all critical facilities is on file with City staff and will not be published for review due to security reasons.

In the event of wildfire, there would likely be little damage to most infrastructure. Most roads and railroads would be without damage except in the worst scenarios. Power lines are the most at risk from wildfire because most poles are made of wood and susceptible to burning. Fires can create conditions that block or prevent access and can isolate residents and emergency service providers. Wildfire typically does not have a major direct impact on bridges, but it can create conditions in which bridges are obstructed. Many bridges in areas of high to moderate fire risk are important because they provide the only ingress and egress to large areas and in some cases to isolated neighborhoods.

13.6 FUTURE TRENDS IN DEVELOPMENT

Roseville is expected to grow considerably in the next 10 years. The moderate potential for wildfire in Roseville is not likely to lessen or prohibit development in Roseville.

The wildfire risk exposure with in the planning area increased by 54% at an increase in value of over $3 billion dollars. This increase in risk exposure can be attributed to the vast extent and location of the moderate fire severity zone within Roseville, and a population growth rate of 14.5% over the performance period of the prior plan. The planning area also saw in increase in assessed valuation of real property of over 34%. This increase in value can be attributed to the continued economic recovery from the 2008 economic down turn that had a significant impact on the State of California as well as the City of Roseville. Any increase in asset value will increase risk quotient when risk is being measured by looking at assets exposed as is with this Plan. However, the vulnerability of this new exposure should be considered to be low due to the application of strong building code standards that are contained within the California Fire Code.

13.7 REVIEW OF EXISTING PROGRAMS, PLANS AND ORDINANCES

The City of Roseville and Roseville Fire Department have adopted a number of policies, programs, plans and ordinances to meet the following fire protection goals detailed in the Roseville General Plan:

- Protect against the loss of life, property, and the environment by appropriate prevention and suppression measures.
- Provide emergency services in a well-planned, cost-effective, and professional manner through the best use of equipment, facilities and training available.

13.7.1 Fire Prevention Programs and Standards

Roseville Fire Prevention

Roseville fire prevention includes the fire marshal, hazardous materials officer, two senior fire inspectors, four fire inspectors and one public safety community relations coordinator (shared with the Police Department). The key role of these staff members is improving the safety and quality of life of the citizens of Roseville.

The Roseville Fire Department has an extensive work program to promote and implement fire prevention in developed and undeveloped areas of the City. These programs promote or provide the following services:

- Regular inspection and code enforcement
- Fire-safe roofing requirements
- Adequate access to and fire breaks adjoining open space areas
- Early warning devices such as automatic detection and reporting devices and smoke detectors
- Automatic fire suppression systems such as fire sprinkler systems
- Public education and information
- Code and ordinance development and updates
- Training and planning
- Fire investigation and data analysis
- Hazardous materials process and inspection.

Development Review Process

Section 16.16.050 of the Roseville Municipal Code specifies that all development plans be reviewed and approved by the Roseville Fire Department prior to construction. The code section states the following:

> "…complete plans, specifications, and information for new construction, remodeling, tenant improvements, or additions to buildings shall be submitted for review and approval prior to construction to the Chief or his/her designated representative having jurisdiction. Plan approval shall be required prior to the issuance of a Fire Department Inspection Record Card for those instances where such card may be

> required. In addition to the submittal of hard copy plan sets, a digitized copy of the approved drawings for new buildings shall be submitted to the Fire Department for pre-fire documentation purposes. Said copy shall be submitted in an approved format."

The Roseville Fire Department is an integral part of the development planning and review process, with specific emphasis on the provision of access to lands for firefighting purposes, street access to all structures, fire prevention programs, and the enforcement of building and fire codes and City ordinances. The Fire Department also evaluates water supply for firefighting and fire suppression systems.

California Building Code

Roseville Municipal Code Title 16 has been adopted to enforce the 2013 California Building Code for all construction in the City. Roofing and building materials, construction techniques, wiring standards, and fire detection/warning devices are defined and enforced to minimize the risk of structural fire damage.

California Fire Code

Chapter 16.16 of the Roseville Municipal Code includes adoption of, reference to and amendments to the Uniform Fire Code. Last amended in 2013, the code provides specifications and standards for fire safety. Early warning devices such as automatic sprinkler systems, automatic detection and reporting devices, and smoke detectors are required as preventative measures to reduce the risk of fire. The code also states the amount of water needed for fire protection.

Weed Abatement Ordinance

Chapter 9.20 of the Roseville Municipal Code includes provisions for the abatement of weeds, dirt, rubbish, and rank growths. The ordinance specifies that weeds be eradicated by property owners to prevent the presence of fire fuels. Properly implemented, the ordinance ensures accessibility of firefighters to open space areas and creation of firebreaks that slow the spread of fire.

13.7.2 Adopted Service Levels for Response Time

Specific Plans

Roseville's specific plan process is used by the Fire Department to plan future fire station locations and response times based on the circulation systems, and to ensure that revenues from the Fire Service Construction Tax and General Fund are sufficient to provide fire protection services to the area and cumulatively city-wide. The Fire Department is involved in every specific plan process from the initial planning process to adoption, construction, and ongoing inspections.

Should there be significant fire-related concerns, the Fire Department may require supplemental analysis as a condition of the specific plan. For example, a mitigation measure for adoption of the Stoneridge Specific Plan required the preparation of the Stoneridge Plan Wildfire Safety Plan. The Safety Plan analyzes the factors contributing to the risk of wildfire in Stoneridge and mitigation measures to enhance fire prevention.

Capital Improvement Program

The Capital Improvement Program is a five-year plan updated annually with the City's fiscal year budget that includes all public projects under construction and planned within the five-year time frame. The Capital Improvement Program allocates funds from each of the revenue sources collected to pay for City facilities, services, and programs. Fire Department stations and apparatus are included in the Capital Improvement Program along with the status of the Fire Service Construction Tax current and projected revenues to ensure that fire stations are built and apparatus is procured to keep pace with development.

Fire Service Construction Tax

The Fire Service Construction Tax, approved by Roseville voters in 1984, requires that 1/2 percent of the value of any new construction be collected as part of the building permit fee and designated for fire suppression and protection. The funds must be spent on capital improvements such as fire stations, fire apparatus, and other Fire Department equipment. The funds may not be allocated to expenses such as salaries or training. The City's newer Specific Plan Areas include provisions that extend this tax collection to the buildout of each Plan Area.

Dedications, Fees, and Exactions

The City of Roseville, through the specific plan process, and if necessary as part of individual project approvals, requires the dedication of property and payment of fees or exactions. The Fire Department reviews the project proposals and may require dedication of land or payment of appropriate fees and exactions to help offset municipal costs for fire-related facilities and services. The City of Roseville requires the dedication of fire station sites through the specific plan process. Should revenues be deemed insufficient to fully support fire services, additional assessments may be required to ensure adequate protection in the future. For example, recent specific plans through development agreements require owners to pay a special assessment for public safety, including fire protection, as part of their annual property tax bills.

Water System Master Plan

The City of Roseville Environmental Utilities Department maintains and updates a distribution system model to ensure adequate water sources, quantities and water pressure, along with emergency backup systems to ensure maximum firefighting capacity.

Interagency Agreements

The City of Roseville Fire Department participates in the statewide mutual aid agreement, whereby the Fire Department will respond to any other department or district should the need arise. In addition, the Department maintains mutual aid agreements with other agencies, including agreements through Cal OES Mutual Aid Region IV and the Placer County Operational Area.

13.7.3 Annual Monitoring of Fire Department Service Levels

Program Performance Measures

The Roseville Fire Department compiles program performance measures as part of the City's annual budget to monitor service levels and address deficiencies before they become serious. The annual evaluation includes establishment of goals and objectives, formulation of key indicators relating to activities, and efficiencies that can be monitored throughout the year, along with a line item cost for the programs and objectives. The Fire Department budget and program performance measures include a review of fire service levels and department goals.

National Fire Incident Reporting System

The National Fire Incident Reporting System requires local fire departments to report fire service data. Performance indicators are routinely reviewed to evaluate capability and coverage, demand for service and trends. Key components of the system include GIS and mapping, fire incident reporting, emergency medical management, personnel and training management, inspection management, and equipment and supplies inventory management. Fire Department incident data are input into a computer database and submitted to the State Fire Marshal's Office per state standards. The data are also used by the City of Roseville to evaluate operations and track trends in fire service within the City.

13.7.4 Personnel Training

The Roseville Fire Department Training program includes dedicated staff and facilities to ensure that personnel are properly trained and updated as new techniques and equipment become available. The Fire Training staff provides training for all firefighters within the department at the City's state of the art training center (Figure 13-5). This training is the most important ingredient to the readiness of Roseville firefighters and emergency responders to fulfill their assigned mission. The Training Center is also used by other fire departments and local agencies on a fee-for-use basis. The training staff consists of one fire training officer.



Figure 13-5. City of Roseville Fire Training Center

13.7.5 Fire Investigation

Fires in the City of Roseville are investigated by Roseville Fire Department investigators. The program ensures proper investigation of the cause, origin, and circumstances of each fire; collects and preserves evidence; coordinates with authorities in detection, apprehension and prosecution of arsonists; and pursues each investigation to conclusion. Information is reported to the State Fire Marshal for inclusion in annual state reports.

13.7.6 Comprehensive Emergency Medical Services

The state requires a Multi-Hazard Function Plan that details response strategies for all types of emergencies. The plan addresses interagency cooperation, emergency functions, continuity of government, and public awareness. In addition, the plan provides for the operation of police, fire and health services, as well as transportation alternatives in the event of a multi-hazard emergency. The City's Emergency Plan conforms with the Standardized Emergency Management System and is approved by the City Council and Cal OES.

13.7.7 Accreditation Recommendation

The Commission on Fire Accreditation International provides a comprehensive system of fire and emergency service evaluation that helps local governments determine their risks and fire safety needs, evaluate the performance of the organizations involved and provide a method for continuous improvement. The self-assessment process covers 10 categories: governance and administration; assessment and planning; goals and objectives; financial resources; programs; physical resources; human resources; training and competency; essential resources; and external systems relations. Within these categories are several related performance indicators and core competencies that the agency must address. In completing the self-assessment process, agencies must develop a strategic or master plan as well as a standard of response coverage document.

The Roseville Fire Department staff spent more than four years on the self-assessment and preparing the materials for the accreditation. In June 2005 the Commission on Fire Accreditation International recommended accreditation for the Roseville Fire Department. Reaccreditation was obtained in 2010. Only 220 departments in the world are accredited, and only 16 in California.

13.8 SCENARIO

As the future growth of Roseville expands into wildland-urban interface areas, a wildfire in Roseville has the potential to cause significant damage to exposed areas. A major wildfire might begin with a wet spring, adding to fuels already present on the forest floor. Flashy fuels would build throughout the spring. The summer could see the onset of insect infestation. A dry summer could follow the wet spring, exacerbated by dry hot winds. Carelessness with combustible materials or a tossed lit cigarette, or a lighting storm could trigger a multitude of small isolated fires.

The embers from these smaller fires could be carried miles by hot, dry winds. The deposition zone for these embers would be deep in the forests and wildland-urban interface zones. Fires that start in flat areas move more slowly, but wind still pushes them. It is not unusual for a wild fire pushed by wind to burn the ground fuel and later climb into the crown and reverse its track. This is one of many ways that fires can escape containment, typically during periods when response capabilities are overwhelmed. These new small fires would likely merge. Suppression resources would be redirected from protecting the natural resources to saving remote subdivisions.

The worst-case scenario would include an active fire season throughout the American west, spreading resources thin. Firefighting teams would be exhausted or unavailable. Many federal assets would be responding to other fires that started earlier in the season. While local fire districts would be useful in the wildland-urban interface areas, they have limited wildfire capabilities or experience, and they would have a difficult time responding to the ignition zones. Even though the existence and spread of the fire is known, it may not be possible to respond to it adequately, so an initially manageable fire can become out of control before resources are dispatched.

To further complicate the problem, heavy rains could follow, causing flooding and landslides and releasing tons of sediment into rivers, permanently changing floodplains and damaging sensitive habitat and riparian areas. Such a fire followed by rain could release millions of cubic yards of sediment into streams for years, creating new floodplains and changing existing ones. With forests removed from the watershed, stream flows could double.

Floods that had been expected every 50 years may occur every couple of years. With streambeds unable to carry the increased discharge because of increased sediment, floodplain elevations would increase.

13.9 ISSUES

The major issues for wildfire are as follows:

- Public education and outreach to people living in or near the fire hazard zones should include information about and assistance with mitigation activities such as defensible space, and advance identification of evacuation routes and safe zones.
- Wildfires could cause landslides as a secondary natural hazard.
- Climate change could affect the wildfire hazard.
- Future growth into wildland-urban interface areas should continue to be managed.
- The Fire Department needs to continue to train on wildland-urban interface type events.
- Expand the City's vegetation management activities. This would include enhancement through expansion of the target areas as well as additional resources.
- Expand certifications and qualifications for Fire Department personnel. Ensure that all firefighters are trained in basic wildfire behavior, basic fire weather, and that all company officer and chief level officers are trained in the wildland command and strike team leader level.

14. HUMAN HEALTH HAZARDS

14.1 GENERAL BACKGROUND

Human health hazards include transmittable diseases and environmental hazards such as extreme weather. The following sections describe commonly recognized human health hazards.

14.1.1 Influenza

Influenza, commonly called flu, is a viral infection that attacks the respiratory system. Epidemics of the flu typically occur in the fall and winter. The U.S. Centers for Disease Control and Prevention (CDC) estimates that the 2014-2015 flu season for California was moderately severe, with high levels of outpatient illness and influenza-associated hospitalizations, particularly among adults 65 and older. The California Department of Public Health received 42,812 reports of cases tested positive for influenza.

Laboratory-confirmed influenza-associated deaths among patients under 65 have been reportable in California since the 2009 influenza pandemic. For the 2014-2015 flu season, there were 78 fatal cases of influenza-related illness statewide among those under 65. This number is significantly down from the 404 fatal cases during the 2013-2014 influenza season.

H1N1

In April 2009, the World Health Organization (WHO) issued a health advisory on an outbreak of influenza-like illness caused by a new subtype of influenza A (A/H1N1) in Mexico and the United States.

The disease spread rapidly, with the number of confirmed cases rising to 2,099 by May 7, despite aggressive measures taken against the disease by the Mexican government. On June 11, the WHO declared an H1N1 pandemic, marking the first global pandemic since the 1968 Hong Kong flu. On October 25, the U.S. declared H1N1 a national emergency. On August 10,

DEFINITIONS

Anthrax—A disease caused by the bacteria *Bacillus anthracis*. Most forms of the disease are lethal, and it affects both humans and other animals. There are effective vaccines against anthrax, and some forms of the disease respond well to antibiotic treatment.

Epidemic—The spread of an infectious disease beyond a local population, reaching people in a wider geographical area. Several factors determine whether an outbreak will become an epidemic: the ease with which the disease spreads from vectors, such as animals, to people and the ease with which it spreads from person to person.

Influenza—A viral infection that attacks the respiratory system; commonly called flu.

H1N1 "Swine Flu"—A subtype of the Influenza A virus that has mutated into various strains including the Spanish Flu strain, mild human flu strains, endemic pig strains, and various strains found in birds.

H5N1/H7N9 "Bird Flu"—A subtype of the Influenza A virus that causes the flu commonly known as "avian influenza" or "bird flu.

Pandemic—A worldwide epidemic.

Vector—An organism (such as an insect or rodent) that transmits pathogens that cause disease

Vector-Borne Illness—Diseases transmitted to people from insects and other animals. These include, but are not limited to, Hanta Virus, Plague, Tularemia, Lyme Disease, West Nile Virus and the Zika Virus.

Viral Hemorrhagic Fever (VHF)-—A group of illnesses caused by a viral infection (usually restricted to a specific geographic area) resulting in fever and gastrointestinal symptoms followed by capillary hemorrhage. These include, but are not limited to, Ebola, Dengue Fever and Yellow Fever.

Severe Acute Respiratory Syndrome (SARS)-—An infectious respiratory illness characterized by fever, dry cough, and breathing difficulties, often accompanied by headache and body aches; believed to be caused by a coronavirus.

Smallpox—An infection caused by the variola virus, a member of the poxvirus family. Throughout history, smallpox has been responsible for epidemics that resulted in large numbers of deaths. The last outbreak was in 1977. The disease was declared eradicated in 1980.

2010, the WHO International Health Regulations Emergency Committee declared an end to the 2009 H1N1 pandemic globally.

H1N1 viruses and seasonal influenza viruses are co-circulating in many parts of the world. It is likely that the 2009 H1N1 virus will continue to spread for years to come, like a regular seasonal influenza virus.

H5N1/H7N9

The highly pathogenic H5N1avian influenza virus is an influenza A subtype that occurs mainly in birds, causing high mortality among birds and domestic poultry. Outbreaks of highly pathogenic H5N1 among poultry and wild birds are ongoing in a number of countries.

H5N1 virus infections of humans are rare and most cases have been associated with direct poultry contact during poultry outbreaks. Rare cases of limited human-to-human spread of H5N1 virus may have occurred, but there is no evidence of sustained human-to-human transmission. Nonetheless, because all influenza viruses have the ability to change and mutate, scientists are concerned that H5N1 viruses one day could be able to infect humans more easily and spread more easily from one person to another, potentially causing another pandemic.

While the H5N1 virus does not now infect people easily, infection in humans is much more serious when it occurs than is infection with H1N1. More than half of people reported infected with H5N1 have died. Figure 14-1 summarizes human cases of the virus through 2013.

Source: World Health Organization

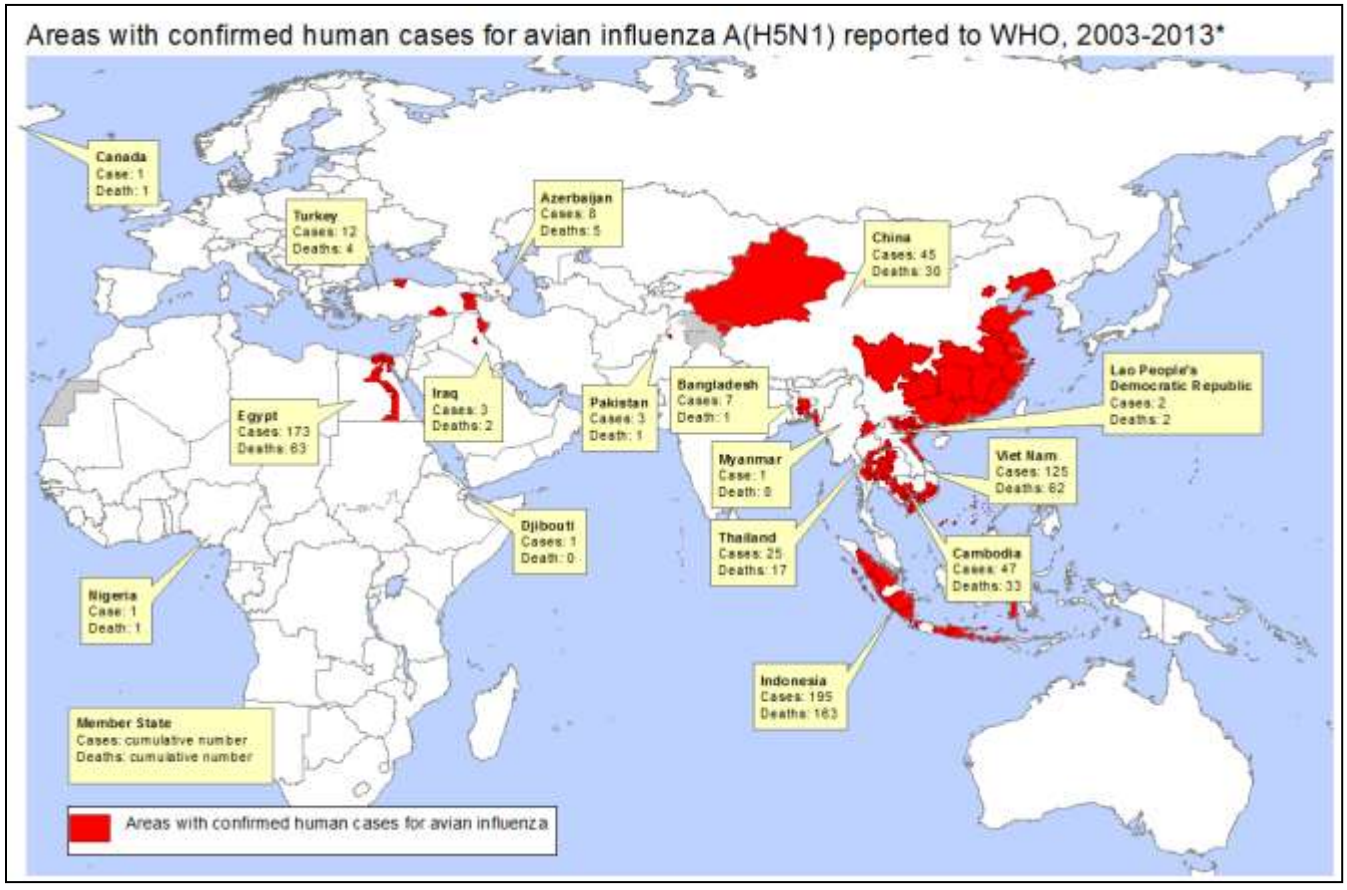


Figure 14-1. Areas with Confirmed H5N1 2003-2013

Infections in humans and poultry by a new avian influenza A virus (H7N9) continue to be reported in China. While mild illness in human cases has been seen, most patients have had severe respiratory illness and some have died. The only case identified outside of China was recently reported in Malaysia.

Source investigation by Chinese authorities is ongoing. Many of the people infected with H7N9 are reported to have had contact with poultry. However some cases reportedly have not had such contact. Close contacts of confirmed H7N9 patients are being followed to determine whether any human-to-human spread of H7N9 is occurring. No sustained person-to-person spread of the H7N9 virus has been found at this time. However, based on previous experience with avian flu viruses, some limited human-to-human spread of this the virus would not be surprising.

As of the publication of this document, H5N1 and the new H7N9 virus have not been detected in people or birds in the United States

14.1.2 Smallpox

Smallpox is a sometimes fatal infectious disease. There is no specific treatment, and the only prevention is vaccination. Symptoms include raised bumps on the face and body of an infected person. The oldest evidence of smallpox was found on the body of Pharaoh Ramses V of Egypt who died in 1157 BC.

Outbreaks have occurred from time to time for thousands of years, but the disease is now eradicated after a successful worldwide vaccination program. The last case of smallpox in the United States was in 1949. The last naturally occurring case in the world was in Somalia in 1977. As of the publication of this document, there are no cases of smallpox in the world. Currently only two locations in the world have samples of smallpox: the CDC in Atlanta and the Ivanovsky Institute of Virology in Russia.

After the disease was eliminated, routine vaccination among the general public was stopped. Therefore, any cases of smallpox in the world would be considered an immediate international emergency. In 2003, the Wisconsin Division of Public Health conducted an investigation of state residents who became ill after having contact with prairie dogs. The cases appeared in May and June of 2003, and symptoms in the human cases included fever, cough, pox-like rash and swollen lymph nodes. CDC laboratory test results indicated that the cause of the human illness was Monkeypox, an orthopox virus that could be transmitted by prairie dogs. This outbreak, and the potential use of smallpox as a weapon of bioterrorism, brought the fear of smallpox back to the forefront of the population. A detailed nationwide smallpox response plan created at the end of 2002 is designed to quickly contain a potential outbreak and vaccinate the population.

14.1.3 Viral Hemorrhagic Fevers

Viral hemorrhagic fevers (VHFs) are a group of illnesses caused by several distinct families of viruses. VHF describes a multisystem syndrome (multiple systems in the body are affected). Characteristically, the overall vascular system is damaged and the body's ability to regulate itself is impaired. These symptoms are often accompanied by hemorrhage (bleeding); however, the bleeding itself is rarely life-threatening. While some types of hemorrhagic fever viruses can cause relatively mild illnesses, many cause severe, life-threatening disease.

The viruses that cause VHFs are distributed over much of the globe. However, because each virus is associated with one or more particular host species, the virus and the disease it causes are usually seen only where the host species live. Some hosts, such as the rodent species carrying several of the New World arenaviruses, live in geographically restricted areas. Therefore, the risk of getting VHFs caused by these viruses is restricted to those areas. Other hosts range over continents, such as the rodents that carry viruses that cause the hantavirus pulmonary syndrome in North and South America, or the rodents that carry viruses that cause hemorrhagic fever with renal syndrome in Europe and Asia.

Ebola

The 2014 Ebola virus outbreak was unprecedented in geographical reach and impact on health care systems across the globe. This was the largest and deadliest Ebola virus outbreak ever recorded. It was the first time the West African countries of Guinea, Liberia, Sierra Leone, Nigeria, Mali, and Senegal saw the virus. Ebola is more common in Central African countries, such as the Democratic Republic of Congo and Sudan, where it was first discovered in 1976. It was also the first time that Ebola made it to the United States and Europe, prompting world-wide preparedness and response efforts. Figure 14-2 shows areas that ultimately were affected. The outbreak was closely monitored and traveler screenings were developed for those returning from West Africa.

Source: World Health Organization

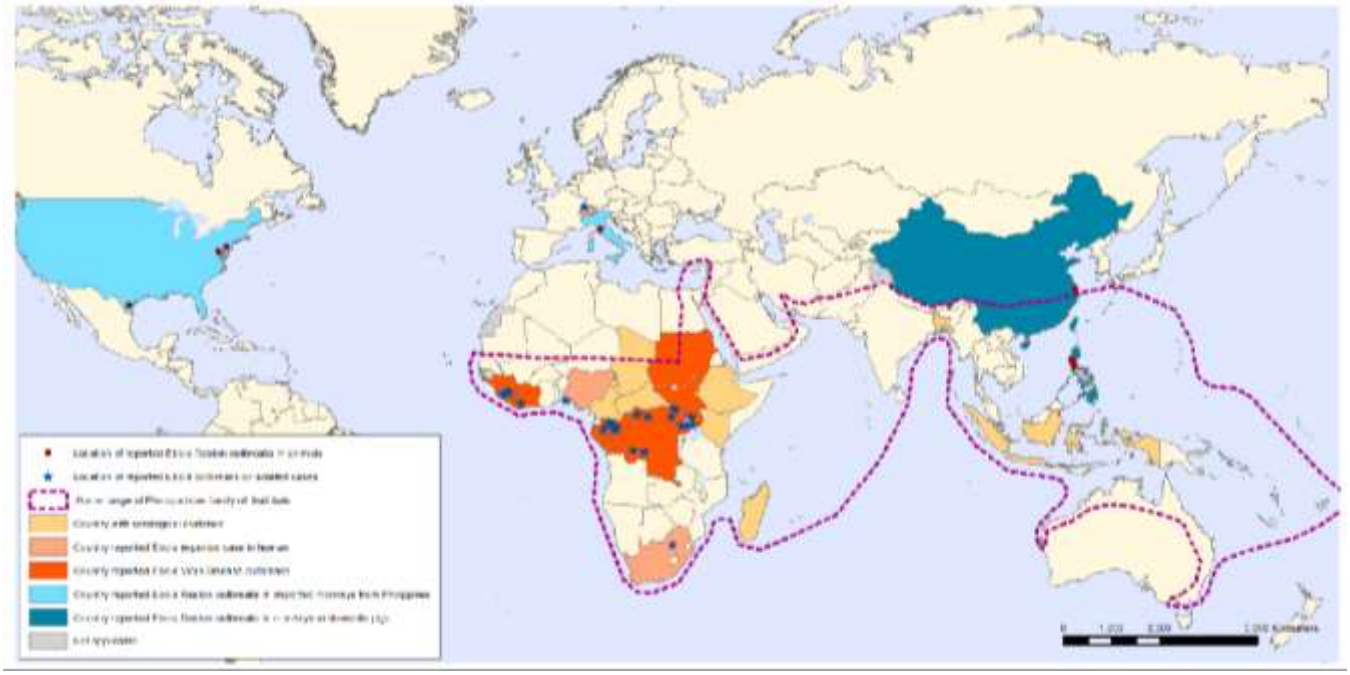


Figure 14-2. 2014 Distribution of Ebola Virus Outbreaks in Humans and Animals

In August 2014 two U.S. healthcare workers returned to the United States for treatment for Ebola. The case that most impacted the health care system in the United States was a patient diagnosed with Ebola in Dallas, Texas who died due to Ebola in October 2014. The nurse who provided care for him later tested positive for Ebola. This caused responses across the country from hospitals, emergency medical teams, fire departments and public health agencies to enhance isolation precautions, develop emergency policies, train with personal protective equipment and conduct multi-agency emergency exercises in case the spread of Ebola became a pandemic.

Before the 2014 outbreak, only 2,200 cases of Ebola had been recorded and 68 percent were fatal. Twenty percent of new Ebola infections were linked to burial traditions in which family and community members wash and touch dead bodies before burial. In Guinea, 60 percent of Ebola infections were linked to traditional burial practices. From 2014 to the publishing of this document, there have been no confirmed cases of Ebola in California.

Hantavirus

Hantavirus is a rodent-borne disease and one of the most important in California. It was discovered in 1993 in the southwestern U.S., and it has determined that the disease had been present, but unrecognized, at least as early as 1959. It has now been identified in over half of the states of the U.S. In 2013, seven cases of Hantavirus occurred in Yosemite National Park. Hantavirus has also been detected in the local Sierra Nevada region.

The hantavirus spreads when individuals touch or eat something contaminated with infected rodent urine, droppings or saliva. It can also be transmitted through aerosolization, which occurs when dried materials contaminated by infected rodent droppings or saliva are disturbed and brought up into the air and inhaled. Infected persons first develop symptoms one to two weeks, and up to five weeks, after exposure. Early symptoms include fever, headache, and muscle aches, especially in the thighs, hips, back, and shoulders. Other early symptoms include dizziness, chills, nausea, vomiting, diarrhea, and abdominal pain. After two to seven days of these symptoms, patients develop breathing difficulties that range from cough and shortness of breath to severe respiratory failure. Approximately 40 percent of hantavirus patients die from the disease.

From 2011 to the publishing of this document there have been 16 cases of hantavirus in California, including one case in Placer County.

14.1.4 Plague

Plague is a potentially fatal infectious disease of animals and humans caused by the *Yersinia pestis* bacterium. People usually get plague from being bitten by a flea that is carrying the plague bacterium or by handling an infected animal. Today, modern antibiotics are effective against plague, but if an infected person is not treated promptly, the disease is likely to cause illness or death.

Plague is an ancient disease but outbreaks throughout the world continue. Major plague epidemics occurred in the middle of the sixth century in Egypt, Europe and Asia; during the 14th century in Europe, following caravan routes; in the 18th century in Austria and the Balkans; and in the late 19th century worldwide (but mostly in China and India). Manchuria in 1910–1911 witnessed about 60,000 deaths due to pneumonic plague with a repeat in 1920–1921. A minor outbreak occurred as recently as the summer of 1994 in Surat, India, closely following an earthquake in September 1993. Globally, the WHO reports 1,000 to 3,000 cases of plague every year. Monitoring of mammals routinely occurs in California to mitigate potential plague (see Figure 14-3).

In North America, plague is found in certain animals and their fleas from the Pacific Coast to the Great Plains, and from southwestern Canada to Mexico. The last urban plague epidemic in the United States occurred in Los Angeles in 1924-25. Since then, human plague in the U.S. has occurred as mostly scattered cases in rural areas (an average of 10 to 15 persons each year per the CDC). Most human cases in the United States occur in northern New Mexico, northern Arizona, southern Colorado, California, southern Oregon, and far western Nevada.

From 2011 to the publishing of this document, there has been one case of plague in California, which occurred in Yosemite National Park.

14.1.5 Tick-Borne Disease

Ticks are small, insect-like creatures most often found in naturally vegetated areas. They feed by attaching to animals and humans, sticking their mouthparts into the skin, and sucking blood for up to several days. Ticks do not fall from trees, jump or fly. Most species are found on wild grasses and low plants. Adult ticks wait at the ends of grass or other foliage for a host to brush by so they may attach. Sometimes ticks carry bacteria or viruses that can be transmitted to a person while the tick is attached and feeding. There are 47 species of ticks in California, but only eight are known to commonly bite humans:

- Western blacklegged tick (*Ixodes pacificus*)
- American dog tick (*Dermacentor variabilis*)
- Pacific Coast tick (*Dermacentor occidentalis*)
- Wood tick (*Dermacentor andersoni*)
- Brown dog tick (*Rhipicephalus sanguineus*)
- *Ornithodoros hermsi*
- *Ornithodoros parkeri*
- *Ornithodoros coriaceus.*

Source: California Department of Public Health

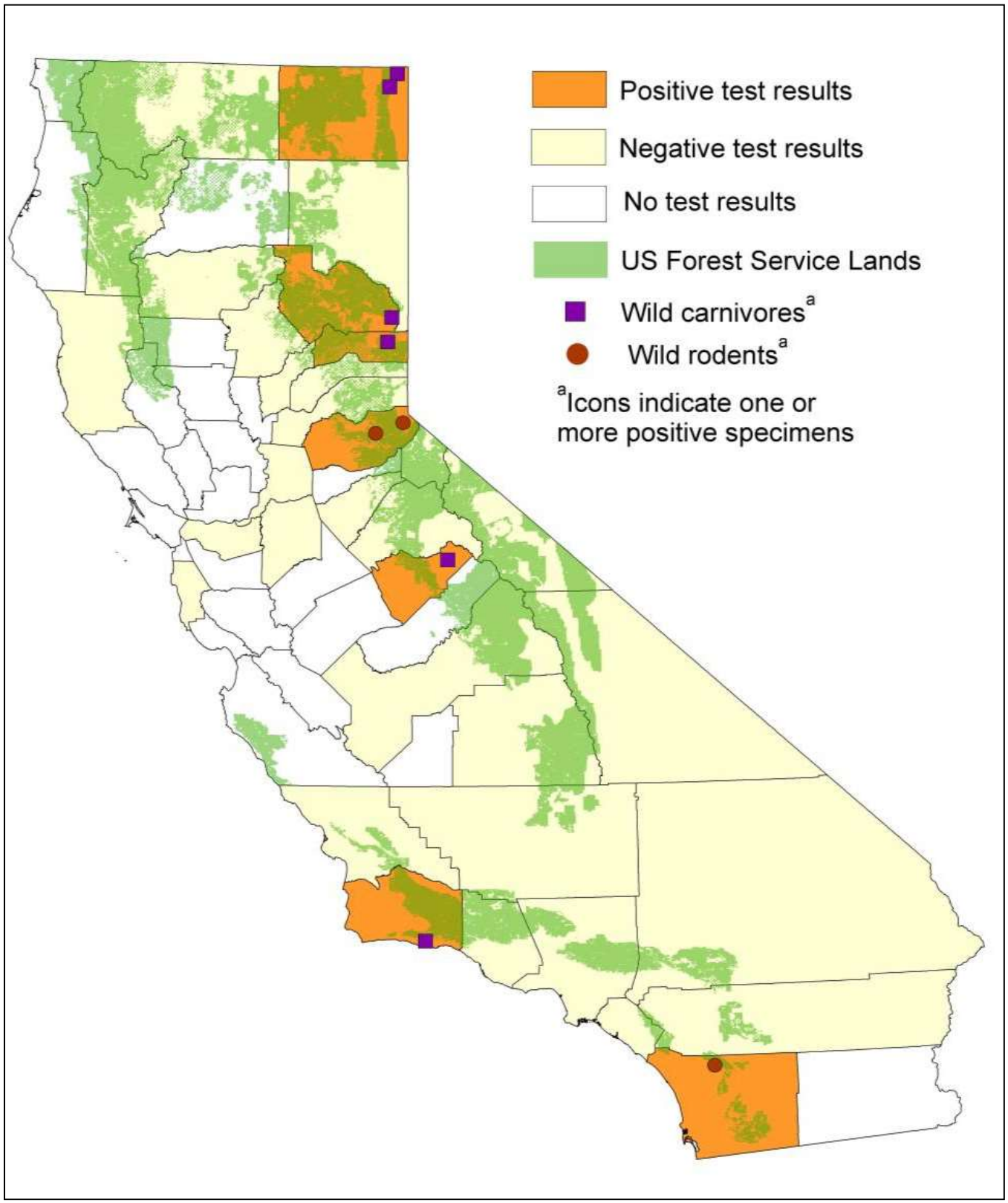


Figure 14-3. California 2014 *Yersinia Pestis* Results in Tested Mammals by County

Tularemia

Tularemia, named after Tulare County in California where it was first described in 1911, is a tick-borne disease of animals and humans caused by the bacterium *Francisella tularensis*. Tularemia is similar to plague, but is typically spread differently. While plague is usually spread to humans by fleas, humans usually become infected with Tularemia by tick and deer fly bites, skin contact with infected animals, ingestion of contaminated water or meat, or inhalation of contaminated dusts or aerosols. Symptoms vary depending upon the route of infection.

Rabbits, hares, and rodents are especially susceptible and often die in large numbers during outbreaks. Although Tularemia can be life-threatening, most infections can be treated successfully with antibiotics. Steps to prevent Tularemia include use of insect repellent, wearing gloves when handling sick or dead animals, and not mowing over dead animals. In the United States, naturally occurring infections have been reported from all states except Hawaii. From 2011to the publishing of this document there have been 11 cases of Tularemia in California.

Lyme Disease

Lyme disease, named after the city in Connecticut where it was first identified in 1975, is a tick-borne disease caused by the bacterium *Borrelia burgdorferi*, which normally lives in mice, squirrels and other small animals. It is transmitted among these animals and to humans through the bites of certain species of ticks. In the northeastern and north-central United States, the black-legged tick (or deer tick, *Ixodes scapularis*) transmits Lyme disease. In the Pacific coastal United States, the disease is spread by the western black-legged tick (*Ixodes pacificus*). Other major tick species found in the United States have not been shown to transmit the disease.

Typical symptoms include fever, headache, fatigue, and a skin rash. If left untreated, infection can spread to joints, the heart, and the nervous system. Lyme disease is diagnosed based on symptoms, physical findings (e.g., rash), and the possibility of exposure to infected ticks. Laboratory testing is helpful in later stages of the disease. Most cases of Lyme disease can be treated successfully with a few weeks of antibiotics. Steps to prevent Lyme disease include using insect repellent, removing ticks promptly, landscaping, and integrated pest management. The ticks that transmit Lyme disease can occasionally transmit other tick-borne diseases as well. From 2011 to the publishing of this document, there have been 458 cases of Lyme disease in California.

Rocky Mountain Spotted Fever

Rocky Mountain spotted fever is a potentially fatal tick-borne disease caused by the bacterium *Rickettsia rickettsii*. It is transmitted to humans by the bite of an infected American dog tick (*Dermacentor variabilis*), Rocky Mountain wood tick (*Dermacentor andersoni*), or brown dog tick (*Rhipicephalus sanguineus)*.

Typical symptoms include fever, headache, abdominal pain, vomiting, and muscle pain. A rash may also develop, but is often absent in the first few days, and in some patients, never develops. Rocky Mountain spotted fever can be a severe or even fatal illness if not treated in the first few days of symptoms. It can be treated successfully with a few weeks of antibiotics. Steps to prevent the disease include using insect repellent, removing ticks promptly, landscaping, and integrated pest management. The ticks that transmit Rocky Mountain spotted fever can occasionally transmit other tick-borne diseases as well. From 2011to the publishing of this document there have been 44 cases of Rocky Mountain spotted fever in California.

14.1.6 Mosquito-Borne Disease

Many of the 48 species of mosquitoes in California can carry disease. The City of Roseville actively supports the Placer County public outreach campaign and task force about the potential for mosquito-borne disease.

Malaria

Malaria is a sometimes fatal mosquito-borne disease caused by a parasite that commonly infects the *Anopheles* mosquito, which feeds on humans. People who contract malaria are typically very sick with high fevers, chills, and flu-like illness. Although malaria can be fatal, illness and death can usually be prevented.

On average 1,500 cases of malaria are diagnosed in the United States each year. The vast majority are in travelers and immigrants returning from countries where malaria transmission occurs, many from sub-Saharan Africa and South Asia. Although rare, cases of malaria have been reported in California. In many temperate areas, such as western Europe and the United States, economic development and public health measures have succeeded in eliminating malaria. However, most of these areas have *Anopheles* mosquitoes that can transmit malaria, and reintroduction of the disease is a constant risk.

Individuals in areas with malaria need to reduce their likelihood of being bitten by mosquitoes. Screens on windows and doors should be examined to confirm that they are in good repair. Repellents containing 20 to 30 percent DEET should be applied to exposed skin and clothing to keep mosquitoes from biting. From 2011to the publishing of this document there have been 44 cases of malaria in California.

West Nile Virus

West Nile virus (WNV) is a potentially serious mosquito-borne that may affect residents in the planning area. Experts believe WNV is established as a seasonal epidemic in North America that flares up in the summer and continues into the fall. WNV is a recent disease to affect California. Mosquitoes transmit the virus to birds, livestock and humans. As of January 2016, human-infection cases of the virus had been reported in all states of the continental U.S. except West Virginia, New Hampshire and Vermont, and those states had reported non-human infections. The Placer County West Nile Virus Task Force has had a strong and active role in the community since WNV arrived in 2004.

According to the CDC, approximately 80 percent of people who are infected with WNV will show no symptoms. Up to 20 percent have symptoms such as fever, headache, and body aches, nausea, vomiting, and sometimes swollen lymph glands or a skin rash on the chest, stomach and back. Symptoms can last for as short as a few days, though even healthy people have become sick for several weeks. About 1 percent of people infected with WNV will develop severe illness, with symptoms that can include high fever, headache, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, vision loss, numbness and paralysis. These symptoms may last several weeks, and neurological effects may become permanent. There is no specific treatment for WNV infection. In more severe cases, people may need to go to the hospital where they can receive supportive treatment including intravenous fluids, help with breathing and nursing care.

Individuals in areas with WNV need to reduce their likelihood of being bitten by mosquitoes. Screens on windows and doors should be examined to confirm that they are in good repair. Repellents containing 20 to 30 percent DEET should be applied to exposed skin and clothing to keep mosquitoes from biting.

From 2011 to the publishing of this document there have been 2,811 cases of WNV in California. Of those, 36 were from Placer County. Between 2005 and 2015, there were 5,205 cases of WNV in California, and Placer County had 82 cases, an average of 7.45 cases per year. Due to proactive mitigation of the hazard with mosquito abatement and education efforts, the number of confirmed cases has trended down. The first year the tracking began, there were 35 human cases of WNV in Placer County. In 2015, there were none. The agricultural nature of Placer County, with the potential for standing water to be present throughout the County, continues to put the planning area at risk from WNV and other mosquito-borne illnesses.

Dengue Fever

Dengue is a mosquito-borne disease caused by any of four closely related dengue viruses (DENV-1, DENV-2, DENV-3 and DENV-4). People get dengue from the bite of an infected mosquito. The mosquito becomes infected when it bites a person who has dengue virus in their blood. It takes a week or more for the dengue virus to replicate in the mosquito; then the mosquito can transmit the virus to another person when it bites. Dengue is transmitted by yellow fever mosquito (*Aedes aegypti)* and the Asian tiger mosquito *(Aedes albopictus)*. These mosquitoes are not native to California, but infestations have been reported in multiple counties in California. Dengue virus cannot be transmitted from person to person.

The main symptoms of dengue are high fever, severe headache, severe pain behind the eyes, joint pain, muscle and bone pain, rash, bruising, and sometimes mild bleeding from the nose or mouth. Generally, younger children and those with their first dengue infection have a milder illness than older children and adults. Severe dengue typically begins with signs and symptoms similar to dengue. Rather than recover, severe dengue patients proceed to experience more bleeding, severe pain in the abdomen, respiratory distress, and fluid accumulation in the abdomen and around the lungs as the smallest blood vessels (capillaries) begin to leak. If not treated, severe dengue can result in death. There is no specific treatment for dengue infection. Rest and fluids are generally sufficient for persons with dengue. Severe dengue may require hospitalization and intensive medical care.

Individuals in areas with dengue need to reduce their likelihood of being bitten by mosquitoes. Screens on windows and doors should be examined to confirm that they are in good repair. Repellents containing 20 to 30 percent DEET should be applied to exposed skin and clothing to keep mosquitoes from biting. From 2011 to the publishing of this document there have been 483 cases of dengue fever in California, with three of the cases in Placer County.

Zika Virus

Zika is a mosquito-borne disease. The most common symptoms of Zika are fever, rash, joint pain, and conjunctivitis (red eyes). The illness is usually mild, with symptoms lasting for several days to a week after being bitten by an infected mosquito. People usually do not get sick enough to go to the hospital, and they rarely die of Zika. For this reason, many people might not realize they have been infected. However, Zika virus infection during pregnancy can cause a serious birth defect called microcephaly, as well as other severe fetal brain defects. Once a person has been infected, he or she is likely to be protected from future infections.

Zika virus is transmitted by yellow fever mosquito (*Aedes aegypti)* and the Asian tiger mosquito *(Aedes albopictus)*. These mosquitoes are not native to California, but infestations have been reported in multiple counties in California. An *Aedes* mosquito can only transmit Zika virus after it bites a person who has this virus in their blood. Thus far in California, Zika virus infections have been documented only in people who were infected while traveling outside the United States or through sexual contact with an infected traveler. Zika virus is not spread through casual contact, but can be spread by infected men to their sexual partners. There is a growing association between Zika and microcephaly (abnormally small head and brain) in newborns, as well as Zika and Guillain-Barré Syndrome, a disease affecting the nervous system. Studies are ongoing to further evaluate these associations. From 2015 to the publishing of this document there has been no local mosquito-borne transmission of Zika virus in California.

Chikungunya

Chikungunya (pronounced chik-en-gun-ye) is an infectious mosquito-borne disease with symptoms that typically include fever and severe joint pain. It is caused by the chikungunya virus, which is transmitted by yellow fever mosquito (*Aedes aegypti)* and the Asian tiger mosquito *(Aedes albopictus)*. These mosquitoes are not native to California, but infestations have been reported in multiple counties in California. An *Aedes* mosquito can only transmit chikungunya virus after it bites a person who has this virus in their blood. A person with chikungunya is

not contagious. As of the publication of this document, chikungunya infections have been documented only in persons who were infected while traveling outside the United States.

14.1.7 Anthrax

Anthrax is a disease caused by *Bacillus anthracis*, a bacterium that forms spores (a spore is a cell that is dormant but may come to life with the right conditions). There are three forms of anthrax:

- **Cutaneous**—The first symptom is a small sore that develops into a blister. The blister then develops into a skin ulcer with a black area in the center. The sore, blister and ulcer do not hurt.
- **Gastrointestinal**—The first symptoms are nausea, loss of appetite, bloody diarrhea, and fever, followed by bad stomach pain.
- **Inhalation**—The first symptoms of inhalation anthrax are like cold or flu symptoms and can include a sore throat, mild fever and muscle aches. Later symptoms include cough, chest discomfort, shortness of breath, tiredness and muscle aches.

Anthrax is a naturally occurring illness and isolated cases occur all over the world yearly. Humans can become infected with anthrax by handling products from infected animals or by breathing in anthrax spores from infected animal products (such as wool). People can become infected with gastrointestinal anthrax by eating undercooked meat from infected animals. Anthrax does occur in California, and animals have tested positive; however, there have been no positive human cases of anthrax in California in the last 10 years. Anthrax can be treated successfully with antibiotics.

Anthrax can be used as a weapon, as happened in the United States in 2001, when anthrax was spread through the postal system by sending letters with powder containing anthrax spores. This caused 22 cases of anthrax infection and brought anthrax back into the public eye. From 2011 to the publishing of this document there have no cases of anthrax in California.

14.1.8 Severe Acute Respiratory Syndrome

Severe Acute Respiratory Syndrome (SARS) is a viral respiratory illness caused by a coronavirus (SARS-CoV). SARS was first reported in Asia in February 2003. Over the next few months, the illness spread to more than two dozen countries in North America, South America, Europe, and Asia before the global outbreak was contained. According to the WHO, 8,098 people worldwide became sick with SARS during the 2003 outbreak and 774 died. In the United States, only eight people had laboratory evidence of SARS-CoV infection. All of these people had traveled to parts of the world where SARS was present. SARS did not spread more widely in the United States.

In general, SARS begins with a high fever, headache, an overall feeling of discomfort and body aches. Some people also have mild respiratory symptoms at the outset. About 10 percent to 20 percent of patients have diarrhea. After two to seven days, SARS patients may develop a dry cough. Most patients develop pneumonia.

The main way that SARS seems to spread is by close person-to-person contact. The virus that causes SARS is thought to be transmitted most readily by respiratory droplets produced when an infected person coughs or sneezes. Droplet spread can happen when droplets from the cough or sneeze of an infected person are propelled a short distance (generally up to 3 feet) through the air and deposited on the mucous membranes of the mouth, nose, or eyes of persons nearby. The virus also can spread when a person touches a surface or object contaminated with infectious droplets and then touches his or her mouth, nose, or eyes. It is also possible that the SARS virus might spread more broadly through the air or by other ways that are not now known.

As of May 2005, according to the CDC, there was no remaining sustained SARS transmission anywhere in the world. However, CDC has developed recommendations and guidelines to help public health and healthcare

officials plan for and respond quickly to the reappearance of SARS if it occurs again. Lessons learned from the SARS outbreak helped healthcare facilities and communities successfully plan and respond to the 2009 H1N1 pandemic. The California Health and Safety Code lists SARS among the communicable diseases that must be reported to health authorities. Placer County is authorized to collect records and data, initiate disease control measures, control property and manage persons (including isolation and quarantine) for containment of communicable disease. From 2011 to the publishing of this document there have no cases of SARS in California.

14.1.9 Extreme Weather

From 2006 to 2010, more people in the U.S. died from extreme heat or extreme cold than from hurricanes, tornadoes, floods and earthquakes combined.The western United States is subject to many weather extremes. Severe spring storms can lead to risk of traumatic injuries, mudslides, flooding and property damage. Extreme heat can lead to dehydration and heat-related illness. Severe winter weather can lead to risk of traumatic injuries, hypothermia and icy conditions.

Severe Spring Storms

Thunderstorms cause most of the severe spring weather. Tornados are rare in California but can occur. Since 2011, a total of 44 tornadoes have occurred in California, one of them in Placer County. When these events occur unexpectedly, the risk of injury and death increases. Advance planning can decrease the risks. Citizens should pay close attention to changing weather conditions when there is a severe thunderstorm watch or warning.

Lightning strikes are a danger during thunderstorms. A lightning bolt is 6 to 8 centimeters in diameter, carrying between 10 and 100 million volts in 20 to 50 thousand amps of direct current. The duration is approximately one millisecond. Volts of 2 billion and 500 thousand amps have been measured. A lightning strike can cause death or injury to one or several persons. Long-term injuries from lightning strike can include memory and attention loss, chronic numbness, muscle spasm, stiffness, depression, hearing loss and sleep disturbance. Seventy percent of all lightning injuries and fatalities occur in the afternoon; 85 percent of victims are children and young men (age 10 to 35) engaged in outdoor recreation and work activities. Hikers, campers, backpackers, skiers, fishermen, and hunters are especially vulnerable.

Extreme Heat

California, Nevada and Arizona experience very high temperatures during the summer. Those susceptible to extreme heat may suffer heat-related illnesses:

- **Heat Exhaustion—**Heat exhaustion is a mild form of heat-related illness that can develop after several days of exposure to high temperatures and inadequate or unbalanced replacement of fluids. It is the body's response to an excessive loss of the water and salt contained in sweat. Those most prone to heat exhaustion are elderly people, people with high blood pressure, and people working or exercising in a hot environment.
- **Heat Cramps—**Heat cramps usually affect people who sweat a lot during strenuous activity. This sweating depletes the body's salt and moisture. The low salt level in the muscles may be the cause of heat cramps. Heat cramps may also be a symptom of heat exhaustion.
- **Heat Stroke—**Heat stroke is a severe, dangerous form of heat-related illness. It occurs when the body's temperature rises rapidly, the sweating mechanism fails, and the body is unable to cool down. Body temperature may rise to 106°F or higher within 10 to 15 minutes. Heat stroke can cause death or permanent disability if emergency treatment is not provided. This is a medical emergency.

Heat has caused 9,000 deaths in the United States from 1979 to 2013. Air-conditioning is the number one protective factor against heat-related illness and death. If a home is not air-conditioned, people can reduce their risk for heat-related illness by spending time in public facilities that are air-conditioned.

The California Office of Emergency Services has a comprehensive contingency plan for excessive heat emergencies. The plan describes state operations during heat-related emergencies and provides guidance for state agencies, local government, and non-governmental organizations in the preparation of heat emergency response plans and related activities. Placer County has an emergency contingency plan and participates in the opening of local cooling centers if extreme heat continues for an extended period of time.

Severe Winter Weather

When winter temperatures drop significantly below normal, staying warm and safe can become a challenge. Extremely cold temperatures often accompany a winter storm, which may also cause power failures and icy roads. Staying indoors as much as possible can help reduce the risk of car crashes and falls on the ice, but cold weather also can present hazards indoors. Many homes will be too cold, either due to a power failure or because the heating system is not adequate for the weather. When people must use space heaters and fireplaces to stay warm, the risk of residential fires increases, as well as the risk of carbon monoxide poisoning.

Extreme cold can bring on health emergencies in susceptible people, such as those without shelter or who are stranded, or who live in a home that is poorly insulated or without heat:

- **Hypothermia**—When exposed to cold temperatures, the body begins to lose heat faster than it can be produced. Prolonged exposure to cold will eventually use up the body's stored energy. The result is hypothermia, or abnormally low body temperature. Body temperature that is too low affects the brain, making the victim unable to think clearly or move well. This makes hypothermia particularly dangerous because a person may not know it is happening and will not be able to do anything about it. Warning signs of hypothermia include shivering, exhaustion, confusion, fumbling hands, memory loss, slurred speech, drowsiness, bright red cold skin, and very low energy.
- **Frostbite**—Frostbite is an injury to the body caused by freezing of the tissues. Frostbite causes a loss of feeling and color in affected areas. It most often affects the nose, ears, cheeks, chin, fingers, or toes. Frostbite can permanently damage the body, and severe cases can lead to amputation. The risk of frostbite is increased in people with reduced blood circulation and among people who are not dressed properly for extremely cold temperatures. A victim is often unaware of frostbite until someone else points it out because the frozen tissues are numb. Signs of frostbite may be a white or grayish-yellow skin area, skin that feels unusually firm or waxy and numbness.

Infants and the elderly are particularly at risk to cold temperatures, but anyone can be affected. If extreme winter weather conditions are expected for an extended period, Placer County has an emergency contingency plan to provide shelter and care areas to provide heating centers for those in need. Preventive action is the best defense against having to deal with extreme cold-weather conditions. Preparing homes and cars in advance for winter emergencies, and observing safety precautions during times of extremely cold weather can reduce the risk of weather-related health problems.

14.2 HAZARD PROFILE

The severity of human health hazards is dependent upon the hazard and the population exposed to it. As the population increases, so does the risk of exposure to hazards. The key to reducing the disease hazard is isolation so that the exposed population does not continue to spread the hazard to the uninfected population. For disease and weather-related human health hazards, promoting education and personal preparedness will help to mitigate and reduce the severity of the hazard.

14.2.1 Past Events

Communicable Diseases

The following is a summary of recent disease outbreak events:

- In the United States during the 2009 H1N1 influenza pandemic, there were 59,979,608 confirmed cases of the disease, 270,435 people hospitalized due to the illness and 12,271 deaths. In California, there were 4,134 people hospitalized due to the illness and 596 deaths. In Placer County, there were 45 confirmed cases, with 5 deaths due to the illness. The pandemic was mild compared to the Spanish Flu pandemic of 1918, which caused 100 million deaths worldwide—a total of 3 percent of the world's total population.
- West Nile Virus arrived in Placer County in July 2004. The first case was diagnosed in September 2004. The 56-year old patient was recovering from meningitis in the hospital when the test came back positive for WNV. From 2011 to the publishing of this document there have been 2,811 cases of WNV in California, 36 of them in Placer County
- There were two confirmed cases of SARS in California during the worldwide outbreak in 2002-2003, none of them in Placer County.
- From 2011 to the publishing of this document there have been 458 cases of Lyme disease in California, 4 of them in Placer County.
- From 2011 to the publishing of this document there have been 16 cases of hantavirus in California, including one in Placer County.
- As of the publishing of this document, no cases of tularemia or plague have been reported in Placer County, but cases of these diseases have been reported in California and nearby counties. Even though these hazards may not be endemic to the area, they can be brought into the planning region and are still considered to be a risk.

Extreme Weather

The following is a summary of recent extreme weather events that threatened human health:

- From 2006 to 2010, excessive heat exposure caused 3,332 deaths in the United States.
- In July 2006, California experienced a heat wave impacting the entire state. Coroners attributed 140 deaths to hyperthermia, and it has been estimated from other data that more than 600 heat-related deaths may have occurred over a 17-day period.
- From 2006 to 2010, hypothermia caused 6,660 deaths in the United States.
- From 2006 to 2010, lightning strikes caused 657 deaths in the United States.

14.2.2 Location

It is difficult to map the extent of human-health hazards compared to others, such as floods, wildfires and dam failures. All of the City of Roseville Planning Area is susceptible to the human health hazards discussed in this chapter. While some hazards, such as the West Nile Virus and Lyme disease, can have a geographic presence within the planning area, other diseases can cause exposure to the planning area from outside the local region. Roseville residents who travel can become exposed to diseases while abroad and bring the diseases back with them, potentially placing the region at risk for exposure. Extreme weather poses an equal human health hazard across the City.

14.2.3 Frequency

Communicable Disease

Due to increased air travel, the growing population and the country's aging population, the probability of a communicable disease epidemic or pandemic is a growing threat. Certain human health hazards, such as influenza, can be expected seasonably, with variations on specific strains year to year. Additionally, tick-borne diseases are likely to increase during spring and fall, when people participate in outdoor activities such as hiking. The frequency of other health hazards is difficult to establish and depends largely on the unique circumstances surrounding a localized outbreak and its subsequent expansion into epidemics and eventually pandemics.

Extreme Weather

Trauma due to injuries directly due to storms (such as motor vehicle collisions and falls), heat related illness and hypothermia are a factor of the weather and in some cases a technological hazard.

14.2.4 Severity

The severity of the human health hazard varies from individual to individual. Typically, young children and older adults are more susceptible to acquiring communicable diseases due to developing or diminishing immune systems or experiencing adverse effects to extreme weather conditions. These populations often experience the most severe of symptoms, as their immune systems are not capable of fighting off infection or efficiently regulating temperature. In general, severity varies depending on the pathology of the disease, the health of the infected, and the availability of treatments for alleviating symptoms or curing the disease.

14.3 SECONDARY HAZARDS

Human health hazards are not like natural hazards that have measurable secondary impacts, such as earthquakes, floods or wildfires. The largest secondary impact caused by human health hazards would be economic. Large outbreaks of any human health hazard could reduce the work force significantly, causing businesses and agencies to close or be greatly impacted.

Another secondary impact could be stigmatization. The fear of the human health hazard and fear of the unknown could lead to isolation, violence and self-inflicted injury. Hospitals and health care providers could be overwhelmed with the "worried well" seeking care and comfort. Providing key and critical information can reduce and mitigate this secondary risk.

14.4 EXPOSURE AND VULNERABILITY

14.4.1 Population

All citizens in the Roseville planning area could be susceptible to the human health hazards discussed in this chapter. A large outbreak or epidemic, a pandemic or a use of biological agents as a weapon of mass destruction could have devastating effects on the population of Roseville.

West Nile Virus and other mosquito-borne illnesses are a significant concern in the local wetlands and west of Roseville in the flooded rice fields. A concentrated at-risk population is on the western border of the city limits near the rice fields where the mosquitoes breed.

While all of the population in the planning area is considered at risk to the human health hazards discussed in this chapter, the young and the elderly, those with compromised immune systems, and those with special needs are

considered the most vulnerable. The City has a large elderly community with a concentration of older residents in areas such as Sun City Roseville. The introduction of a disease such as the plague or influenza could rapidly impact those at risk.

14.4.2 Property

None of the health hazards discussed in this chapter would have significant measurable impact on the structural environment or property of the planning area.

14.4.3 Critical Facilities and Infrastructure

None of the health hazards discussed in this chapter would have significant measurable impact on the critical facilities or infrastructure of the planning area. However, health care facilities (including long-term care and clinics and even veterinary offices) have adopted the recommended "all-hazards" approach to preparedness and have prepared for the health hazards addressed in this chapter.

The acute care hospitals in Roseville have collaborated, trained and planned on a local, regional, state and national level to provide immediate and comprehensive medical care to the citizens of Roseville and the greater western Placer County population. Emergency management and preparedness planning incorporates all response disciplines (fire, law, first responder ground and air ambulance agencies, public health, mental and spiritual health). Planning includes identifying shelters, alternate treatment facilities, isolation capacity and methods to immediately expand physical and human resources.

14.4.4 Environment

None of the health hazards discussed in this chapter would have significant measurable impact on the environment of the planning area. While many of the vectors of the health hazards discussed in this chapter (mosquitoes, rodents, fleas, ticks and deer flies) rely on local or regional environments for their survival, the human health hazard that they carry or potentially transmit would have no significant measurable impact on the environment.

14.4.5 Economy

The economic impact of a human health hazard could be localized to a single region or population, or could be widespread. The impact could be significant, depending on the hazard, number of cases and the availability of resources to care for those affected by the hazard. Other financial impacts could be absorbed or managed by the organization affected.

14.5 FUTURE TRENDS IN DEVELOPMENT

The potential for communicable diseases, vector-borne diseases or extreme weather in Roseville and the planning area is not likely to lessen or prohibit growth or development in Roseville.

14.6 REVIEW OF EXISTING ORDINANCES, PROGRAMS AND PLANS

14.6.1 Hospital Expansions to Care for Growing Populations

Kaiser Permanente operates medical facilities in Roseville as follows:

- In October 1998, Kaiser Permanente opened a 116-bed hospital on Eureka Road adjacent to its medical offices. Since then, the hospital increased the number of beds to 166 (not including the Women's and

Children's Center). In addition to the hospital, comprehensive outpatient, primary, and specialty care services are offered, as well as education, pharmacy, laboratory, radiology, optical, EKG, and physical therapy services at three sites in Roseville.
- Kaiser opened a 75,000 square-foot medical office building in Lincoln in October 2006.
- In December 2008, a $52 million expansion project was completed that quadrupled the size of the Kaiser Roseville emergency room and doubled the number of beds. The radiology department was tripled in size and provided with high tech rooms with advanced diagnostic tools.
- Kaiser Roseville's Women's and Children's Center opened in January 2009 and includes 174 beds, neonatal and pediatric intensive care units, and a second medical office building.
- Kaiser Roseville is a certified Stroke and STEMI (heart attack) Receiving Center.
- Kaiser's Roseville Medical Center was named as a "Top Hospital" on the 2015 Leapfrog Top Hospitals listing—a voluntary program recognizing hospitals that demonstrate success in minimizing mortality rates for high-risk procedures and preventing medical errors.

Sutter Roseville Medical Center operates medical facilities in Roseville as follows:

- The current Sutter Roseville Medical Center campus opened in 1997 and provides comprehensive community health and trauma care for more than seven counties.
- Sutter Roseville Medical Center provides critical care, cardiology, neurology, pulmonary and orthopedic services, a dedicated cancer center, a Family Birth Center, a Neo Natal Intensive Care Unit, wound care, a 24-hour emergency department and the Sutter Rehabilitation Institute, a 55-bed acute rehabilitation center with accreditation from the Commission on Accreditation of Rehabilitation Facilities
- Sutter Roseville Medical Center is an accredited regional Level II trauma center and designated disaster/medical control facility, as well as a certified Stroke Receiving Center, STEMI (heart attack) Receiving Center and National Disaster Medical Systems hospital.
- Sutter Roseville is in the process of expanding its emergency department, intensive care and trauma neuro intensive care units and inpatient and outpatient surgery programs.
- In 2015, Truven Health Analytics named Sutter Health and Sutter Health's Valley Area, which includes Sutter Roseville Medical Center, as two of the nation's top five performers among large health care systems in its 15 Top Health Systems study.

Past and future expansion of these medical centers will enhance the capacity and services offered to treat illness and injury in Roseville and the surrounding region.

14.6.2 Memorandums of Agreement

The following memorandums of agreement enhance Roseville's ability to respond to the human health hazard:

- Sutter Roseville Medical Center has a memorandum of agreement with the Department of Quarantine, a division of the CDC, to provide isolation treatment in the event of a highly contagious and virulent disease.
- Sutter Roseville Medical Center has cooperative memorandums of agreement with Beale Air Force Base and the Placer County Department of Health and Human Services to provide assistance and care in disaster and mass casualty incidents.
- Since 2013 Sutter Roseville Medical Center has been a designated one of the nation's 1,500 National Disaster Medical Systems Hospital by the Department of Defense, Department of Health and Human Services and the Department of Veteran's affairs. This designation can provide the facility and the region more rapid care and assistance if a catastrophe strikes.

- Kaiser Roseville and Sutter Roseville Medical Center are coalition members with Placer County Public Health in the Healthcare Emergency Coalition to prepare, train and exercise to provide services in mass casualty situations.

14.6.3 Integrated Emergency Response

FEMA and the Joint Commission for Accreditation of Healthcare Organizations (JCAHO) expect acute care facilities to provide planning for an "all hazard" disaster response and care for mass casualties, whether the incidents and events are naturally occurring, human caused, or a combination of both. JCAHO requires the integration of emergency response planning with local response agencies, ensuring that the community will receive the highest level of integrated response and protection available. These planning efforts are supported by local, regional, state and federal grant funding.

14.7 SCENARIO

A human health worst-case scenario for the planning area would be an epidemic or large-scale incident of any of the human health hazards discussed in this chapter. Medical treatment facilities in the planning area would be overwhelmed and taxed beyond their capabilities as the numbers of patients escalates. The impacts on the workforce within the planning area could have acute and long-term economic impacts on the primary employers in the planning area. First responders would be exposed to the human health hazards, which could deplete the medical workforce and could have profound impact on the potential escalation of the scenario.

14.8 ISSUES

Important issues associated with the human health hazards include but are not limited to the following:

- Prevention through vaccination and personal emergency and disaster preparation will help to reduce the impacts of human health hazards.
- Medical and response personnel need to be integrated in a unified command to provide care when needed in response to human health hazards.
- Medical and response personnel must be adequately trained and supplied.
- Up-to-date and functional all-hazard contingency planning should be carried out.
- A system needs to be in place for informing the public with a unified message about the human health hazard.
- Health agencies and facilities require surge capacity management and adaptation to the rising number and needs of the region.

15. HUMAN-CAUSED HAZARDS

15.1 GENERAL BACKGROUND

Although the DMA does not require an assessment of human-caused hazards, The City of Roseville is including human-caused hazards in this hazard mitigation plan for the following reasons:

- The City takes a proactive approach to disaster preparedness, especially in an effort to protect the public safety of all citizens.
- Preparation for and response to a human-caused disaster will involve many of the same staff training, critical decisions, and commitment of resources as for a natural hazard.
- The multi-hazard mitigation planning effort is an opportunity to inform the public about all hazards, including human-caused hazards.
- The likelihood of a human-caused hazard in Roseville is greater than several of the identified natural hazards in this Plan.
- The City has a Terrorism Contingency Plan (June 2004) and a Hazardous Materials Contingency Plan (September 2004) already in place with instructions for a response by City of Roseville first responders and staff of the emergency operations center.

Human-caused hazards fall into the following categories:

- Man-made hazards include acts of terrorism and cyber threats. These hazards are intentional, criminal, malicious acts.
- Technological hazards are incidents that arise from human activities such as the manufacture, transportation, storage and use of hazardous materials. These are accidental incidents with unintended consequences.

This report does not address human-caused hazards to the Roseville water treatment facilities, because the City evaluated those facilities in a separate report per EPA requirements. Information on that evaluation is available from the Roseville City Manager's office. In 2003, with input from the City of Roseville, Placer County conducted a State Homeland Security Assessment Survey to review terrorism vulnerabilities, personnel available to respond, and equipment needed. The resulting information is classified and available only to first responders at the time of an emergency (per state and federal laws).

DEFINITIONS

Acts of Terrorism—The unlawful use or threatened use of force or violence against people or property with the intention of intimidating or coercing societies or governments. Terrorism is either foreign or domestic, depending on the origin, base, and objectives of the terrorist or organization.

Technological Hazards—Hazards from accidents associated with human activities such as the manufacture, transportation, storage and use of hazardous materials.

Weapons of Mass Destruction—Chemical, biological, radiological, nuclear, and explosive weapons associated with terrorism.

Hazardous Material—A substance or combination of substances that, because of quantity, concentration, physical, chemical, or infectious characteristics, may cause or contribute to an increase in mortality or an increase in serious irreversible or incapacitating reversible illness, or pose a present or potential hazard to human life, property, or the environment. Hazardous waste is included in the City's working definition.

15.1.1 Man-Made Hazards

Terrorism and Weapons of Mass Destruction

The Federal Bureau of Investigation (FBI) categorizes terrorism in the United States as one of two types:

- Domestic terrorism involves groups or individuals whose terrorist activities are directed at elements of our government or population without foreign direction. The 1995 bombing of the Alfred P. Murrah federal building in Oklahoma City is an example of domestic terrorism. The FBI is the primary response agency for domestic terrorism. The FBI coordinates domestic preparedness programs and activities of the United States to limit acts posed by terrorists including the use of weapons of mass destruction (WMDs).
- International terrorism involves groups or individuals whose terrorist activities are foreign-based and/or directed by countries or groups outside the United States, or whose activities transcend national boundaries. Examples include the 1997 bombing of Mobil Oil's headquarters, the 1983 bombing of the U.S. Capitol, the 1993 bombing of the World Trade Center, and the September 11, 2001 attacks at the World Trade Center and the Pentagon.

The three key elements to defining a terrorist event are as follows:

- Activities involve the use of illegal force.
- Actions are intended to intimidate or coerce.
- Actions are committed in support of political or social objectives.

As detailed in the City's Terrorism Contingency Plan, at least three important considerations distinguish terrorism hazards from other types of hazards:

- In the case of chemical, biological and radioactive agents, their presence may not be immediately obvious, making it difficult to determine when and where they may have been released, who has been exposed, and what danger is present for first responders and emergency medical technicians.
- There is limited scientific understanding of how these agents affect the population at large.
- Terrorism evokes strong emotional reactions, ranging from anxiety to fear to anger to depression.

Those involved with terrorism response, including public health and public information staff, are trained to deal with the public's emotional reaction swiftly as response to the event occurs. The area of the event must be clearly identified in all emergency alert messages to prevent those not affected by the incident from overwhelming local emergency rooms and response resources, thereby reducing service to those actually affected. The public will be informed clearly and frequently about what government agencies are doing to mitigate the impacts of the event. The public will also be given clear directions on how to protect the health of individuals and families.

FEMA defines terrorism as the use of weapons of mass destruction, including biological, chemical, nuclear and radiological weapons; arson, incendiary, explosive and armed attacks; industrial sabotage and intentional hazardous materials releases; agro-terrorism; and cyber-terrorism (FEMA 386-7). The following are potential methods used by terrorists that could affect the City of Roseville as a direct target or collaterally:

- Conventional bomb
- Biological agent
- Chemical agent
- Nuclear bomb
- Radiological agent
- Arson/incendiary attack
- Armed attack
- Cyber-terrorism (see the cyber threats section of this profile)
- Agro-terrorism
- Intentional hazardous material release.

Table 15-1 provides a hazard profile summary for terrorism-related hazards. Most terrorist events in the United States have been bombing attacks, involving detonated or undetonated explosive devices, tear gas, pipe bombs, and firebombs.

Table 15-1. Event Profiles for Terrorism

Hazard	Application Mode[a]	Hazard Duration[b]	Static/Dynamic Characteristics[c]	Mitigating and Exacerbating Conditions[d]
Conventional Bomb	Detonation of explosive device on or near target; delivery via person, vehicle, or projectile.	Instantaneous; additional secondary devices, or diversionary activities may be used, lengthening the duration of the hazard until the attack site is determined to be clear.	Extent of damage is determined by type and quantity of explosive. Effects generally static other than cascading consequences, incremental structural failure, etc.	Overpressure at a given standoff is inversely proportional to the cube of the distance from the blast; thus, each additional increment of standoff provides progressively more protection. Terrain, forestation, structures, etc. can provide shielding by absorbing and/or deflecting energy and debris. Exacerbating conditions include ease of access to target; lack of barriers and shielding; poor construction; and ease of concealment of device.
Chemical Agent	Liquid/aerosol contaminants dispersed using sprayers or other aerosol generators; liquids vaporizing from puddles/ containers; or munitions.	Hours to weeks, depending on the agent and the conditions in which it exists.	Contamination can be carried out of the initial target area by persons, vehicles, water, and wind. Chemicals may be corrosive or otherwise damaging over time if not remediated.	Air temperature can affect evaporation of aerosols. Ground temperature affects evaporation of liquids. Humidity can enlarge aerosol particles, reducing inhalation hazard. Precipitation can dilute and disperse agents but can spread contamination. Wind can disperse vapors but also cause target area to be dynamic. The micro-meteorological effects of buildings and terrain can alter travel and duration of agents. Shielding in the form of sheltering in place can protect people and property from harmful effects.
Arson/ Incendiary Attack	Initiation of fire or explosion on or near target via direct contact or remotely via projectile.	Generally minutes to hours.	Extent of damage is determined by type and quantity of device, accelerant, and materials present at or near target. Effects generally static other than cascading consequences, incremental structural failure, etc.	Mitigation factors include built-in fire detection and protection systems and fire-resistive construction techniques. Inadequate security can allow easy access to target, easy concealment of an incendiary device, and undetected initiation of a fire. Non-compliance with fire and building codes, as well as failure to maintain existing fire protection systems, can substantially increase the effectiveness of a fire weapon.
Armed Attack	Tactical assault or sniping from remote location, or random attack based on fear, emotion, or mental instability.	Generally minutes to days.	Varies based on the perpetrators' intent and capabilities.	Inadequate security can allow easy access to target, easy concealment of weapons, and undetected initiation of an attack.
Biological Agent	Liquid or solid contaminants dispersed using sprayers/ aerosol generators or by point or line sources such as munitions, covert deposits, and moving sprayers.	Hours to years, depending on the agent and the conditions in which it exists.	Depending on the agent used and the effectiveness with which it is deployed, contamination can be spread via wind and water. Infection can spread via humans or animals.	Altitude of release above ground can affect dispersion; sunlight is destructive to many bacteria and viruses; light to moderate wind will disperse agents but higher winds can break up aerosol clouds; the micro-meteorological effects of buildings and terrain can influence aerosolization and travel of agents.

Hazard	Application Mode[a]	Hazard Duration[b]	Static/Dynamic Characteristics[c]	Mitigating and Exacerbating Conditions[d]
Agro-terrorism	Direct, generally covert contamination of food supplies or introduction of pests and/or disease agents to crops and livestock.	Days to months.	Varies by type of incident. Food contamination events may be limited to specific distribution sites, whereas pests and diseases may spread widely. Generally no effects on built environment.	Inadequate security can facilitate adulteration of food and introduction of pests and disease agents to crops and livestock.
Radiological Agent	Radioactive contaminants dispersed using sprayers/ aerosol generators, or by point or line sources such as munitions.	Seconds to years, depending on material used.	Initial effects will be localized to site of attack; depending on meteorological conditions, subsequent behavior of radioactive contaminants may be dynamic.	Duration of exposure, distance from source of radiation, and the amount of shielding between source and target determine exposure to radiation.
Nuclear Bomb	Detonation of nuclear device underground, at the surface, in the air, or at high altitude.	Light/heat flash and blast/shock wave last for seconds; nuclear radiation and fallout hazards can persist for years. Electromagnetic pulse from a high-altitude detonation lasts for seconds and affects only unprotected electronic systems.	Initial light, heat, and blast effects of a subsurface, ground or air burst are static and determined by the device's characteristics and employment; fallout of radioactive contaminants may be dynamic, depending on meteorological conditions.	Harmful effects of radiation can be reduced by minimizing the time of exposure. Light, heat, and blast energy decrease logarithmically as a function of distance from seat of blast. Terrain, forestation, structures, etc. can provide shielding by absorbing and/or deflecting radiation and radioactive contaminants.
Intentional Hazardous Material Release (fixed facility or transportation)	Solid, liquid, and/or gaseous contaminants released from fixed or mobile containers	Hours to days.	Chemicals may be corrosive or otherwise damaging over time. Explosion and/or fire may be subsequent. Contamination may be carried out of the incident area by persons, vehicles, water and wind.	Weather conditions directly affect how the hazard develops. The micro-meteorological effects of buildings and terrain can alter travel and duration of agents. Shielding in the form of sheltering in place can protect people and property from harmful effects. Non-compliance with fire and building codes, as well as failure to maintain existing fire protection and containment features, can substantially increase the damage from a hazardous materials release.

a. **Application Mode**—Application mode describes the human acts or unintended events necessary to cause the hazard to occur.
b. **Duration**—Duration is the length of time the hazard is present. For example, a chemical warfare agent such as mustard gas, if un-remediated, can persist for hours or weeks under the right conditions.
c. **Dynamic or Static Characteristics**—These characteristics of a hazard describe its tendency, or that of its effects, to either expand, contract, or remain confined in time, magnitude, and space. For example, the physical destruction caused by an earthquake is generally confined to the place in which it occurs, and it does not usually get worse unless aftershocks or other cascading failures occur; in contrast, a cloud of chlorine gas leaking from a storage tank can change location by drifting with the wind and can diminish in danger by dissipating over time.
d. **Mitigation and Exacerbating Conditions**—Mitigating conditions are characteristics of the target and its physical environment that can reduce the effects of a hazard. For example, earthen berms can provide protection from bombs; exposure to sunlight can render some biological agents ineffective; and effective perimeter lighting and surveillance can minimize the likelihood of someone approaching a target unseen. In contrast, exacerbating conditions are characteristics that can enhance or magnify the effects of a hazard. For example, depressions or low areas in terrain can trap heavy vapors, and a proliferation of street furniture (trash receptacles, newspaper vending machines, mail boxes, etc.) can provide hiding places for explosive devices.

Source: FEMA 386-7

The effects of terrorism can vary from loss of life and injuries to property damage and disruptions in services such as electricity, water supplies, transportation, or communications. Terrorist acts may have an immediate effect or a delayed effect. Terrorists often choose targets that offer limited danger to themselves and areas with relatively easy public access. Foreign terrorists look for visible targets where they can avoid detection before and after an attack such as international airports, large cities, major special events, and high-profile landmarks.

In dealing with intentional human-caused hazards, the unpredictability of human beings must be considered. People with a desire to perform criminal acts may seek out targets of opportunity that may not fall into established lists of critical areas or facilities. The City of Roseville first responders train not only to respond to organized terrorism events, but also to respond to random acts by individuals who, for a variety of reasons ranging from fear to emotional trauma to mental instability, may choose to harm others and destroy property.

While education, heightened awareness, and early warning of unusual circumstances may deter crime and terrorism, intentional acts that harm people and property are possible at any time. Public safety entities must react to the incident, locate, isolate and neutralize further damage, and conduct investigate to bring criminals to justice.

Cyber Threats

A cyber threat is an intentional and malicious crime that compromises the digital infrastructure of a person or organization, often for financial or terror-related reasons. Such attacks vary in nature and are perpetrated using digital mediums or sometimes social engineering to target human operators. Generally, attacks last minutes to days, but large-scale events and their impacts can last much longer. As information technology continues to grow in capability and interconnectivity, cyber threats become increasingly frequent and destructive. In 2014, internet security teams at Symantec and Verizon indicated that nearly 1 million new pieces of malware—malicious code designed to steal or destroy information—were created every day (Harrison 2015).

Cyber threats differ by motive, attack type and perpetrator profile. Motives range from the pursuit of financial gain to political or social aims. Cyber threats are difficult to identify and comprehend. Types of threats include using viruses to erase entire systems, breaking into systems and altering files, using someone's personal computer to attack others, or stealing confidential information. The spectrum of cyber risks is limitless, with threats having a wide-range of effects on the individual, community, organizational, and national threat (FEMA 2013).

This risk assessment includes cyber attacks and cyberterrorism under the inclusive hazard of cyber threats. The terms often are used interchangeably, though they are not the same. While all cyberterrorism is a form of cyber attack, not all cyber attacks are cyberterrorism.

Cyber Attacks

Public and private computer systems are likely to experience a variety of cyber attacks, from blanket malware infection to targeted attacks on system capabilities. Cyber attacks specifically seek to breach IT security measures designed to protect an individual or organization. The initial attack is followed by more severe attacks for the purpose of causing harm, stealing data, or financial gain. Organizations are prone to different types of attacks that can be either automated or targeted in nature. Table 15-2 describes the most common cyber attack mechanisms faced by organizations today.

Since 2013, a new type of cyber-attack is becoming increasingly common against individuals and small- and medium-sized organizations. This attack is called cyber ransom. Cyber ransom occurs when an individual downloads ransom malware, or ransomware, often through phishing or drive-by download, and the subsequent execution of code results in encryption of all data and personal files stored on the system. The victim then receives a message that demands a fee in the form of electronic currency or cryptocurrency, such as Bitcoin, for the decryption code (Figure 15-1).

Table 15-2. Common Mechanisms for Cyber Attacks

Type	Description
Socially Engineered Trojans	Programs designed to mimic legitimate processes (e.g. updating software, running fake antivirus software) with the end goal of human-interaction caused infection. When the victim runs the fake process, the Trojan is installed on the system.
Unpatched Software	Nearly all software has weak points that may be exploited by malware. Most common software exploitations occur with Java, Adobe Reader, and Adobe Flash. These vulnerabilities are often exploited as small amounts of malicious code are often downloaded via drive-by download.
Phishing	Malicious email messages that ask users to click a link or download a program. Phishing attacks may appear as legitimate emails from trusted third parties.
Password Attacks	Third party attempts to crack a user's password and subsequently gain access to a system. Password attacks do not typically require malware, but rather stem from software applications on the attacker's system. These applications may use a variety of methods to gain access, including generating large numbers of generated guesses, or dictionary attacks, in which passwords are systematically tested against all of the words in a dictionary.
Drive-by Downloads	Malware is downloaded unknowingly by the victims when they visit an infected site.
Denial of Service Attacks	Attacks that focus on disrupting service to a network in which attackers send high volumes of data until the network becomes overloaded and can no longer function.
Man in the Middle	Man-in-the-Middle attacks mirror victims and endpoints for online information exchange. In this type of attack, the attacker communicates with the victims, who believe they are interacting with a legitimate endpoint website. The attacker is also communicating with the actual endpoint website by impersonating the victim. As the process goes through, the attacker obtains entered and received information from both the victim and endpoint.
Malvertising	Malware downloaded to a system when the victim clicks on an affected ad.
Advanced Persistent Threat (APT)	An attack in which the attacker gains access to a network and remains undetected. APT attacks are designed to steal data instead of cause damage.

Source: Danielson 2015



Figure 15-1. Pop-Up Message Indicating Ransomware Infection

With millions of threats created each day, the importance of protection against cyber attacks becomes a necessary function of everyday operations for individuals, government facilities, and businesses. The increasing dependency on technology for vital information storage and the often automated method of infection means higher stakes for the success of measurable protection and education.

Cyberterrorism

Cyberterrorism is the use of computers and information, particularly over the Internet, to recruit others to an organization's cause, cause physical or financial harm, or cause a severe disruption of infrastructure service. Such disruptions can be driven by religious, political, or other motives. Like traditional terrorism tactics, cyberterrorism seeks to evoke very strong emotional reactions, but it does so through information technology rather than a physically violent or disruptive action. Cyberterrorism has three main types of objectives (Kostadinov 2012):

- **Organizational**—Cyberterrorism with an organizational objective includes specific functions outside of or in addition to a typical cyber attack. Terrorist groups today use the internet on a daily basis. This daily use may include recruitment, training, fundraising, communication, or planning. Organizational cyberterrorism can use platforms such as social media as a tool to spread a message beyond country borders and instigate physical forms of terrorism. Additionally, organizational goals may use systematic attacks as a tool for training new members of a faction in cyber warfare.
- **Undermining**—Cyberterrorism with undermining as an objective seeks to hinder the normal functioning of computer systems, services, or websites. Such methods include defacing, denying, and exposing information. While undermining tactics are typically used due to high dependence on online structures to support vital operational functions, they typically do not result in grave consequences unless undertaken as part of a larger attack. Undermining attacks on computers include the following (Waldron 2011):

  - Directing conventional kinetic weapons against computer equipment, a computer facility, or transmission lines to create a physical attack that disrupts the reliability of equipment.
  - Using electromagnetic energy, most commonly in the form of an electromagnetic pulse, to create an electronic attack against computer equipment or data transmissions. By overheating circuitry or jamming communications, an electronic attack disrupts the reliability of equipment and the integrity of data.
  - Using malicious code directed against computer processing code, instruction logic, or data. The code can generate a stream of malicious network packets that disrupt data or logic by exploiting vulnerability in computer software, or a weakness in computer security practices. This type of cyber attack can disrupt the reliability of equipment, the integrity of data, and the confidentiality of communications (Wilson 2008)

- **Destructive**—The destructive objective for cyberterrorism is what organizations fear most. Through the use of computer technology and the Internet, the terrorists seek to inflict destruction or damage on tangible property or assets, and even death or injury to individuals. There are no cases of pure cyberterrorism as of the date of this Plan.

15.1.2 Technological Hazards

Technological hazards are associated with human activities such as the manufacture, transportation, storage and the use of hazardous materials. Incidents related to these hazards are assumed to be accidental, with unintended consequences. Technological hazards in Roseville can be categorized as follows:

- Hazardous materials incidents
- Power utility losses
- Data and telecommunications disruptions

- Water and wastewater disruption
- Air and transportation accidents
- Infrastructure threats.

Hazardous Materials Incidents

Hazardous materials are present in nearly every city and county in the United States in facilities that produce, store, or use them. For example, water treatment plants use chlorine on-site to eliminate bacterial contaminants. Hazardous materials are transported along interstate highways and railways daily. Even the natural gas used in every home and business is a dangerous substance when a leak occurs. Except for severe weather and flooding, hazardous materials incidents are the hazards most likely to affect the City of Roseville.

Title 49 of the CFR lists thousands of hazardous materials, including gasoline, insecticides, household cleaning products, and radioactive materials. State regulated substances that have the greatest probability of adversely impacting the community are listed in the CCR, Title 19. The following are the most common type of hazardous material incidents:

- **Fixed-Facility Hazardous Materials Incident**—This is the uncontrolled release of materials from a fixed site capable of posing a risk to health, safety and property. It is possible to identify and prepare for a fixed-site incident because federal and state laws require those facilities to notify state and local authorities about what is being used or produced at the site.
- **Hazardous Materials Transportation Incident**—A hazardous materials transportation incident is any event resulting in uncontrolled release of materials during transport that can pose a risk to health, safety, and property. Transportation incidents are difficult to prepare for because there is little if any notice about what materials could be involved should an accident happen. Hazardous materials transportation incidents can occur anywhere, although most occur on major federal or state highways or major rail lines. In addition to materials such as chlorine that are shipped throughout the country by rail, thousands of shipments of radiological materials, mostly medical materials and low-level radioactive waste, travel by ground transportation across the United States. Many incidents occur in sparsely populated areas and affect very few people. There are occasions, however, of accidents in areas with much higher population densities, such as the January 6, 2005 train accident in Graniteville, South Carolina, that released chlorine gas killing nine, injuring 500, and causing the evacuation of 5,400 residents.
- **Interstate Pipeline Hazardous Materials Incident**—There are a significant number of interstate natural gas, heating oil, and petroleum pipelines running through California. These are used to provide natural gas to utilities in California and to transport these materials from production facilities to end users.

Power Utility Losses

A power failure is any interruption or loss of electrical service due to disruption of power generation or transmission caused by an accident, sabotage, natural hazards, equipment failure, or fuel shortage. These interruptions can last anywhere from a few seconds to several days. Power failures are considered significant only if the local emergency management organization is required to coordinate basic services such as the provision of food, water, and heating as a result. Power failures are common with severe weather and winter storm activity. However, for medically dependent residents, a power failure can present a life-threatening situation.

The City of Roseville Electric Utility is responsible for operating and maintaining the electrical transmission and distribution system in Roseville. The City supplies electricity to about 56,000 residential and business customers within the service area according to the 2014 Roseville Electric Annual Report. The distribution lines and substations deliver 324 megawatts during peak demand period from June through September.

Roseville Electric has the highest reliability in the country for municipal utilities of its size, due in large part to a redundant system with sophisticated interconnection between the facilities and immediate notification should failure occur along the distribution system. Through its load management program and load shedding agreements with large, local electric users, the City of Roseville avoided any outages during electric crises and brownouts that affected some parts of California in 2000 and 2001.

Roseville has taken a proactive approach to maintaining its reliability standards by building a local generation source—the Roseville Energy Park. The Roseville Energy Park is a natural-gas-fired, combined-cycle electrical generating facility located on an 8.9-acre site adjacent to the Pleasant Grove Wastewater Treatment Plant. Since operations began in 2007, the state-of-the-art, 160-megawatt power generation facility generates enough energy to meet 40 percent of the community's electricity needs.

Data and Telecommunications Disruptions

The loss of data and/or telecommunications is often a secondary hazard to natural and other human-caused hazards. Data and telecommunications provide a primary method for service to the community by the government and the private sector. A loss of data and telecommunications could result in loss of emergency dispatch capabilities, emergency planning services, infrastructure monitoring capabilities, access to statistical data, and loss of financial and personnel records. Losing the primary method of communication for emergency responders (radio) would severely disable their ability to respond in a timely and effective manner.

Water and Wastewater Disruption

Water or wastewater disruption is a secondary impact from a natural disaster or intentional act. The City of Roseville receives surface water from the Folsom Reservoir, a 1 million-acre-foot multi-purpose facility east of the City. A breach in the dam or the pipelines that carry water to the City's Water Treatment Plant on Barton Road in Granite Bay would have significant temporary impacts on the City until alternative water sources, including water from other regional purveyors and groundwater, are pumped and treated. Long-term disruption of the water source from Folsom Lake would have significant impacts on residences and businesses in Roseville should demand exceed secondary supplies and water conservation measures not provide enough relief to reduce demand to equal the secondary supplies.

Disruption of the City's wastewater collection and regional wastewater treatment plants at Dry Creek and Pleasant Grove Creek would also have significant citywide and regional impacts. Such disruption could result if the system were to be overwhelmed by a significant storm or discharge of materials in such quantities that the treatment plant could not adequately treat the waste. Natural hazards such as earthquake or flood, major power outages, or terrorism directed at the facilities and systems could disrupt the process of collecting and treating millions of gallons of waste. Wastewater treatment plants may also have emergencies internal to the plant such as oxygen deficiencies that render them incapable of treating waste. The disruption of service may also have significant environmental impacts on the waterways adjacent to the treatment plants.

Air and Transportation Accidents

Air and transportation accidents are incidents involving air or rail passengers resulting in death or serious injury. The region has a number of airports, including the Sacramento International Airport, as well as several smaller county or municipal airports and private air strips that enhance the potential for an air disaster.

Roseville features several major transportation routes, including Interstate 80 and Highway 65, both of which run through portions of the City. The potential for transportation accidents that block ingress, egress, and movement through the City is significant, as is the likelihood of hazardous material incidents resulting from a traffic accident.

15.1.3 Civil Disorder

Civil disorder refers to incidents that disrupt a community to the degree that law enforcement intervention is required to maintain public safety. These incidents are generally associated with controversial political, judicial, or economic issues and may occur at any time of the year, although statistics indicate that they are more frequent during summer. While Roseville has no history of civil disorder, large public gatherings associated with concerts or sports events have overburdened local law enforcement and fire protection resources in the past.

The effects of civil disorder vary with the type, severity, scope, and duration of event. Essential services (e.g., electricity, water, public transportation, communications) may be disrupted or property damage, injury and loss of life may occur. Facilities most at risk are government buildings, schools, utilities and correctional facilities.

15.2 HAZARD PROFILE

15.2.1 Past Events

State of California

Terrorism Events

According to the Governor's Office of Emergency Services Terrorism Response Plan, California has had a long history of defending the public against domestic and foreign terrorists. Domestic terrorist groups in California have been focused on political or social issues, while the limited internationally based incidents have targeted the state's immigrant communities due to foreign disputes. Advanced technologies and communication have allowed these groups to become more sophisticated and better organized, with remote members linked electronically.

Technological Hazard Incidents

No comprehensive source exists for technological hazard incidents in California. Given the complex system of transportation networks, the large population, and the number of businesses in California, incidents occur on a regular basis throughout the state, as reported by the news media.

Region

Terrorism Events

In 2005, development projects in Placer County were the subject of arson activity by an individual who claimed to be from the Earth Liberation Front or ELF, a splinter group of Earth First!, a radical environmental activist movement. ELF is a somewhat active domestic terrorism group that says it uses eco-sabotage to protect the Earth and to seek revenge on "those who are destroying the Earth and its inhabitants."

On December 3, 1999, the FBI arrested two anti-government militia members who planned a bomb attack at the Suburban Propane facility in Elk Grove, CA. The alleged plot involved a plan to blow up the Suburban Propane site, which stores about 24 million gallons of liquefied propane and is located one mile from residential homes. According to the Sacramento Bee, the plot resulted in heightened on-site security and a year-long investigation resulting in the two arrests.

Technological Hazard Incidents

Placer County and its incorporated cities have experienced many accidental hazardous materials incidents. Accidents involving high pressure gas lines in the County have caused injury and property damage. An underground Kinder Morgan pipeline failed in 2002, causing a significant spill of diesel fuel within a Rocklin

neighborhood adjacent to where the breach occurred (Former Roseville Fire Department Battalion Chief Jeff Carman, pers. com).

Air and Transportation Accidents

The Sacramento region was once the location of three large military installations: the Sacramento Army Depot, Mather Air Force Base and McClellan Air Force Base. All three have been decommissioned and transferred to civilian uses. The only active military installation is Beale Air Force Base, located to the north near Yuba City, California. A review of McClellan Fire Department history prior to the base closure identifies several responses to accidents near Roseville (see Table 15-3).

Table 15-3. Accidents Responded to by McClellan Fire Department, 1950-1980s

Timeframe	Incident
Early 1950s	Apparatus responded to Code 3 alarm at Travis Air Force Base for B-29 crash that involved a nuclear weapon
October 29, 1951	B-29 making an emergency landing crashed and caught fire on Runway 16 injuring 11 crewmen. One firefighter died.
Mid-1950s	EC-121 crashed near Watt Avenue and U Street in Sacramento
Mid-1960s	F-104 crashed next to Haggin Oaks Golf Course.
April 28, 1973	McClellan Fire Department responded to mutual aid at Roseville Rail Yard fire
1982	Multiple alarm fire including a chemical warehouse. Toxic smoke column closed Interstate 80 for several hours
Early 1980s	HH-53 helicopter crashed near PFE Road during an air show at McClellan Air Force Base. The helicopter was attempting a refueling operation with a C-130 refueler when the hose became entangled in the rotor.
Early 1980s	F-111 crashed near Woodland

Source: McClellan Fire Department History

While the risk of military aircraft accidents in the area has been reduced with the closure of McClellan Air Force Base, which was the closest military base to the City of Roseville, the region is not immune to air transportation accidents. On February 16, 2000, an aircraft crashed after take-off from the Sacramento Mather Airport in Rancho Cordova, California. The cargo flight was bound for Dayton, Ohio and all three crewmembers were killed. The cause of the accident was a mechanical failure. The aircraft crashed into an automobile salvage yard.

Local

Air and Transportation Accidents

On February 12, 2006, a Glasair II-S FT kit plane crashed into a home at 1302 Longfellow Drive in Roseville (see Figure 15-2). The pilot was reported to be performing aerial acrobatics when he lost control of the plane and it crashed. The pilot, his passenger, and a resident in the house were killed, and the home was determined to be a total loss. The fire spread to an adjacent home and caused significant damage, however the residents escaped injury.



Figure 15-2. February 12, 2006 Aircraft Crash into Residence

Arson Events

On October 21, 2010, an arsonist set fire to the Roseville Galleria Mall that caused an estimated $55 million in property damage (see Figure 15-3). Police responded to the mall after a call from the tenant at GameSpot. They said a young male had entered, said he had a gun, and told them to get out. When police arrived, the male, who did not have a gun, had locked himself in the store. Once barricaded, he started a fire. The blaze destroyed an entire section of the mall, which is a core of the Sacramento economy. With over 240 stores operated by Westfield, the mall – built in 2000 and renovated in 2008 for $270 million – has generated $3.2 million in annual sales tax for the region. Reasons for the arson are unknown. The suspect suffered from mental illness.



Figure 15-3. October 21, 2010 Arson Fire at Galleria Mall

Terrorism Events

Terrorism incidents in Roseville have been limited to individuals seeking to cause damage at Roseville schools. Pipe bombs have been left at a school facility in one past occurrence. No WMDs have been used in a terrorist attack in Roseville.

Technological Hazard Incidents

The City of Roseville has had a number of accidental incidents at the Roseville Rail Yard, private businesses and City facilities. The Fire Department has been called to both the Oakmont High School pool and the Roseville Aquatics Center for chlorine leaks. Sewage spills have occurred on occasion and overflowed into the City's creeks. Roseville Rail Yard accidents have included derailments and leaks of toxic chemicals from transporting hazardous materials in the wrong type of railcars.

The worst human-caused disaster in Roseville's history occurred on April 28, 1973 when a train loaded with munitions bound for Vietnam caught fire in the Roseville Yard (see Figure 15-4). No lives were lost, but significant damage to property in Roseville and jurisdictions in Sacramento County occurred during the 18 hours of explosions. In 1997, a number of unexploded bombs were discovered at the yard during construction of a modernization project (see Figure 15-5).

Roseville's history parallels that of the transcontinental railroad. The federal government passed the act to build the transcontinental railroad in 1862 and shortly thereafter the Central Pacific Railroad was started in Sacramento in 1863. A northern route for the first transcontinental rail line was selected when the South seceded from the Union during the Civil War, and Trustees Charles Crocker, Mark Hopkins, Collis P. Huntington and Leland Stanford started construction on this northern line. The line extended from Sacramento to Rocklin by May 1864 and then construction across the Sierra Nevada Mountains began.

The first structure in Roseville was built in 1864 to serve as a freight and passenger depot for the fledgling railroad. In December 1905, a decision by the Central Pacific Railroad to move the division headquarters from Rocklin to Roseville meant a development boom for Roseville. The junction of the Central Pacific Railroad and the California Central, a north-south line became Roseville, where the largest artificial ice plant in the world operated to keep California's fruit and vegetables fresh as they were transported by rail car to the East. The Pacific Fruit Exchange Ice Plant operated from 1908 to 1974 when all of Southern Pacific's 21,000 rail cars were self-refrigerating.

During wartime, Roseville was a hub of activity as troops and war materials moved through the Roseville rail yards. Thousands of munitions shipments moved through Roseville during World Wars I and II, the Korean and Vietnam conflicts, and Desert Storm.

The largest human-caused disaster in the local area occurred on April 28, 1973 when a wooden floor in a munitions boxcar caught fire from brake shoe sparks. A train engine pulling 103 cars, including 21 Department of Defense freight cars with 7,056 Mark 81 bombs, was loaded at the Navy's ammunition depot in Hawthorne, Nevada on their way to western ports and the Vietnam War.

As the train pulled in to the Roseville yard just west of the Roseville city limits, one of the cars caught fire and the flames spread, igniting other freight cars on the tracks, which were 21 rails wide. Nearly every car was loaded with cargo including paint, lumber, and fertilizer. The most dramatic explosions occurred when cars carrying liquid propane caught fire resulting in explosions that blew out windows five miles away and could be heard 100 miles away. Metal and wood was thrown 3,000 feet into the air.

The result was a series of explosions that caused damages of more than $5.6 million in Roseville and the neighboring communities of Citrus Heights, Antelope, and North Highlands. No lives were lost, but over 100 people were treated for assorted cuts and bruises caused by broken glass and flying debris.







After 18 hours of explosions, Army munitions teams recovered 1,200 unexploded bombs scattered around the area and collected another 300 from rail cars. Aerial photographs from that time show a railroad smoldering and piled with twisted track, shattered cars, and scraps of metal from bomb casings. Much of the debris was buried in the 10-foot-deep craters left by the blast.

Milestones & Memories: the Story of Roseville, California, 1850-2000 by Leonard "Duke" Davis

Figure 15-4. 1973 Roseville Rail Yard Disaster

In 1997, Union Pacific Railroad began work on a $130 million project to modernize the Roseville train yard, including significant automation improvements and the replacement of 86 miles of track with 136 miles of new track.

During project grading, backhoe operators uncovered a Mark 81 bomb intact. Bomb disposal experts from Moffett Field in Mountain View, California were flown in by the Sacramento Sheriff's Department to dispose of the bomb, which they do by digging a pit and exploding the ordnance. When another eight bombs were discovered at the western end of the yard in Antelope, California unexploded ordnance experts from Moffett Field were called back and made the decision to place the bombs in pits and build berms around them. The Sacramento County Sheriff evacuated 300 to 400 homes near the rail yard, and at 2 a.m. blew up the bombs. The explosions shattered windows, cracked walls, and rained shrapnel through the roofs of nearby homes

In all, recovered materials included 16 unexploded MK 81 bombs; 11 partial fragments containing explosive residue; 8,625 pounds (4.31 tons) of bomb fragments; and 131,560 pounds (65.78 tons) of ferrous material. Experts found the bombs were not fused (armed), making them less likely to accidentally detonate. The bombs not destroyed on-site were packaged and transported to a facility in Colfax, Louisiana for detonation.



Figure 15-5. 1997 Bomb Discovery

With growth in the region and in trips through the region to tourist destinations such as the ski resorts at Lake Tahoe, the number of traffic accidents has been steadily increasing. Fatal traffic accidents since 2009 are shown in Table 15-4. Truck with trailer accidents account for a small percentage of the City's reported traffic accidents, but they represent the highest potential for hazardous materials incidents on roadways in the City of Roseville.

Table 15-4. Traffic Accident Counts—2009 to 2014

	2009	2010	2011	2012	2013	2014
Vehicles Involved in Fatal Accidents	10	8	8	12	10	1
Fatalities	6	6	5	6	2	1

Source: http://www.city-data.com/accidents/acc-Roseville-California.html

15.2.2 Location

Large population centers, high visibility tourist attractions, and critical infrastructure accessible to the public present security challenges of an ongoing nature in California. The network of highways, railways, ports and airports used to transport significant amounts of hazardous materials poses a significant technological hazards threat. Hazardous materials incidents may occur anywhere in Placer County. Multiple incidents may happen simultaneously, and all typically require a multi-agency, multi-jurisdictional response. The following sections describe the local areas with the greatest likelihood of hazardous materials incidents, as identified in the *Roseville Hazardous Materials Contingency Plan*.

Transportation Routes

The following transportation facilities have the potential to be affected by human-caused hazards:

- Interstate 80 and State Route 65 bisect the City.
- The J.R. Davis Yard in Roseville, the largest train yard west of the Mississippi, is a major Union Pacific switching center built in 1907 (see Figure 15-6). The 850-acre yard includes 136 miles of track. The site includes a former railcar rebuilding facility, the Antelope Yard, fueling areas, and diesel servicing facilities. The site has been designated as contaminated by the federal government, with substances including volatile organics, chlorinated solvents, polynuclear aromatic hydrocarbons, and heavy metals present due to decades of continuous use as a railroad repair and switching facility. Remediation is ongoing at the site.
- Sacramento International Airport in northwestern Sacramento County operates continuously with two major runways and thousands of passengers traveling via commercial and private airlines. Several major airlines operate out of Sacramento International Airport, with most flying light- to medium-weight passenger jets. Approach and takeoff patterns are usually over rural farmland; however, occasionally patterns are adjusted over more populated locations including Roseville. The City is more than 20 miles from Sacramento International Airport and is not in the direct flight path for the airport, although planes do cross Roseville continuously at high altitudes.
- Additional airports within a 20-mile radius of Roseville include the Lincoln and Auburn Airports in Placer County, Beale Air Force Base (34 miles to the north and the closest active military installation), McClellan Airfield, and the Yuba County airport. The instrument-landing approach to Runway 16 at McClellan crosses a portion of the western edge of the Sierra Vista Specific Plan Area. Aircraft on approach fly as low as 1,600 feet at Baseline Road (approximately 4 miles from the runway threshold). Aircraft using McClellan Airpark include aircraft as large as Boeing 747 and 707 aircraft, in addition to Coast Guard C-130s. Additionally, the National Guard flies T-38 aircraft and Blackhawk helicopters out of Mather Air Force Base.
- Sutter Roseville Medical Center maintains a helistop for critically injured patients flown to the hospital. At one time, the facility was limited to accepting one helicopter. If another patient was being transported

to the medical center, the Roseville Fire Department had to respond to the helipad and emergency medical personnel were on standby should anything occur with more than one helicopter using the helipad. The landing area has been expanded and now the helistop has the capacity to accept more than one helicopter at any one time.

- Emergency and public safety helicopter traffic as well as media aircraft and small commercial aircraft frequently fly over the interstates to respond to emergencies and provide public information via local news media.
- Roseville has a number of established truck routes with a higher potential for hazardous material incidents to occur as a result of traffic incidents, as shown in Figure 15-7.



Figure 15-6. The J.R. Davis Yard in Roseville, the Largest Train Yard West of the Mississippi

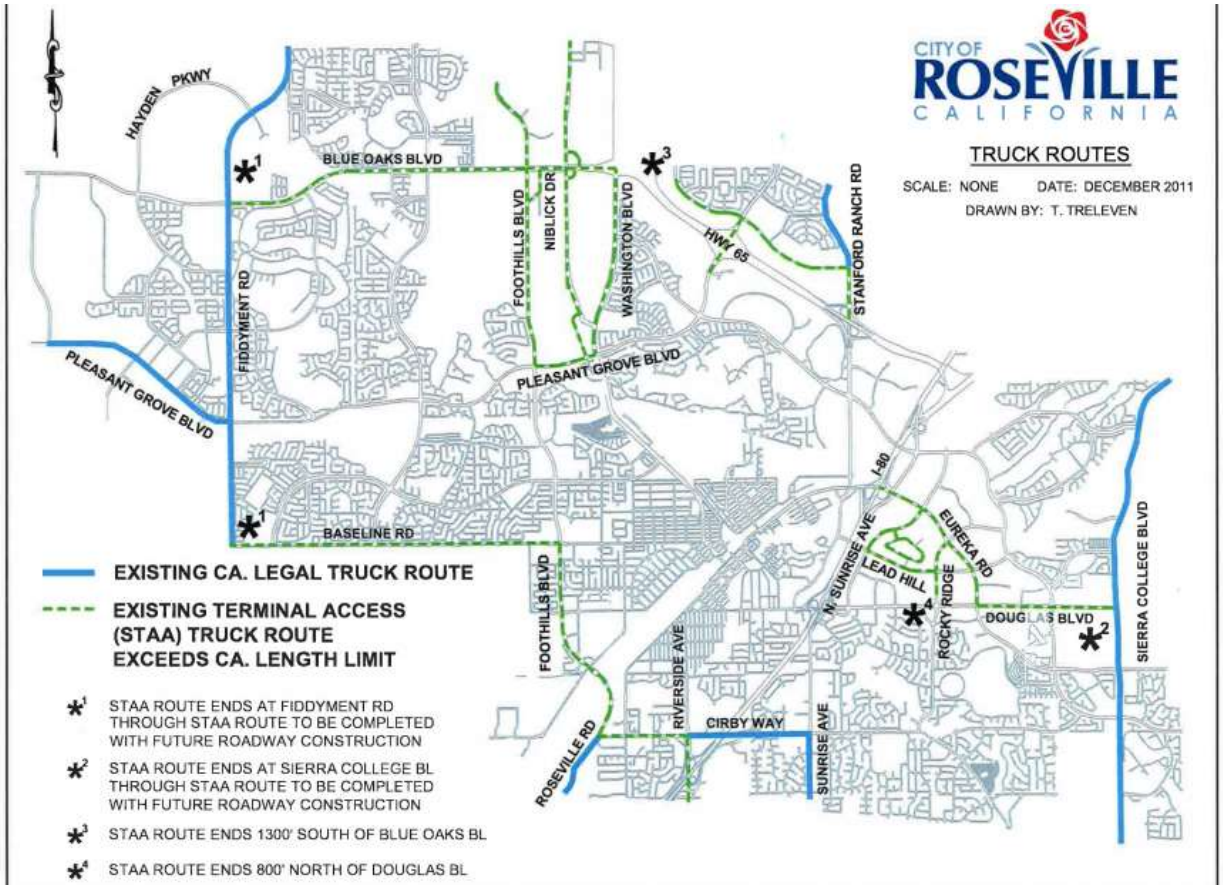


Figure 15-7. Roseville Truck Routes with High Potential for Hazardous Materials Incidents

Pipelines

The Kinder Morgan company owns 3 miles of pipelines generally parallel to the Union Pacific railroad tracks in Roseville that transport high volumes of natural gas through the City (Figure 15-8 shows the company's national pipelines). Other natural gas pipelines run along Interstate 80 with connections between Roseville and Chico. The route to Chico travels through residential areas from the tank farm in Rocklin. The trans-Sierra route from the tank farm in Rocklin to Reno roughly follows the same track as Interstate 80. Pacific Gas and Electric maintains natural gas pipelines in and through Roseville as well.

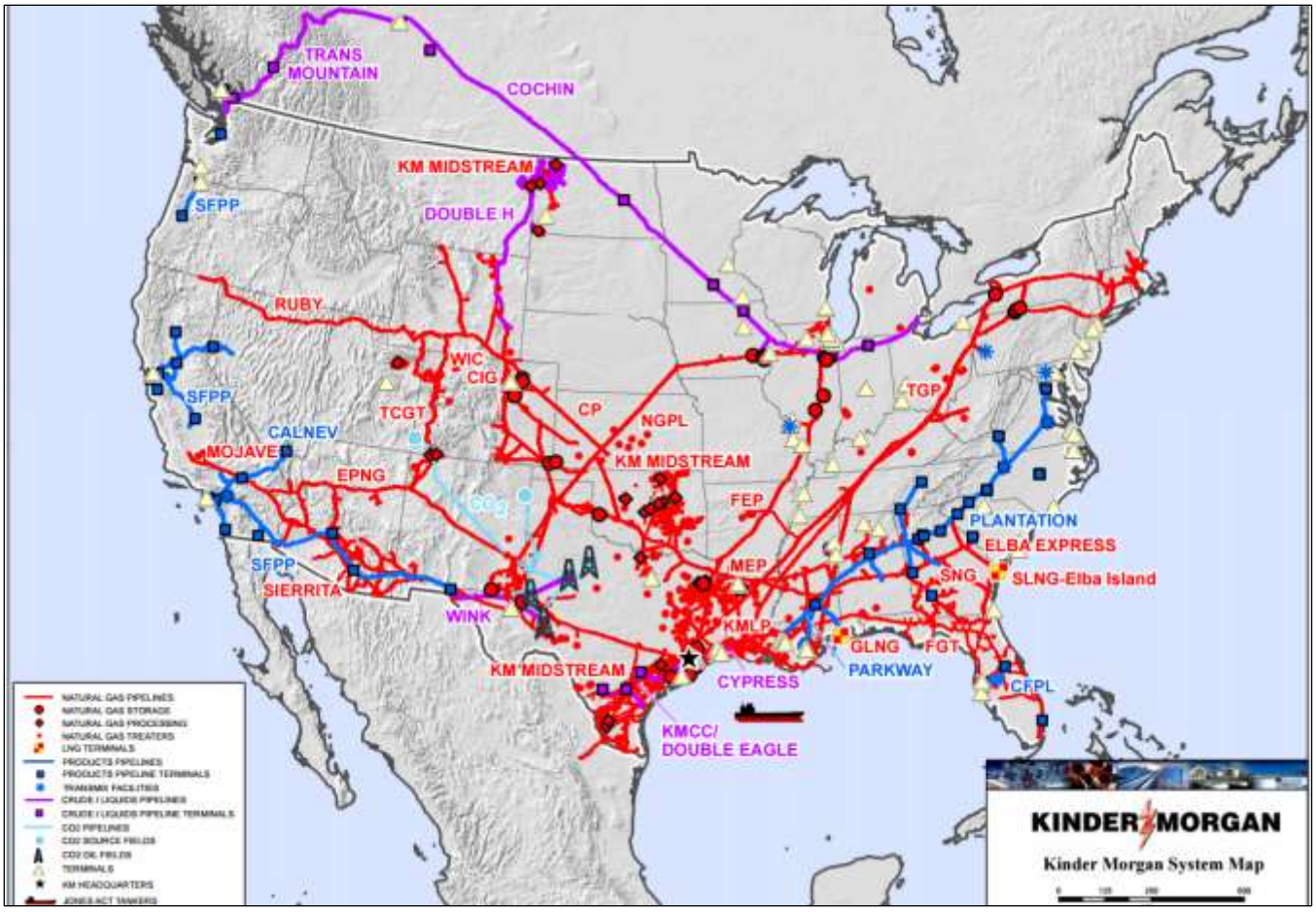


Figure 15-8. Kinder Morgan National Pipeline Map

Business and Industrial Areas

Retail, manufacturing and light industrial firms near State Route 65 (northeastern Roseville and the Sunset Industrial Area of Rocklin) are areas of concern. These facilities have the highest concentration of hazardous materials at fixed facilities in Roseville due to their manufacturing operations. Each business is required to file a detailed, confidential plan with the Roseville Fire Department regarding materials on-site and safety measures taken to protect the public.

Agricultural

Accidental releases of pesticides, fertilizers, and other agricultural chemicals may be harmful to both humans and the environment. Agricultural pesticides are transported daily in and around Roseville en route to their destination in rural areas of Placer County.

Illegal Drug Operations

Illegal operations such as laboratories for methamphetamine pose a significant hazard. Laboratory residues are often dumped along roadways or left in rented hotel rooms, creating a serious health hazard to unsuspecting individuals and to the environment.

Illegal Dumping Sites

Hazardous wastes such as used motor oil, solvents, or paint are occasionally dumped in remote areas of Placer County and Roseville or along roadways, creating a potential health hazard to unsuspecting individuals and to the environment.

Radioactive Materials

Licensed carriers transport radioactive materials along several transportation routes (Interstate 80 and the railroads) through the City of Roseville. The City is notified in advance of these shipments and commits resources as a standby measure should an accident occur.

15.2.3 Frequency

Terrorism

As of 2014, California's economy was the largest of any state in the U.S. Placer County's proximity to the state capitol presents unique conditions for terrorist attacks. The transportation, energy, and communications systems that cross the county have impacts on the local, regional, and even national economy. In general, the risks of a terrorist event involving a WMD are as follows:

- **Chemical**—The risk of a chemical event is present in the City of Roseville. The agricultural community in Placer County uses and stores significant amounts of chemicals for peaceful and productive means that could be used in destructive ways.
- **Explosives**—Pipe bomb and suspicious package events have occurred in Placer County and Roseville in the past. While none of the events has been identified as a WMD, the elements necessary to construct a WMD are readily available. Additionally, the agricultural communities maintain sufficient products and quantities for use in explosive events.
- **Radiological/Nuclear**—The major transportation arteries for vehicles or rail that cross through or near the City of Roseville contribute to the risk of a radiological event. Such products can pass unknown through any one of the regional transportation corridors.
- **Biological**—Anthrax incidents that occurred in the U.S. in October 2001 demonstrate the potential for spreading terror through biological WMDs. The introduction of Newcastle disease in the United States demonstrates how an agent can be introduced to livestock, causing harm to public health and the economy.
- **Combined Hazards**—WMD agents can be combined to have a greater total effect. When combined, the impacts of the event can be immediate and longer-term. Casualties will likely suffer from both immediate and long-term burns and contamination. Given the risks associated with chemical agents in Placer County and the City of Roseville, the possibility exists for such a combined event to occur.

Technological

Hazardous material incidents may occur at any time in the City of Roseville, given the presence of transportation routes bisecting the City, the location of businesses and industry that use hazardous materials, the presence of scattered illegitimate businesses such as clandestine drug laboratories at any given time, and the improper disposal of hazardous waste.

15.2.4 Severity

The severity of human-caused hazards could range from a minor transportation accident or power outage to a full-scale terrorist attack.

The term mass casualty incident (MCI) is often applied to transportation accidents involving air and rail travel, as well as multi-vehicle highway accidents. However, MCIs may also result from hazardous materials incidents or acts of violence, such as shootings or hostage situations. Effects may include serious injuries, loss of life, and associated property damage.

Because large numbers of patients may be involved, significant MCIs may tax local emergency medical and hospital resources, and therefore require a regional response. MCIs may occur throughout the City, day or night, at any time of the year: Interstate 80, State Route 65, and State Route 49 offer the potential for MCIs because of the heavy volume of traffic, although no highway or surface street in the City is exempt from this hazard.

The railroad tracks traversing Placer County, carrying Amtrak passengers as well as freight, also face the risk of an MCI, as do the air corridors above the county. Adverse weather may play a role in roadway, air, or rail accidents. MCIs may also result from acts of violence or terrorism, which could include a chemical, biological or radiological incident, contaminating persons and requiring mass decontamination.

In Placer County, an MCI is defined as any incident with three or more fatalities or critically injured. The first responders, including Roseville Fire, Roseville Police, and emergency room staffs at the local hospitals, follow the same protocol for an MCI whether the number of dead and injured is three, 30 or 300. Mutual aid is requested should Roseville be unable to respond appropriately with available personnel and equipment.

15.2.5 Warning Time

According to the Roseville Terrorism Contingency Plan, only 5 percent of all terrorism incidents are preceded by a warning. In the case of a technological hazard, accidents occur without predictability under circumstances that give responders little time to prepare.

15.3 SECONDARY HAZARDS

The largest secondary impact caused by human-caused hazards would be economic. Economic impacts from human-caused hazards are described in Section 15.5.5.

15.4 EXPOSURE

The risk assessment for this hazard is based on a facility's criticality and physical vulnerability:

- Criticality is a measure of the potential consequence of an accidental or terrorist event as well as the attractiveness of the facility to a potential adversary or threat. The criticality for each critical facility is based on the factors shown in Table 15-5.
- Vulnerability is a measure of the physical opportunity for an accident or an adversarial attack. This assessment takes into consideration physical design, existing countermeasures, and site layout. The vulnerability for each critical facility is based on the criteria shown in Table 15-6.

Table 15-5. Criticality Factors

Criterion	Low Criticality	Medium Criticality	High Criticality
Awareness[a]	Not known/Neighborhood	City/Region/County	State/National
Hazardous Materials[b]	None / limited and secure	Moderate to large and secure	Large, minimum or no security
Collateral Damage Potential[c]	None or low	Moderate/immediate area or within 1 mile radius	High/immediate area or within 1 mile radius

Site Population[d]	0 – 300	301 – 1,000	1,001 or greater
Public/ Emergency Function[e]	No emergency function, or could be used for emergency function in the future	Support emergency function—redundant site	Emergency function—critical service with or without redundancy

a. Awareness—How aware is the public of the existence of the facility, site, system, or location?
b. Hazardous Materials—Are flammable, explosive, biological, chemical and/or radiological materials present on site?
c. Collateral Damage Potential—What are the potential consequences for the surrounding area if the asset is attacked or damaged?
d. Site Population—What is the potential for mass causalities, based on the capacity of the facility.
e. Public or Emergency Functions—Does the facility perform a function during an emergency? Is this facility or function capable of being replicated elsewhere?

Table 15-6. Vulnerability Criteria

Criterion	Low Vulnerability	Medium Vulnerability	High Vulnerability
Accessibility[a]	Remote location, secure perimeter, tightly controlled access	Controlled access, protected or unprotected entry	Open access, unrestricted, patrolling security, sign restrictions
Automobile Proximity[b]	Not within 75' – 100'	Not within 25' – 50'	Adjacent or not within 10'
Asset Mobility[c]	Moves or is relocated frequently	Moves or is relocated occasionally	Permanent/Fixed
Proximity to other Critical Facilities[d]	Greater than 1.5 – 2 miles	Greater than 3/4 - 1 mile	Within 1/2 – 3/4 mile
Secure Design[e]	No areas for concealment of packages, air intakes are on roof, access ways are not under the structure.	Area of concealment present, greater than 25' from the structure; Air intakes located at least 10' above ground, may have under structure access drives.	Areas of concealment within 25', air intakes at ground level, under structure access drives.

a. Accessibility—How accessible is the facility or site to the public?
b. Automobile Proximity—How close can an automobile get to the facility? How vulnerable is the facility to a car bomb attack?
c. Asset Mobility—Is the facility or asset's location fixed or mobile? If mobile, how often is it moved, relocated, or repositioned?
d. Proximity to other critical facilities—If the facility is close to other critical facilities then there could be an increased probability of the facility receiving collateral damage.
e. Secure design—General evaluation of areas of obstruction, air intake locations, parking lot and road design and locations and other site design aspects.

15.4.1 Population

A human-caused hazard event could range from an isolated accident to a coordinated attack by multiple agents upon multiple targets. Large-scale incidents have the potential to kill or injure many citizens in the immediate vicinity, and may also affect people a relative distance from the initial event. Variables affecting exposure for a WMD attack and a hazardous material accident include the physical and chemical properties of the WMD, the ambient temperature, wind speed, wind direction, barometric pressure, and humidity.

Computer models are used by Roseville's Hazardous Materials teams to provide general data to first responders to advise evacuations or sheltering in place. With so many variables to determine "toxic endpoints" as defined by the California Environmental Protection Agency, distances are difficult to forecast. In general, those close to the City's transportation corridors or businesses with acutely hazardous materials are more at risk for some sort of effect. Each chemical incident will be different and the scenarios are too numerous to describe in this Plan.

Hazardous materials pose a significant risk to emergency response personnel. All potential first responders and follow-on emergency personnel in the City of Roseville currently are and will be properly trained to the level of emergency response actions required of their individual position at the response scene. Hazardous materials also pose a serious long-term threat to public health and safety, property and the environment.

15.4.2 Property

According to the City of Roseville's 2035 General Plan, there were 49,998 housing units in the City as of 2010. Single-family detached residential units account for 75.7 percent of the total developed residential units in Roseville according to the City's current General Plan. The total number of units by type of dwelling unit is shown in Table 15-7.

Table 15-7. Residential Dwelling Units in the City of Roseville as of 2012

Type of Unit	Existing Citywide Units
Single Family	35,809
Mobile Home	491
Multi-Family (>=3 units attached)	10,988
Total	**47,288**

Source: City of Roseville 2035 General Plan, Housing Element

Roseville has over 27 million square feet of developed non-residential land uses covering over 3,000 acres city-wide. A majority of this development has occurred since the mid-1980s when the specific plan process was established and large tracts of land were entitled for development. Roseville and Placer County are among the fastest growing communities in California, making them a higher profile target for terrorism. New development has been the target of arson fires and eco-terrorism in the County.

15.4.3 Critical Facilities and Infrastructure

There are no high profile federal or state buildings in Roseville. Critical facilities are limited to City facilities, Placer County facilities, and other government facilities such as the U.S. Post Office, private utility infrastructure and administrative offices, and medical facilities. Roseville's civic facilities are designed to welcome the public, with convenient parking and customer service areas. Except for the Roseville Police Facility, there are limited secure areas that are restricted to the public. Based on the criticality factors and vulnerability criteria described above, these facilities are all at risk because of their accessibility, automobile accessibility, and lack of a secure or hardened design.

Several of Roseville's critical emergency response facilities are located adjacent to the Roseville Rail Yard and pressurized underground pipelines, including the Roseville Civic Center, a primary location for City staff and services (see Figure 15-9), the Roseville Fire Department, which houses administration functions in Fire Station No. 1, and the City's emergency operations center. Significant regional critical facilities such as the Placer County courts and the main office for the U.S. Post Office are also close to the rail yard.



Figure 15-9. Roseville Civic Center

Several factors make gathering places such as the Roseville Civic Center vulnerable to human-caused hazards:

- All are accessible to the general public, to benefit aesthetically pleasing design and customer service.
- Design features, including types of building materials, and screened enclosures for mechanical equipment and solid waste, limit visibility and may contribute to the damage incurred should an intentional or accidental event occur.
- Automobile access is required in the design of most buildings in Roseville, with disabled access parking and easily accessible parking a valued feature.
- Most high population centers do not feature any limitations to access by the public or vehicles, although restricted access to large employment center sites with acutely hazardous materials is built into the design at these facilities.

15.4.4 Environment

The risk of human-caused hazards to the environment is considerable. Hazardous materials spilled along roads or railways could easily pollute rivers, streams, wetlands, riparian areas and adjoining fields. Other hazardous materials released into the air could severely impact plant and animal species. The City of Roseville recognizes this risk and has taken steps to reduce the risk exposure to the natural environment. By reducing the risk exposure to the built environment, the City will also mitigate potential losses to the natural environment.

15.5 VULNERABILITY

15.5.1 Population

Although human-caused hazards have not resulted in a large number of deaths in this area, this type of hazard can be deadly and widespread. Injuries and casualties were not estimated for this hazard. Any individuals exposed to human-caused hazards are considered to be at risk, particularly those working as first responder professionals.

15.5.2 Property

All structures in Roseville are physically vulnerable to a human-caused hazard. The emphasis on accessibility, the opportunity for roof access, driveways underneath some structures, unmonitored areas, the proximity of many structures to transportation corridors and underground pipelines, and the potential for a terrorist to strike any structure randomly all have an impact on the vulnerability of structures. Specific vulnerabilities are on file with the Roseville Fire Department as part of a State Homeland Security Assessment Survey and surveys conducted to complete this mitigation plan.

15.5.3 Critical Facilities and Infrastructure

Most critical facilities and infrastructure in Roseville would be vulnerable to human-caused hazards, including utilities, data and telecommunications systems, and transportation facilities.

15.5.4 Environment

The environment vulnerable to a human-caused hazard is the same as the environment exposed to the hazard. While human-caused disasters have caused significant damage to the environment, estimating damage can be difficult. Loss estimation platforms such as HAZUS-MH are not equipped to measure environmental impacts of these types of hazards. The best gauge of vulnerability of the environment would be a review of damage from past human-caused hazard events. Loss data for damage to the environment were not available at the time of this Plan update. Capturing this data from future events could be beneficial in measuring the vulnerability of the environment for future updates.

15.5.5 Economic impacts

Economic impacts from human-caused hazards could be significant. The cost of a terrorist act would be felt in terms of loss of life and property, disruption of business activity and long-term emotional impacts. Recovery would take significant resources at the local level.

Utility losses could cause a reduction in employment, wholesale and retail sales, utility repairs, and increased medical risks. The City may lose sales tax and property taxes, and the finances of private utility companies and the businesses that rely on them would be disrupted.

The economic impact of data and telecommunications losses can be great, as computer security breaches, crime conducted via the world wide web such as identify theft, and many more forms of human-caused economic losses occur daily. Millions of dollars are lost each year as criminals and cyberterrorists steal sensitive information and funds from individuals and organizations.

The economic impacts would be significant if a transportation facility were rendered impassable. The loss of a roadway or railway would have serious effects on the City's economy and ability to provide services. Loss of travel routes on Interstate 80 or State Route 65 would result in loss of commerce, and may impact the City's ability to provide emergency services to its citizens by delaying response times or limiting routes for equipment such as fire apparatus, police vehicles, and ambulances. Fuel deliveries would also be impacted.

The effects of re-routed traffic could also have a serious impact on local roadways. For example, the closure of the roadway at Folsom Dam has resulted in severe local traffic and the closure of businesses in downtown Folsom due to lack of traffic along the Dam Road route. Heavy traffic on routes through central Roseville already occur at peak commute times when Interstate 80 is congested. Traffic control may burden the City's Public Works Department. Mass transit services would be impacted as routes may be delayed or forced to be detoured, causing economic impacts on Roseville transit and on those who ride buses in Roseville.

15.6 FUTURE TRENDS IN DEVELOPMENT

The potential for human-caused hazards in Roseville is not likely to lessen or prohibit development in Roseville. The threat of human-caused hazards and the availability of Homeland Security Funds will influence future development of the City's critical facilities. Multi-purpose facilities such as the Mahany Library (which also includes a community center and the public access studio) can be used as both an emergency response command center on the west side of Roseville and an information center to inform the public through the internet and broadcast facilities that will be on site.

15.7 REVIEW OF EXISTING ORDINANCES, PROGRAMS, AND PLANS

15.7.1 City of Roseville Emergency Response Plan

Adopted on July 21, 2004 and updated in 2010, the Roseville Emergency Operations Plan addresses the planned response to emergency situations associated with natural disasters, technological (human-caused) emergencies, and war emergency operations in or affecting the City of Roseville. The plan is an operational plan as well as a reference document for pre-emergency planning and emergency operations. It establishes the following:

- An emergency management organization to mitigate any significant emergency or disaster affecting the City of Roseville
- Policies, responsibilities and procedures to protect the health and safety of citizens, public and private property, and the environment from the effects of natural and human-caused emergencies and disasters
- Operational concepts and procedures associated with field response to emergencies, emergency operations center activities, and the recovery process
- A framework for implementing the Standardized Emergency Management System in Roseville.

The Emergency Operations Plan outlines the natural and human-caused hazards most likely to occur in Roseville. It provides significant detail for each responding section assigned to City staff and mutual aid agencies prior to an emergency—management, operations, planning, logistics and finance. Roseville's Emergency Preparedness Manager conducts periodic tabletop and simulated exercises in conjunction with the Placer County Office of Emergency Services and affiliated agencies such as Sutter Roseville Medical Center and Kaiser Permanente Medical Center to ensure that staff is prepared and adequate resources are in place prior to any incident.

City of Roseville departments and other agencies providing emergency response within the City will review this plan at least annually in association with the Multi-Hazard Mitigation Steering Committee. A comprehensive review and subsequent gap analysis report was conducted on the Roseville Emergency Operations Plan in conjunction with the 2016 hazard mitigation planning process. Prioritized recommendations for revisions were provided to the City of Roseville.

15.7.2 City of Roseville Terrorism Contingency Plan

The City of Roseville Terrorism Contingency Plan was prepared in 2004 with grant funds provided through Cal OES by the U.S. Department of Homeland Security. The plan was prepared in collaboration with the Placer

County Office of Emergency Services, Placer County staff and representatives of the six incorporated cities in the Placer County Operational Area. The Terrorism Plan provides an overview of how the Emergency Operations Plan will be activated, how resources will be organized, and how staff will respond with state and federal resources. Specifically, the Terrorism Plan has the following provisions:

- Identifies how local, state, and federal response resources are integrated.
- Establishes a common response protocol to terrorist threats and events.
- Implements existing mutual aid programs.
- Outlines a unified strategic plan for all responders.

The Terrorism Plan is on file with the City of Roseville Fire Department. The City's Emergency Response Manager conducts training for all those assigned responsibilities as part of the plan in addition to coordinating with the Placer County Office of Emergency Services and other agencies charged with protecting the public in the event of a terrorist attack.

15.7.3 City of Roseville Hazardous Materials Contingency Plan

The Hazardous Materials Contingency Plan, completed in September 2004, identifies non-terrorist related hazardous materials responsibilities in order for the City to prepare, respond and recover from an event. The objectives of the Hazardous Materials Plan are as follows:

- Establish policies and responsibilities for protecting the health and safety of the general population and visitors in the City of Roseville and surrounding communities, the environment, and public and private property from the effects of accidental hazardous materials incidents.
- Identify the emergency response organizations that are responsible for managing hazardous materials incidents in or near the City of Roseville.
- Establish operational concepts for staffing, training, operating and supporting the City of Roseville hazardous materials team. The Hazardous Materials Plan is coordinated with the Placer Operational Interagency Response Team Hazard Plan.
- Direct all individuals, agencies, and departments referenced in the Hazardous Materials Plan to develop standard operating procedures and emergency response checklists that are consistent with the Hazardous Materials Plan and the City's Emergency Operations Plan.

15.7.4 State of California Certified Unified Program Agency

The City of Roseville is a State of California Certified Unified Program Agency. This designation identifies the City as a licensing agency for six hazardous-material-related programs. It enables the City of Roseville to implement its own hazardous materials emergency response program. Mutual aid agreements are also in place for incident response. Each business that responds yes to any of the following questions must submit a Unified Program Consolidated Form with facility information to the Roseville Fire Department:

- **Hazardous Materials**—Do you have on-site hazardous materials at or above 55 gallons for liquids, 500 pounds for solids, or 200 cubic feet for compressed gases, or the applicable threshold for an extremely hazardous substance specified in federal law; or do you handle radiological materials in quantities for which an emergency plan is required pursuant to applicable law?
- **Underground Storage Tank**—Do you have on-site underground storage tanks?
- **Above-Ground Storage Tank**—Do you have on-site above-ground storage tanks for storage of petroleum?
- **Hazardous Waste**—Do you operate a facility that generates, recycles, or treats hazardous waste, among other activities?

The Fire Department requires existing and proposed businesses to submit lists of hazardous materials they use. The list is maintained by the Fire Department Life Safety/Hazardous Materials Officer and updated periodically.

15.7.5 Roseville Police Department

Following the provisions and emergency response, mitigation, and recovery structure of the State Emergency Management System, the federally mandated National Incident Management System, and the National Response Plan, the Roseville Police Department is prepared to meet the challenge of intentional criminal acts, including acts of terrorism, as well as technological, accidental, or natural hazards in the following ways:

- Activation of local emergency response plans using multi-disciplinary resources, including but not limited to regional municipal and county law enforcement, the Joint Terrorism Task Force overseen by the FBI, the Department of Justice Anti-Terrorism Information Center, state and federal military personnel, and private resource agencies
- Deployment of local tactical resources to mitigate human-caused acts of terrorism or intentional business disruption, including SWAT, hostage negotiators, rapid containment team, the tactical communications team, and explosive ordnance personnel as necessary
- Use of the Crime Scene Investigations Unit for post-incident evidence collection and investigation
- Intake, processing, analysis, and investigation of all incidents with the potential for large-scale impact in a professional, timely manner.

15.7.6 Roseville Public Safety Communications

Communications personnel are prepared to take the following actions:

- Appropriately recognize and document citizens' reports of suspicious activity.
- Deploy appropriate resources to prevent, investigate, mitigate, and provide recovery services following incidents of human caused hazards, as well as natural and technological disasters.
- Coordinate resource management of personnel, equipment, and facilities during established crisis incidents.
- Work within the framework of the State Emergency Management System to provide emergency communications to field units and emergency operations personnel during emergency events.
- Deploy mutual aid assistance in support of local, state, and national entities during crisis incidents.
- Provide life-saving pre-arrival instructions on emergency medical incidents, both large-scale and of an individual nature.

15.7.7 Roseville Fire Department

Training

Roseville Fire Department personnel are highly trained to handle all aspects of emergency service. All first response personnel are trained in incident command, advanced firefighting skills, basic life support, essential rescue skills, and basic hazardous materials response. All first response personnel are trained to meet or exceed the following state training certification levels: Firefighter I & II, CPR, Emergency Medical Technician I, Hazmat First Responder Operations Decon and ICS 200.

To support these first responders, specialized teams of personnel are trained and certified in tower rescue, above/below grade rescue, confined space rescue, trench rescue, technical rescue, swift water rescue, dive rescue, specialized hazardous materials response, hazardous materials railcar and tank truck response, terrorism response, multi-casualty management, and advanced life support.

The department's staffing includes a full-time training officer who oversees the Fire Training Division. In addition to the training officer, the department draws from a cadre of state certified ICS, fire, EMS, hazmat and technical rescue instructors to conduct regular training exercises to maintain and enhance competency of personnel in all aspects of emergency response. The department also sends personnel to the National Fire Academy, California Specialized Training Institute, Hazmat Continuing Challenge and other off site programs for advanced certifications and training.

The Fire Department maintains a state-of-the-art training facility within the city limits. The Fire Training Center includes two classrooms, a six-story burn tower, command center and other specialized training props such as above- and below-grade vaults, tanks, cargo tanks and a rail tank car. The Roseville Fire Training Center has been state certified as a regional fire academy and for Hazardous Materials Technician / Specialist, Urban Search and Rescue Systems and Confined Space training.

In addition to training in-service response personnel, the Roseville Fire Training Center hosts a regional fire academy in cooperation with Sierra College. The Roseville Fire Training Center also provides regional training to other fire agencies, some of which are under contract with the Department of Homeland Security. Regular regional training includes the Hazardous Materials Technician / Specialist series, Low Angle Rope Rescue, Trench Rescue, Confined Space Rescue, and Urban Search and Rescue Systems I.

Response Time and Mutual Aid

The Roseville Fire Department is a fully functional agency that primarily provides fire suppression and emergency medical services for the urban environment of the City. The department operates eight stations. The department has eight paramedic engine companies, with a minimum staffing of three, two paramedic truck companies with a minimum staffing of four, and one battalion chief. The department also operates a hazardous materials response unit (cross-staffed the truck company); five grass/wildland units, and one technical rescue unit (cross-staffed by engine companies). The department maintains four reserve engines and one reserve truck.

The Fire Department has established a Standards of Response Coverage Plan that includes a travel time standard of 4 minutes from the time the apparatus leaves the station to the arrival of the first engine on scene. Due to significant growth in the City, additional fire stations are needed to achieve this response time. Fire Station 9 opened in May 2013 to serve the new development anticipated in West Roseville.

The City of Roseville has mutual aid agreements with local fire departments and districts in surrounding Placer County and Sacramento County. These personnel cooperate in the same training program as the City firefighters to ensure a high level of competency even with borrowed resources. The department participates in the statewide mutual aid system to bring additional resources from anywhere in California or the nation if this level of aid does not meet the incident needs.

Hazardous Materials Response

Hazardous Materials Listing

All hazardous materials handlers that store in excess of 55 gallons of liquid, 500 pounds of solids, or 200 cubic feet of gas are required to submit Hazardous Materials Management Business Plans to the Roseville Fire Department. These plans provide emergency contact information, site-specific chemical inventories, and vicinity and facility maps. Facilities storing materials that are "acutely" hazardous and in excess of the quantities in CCR, Title 19, Tables I, II or III must submit a more comprehensive Risk Management Plan, which includes off-site consequences analysis, maintenance, and training programs, and an executive summary. Owners/operators of above-ground tanks containing in excess of 660 gallons of petroleum hydrocarbons (or an aggregate quantity of 1,320 gallons) must comply with the California Aboveground Petroleum Storage Act, which requires the preparation of a spill prevention, control, and countermeasure plan.

Development Review Process

The Fire Department reviews any development proposal that may be impacted by or cause an impact related to the storage, handling, or disposal of hazardous materials. A Hazardous Materials Management Plan and, if necessary, a Risk Management Prevention Plan are required as part of the development process per state law. When considering any use, the City analyses the use of toxic or hazardous materials requiring the filing of a business plan for emergency response pursuant to Section 25503.5 of the California Health and Safety Code or materials identified in Section 5194, Title 8 of the CCR. All users must submit a list of hazardous and toxic materials with a qualified discussion of potential chronic and acute long-term health effects, including effects on children, and effects from acute short-term or chronic long-term exposure.

In addition, a plan must be submitted specifying procedures for mitigating the emissions of toxic substances and groundwater monitoring and for identifying methods of hazardous waste disposal. All projects must be reviewed for compliance with the Placer County Hazardous Waste Management Plan.

Intergovernmental Coordination

The Roseville Fire Department works cooperatively with other local and state agencies in a coordinated effort to inform and educate the public regarding the storage, handling, and disposal of household hazardous materials. This includes continued coordination with the Placer County Hazardous Materials Response Teams.

Hazardous Waste Drop-off

The City of Roseville partners with public and private entities to remove household hazardous waste from Roseville's waste stream. The disposals include the following:

- **Household Hazardous Waste Collection**—The Western Placer Waste Management Authority provides a collection service for household hazardous waste. Residents can transport waste to the Authority's facility north of Roseville or schedule a pickup through the Roseville Solid Waste Division.
- **Used Electronic Equipment**—The Materials Recovery Facility accepts old televisions and other electronic waste.
- **Used Motor Oil Recycling**—There are six locations in Roseville designated for used motor oil recycling drop-off.
- **Sharps (or Needles)**—Roseville residents who use medical needles for in-home care are encouraged to purchase sharps containers, which hold 100 needles, at a nominal cost from several drug stores in the City. Residents are asked to dispose of all medical needles and containers properly so they do not enter the waste stream.

Interagency Cooperation for Emergency Response

The City of Roseville Fire Department responds in accordance with the City of Roseville Hazardous Materials Emergency Response Plan to hazardous materials emergencies. Both the California Highway Patrol and the City of Roseville have developed a Hazardous Materials Emergency Plan that discusses the participants' responsibilities, organization and operation to be complied with in the event of a hazardous materials emergency, including clean-up and decontamination procedures.

Hazardous Materials Truck Route

The City of Roseville does not have specific truck routes for hazardous materials. The City does have established truck routes in the city limits, and in the event hazardous materials are to be transported within the city limits, a permit is required from the Roseville Police Department. Typically, trucks with bulk deliveries of hazardous materials use State Route 65 to Blue Oaks Boulevard and then access any of the north-south corridors, including

Washington Boulevard, Industrial Avenue, and Foothills Boulevard where local businesses use hazardous materials in their business activities.

Routes for hazardous materials are coordinated with the California Department of Transportation (Caltrans), the California Highway Patrol, and the Roseville Police, Fire, and Public Works Departments.

Since Blue Oaks Boulevard remains incomplete, there is a risk of hazardous material being transported on bulk trucks through residential areas to reach the Pleasant Grove Wastewater Treatment Plant and the Energy Park. The same is true for transportation of hazardous material to the Booth Road plant, but chlorine gas is no longer used for disinfection there (nor at other water plants serving Roseville).

Hazardous Materials Fee Program

The Roseville Fire Department has adopted a fee schedule for hazardous material permitting, storage, use, handling, and generation. The department also charges for fire and life safety inspections, plan review, and miscellaneous activities such as a Hazardous Materials Business Plan Review.

15.8 SCENARIO

Two human-caused hazard scenarios could have a significant impact on the City of Roseville:

- The first scenario would involve hazardous materials being transported via rail or highway (Interstate 80) across the planning area. The release of hazardous materials via intentional or unintentional means could impact large population centers within the City. Advance knowledge of these shipments and their contents would play a role in preparedness for this scenario, thus reducing its potential impact. The biggest issue in response to hazardous material is material identification and containment.
- The second scenario would be a terrorist event at a large gathering place such as a mall or event center. Terrorist events happen with little or no warning. With a population in excess of 120,000 people, Roseville does possess potential targets for terrorist activities. The City has taken steps to assess these sites as well as probable scenarios in its Terrorism Contingency Plan.

15.9 ISSUES

Future actions needed at the local level to address human-caused hazards include but are not limited to the following:

- Continue all facets of emergency preparedness training for police, fire, public works, and city manager/public information staff in order to respond quickly in the event of a human-caused disaster. Enhance awareness training for all City employees to recognize threats or suspicious activity in order to prevent an incident from occurring.
- Continue all facets of the City's hazardous materials team training and response through commitment of resources from the Fire Department budget and the addition of funding through the Sacramento Regional Homeland Security budget.
- Continue to improve response times for public safety throughout the City so as to reduce exposure to human-caused incidents. The City will maintain appropriate staffing levels of public safety personnel to address vulnerabilities identified in this chapter.
- Train first responders and all appropriate City staff to implement protocols contained in the City of Roseville Terrorism Response Plan.
- Continue to implement the City of Roseville Hazardous Materials Contingency Plan with enhancements as warranted by the type of uses in the City and new technologies in preventing hazardous materials incidents.

- Continue to work proactively with Union Pacific Railroad regarding the following:
  - Placards and labeling of containers
  - Emergency plans and coordination
  - Standardized response procedures
  - Notification of the types of materials being transported through Roseville on at least an annual basis
  - Random inspections of transporters as allowed by Union Pacific
  - Installation of mitigating techniques along the rail yard at critical locations
  - Routine hazard communication initiatives
  - Enhancing security along the rail corridor should the alert system go higher than Orange
  - Continuously looking to the use of safer alternative products to conduct rail transport operations.
- Continue regular testing of the alarm system along the Union Pacific railroad tracks in Central Roseville.
- Utilize Crime Prevention Through Environmental Design (CPTED) in future planning efforts as well as enhancing existing infrastructure and buildings to prevent or mitigate human-cause incidents. CPTED is an urban planning design process that integrates crime prevention with neighborhood design and community development. CPTED is based on the theory that the proper design and effective use of the built environment can reduce crime and the fear of crime and improve the quality of life. CPTED creates an environment where the physical characteristics, building layout, and site planning allow inhabitants to become key agents in ensuring their own security.
- Work with the private sector to enhance and create Business Continuity Plans in the event of an emergency.
- Relocate or construct a redundant Emergency Operations Center farther from the Roseville Rail Yard and floodplain.
- Maintain an emergency services information line that the public can contact 24 hours a day during an emergency incident to ask questions of emergency staff.
- Coordinate with all Roseville school districts to ensure that their emergency preparedness plans include preparation for human-caused incidents.
- Encourage local businesses to adopt Information Technology and telecommunications recovery plans.
- Promote 72-hour self-sufficiency through the Emergency Preparedness Manager's efforts, the Roseville website, Roseville Coalition of Neighborhood Associations, and other media.
- Continue to share the human-caused hazard risk and preparedness presentation given at the public meetings and City Council workshop as part of this preparedness effort.
- Maintain the on-line Citizens Advisory Panel of 2,400 households and periodically e-mail emergency preparedness information including human-caused hazard preparedness instructions and reminders.

Future actions needed at the regional level to address human-caused hazards include but are not limited to the following:

- Participate in regional, state and federal efforts to gather terrorism information at all levels and keep public safety officials briefed at all times regarding any local threats. Staff will then further develop response capabilities based on emerging threats.
- Participate in the Cal OES Disaster Resistant California annual conference and other training sessions sponsored by regional, state and federal agencies.
- Participate in regional training exercises per the requirements of Homeland Security Presidential Directive #8 in support of national preparedness. These training exercises, sponsored by the Sacramento Regional Office of Homeland Security, will test and evaluate the ability to coordinate the activities of city, county and state government first responders, volunteer organizations and the private sector in responding to terrorism and technological hazards. The trainings will enhance interagency coordination,

provide training to staff, test response and recovery capabilities, and activate the National Incident Management System and the mutual aid system.

- Review existing automatic/mutual aid agreements with other public safety agencies to identify opportunities for enhancement.

16. PLANNING AREA RISK RANKING

A risk ranking was performed for the hazards of concern described in this Plan. This risk ranking assesses the probability of each hazard's occurrence as well as its likely impact on the people, property, and economy of the planning area. When available, estimates of risk were generated with data from Hazus-MH or GIS analysis using methodologies promoted by FEMA. For hazards of concern with less robust datasets, qualitative assessments were used. The results are used in establishing mitigation priorities.

The climate change hazard was not ranked because its impacts are factored into each individual hazard and thus are peripherally included in this assessment. The human-health and human-caused hazards were not ranked because they are not considered natural hazards.

16.1 PROBABILITY OF OCCURRENCE

The probability of occurrence of a hazard is indicated by a probability factor based on likelihood of annual occurrence:

- High—Hazard event is likely to occur within 25 years (Probability Factor = 3)
- Medium—Hazard event is likely to occur within 100 years (Probability Factor =2)
- Low—Hazard event is not likely to occur within 100 years (Probability Factor =1)
- No exposure—There is no probability of occurrence (Probability Factor = 0)

The assessment of hazard frequency is generally based on past hazard events in the area. Table 16-1 summarizes the probability assessment for each hazard of concern for this Plan.

Table 16-1. Probability of Hazards

Hazard Event	Probability (high, medium, low)	Probability Factor
Dam Failure	Low	1
Drought	High	3
Earthquake	High	3
Flooding	Medium	2
Landslide	Low	1
Severe Weather	High	3
Wildfire	High	3

16.2 IMPACT

Hazard impacts were assessed in three categories: impacts on people, impacts on property and impacts on the local economy. Numerical impact factors were assigned as follows:

- **People**—Values were assigned based on the percentage of the total ***population exposed*** to the hazard event. The degree of impact on individuals will vary and is not measurable, so the calculation assumes for

simplicity and consistency that all people exposed to a hazard because they live in a hazard zone will be equally impacted when a hazard event occurs. An element of subjectivity can be used in assigning values for impacts on people. Impact factors were assigned as follows:

- High—50 percent or more of the population is exposed to a hazard (Impact Factor = 3)
- Medium—25 percent to 49 percent of the population is exposed to a hazard (Impact Factor = 2)
- Low—25 percent or less of the population is exposed to the hazard (Impact Factor = 1)
- No impact—None of the population is exposed to a hazard (Impact Factor = 0)

- **Property**—Values were assigned based on the percentage of the total ***property value exposed*** to the hazard event:

  - High—30 percent or more of the total assessed property value is exposed to a hazard (Impact Factor = 3)
  - Medium—15 percent to 29 percent of the total assessed property value is exposed to a hazard (Impact Factor = 2)
  - Low—14 percent or less of the total assessed property value is exposed to the hazard (Impact Factor = 1)
  - No impact—None of the total assessed property value is exposed to a hazard (Impact Factor = 0)

- **Economy**—Values were assigned based on the percentage of the total ***property value vulnerable*** to the hazard event. Values represent estimates of the loss from a major event of each hazard in comparison to the total assessed value of the property exposed to the hazard. For some hazards, such as wildfire, landslide and severe weather, vulnerability was considered to be the same as exposure due to the lack of loss estimation tools specific to those hazards. Loss estimates separate from the exposure estimates were generated for the earthquake and flood hazards using Hazus-MH.

  - High—Estimated loss from the hazard is 20 percent or more of the total exposed property value (Impact Factor = 3)
  - Medium—Estimated loss from the hazard is 10 percent to 19 percent of the total exposed property value (Impact Factor = 2)
  - Low—Estimated loss from the hazard is 9 percent or less of the total exposed property value (Impact Factor = 1)
  - No impact—No loss is estimated from the hazard (Impact Factor = 0)

Each category of impact was assigned a weighting factor to reflect its significance: impact on people was given a weighting factor of 3; impact on property was given a weighting factor of 2; and impact on the economy was given a weighting factor of 1. Table 16-2, Table 16-3 and Table 16-4 summarize the impacts for each hazard.

Table 16-2. Impact on People from Hazards

Hazard Event	Impact (high, medium, low)	Impact Factor	Multiplied by Weighting Factor (3)
Dam Failure	High	3	9
Drought[a]	None	0	0
Earthquake	High	3	9
Flooding	Low	1	3
Landslide	Low	1	3
Severe Weather	High	3	9
Wildfire	Medium	2	6

a. All people in the planning area would be exposed to drought, but the impact on the safety of individuals is expected to be minimal.

Table 16-3. Impact on Property from Hazards

Hazard Event	Impact (high, medium, low)	Impact Factor	Multiplied by Weighting Factor (2)
Dam Failure	High	3	6
Drought[a]	None	0	0
Earthquake	High	3	6
Flooding	Low	1	2
Landslide[b]	Low	0	0
Severe Weather	High	3	6
Wildfire	High	3	6

a. All properties in the planning area would be exposed to drought, but the impact on properties is expected to be minimal.
b. Impact on property is less than 0.5% and thus registers as 0.

Table 16-4. Impact on Economy from Hazards

Hazard Event	Impact (high, medium, low)	Impact Factor	Multiplied by Weighting Factor (1)
Dam Failure	High	3	3
Drought	Low	1	1
Earthquake	Low	1	1
Flooding	Low	1	1
Landslide	Low	1	1
Severe Weather	Low	1	1
Wildfire	Low	0	0

16.3 RISK RATING AND RANKING

The risk rating for each hazard was determined by multiplying the probability factor by the sum of the weighted impact factors for people, property and operations, as summarized in Table 16-5.

Based on these ratings, a priority of high, medium or low was assigned to each hazard. The hazards ranked as being of highest concern are earthquake, severe weather, and wildfire. Hazards ranked as being of medium concern are flood and dam failure. The hazards ranked as being of lowest concern are drought and landslide. Table 16-6 shows the hazard risk ranking.

Table 16-5. Hazard Risk Rating

Hazard Event	Probability Factor	Sum of Weighted Impact Factors	Total (Probability x Impact)
Dam Failure	1	18	18
Drought	3	1	3
Earthquake	3	16	48
Flooding	2	6	12
Landslide	1	4	4
Severe Weather	3	16	48
Wildfire	3	12	36

Table 16-6. Hazard Risk Ranking

Hazard Ranking	Hazard Event	Category
1	Severe Weather	High
2	Earthquake	High
3	Wildfire	High
4	Dam Failure	Medium
5	Flood	Medium
6	Landslide	Low
7	Drought	Low

Part 3. Mitigation Strategy

17. GUIDING PRINCIPLE, GOALS, OBJECTIVES, AND PREVIOUS ACTION STATUS

Hazard mitigation plans must identify goals for reducing long-term vulnerabilities to identified hazards (44 CFR Section 201.6(c)(3)(i)). For the purposes of this Plan, goals and objectives are defined as follows:

- **Goals** are general guidelines that explain what is to be achieved. They are usually broad-based, policy-type statements, long-term, and represent global visions. Goals help define the benefits that the Plan is trying to achieve. The success of the hazard mitigation plan should be measured by the degree to which its goals have been met (that is, by the actual benefits in terms of hazard mitigation).
- **Objectives** are short-term aims which, when combined, form a strategy or course of action to meet a goal. Unlike goals, objectives are specific and measurable.

After establishing a guiding principle for this hazard mitigation plan, the City of Roseville developed goals and objectives for the initial plan through discussions, research, and meetings of the Steering Committee and based on input from stakeholders and the public. Information for this process was garnered from the public involvement strategy, the risk assessment, and review of the California and Placer County hazard mitigation plans.

The Steering Committee identified seven goals, working from a catalog of goal statements created through review of other similar plans and FEMA planning guidance. Once the goals were established, objectives that meet multiple goals were selected through a similar exercise.

For the 2016 Plan, the Steering Committee reviewed the goals and objectives established for the previous plan to determine if they still fulfill the vision of reducing risk in the planning area. It was determined that the goals and objectives are still relevant to the vision.

17.1 GUIDING PRINCIPLE

A guiding principle or a mission statement for a plan is a written declaration of the plan's core purpose and focus. It normally remains unchanged over time, regardless of a change to the plan's goals or objectives. Though not required for DMA compliance, the incorporation of a guiding principle provides a clear, singular message that can be a focal point throughout all facets of the planning process. The City of Roseville developed the following guiding principle for 2016 to be carried through to subsequent updates to the hazard mitigation plan:

> *Through community partnerships, establish a plan to reduce vulnerability to hazards in order to protect the health, safety, welfare, and economy of the City.*

17.2 GOALS

The goals for the 2016 Plan, consistent with the hazards identified in this plan, are as follows:

- G-1: Protect lives and reduce injury.
- G-2: Promote hazard mitigation as an integrated policy.

- G-3: Protect the continuity of local government to ensure no significant disruption of services during or due to a disaster.
- G-4: Improve community emergency management preparedness, collaboration and outreach.
- G-5: Minimize or reduce damage to property, including critical facilities.
- G-6: Develop and implement mitigation strategies that optimize public funds in an efficient and cost-effective way.
- G-7: Monitor and support the natural environment's capacity to deal with the impacts of natural hazards, taking into account the potential impacts of global climate change.

17.3 OBJECTIVES

The Steering Committee selected the objectives listed in Table 17-1 to meet multiple goals. The objectives serve as a stand-alone measurement of a mitigation action rather than as a subset of a goal. Achievement of the objectives is a measure of the effectiveness of a mitigation strategy. The objectives are also used to help establish priorities.

Table 17-1. Objectives for 2011 Multi-Hazard Mitigation Plan

Objective Number	Objective Statement	Goals for which it can be applied
O-1	Consider the impacts of hazards on future land uses in the City of Roseville by coordinating with other planning mechanisms such as the General Plan and land-use code development.	1, 2, 5, 7
O-2	Protect and sustain reliable local emergency operations and communication facilities during and after disasters.	1, 3, 4
O-3	Develop new or enhance existing early warning response systems and plans.	1, 3, 4, 5
O-4	Seek to enhance emergency response capabilities through improvements to infrastructure and City programs.	1, 4, 5
O-5	Enhance the understanding of all present and future hazards that impact the City of Roseville and the risk they pose.	1, 3, 4, 5, 7
O-6	Seek mitigation projects that provide the highest degree of hazard protection at the least cost.	1, 5, 6
O-7	Seek to update information on natural, environmental, and human-caused hazards, vulnerabilities, and mitigation measures by coordinating planning efforts and creating partnerships with appropriate local, private, county, state, and federal agencies.	1, 2, 3, 4, 5, 7
O-8	Seek to implement codes, standards, and policies that will protect life and property, including natural habitat, from the impacts of hazards within the City of Roseville.	1, 2, 3, 5, 6
O-9	Educate the public on preparedness for and mitigation of potential impacts of hazards on the City of Roseville.	1, 2, 4
O-10	Support efforts to retrofit, purchase, or relocate structures in high hazard areas, including those known to be repetitively damaged.	3, 5, 6

17.4 STATUS OF PREVIOUS ACTIONS

The City of Roseville develops an annual Progress Report which includes the status of previous actions. This Progress Report details completed actions as well as those actions added outside of the 5-year update cycle. A copy of the 2015 Progress Report is located in Appendix B.

18. MITIGATION ALTERNATIVES

Catalogs of hazard mitigation alternatives were developed that present a broad range of alternatives to be considered for use in the planning area, in compliance with 44 CFR (Section 201.6(c)(3)(ii)). One catalog was developed for each hazard of concern evaluated in this Plan. The catalogs present alternatives that are categorized in two ways:

- By who would have responsibility for implementation:
  - Individuals (personal scale)
  - Businesses (corporate scale)
  - Government (government scale).
- By what the alternative would do:
  - Manipulate the hazard
  - Reduce exposure to the hazard
  - Reduce vulnerability to the hazard
  - Increase the ability to respond to or be prepared for the hazard.

Hazard mitigation actions recommended in this Plan were selected from among the alternatives presented in the catalogs. The catalogs provide a baseline of mitigation alternatives that are backed by a planning process, are consistent with the established goals and objectives, and are within the capabilities of the City of Roseville to implement. Some of these actions may not be feasible based on the selection criteria identified for this Plan. The purpose of the catalog was to provide a list of what could be considered to reduce risk of the flood hazard within the planning area. Actions in the catalog that are not included for the action plan were not selected for one or more of the following reasons:

- The action is not feasible.
- The action is already being implemented.
- There is an apparently more cost-effective alternative.
- The action does not have public or political support.

The catalogs for each hazard are presented in Table 18-1 through Table 18-9.

Table 18-1. Alternatives to Mitigate the Dam Failure Hazard

Personal-Scale	Corporate-Scale	Government-Scale
• **Manipulate the hazard:** ○ **None** • **Reduce exposure to the hazard:** ○ **Relocate out of dam failure inundation areas.** • **Reduce vulnerability to the hazard:** ○ **Elevate home to appropriate levels.** • **Increase the ability to respond to or be prepared for the hazard:** ○ **Learn about risk reduction for the dam failure hazard.** ○ **Learn the evacuation routes for a dam failure event.** ○ **Educate yourself on early warning systems and the dissemination of warnings.**	• **Manipulate the hazard:** ○ Remove dams. ○ Remove levees. ○ Harden dams. • **Reduce exposure to the hazard:** ○ Replace earthen dams with hardened structures. • **Reduce vulnerability to the hazard:** ○ Flood-proof facilities within dam failure inundation areas. • **Increase the ability to respond to or be prepared for the hazard:** ○ Educate employees on the probable impacts of a dam failure. ○ Develop a continuity of operations plan.	• **Manipulate the hazard:** ○ Remove dams. ○ Remove levees. ○ Harden dams. • **Reduce exposure to the hazard:** ○ Replace earthen dams with hardened structures ○ Relocate critical facilities out of dam failure inundation areas. ○ Consider open space land use in designated dam failure inundation areas. • **Reduce vulnerability to the hazard:** ○ Adopt higher regulatory floodplain standards in mapped dam failure inundation areas. ○ Retrofit critical facilities within dam failure inundation areas. • **Increase the ability to respond to or be prepared for the hazard:** ○ Map dam failure inundation areas. ○ Enhance emergency operations plan to include a dam failure component. ○ Institute monthly communications checks with dam operators. ○ Inform the public on risk reduction techniques ○ Adopt real-estate disclosure requirements for the re-sale of property located within dam failure inundation areas. ○ Consider the probable impacts of climate in assessing the risk associated with the dam failure hazard. ○ Establish early warning capability downstream of listed high hazard dams. ○ Consider the residual risk associated with protection provided by dams in future land use decisions.

Table 18-2. Alternatives to Mitigate the Drought Hazard

Personal-Scale	Corporate-Scale	Government-Scale

• **Manipulate the hazard:**
  ○ **None**
• **Reduce exposure to the hazard:**
  ○ **None**
• **Reduce vulnerability to the hazard:**
  ○ **Drought-resistant landscapes**
  ○ **Reduce water system losses**
  ○ **Modify plumbing systems (through water saving kits)**
• **Increase the ability to respond to or be prepared for the hazard:**
  ○ **Practice active water conservation**
	• **Manipulate the hazard:**
	  ○ None
	• **Reduce exposure to the hazard:**
	  ○ None
	• **Reduce vulnerability to the hazard:**
	  ○ Drought-resistant landscapes
	  ○ Reduce private water system losses
	• **Increase the ability to respond to or be prepared for the hazard:**
	  ○ Practice active water conservation
		• **Manipulate the hazard:**
		  ○ Groundwater recharge through stormwater management
		• **Reduce exposure to the hazard:**
		  ○ Identify and create groundwater backup sources
		• **Reduce vulnerability to the hazard:**
		  ○ Reduce water system losses
		  ○ Distribute water saving kits
		  ○ Increase use of recycled water
		  ○ Diversify water supply diversion points
		• **Increase the ability to respond to or be prepared for the hazard:**
		  ○ Public education on drought resistance
		  ○ Identify alternative water supplies for times of drought; mutual aid agreements with alternative suppliers
		  ○ Implement drought contingency plan
		  ○ Develop criteria “triggers” for drought-related actions
		  ○ Improve accuracy of water supply forecasts

Table 18-3. Alternatives to Mitigate the Earthquake Hazard

Personal-Scale	Corporate-Scale	Government-Scale
• **Manipulate the hazard:** ○ **None** • **Reduce exposure to the hazard:** ○ **Locate outside of hazard area (off soft soils)** • **Reduce vulnerability to the hazard:** ○ **Retrofit structure (anchor house structure to foundation)** ○ **Secure household items that can cause injury or damage (such as water heaters, bookcases, and other appliances)** ○ **Build to higher design** • **Increase the ability to respond to or be prepared for the hazard:** ○ **Practice "drop, cover, and hold"** ○ **Develop household mitigation plan, such as creating a retrofit savings account, communication capability with outside, 72-hour self-sufficiency during an event** ○ **Keep cash reserves for reconstruction** ○ **Become informed on the hazard and risk reduction alternatives available.** ○ **Develop a post-disaster action plan for your household**	• **Manipulate the hazard:** ○ None • **Reduce exposure to the hazard:** ○ Locate or relocate mission-critical functions outside hazard area where possible • **Reduce vulnerability to the hazard:** ○ Build redundancy for critical functions and facilities ○ Retrofit critical buildings and areas housing mission-critical functions • **Increase the ability to respond to or be prepared for the hazard:** ○ Adopt higher standard for new construction; consider "performance-based design" when building new structures ○ Keep cash reserves for reconstruction ○ Inform your employees on the possible impacts of earthquake and how to deal with them at your work facility. ○ Develop a continuity of operations plan	• **Manipulate the hazard:** ○ None • **Reduce exposure to the hazard:** ○ Locate critical facilities or functions outside hazard area where possible • **Reduce vulnerability to the hazard:** ○ Harden infrastructure ○ Provide redundancy for critical functions ○ Adopt higher regulatory standards • **Increase the ability to respond to or be prepared for the hazard:** ○ Provide better hazard maps ○ Provide technical information and guidance ○ Enact tools to help manage development in hazard areas (e.g., tax incentives, information) ○ Include retrofitting and replacement of critical system elements in capital improvement plan ○ Develop strategy to take advantage of post-disaster opportunities ○ Warehouse critical infrastructure components such as pipe, power line, and road repair materials ○ Develop and adopt a continuity of operations plan ○ Initiate triggers guiding improvements (such as <50% substantial damage or improvements) ○ Further enhance seismic risk assessment to target high hazard buildings for mitigation opportunities. ○ Develop a post-disaster action plan that includes grant funding and debris removal components.

Table 18-4. Alternatives to Mitigate the Flooding Hazard

Personal-Scale	Corporate-Scale	Government-Scale
• **Manipulate the hazard:** ○ **Clear storm drains and culverts** ○ **Use low-impact development techniques** • **Reduce exposure to the hazard:** ○ **Locate outside of hazard area** ○ **Elevate utilities above base flood elevation** ○ **Use low-impact development techniques** • **Reduce vulnerability to the hazard:** ○ **Raise structures above base flood elevation** ○ **Elevate items within house above base flood elevation** ○ **Build new homes above base flood elevation** ○ **Flood-proof structures** • **Increase the ability to respond to or be prepared for the hazard:** ○ **Buy flood insurance** ○ **Develop household plan, such as retrofit savings, communication with outside, 72-hour self-sufficiency during and after an event**	• **Manipulate the hazard:** ○ Clear storm drains and culverts ○ Use low-impact development techniques • **Reduce exposure to the hazard:** ○ Locate critical facilities or functions outside hazard area ○ Use low-impact development techniques • **Reduce vulnerability to the hazard:** ○ Build redundancy for critical functions or retrofit critical buildings ○ Provide flood-proofing when new critical infrastructure must be located in floodplains • **Increase the ability to respond to or be prepared for the hazard:** ○ Keep cash reserves for reconstruction ○ Support and implement hazard disclosure for sale of property in risk zones. ○ Solicit cost-sharing through partnerships with others on projects with multiple benefits.	• **Manipulate the hazard:** ○ Maintain drainage system ○ Institute low-impact development techniques on property ○ Dredging, levee construction, and providing regional retention areas ○ Structural flood control, levees, channelization, or revetments. ○ Stormwater management regulations and master planning ○ Acquire vacant land or promote open space uses in developing watersheds to control increases in runoff • **Reduce exposure to the hazard:** ○ Locate or relocate critical facilities outside of hazard area ○ Acquire or relocate identified repetitive loss properties ○ Promote open space uses in identified high hazard areas via techniques such as: planned unit developments, easements, setbacks, greenways, sensitive area tracks. ○ Adopt land development criteria such as planned unit developments, density transfers, clustering ○ Institute low impact development techniques on property ○ Acquire vacant land or promote open space uses in developing watersheds to control increases in runoff • **Reduce vulnerability to the hazard:** ○ Harden infrastructure, bridge replacement program ○ Provide redundancy for critical functions and infrastructure ○ Adopt regulatory standards such as freeboard standards, cumulative substantial improvement or damage, lower substantial damage threshold; compensatory storage, non-conversion deed restrictions. ○ Stormwater management regulations and master planning. ○ Adopt “no-adverse impact” floodplain management policies that strive to not increase the flood risk on downstream communities. • **Increase the ability to respond to or be prepared for the hazard:** ○ Produce better hazard maps ○ Provide technical information and guidance ○ Enact tools to help manage development in hazard areas (stronger controls, tax incentives, and information) ○ Incorporate retrofitting or replacement of critical system elements in capital improvement plan ○ Develop strategy to take advantage of post-disaster opportunities ○ Warehouse critical infrastructure components ○ Develop and adopt a continuity of operations plan ○ Consider participation in the Community Rating System ○ Maintain and collect data to define risks and vulnerability ○ Train emergency responders ○ Create an elevation inventory of structures in the floodplain ○ Develop and implement a public information strategy ○ Charge a hazard mitigation fee ○ Integrate floodplain management policies into other planning mechanisms within the planning area. ○ Consider the probable impacts of climate change on the risk associated with the flood hazard ○ Consider the residual risk associated with structural flood control in future land use decisions ○ Enforce National Flood Insurance Program ○ Adopt a Stormwater Management Master Plan

Table 18-5. Alternatives to Mitigate the Landslide Hazard

Personal-Scale	Corporate-Scale	Government-Scale
• **Manipulate the hazard:** ○ **Stabilize slope (dewater, armor toe)** ○ **Reduce weight on top of slope** ○ **Minimize vegetation removal and the addition of impervious surfaces.** • **Reduce exposure to the hazard:** ○ **Locate structures outside of hazard area (off unstable land and away from slide-run out area)** • **Reduce vulnerability to the hazard:** ○ **Retrofit home** • **Increase the ability to respond to or be prepared for the hazard:** ○ **Institute warning system, and develop evacuation plan** ○ **Keep cash reserves for reconstruction** ○ **Educate yourself on risk reduction techniques for landslide hazards**	• **Manipulate the hazard:** ○ Stabilize slope (dewater, armor toe) ○ Reduce weight on top of slope • **Reduce exposure to the hazard:** ○ Locate structures outside of hazard area (off unstable land and away from slide-run out area) • **Reduce vulnerability to the hazard:** ○ Retrofit at-risk facilities • **Increase the ability to respond to or be prepared for the hazard:** ○ Institute warning system, and develop evacuation plan ○ Keep cash reserves for reconstruction ○ Develop a continuity of operations plan ○ Educate employees on the potential exposure to landslide hazards and emergency response protocol.	• **Manipulate the hazard:** ○ Stabilize slope (dewater, armor toe) ○ Reduce weight on top of slope • **Reduce exposure to the hazard:** ○ Acquire properties in high-risk landslide areas. ○ Adopt land use policies that prohibit the placement of habitable structures in high-risk landslide areas. • **Reduce vulnerability to the hazard:** ○ Adopt higher regulatory standards for new development within unstable slope areas. ○ Armor/retrofit critical infrastructure against the impact of landslides. • **Increase the ability to respond to or be prepared for the hazard:** ○ Produce better hazard maps ○ Provide technical information and guidance ○ Enact tools to help manage development in hazard areas: better land controls, tax incentives, information ○ Develop strategy to take advantage of post-disaster opportunities ○ Warehouse critical infrastructure components ○ Develop and adopt a continuity of operations plan ○ Educate the public on the landslide hazard and appropriate risk reduction alternatives.

Table 18-6. Alternatives to Mitigate the Severe Weather Hazard

Personal-Scale	Corporate-Scale	Government-Scale
• **Manipulate the hazard:** ○ **None** • **Reduce exposure to the hazard:** ○ **None** • **Reduce vulnerability to the hazard:** ○ **Insulate house** ○ **Provide redundant heat and power** ○ **Insulate structure** ○ **Plant appropriate trees near home and power lines ("Right tree, right place" National Arbor Day Foundation Program)** • **Increase the ability to respond to or be prepared for the hazard:** ○ **Trim or remove trees that could affect power lines** ○ **Promote 72-hour self-sufficiency** ○ **Obtain a NOAA weather radio.** ○ **Obtain an emergency generator.**	• **Manipulate the hazard:** ○ None • **Reduce exposure to the hazard:** ○ None • **Reduce vulnerability to the hazard:** ○ Relocate critical infrastructure (such as power lines) underground ○ Reinforce or relocate critical infrastructure such as power lines to meet performance expectations ○ Install tree wire • **Increase the ability to respond to or be prepared for the hazard:** ○ Trim or remove trees that could affect power lines ○ Create redundancy ○ Equip facilities with a NOAA weather radio ○ Equip vital facilities with emergency power sources.	• **Manipulate the hazard:** ○ None • **Reduce exposure to the hazard:** ○ None • **Reduce vulnerability to the hazard:** ○ Harden infrastructure such as locating utilities underground ○ Trim trees back from power lines ○ Designate snow routes and strengthen critical road sections and bridges • **Increase the ability to respond to or be prepared for the hazard:** ○ Support programs such as "Tree Watch" that proactively manage problem areas through use of selective removal of hazardous trees, tree replacement, etc. ○ Establish and enforce building codes that require all roofs to withstand snow loads ○ Increase communication alternatives ○ Modify land use and environmental regulations to support vegetation management activities that improve reliability in utility corridors. ○ Modify landscape and other ordinances to encourage appropriate planting near overhead power, cable, and phone lines ○ Provide NOAA weather radios to the public

Table 18-7. Alternatives to Mitigate the Wildfire Hazard

Personal-Scale	Corporate-Scale	Government-Scale
• **Manipulate the hazard:** ○ **Clear potential fuels on property such as dry overgrown underbrush and diseased trees** • **Reduce exposure to the hazard:** ○ **Create and maintain defensible space around structures** ○ **Locate outside of hazard area** ○ **Mow regularly** • **Reduce vulnerability to the hazard:** ○ **Create and maintain defensible space around structures and provide water on site** ○ **Use fire-retardant building materials** ○ **Create defensible spaces around home** • **Increase the ability to respond to or be prepared for the hazard:** ○ **Employ techniques from the National Fire Protection Association's Firewise Communities program to safeguard home** ○ **Identify alternative water supplies for fire fighting** ○ **Install/replace roofing material with non-combustible roofing materials.**	• **Manipulate the hazard:** ○ Clear potential fuels on property such as dry underbrush and diseased trees • **Reduce exposure to the hazard:** ○ Create and maintain defensible space around structures and infrastructure ○ Locate outside of hazard area • **Reduce vulnerability to the hazard:** ○ Create and maintain defensible space around structures and infrastructure and provide water on site ○ Use fire-retardant building materials ○ Use fire-resistant plantings in buffer areas of high wildfire threat. • **Increase the ability to respond to or be prepared for the hazard:** ○ Support Firewise community initiatives. ○ Create /establish stored water supplies to be used for firefighting.	• **Manipulate the hazard:** ○ Clear potential fuels on property such as dry underbrush and diseased trees ○ Implement best management practices on public lands. • **Reduce exposure to the hazard:** ○ Create and maintain defensible space around structures and infrastructure ○ Locate outside of hazard area ○ Enhance building code to include use of fire resistant materials in high hazard area. • **Reduce vulnerability to the hazard:** ○ Create and maintain defensible space around structures and infrastructure ○ Use fire-retardant building materials ○ Use fire-resistant plantings in buffer areas of high wildfire threat. ○ Consider higher regulatory standards (such as Class A roofing) ○ Establish biomass reclamation initiatives • **Increase the ability to respond to or be prepared for the hazard:** ○ More public outreach and education efforts, including an active Firewise program ○ Possible weapons of mass destruction funds available to enhance fire capability in high-risk areas ○ Identify fire response and alternative evacuation routes ○ Seek alternative water supplies ○ Become a Firewise community ○ Use academia to study impacts/solutions to wildfire risk ○ Establish/maintain mutual aid agreements between fire service agencies. ○ Create/implement fire plans ○ Consider the probable impacts of climate change on the risk associated with the wildfire hazard in future land use decisions

Table 18-8. Alternatives to Mitigate Health Hazards

Personal-Scale	Corporate-Scale	Government-Scale
• **Manipulate the hazard:** ○ **None** • **Reduce exposure to the hazard:** ○ **Eliminate or reduce environments on private property that favor mosquito infestation** • **Reduce vulnerability to the hazard:** ○ **Immunization** • **Increase the ability to respond to or be prepared for the hazard:** ○ **Get informed**	• **Manipulate the hazard:** ○ None • **Reduce exposure to the hazard:** ○ Eliminate or reduce environments on private property that favor mosquito infestation • **Reduce vulnerability to the hazard:** ○ Immunize employees • **Increase the ability to respond to or be prepared for the hazard:** ○ Inform employees on human health hazards	• **Manipulate the hazard:** ○ Mosquito abatement • **Reduce exposure to the hazard:** ○ Eliminate or reduce environments on public property that favor mosquito infestation • **Reduce vulnerability to the hazard:** ○ Immunize employees • **Increase the ability to respond to or be prepared for the hazard:** ○ Collaborate with the Placer County Health Department to ensure the health and welfare of the community ○ Public education on mosquito abatement and general human health issues

Table 18-9. Alternatives to Mitigate Human-Cause Hazards

Personal-Scale	Corporate-Scale	Government-Scale
• **Manipulate the hazard:** ○ **None** • **Reduce exposure to the hazard:** ○ **None** • **Reduce vulnerability to the hazard:** ○ **None** • **Increase the ability to respond to or be prepared for the hazard:** ○ **Increase awareness of vulnerability to threats** ○ **Neighborhood watch program** ○ **Keep informed** ○ **Develop an emergency response plan** ○ **Report suspicious activities**	• **Manipulate the hazard:** ○ None • **Reduce exposure to the hazard:** ○ Incorporate anti-terrorism and security mitigation measures in site and layout design of facilities ○ Consider site security in landscape design of facilities • **Reduce vulnerability to the hazard:** ○ Restrict access by implementing controlled access zones ○ Increase security measures ○ Install physical barriers around critical facilities ○ Employ parking restrictions as a means to reduce vulnerability • **Increase the ability to respond to or be prepared for the hazard:** ○ Become a partner (stakeholder) in mitigation and prevention ○ Educate employees ○ Develop an emergency response plan ○ Develop a Continuity of Operations Plan ○ Use liberal signage techniques to inform and increase capability of users of facilities	• **Manipulate the hazard:** ○ None • **Reduce exposure to the hazard:** ○ Construct new critical facilities with clear zones. ○ Retrofit existing critical facilities • **Reduce vulnerability to the hazard:** ○ Restrict access by implementing controlled access zones ○ Reduce single-point vulnerabilities such as: redundancy for critical lifelines and infrastructure ○ Install physical barriers around critical facilities ○ Provide regular education to personnel regarding cyber attacks • **Increase the ability to respond to or be prepared for the hazard:** ○ Educate public on threats and vulnerability ○ Enhance emergency response capability by contingency planning for specific events based on identified vulnerabilities ○ Consider performance-based zoning as a land use alternative to mitigate impacts of human-caused hazards ○ Employ Crime Prevention Through Environmental Design (CPTED techniques in design of public facilities ○ Consider providing incentives for mitigation ○ Develop a City THIRA ○ Establish secure communications between multiple entities to communicate sensitive information.

19. ACTION PLAN AND IMPLEMENTATION

19.1 HAZARD MITIGATION ACTION PLAN

The Steering Committee reviewed the catalogs of hazard mitigation alternatives and selected actions to be included in a hazard mitigation action plan. The selection of actions was based on the risk assessment of identified hazards of concern and the defined Roseville hazard mitigation goals and objectives. Table 19-1 lists the recommended hazard mitigation actions that make up the action plan. The timeframe indicated in the table is defined as follows:

- Short Term = to be completed in 1 to 5 years
- Long Term = to be completed in greater than 5 years
- Ongoing = currently being funded and implemented under existing programs.

Table 19-1. Action Plan

Hazards Addressed	Funding Options	Timeframe	Objectives Met	In Previous Plan? (# from previous plan)
Lead Agency: Central Services Department				
Action #F-20— Retrofit the City's Downtown library by sealing the exterior and installing a flood door to protect against flood damage should Dry Creek overspill the existing floodwall.				
Flood	Grant funding (PDM, HMGP, and FEMA) based on benefits exceeding costs	Long term	6, 10	Yes (F-21)
Lead Agency: City Council				
Action #HC-3—Seek to establish appropriate staffing levels of public safety personnel to address vulnerabilities identified through an incremental targeted study that provides immediate needs as well as anticipated needs in 1 year, 5 years, and 10 years.				
Human-Caused	General Fund	Short term	2, 4	Yes (HC-3)
Lead Agency: City Manager's Office				
Action #HH-3—Collaborate with the Placer County Mosquito Abatement District to review resource protection policies that conflict with human health protection in the City of Roseville and work to resolve these policy issues				
Human Health	Currently budgeted for under the General Fun	Short term	5, 6, 7, 9	Yes (HH-3)
Lead Agency: Public Affairs & Communications Department				
Action #HH-2—Support the public education efforts of the Placer County Health Department and the Placer Mosquito Abatement District				
Human Health	Currently budgeted for under the General Fund	Short term	5, 6, 7, 9	Yes (HH-2)
Action #MH-2—Continue to maintain the hazard mitigation page on City website that provides following types of information: • The Hazard Management Plan and its progress reports • Hazard-specific information • Mitigation information by hazard, with specific emphasis on private property • Emergency response and warning information • Links to county, state, and federal related agencies				
	General Fund; PDM grant funding	Short term	2, 3, 5, 6, 9	Yes (MH-2)
Lead Agency: Development Services Department				
Action #EQ-1—Perform building-specific, structural seismic vulnerability assessment of City-owned critical facilities constructed prior to 1980 (including infrastructure). Included in this assessment will be recommended mitigation alternatives that meet goals and objectives of this Plan.				
Earthquake	General Fund; Possible grant funding under PDM program	Long term	5, 10	Yes (EQ-1)
Action #EQ-2—Incorporate earthquake mitigation measures for private property into existing City-sponsored outreach programs such as printed media and the City's website.				
Earthquake	City General fund	Short term	1, 9, 10, 11	Yes (EQ-2)
Action #EQ-3—Reassess the overall vulnerability to the earthquake hazard using the best available science and technology as it becomes available. State-sponsored programs, Seismic Hazards Mapping Act, and future FEMA- sponsored initiatives are anticipated to create a wealth of knowledge regarding this hazard that did not exist during the preparation of this Plan.				
Earthquake	General Fund; Possible grant funding under PDM program	Short term	1, 5, 7, 9	Yes (EQ-3)
Action #F-1—The City shall designate all areas identified as the 100-year floodplain. The boundaries of the 100-year floodplain shall be as specified in the floodplain designations section of this component of the City's General Plan. Floodplain areas shall be preserved as specified in the open space and conservation element. Such preservation may include required dedication to the City. If needed, modify the City's ordinances to include floodplain use regulations consistent with the goals, policies, and implementation measures of the safety, land use, open space and conservation, and parks and recreation elements of the City's General Plan.				
Flood	Currently funded by General Fund allocation	Long term	1, 6, 7	Yes (F-1)

Hazards Addressed	Funding Options	Timeframe	Objectives Met	In Previous Plan? (# from previous plan)
Action #F-2—Refer any development proposal that has a direct or indirect impact on flood protection to Public Works for comment. In addition, forward such proposals to other agencies as applicable, including the U.S. Army Corps of Engineers, California Central Valley Flood Protection Board, FEMA, California Department of Fish and Wildlife, Placer County Resource Conservation District, and Placer County Flood Control District. Consider the comments of the agencies during the development review process.				
Flood	Currently funded by General Fund allocation	Short term	1, 5, 7	Yes (F-2)
Action #F-9—Ensure that future specific plans and specific plan amendments are consistent with the goals and policies of the General Plan. The specific plans shall include the designation and preservation of floodplain areas and adjacent habitat. Provisions shall be incorporated to ensure that public infrastructure, utilities, and emergency services remain functional during flood conditions. Such infrastructure and facilities include water, sewer and gas mains, telephone and electric lines, streets and bridges, hospitals, and fire and police stations. Financing mechanisms shall be explored to fund necessary flood protection improvements and maintenance. Development agreements may be used to secure implementation and funding provisions. (Specific plans have 100% cost recovery by developers).				
Flood	Specific plans have 100% cost recovery by developers	Long term	1, 6, 7, 8	Yes (F-9)
Action #F-11—Require a master drainage plan as part of the approval process for all specific plans and large development projects as determined by the Public Works director. The master drainage plan should consider cumulative regional drainage and flooding mitigation. The plan's intent is to ensure that the overall rate of runoff from a project does not exceed predevelopment levels. If necessary, this objective shall be achieved by incorporating run-off control measures to minimize peak flows and/or assistance in financing or otherwise implementing comprehensive drainage plans.				
Flood	General Fund; Developer-based funding under specific plan requirements	Long term	1, 6, 8	Yes (F-11)
Action #LS-2— Continue to implement policies adopted by the General Plan that promote open space land uses within identified steep slope areas of Roseville. The City of Roseville Northeast Roseville Specific Plan and Stoneridge Specific Plans include the identified steep slope areas within Roseville. Both Plan Areas have continuing development.				
Landslide	General Fund; Developer-based funding and specific plan requirements	Short term	1, 6, 8	Yes (LS-2)
Action #MH-1—Continue to maintain Office of Emergency Services certification of all City inspectors for post-disaster damage assessment.				
Multi-Hazard	General Fund	Short term	2, 7	Yes (MH-1)
Lead Agency: Environmental Utilities Department (EUD)				
Action #D-1—Perform a groundwater recharge feasibility study to determine the most cost-effective way to replenish groundwater resources within Roseville.				
Drought	Water utility funds; General fund; Developer-based funding under specific plan requirements	Long term	5, 6	Yes (D-1)
Action #D-2—Implement aquifer storage and recovery program that uses direct injection technique in areas identified as appropriate.				
Drought	Water Construction Fund	Long term	6, 8	Yes (D-2)
Action #D-3—Continue to implement the Environmental Utility Department's recycled water program and seek all opportunities to expand its coverage, currently focusing on urban growth areas. The City pumps recycled water through a system of purple pipes completely separate from potable (drinking water) pipes. The City pumps the recycled water to customers such as streetscapes, golf courses and parks, where it irrigates turf and shrubs. Using recycled water for uses such as landscape irrigation reduces demand on the potable water system, creating a more reliable water supply for the entire City. Recycled water is not subject to the effects of drought.				
Drought	Water utility rates, developer-based fees under specific plan requirements	Short term	6, 8	Yes (D-3)
Action #D-4—Promote active water conservation techniques and strategies to private property owners through Roseville-sponsored outreach projects such as printed media and the City's website.				
Drought	Currently funded by General Fund allocation	Short term	5, 9	Yes (D-4)
Action #HC-5—Address vulnerabilities identified in vulnerability assessment of water facilities performed by the Environmental Utilities Department in response to EPA initiative.				
Human-Caused	EUD CIP, and EPA grant funding	Long term	5, 7	Yes (HC-5)

Hazards Addressed	Funding Options	Timeframe	Objectives Met	In Previous Plan? (# from previous plan)
Action #SW-4—Enhance and implement strategies for debris management and removal during severe weather events.				
	General Fund	Short term	6, 8	Yes (SW-5)
Lead Agency: Information Technology Division				
Action #HC-9—Protect the City's data, technology infrastructure and staff against malicious cyber-attacks and Cyber terrorism, such as but not limited to: • Identity Theft • Virus/Malware/Ransomware/Spyware/Spam/Phishing • Network and system attacks • Web site hacking • Denial-of-service attacks				
Human-Caused	General Fund	Short term	2, 5, 7	Yes (HC-9)
Action #MH-7—Strive to maintain high availability of essential communication services				
Multi-Hazard	EUD CIP, General Fund	Ongoing	2, 3, 4, 7	Yes (MH-7)
Action #MH-8—Secure the City's physical locations that contain technology infrastructure				
Multi-Hazard	EUD CIP, General Fund	Ongoing	2, 3, 4, 7	Yes (MH-8)
Lead Agency: Parks, Recreation & Libraries Department: Open Space Division				
Action #F-12—Continue the Parks, Recreation & Libraries Department's regular creek maintenance program within the City's creeks and floodplain areas. This program clears and removes debris that could contribute to blockage and flooding and may include the removal of silt. This is only done in areas of high risk to flood damage or where property or facilities are threatened by flooding.				
Flood	Currently funded by General Fund allocation	Ongoing	8	Yes (F-12)
Action #F-21—Continue the Tree Mitigation Fund program administered by the Open Space Division in conjunction with non-profit organizations. The planting of oak trees in the open spaces adjacent to riparian zones increases infiltration and slows storm water surges.				
Flood	General Fund	Ongoing	1, 5, 7, 9	Yes (F-22)
Action #F-22—Manage beaver dam sites for flood control protection and habitat restoration after dam removal. One primary issue is impacts to floodwater capacity of creeks. Part of the desired comprehensive approach to beaver management includes establishment of quantitative and qualitative "carrying capacity," including acre-feet of flood capacity lost. Implement a standard monitoring and reporting process to track beaver dam locations, population, and impacts. Gain regulatory approval for beaver management techniques such as biological control and habitat manipulation using the most benign options first.				
Flood	Currently funded by General Fund allocation	Ongoing	1, 6, 8	Yes (F-23)
Action #WF-1—Continue "Goat Grazing" program for removal of grassland in areas of Roseville potentially vulnerable to wildfire. Implement goat grazing in City open space and preserve areas for fire and invasive plant species management and native plant restoration.				
Wildfire	General Fund; Community Facilities District funding; PDM grant funding	Ongoing	6, 9	Yes (WF-2)
Action #MH-4—Implement an "Adopt an Open Space" program in coordination with the open space management program. Develop "adoption contracts" with neighborhoods, organizations, businesses, etc., describing the level of stewardship and the terms of the "adoption." Publicize these activities through online resource directory and other media to encourage participation.				
Multi-Hazard	General Fund; Community Facilities District funding; PDM grant funding	Short term	1, 5, 7, 9	Yes (MH-4)
Action #MH-5—Develop and disseminate best practices information to private property owners whose land is adjacent to open space areas describing stewardship opportunities and owners' role in preserving beneficial uses of open space areas (including vernal pool grassland and creek or riparian uses). Offer classes to provide in-depth information, such as demonstration projects, techniques for ecologically friendly weed abatement and vegetation control, and creating a backyard habitat compatible with open space areas.				
Multi-Hazard	General Fund; PDM grant funding	Short term	1, 5, 7, 9	Yes (MH-5)
Action #MH-6—Work with the Roseville City School District, local high school districts, and non-profit organizations to promote ecology-oriented curricula and stewardship activities. Identify resource and administrative barriers that may be limiting schools' abilities to more actively participate in stewardship, and work collaboratively to identify solutions.				
Multi-Hazard	General Fund; PDM grant funding	Long term	1, 5, 7, 9	Yes (MH-6)

Hazards Addressed	Funding Options	Timeframe	Objectives Met	In Previous Plan? (# from previous plan)
Lead Agency: Police and Fire Department				
Action #DF-1—Create a dam failure element for the City's emergency response plan that includes a phased warning protocol in response to the findings of the Folsom Dam Containment Dike Risk Assessment.				
Dam Failure	General Fund; Department of Homeland Security (DHS) grant funding	Short term	2, 3, 4, 9	Yes (DF-1)
Action #F-19—Implement recommendation of Downtown Roseville Specific Plan to relocate the Public safety Building				
Flood	Grant funding (PDM, HMGP, and FEMA) based on benefits exceeding costs	Short term	6, 10	Yes (F-20)
Action #HC-1—Commit support to initiatives within the Sacramento-Roseville-Arden-Arcade Metropolitan Statistical Area; continue to seek funding from other federal sources to fund its initiatives				
Human-Caused	General Fund	Short term	2, 7	Yes (HC-1)
Action #HC-2—Enhance emergency response capability of City by contingency planning for specific events based on identified vulnerabilities.				
Human-Caused	General Fund; DHS grant funding	Short term	2, 3, 4, 9	Yes (HC-2)
Action #HC-4—Prepare a site-specific vulnerability assessment of City- owned critical facilities that use the best available science and technology with regards to human-caused hazards.				
Human-Caused	General Fund; DHS grant funding	Short term	2, 5, 7	Yes (HC-4)
Action #HH-1—Continue to collaborate with the Placer County Health Department to ensure the health and welfare of the community				
Human Health	Currently budgeted for under the General Fund	Short term	5, 6, 7, 9	Yes (HH-1)
Action #SW-3—Continue education/outreach programs to improve winter preparedness and minimize loss of life or injury.				
	General Fund	Short term	6, 9	Yes (SW-4)
Action #WF-2—Enhance existing City public outreach programs to include information on fire safety, defensible spaces, and areas of concern.				
Wildfire	General Fund; Grant funding under PDM program and HMGP	Short term	6, 9	Yes (WF-3)
Action #MH-3—Establish/maintain a post-disaster action plan to be part of the City Emergency operations plan that will include following elements: • Procedures for public information • Post-disaster damage assessment • Grant writing • Code enforcement • Redundant operations				
Multi-Hazard	General Fund; PDM Grant Funding	Short term	2, 3, 4, 7	Yes (MH-3)
Lead Agency: Public Works Department				
Action #F-3—Continue City participation in the National Flood Insurance Program and the Community Rating System (CRS). Seek CRS classification improvements within capabilities of City programs, including adoption and administration of FEMA-approved ordinances and flood insurance rate maps (FIRM).				
Flood	Currently funded by General Fund allocation	Short term	1, 5, 9	Yes (F-3)
Action #F-4—Maintain Roseville's compliance and good standing under the National Flood Insurance program.				
	General Fund	Short term	2, 3, 4, 5, 10	Yes (F-4)
Action #F-5—Continue the City's outreach program to flood-prone property owners and the citizens of Roseville, to help make them aware of the flood threat and how best to deal with them.				
Flood	Currently funded by General Fund allocation	Short term	5, 9	Yes (F-5)

Hazards Addressed	Funding Options	Timeframe	Objectives Met	In Previous Plan? (# from previous plan)
Action #F-6—Continue to pursue a regional approach to flood issues by remaining actively involved in the Placer County Flood Control District. This involvement includes cooperation in the development of a comprehensive regional database. Continue to participate in regional flooding studies, including the Auburn Creek/Coon Creek/Pleasant Grove Creek flood mitigation plan and the Dry Creek watershed flood control plan.				
Flood	Currently funded by General Fund allocation	Long term	1, 5, 7	Yes (F-6)
Action #F-7—Continue City coordination with other agencies on issues of flood control. Coordination between the City and adjacent jurisdictions occurs through several mechanisms, including distribution of development proposals for review and comment. Continue City cooperation with federal, state, and local agencies, including the U.S. Army Corps of Engineers, California Central Valley Flood Protection Board, FEMA, California Department of Fish and Wildlife, Placer County Resource Conservation District, and the Placer County Flood Control District.				
Flood	Currently funded by General Fund allocation	Short term	1, 5, 7	Yes (F-7)
Action #F-8—Continue to develop, implement, and expand the Flood Alert and Early Warning Program systems and integrate the systems with other local jurisdictions to form a regional warning program.				
Flood	General Fund; Possible grant funding (PDM, HMGP, and Flood Mitigation Assistance)	Long term	2, 3	Yes (F-8)
Action #F-10—Monitor and regularly update City flood studies, modeling, and associated land use, zoning, and other development regulations at a minimum of every 5 years or whenever information becomes available that would significantly modify previous data. New information could include new studies, change in City policy, consideration of a major development project or specific plan, or implementation of a flood control project.				
Flood	General Fund; FEMA map modernization; Developer-based funding and specific plan requirements	Long term	1, 5, 7	Yes (F-10)
Action #F-13—Continue annual inspection and maintenance program of City storm drain systems. Review after every major storm system function and performance. This program removes debris that could contribute to blockage of the storm drain system.				
Flood	Currently funded by General Fund allocation and; gas tax	Short term	8	Yes (F-13)
Action #F-14—Complete the final two phases of the Cirby/Linda/Dry Creek flood control project (Phase 1 and 2). Five of the seven phases of this project have been completed at a cost of about $18,000,000. The basis for determining viability of this project will be a benefit /cost analysis to determine if project meets federal grant eligibility requirements.				
Flood	General Fund; Impact fees; Grant funding (PDM and HMGP) based on benefits exceeding costs	Long term	6, 8, 10	Yes (F-14)
Action #F-15—Analyze alternative improvements to the Cirby/Linda/Dry Creek flood control project that may be cost effective in the flood-prone areas of Roseville: • Dry Creek from Darling Way to Riverside Avenue • Area on Dry Creek upstream of Folsom Road in the Columbia Avenue/Marilyn Avenue/Bonita Street area • Linda Creek near Champion Oaks Drive/Samoa Way/Hurst Way area • Cirby Creek in the Trimble Way/Zien Court area				
Flood	General Funds; Developer-based funds, grant funding (PDM, HMGP, and FEMA) based on benefits exceeding costs	Long term	6, 8, 10	Yes (F-15)
Action #F-16—Replace the Huntington Drive/Cirby Creek culvert with a bridge to protect Queens Court/Huntington Drive area. The Public Works Department oversees this project.				
Flood	General Fund; CIP, developer-based funds, grant funding (PDM, HMGP, and FEMA) based on benefits exceeding costs	Long term	6, 10	Yes (F-16)
Action #F-17—Divert the main drainage storm drain system down Crestmont Avenue to Cirby Way and then into Dry Creek so that the existing system will not exceed capacity. If system capacity is exceeded, the intersection on Cirby Way and Crestmont Avenue and nearby homes will flood during major flood events.				
Flood	General Fund; CIP, developer-based funds, grant funding (PDM, HMGP, and FEMA) based on benefits exceeding costs	Short term	6, 10	Yes (F-17)

Hazards Addressed	Funding Options	Timeframe	Objectives Met	In Previous Plan? (# from previous plan)
Action #F-18—Continue to promote and sponsor programs to buy out, relocate, and flood-proof existing flood-prone structures within Roseville.				
Flood	Grant funding (PDM, HMGP, and FEMA) based on benefits exceeding costs	Short term	6, 10	Yes (F-18)
Action #F-23 – Develop the City's multi-use, multi-benefit stormwater retention project within the Pleasant Grove Creek Watershed, the Reason Farms Stormwater Retention Project.				
Flood	Developer-based funds, grant funding (PDM, HMGP, and FEMA) based on benefits exceeding costs	Long term	6, 10	No
Action #HC-10 – Improve evacuation transportation routes within the City of Roseville by removing traffic constrictions.				
Human Caused	Developer-based funds, grant funding (PDM, HMGP, and FEMA) based on benefits exceeding costs	Long term	6, 10	No
Action #LS-1—Once California Geological Survey completes soils mapping for the Roseville vicinity under the Seismic Hazards Mapping Act, reassess landslide hazard using best available data to gauge the true vulnerability to this hazard.				
Landslide	General Fund; Developer-based funding and specific plan requirements; Possible grant funding under PDM program	Long term	1, 5, 7	Yes (LS-1)
Lead Agency: Roseville Electric				
Action #HC-6—Maintain compliance with California Energy Commission ("CEC") license conditions for the operations of the Roseville Energy Park ("REP") with respect to Hazardous Material Management				
Human-Caused	EUD CIP, General Fund	Short term	5, 7	Yes (HC-6)
Action #HC-7—Maintain compliance with state and local laws and regulations for the operation of the Roseville Power Plant #2.				
Human-Caused	EUD CIP, General Fund	Long term	2, 5, 7	Yes (HC-7)
Action #HC-8—Maintain compliance with North American Electric Reliability Corporation mandatory reliability standards related to plant operation, sabotage reporting and critical infrastructure protection (cyber security.				
Human-Caused	EUD CIP, General Fund	Short term	2, 5, 7	Yes (HC-8)
Action #SW-1—Continue the Shade Tree Program, an energy conservation rebate program provided by Roseville Electric				
Severe Weather	Roseville Electric operational budget	Short term	7, 9	Yes (SW-2)
Action #SW-2—Continue ongoing line clearing and weed abatement of electrical utility facilities in order to reduce public exposure to vegetation hazards and maintain higher reliability during severe weather conditions.				
Severe Weather	CIP	Short term	2	Yes (SW-3)
Action #SW-5—Continue to operate the Roseville Energy Park to support the City's electrical requirements and maintain service continuity during severe weather events.				
Severe Weather	EUD CIP, General Fund	Short term	5, 7	Yes (SW-6)
Action #SW-6— Continue to operate Roseville Power Plant #2 to support the City's electrical requirements and maintain service continuity during severe weather events.				
Severe Weather	General Fund	Short term	5, 7	Yes (SW-7)

19.1.1 Benefit-Cost Review

The action plan must be prioritized according to a benefit/cost analysis of the proposed projects and their associated costs (44 CFR, Section 201.6(c)(3)(iii)). The benefits of proposed projects were weighed against estimated costs as part of the project prioritization process. The benefit/cost analysis was not of the detailed variety required by FEMA for project grant eligibility under the Hazard Mitigation Grant Program (HMGP) and Pre-Disaster Mitigation (PDM) grant program. A less formal approach was used because some projects may not be implemented for up to 10 years, and associated costs and benefits could change dramatically in that time. Therefore, a review was performed of the apparent benefits versus the apparent cost of each project. Parameters were established for assigning subjective ratings (high, medium, and low) to the costs and benefits of these projects.

Cost ratings were defined as follows:

- **High**—Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).
- **Medium**—The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.
- **Low**—The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.

Benefit ratings were defined as follows:

- **High—**Project will provide an immediate reduction of risk exposure for life and property.
- **Medium—**Project will have a long-term impact on the reduction of risk exposure for life and property, or project will provide an immediate reduction in the risk exposure for property.
- **Low—**Long-term benefits of the project are difficult to quantify in the short term.

Using this approach, projects with positive benefit versus cost ratios (such as high over high, high over medium, medium over low, etc.) are considered cost-beneficial and are prioritized accordingly.

For many of the strategies identified in this action plan, the City may seek financial assistance under the HMGP or PDM programs, both of which require detailed benefit/cost analyses. These analyses will be performed on projects at the time of application using the FEMA benefit-cost model. For projects not seeking financial assistance from grant programs that require detailed analysis, the City reserves the right to define "benefits" according to parameters that meet the goals and objectives of this Plan.

19.1.2 Action Plan Prioritization

Table 19-2 lists the priority of each action, based on the qualitative benefit-cost review, the number of plan objectives achieved, and the availability of funding:

19.1.3 Analysis of Mitigation Actions

Each recommended action was classified based on the hazard it addresses and the type of mitigation it involves. Table 19-3 shows the classification based on this analysis.

19.2 ADOPTION

A hazard mitigation plan must include documentation of formal adoption by the governing body of the jurisdiction requesting federal approval of the plan (44 CFR Section 201.6.c.5). This Plan will be submitted to Cal OES and the ISO prior to adoption for a pre-adoption review. Once the Plan has been determined to comply with the criteria specified under the DMA, Cal OES will forward it to FEMA Region IX for review and approval.

ISO is responsible for determining compliance for the CRS program. Since this Plan will be a key element in the City meeting the prescribed requirements for a CRS rating of Class 1, ISO will be asked to review the Plan for CRS Activity 510 compliance. Once pre-adoption approval has been granted by Cal OES, FEMA Region IX and the ISO, the City will initiate its process to formally adopt the Plan.

Table 19-2. Prioritization of Mitigation Actions

Action #	# of Objectives Met	Benefits	Costs	Do Benefits Equal or Exceed Costs?	Is project Grant Eligible?	Can Project be Funded under Existing Programs/ Budgets?	Priority (High, Med., Low)[a]
DF-1	4	High	Low	Yes	Yes	Yes	High
D-1	2	Medium	Low	Yes	No	Yes	Medium
D-2	2	Medium	Medium	Yes	No	Yes	Medium
D-3	2	High	Low	Yes	No	Yes	High
D-4	2	High	Low	Yes	No	Yes	High
EQ-1	2	Medium	Medium	Yes	Yes	Yes	Medium
EQ-2	4	High	Low	Yes	No	Yes	High
EQ-3	4	Medium	Low	Yes	Yes	Yes	Medium
F-1	3	High	Low	Yes	No	Yes	High
F-2	3	High	Low	Yes	No	Yes	High
F-3	3	High	Low	Yes	No	Yes	High
F-4	5	High	Low	Yes	No	Yes	High
F-5	2	High	Low	Yes	No	Yes	High
F-6	3	High	Low	Yes	No	Yes	High
F-7	3	High	Low	Yes	No	Yes	High
F-8	2	High	Medium	Yes	Yes	Yes	Medium
F-9	3	High	Low	Yes	No	Yes	High
F-10	3	High	Medium	Yes	Yes	Yes	Medium
F-11	3	Medium	Medium	Yes	No	Yes	Medium
F-12	1	High	Medium	Yes	Yes	Yes	Medium
F-13	3	Medium	Low	Yes	No	Yes	Medium
F-14	3	High	High	Yes	Yes	No	Low
F-15	3	Medium	Medium	Yes	Yes	Yes	Medium
F-16	2	High	High	Yes	Yes	No	Low
F-17	2	High	Medium	Yes	Yes	No	Medium
F-18	2	High	Medium	Yes	Yes	No	Medium
F-19	2	Medium	High	No	Yes	No	Low
F-20	2	High	High	Yes	Yes	No	Low
F-21	4	High	Low	Yes	No	Yes	High
F-22	3	High	Low	Yes	No	Yes	High
F-23	2	High	High	Yes	Yes	No	Medium
LS-1	3	Low	Low	Yes	Yes	Yes	Low
LS-2	3	High	Low	Yes	No	Yes	High
SW-1	2	High	Low	Yes	No	Yes	High
SW-2	1	High	Low	Yes	No	Yes	High
SW-3	2	Medium	Low	Yes	No	Yes	Medium
SW-4	2	Medium	Medium	Yes	No	Yes	Medium
SW-5	2	High	Low	Yes	No	Yes	High
SW-6	2	High	Low	Yes	No	Yes	High
WF-1	2	High	Low	Yes	No	Yes	High
WF-2	2	Medium	Low	Yes	No	Yes	Medium
MH-1	2	Medium	Low	Yes	No	Yes	Medium

Action #	# of Objectives Met	Benefits	Costs	Do Benefits Equal or Exceed Costs?	Is project Grant Eligible?	Can Project be Funded under Existing Programs/ Budgets?	Priority (High, Med., Low)[a]
MH-2	5	High	Low	Yes	No	Yes	High
MH-3	4	Medium	Low	Yes	Yes	Yes	Medium
MH-4	4	Medium	Low	Yes	Yes	Yes	Medium
MH-5	4	Medium	Low	Yes	Yes	Yes	Medium
MH-6	4	Medium	Low	Yes	Yes	Yes	Medium
MH-7	4	High	Low	Yes	No	Yes	High
MH-8	4	High	Low	Yes	No	Yes	High
HC-1	2	Medium	Low	Yes	No	Yes	Medium
HC-2	4	Medium	Low	Yes	No	Yes	Medium
HC-3	2	High	Low	Yes	No	Yes	High
HC-4	3	Medium	Medium	Yes	Yes	Yes	Medium
HC-5	2	High	High	Yes	Yes	Yes	Low
HC-6	2	High	Low	Yes	Yes	Yes	High
HC-7	3	High	Low	Yes	No	Yes	High
HC-8	3	High	Low	Yes	No	Yes	High
HC-9	3	High	Low	Yes	No	Yes	High
HC-10	2	High	High	Yes	Yes	No	Medium
HH-1	4	Medium	Low	Yes	No	Yes	Medium
HH-2	2	High	Low	Yes	No	Yes	High
HH-3	4	High	Low	Yes	No	Yes	High

a. Priorities defined as follows:

- High Priority—A project that meets multiple objectives, has benefits that exceed cost, has funding secured or is an ongoing project and meets eligibility requirements for the HMGP or PDM grant program. High priority projects can be completed in the short term (1 to 5 years).
- Medium Priority—A project that meets goals and objectives, that has benefits that exceed costs, and for which funding has not been secured but that is grant eligible under HMGP, PDM or other grant programs. Project can be completed in the short term, once funding is secured. Medium priority projects will become high priority projects once funding is secured.
- Low Priority—A project that will mitigate the risk of a hazard, that has benefits that do not exceed the costs or are difficult to quantify, for which funding has not been secured, that is not eligible for HMGP or PDM grant funding, and for which the time line for completion is long term (1 to 10 years). Low priority projects may be eligible for other sources of grant funding from other programs.

Table 19-3. Analysis of Mitigation Actions

Hazard	Actions That Address the Hazard, by Mitigation Type[a]					
	Prevention[a]	Property Protection[b]	Public Education and Awareness[c]	Natural Resource Protection [d]	Emergency Services[e]	Structural Projects[f]
Dam Failure					DF-1	
Drought	D-1, D-2, D-3, D-4					
Earthquake	EQ-3	EQ-1	EQ-2			
Flooding	F-1, F-2, F-3, F-4, F-6, F-7, F-9, F-10, F-11, F-21, F-22	F-13, F-18, F-19, F-20	F-5	F-1, F-21, F-22, F-23	F-8, F-12	F-14, F-15, F-16, F-17, F-23
Landslide	LS-1, LS-2					
Severe Weather	SW-1, SW-6	SW-2, SW-4	SW-3		SW-5	
Wildfire	WF-1		WF-2			
Multiple Hazards	MH-2, MH-3, MH-4	MH-8	MH-5, MH-6	MH-4	MH-1, MH-7	
Health Hazards	HH-1, HH-2		HH-2			
Human-Caused Hazards	HC-3, HC-5, HC-6, HC-7, HC-8, HC-9	HC-4			HC-1, HC-2, HC-3, HC-8, HC-10	

a. **Prevention**—Government, administrative or regulatory actions that influence the way land and buildings are developed to reduce hazard losses. Includes planning and zoning, floodplain laws, capital improvement programs, open space preservation, and stormwater management regulations.
b. **Property Protection**—Modification of buildings or structures to protect them from a hazard or removal of structures from a hazard area. Includes acquisition, elevation, relocation, structural retrofit, storm shutters, and shatter-resistant glass.
c. **Public Education and Awareness**—Actions to inform citizens and elected officials about hazards and ways to mitigate them. Includes outreach projects, real estate disclosure, hazard information centers, and school-age and adult education.
d. **Natural Resource Protection**—Actions that minimize hazard loss and preserve or restore the functions of natural systems. Includes sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.
e. **Emergency Services**—Actions that protect people and property during and immediately after a hazard event. Includes warning systems, emergency response services, and the protection of essential facilities.
f. **Structural Projects**—Actions that involve the construction of structures to reduce the impact of a hazard. Includes dams, setback levees, floodwalls, retaining walls, and safe rooms.

Simultaneous with this process, the draft action plan will be sent to the following agencies with a request for review and comment:

- Placer County Office of Emergency Services
- City of Rocklin
- Sacramento County Department of Water Resources
- California Department of Water Resources
- City of Citrus Heights
- Placer County Flood Control District.

Final FEMA approval was granted on _____, 2016. The Roseville City Council adopted the Plan through Resolution ##-## on _____, 2016. A copy of the resolution is provided in Figure 19-1. The City of Roseville is considered eligible for the benefits afforded under the Disaster Mitigation Act as of this date.



Figure 19-1. Resolution Adopting the Roseville Hazard Mitigation Plan

19.3 PLAN MAINTENANCE STRATEGY

A hazard mitigation plan must present a plan maintenance process that includes the following (44 CFR Section 201.6(c)(4)):

- A method and schedule for monitoring, evaluating, and updating the mitigation plan
- A process for incorporating the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate
- A strategy for continuing public participation through the plan maintenance process.

This section details the formal process that will ensure that the hazard mitigation plan remains an active and relevant document and that the City of Roseville maintains its eligibility for applicable funding sources. The plan maintenance process includes a schedule for monitoring and evaluating the Plan annually and producing an updated plan every five years. This section also describes how public participation will be integrated throughout the plan maintenance and implementation process. It explains how the mitigation strategies outlined in this Plan will be incorporated into existing planning mechanisms and programs, such as comprehensive land-use planning processes, capital improvement planning, and building code enforcement and implementation. The Plan's format allows sections to be reviewed and updated when new data become available, resulting in a plan that will remain current and relevant.

Pursuant to 44CFR 201.6(c)(4)(i), the following matrix provides a synopsis of responsibilities for plan monitoring, evaluation, and update which are discussed in further detail in sections 19.3.1 to 19.3.4 of this Plan:

Task	Approach	Timeline	Lead Responsibility	Support Responsibility
Monitoring	Preparation of status updates and action implementation tracking as part of submission to the Steering Committee for annual progress report. Deputy City Manager or Designee is responsible for initiating status updates with identified secondary responsibility departments.	Annual (July-September)	Deputy City Manager or Designee	• Central Service Dept. • City Council • City Manager's Office • Public Affairs/Communication Dept. • Development Services Dept. • Environmental Utilities Dept. • Information Technology Div. • Parks/Rec/Libraries: Open Space Div. • Police and Fire Dept. • Public Works Dept. • Roseville Electric
Evaluation	Review the status of previous actions as submitted by the monitoring task lead and support entities noted above to assess the effectiveness of the plan; complete and finalize the Annual Progress Report.	Annual (September) – prior to CRS recertification process on October 1	Planning Team • City Manager's Office • Public Works • Fire Dept. • Development Svcs • Technical Consultant	Steering Committee • City Manager's Office • Public Works • Fire Dept. • Development Svcs • Communications • Public Volunteers • Local businesses/organizations

Task	Approach	Timeline	Lead Responsibility	Support Responsibility
Update	The Planning Team will call the Steering Committee to reconvene, at a minimum, every 5 years to guide a comprehensive update to review and revise the Plan.	Every 5 years or upon comprehensive update to General Plan or major disaster	Planning Team • City Manager's Office • Public Works • Fire Dept. • Development Svcs • Technical Consultant	Steering Committee • City Manager's Office • Public Works • Fire Dept. • Development Svcs • Communications • Public Volunteers • Local businesses/organizations

19.3.1 Plan Implementation

The hazard mitigation plan includes a range of action items to reduce losses from hazard events. Together, the action items provide a framework for activities that the City can choose to implement over the next five years. The effectiveness of the Plan depends on the incorporation of the action items into existing City plans, policies, and programs.

The Roseville City Manager's Office and the Development Services Department will be jointly responsible for monitoring the Plan's implementation and maintenance through existing City programs. The Deputy City Manager or designated appointee will assume lead responsibility for facilitating plan implementation and maintenance meetings. Although the City Manager's Office will have primary department responsibility for review, coordination, and promotion, plan implementation and evaluation will be a shared responsibility among all departments and agencies identified as lead agencies in the mitigation action plan (see Chapter).

19.3.2 Steering Committee

The Steering Committee is a volunteer body that contributed greatly to the development of the initial and updated plans. The initial committee oversaw the development of the initial plan and made recommendations on key elements of the Plan, including a maintenance strategy. An oversight committee with representation similar to the initial Steering Committee then took an active role in the maintenance strategy. By maintaining progress reports, and keeping the Plan dynamic, Roseville was able to successfully complete many of the actions identified in the initial action plan. A reactivated Steering Committee then oversaw development of the 2011 and 2016 Plan updates.

A Steering Committee of not more than 14 members, as determined by the Roseville City Manager's Office, should remain involved in key elements of the proposed maintenance strategy. The Steering Committee will convene annually to perform annual reviews of the updated plan and its implementation. The make-up of this Steering Committee will strive for no less than 50 percent representation from citizens, citizen groups, and stakeholders within the planning area. Previous and existing members will be given the option to remain involved in the process.

A technical subcommittee with a make-up similar to the subcommittee used for initial plan development could be used in the plan maintenance strategy, at the discretion of the planning team and the Steering Committee.

19.3.3 Annual Progress Report

The minimum task of the annual Steering Committee meetings will be the evaluation of the progress of the 2016 Plan. This review will include the following:

- Summary of any hazard events that occurred during the prior year and their impact on the planning area
- Review of successful mitigation actions identified in the 2016 Plan
- Brief discussion about why targeted strategies were not completed
- Re-evaluation of the action plan to determine if the timeline for identified projects needs to be amended (such as changing a long-term project to a short-term project because of funding availability)
- Recommendations for new projects
- Changes in or potential for new funding options (grant opportunities)
- Impacts of any other planning programs or actions in the City that involve hazard mitigation

The planning team created a template to guide the Steering Committee in preparing a progress report during the previous planning process. The Steering Committee will provide feedback to the planning team on items included in the template. The planning team will continue to use this progress report template to prepare a formal annual report on the progress of the 2016 Plan. This report will be used as follows:

- Posted on the City website on the page dedicated to the hazard mitigation plan
- Announced on multiple social media platforms
- Provided to the local media through a press release
- Presented to the Roseville City Council
- Provided as part of the CRS annual re-certification package.

The CRS program requires an annual recertification to be submitted by October 1 of every calendar year for which the community has not received a formal audit. To meet this recertification timeline, the planning team will strive to complete the progress report process between June and September every year.

19.3.4 Plan Update

Section 201.6.d.3 of 44 CFR requires that local hazard mitigation plans be reviewed, revised if appropriate, and resubmitted for approval in order to remain eligible for benefits awarded under the DMA. The City of Roseville intends to update its hazard mitigation plan on a 5-year cycle. This cycle may be accelerated to less than 5 years based on the following triggers:

- A Presidential Disaster Declaration that impacts the City of Roseville
- A hazard event that causes loss of life
- A comprehensive update of the City of Roseville General Plan

It will not be the intent of this update process to start from scratch and develop a complete new hazard mitigation plan. Based on needs identified by the planning team, this update will, at a minimum, include the following elements:

- The update process will be convened through a Steering Committee.
- The hazard risk assessment will be reviewed and updated using best available information and technologies.
- The action plan will be reviewed and revised to account for any actions completed, dropped, or changed and to account for changes in the risk assessment or new City policies identified under other planning mechanisms, as appropriate (such as the General Plan).
- The draft update will be sent to appropriate agencies and organizations for comment.

- The public will be given an opportunity to comment on the update prior to adoption.
- The Roseville City Council will adopt the updated Plan.

19.3.5 Continuing Public Involvement

The public will continue to be apprised of hazard mitigation actions through the City website and by providing copies of the annual progress reports to the media. Copies of the 2016 Plan will be distributed to the Roseville City Library System. Upon initiation of the update process, a new public involvement strategy will be initiated based on guidance from the Steering Committee. This strategy will be based on the needs and capabilities of the City at the time of the update. At a minimum, this strategy will include the use of local media outlets within the planning area.

19.3.6 Incorporation into Other Planning Mechanisms

The City began planning for the impacts of hazards through the Safety Element of its 1992 General Plan. The hazard mitigation plan update process provided the City with an opportunity to review and expand on policies contained in the General Plan. The City views the General Plan and the hazard mitigation plan as complementary documents that work together to reduce risk exposure to the citizens of Roseville. A comprehensive update to the General Plan will trigger an update to the hazard mitigation plan. Many of the ongoing recommendations identified in the 2016 Plan are programs recommended by the General Plan. Processes and programs that the City will coordinate with the hazard mitigation plan recommendations include the following:

- City emergency response plan
- Capital improvement programs
- Roseville municipal code
- Community design guidelines
- Stormwater management program

Some action items do not need to be implemented through regulation. Instead, these items can be implemented through the creation of new educational programs, continued interagency coordination, or improved public participation.

Plan Integration During the 2011 RMHMP Performance Period

The 2011 RMHMP identified 24 actions related to plan integration. Due to the nature of plan integration, these actions were identified as ongoing initiatives and were carried over into the 2016 Plan update. Plan integration actions remain ongoing, as they serve as a benchmark for annual progress reporting and encourage the use of the Plan as a living document. During the performance period of the 2011 plan, 23 of the identified actions resulted in measurable plan integration of 2011 RMHMP goals, risk assessment, or recommendations into the following plans and programs:

- Specific Plans and Specific Plan Amendments
- Master Drainage Plan requirements for Specific Plans
- Groundwater Environmental Impact Report
- Water Recycling Master Plan
- Debris Management Plan (Completed in conjunction with the 2016 planning process)

Specific information regarding how each of these plans and programs integrated 2011 RMHMP information is available in the 2015 Progress Report located in Appendix B.

Plan Integration for the 2016 Mitigation Action Plan

Implementation of the 2016 mitigation action plan has and will continue to enhance and expand the integration efforts of the 2011 Plan. Inter-agency coordination occurred through involvement by local, regional, state and federal stakeholders involved in and consulted with during the planning process. This coordination is expected to continue through Steering Committee activities, annual progress reporting, implementation coordination, and the continued public engagement.

As the plan is implemented, all City agencies will use information from this updated plan as the best available science and data on natural hazards impacting the City of Roseville. 24 actions related to plan integration have been recommended for continued implementation in this Plan.

REFERENCES

Cal-Adapt. 2016. http://cal-adapt.org/ Exploring California's Climate Change Research.

California Department of Water Resources (CA DWR). 2013. http://www.water.ca.gov/waterplan/ The California Water Plan

CA DWR. 2016. http://www.water.ca.gov/climatechange/ Climate Change

CA DWR. 2016a. http://www.water.ca.gov/damsafety/FAQAnswer/index.cfm Frequently Asked Questions

California Department of Finance. 2016. http://www.dof.ca.gov/Forecasting/Demographics/Estimates/e-1/ Population Estimates for Cities, Counties, and the State – January 1, 2015 and 2016

California Emergency Management Agency, et al. 2012. http://resources.ca.gov/docs/climate/APG_Understanding_Regional_Characteristics.pdf California Adaptation Planning Guide: Understanding Regional Characteristics.

CAL FIRE. 2012. http://frap.cdf.ca.gov/. California Department of Forestry and Fire Prevention. 2012. Fire and Resource Assessment Program. Website mapping and data, 2012.

Danielson, Tess. 2015. http://www.businessinsider.com/ransomware-is-everywhere-but-this-software-can-save-you-2015-10 How to avoid the curse of Ransomware.

Federal Emergency Management Agency (FEMA). 1982. http://www.archives.gov/federal-register/codification/executive-order/11988.html Executive Order 11988-Floodplain management

FEMA. 2001. Understanding Your Risks; Identifying Hazards and Determining your Risks. FEMA (386-2). August 2001

FEMA. 2002. Getting Started; Building support for Mitigation Planning; FEMA (386-1). September 2002

FEMA. 2003. Developing the Mitigation Plan; Identifying Mitigation Actions and Implementing Strategies. FEMA (386-3). April 2003

FEMA. 2003. Integrating Manmade Hazards into Mitigation Planning. FEMA (386-7). September 2003

FEMA. 2004. http://www.damsafety.org/media/Documents/PDF/fema-333.pdf Federal Guidelines for Dam Safety

FEMA. 2007. FEMA, National Flood Insurance Program, Community Rating System; CRS Coordinator's Manual FIA-15/2007 OMB No. 1660-0022

FEMA. 2013. http://www.fema.gov/news-release/2013/10/18/be-cyber-smart-stay-cyber-secure Be Cyber Smart, Stay Cyber Secure

FEMA. 2015. https://www.fema.gov/national-dam-safety-program National Dam Safety Program

FEMA. 2016. https://www.fema.gov/disasters Disaster Declarations

FEMA. 2016a. http://www.fema.gov/what-mitigation What is Mitigation?

Harrison, Virginia. 2015. http://money.cnn.com/2015/04/14/technology/security/cyber-attack-hacks-security/. CNN Money

Intergovernmental Panel on Climate Change. 2014. http://www.ipcc.ch/report/ar5/wg2/ Climate Change 2014: Impacts, Adaptation, and Vulnerability

International Strategy for Disaster Reduction. 11/11/2008. "Disaster Risk Reduction Strategies and Risk Management Practices: Critical Elements for Adaptation to Climate Change"

Iverson, R.M., 2004, Granular avalanches across irregular three-dimensional terrain: 1. theory and computation, Journal of Geophysical Research, v. 109, F01014, doi: 10.1029/2003JF000085. 14 p.

Kostadinov, Dimitar. 2012. http://resources.infosecinstitute.com/cyberterrorism-distinct-from-cybercrime/ Cyberterrorism Defined

Michigan Tech University. n.d. http://www.geo.mtu.edu/UPSeis/intensity.html How Are Earthquake Magnitudes Measured?

National Archives. 2016. http://www.archives.gov/federal-register/codification/executive-order/11990.html Executive Order 11990 -Protection of wetlands

NASA. 2016. http://climate.nasa.gov/vital-signs/carbon-dioxide/ Global Climate Change – Vital Signs of the Planet. Carbon Dioxide.

NASA. 2015. http://www.nasa.gov/audience/forstudents/5-8/features/nasa-knows/what-is-climate-change-58.html What are Climate and Climate Change?

NASA. 2004. http://www.nasa.gov/home/hqnews/2004/jul/HQ_04252_glaciers.html Retreating Glaciers Spur Alaskan Earthquakes

NOAA. 2016. https://www.ncdc.noaa.gov/stormevents/. NOAA, National Climatic Data Center website, Storm Events Database

Northern California Earthquake Data Center. 2014. UC Berkeley Seismological Laboratory. Dataset. doi:10.7932/NCEDC.

Office of Federal Lands Highway. United States Department of Transportation, Federal Highway Administration. 2016. https://flh.fhwa.dot.gov/programs/erfo/ Emergency Relief for Federally Owned Roads (ERFO)

Office of the Press Secretary. 2015. https://www.whitehouse.gov/the-press-office/2015/01/30/executive-order-establishing-federal-flood-risk-management-standard-and- Executive Order – Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input

Placer County. 2016. Placer County Local Hazard Mitigation Plan Update.

Placer County Office of Economic Development. 2014. Placer County Economic and Demographic Profile.

Rickenmann, Dieter and Weber, Daniel. 2000. ftp://ftp.wsl.ch/pub/rickenmann/Rickenmann-pdf/2000/Rickenmann-Weber-2000_DFHM.pdf Debris Flow Hazards Mitigation: Mechanics, Prediction, and Assessment.

Roseville. 2015. City of Roseville General Plan 2035.

Roseville. 2015a. Urban Water Management Plan.

Roseville. 2010. http://www.roseville.ca.us/visiting/history_of_roseville/default.asp History of Roseville on City of Roseville Website, accessed 2016

Roseville. n.d. https://www.roseville.ca.us/civicax/filebank/blobdload.aspx?blobid=18782 Sustainability Efforts

Roseville. 2010a. https://roseville.ca.us/civicax/filebank/blobdload.aspx?blobid=18854 Special Presentation – City of Roseville Communitywide Sustainability Action Plan.

Savage, S. B., and K. Hutter. 1991. Dynamics of avalanches of granular materials from initiation to run-out. Part 1: Analysis, Acta Mech., 86, 201–223, doi:10.1007/BF01175958.

Seattle Office of Emergency Management. 2014. http://www.seattle.gov/Documents/Departments/Emergency/PlansOEM/SHIVA/SHIVAv6.3Final.pdf Seattle Hazard Identification and Vulnerability Assessment.

Spatial Hazard Events and Losses Database for the United States maintained by the University of South Carolina's (USC) Hazard Research Lab

United States Army Corps of Engineers. 2011. http://planning.usace.army.mil/toolbox/library/ERs/ER1100_2_1156_28Oct11.pdf Safety of Dams - Policies and Procedures

United States Census. 2010. Data from 2010 U.S. Census. U.S. Census Bureau.

United States Census. 2016. http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml American FactFinder

United States Department of Transportation. n.d. https://www.environment.fhwa.dot.gov/projdev/tdmmitig2.asp Mitigation of Environmental Impacts

United States Environmental Protection Agency. 2013. https://www3.epa.gov/climatechange/glossary.html Glossary

United States Global Change Research Program. 2009. https://nca2009.globalchange.gov/ Global Change Impacts in the United States: 2009 Report

United States Geological Survey (USGS). 1989. http://pubs.usgs.gov/gip/earthq4/severity_text.html The Severity of an Earthquake. U.S. Government Printing Office: 1989-288-913.

USGS. 2008. An Atlas of ShakeMaps for Selected Global Earthquakes. U.S. Geological Survey Open-File Report 2008-1236. Prepared by Allen, T.I., Wald, D.J., Hotovec, A.J., Lin, K., Earle, P.S. and Marano, K.D.

USGS. 2010. PAGER—Rapid Assessment of an Earthquake's Impact. U.S. Geological Survey Fact Sheet 2010-3036. September 2010.

USGS. n.d. http://landslides.usgs.gov/learn/ls101.php Landslides 101

Washington Department of Ecology. 2014. http://www.ecy.wa.gov/programs/sea/landslides/about/about.html Puget Sound Landslides The website of the Washington Department of Ecology.

Weather Channel. 2016. https://weather.com/weather/monthly/l/USCA0957:1:US Roseville

Wilson, C. 2008. Botnets, Cybercrime, and Cyberterrorism. Federation of American Scientists.

GLOSSARY

ACRONYMS

Cal EMA—California Emergency Management Agency
CAL FIRE—California Department of Forestry and Fire Protection
Cal OES— California Office of Emergency Services
CBC—California Building Code
CCR—California Code of Regulations
CDBG-DR—Community Development Block Grant Disaster Recovery grants
CEQA—California Environmental Quality Act
CIP—Capital Improvements Plan
CFR—Code of Federal Regulations
CPTED—Crime Prevention Through Environmental Design
CRS—Community Rating System
DFIRM—Digital Flood Insurance Rate Map
DHS—Department of Homeland Security
DMA —Disaster Mitigation Act
DWR—Department of Water Resources
EOP—Emergency Operations Plan
EPA—U.S. Environmental Protection Agency
ESA—Endangered Species Act
EUD—Environmental Utilities Department
FEMA—Federal Emergency Management Agency
FIRM—Flood Insurance Rate Map
FRAP—Fire and Resource Assessment Program
GIS—Geographic Information System
HAZUS-MH—Hazards, United States-Multi Hazard
HMGP—Hazard Mitigation Grant Program
IBC—International Building Code
MCI—Multi-Casualty Incident
MM—Modified Mercalli Scale
MND— Mitigated Negative Declaration
NEHRP—National Earthquake Hazards Reduction Program

NFIP—National Flood Insurance Program
NIMS—National Incident Management System
NOAA—National Oceanic and Atmospheric Administration
OES—Office of Emergency Services
OSPOMP—Open Space Preserve Overarching Management Plan
PCFCD—Placer County Flood Control District
PCWA—Placer County Water Agency
PDM—Pre-Disaster Mitigation Grant Program
PGA—Peak Ground Acceleration
RMC—Roseville Municipal Code
SARS—Severe acute respiratory syndrome
SEMS—Standardized Emergency Management System
SFHA—Special Flood Hazard Area
SJWD—San Juan Water District
SPI—Standardized Precipitation Index
STEMI—ST-elevation myocardial infarction
UBC—Uniform Building Code
ULOP—Urban Level of Flood Protection
USBR—U.S. Bureau of Reclamation
USGS—United States Geological Survey
VHF— Viral Hemorrhagic Fevers
WMD—Weapon of Mass Destruction
WNV—West Nile Virus

DEFINITIONS

100-Year Flood: The term "100-year flood" can be misleading. The 100-year flood does not necessarily occur once every 100 years. Rather, it is the flood that has a 1 percent chance of being equaled or exceeded in any given year.. Thus, the 100-year flood could occur more than once in a relatively short period of time. The Federal Emergency Management Agency (FEMA) defines it as the 1 percent annual chance flood, which is now the standard definition used by most federal and state agencies and by the National Flood Insurance Program (NFIP).

Acre-Foot: An acre-foot is the amount of water it takes to cover 1 acre to a depth of 1 foot. This measure is used to describe the quantity of storage in a water reservoir. An acre-foot is a unit of volume. One acre foot equals 7,758 barrels; 325,829 gallons; or 43,560 cubic feet. An average household of four will use approximately 1 acre-foot of water per year.

Act of Terrorism: According to the Federal Bureau of Investigation (FBI), an act of terrorism is "a violent act or an act dangerous to human life, in violation of the criminal laws of the United States or of any state, to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social goals." Acts of terrorism are intentional, criminal, and malicious and can be foreign or domestic, depending on the origin, base, and objectives of the terrorist or organization. Acts of terrorism can involve the use of weapons of

mass destruction, arson, and incendiary, explosive, and armed attacks; industrial sabotage and intentional hazardous materials releases; agro-terrorism; and cyber-terrorism.

Asset: An asset is any man-made or natural feature that has value, including, but not limited to, people; buildings; infrastructure, such as bridges, roads, sewers, and water systems; lifelines, such as electricity and communication resources; and environmental, cultural, or recreational features such as parks, wetlands, and landmarks.

Base Flood: The flood having a 1% chance of being equaled or exceeded in any given year, also known as the "100-year" or "1% chance" flood. The base flood is a statistical concept used to ensure that all properties subject to the National Flood Insurance Program (NFIP) are protected to the same degree against flooding.

Basin: A basin is the area within which all surface water – whether from rainfall, snowmelt, springs, or other sources – flows to a single water body or watercourse. The boundary of a river basin is defined by natural topography, such as hills, mountains, and ridges. Basins are also referred to as "watersheds" and "drainage basins."

Benefit: A benefit is a net project outcome and is usually defined in monetary terms. Benefits may include direct and indirect effects. For the purposes of benefit-cost analysis of proposed mitigation measures, benefits are limited to specific, measurable, risk reduction factors, including reduction in expected property losses (buildings, contents, and functions) and protection of human life.

Benefit/Cost Analysis: A benefit/cost analysis is a systematic, quantitative method of comparing projected benefits to projected costs of a project or policy. It is used as a measure of cost effectiveness.

Benioff Earthquake: Sometimes called "deep quakes," these occur in the Pacific Northwest when the Juan de Fuca plate breaks up underneath the continental plate, approximately 30 miles beneath the earth's surface.

Building: A building is defined as a structure that is walled and roofed, principally aboveground, and permanently fixed to a site. The term includes manufactured homes on permanent foundations on which the wheels and axles carry no weight.

Capability Assessment: A capability assessment provides a description and analysis of a community's current capacity to address threats associated with hazards. The assessment includes two components: an inventory of an agency's mission, programs, and policies, and an analysis of its capacity to carry them out. A capability assessment is an integral part of the planning process in which a community's actions to reduce losses are identified, reviewed, and analyzed, and the framework for implementation is identified. The following capabilities were reviewed under this assessment:

- Legal and regulatory capability
- Administrative and technical capability
- Fiscal capability

Certified Unified Program Agency: An agency (such as the City of Roseville) certified to act as a licensing agency for six hazardous materials-related programs. The Certified Unified Program Agency enables the City of Roseville to implement its own hazardous materials emergency response program. Mutual aid agreements are also in place for incident response. Each business that deals with hazardous materials generally must submit a Unified Program Consolidated Form with facility information to the Roseville Fire Department.

Civil Disorder: Civil disorder results from incidents intended to disrupt a community to the degree that law enforcement intervention is required to maintain public safety. Civil disorder is generally associated with controversial political, judicial, or economic issues and events and may occur at any time, although statistics indicate that civil disorder is more frequent during the summer months. Although the City of Roseville does not

have a history of civil disorder or rioting, large public gatherings, often associated with concerts or sports events, have overburdened local law enforcement and fire protection resources in the past. The effects of civil disorder and riots vary and depend on the type of event and its severity, scope, and duration. Essential services (such as electricity, water, public transportation, and communications) may be disrupted, and property damage, injuries, and loss of life may occur.

Communicable Disease: For the purposes of this Plan, communicable diseases include severe acute respiratory syndrome (SARS), flu, small pox, and diseases carried by insects. Diseases carried by insects include plague (fleas), encephalitis, malaria, West Nile virus (mosquitoes), and Lyme disease (ticks).

Community Rating System (CRS): The CRS is a voluntary program under the NFIP that rewards participating communities (provides incentives) for exceeding the minimum requirements of the NFIP and completing activities that reduce flood hazard risk by providing flood insurance premium discounts.

Critical Facility: A critical facility is vital to the City's ability to provide essential services and protect life and property. Loss of a critical facility would result in a severe economic or catastrophic impact. Under the Roseville hazard mitigation plan definition, critical facilities include the following:

- Police stations, fire stations, vehicle and equipment storage facilities, and emergency operations centers needed for disaster response before, during, and after hazard events
- Public and private utilities and infrastructure vital to maintaining or restoring normal services to areas damaged by hazard events
- Hospitals, nursing homes, and housing likely to contain occupants who may not be sufficiently mobile to avoid death or injury during a hazard event
- Structures or facilities that produce, use, or store highly volatile, flammable, explosive, toxic, and/or water-reactive materials

Crustal Earthquake: Crustal quakes occur at a depth of 5 to 10 miles beneath the earth's surface and are associated with fault movement within a surface plate.

Dam: A dam is any artificial barrier or controlling mechanism that can or does impound 10 acre-feet or more of water.

Dam Failure: Dam failure refers to a partial or complete breach in a dam (or levee) that impacts its integrity. Dam failures occur for a number of reasons, such as flash flooding, inadequate spillway size, mechanical failure of valves or other equipment, freezing and thawing cycles, earthquakes, and intentional destruction.

Debris Avalanche: Volcanoes are prone to debris and mountain rock avalanches that can approach speeds of 100 mph.

Debris Flow: Dense mixtures of water-saturated debris that move down-valley; looking and behaving much like flowing concrete. They form when loose masses of unconsolidated material are saturated, become unstable, and move down slope. The source of water varies but includes rainfall, melting snow or ice, and glacial outburst floods.

Debris Slide: Debris slides consist of unconsolidated rock or soil that has moved rapidly down slope. They occur on slopes greater than 65 percent.

Depth of Flooding: The depth of flooding is difference between regulatory flood elevation and the elevation of the lowest grade adjacent to a structure.

Disaster Mitigation Act of 2000 (DMA); The DMA is Public Law 106-390 and is the latest federal legislation enacted to encourage and promote proactive, pre-disaster planning as a condition of receiving financial assistance under the Robert T. Stafford Act. The DMA emphasizes planning for disasters before they occur. Under the DMA, a pre-disaster hazard mitigation program and new requirements for the national post-disaster hazard mitigation grant program (HMGP) were established.

Drainage Basin: A basin is the area within which all surface water (whether from rainfall, snowmelt, springs, or other sources) flows to a single water body or watercourse. The boundary of a river basin is defined by natural topography, such as hills, mountains, and ridges. Drainage basins are also referred to as "watersheds" and "basins." The City of Roseville is located within portions of two major drainage basins: the Pleasant Grove Creek Basin and the Dry Creek Basin. Pleasant Grove Creek and its tributaries drain most of the western and central areas of the City, and the Dry Creek Basin and its tributaries drain the remainder of the City. The Dry Creek system has year-round flows in its major watercourses, and the Pleasant Grove Creek system is intermittent, with only seasonal flows. As a result, portions of the City lie within a flood hazard area. However, since 1950, there have been no reports of structural flood damage along Pleasant Grove Creek and there are presently no structures subject to flooding within the Pleasant Grove Creek Basin.

Drought: Drought is a period of time without substantial rainfall or snowfall from one year to the next. Drought can also be defined as the cumulative impacts of several dry years or a deficiency of precipitation over an extended period of time, which in turn results in water shortages for some activity, group, or environmental function. A hydrological drought is caused by deficiencies in surface and subsurface water supplies. A socioeconomic drought impacts the health, well being, and quality of life or starts to have an adverse impact on a region. Drought is a normal, recurrent feature of climate and occurs almost everywhere.

Duration: For the purposes of this Plan, duration is defined as the length of time that a hazard occurs. For example, the duration of a tornado can be minutes, but release of a chemical warfare agent such as mustard gas can persist for hours or weeks if not remediated.

Earthquake: An earthquake is defined as a sudden slip on a fault, volcanic or magmatic activity, and sudden stress changes in the earth that result in ground shaking and radiated seismic energy. Earthquakes can last from a few seconds to over 5 minutes, and have been known to occur as a series of tremors over a period of several days. The actual movement of the ground in an earthquake is seldom the direct cause of injury or death. Casualties may result from falling objects and debris as shocks shake, damage, or demolish buildings and other structures.

Exposure: Exposure is defined as the number and dollar value of assets considered to be at risk during the occurrence of a specific hazard.

Extent: The extent is the size of an area affected by a hazard.

Fire Behavior: Fire behavior refers to the physical characteristics of a fire and is a function of the interaction between the fuel characteristics (such as type of vegetation and structures that could burn), topography, and weather. Variables that affect fire behavior include the rate of spread, intensity, fuel consumption, and fire type (such as underbrush versus crown fire).

Fire Frequency: Fire frequency is the broad measure of the rate of fire occurrence in a particular area. An estimate of the areas most likely to burn is based on past fire history or fire rotation in the area, fuel conditions, weather, ignition sources (such as human or lightning), fire suppression response, and other factors.

Flash Flood: A flash flood occurs with little or no warning when water levels rise at an extremely fast rate

Flood Insurance Rate Map (FIRM): FIRMs are the official maps on which the Federal Emergency Management Agency (FEMA) has delineated the Special Flood Hazard Area (SFHA).

Flood Insurance Study: A report published by the Federal Insurance and Mitigation Administration for a community in conjunction with the community's Flood Insurance rate Map. The study contains such background data as the base flood discharges and water surface elevations that were used to prepare the FIRM. In most cases, a community FIRM with detailed mapping will have a corresponding flood insurance study.

Floodplain: Any land area susceptible to being inundated by flood waters from any source. A flood insurance rate map identifies most, but not necessarily all, of a community's floodplain as the Special Flood Hazard Area (SFHA).

Floodway: Floodways are areas within a floodplain that are reserved for the purpose of conveying flood discharge without increasing the base flood elevation more than 1 foot. Generally speaking, no development is allowed in floodways, as any structures located there would block the flow of floodwaters.

Floodway Fringe: Floodway fringe areas are located in the floodplain but outside of the floodway. Some development is generally allowed in these areas, with a variety of restrictions. On maps that have identified and delineated a floodway, this would be the area beyond the floodway boundary that can be subject to different regulations.

Fog: Fog refers to a cloud (or condensed water droplets) near the ground. Fog forms when air close to the ground can no longer hold all the moisture it contains. Fog occurs either when air is cooled to its dew point or the amount of moisture in the air increases. Heavy fog is particularly hazardous because it can restrict surface visibility. Severe fog incidents can close roads, cause vehicle accidents, cause airport delays, and impair the effectiveness of emergency response. Financial losses associated with transportation delays caused by fog have not been calculated in the United States but are known to be substantial.

Freeboard: Freeboard is the margin of safety added to the base flood elevation.

Frequency: For the purposes of this Plan, frequency refers to how often a hazard of specific magnitude, duration, and/or extent is expected to occur on average. Statistically, a hazard with a 100-year frequency is expected to occur about once every 100 years on average and has a 1 percent chance of occurring any given year. Frequency reliability varies depending on the type of hazard considered.

Fujita Scale of Tornado Intensity: Tornado wind speeds are sometimes estimated on the basis of wind speed and damage sustained using the Fujita Scale. The scale rates the intensity or severity of tornado events using numeric values from F0 to F5 based on tornado wind speed and damage. An F0 tornado (wind speed less than 73 miles per hour [mph]) indicates minimal damage (such as broken tree limbs), and an F5 tornado (wind speeds of 261 to 318 mph) indicates severe damage.

General Plan: California state law requires that every county and city prepare and adopt a comprehensive long-range plan to serve as a guide for community development. The plan must consist of an integrated and internally consistent set of goals, policies, and implementation measures. In addition, the plan must focus on issues of the greatest concern to the community and be written in a clear and concise manner. City actions, such as those relating to land-use allocation, annexations, zoning, subdivision and design review, redevelopment, and capital improvements, must be consistent with such a plan. The City of Roseville's general plan serves these purposes. As the principle planning document that directs the City's growth and land use, the general plan is as an integral part of the Roseville hazard mitigation plan. A technical update to Roseville's general plan was completed in January 2003.

Goal: A goal is a general guideline that explains what is to be achieved. Goals are usually broad-based, long-term, policy-type statements and represent global visions. Goals help define the benefits that a plan is trying to achieve.

The success of the Roseville hazard mitigation plan, once implemented, should be measured by the degree to which its goals have been met (that is, by the actual benefits in terms of actual hazard mitigation).

Geographic Information System (GIS): GIS is a computer software application that relates data regarding physical and other features on the earth to a database for mapping and analysis.

Hazard: A hazard is a source of potential danger or adverse condition that could harm people and/or cause property damage. Natural hazards include floods, winds, and earthquakes. Man-made hazards include acts of terrorism and hazardous material spills.

Hazardous Material: A hazardous material is a substance or combination of substances that (1) can cause or contribute to an increase in mortality or serious irreversible or incapacitating reversible illnesses, or (2) pose a present or potential hazard to human life, property, or the environment. Hazardous materials could cause these effects because of their quantity, concentration, or physical, chemical, or infectious characteristics. Hazardous waste is included in the City's working definition of hazardous material.

Hazardous Material Incident: This type of incident involves the accidental or intentional release of hazardous materials to the environment. Such incidents typically occur as fixed facility incidents or transportation incidents. It is possible to identify and prepare for a fixed facility incident because federal and state laws require facilities to notify state and local authorities about hazardous materials used or produced at the facility. Transportation incidents are more difficult to prepare for because there is little (if any) notice about the materials involved. Except for severe weather and flooding, hazardous materials incidents are the most likely hazards to affect the City of Roseville.

Hazard Mitigation Grant Program (HMGP): Authorized under Section 202 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, the HMGP is administered by FEMA and provides grants to states, tribes, and local governments to implement hazard mitigation actions after a major disaster declaration. The purpose of the program is to reduce the loss of life and property due to disasters and to enable mitigation activities to be implemented as a community recovers from a disaster

Hazards U.S. Hazard (HAZUS-MH) Loss Estimation Program: HAZUS-MH is a GIS-based program used to support the development of risk assessments as required under the DMA. The HAZUS-MH software program assesses risk in a quantitative manner to estimate damages and losses associated with natural hazards. HAZUS-MH is FEMA's nationally applicable, standardized methodology and software program and contains modules for estimating potential losses from earthquakes, floods, and wind hazards. HAZUS-MH has also been used to assess vulnerability (exposure) for other hazards facing Roseville.

Hydraulics: Hydraulics is the branch of science or engineering that addresses fluids (especially water) in motion in rivers or canals, works and machinery for conducting or raising water, the use of water as a prime mover, and other fluid-related areas.

Hydrology: Hydrology is the analysis of waters of the earth. For example, a flood discharge estimate is developed by conducting a hydrologic study.

Intensity: For the purposes of this Plan, intensity refers to the measure of the effects of a hazard.

Inventory: The assets identified in a study region comprise an inventory. Inventories include assets that could be lost when a disaster occurs and community resources are at risk. Assets include people, buildings, transportation, and other valued community resources.

Landslide: Landslides can be described as the sliding movement of masses of loosened rock and soil down a hillside or slope. Fundamentally, slope failures occur when the strength of the soils forming the slope exceeds the pressure, such as weight or saturation, acting upon them.

Large Gathering Places: For the purposes of this Plan, such places are defined as follows:

- Any facility listed as a Type A-2.1 in the California Uniform Building Code (UBC) because it has an assembly room with an occupant load of 300 or more without a stage (34 locations in Roseville)
- Any buildings listed as E-1 used for educational purposes through the 12th grade by 50 or more persons for more than 12 hours per week or 4 hours any 1 day (29 buildings in Roseville)
- Any facility likely to have an occupancy of greater than 300, such as a large employment centers, retail centers, cultural centers, and places of worship

Lightning: Lightning is an electrical discharge resulting from the buildup of positive and negative charges within a thunderstorm. When the buildup becomes strong enough, lightning appears as a "bolt," usually within or between clouds and the ground. A bolt of lightning instantaneously reaches temperatures approaching 50,000ºF. The rapid heating and cooling of air near lightning causes thunder. Lightning is a major threat during thunderstorms. In the United States, 75 to 100 Americans are struck and killed by lightning each year (see http://www.fema.gov/hazard/thunderstorms/thunder.shtm).

Liquefaction: Liquefaction is the complete failure of soils, occurring when soils lose shear strength and flow horizontally. It is most likely to occur in fine grain sands and silts, which behave like viscous fluids when liquefaction occurs. This situation is extremely hazardous to development on the soils that liquefy, and generally results in extreme property damage and threats to life and safety.

Local Government: Any county, municipality, city, town, township, public authority, school district, special district, intrastate district, council of governments (regardless of whether the council of governments is incorporated as a nonprofit corporation under State law), regional or interstate government entity, or agency or instrumentality of a local government; any Indian tribe or authorized tribal organization, or Alaska Native village or organization; and any rural community, unincorporated town or village, or other public entity.

Magnitude: Magnitude is the measure of the strength of an earthquake, and is typically measured by the Richter scale. As an estimate of energy, each whole number step in the magnitude scale corresponds to the release of about 31 times more energy than the amount associated with the preceding whole number value.

Mass movement: A collective term for landslides, mudflows, debris flows, sinkholes and lahars.

Mitigation: A preventive action that can be taken in advance of an event that will reduce or eliminate the risk to life or property.

Mitigation Actions: Mitigation actions are specific actions to achieve goals and objectives that minimize the effects from a disaster and reduce the loss of life and property.

Nolte Future Floodplain: The Nolte Future Floodplain is the portion of the regulatory floodplain based on the Roseville City of Roseville Floodplain Analysis published by Nolte and Associates in August 1986. This analysis used hydrologic parameters that better represented the observed flooding scenarios that caused flooding in Roseville. The study also used hydrologic parameters based on projected growth for the region assuming total development of the watershed instead of existing conditions used by FEMA. This approach generated a floodplain area greater than that reflected of on the FIRM for portions of Roseville. Although this study was never formally adopted, it is used by the City as the best available information for regulatory and land- use programs such as the specific plan program and improvement standards.

Objective: For the purposes of this Plan, an objective is defined as a short-term aim that, when combined with other objectives, forms a strategy or course of action to meet a goal. Unlike goals, objectives are specific and measurable.

Peak Ground Acceleration: Peak Ground Acceleration (PGA) is a measure of the highest amplitude of ground shaking that accompanies an earthquake, based on a percentage of the force of gravity.

Preparedness: Preparedness refers to actions that strengthen the capability of government, citizens, and communities to respond to disasters.

Presidential Disaster Declaration: These declarations are typically made for events that cause more damage than state and local governments and resources can handle without federal government assistance. Generally, no specific dollar loss threshold has been established for such declarations. A Presidential Disaster Declaration puts into motion long-term federal recovery programs, some of which are matched by state programs, designed to help disaster victims, businesses, and public entities.

Probability of Occurrence: The probability of occurrence is a statistical measure or estimate of the likelihood that a hazard will occur. This probability is generally based on past hazard events in the area and a forecast of events that could occur in the future. A probability factor based on yearly values of occurrence is used to estimate probability of occurrence.

Regulatory Floodplain: This term refers to an area regulated by the City of Roseville as floodplain through its land-use regulations and improvement standards. It includes areas identified by FEMA and published on FIRMs and additional areas identified by Roseville as being susceptible to flooding. These areas are delineated based on detailed hydrologic and hydraulic floodplain modeling that meets or exceeds FEMA criteria for mapping and modeling floodplains. The flood event used to delineate these boundaries is referred to as "the regulatory flood" in this Plan to differentiate it from the "base flood" used by FEMA. The City of Roseville designates the 100-year floodplain area on its land-use map in accordance with best available floodplain information as determined by the Public Works Director. In many portions of the City, the Nolte Future Floodplain (May 1987) has been used to designate floodplain boundaries. When Nolte Future Floodplain information does not exist or does not represent the best available information, new floodplain information is generated by the project proponent. New floodplain information is generally developed (1) consistent with build-out development assumptions used by the Nolte Future Floodplain analysis, and (2) in compliance with the most recent Placer County floodplain manual. Floodplain boundaries can normally be terminated where the 100-year floodplain narrows to a width of 200 feet or less and where the associated drainage area is less than 300 acres. Precise termination of boundaries must be approved by the Public Works Director.

Repetitive Loss Property: Any NFIP-insured property that, since 1978 and regardless of any changes of ownership during that period, has experienced:

- Four or more paid flood losses in excess of $1000.00; or
- Two paid flood losses in excess of $1000.00 within any 10-year period since 1978 or
- Three or more paid losses that equal or exceed the current value of the insured property.

Return Period (or Mean Return Period): This term refers to the average period of time in years between occurrences of a particular hazard (equal to the inverse of the annual frequency of occurrence).

Riverine: Of or produced by a river. Riverine floodplains have readily identifiable channels. Floodway maps can only be prepared for riverine floodplains.

Risk: Risk is the estimated impact that a hazard would have on people, services, facilities, and structures in a community. Risk measures the likelihood of a hazard occurring and resulting in an adverse condition that causes

injury or damage. Risk is often expressed in relative terms such as a high, moderate, or low likelihood of sustaining damage above a particular threshold due to occurrence of a specific type of hazard. Risk also can be expressed in terms of potential monetary losses associated with the intensity of the hazard.

Risk Assessment: Risk assessment is the process of measuring potential loss of life, personal injury, economic injury, and property damage resulting from hazards. This process assesses the vulnerability of people, buildings, and infrastructure to hazards and focuses on (1) hazard identification; (2) impacts of hazards on physical, social, and economic assets; (3) vulnerability identification; and (4) estimates of the cost of damage or costs that could be avoided through mitigation.

Risk Ranking: This ranking serves two purposes, first to describe the probability that a hazard will occur, and second to describe the impact a hazard will have on the people, property, and economy of Roseville. Risk estimates for the City are based on the methodology that the City used to prepare the risk assessment for this Plan. The following equation shows the risk ranking calculation:

Risk Ranking = Probability + Impact (people + property + economy)

Robert T. Stafford Act: The Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 100-107, was signed into law on November 23, 1988. This law amended the Disaster Relief Act of 1974, Public Law 93-288. The Stafford Act is the statutory authority for most federal disaster response activities, especially as they pertain to FEMA and its programs.

Sinkhole: A collapse depression in the ground with no visible outlet. Its drainage is subterranean. It is commonly vertical-sided or funnel-shaped.

Slab: This refers to one or more layers of snow in which the grains are bonded together. A slab initially fails over a large area instead of at a single point.

Special Flood Hazard Area: The base floodplain delineated on a Flood Insurance Rate Map. The SFHA is mapped as a Zone A in riverine situations and zone V in coastal situations. The SFHA may or may not encompass all of a community's flood problems

Stakeholder: Business leaders, civic groups, academia, non-profit organizations, major employers, managers of critical facilities, farmers, developers, special purpose districts, and others whose actions could impact hazard mitigation.

Steering Committee: The Steering Committee is the Roseville City Council-approved group that oversaw all phases of the hazard mitigation plan's development. The members of this committee included key city personnel, citizens, and other stakeholders from within the planning area.

Stream Bank Erosion: Stream bank erosion is common along rivers, streams and drains where banks have been eroded, sloughed or undercut. However, it is important to remember that a stream is a dynamic and constantly changing system. It is natural for a stream to want to meander, so not all eroding banks are "bad" and in need of repair. Generally, stream bank erosion becomes a problem where development has limited the meandering nature of streams, where streams have been channelized, or where stream bank structures (like bridges, culverts, etc.) are located in places where they can actually cause damage to downstream areas. Stabilizing these areas can help protect watercourses from continued sedimentation, damage to adjacent land uses, control unwanted meander, and improvement of habitat for fish and wildlife.

Steep Slope: Different communities and agencies define it differently, depending on what it is being applied to, but generally a steep slope is a slope in which the percent slope equals or exceeds 25%. For this study, steep slope is defined as slopes greater than 33%.

Subduction Zone Earthquake: This type of quake occurs along two converging plates, attached to one another along their interface. When the interface between these two plates slips, a sudden, dramatic release of energy results, propagated along the entire fault line.

Sustainable Hazard Mitigation: This concept includes the sound management of natural resources, local economic and social resiliency, and the recognition that hazards and mitigation must be understood in the largest possible social and economic context.

Technical Subcommittee: This City of Roseville group convened to provide guidance, support, and feedback to the planning team during all phases of Roseville hazard mitigation plan development. The technical subcommittee consisted of key staff from City departments integral to implementing City programs pertinent to hazard mitigation.

Technological Hazard: A technological hazard arises from human activities such as the manufacture, transportation, storage, and use of hazardous materials. Technological hazards are assumed to be accidental in nature, with unintended consequences.

Thunderstorm: A thunderstorm is a storm with lightning and thunder produced by cumulonimbus clouds. Thunderstorms usually produce gusty winds, heavy rains, and sometimes hail. Thunderstorms are usually short in duration (seldom more than 2 hours). Heavy rains associated with thunderstorms can lead to flash flooding during the wet or dry seasons.

Tornado: A tornado is a violently rotating column of air extending between and in contact with a cloud and the surface of the earth. Tornadoes are often (but not always) visible as funnel clouds. On a local scale, tornadoes are the most intense of all atmospheric circulations, and winds can reach destructive speeds of more than 300 mph. A tornado's vortex is typically a few hundred meters in diameter, and damage paths can be up to 1 mile wide and 50 miles long.

Vulnerability: Vulnerability describes how exposed or susceptible an asset is to damage. Vulnerability depends on an asset's construction, contents, and the economic value of its functions. Like indirect damages, the vulnerability of one element of the community is often related to the vulnerability of another. For example, many businesses depend on uninterrupted electrical power. Flooding of an electric substation would affect not only the substation itself but businesses as well. Often, indirect effects can be much more widespread and damaging than direct effects.

Water Supply Strategy: A water supply strategy is a comprehensive approach to ensure water reliability for Roseville's customers. The City has a diverse set of water supply options, including surface water contracts, recycled water, and groundwater wells to ensure that even after a period of dry years, a combination of available water supplies and water conservation measures will ensure that the community has adequate water. The City has contracts for surface water with three agencies

Watershed: A watershed is an area that drains downgradient from areas of higher land to areas of lower land to the lowest point, a common drainage basin.

Weapon of Mass Destruction (WMD): WMDs include chemical, biological, radiological, nuclear, and explosive weapons associated with terrorism.

West Nile Virus: West Nile virus is a recent natural hazard affecting California. Mosquitoes transmit this potentially deadly disease to livestock and humans alike. West Nile virus first struck the northern hemisphere in Queens, New York, in 1999 and killed four people. In 2003, all 50 states warned of an outbreak from any of the 30 mosquito species known to carry it. From 62 severe cases in 1999, confirmed human cases of the virus spread

to 39 states in 2002 and killed 284 people. Less than 1 percent of those infected develop severe illness. People over 50 years of age appear to be at high risk for the severe aspects of the disease.

Wildfire: These terms refer to any uncontrolled fire occurring on undeveloped land that requires fire suppression. The potential for wildfire is influenced by three factors: the presence of fuel, topography, and air mass. Fuel can include living and dead vegetation on the ground, along the surface as brush and small trees, and in the air such as tree canopies. Topography includes both slope and elevation. Air mass includes temperature, relative humidity, wind speed and direction, cloud cover, precipitation amount, duration, and the stability of the atmosphere at the time of the fire. Wildfires can be ignited by lightning and, most frequently, by human activity including smoking, campfires, equipment use, and arson.

Windstorm: Windstorms are generally short-duration events involving straight-line winds or gusts exceeding 50 mph. These gusts can produce winds of sufficient strength to cause property damage. Windstorms are especially dangerous in areas with significant tree stands, exposed property, poorly constructed buildings, mobile homes (manufactured housing units), major infrastructure, and aboveground utility lines. A windstorm can topple trees and power lines; cause damage to residential, commercial, critical facilities; and leave tons of debris in its wake.

Zoning Ordinance: The zoning ordinance designates allowable land use and intensities for a local jurisdiction. Zoning ordinances consist of two components: a zoning text and a zoning map.

Appendix A. Public Outreach Materials

City of Roseville Survey: 2016 Hazard Mitigation Plan Update Questionnaire

1. Survey Introduction

City of Roseville Hazard Mitigation Questionnaire

A range of natural and man-made disasters can affect any community. The City of Roseville works diligently to mitigate threats and prepare for disasters, and has been recognized nationally for its level of excellence in the area of hazard mitigation. This ensures our community minimizes the impact of adversity and can recover as quickly as possible.

To remain at this high level of preparedness, we need your help to identify and plan for future disasters. Data collected through this survey will help the City of Roseville Multi-Hazard Mitigation Committee:

- **Assess our residents' level of awareness regarding disasters;**
- **Determine areas vulnerable to various types of disasters;**
- **Coordinate activities to reduce the risk of injury or property damage in the future; and,**
- **Update the City of Roseville Hazard Mitigation Plan.**

The City of Roseville Hazard Mitigation Plan is required to be updated every five years by the federal Disaster Mitigation Act of 2000.

The Plan details the risks of both natural and manmade hazards in Roseville and includes programs and projects that can help reduce the exposure of City residents and businesses should an event occur in Roseville. The Plan also makes the City eligible for federal pre-disaster and post-disaster assistance. The City has been very successful to date in securing funds for projects in Roseville to lessen the risks associated with natural hazards in Roseville.

This survey consists of three sets of questions: The first section consists of demographic information that will be used in evaluating the responses to the questionnaire. The second section is about the potential hazards near you and whether your knowledge of potential hazards influenced your decision to choose where you live. The last section is about your experience and knowledge of natural and manmade hazards in general, and steps your household has taken to prepare for disasters.

Thank you for taking the time to participate in the 2016 Hazard Mitigation Questionnaire!

City of Roseville Survey: 2016 Hazard Mitigation Plan Update Questionnaire

2. About You

First, please tell us about yourself. This information will aid the City's Multi-Hazard Mitigation Plan Steering Committee in evaluating the responses to this questionnaire. The answers will be used only for the preparation of this Plan and will not be provided to any other group or interest.

1. How much is your gross household income?

- ◯ $20,000 or less
- ◯ $20,001 to $49,999
- ◯ $50,000 to $74,999
- ◯ $75,000 to $99,999
- ◯ $100,000 or More

2. Do you work in Roseville?

- ◯ Yes
- ◯ No

3. Please indicate the primary language spoken in your household.

- ◯ English
- ◯ Spanish
- ◯ Other (please specify)
- ◯ Other Indo-European Language
- ◯ Asian and Pacific Island Languages

4. Which of the following digital media outlets do you subscribe to receive news and information about the City of Roseville?

Select all that apply.

- ☐ Facebook
- ☐ Twitter
- ☐ Nextdoor
- ☐ Other (please specify)
- ☐ E-mail and/or text messages
- ☐ Alert Roseville

City of Roseville Survey: 2016 Hazard Mitigation Plan Update Questionnaire

3. Location

Please tell us about where you live and if the potential impacts of natural or manmade hazards influenced your decision.:

* 5. Do you live in Roseville?

- Yes
- No

6. Do you own or rent your place of residence?

- Own
- Rent

7. How long have you lived in at your current residence?

- Less than a year
- 1 – 2 years
- 3 – 5 years
- 6 – 10 years
- 11 – 15 years
- 16 – 20 years
- More than 20 years
- I don't live in Roseville

* 8. When you moved into your home, did you consider the impact a natural or human-caused disaster could have on your home?

- Yes
- No

* 9. Was the presence of a natural hazard risk zone (e.g., dam failure zone, flood zone, landslide hazard area, high fire risk area) disclosed to you by a real estate agent, seller, or landlord before you purchased or moved into your home?

- Yes
- No

* 10. Is your residence located in or near a FEMA designated floodplain?

- Yes
- No
- Not Sure

11. Is your residence located in a dam failure zone?

- Yes
- No
- Not sure

* 12. Do you have flood insurance?

- Yes
- No
- Not Sure

* 13. Is your residence located near an earthquake fault?

- Yes
- No
- Not Sure

* 14. Do you have earthquake insurance?

- ◯ Yes
- ◯ No
- ◯ Not Sure

* 15. Is your property located in an area at risk for wildfires?

- ◯ Yes
- ◯ No
- ◯ Not Sure

16. Have you ever had problems securing homeowners or renters insurance due to risks from hazards?

- ◯ Yes
- ◯ No

If "yes," what hazard was the cause of the difficulty?

17. Do you support policies to restrict or prohibit development in designated hazard zones?

- ◯ Yes
- ◯ No

* indicates a question that requires an answer.

City of Roseville Survey: 2016 Hazard Mitigation Plan Update Questionnaire

4. Hazard Knowledge

The next set of questions is about your experience and knowledge of natural and manmade hazards and steps your household has taken to prepare for disasters:

18. Which of the following natural hazard events have you or has anyone in your household experienced within the past 20 years in Roseville? (Check all that apply)

- ☐ Dam Failure
- ☐ Drought
- ☐ Earthquake
- ☐ Epidemic/Pandemic (flu, avian flu, H1N1, West Nile)
- ☐ Extreme Heat
- ☐ Flood
- ☐ Freeze
- ☐ Landslide & Other Earth Movements (non-seismic induced landslides and earth movements;subsidence;sinkholes;geologic hazard)
- ☐ Severe Weather (wind, lightning, winter storm, etc.)
- ☐ Wildfire
- ☐ None
- ☐ Other (please specify)

* 19. How concerned are you about the following natural hazards in Roseville? (Please check one for each hazard)

	Not concerned	Somewhat concerned	Concerned	Very concerned	Extremely concerned
Dam Failure					
Drought					
Earthquake					
Epidemic/Pandemic (flu, avian flu, H1N1, West Nile, Ebola)					
Extreme Heat					
Flood					
Freeze					
Landslide & Other Earth Movements (non-seismic induced landslides and earth movements;subsidence;sinkholes;geologic hazard)					
Severe Weather (wind, lightning, winter storm, etc.)					
Wildfire					
Other Natural Hazard					

If you are concerned about a natural hazard not listed above, please specify.

* 20. How concerned are you with the following manmade hazards in Roseville? (Check all that apply)

	Not concerned	Somewhat concerned	Concerned	Very concerned	Extremely concerned
Energy Shortage					
Act of Terrorism					
Hazardous Materials Release					
Cyber Threats					
Other Human-Caused Hazard					

If you are concerned about a human-caused hazard not listed above, please specify.

* 21. The FEMA website - Ready.gov - provides important information on how to prepare you and your family in the event of a disaster.

How prepared is your household for a natural or human-caused hazard event? (Check one)

- ◯ Not at all Prepared
- ◯ Somewhat Prepared
- ◯ Adequately Prepared
- ◯ Well Prepared
- ◯ Very Well Prepared

* 22. How would you expect to be notified in case of an immediate threat caused by a natural or human-caused hazard.

Select all that apply.

- ☐ Television
- ☐ Radio
- ☐ Facebook
- ☐ Twitter
- ☐ Nextdoor
- ☐ Alert Roseville
- ☐ Other (please specify)

23. FEMA suggests that households have at least 3 days of food, water, and vital supplies (e.g. medications) in hand in the event of a disaster. How many days of food, water, and vital supplies does your family have on hand in the event of a disaster?

◯ 1 ◯ 2 ◯ 3 ◯ 4 ◯ 5 ◯ 6 ◯ 7 ◯ 8 ◯ 9 ◯ 10 ◯ None

24. How prepared are you to get along without electricity or natural gas for one to five days?

- ◯ Not at all prepared
- ◯ Somewhat prepared
- ◯ Very prepared

25. Where would you expect to find useful information to help you be prepared?

Select all that apply.

- ☐ Television
- ☐ Internet
- ☐ Social Media
- ☐ Newspaper/magazine
- ☐ Other (please specify)
- ☐ City of Roseville Public Library
- ☐ Public government meetings
- ☐ Schools/academic institutions

26. Which of the following steps has your household already undertaken to prepare for a natural or manmade disaster?

Select all that apply.

- [ ] Received first aid/CPR training
- [ ] Made a fire escape plan
- [ ] Designated a meeting place
- [ ] Identified utility shutoffs
- [ ] Community Emergency Response Training (CERT)
- [ ] Prepared a disaster supply kit
- [ ] Installed smoke detectors on each level of the house
- [ ] Stored food and water
- [ ] Stored flashlights and batteries
- [ ] Stored a battery-powered radio
- [ ] Stored a fire extinguisher
- [ ] Stored medical supplies (first aid kit, medications)
- [ ] Other (please specify)

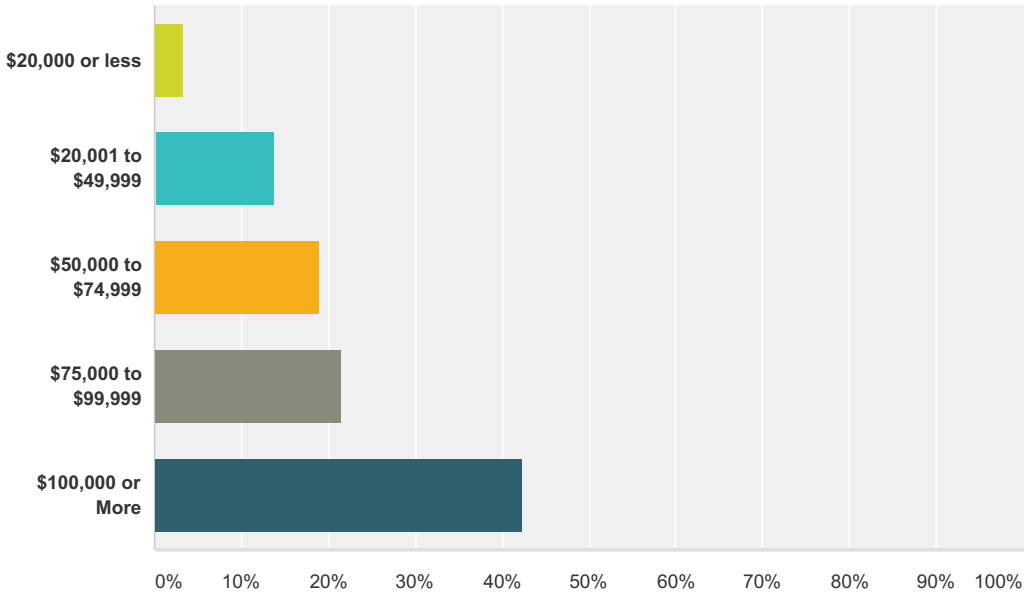
27. Please provide any additional comments you would like to share with the City of Roseville Planning Team.

* indicates a question that requires an answer.

28. If you would like to receive information regarding upcoming public events and other participatory opportunities regarding hazard mitigation, please provide your email address below.

Q1 How much is your gross household income?

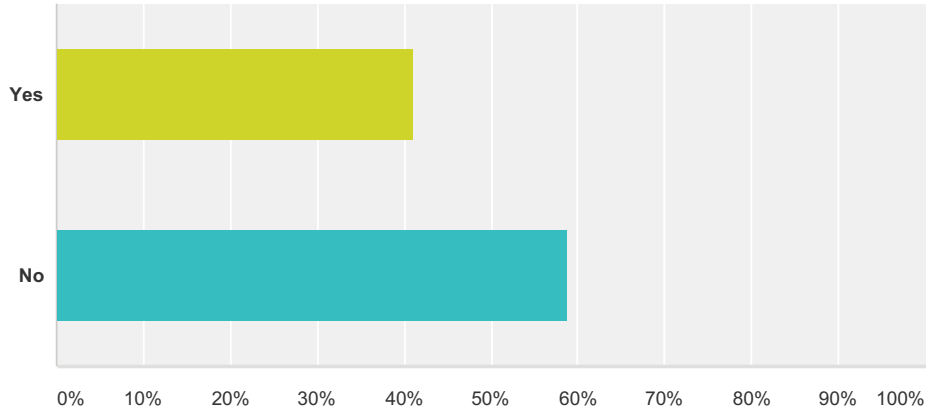
Answered: 641 Skipped: 30



Answer Choices	Responses	
$20,000 or less	**3.28%**	21
$20,001 to $49,999	**13.73%**	88
$50,000 to $74,999	**19.03%**	122
$75,000 to $99,999	**21.53%**	138
$100,000 or More	**42.43%**	272
Total		**641**

Q2 Do you work in Roseville?

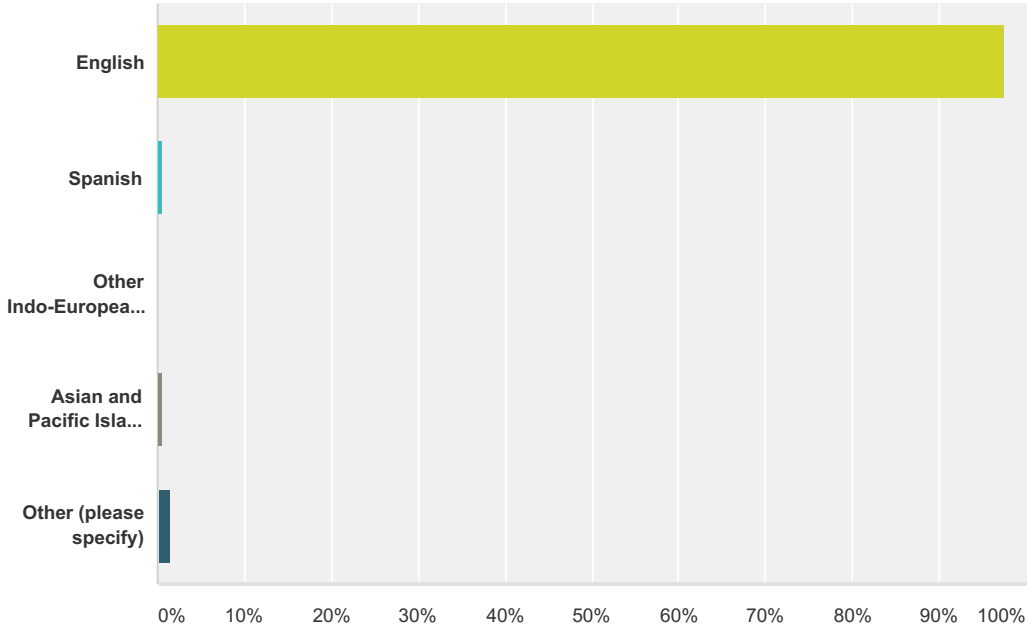
Answered: 650 Skipped: 21



Answer Choices	Responses	
Yes	**41.23%**	268
No	**58.77%**	382
Total		**650**

Q3 Please indicate the primary language spoken in your household.

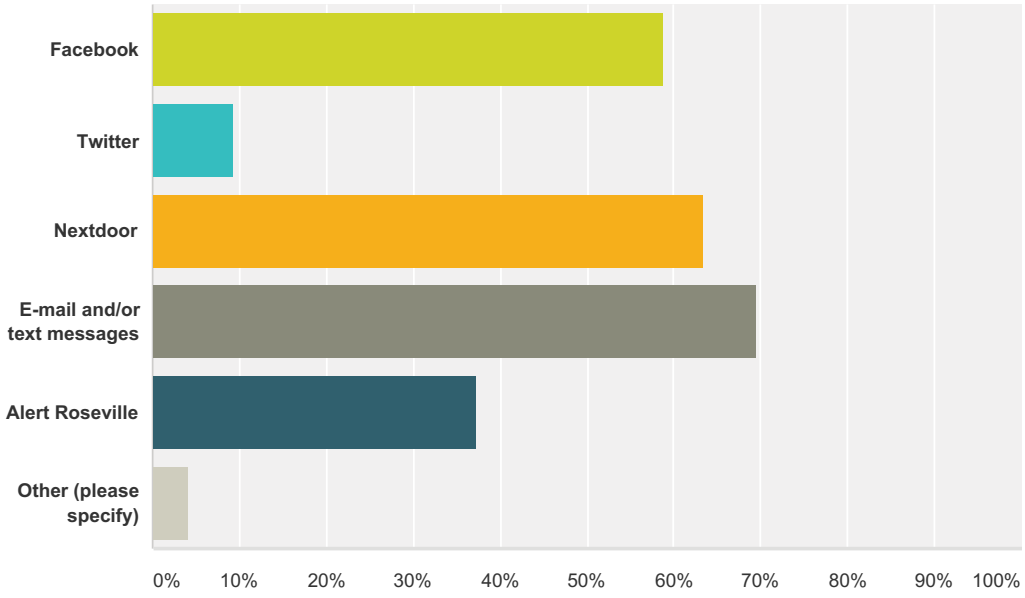
Answered: 662 Skipped: 9



Answer Choices	Responses	
English	**97.43%**	645
Spanish	**0.60%**	4
Other Indo-European Language	**0.00%**	0
Asian and Pacific Island Languages	**0.60%**	4
Other (please specify)	**1.36%**	9
Total		**662**

Q4 Which of the following digital media outlets do you subscribe to receive news and information about the City of Roseville? Select all that apply.

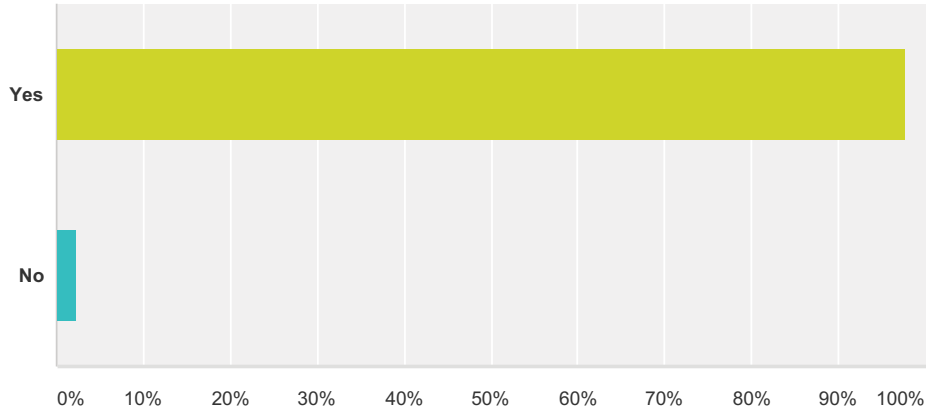
Answered: 658 Skipped: 13



Answer Choices	Responses	
Facebook	**58.97%**	388
Twitter	**9.42%**	62
Nextdoor	**63.37%**	417
E-mail and/or text messages	**69.45%**	457
Alert Roseville	**37.39%**	246
Other (please specify)	**4.10%**	27
Total Respondents: 658		

Q5 Do you live in Roseville?

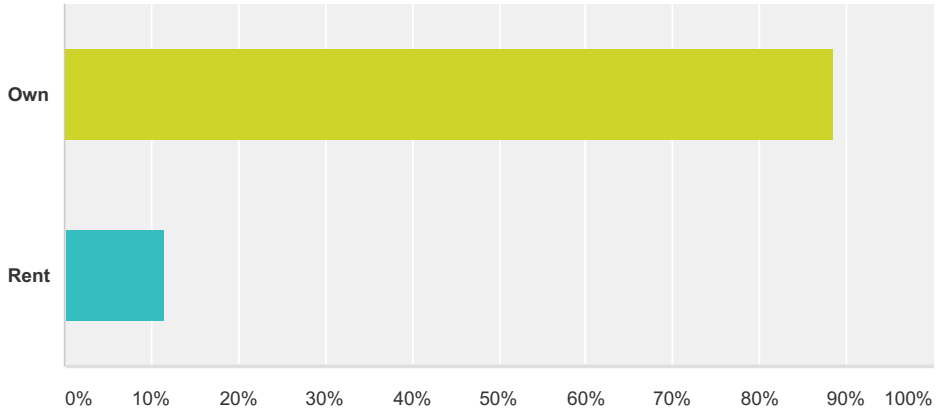
Answered: 646 Skipped: 25



Answer Choices	Responses	
Yes	**97.68%**	631
No	**2.32%**	15
Total		**646**

Q6 Do you own or rent your place of residence?

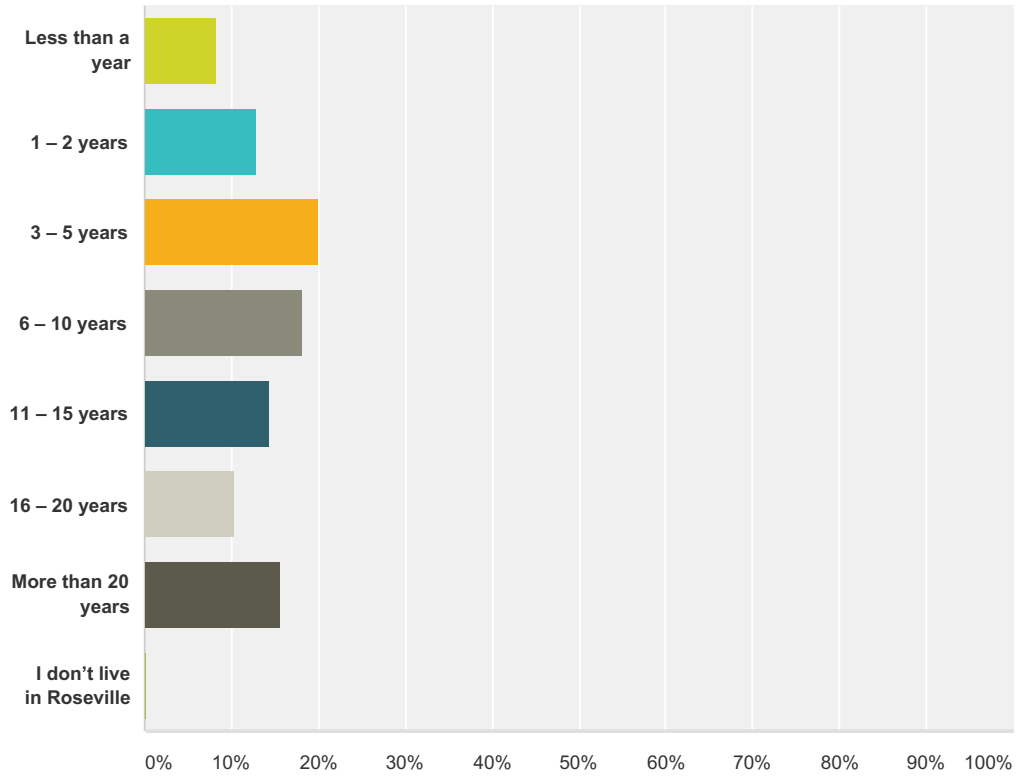
Answered: 641 Skipped: 30



Answer Choices	Responses	
Own	**88.46%**	567
Rent	**11.54%**	74
Total		**641**

Q7 How long have you lived in at your current residence?

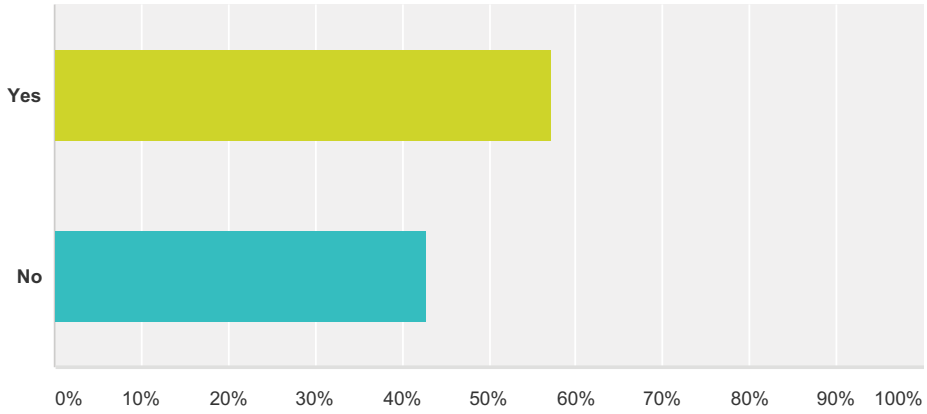
Answered: 642 Skipped: 29



Answer Choices	Responses	
Less than a year	**8.41%**	54
1 – 2 years	**12.93%**	83
3 – 5 years	**19.94%**	128
6 – 10 years	**18.22%**	117
11 – 15 years	**14.33%**	92
16 – 20 years	**10.44%**	67
More than 20 years	**15.58%**	100
I don't live in Roseville	**0.16%**	1
Total		**642**

Q8 When you moved into your home, did you consider the impact a natural or human-caused disaster could have on your home?

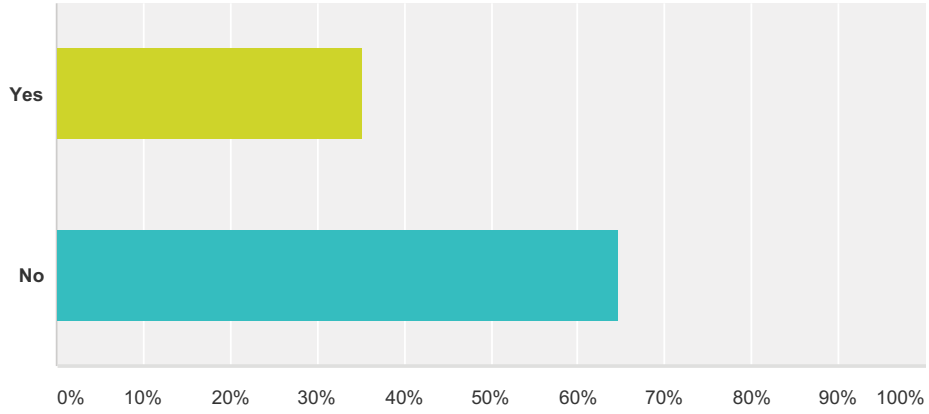
Answered: 646 Skipped: 25



Answer Choices	Responses	
Yes	**57.12%**	369
No	**42.88%**	277
Total		**646**

Q9 Was the presence of a natural hazard risk zone (e.g., dam failure zone, flood zone, landslide hazard area, high fire risk area) disclosed to you by a real estate agent, seller, or landlord before you purchased or moved into your home?

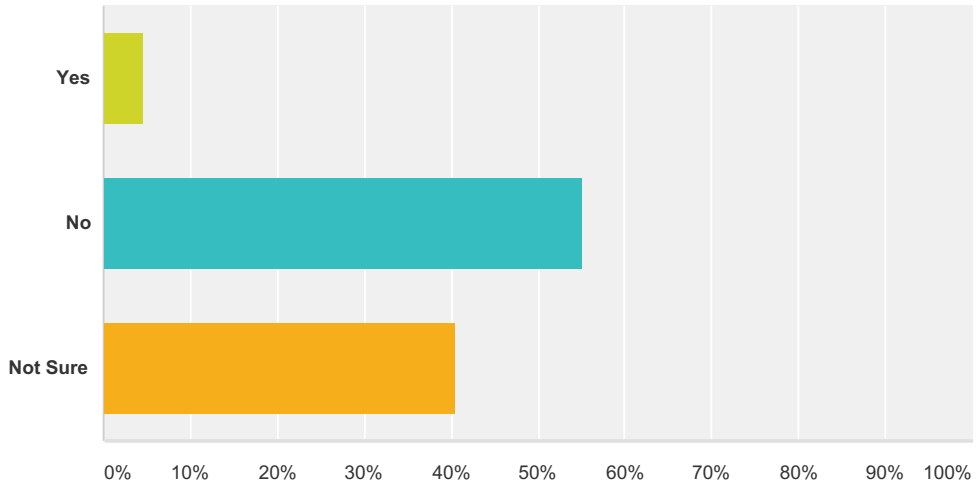
Answered: 646 Skipped: 25



Answer Choices	Responses	
Yes	**35.29%**	228
No	**64.71%**	418
Total		**646**

Q10 Is your residence located in or near a FEMA designated floodplain?

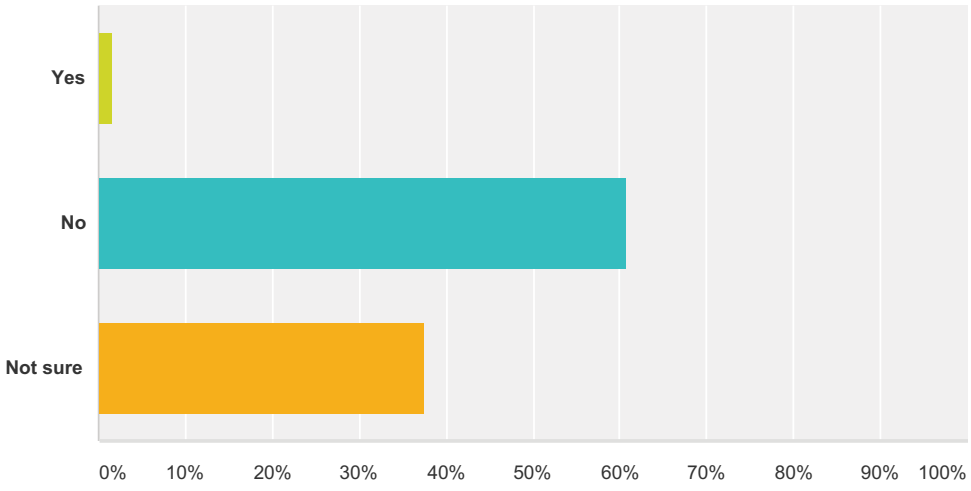
Answered: 646 Skipped: 25



Answer Choices	Responses	
Yes	**4.49%**	29
No	**55.11%**	356
Not Sure	**40.40%**	261
Total		**646**

Q11 Is your residence located in a dam failure zone?

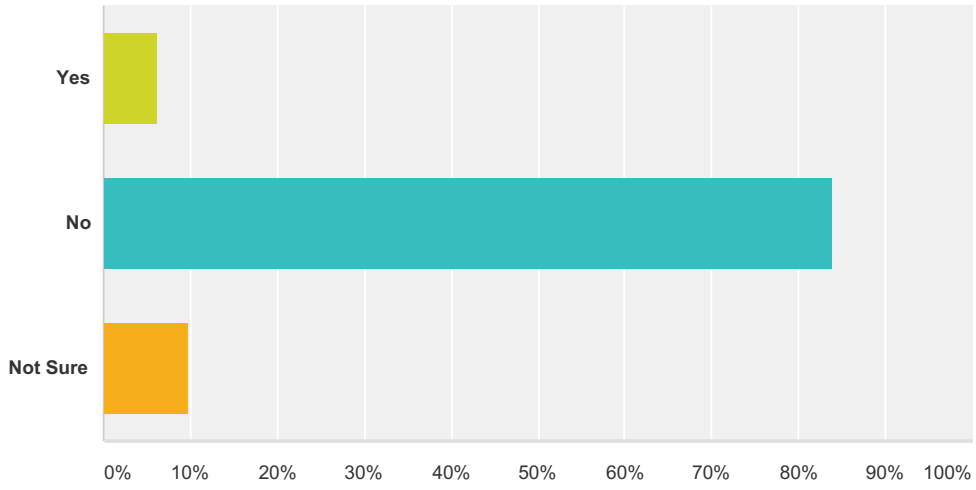
Answered: 642 Skipped: 29



Answer Choices	Responses	
Yes	**1.71%**	11
No	**60.75%**	390
Not sure	**37.54%**	241
Total		**642**

Q12 Do you have flood insurance?

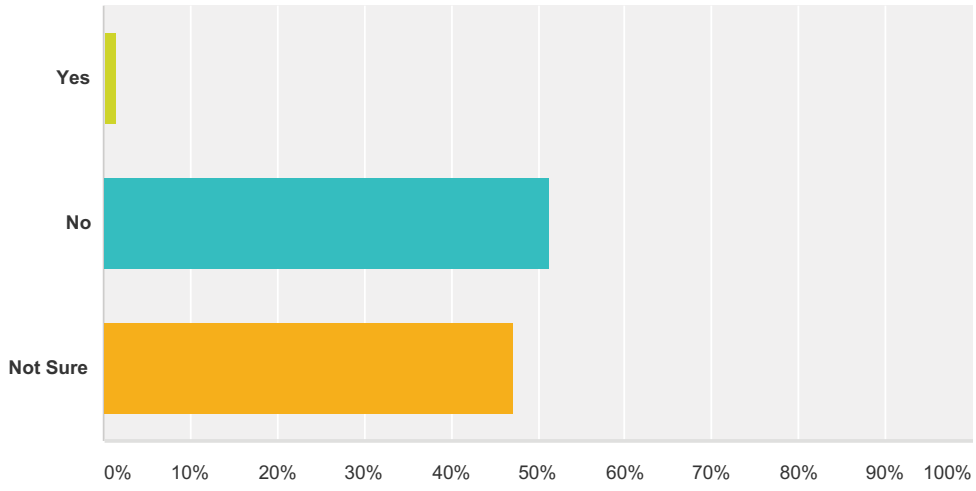
Answered: 646 Skipped: 25



Answer Choices	Responses	
Yes	**6.19%**	40
No	**83.90%**	542
Not Sure	**9.91%**	64
Total		**646**

Q13 Is your residence located near an earthquake fault?

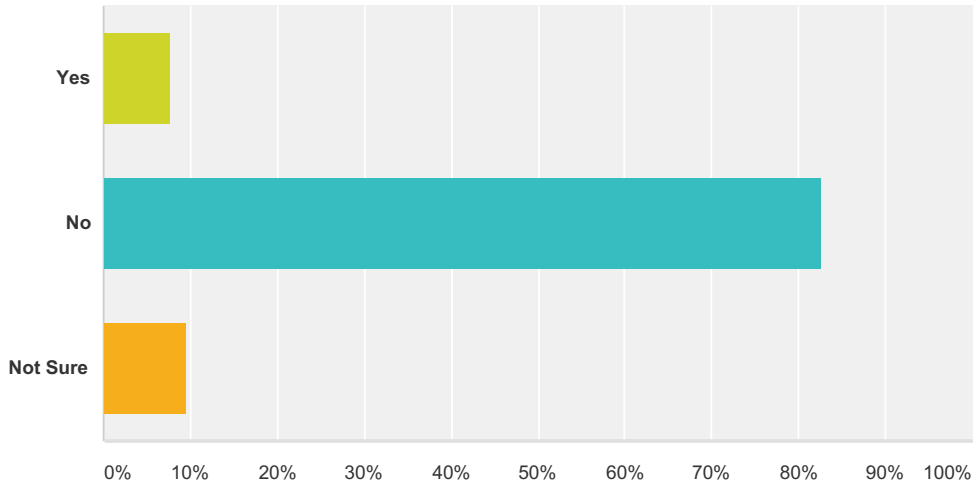
Answered: 646 Skipped: 25



Answer Choices	Responses	
Yes	**1.39%**	9
No	**51.39%**	332
Not Sure	**47.21%**	305
Total		**646**

Q14 Do you have earthquake insurance?

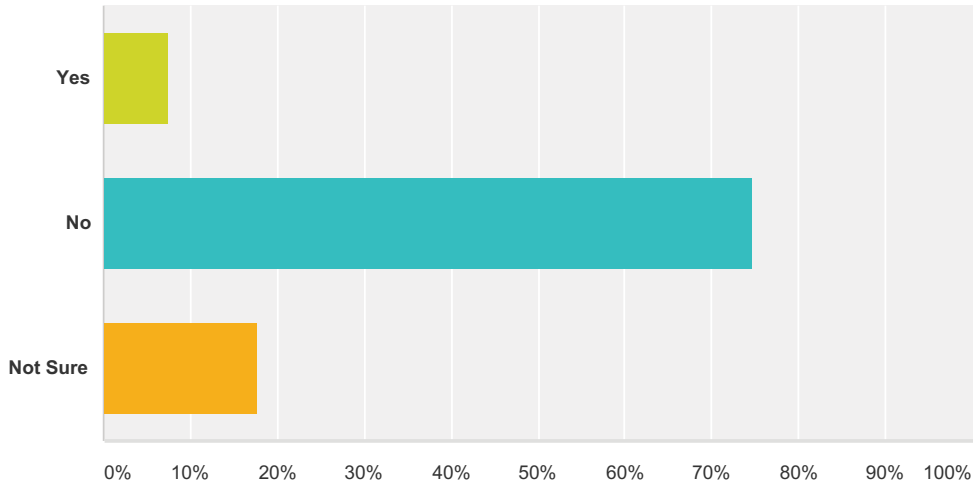
Answered: 646 Skipped: 25



Answer Choices	Responses	
Yes	**7.74%**	50
No	**82.66%**	534
Not Sure	**9.60%**	62
Total		**646**

Q15 Is your property located in an area at risk for wildfires?

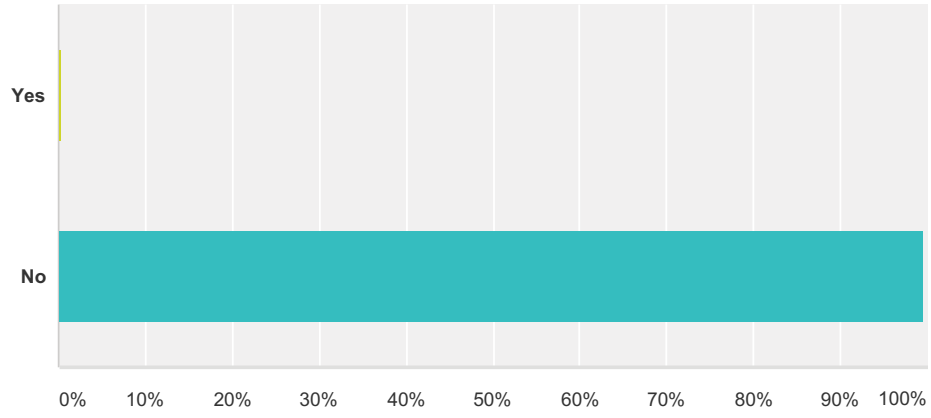
Answered: 646 Skipped: 25



Answer Choices	Responses	
Yes	**7.59%**	49
No	**74.77%**	483
Not Sure	**17.65%**	114
Total		**646**

Q16 Have you ever had problems securing homeowners or renters insurance due to risks from hazards?

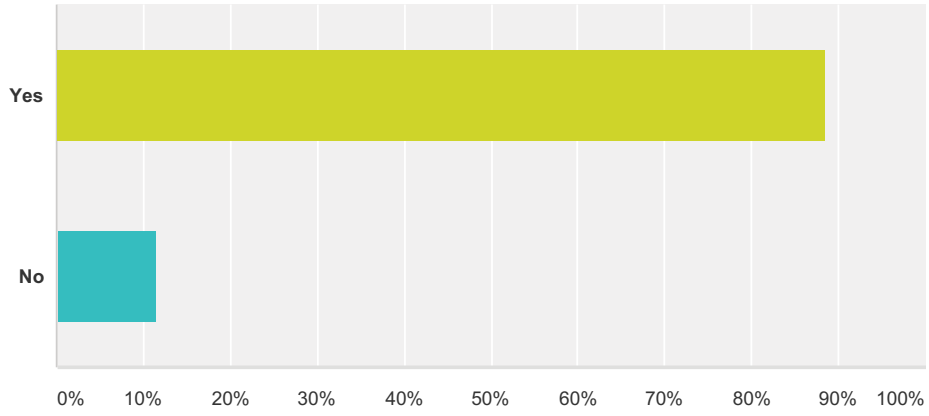
Answered: 641 Skipped: 30



Answer Choices	Responses	
Yes	**0.47%**	3
No	**99.53%**	638
Total		**641**

Q17 Do you support policies to restrict or prohibit development in designated hazard zones?

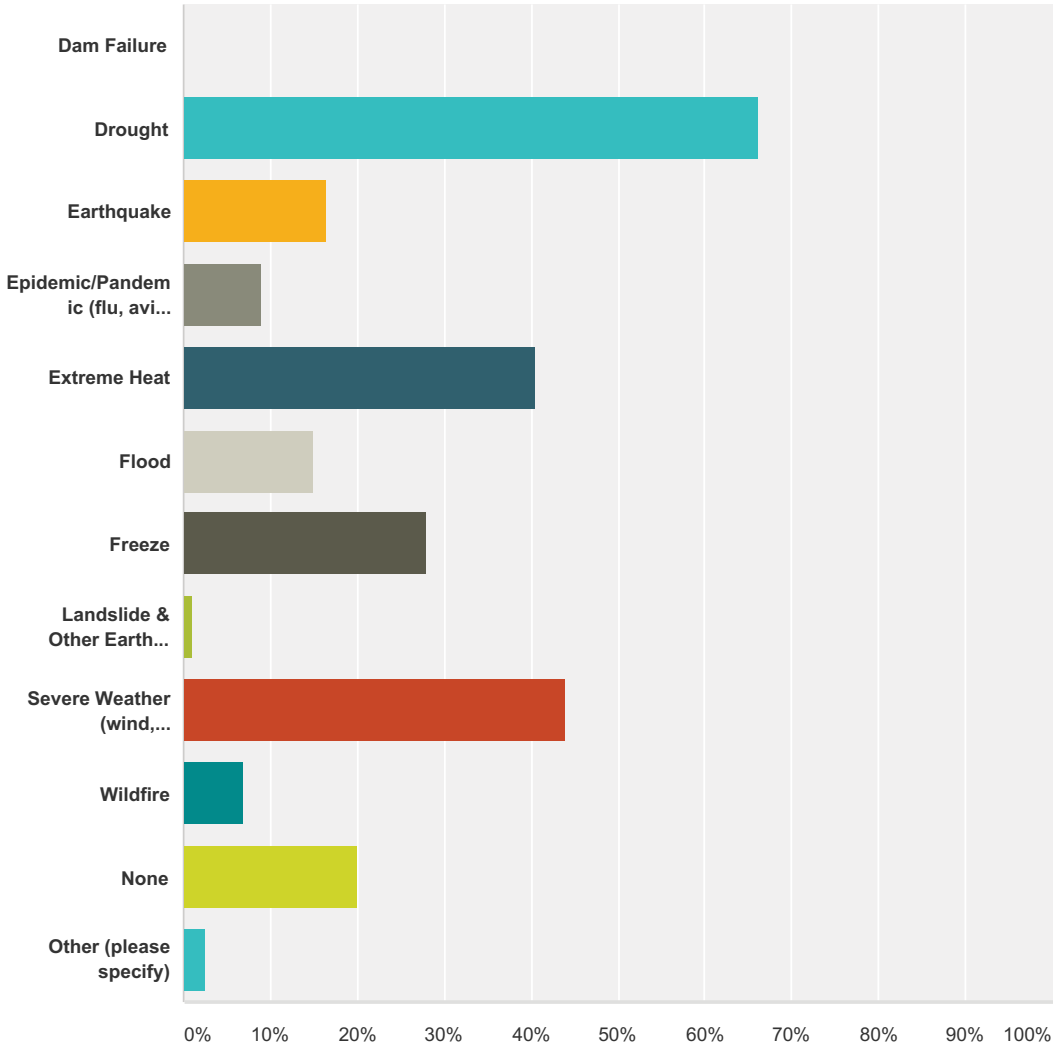
Answered: 623 Skipped: 48



Answer Choices	Responses	
Yes	**88.60%**	552
No	**11.40%**	71
Total		**623**

Q18 Which of the following natural hazard events have you or has anyone in your household experienced within the past 20 years in Roseville? (Check all that apply)

Answered: 556 Skipped: 115

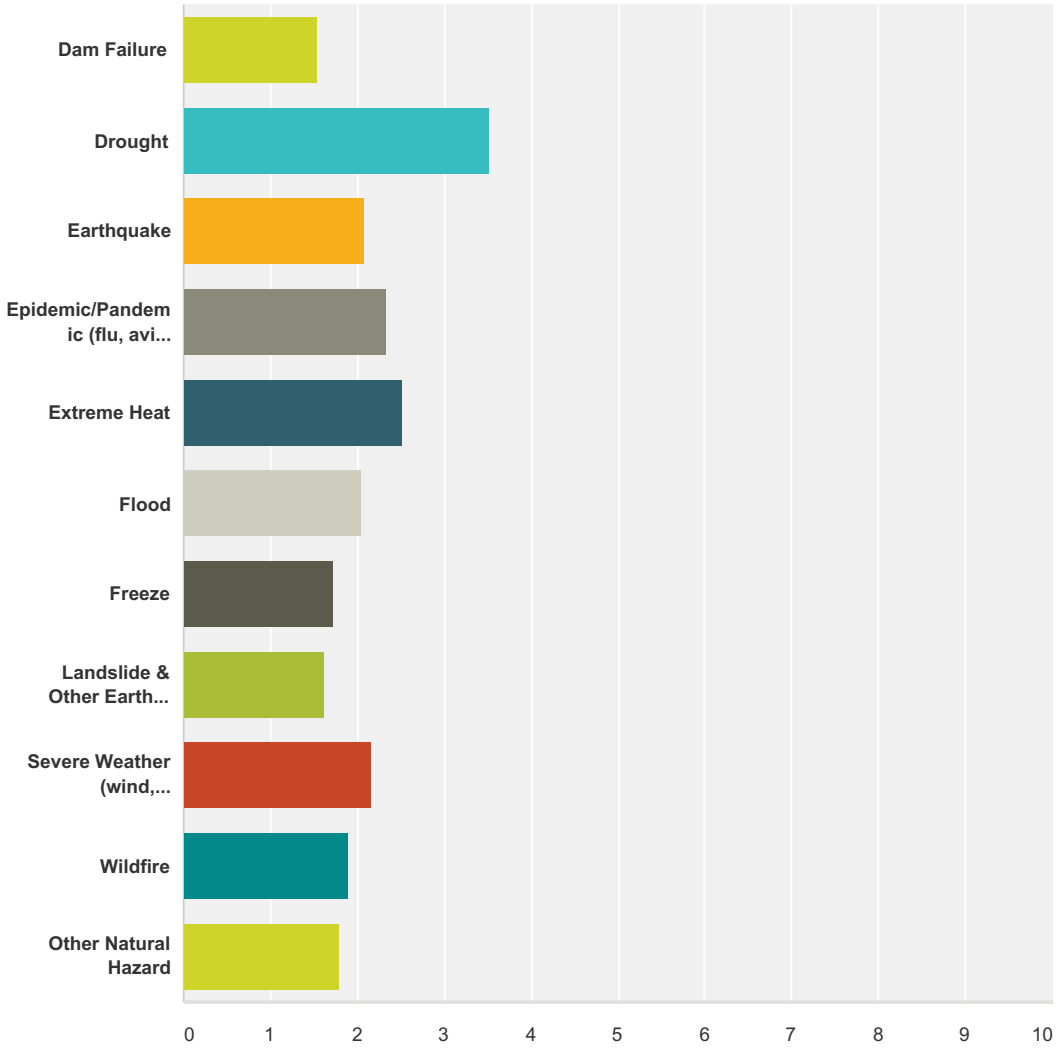


Answer Choices	Responses	
Dam Failure	**0.00%**	0
Drought	**66.19%**	368
Earthquake	**16.55%**	92
Epidemic/Pandemic (flu, avian flu, H1N1, West Nile)	**8.99%**	50
Extreme Heat	**40.47%**	225
Flood	**15.11%**	84
Freeze	**27.88%**	155

Landslide & Other Earth Movements (non-seismic induced landslides and earth movements;subsidence;sinkholes;geologic hazard)	**1.08%**	6
Severe Weather (wind, lightning, winter storm, etc.)	**44.06%**	245
Wildfire	**6.83%**	38
None	**19.96%**	111
Other (please specify)	**2.52%**	14
Total Respondents: 556		

Q19 How concerned are you about the following natural hazards in Roseville? (Please check one for each hazard)

Answered: 562 Skipped: 109

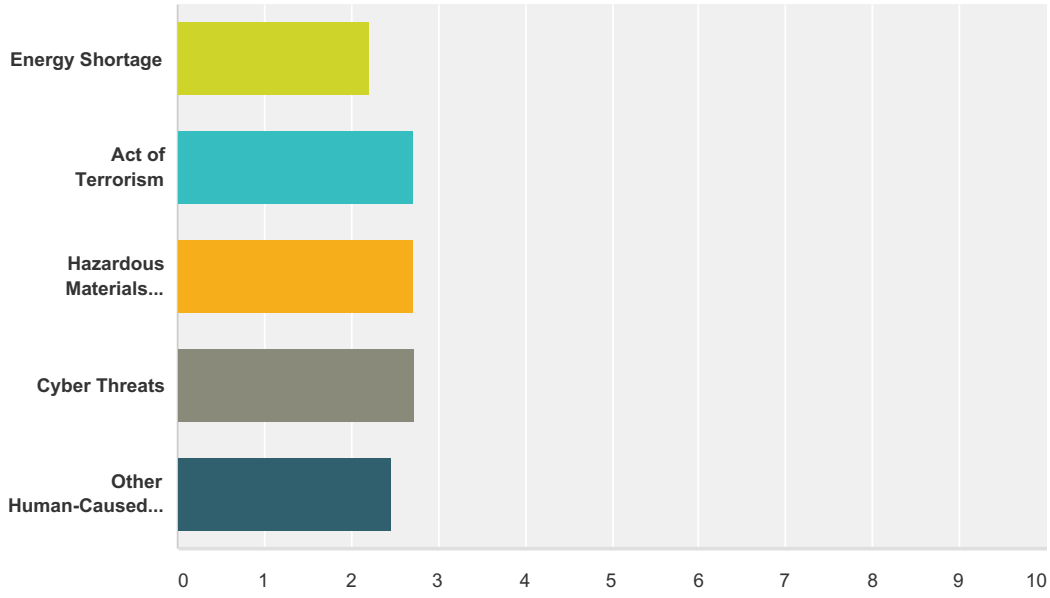


	Not concerned	Somewhat concerned	Concerned	Very concerned	Extremely concerned	Total	Weighted Average
Dam Failure	**64.76%** 351	**22.51%** 122	**8.86%** 48	**2.03%** 11	**1.85%** 10	542	1.54
Drought	**7.10%** 38	**12.15%** 65	**25.42%** 136	**32.52%** 174	**22.80%** 122	535	3.52
Earthquake	**32.15%** 172	**38.88%** 208	**20.00%** 107	**5.98%** 32	**2.99%** 16	535	2.09
Epidemic/Pandemic (flu, avian flu, H1N1, West Nile, Ebola)	**28.01%** 149	**31.58%** 168	**25.38%** 135	**8.46%** 45	**6.58%** 35	532	2.34
Extreme Heat	**24.54%** 132	**27.14%** 146	**26.02%** 140	**15.99%** 86	**6.32%** 34	538	2.52

Flood	**38.14%** 201	**32.83%** 173	**18.98%** 100	**6.07%** 32	**3.98%** 21	527	2.05
Freeze	**52.31%** 272	**29.23%** 152	**12.50%** 65	**4.04%** 21	**1.92%** 10	520	1.74
Landslide & Other Earth Movements (non-seismic induced landslides and earth movements;subsidence;sinkholes;geologic hazard)	**60.30%** 319	**25.33%** 134	**8.70%** 46	**3.21%** 17	**2.46%** 13	529	1.62
Severe Weather (wind, lightning, winter storm, etc.)	**30.78%** 165	**35.45%** 190	**22.95%** 123	**7.65%** 41	**3.17%** 17	536	2.17
Wildfire	**50.37%** 270	**25.19%** 135	**14.18%** 76	**5.22%** 28	**5.04%** 27	536	1.89
Other Natural Hazard	**53.80%** 262	**25.05%** 122	**13.76%** 67	**3.08%** 15	**4.31%** 21	487	1.79

Q20 How concerned are you with the following manmade hazards in Roseville? (Check all that apply)

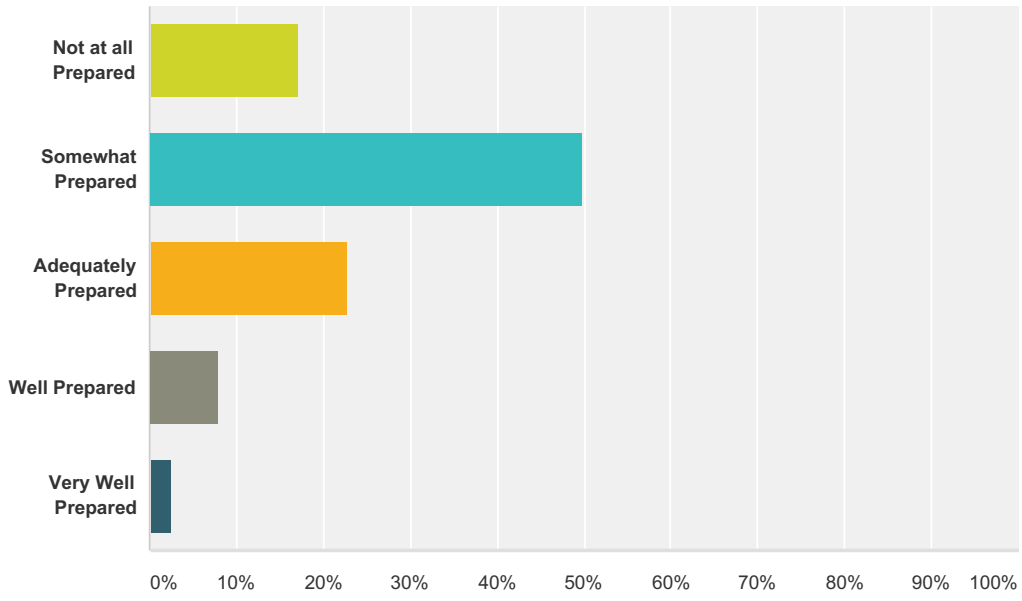
Answered: 562 Skipped: 109



	Not concerned	Somewhat concerned	Concerned	Very concerned	Extremely concerned	Total	Weighted Average
Energy Shortage	**28.30%** 150	**37.55%** 199	**22.83%** 121	**7.36%** 39	**3.96%** 21	530	2.21
Act of Terrorism	**16.76%** 90	**30.54%** 164	**26.63%** 143	**16.95%** 91	**9.12%** 49	537	2.71
Hazardous Materials Release	**15.92%** 85	**32.02%** 171	**26.97%** 144	**15.17%** 81	**9.93%** 53	534	2.71
Cyber Threats	**15.99%** 86	**29.93%** 161	**28.07%** 151	**17.47%** 94	**8.55%** 46	538	2.73
Other Human-Caused Hazard	**25.20%** 125	**29.84%** 148	**25.81%** 128	**11.49%** 57	**7.66%** 38	496	2.47

Q21 The FEMA website - Ready.gov - provides important information on how to prepare you and your family in the event of a disaster.How prepared is your household for a natural or human-caused hazard event? (Check one)

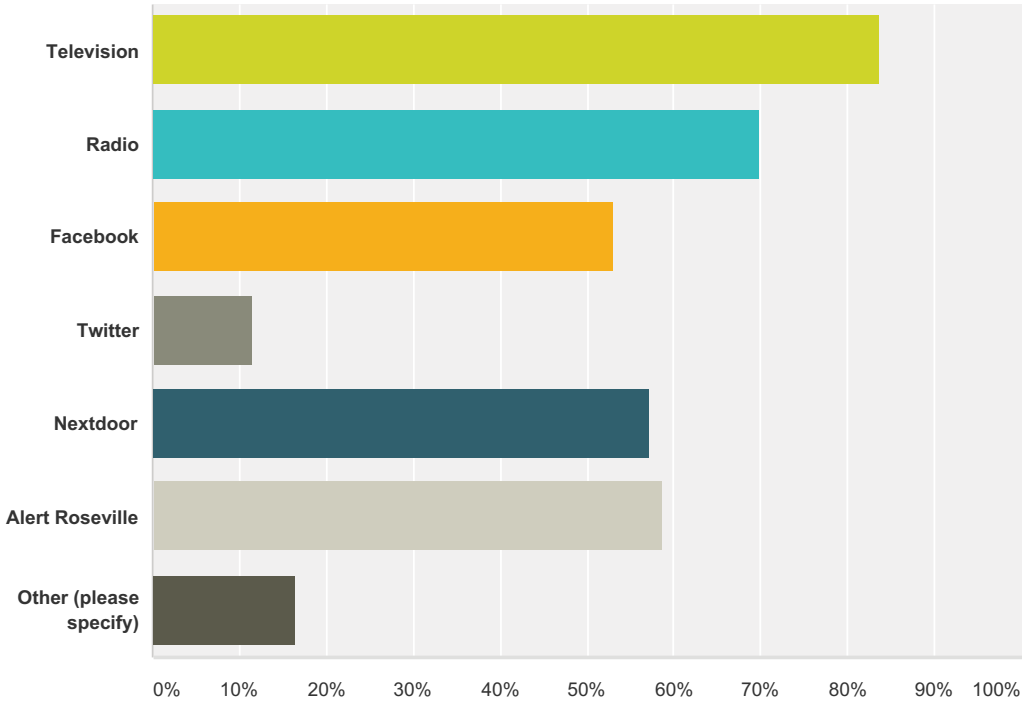
Answered: 562 Skipped: 109



Answer Choices	Responses	
Not at all Prepared	**17.08%**	96
Somewhat Prepared	**49.82%**	280
Adequately Prepared	**22.78%**	128
Well Prepared	**7.83%**	44
Very Well Prepared	**2.49%**	14
Total		**562**

Q22 How would you expect to be notified in case of an immediate threat caused by a natural or human-caused hazard.Select all that apply.

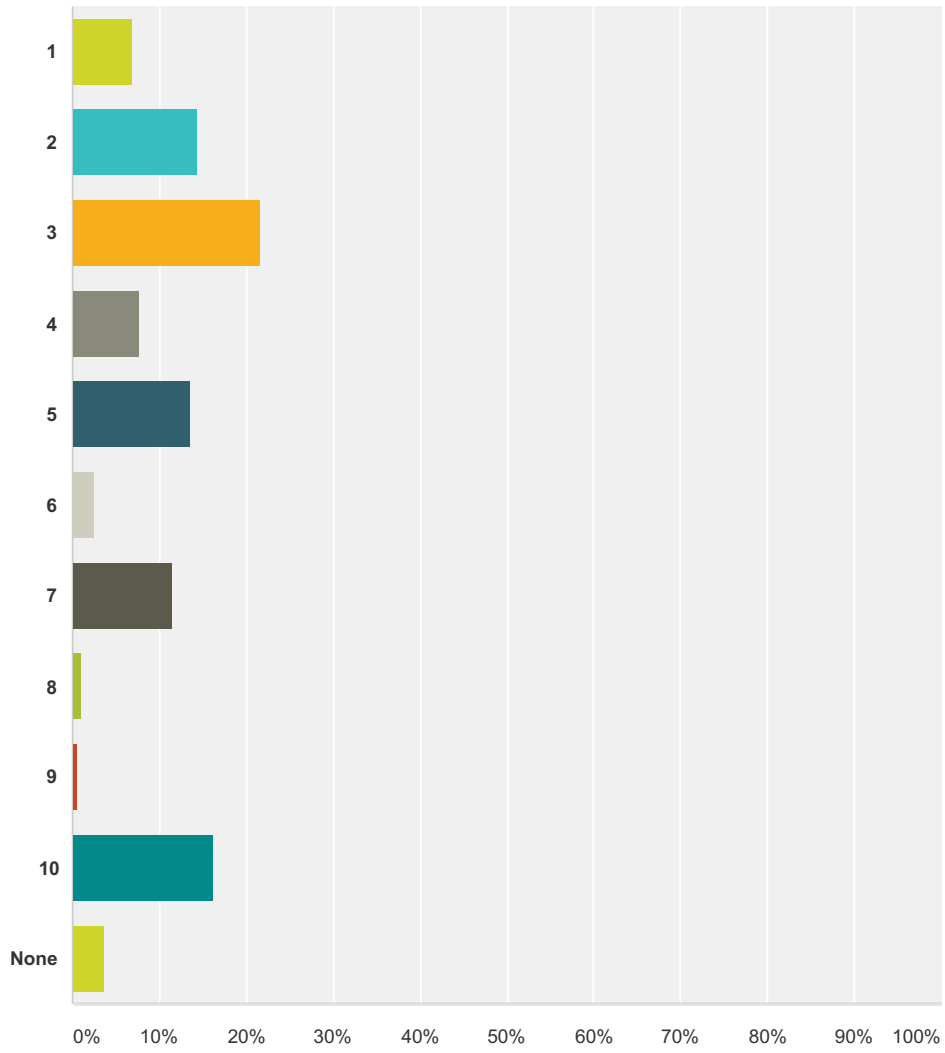
Answered: 562 Skipped: 109



Answer Choices	Responses	
Television	**83.81%**	471
Radio	**69.93%**	393
Facebook	**53.02%**	298
Twitter	**11.57%**	65
Nextdoor	**57.12%**	321
Alert Roseville	**58.72%**	330
Other (please specify)	**16.55%**	93
Total Respondents: 562		

Q23 FEMA suggests that households have at least 3 days of food, water, and vital supplies (e.g. medications) in hand in the event of a disaster. How many days of food, water, and vital supplies does your family have on hand in the event of a disaster?

Answered: 556 Skipped: 115

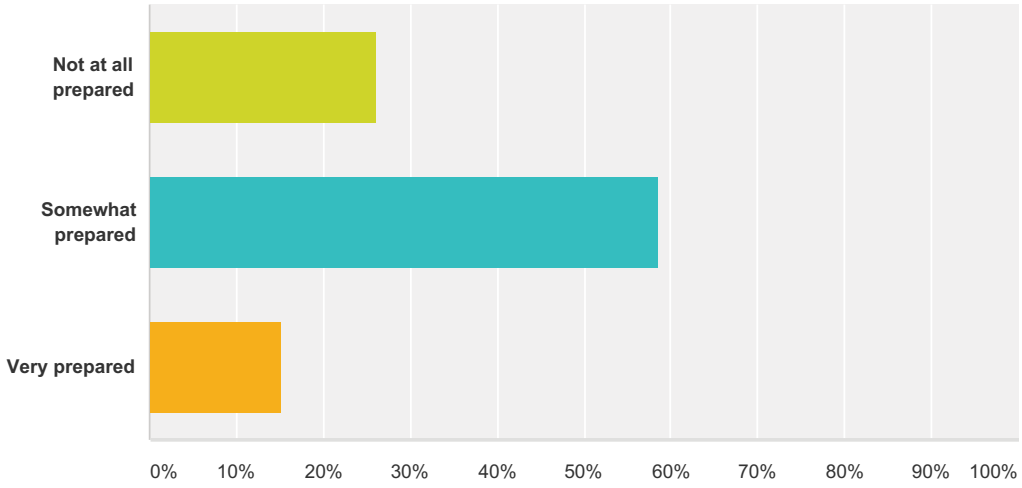


Answer Choices	Responses	
1	**6.83%**	38
2	**14.39%**	80
3	**21.76%**	121
4	**7.73%**	43
5	**13.67%**	76

6	**2.52%**	14
7	**11.51%**	64
8	**1.08%**	6
9	**0.54%**	3
10	**16.19%**	90
None	**3.78%**	21
Total		**556**

Q24 How prepared are you to get along without electricity or natural gas for one to five days?

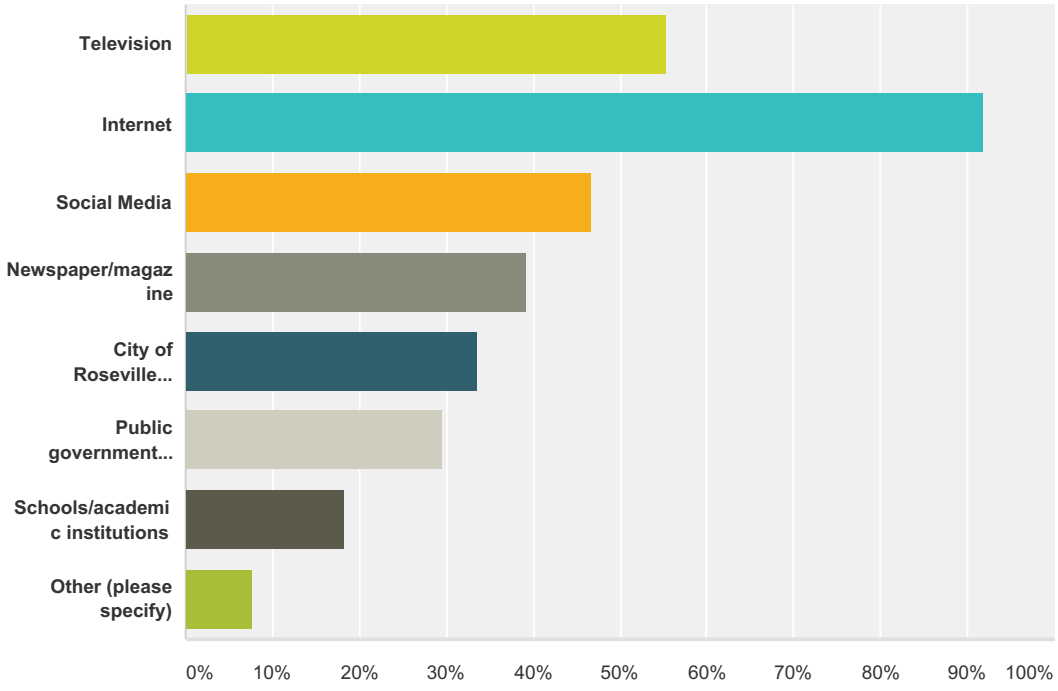
Answered: 558 Skipped: 113



Answer Choices	Responses	
Not at all prepared	**26.16%**	146
Somewhat prepared	**58.60%**	327
Very prepared	**15.23%**	85
Total		**558**

Q25 Where would you expect to find useful information to help you be prepared?Select all that apply.

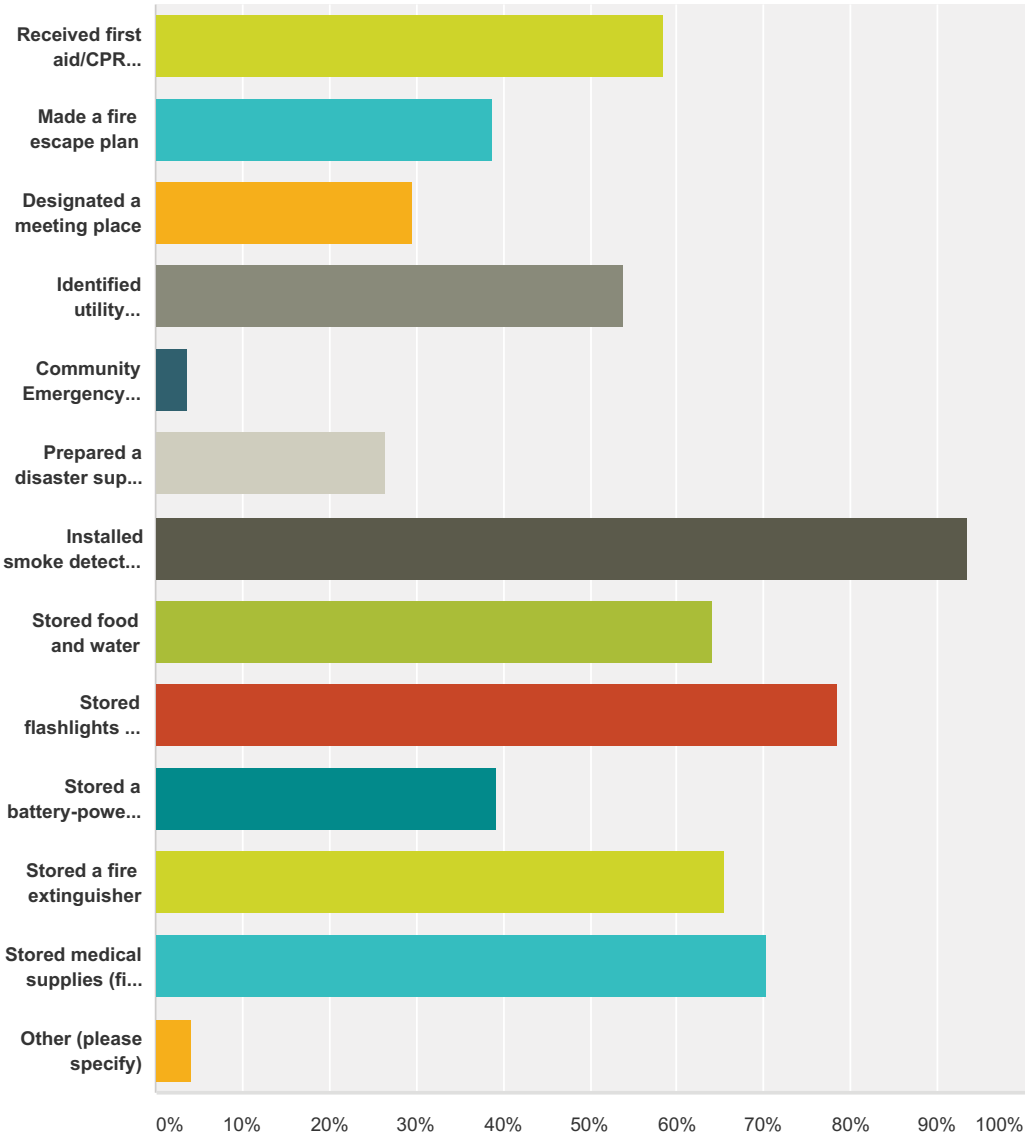
Answered: 560 Skipped: 111



Answer Choices	Responses	
Television	**55.36%**	310
Internet	**91.79%**	514
Social Media	**46.79%**	262
Newspaper/magazine	**39.29%**	220
City of Roseville Public Library	**33.57%**	188
Public government meetings	**29.64%**	166
Schools/academic institutions	**18.39%**	103
Other (please specify)	**7.68%**	43
Total Respondents: 560		

Q26 Which of the following steps has your household already undertaken to prepare for a natural or manmade disaster?Select all that apply.

Answered: 558 Skipped: 113



Answer Choices	Responses	
Received first aid/CPR training	**58.42%**	326
Made a fire escape plan	**38.89%**	217
Designated a meeting place	**29.57%**	165
Identified utility shutoffs	**53.94%**	301
Community Emergency Response Training (CERT)	**3.76%**	21

Prepared a disaster supply kit	**26.52%**	148
Installed smoke detectors on each level of the house	**93.55%**	522
Stored food and water	**64.16%**	358
Stored flashlights and batteries	**78.49%**	438
Stored a battery-powered radio	**39.25%**	219
Stored a fire extinguisher	**65.59%**	366
Stored medical supplies (first aid kit, medications)	**70.25%**	392
Other (please specify)	**4.12%**	23
Total Respondents: 558		

Q27 Please provide any additional comments you would like to share with the City of Roseville Planning Team.

Answered: 65 Skipped: 606

Q28 If you would like to receive information regarding upcoming public events and other participatory opportunities regarding hazard mitigation, please provide your email address below.

Answered: 223 Skipped: 448

From: City of Roseville <Roseville@public.govdelivery.com>
Sent: Tuesday, March 1, 2016 8:59 AM
To:
Subject: City of Roseville News - March 1, 2016





Downtown Roseville update

It will be a busy couple years for city building projects in Downtown Roseville. All of the projects are part of the Downtown Specific Plan designed through a community visioning process in 2009. The highly popular Vernon Street Town Square and roundabout at Washington Boulevard and Oak Street are examples of projects already completed in accordance with the plan.

Current projects include an office building at 316 Vernon Street, the Oak Street Parking facility, a new downtown Fire Station, three pedestrian bridges and bike trail connections through downtown.

Find out more



Leaks can run, but they can't hide! Every day during Fix a Leak Week, visit the Roseville Utility Exploration Center to learn where water-wasting leaks hide around home, and learn how to fix them. Use a dye tablet to find toilet leaks, get your hands on a variety of sprinklers, and enter for a chance to win a smart timer or other water-saving technology. Best of all, it is free.

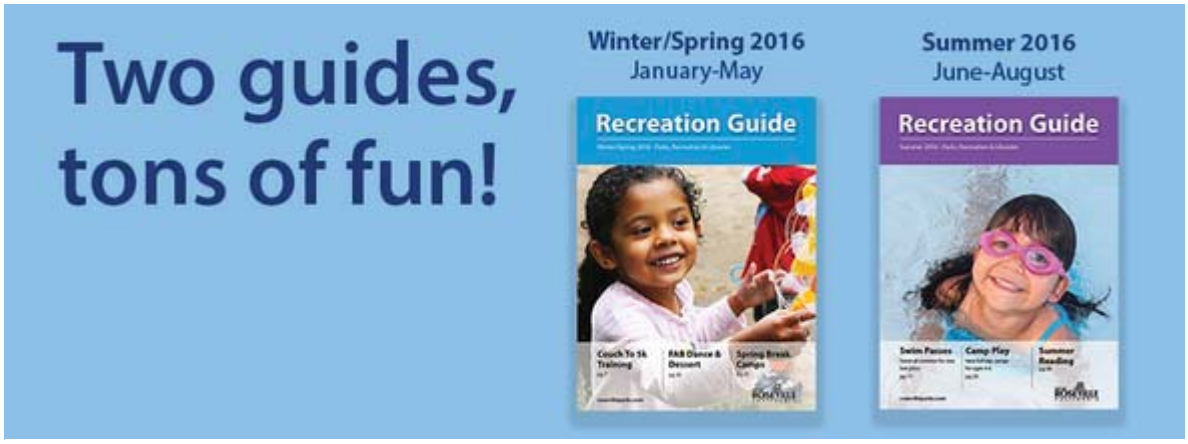
For more information call 916-746-1550 or visit the Fix A Leak Week page.



Roseville explores creating waste into energy

Work is underway right now to develop a project that would one day help power one of the city's wastewater treatment plants or provide fleet vehicle fuel using Compressed Natural Gas (CNG). This project is in its infancy and more work is needed to see this effort become a reality. But we're hard at work behind the scenes to bring this project online within the next three to five years.

For more information



Download them now at roseville.ca.us/guide



Affordable Housing Information & Workshop

The City of Roseville Affordable Housing Program is offering down payment assistance for qualified households to purchase affordable homes at a new Lennar community in West Roseville.

The City and Lennar will host an affordable housing workshop to provide more information about the program, **5:30 p.m., Wednesday, March 9** in the Roseville City Council Chambers, 311 Vernon Street in Roseville.

Find out more.



Do you know your risk...

. . .when it comes to flood, earthquake or any natural or man made disaster here in Roseville? Do you and your family have a three day supply ...of food and water should a disaster occur?

While a range of natural and man-made disasters can affect any community, the City of Roseville is always taking steps to reduce the risk to residents and businesses. We need your input to remain prepared and ensure our community can recover as quickly as possible, should a disaster occur. Please help us by taking a few minutes to complete this community survey

---



Apply for up to $200 toward a new commuter bike

Apply for an opportunity to receive up to $200 toward a new commuter bike. Bucks for Bikes helps commuters start using an active, clean, traffic-relieving mode of travel—bicycling! **Submit your application by 5 p.m., Monday, March 21.** This is made possible by the City of Roseville and Placer County Transportation Planning Agency.

Find out more.



Superhero Storytime

We are all super heroes! Visit the Martha Riley Library on the 4th Tuesday of the month through May and we'll explore the everyday superheroes of our city. From 1-1:30 p.m., Miss Lisa will guide us through stories, songs, and activities to discover the super hero in you. Then, come explore the Utility Exploration Center from 1:30 - 2 p.m. to discover play time with special activities to help practice your superhero skills. These fun events are free.

For more information call 916-746-1550.



UPCOMING CITY MEETINGS

Meeting agendas and minutes

City Council Meeting - 7 p.m., Wednesday, March 2

Planning Commission Meeting - 7 p.m., Thursday, March 10

Parks and Recreation Commission Meeting - 7 p.m., Monday, March 7

Transportation Commission Meeting - 7 p.m., Tuesday, March 15

Public Utilities Commission Meeting - 7 p.m., Tuesday, March 22

Multi-Hazard Mitigation Plan Steering Committee Meeting - 5:30 p.m., Tuesday, March 1, Civic Center Meeting Rooms 1 & 2

Unless otherwise noted, Council and Commission meetings are held in the Roseville City Council Chambers at 311 Vernon Street. Meetings held in the City Council Chambers can be viewed live online or later on demand.

AlertRoseville

If we can't reach you, we can't alert you. Sign up now.

311 Vernon Street, Roseville, CA 95678

(916) 774-5200 | www.roseville.ca.us

Unsubscribe/Update profile

This email was sent to hdyda@roseville.ca.us using GovDelivery, on behalf of: City of Roseville · 311 Vernon St. Roseville · CA 95678

powered by govDELIVERY get the word out.

From: City of Roseville <Roseville@public.govdelivery.com>
Sent: Tuesday, August 2, 2016 8:33 AM
To:
Subject: City of Roseville News - August 2, 2016





Roseville named 11th healthiest city in U.S.

Roseville is the 11th healthiest city in the United States, according to Niche.com.

The ranking provides a comprehensive assessment of the general levels of health among residents in Roseville.

This grade takes into account key indicators of personal health, such as smoking, excessive alcoholic consumption, rates of obesity, as well as the availability and proximity of fitness facilities, doctors, and mental health practitioners, in an attempt to measure an area's performance in health and fitness.

You can read more about the rankings here.



Roseville among 25 safest cities in the country

Roseville has been ranked among the 25 safest cities in the US! Niche.com ranked U.S. cities over 100,000 population for safety, based on FBI crime statistics.

Roseville Police Chief Daniel Hahn said, “It takes more a good police department to create a safe city. It also takes city leaders who put public safety first; and a community that won’t settle for anything less, and is willing to get involved to make it happen. We’re very blessed in Roseville to have all three.”

See the rankings here.



Roseville recognized as national flood protection leader

FEMA has again been recognized Roseville as the national leader in flood preparation. Roseville is the only city in the country to hold FEMA's top flood control rating. Roseville's top rating means flood insurance discounts of up to 45% for residents and businesses.

Find out more



National Night Out is tonight

National Night Out is considered America's night out against crime.

We encourage you to lock your home and connect with your neighbors at one of the 40 National Night Out community events in Roseville.

Not sure if your neighborhood is hosting an NNO party? Visit the Roseville Coalition of Neighborhood Associations website at www.RCONA.org to contact your neighborhood association.

Find out more



Talk trash with Curby

You know where trash comes from, but where does it go? Join the Utility Exploration Center **Saturday, August 27** for free family fun at Curby's Waste-a-Palooza!

Fight the unflushables in the Sewer Swim, defend against Trashville and talk trash with Curby to test your knowledge in our quiz show. Challenge yourself in the game room where you can reuse, rethink, recycle and help knock out excess waste.

Grab a water repair LEGO® City set for just $10 (while supplies last) in the activity room for a fun build-it activity!

Find out more

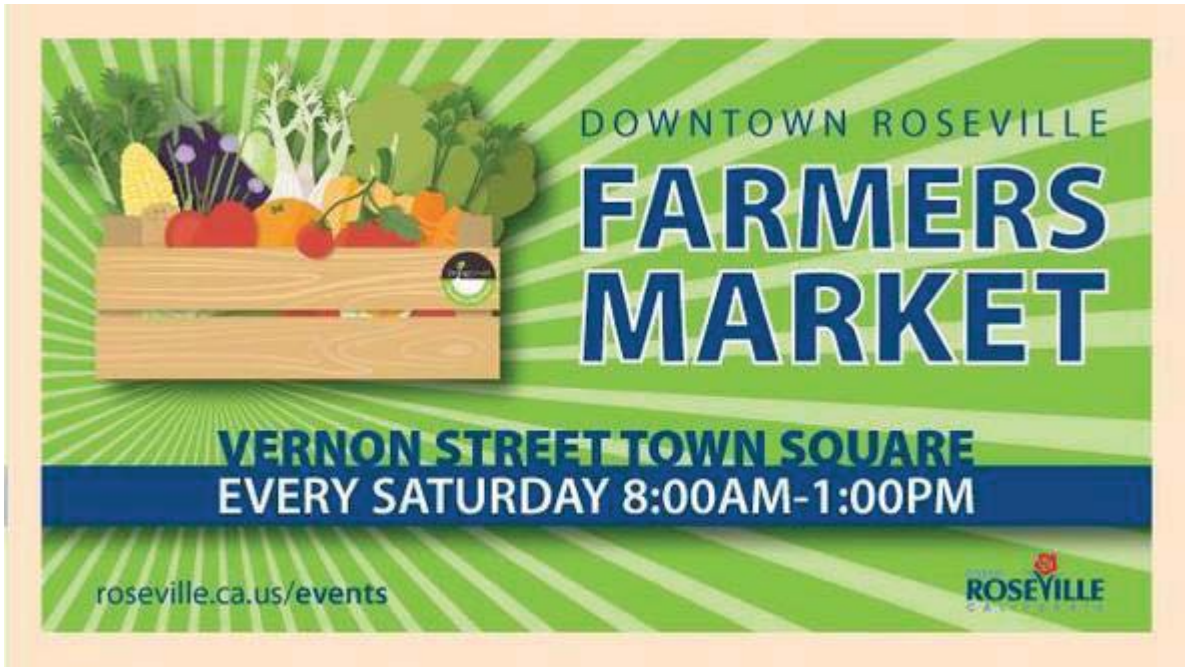


Tired of the traffic backups?

Traffic is one of the topics we hear most about from you. There is a plan to raise about $1.6 billion to fund highway projects, public transit expansion, local street maintenance and improvements including Highway 65 widening and the Highway 65 / I-80 interchange.

With other funding being more difficult to obtain, a ballot measure to increase retail sales tax by a half percent to raise funds for transportation improvements in Placer County was placed on the November 8, 2016, presidential general election ballot by the Placer County Board of Supervisors.

Find out more



Street resurfacing ahead for parts of Roseville

Resurfacing is scheduled **to begin late summer/fall** for residential streets in the Foothills/Junction and West Park neighborhoods.



Some more heavily traveled roads in Roseville will also be resurfaced this summer. The specific roads and schedule can be found here.

Regular roadway maintenance reduces the need for major costly street repairs in the future by protecting Roseville streets.

Check out this short video to learn more about how we prioritize road maintenance.



Tri County Job Fair to be held August 18

The Tri County Job Fair provides an excellent opportunity for job seekers to meet with businesses within the region and demonstrate their qualifications. This year's event will be held from **9 a.m. - noon, Thursday, August 18 at William Jessup University.**

For more information and to register

Learn about planned changes to 916 area code

The 916 area code we use in Roseville is expected to use up its available prefixes by December 2018. The California Public Utilities Commission (CPUC) will be holding a public meeting to discuss proposed changes and to get public feedback on their plan at **1 p.m., Tuesday, August 16** in the Roseville Civic Center's Meeting Rooms 1 & 2.

The CPUC is proposing adding an additional area code to the region. The proposal would allow current customers to keep their area code. Beginning in June 2018, customers requesting new phone numbers may be assigned a new area code.

Find out more

Comment on city's Draft Multi-Hazard Mitigation Plan

You are invited to review and provide comments on the 2016 City of Roseville Multi-Hazard Mitigation Plan.

This plan details the risks of both natural and manmade hazards in Roseville and includes programs and projects to help reduce the exposure of city residents and businesses should an event occur. By having a plan in place, Roseville is eligible for federal pre-disaster and post-disaster assistance.

Input on the plan can be submitted through Friday, August 19, 2016.

View the plan and find out more



UPCOMING CITY MEETINGS

Meeting agendas and minutes

City Council Meeting - 7 p.m., Wednesday, August 3

Planning Commission Meeting - 7 p.m., Thursday, August 11

Parks and Recreation Commission Meeting - September meeting canceled

Transportation Commission Meeting - August meeting canceled

Public Utilities Commission Meeting - 7 p.m., Tuesday, August 23

Unless otherwise noted, Council and Commission meetings are held in the Roseville City Council Chambers at 311 Vernon Street. Meetings held in the City Council Chambers can be viewed live online or later on demand.

AlertRoseville

If we can't reach you, we can't alert you. Sign up now.

311 Vernon Street, Roseville, CA 95678

(916) 774-5200 | www.roseville.ca.us

Unsubscribe/Update profile

This email was sent to hdyda@roseville.ca.us using GovDelivery, on behalf of: City of Roseville · 311 Vernon St. Roseville · CA 95678

powered by govDELIVERY get the word out.

From: City of Roseville <Roseville@public.govdelivery.com>
Sent: Tuesday, August 16, 2016 9:18 AM
To:
Subject: City of Roseville News - August 16, 2016





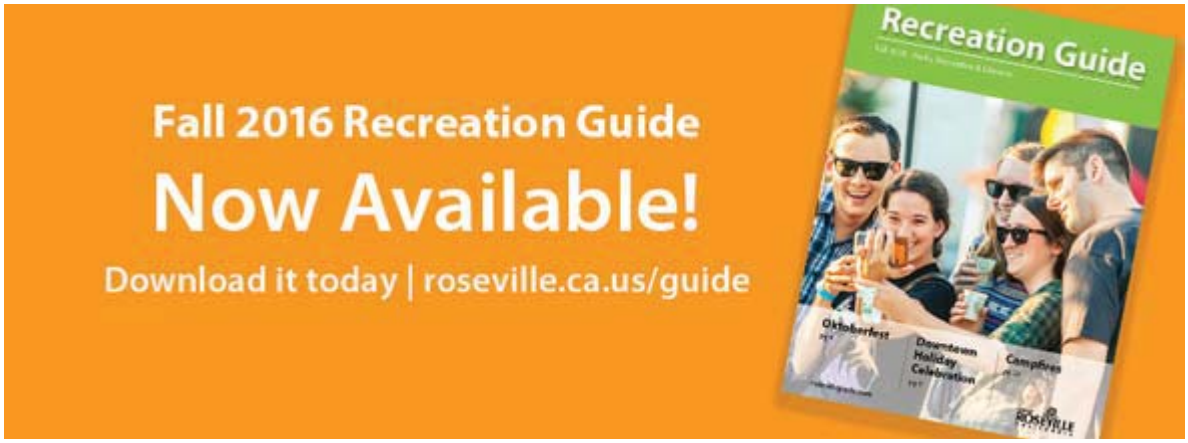
Be safe heading back to school

All Roseville-area high school and elementary schools will be back in session this week. That means traffic around those schools will be congested.

Read on for a refresher course on back-to-school safety.

Walking or biking to school is a great idea. To combat the common fear that walking to school isn't safe, City of Roseville traffic engineers and the Safe Routes to School Coordinators have designated safe routes for students of all ages and abilities.

Learn about our Safe Routes to School program



Unemployment rate drops to 3.8 percent in Roseville



The unemployment rate in Roseville is in the lowest 4 percent in the state, 20th of 482 cities in California.

“The leading job sector is healthcare, and healthcare-related businesses,” said Roseville Economic Development Director Chris Robles.

“We have Kaiser, the largest employer in the city, and then Sutter is also one of our top employers. Then we have Adventist Health, which is also a significant employer in the city. Their west coast headquarters are here in Roseville.”

"A part of Roseville’s economic growth is correlated with education levels; namely a more educated work force. The local population over age 25 with a bachelor’s degree or higher was over 39 percent as of 2014 – a growth margin of 5 percent since 2010, correlating with the increase in educated workforce members and growing employment figures."

Read more in this article from the Roseville Press Tribune.





Talking traffic

Traffic is one of the topics we hear most about from you. There is a plan to raise about $1.6 billion to fund highway projects, public transit expansion, local street maintenance and improvements including Highway 65 widening and the Highway 65 / I-80 interchange.

With other funding being more difficult to obtain, a ballot measure to increase retail sales tax by a half percent to raise funds for transportation improvements in Placer County was placed on the November 8, 2016, presidential general election ballot by the Placer County Board of Supervisors.

Find out more



Woodcreek Oaks widening project workshop

We invite you to a community workshop to learn more about the Woodcreek Oaks Widening Project. The project team will be available to answer questions in an informal format.

Exhibits showing the project features and anticipated schedule will be on display.

Wednesday, August 24
5 - 7 p.m.
Martha Riley Library, Reading Room 3
1501 Pleasant Grove Blvd

The proposed project will widen the segment of Woodcreek Oaks Boulevard, from Crimson Ridge way south to 600 feet north of Pleasant Grove Boulevard, into the median to a four lane road.

This project also proposes to widen the bridge over the south branch of Pleasant Grove Creek to accommodate the additional roadway.

The new Campus Oaks development will widen Woodcreek Oaks Boulevard from Blue Oaks Blvd south to Crimson Ridge Way, and is expected to be constructed by the end of 2016.

Find out more





Trail resurfacing this week

Portions of Roseville trails system will be resurfaced this week. Notices of the upcoming closures will be posted at the trail entrances. While the resurfacing is underway, barricades will mark where the trails are closed. After the resurfacing is complete and the trail has reopened to the public, striping and sweeping will be performed.

Find out more

Street resurfacing ahead for parts of Roseville



Resurfacing is scheduled **to begin late summer/fall** for residential streets in the Foothills/Junction and West Park neighborhoods.

Some more heavily traveled roads in Roseville will also be resurfaced this summer. The specific roads and schedule can be found here.

Regular roadway maintenance reduces the need for major costly street repairs in the future by protecting Roseville streets.

Check out this short video to learn more about how we prioritize road maintenance.





Tri County Job Fair to be held August 18

The Tri County Job Fair provides an excellent opportunity for job seekers to meet with businesses within the region and demonstrate their qualifications. This year's event will be held from **9 a.m. - noon, Thursday, August 18 at William Jessup University.**

For more information and to register



Comment on city's Draft Multi-Hazard Mitigation Plan

You are invited to review and provide comments on the 2016 City of Roseville Multi-Hazard Mitigation Plan.

This plan details the risks of both natural and manmade hazards in Roseville and includes programs and projects to help reduce the exposure of city residents and businesses should an event occur. By having a plan in place, Roseville is eligible for federal pre-disaster and post-disaster assistance.

Input on the plan can be submitted through Friday, August 19, 2016.

View the plan and find out more



UPCOMING CITY MEETINGS

Meeting agendas and minutes

City Council Meeting - 7 p.m., Wednesday, August 17

Planning Commission Meeting - 7 p.m., Thursday, August 25

Parks and Recreation Commission Meeting - September meeting canceled

Transportation Commission Meeting - August meeting canceled

Public Utilities Commission Meeting - 7 p.m., Tuesday, August 23

Senior Commission Workshop - 11 a.m., Tuesday, August 23 at Maidu Community Center

Unless otherwise noted, Council and Commission meetings are held in the Roseville City Council Chambers at 311 Vernon Street. Meetings held in the City Council Chambers can be viewed live online or later on demand.

AlertRoseville

If we can't reach you, we can't alert you. Sign up now.

311 Vernon Street, Roseville, CA 95678

(916) 774-5200 | www.roseville.ca.us



Unsubscribe/Update profile

This email was sent to hdyda@roseville.ca.us using GovDelivery, on behalf of: City of Roseville · 311 Vernon St. Roseville · CA 95678

powered by govDELIVERY get the word out.

Appendix B. 2015 Progress Report

Roseville Multi-Hazard Mitigation Plan
2015 PROGRESS REPORT

Reporting Period

August 2014 through July 2015

Background

Following a tradition of progressive and innovative planning, the City of Roseville City Council approved an update to the Roseville Multi-Hazard Mitigation Plan (RMHMP) on January 3, 2011. The RMHMP details the City's vision for reducing risk from all hazards, identifying resources, information, and strategies for risk reduction. In accordance with requirements of the Disaster Mitigation Act of 2000, the City completed a 10-month process to update its 2005 RMHMP in a way that provided as many tangible benefits for the City as possible from a single planning effort. These benefits are associated with grant funding eligibility and maintaining the nation's only Class 1 rating under FEMA's Community Rating System (CRS). The plan was approved by FEMA Region IX for compliance with Section 201.6, Chapter 44 of the Code of Federal Regulations on March 28, 2011. By completing this process, the City complied with the Disaster Mitigation Act and maintained eligibility for hazard mitigation grant funding opportunities afforded under the Robert T. Stafford Act. The plan is available to the public through the City of Roseville Public Library online at the following website:

https://www.roseville.ca.us/fire/preparedness/hazard_mitigation_plan.asp

Benefits of Mitigation Planning

Maintenance of this plan enables the City of Roseville to pursue hazard mitigation grant funding administered by FEMA under the Robert T Stafford Act. A FEMA-approved Hazard Mitigation Plan is a principal prerequisite for this funding. Roseville has leveraged funding from this program in the past to significantly reduce the City's risk associated with natural hazards.

Summary Overview of the Plan's Progress

The performance period for the Hazard Mitigation Plan began on March 28, 2011, with FEMA's final approval. The initial performance period for this plan is 5 years, with an update anticipated before March 2016. As of the most recent reporting period, the performance period is 82 percent complete. The Hazard Mitigation Plan identified 63 hazard mitigation initiatives to be pursued during the 5-year performance period. As of the most recent reporting period, the following progress can be reported:

- 51 out of 63 initiatives (81%) reported ongoing action toward completion.
- 10 out of 63 initiatives (16%) reported no action taken.
- 1 out of 63 initiatives (2%) was completed.
- 1 initiative was removed due to elimination of a program.

Purpose

The purpose of this report is to provide the Roseville City Council, stakeholders and citizens an annual update on implementation of the action plan identified in the RMHMP. The objective of the annual evaluation is to ensure a continuous planning process that keeps the RMHMP dynamic and responsive to the needs of the stakeholders. This report was prepared by the planning team. It was reviewed and confirmed by the RMHMP Steering Committee, in accordance with Section 7.4 of the Plan, at the Steering Committee's annual meeting on November 3, 2015. This report discusses the following:

- Natural hazard events that have occurred within the last year
- Changes in risk exposure within the planning area
- Mitigation success stories
- Review of the action plan
- Changes in capability in the planning area that could impact plan implementation
- Recommendations for changes/enhancement

The RMHMP Steering Committee

The update to the RMHMP was overseen by a steering committee appointed by the Roseville City Council and made up of stakeholders in the planning area. During the plan's development, the Steering Committee agreed that it would remain as a body to oversee the maintenance of the plan as established in Chapter 7. The Steering Committee continues to exist and function as organized in its established ground rules. At a minimum, it provides technical review and oversight on development of the annual progress report. It is anticipated the Steering Committee's role in overall plan implementation will evolve, based on the hazard mitigation needs of the city. Annual turnover in its membership is monitored via the progress report. For this reporting period, the Steering Committee membership is as indicated in Table 1.

TABLE 1
2015 STEERING COMMITTEE MEMBERS

Name	Title	Jurisdiction or Agency
Rob Jensen	Acting City Manager	City Manager's Office
Jason Rizzi	Emergency Preparedness Manager	Fire Department
Wayne Wiley	Associate Planner	Development Services Dept.
Carl Walker	Senior Engineer/Floodplain Manager	Public Works Dept.
Helen Dyda	Public Information Specialist	Communications Dept.
Grace Keller	Resident	Community Emergency Response Team
Erik Angle	Emergency Preparedness Program	Sutter Roseville Medical Center
Brenette Macintosh	Safety Officer	Consolidated Communications
Mark Lacher	Risk Manager	Consolidated Communications
Mark Smith	Resident	RCONA Treasurer
Rod Rodriguez	Senior Emergency Services Specialist	Placer County OES
Rick Stalker	Stalker & Burnett RE Group	Placer County Association of Realtors
Michael Algots	Manager - Hazardous Materials	Union Pacific Railroad

Natural Hazard Events in the Planning Area

During the reporting period, the following hazard events affected the planning area:

- Due to the continuation of drought conditions, in May 2015, the City of Roseville announced further water-use restrictions for Roseville water customers. The restrictions were placed in response to Governor Brown's Executive Order and the State Water Resources Control Board's drought emergency action requiring a 25 percent statewide water-use reduction goal. In order to meet the State's goal, City of Roseville water customers were required to reduce water consumption by 28 percent over their use in 2013. For residential customers, the most noticeable change includes watering day restrictions for outdoor irrigation. Watering days for residential turf will be limited to two days per week, Monday and Friday only, before 10 a.m. and after 8 p.m. Commercial customers will have watering days limited to Monday and Thursday.

  In addition to restricted watering days, Roseville also incorporated additional water-use reduction strategies to achieve more water savings:

  – Water waste is prohibited.

  – Washing hardscape is prohibited, unless for health and safety concerns.

  – New or expanded landscape is limited to drought tolerant trees, shrubs and ground-cover irrigated on a drip irrigation system.

  – Fountains, ponds and decorative pools must be drained (unless ponds contain fish.)

  – Covers are required for all new pools and spas.

  – Low volume drip irrigation systems that irrigate at less than two gallons per hour are exempt from day of week watering restrictions.

- December 10-12, 2014: Over a three-day period, from December 10th to December 12, 2014, The National Weather Service forecasted a major winter storm to impact Northern California. All reasonable data from the National Weather Service estimated that the City of Roseville would receive 3.6 inches of rain from the storm event. Additionally, severe winds were forecasted to be a major factor in the event. In preparation of the storm event, the City of Roseville Fire Department chose to activate a Limited Emergency Operations Center (LEOC) at the Fire Department Administrative Headquarters, located at 401 Oak Street. The LEOC was staffed for a 36-hour period. The Placer County Office of Emergency Services was also activated during the storm event.

Changes in Risk Exposure in the Planning Area

The RMHMP update addressed the probable impact of the following natural hazard events in the City of Roseville:

- Dam failure
- Drought
- Earthquake
- Flood
- Landslides
- Human-caused hazards
- Human health hazards
- Severe weather
- Wildland fire

There was an F-0 tornado occurrence during the reporting period. Damage associated with the event was minimal. The occurrence of this event should be acknowledged in future updates to the risk assessment for

this plan. There were no other events during the reporting period that would alter or change the probability of occurrence or ranking of risk for the natural hazards addressed by the RMHMP.

Mitigation Success Stories

During the current reporting period, the City had a number of mitigation success stories that reflect the City's commitment to multi-hazard mitigation and the philosophy that the City Council and staff are responsible for the good stewardship of City resources.

Deployment of Everbridge Notification System and Alert Roseville

Using a Homeland Security grant, the City, along with Placer, Sacramento, and Yolo counties, implemented the Everbridge Mass Notification system. This is a robust and popular system that is used globally. The system will be used for both emergency and non-emergency notification of the public. In preparation for the deployment, over 100 city staff members from 13 city departments were trained in its use. Special courses were designed for public safety officials, including dispatchers, fire department chief officers, and police managers.

"Alert Roseville" (aka "Opt-In") went live in August 2014. This internet site was established to help members of the public register their contact information into the Everbridge system. A significant media and outreach program was developed to advertise the importance of getting this information from the public. The "Opt-In" portal will be explained at every public education event the Fire Department attends. Currently approximately 2,050 public members are signed up in the "Opt-In" portion of Everbridge. A significant increase is anticipated with the aggressive outreach program. To make this system really effective, the City will actively pursue getting those residents with primary cell phone service signed up to the Everbridge system. This is a high priority for the City.

Emergency Operation Center Drills, Incident Activations, and Training

Establishment of the Emergency Management Team

In October 2014, the City of Roseville established the Emergency Management Team, which is a standing committee, whose mission is to plan and prioritize emergency preparedness activities, training, and facilities of the City's Emergency Management Organization. The Emergency Management is comprised of at least one member of each City department and meets monthly to:

- Develop the organizational framework for implementation of the California Standardized Emergency Management System (SEMS) and the National Incident Management System (NIMS) within the City of Roseville.
- Ensure that each City department has the resources and training to function effectively in the roles outlined in the City's Emergency Operations Plan (EOP).
- Plan and develop a minimum of two Emergency Operations Center (EOC) exercises annually.
- Develop and maintain EOC facilities that provide an effective location to conduct EOC operations.
- Develop and maintain technology resources within the EOC necessary to gather and disseminate information effectively.

Preseason Flood Coordination

On October 30, 2014, City Floodplain Management staff presented the 2014-15 Preseason Flood Coordination and Severe Weather Plan Update to the City's Emergency Management Team. The update

included information on the 2014-15 winter weather outlook from the Climate Prediction Center and an overview of the changes to the City's Flood Warning & Response Plan. The most significant change to the Flood Warning & Response Plan was the addition of a Floodwall & Levee Failure component to the Plan.

EOC Activation—Levee Failure Exercise

On May 11, 2015, City Emergency Management staff conducted a four-hour EOC activation drill. This exercise was a full activation of the Emergency Management Organization, including Department Operations Centers (DOC). The exercise centered on a levee failure scenario, which included the flooding of an assisted living facility. This exercise emphasized the need for multiple Incident Actions Plans from various City departments.

Roseville Galleria Exercise

On May 27, 2015 the Roseville and Rocklin Regional SWAT Team, Roseville Rapid Containment Team, Explosive Ordnance Disposal Team, Placer County Special Enforcement Team, FBI and Roseville Fire Department's Tactical Medics, conducted a full scale training exercise at the Roseville Galleria. This was the third straight year Roseville's Public Safety teams and the Galleria have come together for critical incident planning and response training. This year's exercise was designed to address responses to improvised explosive devices by Public Safety and Galleria personnel.

The drill required unified command for organizing and deploying resources, coordinated response to multiple threats, and the ability to establish inter-operable communications across the agencies. Each FBI Field Office across the country was required to conduct a similar drill in coordination with local resources and our city was selected by FBI-Sacramento to be the lead partner agency out of all of the cities in the Sacramento FBI Field Office which covers most of the Central Valley from Fresno up to Oregon. Our drill was the first drill conducted in the country under this training requirement and was monitored from FBI HQ in Washington DC.

MCI 2015—Countywide First Responder Exercise

On June 17, 2015 the Roseville Police and Fire Department, Rocklin Fire, South Placer Fire, American Medical Response, the National Guard, the Officer of Emergency Services and the Sutter Roseville Medical Center all participated in a regional planning and training exercise at Sutter Roseville. The exercise was centered on a mock helicopter crash. Public Safety's planning and training objectives included the development of a unified command structure as identified by the Incident Command Structure as well as planning and response to security needs on the hospital's grounds.

Terrorism Threat Assessments

On May 7, 2014 Roseville Police Department staff performed a threat assessment of Roseville Electric's Power Plant, consisting of a "real-world "vulnerability and site security test at that location with unsuspecting employees Electric personnel.

A similar terrorism threat assessment was conducted in October 2014 at the Civic Center as well as Roseville Fire Station #1. Locations for the threat assessment were expanded to include Fire Stations #2, #5, and #9. Roseville Police Department plans to conduct future assessments for Fire Stations #3 and #4 in July and August of 2015.

Community Preparedness Education

In support of Homeland Security Presidential Directive/HSPD-8, the Sutter-Roseville Medical Center (SRMC) Emergency Preparedness Program rolled out the "Emergency Preparedness and You" community education program. This program focused on how individuals can be safe and prepared when disasters

strike. A version of this program was also rolled-out to healthcare staff, to provide staff readiness and add resiliency. To date, the SRMC Emergency Preparedness Program has provided training for over two hundred students.

Reorganization of the Emergency Operations Center

The City's Emergency Preparedness Manager, working closely with the Central Services and Information Technology—GIS staff, have revised the layout of the City's Emergency Operations Center, and have included new technology to assist with the presentation and dissemination of geographic information during an EOC activation. Computers with access to GIS data and overhead projector displays have replaced the use of ineffective Plexiglas-topped tables and grease pens to supplement Planning Section briefings within the EOC. The new technology also allows for better communication between the EOC and the City's Department Operation Centers, located throughout the City.

Department of Water Resources—Flood Fight Methods Training

On March 18, 2015 State of California Department of Water Resources staff provided a one-day Flood Fight Methods training exercise for the City's Public Works—Street Maintenance and Park Maintenance—Open Space Division staff. The Flood Fight Methods training is designed to assist public agencies with the implementation of corrective temporary methods utilized while combatting flood-related problems. The training consisted of four hours of classroom presentation and an afternoon of instruction on the techniques used to construct various sandbag structures and erosion protection methods.

Sutter Roseville Medical Center (SRMC)

Sutter Roseville Medical Center (SRMC) prides itself in the quality it provides in the realm of patient care and excelling above national standards and best practice. The **SRMC Emergency Preparedness Program** is no different. Disasters strike daily all over the globe. California is no exception. For the benefit of the staff, patients, visitors and the community and with the strong support of our leadership and the Emergency Preparedness Committee, SRMC continues on the ongoing journey of Emergency Preparedness and quality best practices. In the past year, SRMC has demonstrated the following in **Mitigation Success Stories** in Emergency Preparedness:

- **Master Exercise Practitioner (MEP) Certification:** The SRMC EP Coordinator completed the national level certification from FEMA/DHS as that of **Master Exercise Practitioner (MEP)**. With this this certifies that the coordinator has obtained and demonstrated competency in high level of disaster exercise design, from Table Top; functional and Full Scale Disaster Exercise. Due to the difficulty in being accepted into this program and the challenge of the program, as of now there are only 2,300 individuals certified with MEP in the country.
- **National Level Instructor Certification:** The SRMC EP Coordinator completed the national level certification from FEMA/DHS as that of a national level **Certified Instructor**. The course is conducted in two phases: fundamental principles and applied principle. During the fundamental principles phase participants receive an overview of adult learning, task analysis, risk and hazard analysis, learning objectives and lesson plans, communication skills, instructional delivery and multimedia, testing and evaluations, and after action reviews. Then, during the applied principles phase, participants put these lessons into practice through a series of practice training sessions. With this this certifies that the coordinator has obtained and demonstrated competency and the ability to interact and instruct adult learners.
- **Disaster Education:** Sutter Roseville Medical Center (SRMC) EP Program prides itself on education. Our education program for 2015 is holding 45 courses on Emergency Preparedness and has also worked with TEEX and FEMA for bringing their courses and staff here to teach as well. The EP Program coordinator had the honor of teaching a lecture at the FEMA National Training

Center in February of 2014 and March 2015 teaching lectures at the Emergency Nurse's Association (ENA) and Association of Critical Care Nurses (AACN) conference in April 2014 and July 2015. Annually in December, SRMC hosts the EMS-a-Palooza educational event at the facility. Speakers from all aspects of emergency care, from Trauma, Burns and Pediatrics, provide presentations to not only Sutter Health staff but all of our hospitals throughout the region and our EMS community partners. The Emergency Preparedness Program Coordinator for Sutter Roseville Medical Center which provided an in-depth lecture on lecture on **Active Shooter Response for EMS and Healthcare.**

- **Disaster Exercises:** Sutter Roseville Medical Center (SRMC) held 20 Disaster exercises in the past year. These exercises are based on the identified Risks from our annual Hazard Vulnerability Assessment (HVA). Some exercises worthy of note due to their exceptional Interagency Cooperation and Participation were:
  - **2014 Ebola Response Exercise:** This tested the facility's ability to manage victims infected by the Ebola Virus Disease. This drill assisted in the designing and development of the EVD Response Training Program for SRMC.
  - **2015 Helipad Emergency Response Blackhawk Crash Exercise:** As SRMC is the Primary Receiving facility for the Air National Guard with back country rescues, SRMC held a **two-day** Full Scale Exercise which tested our ability to manage not only a surge of victims from a massive earthquake caused landslide but also a crash onto the helipad of a Medical Blackhawk Helicopter. This exercise had the participation with Roseville Fire Department, Rocklin Fire Department, Roseville Police Department and the California Air National Guard.
- **Emergency Preparedness Development- Hospital Incident Command System (HICS) Update:** The SRMC Emergency Preparedness Coordinator was selected by the California Emergency Management Authority (EMSA) to be a member of the national level committee that assisted in the development and review of the Hospital Incident Command System 2014 Updates. These updates are utilized all across the country at hospitals for incident response.
- **Emergency Preparedness Development- Hazardous Materials and Decontamination for Healthcare Facilities Course Update:** The SRMC Emergency Preparedness Coordinator was selected by the California State Training Institute (CSTI) to be a member of the committee that assisted in the development and review of the Hazardous Materials and Decontamination for Healthcare Facilities 2014 Course updates. These updates are utilized all across the country at hospitals for hazardous materials incident response. Additionally, portions of the plan from SRMC in regards to Vulnerable Populations was included in the teaching materials as **Best Practice** examples.
- **Emergency Preparedness Development- Management of Aggressive Behavior (MAB) Program and Course Update:** The SRMC Emergency Preparedness Coordinator, with Regional Safety and Security, on management and development team for the new and updated Violence in the Workplace Training Course and Policy Development and representing Sutter Health at CalOSHA Meetings. This will ensure the facility and Sutter Health is compliant with HSC 1257.8 and 1257.9 and with the new AB 1299 and drafted potential changes that were submitted to Cal OSHA related to SB 1299.
- **Community Involvement- Placer County Emergency Medical Control Committee Chair:** The SRMC Emergency Preparedness Coordinator is the co-chair of the Placer County Emergency Medical Control Committee. In this role, the chair coordinates meetings with all responders from the Placer County Region and reviews and approves policies and procedures for the region.
- **Community Involvement-City of Roseville Police and Fire Safety Fair:** The SRMC Emergency Preparedness Coordinator partnered with the City of Roseville Police Department and the city of Roseville Fire Department for their Second Annual City of Roseville Police and Fire Safety Fair. In this SRMC EP Program and SRMC had a booth on Emergency Preparedness, Safety and the medical center itself. On this day, over 500 brochures, coloring books on safety and emergency preparedness

were handed out. Also, 300 Bike Safety Lights were handed out as well. Due to our active participation, the City of Roseville Police Department donated $500.00 back to our Foundation to be used for Trauma or emergency Services.

2014 Ebola Response

Emerging Infectious diseases, such as the 2014 Ebola virus outbreak, can significantly impact the health and safety of the citizens of Roseville. With the outbreak being monitored for a potential spread to California, the Roseville Fire Department (RFD) worked cooperatively with its regional partners to develop operational procedures and to obtain the necessary equipment to respond safely if necessary. The RFD continues to be proactive with its regional partners on training, protective equipment and is prepared to respond to an Ebola outbreak, or any other emerging infectious disease.

Oil Train Response Plan

The City of Roseville is situated in a rail corridor that connects the Sierra Nevada Mountains to the San Francisco Bay. With the increased production of crude oil in North America, shipments have increased in recent years with the commodity currently traveling through the City of Roseville. The Roseville Fire Department (RFD) working with cooperating agencies throughout Placer and Nevada Counties developed an operational plan to respond to a rail emergency involving crude oil transport. The plan is maintained by the county of Placer Office of Emergency Services and is incorporated in regional training exercises.

Review of the Action Plan

This section reviews the action plan and lists the status of each initiative from the hazard mitigation plan, grouped by the agency or department responsible for its completion. The action plan matrix in Table 2 provides the following information:

- Initiative number and brief summary; initiative numbers are coded by hazard type as follows:
  - DF = dam failure
  - D = drought
  - EQ = earthquake
  - F = flood
  - HC = human-caused hazards
  - HH = human health hazards
  - LS = landslides
  - SW = severe weather
  - WF = wildland fire
  - MH = multiple hazards
- Indication of whether any action has been taken
- Current timeline
- Indication of whether the project priority has changed
- Status (complete, ongoing or no progress)
- Comments, including the following information:
  - Was any element of the initiative carried out during the reporting period?
  - If no action was completed, why?
  - Is the timeline for implementation for the initiative still appropriate?
  - If the initiative was completed, does it need to be changed or removed from the action plan?

Part 4 of the plan provides detailed descriptions of each initiative and the prioritization process.

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Central Services Department Initiatives				
Initiative #F-21—Retrofit the city's Downtown library by sealing the exterior and installing a flood door to protect against flood damage should Dry Creek overspill the existing floodwall.				
No	Long Term	No	No action was completed on this initiative during the reporting period. Priority and time line remain as assigned. Project priority should be changed to medium and time line should be cahnged to long-term pendiong the indentification of funding for this project.	No Progress
City Council Initiatives				
Initiative #HC-3—Seek to establish appropriate staffing levels of public safety personnel to address vulnerabilities identified.				
Yes	Short Term	No	The Police and Fire Chiefs meet quarterly with the City Manager to discuss staffing levels and needs based on current trends, population growth, and calls for service. The Police Department Completed a "Request for Proposals," titled, Roseville Police Department Staffing Study. This RFP requested a professional, independent firm to assess the adequacy of current staffing levels for both sworn and non-sworn staff in the police department, and a sound methodology to project future staffing. Police and City Attorney staff reviewed the submittals and conducted interviews. The PD selected Matrix Consulting to complete the Staffing Study, which was approved by the City Council in October, 2015. The study is scheduled to commence in November, 2015.	Ongoing
City Manager's Office Initiatives				
Initiative #HH-3—Collaborate with the Placer County Mosquito Abatement District to review resource protection policies that conflict with human health protection in the City of Roseville and work to resolve these policy issues				
Yes	Short Term	No	The Placer Mosquito Abatement District and Roseville Environmental Coordinator is working together to both protect open space and wetland areas while limiting the amount of habitat for mosquitoes and vectors.	Ongoing
Public Affairs & Communications Department Initiatives				
Initiative #HH-2—Support the public education efforts of the Placer County Health Department and the Placer Mosquito Abatement District				
Yes	Short Term	No	The City supports the public education efforts of the Health Department and Mosquito Abatement District through print, government access television, social media channels, and web materials. The City has also had significant assistance from the District on public outreach efforts for rodent control through presentations at neighborhood meetings. The Placer Mosquito Abatement District purchased a building in Roseville at 2021 Opportunity Drive and moved a majority of the operations to Roseville. This will enhance the availability of resources in closer proximity to Roseville residents and the mosquito-breeding areas west of Roseville.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #MH-2—Continue to maintain the hazard mitigation page on City website that provides following types of information: • The Hazard Management Plan and its progress reports • Hazard-specific information • Mitigation information by hazard, with specific emphasis on private property • Emergency response and warning information • Links to county, state, and federal related agencies				
Yes	Short Term	No	This is an on-going action. The City continues to maintain its website as specified in the plan maintenance section of the plan. The website can be viewed at: http://www.roseville.ca.us/fire/preparedness/hazard_mitigation_plan.asp	Ongoing
Development Services Department Initiatives				
Initiative #EQ-1—Perform building-specific, structural seismic vulnerability assessment of City- owned critical facilities constructed prior to 1980 (including infrastructure). Included in this assessment will be recommended mitigation alternatives that meet goals and objectives of this plan.				
No	Long Term	Yes	Major construction on any city-owned building would require an assessment of the seismic vulnerability. The City will be applying for a Planning Grant under FEMA's various Hazard Mitigation Grant programs. This initiative will be included in the scope of work for updating the risk assessment to the plan. Priority should be changed to medium while timeline should be changed to long-term	No Progress
Initiative #EQ-2—Incorporate earthquake mitigation measures for private property into existing City-sponsored outreach programs such as printed media and the City's website.				
Yes	Short Term	No	The California Building Officials (CALBO) website has consumer web pages and one in particular regarding Seismic Safety. The site will be upgraded and improved over time with more value to the average consumer regarding measures to improve earthquake safety.	Ongoing
Initiative #EQ-3—Reassess the overall vulnerability to the earthquake hazard using the best available science and technology as it becomes available. State-sponsored programs, Seismic Hazards Mapping Act, and future FEMA-sponsored initiatives are anticipated to create a wealth of knowledge regarding this hazard that did not exist during the preparation of this plan.				
Yes	Short Term	No	Council has updated the maps for the Roseville area. The Public Works Department and Building Division anticipate review and implementation of the new mapping in conjunction with the International Building Council in 2008. The seismic risk assessment of the plan was updated using FEMA's enhanced HAZUS model (MR04) during the plan update process. The 2010 California Building Code based upon the International Building Code has been adopted by the City.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #F-1—The City shall designate all areas identified as the 100-year floodplain. The boundaries of the 100-year floodplain shall be as specified in the floodplain designations section of this component of the city's general plan. Floodplain areas shall be preserved as specified in the open space and conservation element. Such preservation may include required dedication to the City. If needed, modify the City's ordinances to include floodplain use regulations consistent with the goals, policies, and implementation measures of the safety, land use, open space and conservation, and parks and recreation elements of the City's general plan.				
Yes	Long Term	No	The city continued to implement its ongoing protocols and standard for identifying, mapping, and preserving the 100 yr floodplain during this reporting period. This initiative will continue to be implemented on an on-going basis, with a high priority. To comply with the new state Urban Level of Flood Protection, the City has contracted with a qualified engineering firm to determine the 200-year water surface elevation for the City's streams and areas that could potentially be inundated with 3 feet or more of floodwater during a 200-yr storm event.	Ongoing
Initiative #F-2—Refer any development proposal that has a direct or indirect impact on flood protection to Public Works for comment. In addition, forward such proposals to other agencies as applicable, including the U.S. Army Corps of Engineers, California Central Valley Flood Protection Board, FEMA, California Department of Fish and Game, Placer County Resource Conservation District, and Placer County Flood Control District. Consider the comments of the agencies during the development review process.				
Yes	Short Term	No	The city continued to implement its ongoing protocols and standard for reviewing flooding impacts that may be caused by new developments and forward such developments to other agencies as applicable during this reporting period. This initiative will continue to be implemented on an ongoing basis, with a high priority. The PCFCD has completed a region-wide update of the Dry Creek Watershed Flood Control Plan in November 2011.	Ongoing
Initiative #F-9—Ensure that future specific plans and specific plan amendments are consistent with the goals and policies of the general plan. The specific plans shall include the designation and preservation of floodplain areas and adjacent habitat. Provisions shall be incorporated to ensure that public infrastructure, utilities, and emergency services remain functional during flood conditions. Such infrastructure and facilities include water, sewer and gas mains, telephone and electric lines, streets and bridges, hospitals, and fire and police stations. Financing mechanisms shall be explored to fund necessary flood protection improvements and maintenance. Development agreements may be used to secure implementation and funding provisions. (Specific plans have 100% cost recovery by developers).				
Yes	Long Term	No	The city continued to implement its protocols and standard for reviewing proposed public infrastructure, utilities, and other emergency services so that they would remain functional during flood during this reporting period. This initiative will continue to be implemented on an ongoing basis, with a high priority. The Sierra Vista and Creekview Specific Plans were adopted by the City. The Amoruso Ranch and Placer Ranch Specific Plans are currently begin processed. The areas designated as floodplain and/or natural resource conservation areas will be preserved as permanent open space, consistent with General Plan policy and this action item.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #F-11—Require a master drainage plan as part of the approval process for all specific plans and large development projects as determined by the Public Works director. The master drainage plan should consider cumulative regional drainage and flooding mitigation. The plan's intent is to ensure that the overall rate of runoff from a project does not exceed predevelopment levels. If necessary, this objective shall be achieved by incorporating run-off control measures to minimize peak flows and/or assistance in financing or otherwise implementing comprehensive drainage plans.				
Yes	Long Term	No	Master Drainage plans and flood studies have been prepared for the Sierra Vista and Creekview Specific Planning areas. The City is working with developers to prepare these studies for the Amoruso Ranch and Placer Ranch Specific Plans. The priority and timeline for this initiative will remain as assigned	Ongoing
Initiative #LS-2— Continue to implement policies adopted by the general plan that promote open space land uses within identified steep slope areas of Roseville. The City of Roseville Northeast Roseville Specific Plan and Stoneridge Specific Plans include the identified steep slope areas within Roseville. Both plan areas have continuing development.				
Yes	Short Term	No	The City of Roseville Northeast Roseville Specific Plan and Stoneridge Specific Plans include the identified steep slope areas within Roseville. Both plan areas have continuing development. When individual projects are submitted, for example a housing development along a ravine in the Stoneridge area, all City development departments and the Fire Department enforce the General Plan, Specific Plan, City construction standards and individual project conditions to protect the steep slope open space that is dedicated to the City as part of the final maps for the projects.	Ongoing
Initiative #MH-1—Continue to maintain Office of Emergency Services certification of all City inspectors for post-disaster damage assessment.				
Yes	Short Term	No	All building inspectors are certified by the Office of Emergency Services and have been recertified this year. The Building Division will continue to make sure staff keeps their certifications updated and that the certifications are documented per the International Accreditation requirements.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Environmental Utilities Department Initiatives				
Initiative #D-1—Perform a groundwater recharge feasibility study to determine the most cost-effective way to replenish groundwater resources within Roseville.				
Yes	Long Term	No	The City completed a program-wide Environmental Impact Report review under the California Environmental Quality Act requirements. The Environmental Impact Report was adopted by the City Council on March 21, 2012. The City received an operating permit from the State Water Quality Control Board in 2012. The City has implemented this action by injecting excess treated surface water into two existing wells in 2013 and is constructing two additional groundwater wells with partial grant funding by the California Department of Water Resources. A long term ASR operations plan is being developed. The City is also the lead agency within the Western Placer Groundwater Management Plan area.	Ongoing
Initiative #D-2—Implement aquifer storage and recovery program that uses direct injection technique in areas identified as appropriate.				
Yes	Long Term	No	EU has implemented this action by injecting treated drinking water into two wells in early 2013. Two more wells will be completed in 2014 to increase the injection capabilities, and a long term ASR operations plan is being developed.	Ongoing
Initiative #D-3—Continue to implement the Environmental Utility Department's recycled water program and seek all opportunities to expand its coverage, currently focusing on urban growth areas. The City pumps recycled water through a system of purple pipes completely separate from potable (drinking water) pipes. The City pumps the recycled water to customers such as streetscapes, golf courses and parks, where it irrigates turf and shrubs. Using recycled water for uses such as landscape irrigation reduces demand on the potable water system, creating a more reliable water supply for the entire City. Recycled water is not subject to the effects of drought.				
Yes	Short Term	No	A Water Recycling Master Plan has been developed and is being implemented. This includes expanding recycled water in the region as well as finding opportunities in the existing service areas. Recycled water is considered as a resource in all new development areas being considered.	Ongoing
Initiative #D-4—Promote active water conservation techniques and strategies to private property owners through Roseville-sponsored outreach projects such as printed media and the City's website.				
Yes	Short Term	No	Conservation efforts are an ongoing initiative of the Water Division and have been increased and accelerated in all areas due to the unprecedented drought conditions facing the state.	Ongoing
Initiative #F-19—Set back and raise the sewer ponds levees at the Dry Creek Sewer Plant so raw sewage will not enter Dry Creek.				
Yes	Short Term	No	The construction of the Dry Creek Wastewater Treatment Plan Levee Relocation Project was completed in November 2011.	Complete

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #HC-5—Address vulnerabilities identified in vulnerability assessment of water facilities performed by the Environmental Utilities Department in response to EPA initiative.				
Yes	Long Term	No	A Water System Security CIP was completed several years ago by the Environmental Utilities Department and continues to be updated as new facilities come on line. The project enhanced the physical security of water facilities with video monitoring and access control. Timeline for this initiative has been changed from long-term to on-going.	Ongoing
Initiative #SW-5—Enhance and implement strategies for debris management and removal during severe weather events.				
Yes	Short Term	No	No change in the debris management and removal strategy that adopted in 2009. The Parks and Open Space Divisions implemented an Emergency action plan for storm situations. The Open Space Division Department purchased a new bucket truck this fiscal year that aids in the removal of hazardous and storm damaged trees.	Ongoing
Information Technology Department Initiatives				
Initiative #HC-9—Protect the city's data, technology infrastructure and staff against malicious cyber-attacks and Cyber terrorism, such as but not limited to: • Identity Theft • Virus/Malware/Spyware/Spam • Network and system attacks • Web site hacking • Denial-of-service attacks				
Yes	Short Term	No	The Information Technology Department uses several strategies and technologies to combat Cyber-attacks including: • Anti-phishing capability • Internet content filtering • PCI-DSS compliance • Virus, malware, spyware and spam scanning • Perimeter firewalls report and prevent intrusions • Secure authentication • Encryption • EOC Cyber Security Incident Exercises	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #MH-7—Strive to maintain high availability of essential communication services				
Yes	Short Term	No	For the Communication and Information Systems: The city has multiple, fully functional data centers which provide redundant hardware infrastructure. In the event of an extended outage; procedures are in place to restore essential communication and information services. The city's primary radio system has redundant components throughout. In addition the Police and Fire departments have alternative and independent systems in case the primary system fails. One of the current production data centers is scheduled to be relocated at the end of the 2016 calendar year. This move will reduce the risk of flooding as it moves the critical technology infrastructure further away from the nearby creek. The City is at present, working on an enterprise wide Business Impact Analysis study. This report will look at all information systems and services to evaluate and rank the level of impact to the City. This Business Impact Analysis report will be the primary input to developing a revised, more comprehensive Disaster Recovery/Business Continuity Plan.	Ongoing
Initiative #MH-8—Secure the city's physical locations that contain technology infrastructure				
Yes	Short Term	No	Both of the cities data centers are armed with perimeter alarm systems and internal and external security cameras. Also access to these sites is restricted to a limited number of city employees. In addition, vendors and visitors will be required to sign in and be escorted.	Ongoing
Parks and Recreation Department Open Space Division Initiatives				
Initiative #F-12—Continue the Parks and Recreation Department's regular creek maintenance program within the City's creeks and floodplain areas. This program clears and removes debris that could contribute to blockage and flooding and may include the removal of silt. This is only done in areas of high risk to flood damage or where property or facilities are threatened by flooding.				
Yes	Long Term	No	The city continued to implement its ongoing protocol of inspecting and maintaining its creeks and streams during the reporting period. The Department of Fish and Wildlife executed a five-year Routine Maintenance Agreement with the City in April 2010 for work that is ongoing this summer. During the reporting period, the City of Roseville worked with the Placer County Resource Conservation District to remove Red Sesbania from stream segments within the Dry Creek basin. This initiative will continue to be implemented on an ongoing basis, with a higb priority. The City will continue to seek grant funding opportunities from FEMA and state agencies, when available, to assist in funding Arundo eradication along infested stream channels in the Dry Creek watershed.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #F-22—Continue the Tree Mitigation Fund program administered by the Open Space Division in conjunction with non-profit organizations. The planting of oak trees in the open spaces adjacent to riparian zones increases infiltration and slows storm water surges.				
Yes	Short Term	No	The Tree Mitigation program for native oak woodland restoration uses oak mitigation funds for projects in the open spaces. Over 7000 trees have been planted to date.	Ongoing
Initiative #F-23—Manage beaver dam sites for flood control protection and habitat restoration after dam removal. One primary issue is impacts to floodwater capacity of creeks. Part of the desired comprehensive approach to beaver management includes establishment of quantitative and qualitative "carrying capacity," including acre-feet of flood capacity lost. Implement a standard monitoring and reporting process to track beaver dam locations, population, and impacts. Gain regulatory approval for beaver management techniques such as biological control and habitat manipulation using the most benign options first.				
Yes	Short Term	No	The Park Maintenance—Open Space Division continues to use a Geographical Information Systems (GIS) database for tracking beaver dam locations and coordinates beaver removal per the City's Beaver Management Policy and Nuisance Abatement Ordinance.	Ongoing
Initiative #WF-2—Continue "Goat Grazing" program for removal of grassland in areas of Roseville potentially vulnerable to wildfire. Implement goat grazing in City open space and preserve areas for fire and invasive plant species management and native plant restoration.				
Yes	Short Term	No	The Fire Department and the Open Space Division continue working together to implement a goat grazing program. Approximately 400 goats have been utilized for the grazing of open space preserves. Goats provide an innovative, environmentally sensitive way to reduce fire fuel load by keeping open space vegetation under control. Projects completed in 2012-2013 include the open space area located east of Dry Creek near Lincoln Estates to Linda Creek. Grazing reduces fuel load by removing thatch and thinning woody plants and also removes non-native vegetation.	Ongoing
Initiative #MH-4—Implement an "Adopt an Open Space" program in coordination with the open space management program. Develop "adoption contracts" with neighborhoods, organizations, businesses, etc., describing the level of stewardship and the terms of the "adoption." Publicize these activities through online resource directory and other media to encourage participation.				
Yes	Long Term	No	During the reporting period, the City has implemented an "Adopt a Creek" program. The Adopt a Creek program is administered by the City's Park Maintenance—Open Space Division. The City publicizes the program at the following website: http://www.roseville.ca.us/eu/stormwater_management/public_involvement_opportunities.asp	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #MH-5—Develop and disseminate best practices information to private property owners whose land is adjacent to open space areas describing stewardship opportunities and owners' role in preserving beneficial uses of open space areas (including vernal pool grassland and creek or riparian uses). Offer classes to provide in-depth information, such as demonstration projects, techniques for ecologically friendly weed abatement and vegetation control, and creating a backyard habitat compatible with open space areas.				
No	Short Term	Yes	No actions towards the completion of this initiative were completed during the reporting period. This will continue to be a short-term initiative with a high priority pending funding.	No Progress
Initiative #MH-6—Work with the Roseville City School District, local high school districts, and non-profit organizations to promote ecology-oriented curricula and stewardship activities. Identify resource and administrative barriers that may be limiting schools' abilities to more actively participate in stewardship, and work collaboratively to identify solutions.				
No	Short Term	No	No actions towards the completion of this initiative were completed during the reporting period. This will continue to be an ongoing initiative with a medium priority pending funding.	No Progress
Police and Fire Department Initiatives				
Initiative #DF-1—Create a dam failure element for the City's emergency response plan that includes a phased warning protocol in response to the findings of the Folsom Dam Containment Dike Risk Assessment.				
Yes	Short Term	Yes	The City of Roseville and the Placer County Office of Emergency Services has obtained a grant from the California Department of Water Resources to fund revisions to the City's and County's Dam Failure Emergency Response Plan under the DWR Flood Emergency Response Project grant program. The funding will assist in creating a dam failure element in the City's Emergency Response Plan during the next year.	Ongoing
Initiative #F-20—Implement recommendation of Downtown Roseville Specific Plan to relocate the Public safety Building				
Yes	Short Term	No	The City plans to grade the parking lot and building pad for the future relocation of Fire Station #1 in 2014. The fire station will be relocated from it's current location at the intersection of Oak Street and Grant Street to the intersection of Oak Street and Lincoln Street. Building construction is planned to begin in 2015.	Ongoing
Initiative #HC-1—Commit support to Sacramento Urban Area Security Initiative; continue to seek funding from other federal sources to fund its initiatives				
Yes	Short Term	No	Roseville hosts various training courses designed to support the regional Urban Areas Security Initiative (UASI) program. The City hosts a lot of classes for the UASI and they provide us with free seats in the classes in return. The Fire Chief continues to participate on the Joint Terrorism task Force Executive Committee (JTTF). The Police Department continues to support and participate in the Joint Terrorism Task Force by having three officers identified as liaisons to the Sacramento Regional Threat Assessment Center (SacRTAC). These officers communicate with the SacRTAC and disseminate security unclassified information to Roseville officers.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #HC-2—Enhance emergency response capability of City by contingency planning for specific events based on identified vulnerabilities.				
Yes	Short Term	No	The Fire Department's Hazmat Team has completed one Type I recertification since 2006 and is currently in the process of going through another one right now. The City's Training Division has determined that all new employees who are required to have the basic and intermediate level of ICS training (ICS 100, 200, 700, 800) obtain training and certification through FEMA's Online Emergency Management Institute's Independent Study program. Certificates are provided at the completion of the courses, and maintained in the form of individual transcripts by FEMA. Audits for compliance are completed by the training division annually. Those employees required to have advanced level ICS courses (ICS 300, 400) have been identified by the City's Training Division based on NIMS requirements. ICS 300-400 training is provided annually in multiple 16-hour blocks. The FEMA exercise mandates have been meet and exceeded. In October of 2009, the H1N1 virus EOC activation was completed and included the activation of a South Placer Point of Distribution (POD) for the H1N1 virus vaccination. In May of 2010, the EOC was activated for the "MCI 2010 Homeland Security Exercise" comprising of the cities of Roseville, Rocklin and surrounding jurisdictions. In 2011, the City participated in the "Golden Guardian" full scale exercise that was hosted by California Emergency Management Agency (CalEMA). This scenario centered on a catastrophic release of Folsom Lake due to a dam failure. In 2012 the EOC staff conducted an enhanced tabletop exercise that practiced Continuity of Operations Plans (COOP). The exercise scenario included a major explosion of a natural gas main in the Civic Center area. Again in 2012, the city participated and hosted the "MCI 2012 Homeland Security Exercise" that included a major chemical release with a fast moving vapor cloud into neighboring jurisdictions. This was a full scale exercise with a complete activation of the entire EOC staff.	Ongoing
Initiative #HC-4—Prepare a site-specific vulnerability assessment of City- owned critical facilities that use the best available science and technology with regards to human-caused hazards.				
Yes	Short Term	No	Through the California Emergency Management Agency, Critical Infrastructure Protection Section and the 2008 Buffer Zone Protection Program, an assessment of the Sutter Roseville Medical Center was conducted. While SRMC is not city-owned, it is designated the City's medical provider.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #HH-1—Continue to collaborate with the Placer County Health Department to ensure the health and welfare of the community				
Yes	Short Term	No	The City Manager's Office, Fire Department, and Communications Division collaborate with the Placer County Health Department on issues that affect the health and welfare of Roseville residents and visitors.	Ongoing
Initiative #SW-4—Continue education/outreach programs to improve winter preparedness and minimize loss of life or injury.				
Yes	Short Term	No	Educational materials are included on the city's web site on an ongoing basis, as well as a weekly tip sheet sent to all local media (print/broadcast). Web content is available to any viewer with a personal computer and Internet access. Typically there is also at least one city-authored column in the Roseville Press-Tribune on this topic per year—which reaches 40,000 readers.	Ongoing
Initiative #WF-3—Enhance existing City public outreach programs to include information on fire safety, defensible spaces, and areas of concern.				
Yes	Short Term	No	The Fire Department continually evaluates the efficiency and effectiveness of its public education programs. Comparison with other accredited fire agencies reveals that our performance standards meet those of other agencies. Outreach efforts include seasonal safety messages through the media and City website. Public education programs have been reduced, with the primary focus being assembly type presentations at several elementary schools. The fire department has taken an active role in the Neighborhood Association Meetings by having the on-duty staff to attend when possible. This allows the department to update it's citizens on various services and programs, as well as allows the citizens to voice any questions or concerns they have.	Ongoing
Initiative #MH-3—Establish/maintain a post-disaster action plan to be part of the City Emergency operations plan that will include following elements: • Procedures for public information • Post-disaster damage assessment • Grant writing • Code enforcement • Redundant operations				
No	Short Term	No	No action was taken on this initiative during the reporting period. The City is still committed to completing this action in the performance period of the plan. However, the City will pursue grants to complete this task.	No Progress

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Public Works Department Initiatives				
Initiative #F-3—Continue City participation in the National Flood Insurance Program and the Community Rating System (CRS). Seek CRS classification improvements within capabilities of City programs, including adoption and administration of FEMA-approved ordinances and flood insurance rate maps (FIRM).				
Yes	Short Term	No	The City of Roseville continued to participate in the CRS program, and re-certified its participation during the reporting period. The City's CRS Class I classification became effective on October 1, 2006. Flood Insurance policy holders within the City for property owners in flood areas will receive up to a 45% premium reduction based on the classification. Roseville is the first and only CRS Class 1 community in the nation. This initiative will continue to be implemented on an ongoing basis, with a high priority. The City has maintained its Class 1 rating through the reporting period.	Ongoing
Initiative #F-4—Maintain Roseville's compliance and good standing under the National Flood Insurance program.				
Yes	Short Term	No	A Community Assistance Visit (CAV) was last performed on the City of Roseville on November 1, 2011. The CAV is the principle means by which FEMA monitors a community's NFIP compliance. This CAV found that the City was in full compliance and in is in good standing under the NFIP.	Ongoing
Initiative #F-5—Continue the City's outreach program to flood-prone property owners and the citizens of Roseville, to help make them aware of the flood threat and how best to deal with them.				
Yes	Short Term	No	This is an on-going action that is a part of the City's CRS program.	Ongoing
Initiative #F-6—Continue to pursue a regional approach to flood issues by remaining actively involved in the Placer County Flood Control District. This involvement includes cooperation in the development of a comprehensive regional database. Continue to participate in regional flooding studies, including the Auburn Creek/Coon Creek/Pleasant Grove Creek flood mitigation plan and the Dry Creek watershed flood control plan.				
Yes	Long Term	No	The City continued to be actively involved in the Placer County Flood Control District (PCFCD) and participate in regional flooding studies during this reporting period. Staff from the Floodplain Management Division attends the meetings on a monthly basis and a Councilmember serves on the District Board. The PCFCD is developing the Antelope Creek Flood Control Project, which is a regional flood control project, located within the City of Roseville. City staff will be assisting the PCFCD with the development and construction of the regional flood control project, scheduled for construction in 2015. This initiative will continue to be implemented on an ongoing basis, with a high priority.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #F-7—Continue City coordination with other agencies on issues of flood control. Coordination between the City and adjacent jurisdictions occurs through several mechanisms, including distribution of development proposals for review and comment. Continue City cooperation with federal, state, and local agencies, including the U.S. Army Corps of Engineers, California Central Valley Flood Protection Board, FEMA, California Department of Fish and Game, Placer County Resource Conservation District, and the Placer County Flood Control District.				
Yes	Short Term	No	The City continued to coordinate with other outside agencies on issues of flood control during this reporting period. The coordination typically occurs on a project-by-project basis and agencies are included in the meetings based on their particular jurisdiction or expertise. This initiative will continue to be implemented on an on-going basis, with a high priority. The City is also actively involved with the State's new Flood-Safe program.	Ongoing
Initiative #F-8—Continue to develop, implement, and expand the Flood Alert and Early Warning Program systems and integrate the systems with other local jurisdictions to form a regional warning program.				
Yes	Long Term	No	The City continues to develop, implement, and expand the Flood Alert system. New "ALERT" software was installed and the Flood Warning web site was updated. Durig the reporting period, the City and the Placer County Flood Control District applied a State Department of Water Resources Flood Emergency Response Projects grant to upgrade the Flood Alert System data transmission system to the "ALERT-2" protocol. While the grant application was not sucessful during the current grant cycle, the City and PCFCD will apply for funding in future grant cycles. This initiative will continue to be implemented on an ongoing basis with a high priority.	Ongoing
Initiative #F-10—Monitor and regularly update City flood studies, modeling, and associated land use, zoning, and other development regulations at a minimum of every 5 years or whenever information becomes available that would significantly modify previous data. New information could include new studies, change in City policy, consideration of a major development project or specific plan, or implementation of a flood control project.				
Yes	Long Term	No	The City has updated the Pleasant Grove Creek flood studies. The City also participated with the 2011 update to PCFCD's Dry Creek flood study. The studies have also determined the 200-year WSE to comply with the implementation of the Urban Level of Flood Protection criteria. The priority and timeline for this initiative will remain as assigned.	Ongoing
Initiative #F-13—Continue annual inspection and maintenance program of City storm drain systems. Review after every major storm system function and performance. This program removes debris that could contribute to blockage of the storm drain system.				
Yes	Short Term	No	The City continued to implement its ongoing protocol of inspecting and maintaining its storm drain system during the reporting period. This initiative will continue to be implemented on an ongoing basis with a high priority.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #F-14—Complete the final two phases of the Cirby/Linda/Dry Creek flood control project (Phase 1 and 2). Five of the seven phases of this project have been completed at a cost of about $18,000,000. The basis for determining viability of this project will be a benefit /cost analysis to determine if project meets federal grant eligibility requirements.				
No	Long Term	No	No actions towards the completion of this initiative were completed during the reporting period. This will continue to be a long-term initiative with a low priority pending funding.	No Progress
Initiative #F-15—Analyze alternative improvements to the Cirby/Linda/Dry Creek flood control project that may be cost effective in the flood-prone areas of Roseville: • Dry Creek from Darling Way to Riverside Avenue • Area on Dry Creek upstream of Folsom Road in the Columbia Avenue/Marilyn Avenue/Bonita Street area • Linda Creek near Champion Oaks Drive/Samoa Way/Hurst Way area • Cirby Creek in the Trimble Way/Zien Court area				
No	Long Term	No	No actions towards the completion of this initiative were completed during the reporting period. This will continue to be a long-term initiative with a low priority pending funding. The City continues to pursue opportunities to acquire flood prone properties and remove them from the floodplain as a viable alternative to structural flood control.	No Progress
Initiative #F-16—Replace the Huntington Drive/Cirby Creek culvert with a bridge to protect Queens Court/Huntington Drive area. The Public Works Department oversees this project.				
No	Long Term	Yes	The City is continuing to research grants that may be available for this project. The City has the 25% match for the project. The priority for this project has been changed to medium and the time line has been changed to long term pending the identification of funding for this project.	No Progress
Initiative #F-17—Divert the main drainage storm drain system down Crestmont Avenue to Cirby Way and then into Dry Creek so that the existing system will not exceed capacity. If system capacity is exceeded, the intersection on Cirby Way and Crestmont Avenue and nearby homes will flood during major flood events.				
Yes	Short Term	No	Funds were allocated for this initiative in the 07/08 capital improvements budget but were diverted to fix a culvert on Atlantic Street in downtown Roseville rather than replacing this culvert. A portion of the project, consisting of the 48-inch outfall into Linda Creek and the storm drain pipe crossing South Cirby Way at the intersection of Piedmont Way, was constructed in 2010. The priority and timeline for this initiative will remain as assigned. Funding was replaced with the approval of the FY 2011/12 budget.	Ongoing
Initiative #F-18—Continue to promote and sponsor programs to buy out, relocate, and flood-proof existing flood-prone structures within Roseville.				
Yes	Short Term	No	The City will continue to pursue the acquisition of additional target properties with a high priority. The City has targeted the property on Riverside Dr for grant funding under the FY-2013 HMA grant cycle. Completion of this project will be contngent upon grant award.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #LS-1—Once California Geological Survey completes soils mapping for the Roseville vicinity under the Seismic Hazards Mapping Act, reassess landslide hazard using best available data to gauge the true vulnerability to this hazard.				
No	Long Term	No	There was no mapping performed by CAGS in the Roseville vicinity under the Seismic Hazards Mapping Act during the reporting period. Time line and priority for this project will remain unchanged, pending action by CAGS.	No Progress
Roseville Electric Initiatives				
Initiative #HC-6—Maintain compliance with California Energy Commission ("CEC") license conditions for the operations of the Roseville Energy Park ("REP") with respect to Hazardous Material Management				
Yes	Short Term	No	The operation of the REP is in compliance with the CEC license conditions including the preparation of a Business Plan and a Risk Management Plan (RMP) submitted to the City's Fire Department and the CEC. In addition, a Vulnerability Assessment has been prepared and Site Security measures have been implemented to ensure that neither the REP site nor a shipment of hazardous material is the target of unauthorized access.	Ongoing
Initiative #HC-7—Maintain compliance with state and local laws and regulations for the operation of the Roseville Power Plant #2.				
Yes	Long Term	No	All operating and compliance permits are being maintained by the power generation staff. Compliance with state and local laws is an ongoing practice.	Ongoing
Initiative #HC-8—Maintain compliance with North American Electric Reliability Corporation mandatory reliability standards related to plant operation, sabotage reporting and critical infrastructure protection (cyber security.				
Yes	Short Term	No	Establishing compliance through development, implementation and adherence to policies and procedures	Ongoing
Initiative #SW-1—Continue ongoing program of conversion of overhead utilities to underground service.				
Yes	Short Term	No	This Program is no longer being implemented by the City. Action should be removed from action plan at the next update.	No Progress
Initiative #SW-2—Continue the Shade Tree Program, an energy conservation rebate program provided by Roseville Electric				
Yes	Short Term	No	Although temporarily suspended due to the drought, this ongoing program will continue upon reactivation to offer Roseville residents a rebate for trees that they select, purchase and plant at their own convenience. Rebates are limited to 6 trees per household and available to Roseville Electric customers only.	Ongoing
Initiative #SW-3—Continue ongoing line clearing and weed abatement of electrical utility facilities in order to reduce public exposure to vegetation hazards and maintain higher reliability during severe weather conditions.				
Yes	Short Term	No	This is an ongoing program of Roseville Electric to both protect the public from hazards and to maintain the reliability of electricity service to Roseville Electric's more than 56,000 customers.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #SW-6—Continue to operate the Roseville Energy Park to support the City's electrical requirements and maintain service continuity during severe weather events.				
Yes	Short Term	No	The Roseville Energy Park (REP), which opened in October 2007, is producing power and provides additional electric support to meet the City's electrical needs. In the event of a transmission line outage, the REP will help maintain electric service continuity. The Operations Department's Emergency Action Plan (EAP) specifically addresses severe weather operations in Section 5.9. The severe weather EAP will ensure continuity of operations while securing the safety of personnel and equipment.	Ongoing
Initiative #SW-7— Continue to operate Roseville Power Plant #2 to support the City's electrical requirements and maintain service continuity during severe weather events.				
Yes	Short Term	No	Roseville Power Plant #2 is operated from the Roseville Energy Park Control Room. The Operations Department's Emergency Action Plan (EAP) specifically addresses severe weather operations in Section 5.9. The severe weather EAP will ensure continuity of operations while securing the safety of personnel and equipment.	Ongoing

Planning Area Changes That May Impact Plan Implementation

The planning area for the City changed with the adoption of 3 new Specific plans. The impacts of these changes will be addressed at the next update to this plan.

Recommendations for Changes or Enhancements

Based on the review of this report by the RMHMP Steering Committee, the following recommendations will be noted for future updates or revisions to the plan.

- The Information Technology Department has recommended that Initiatives MH-3 and MH-7 be combined into a single initiative
- Include information on the potential impacts of the Biggerts/Waters Flood Insurance Reform Act in annual mailings to floodplain residents.
- Continue to hold a pre-rainy season meeting with all key departments and stakeholders, such as the meeting held on December 10, 2013 to review the City's Flood Warning & Response Plan.
- Continue to train with WebEOC to enhance communication with the county. Continue to offer classes prior to every EOC exercise; last year over 100 city staff received a WebEOC refresher class.
- Try to better forecast impacts on city storm drains from debris accumulations.
- Consider training in street closure in a flood scenario for street workers.

- Data from stream gauges was not a representation of actual emergencies in the field. During flooding events, field observers should be deployed to known street flooding locations, even if no gauge information indicates flooding at those locations.
- Continue to evaluate (and add as appropriate) new social media channels, which have proven essential for public and media communication in emergencies.
- The growth of recreational access to and residential units adjacent to the Pleasant Grove Creek oak forest in the Woodcreek, Crocker Ranch, and Fiddyment Farms neighborhoods increases the frequency, risk, and human impact of wildland fires. These increases may require fire and safety personnel reviews of first responder vehicle access to newly populated sections of the creek, updates of resident fire emergency notification and evacuation procedures, and creation or updates of interagency coordination procedures for resident relocation.
- Create different wording for the WebEOC initiative
- Enhance the drought hazard profile based on new information available on current drought situation in CA.
- Enhance human caused hazard profile to include discussion on cyber-terrorism.
- Create separation between natural and non-natural hazards of concern in part II of the plan

Public review notice: *The contents of this report are considered to be public knowledge and have been prepared for total public disclosure. Copies of the report have been provided to the Roseville City Council and local media outlets. The report is also posted on the City of Roseville Multi-Hazard Mitigation Plan website. Any questions or comments regarding the contents of this report should be directed to:*

Jason Rizzi
City of Roseville
311 Vernon St.
Roseville, CA 95678
(916) 774-5802
jrizzi@roseville.ca.us

Appendix C. Steering Committee Meeting Information

TETRA TECH

MEETING SUMMARY

Date of Meeting:	November 3, 2015
Subject:	1st Steering Committee (SC) meeting
Project Name:	City of Roseville Multi-Hazard Mitigation Plan –Update
In Attendance:	**Steering Committee**- Grace Keller (Chair), Rob Jensen, Jason Rizzi, Wayne Wiley, Carl Walker, Brian Jacobson (for Helen Dyda), Erik Angle, Brenette Macintosh, Mark Lacher, Rod Rodriguez, Rick Stalker, Jim Williams **Planning Team**- Rob Flaner
Not Present:	Mark Smith, Michael Algots
Summary Prepared by:	Rob Flaner- 11/17/2015
Project No.:	103S4157
Quorum- Yes or No	Yes

Item	Action

Welcome and Introductions

- Chair, Grace Keller opened the meeting with brief group introduction.
- Round table introductions by all in attendance.
- Agenda was reviewed with no request for changes.
- There were no members of the public present and no public comment received by the Committee.
- Handouts provided included: Agenda, 2015 Progress report, work-plan for the plan update, Steering Committee ground rules, table of contents from the 2011 Multi-hazard mitigation plan.

Why are you here? Purposes for planning

Rob Flaner, the City's planning consultant from Tetra Tech, Inc. provided the committee and overview of the drivers for a hazard mitigation plan, and the Steering Committee's role in the process. There are 2 principle drivers for the City having a hazard mitigation plan; the Disaster Mitigation Act of 2000 (DMA) and the Community Rating System (CRS).

- **The DMA**- Federal legislation that stipulates that communities must have an approved all hazard mitigation plan to eligible for certain federal grant programs administered by the Federal Emergency Management Agency (FEMA). The City of Roseville has leveraged many of these grant programs in the past and wanted to continue to be eligible to pursue that funding, so it developed its hazard mitigation plan.
- **The CRS**- This is a FEMA program that is part of the National Flood Insurance Program (NFIP) that rewards participating communities for exceeding the minimum requirements of the NFIP

Item	Action

by lowering the costs of flood insurance in participating communities. Communities are rated on a scale of 1-10, with class 1 being the best with up to a 45% reduction in flood insurance premiums. The City of Roseville is the nation's highest rated community, and the only CRS class 1. To achieve that designation, the City need to have a mitigation plan that met very prescriptive planning requirements

So utilizing these 2 drivers, the City developed its 1st hazard mitigation plan in 2005. That plan was updated in 2010, which is now being updated with this process. FEMA and CRS require that these plans be reviewed and updated every 5 years. Each of the planning processes were overseen bay steering committee made up of community stakeholders city officials. This plan update process will follow suit and has been scripted to meet CRS class 1 planning requirements.

2015 Annual progress report

The City has prepared a 2015 annual progress report for the 2011 Multi-hazard Mitigation plan in accordance with the plan maintenance chapter (chapter 7) of the plan. The progress report provides and overview of the plan and provides a status report of the 63 initiatives that were identified in the 2011 plan.

The performance period for the Hazard Mitigation Plan began on March 28, 2011, with FEMA's final approval. The initial performance period for this plan is 5 years, with an update anticipated before March 2016. As of the most recent reporting period, the performance period is 82 percent complete. The Hazard Mitigation Plan identified 63 hazard mitigation initiatives to be pursued during the 5-year performance period. As of the most recent reporting period, the following progress can be reported:

- 51 out of 63 initiatives (81%) reported ongoing action toward completion.
- 10 out of 63 initiatives (16%) reported no action taken.
- 1 out of 63 initiatives (2%) was completed.
- 1 initiative was removed due to elimination of a program.

The SC review the progress report, and made the following recommendations for changes before transmittal to City Council:

- Add a short write-up on the Ebola exercise conducted during the reporting period to the hazard events section.
- Add a short write-up about the City's "Oil by Rail" plan in the mitigation success story section of the plan.
- Rob was asked to provide an overview of all the recommended changes/enhancements for the plan from the prior progress reports to the SC at the next meeting.

Erik Angle will write a paragraph about the Ebola exercise

Jason Rizzi will write a paragraph about the Oil by Rail Plan

Rob Flaner will provide a summary of all the annual recommendations from the annual plans to the next meeting

Item	Action
After the discussion on the progress report, the SC approved the report as amended for transmittal to City Council (Motion – Jason Rizzi, Second – Rob Jensen). Carl Walker will present the Progress Report to Council via GIM on or before December 16th.	Carl Walker will present the Progress Report to Council via GIM on or before December 16th
2015/2016 Plan Update Work plan Rob went over the scope of work for the plan update. The handout provided to the SC was the actual contact scope of work from Tetra Tech's contract with the City. The work plan is broken down in to 6 phases: • Phase 1-Organize and review • Phase 2-Update/Enhance the Risk Assessment • Phase 3-Engage the Public • Phase 4- PPI Framework • Phase 5-Assemble the updated Plan • Phase 6- Plan Adoption	
The current plan will expire on March 28, 2016. Plan expiration is not a big issue, unless the City's current pending grant application for the acquisition of 645 Riverside Dr. is not funded prior to March 28, 2016. This grant application has been held up by FEMA due to procedural requirements. Both Rob and Carl do not believe, that plan expiration will be an issue for this grant, however, they will seek clarification for both CalOES and FEMA Region IX. There may be a need to expedite the timeline for this project based on direction received from FEMA and the State.	Rob and Carl will reach out to CalOES and FEMA region IX to determine if an expedited schedule is warranted in order to process the grant for 645 Riverside Dr.
Steering Committee Ground Rules Since Steering Committee meetings will be conducted as open public meetings, the SC will need to have established ground rules for operation during the plan update process. The ground rules confirmed by the SC for the last plan update were provided to the SC. Rob went thru each of the components of the ground rules to make sure the current SC understood their application, and to seek input for changes or enhancements. The following changes were recommended by the SC for the 2015/2016 SC ground rules: • Grace Keller was re-confirmed as Chairperson, and Wayne Wiley was confirmed as Vice-Chairperson for the next performance period of the plan. • The quorum for the SC will remain as 50% plus 1, which will be 8 members for this plan update process. • SC members will have the option to designate an alternate and these alternates will have full voting privileges when they attend a SC meeting in the place of a primary SC member. SC members wishing to designate an alternate will inform the planning team by Friday, November 20th.	SC members wishing to designate an alternate should inform planning team by Friday, November 20th, 2015.

Item	Action
• The city's standard protocol for receiving public comment at City Council meetings was incorporated in to the ground rules. • The standard meeting date/time will strive for the 1st Tuesday of each month, from 6:00 to 8:00 PM at the Roseville City offices at 311 Vernon St.	
The SC voted to approve the ground rules as amended (Motion – Rick Stalker, Second – Mark Lacher). Carl will make sure that the final ground rules are posted on the Mitigation Plan website as soon as possible.	Carl to poste the final ground rules on the mitigation plan website.
Hazards of Concern The table of contents from the last plan illustrating the hazards of concern addressed was provided to the SC as a hand out. Rob explained that local hazard mitigation plans are required to be consistent with the State Hazard Mitigation plan as far as the hazards of concern addressed by a plan. So in other words, id the State plan says that Placer County and the City of Roseville is susceptible to a certain hazard, then the Roseville and Placer County plans should assess those hazards in their individual mitigation plans. The 2011 Roseville Multi-Hazard Mitigation Plan assessed: Dam Failure, Drought, Earthquake, Flood, Human Caused hazards, Human health hazards, Landslide, severe weather, and wildfire. These hazards were consistent with the last CA State hazard Mitigation plan.	
The Steering Committee was asked to do some homework prior to the next SC meeting as follow: All to read Chapter 11-18 of the 2011 plan and answer the following questions: • Is there another hazard we need to assess? • Since California will have Climate Change (Future Conditions) as a stand-alone risk, how should we accomplish that in our plan? All to read Goal section and answer the following questions: • Are the Goals still valid? • Do we need to add any new Goals? All to review the Annual reports for the last five years.	SC members to do homework as described.
Meeting was adjourned at 8:00 PM The next Steering Committee meeting is:	

Item	Action

November 30th from 6:00 PM to 8:00 PM
Roseville City Hall
311 Vernon St., Roseville, CA 95678

TETRA TECH

MEETING SUMMARY

Date of Meeting:	November 30, 2015
Subject:	2nd Steering Committee (SC) meeting
Project Name:	City of Roseville Multi-Hazard Mitigation Plan –Update
In Attendance:	**Steering Committee**- Grace Keller (Chair), Rob Jensen, Jason Rizzi, Wayne Wiley, Carl Walker, Helen Dyda, Erik Angle, Brenette Macintosh, Mark Lacher, Rick Stalker, Jim Williams, Paul Holt, Joe Van Zant **Planning Team**- Rob Flaner
Not Present:	Mark Smith, Rod Rodriguez, Michael Algots
Summary Prepared by:	Rob Flaner- 12/14/2015
Project No.:	103S4157
Quorum- Yes or No	Yes

Item	Action

Welcome and Introductions

- Vice-Chair, Wayne Wiley opened the meeting with a brief group introduction.
- Round table introductions by all in attendance.
- Agenda was reviewed with no request for changes.
- Meeting summary for Steering Committee (SC) Meeting #1 were reviewed and approved.
- There were no members of the public present and no public comment received by the SC.
- Handouts provided included: Agenda, Meeting #1 summary, example guiding principles and mission statements, the 2012 plan Goals and Objectives, Planning area map for the 2016 plan update, recommendations for changes and enhancements from the 2015 annual progress report.
- Chair, Grace Keller assumed leadership of the meeting upon her arrival.

Progress Report Recommendations

At the last SC meeting, the committee requested to see the changes and enhancement sections from the past progress reports. Rob provided the SC a handout that summarized the notations for changes and enhancements to the plan from the 2012 through 2014 progress reports. Rob led a discussion with the SC on what recommendations for changes or enhancements should be included in the 2015 progress report. The following recommendations were requested by the SC:

Item	Action
• Create different wording for the WebEOC initiative • Enhance the drought hazard profile based on new information available on current drought situation in California. • Enhance the human-caused hazard profile to include a discussion on cyber-terrorism. • Enhance the human health hazard profile to include a discussion on Ebola. • Create separation between natural and non-natural hazards of concern in part II of the plan. Rob and Carl will finalize the 2015 progress report for posting on the City website and submittal to the City Council Carl asked the SC to review the planning area map that was provided as a handout. Carl explained to the SC that the planning area for the City has changed dramatically since the initial planning effort in 2005. The City has and will continue to grow that the direction of its General Plan and Specific Planning process. The map handout illustrated the new specific plan areas that will need an assessment in the 2016 update. **<u>Confirm the Hazards of Concern</u>** The SC was asked at the last meeting to review the 2012 Roseville HMP and the 2013 CA State Hazard Mitigation plan and come to this meeting prepared to confirm the hazards of concern to be addressed by the 2016 plan update. After discussion of their observations from this review, the SC confirmed the following hazards of concern for the 2016 plan update, inclusive of the newly identified cyber terrorism and Ebola components of human-caused and human health hazards, respectively: • Dam Failure • Drought • Earthquake • Flood • Human caused - Terrorism & Weapons of Mass Destruction - Technological - Civil Disorder - ***Cyber terrorism*** • Human Health - Influenza - Small Pox - Viral Hemorrhagic Fevers - Plague - Tularemia - Mosquito-borne Disease - Lyme Disease	Rob and Carl to final finalize the 2015 progress report for posting on the City website and submittal to City Council

Item	Action

  - Anthrax
  - Severe Acute Respiratory Syndrome
  - Extreme weather
  - ***Ebola***
- Landslide
- Severe Weather
- Wildfire-to include a discussion/profile on air quality issues

Additionally, the 2016 update will include a stand-alone chapter on climate change that will discuss qualitatively the possible impacts of climate change on each of the above hazards of concern. There will be separation created in the plan between the natural and non-natural hazards since they will be profiled and ranked differently. The risk ranking of the plan will only consider the natural hazards of concern.

Guiding Principle/ Vision/Mission Statement

A guiding principle or a mission statement for a plan is a written declaration of a plan's core purpose and focus that normally remains unchanged over time, regardless of a change to the plan's goals or objectives. Rob explained to the SC that the last 2 versions of the Roseville Hazard Mitigation plan did not identify a guiding principle or mission statement. These are not required components for DMA compliance, however, Rob explained to the SC that they are beneficial, as they provide a clear, singular message that can be the focal point for public engagement. Rob explained to the SC that he was unaware as to why the past Steering Committees chose to not identify a guiding principle, however, this SC could identify one for the 2016 update. The SC received a handout that listed several example mission statements from other planning efforts for reference and review. After reviewing the handout, Rob asked the SC if they wanted a guiding principle/ statement for the 2016 plan update. The consensus of the SC agreed on identifying a guiding principle. After discussion, the SC settled on the following guiding principle for the 2016 plan update:

Through community partnerships, establish a plan to reduce vulnerability to hazards in order to protect the health, safety, welfare, and economy of the City.

Confirm Goals

The SC received a handout that listed the 7 goals from the 2012 plan. Rob explained that the initial 2005 plan included 7 goals that were slightly enhanced during the 2012 plan update process. Rob asked the SC to review the 7 goals and identify any additions, deletions, or enhancements to the goals for the 2016 update. One change was requested by the SC. This change involved replacing "maintain, enhance, and restore" with "monitor and support" on Goal #7. The SC confirmed the following goals for the 2016 plan update:

Item	Action

G-1: Protect lives and reduce injury.

G-2: Promote hazard mitigation as an integrated policy.

G-3: Protect the continuity of local government to ensure no significant disruption of services during or due to a disaster.

G-4: Improve community emergency management preparedness, collaboration and outreach.

G-5: Minimize or reduce damage to property, including critical facilities.

G-6: Develop and implement mitigation strategies that optimize public funds in an efficient and cost-effective way.

G-7: Monitor and support the natural environment's capacity to deal with the impacts of natural hazards, taking into account the potential impacts of global climate change.

Confirm Objectives

The SC received a handout that listed the 10 objectives from the 2012 plan. Rob explained that the initial 2005 plan included 10 objectives that were slightly enhanced during the 2012 plan update process. Rob asked the SC to review the 10 objectives and identify any additions, deletions, or enhancements to the goals for the 2016 update. The SC requested minor changes to objectives # 5, 7, and 10. The SC confirmed the following objectives for the 2016 plan update:

O-1: Consider the impacts of hazards on future land uses in the City of Roseville by coordinating with other planning mechanisms such as the general plan and land-use code development.

O-2: Protect and sustain reliable local emergency operations and communication facilities during and after disasters.

O-3: Develop new or enhance existing early warning response systems and plans.

O-4: Seek to enhance emergency response capabilities through improvements to infrastructure and City programs.

O-5: Enhance the understanding of all present and future hazards that may impact the City of Roseville and the risk they pose.

O-6: Seek mitigation projects that provide the highest degree of hazard protection at the least cost.

O-7: Seek to update information on natural, environmental, and human-caused hazards, vulnerabilities, and mitigation measures by coordinating

Carl to post the final Guiding Principle, Goals and Objectives on the City HMP website

Item	Action

planning efforts and creating partnerships with appropriate local, private, county, state, and federal agencies.

O-8: Seek to implement codes, standards, and policies that will protect life and property, including natural habitat, from the impacts of hazards within the City of Roseville.

O-9: Educate the public on preparedness for and mitigation of potential impacts of hazards on the City of Roseville.

O-10: Support efforts to retrofit, purchase, or relocate structures in high hazard areas, including those known to be repetitively damaged.

Public Involvement Strategy

Discussion on this topic was tabled until the next meeting due to the lack of time.

The meeting adjourned at 8:00 PM

The next Steering Committee meeting is:

January 5th from 6:00 PM to 8:00 PM
Roseville City Hall
311 Vernon St., Roseville, CA 95678

TETRA TECH

MEETING SUMMARY

Date of Meeting:	January 5, 2016
Subject:	3rd Steering Committee (SC) meeting
Project Name:	City of Roseville Multi-Hazard Mitigation Plan –Update
In Attendance:	**Steering Committee**- Grace Keller (Chair), Jason Rizzi, Wayne Wiley, Carl Walker, Helen Dyda, Erik Angle, Brenette Macintosh, Mark Lacher, Joe Van Zant, Rick Stalker, Michael Algots, Jim Williams, Paul Holt, Dom Casey, Jamie Garret **Planning Team**- Rob Flaner, Jessica Cerutti
Not Present:	Rob Jensen, Rod Rodriguez
Summary Prepared by:	Jessica Cerutti – 01/08/16
Project No.:	103S4157
Quorum- Yes or No	Yes

Item	Action

Welcome and Introductions

- Chair Grace Keller opened the meeting with a brief group introduction.
- Round table introductions by all in attendance.
- Agenda was reviewed with no request for changes.
- Meeting summary for Steering Committee (SC) Meeting #2 were reviewed and approved.
- There were no members of the public present and no public comment received by the SC.
- Handouts provided included: Agenda, Meeting #2 summary, Critical Facilities definition, Risk Assessment Update, Copy of the City of Roseville 2010 Public Survey.

Risk Assessment Update

Rob opened the discussion on the risk assessment (RA) update by indicating little change. He said that Tetra Tech is still data mining and addressing identified data gaps.

Rob and Carl revealed that they are adjusting the RA to reflect the Preliminary Flood Insurance rate Map (PFIRM) as the best available data for this plan update. Carl explained that the updated RA for flood will use the PFIRM received from FEMA on December 28th as the basis of the flood RA instead of the current effective FIRM. Carl said that the PFIRM provides a new study on Pleasant Grove Creek and will be best suited for inclusion into the 2016 plan update for enhanced future impact assessments.

Item	Action

Public Involvement Strategy

CRS Requirements

Rob reviewed the Community Rating System (CRS) requirements for public engagement, noting that the City of Roseville is already fulfilling most requirements through inviting public participation during committee meetings and maintaining a public facing website. He stressed that such initiatives must be maintained and public engagement must continue.

To survey or not to survey

Rob presented the SC with the 2010 Roseville HMP public survey and posed the question of whether or not the survey should be updated and distributed for the 2016 initiative. He said that to truly reap the benefits of the survey, the public must be provided a minimum of 30 days to maximize participation. He stressed that distribution of the survey may not necessarily be conducive to the expedited timeline for HMP completion, noting that the current target submission to FEMA is March 2016. This led to a discussion on the ramifications of extending the target submission. Rob mentioned that the City is still able to submit a LOI with an expired plan. Additionally, he said that HMGP approval can take anywhere from 6-8 months after initial submission. Carl noted that the only project that may be affected by an extended submission of the HMP to FEMA would be the acquisition project associated with 645 Riverside. Rob added that the City should be afforded some latitude regarding this project due to the lag in progress caused by CalOES and FEMA. At this point, Carl suggested to extend the HMP process to afford ample time to maximize public participation.

SC to review the previous survey by January 8 and return comments to Jessica.

Grace noted that the Flood Control District and FEMA will be meeting during late January and recommended engaging FEMA to be put on the agenda. Jason followed up by recommending that participating in RCONA meeting may be beneficial for furthering public outreach.

Carl and Jason to introduce the Roseville HMP initiative and public survey to the County CCO meeting, if possible.

PPI Subcommittee

Rob initiated a discussion regarding the next item on the agenda – the Program for Public Information (PPI). He noted that this is an option for additional CRS credit. Given the City's current outreach initiatives, Rob said that it makes sense to capture them in a formalized program. He said that the PPI would be an annex to the plan, as the process for PPI planning will extend beyond the 2016 HMP effort. Carl requested additional information regarding the PPI, after which the subcommittee will meet – tentatively at the end of January. The PPI subcommittee is tentatively identified as follows:

- Carl Walker
- Jason Rizzi
- Helen Dyda
- Jamie Garrett
- Rick Stalker
- Paul Holt
- Michael Algots

Jessica to develop and send an overview of the PPI initiative, inclusive of requirements and considerations.

Item	Action

Confirm Critical Facilities Definition

Next, Rob reviewed the previous iterations of the critical facility definitions from the 2005 and 2010 plans. He stated that, at a minimum, the City should use the CRS standard definition. He provided additional examples for review and asked the SC for their views on the definition. The SC agreed that the standard definition should be used with some modification. The following definition was constructed and subsequently approved by the SC with a motion to approve from Joseph Van Zant and a second from Rick Stalker:

> *A structure or other improvement, public or private, that, because of its function, size, service area, or uniqueness, has the potential to cause serious bodily harm, extensive property damage, or disruption of vital socioeconomic activities if it is destroyed or damaged or if its functionality is impaired. Critical facilities may include, but is not limited to, health and safety facilities, utilities, government facilities, hazardous materials facilities, and transportation infrastructure.*

General Plan Update/New CA General Planning Law

Wayne updated the SC on current general Plan initiatives, including a discussion of SB 379. During this discussion, Wayne indicated that SB 379 will require a climate change component beginning with the first plan adopted after January 2017. As a result, the 2016 mitigation planning initiative will not be required to contain climate change, however Rob indicated that the previously discussed climate change chapter will serve as a segue into the post-2017 requirement.

Emergency Operations Plan Review

Rob indicated that the EOP review was currently underway. He stressed that an anticipated gap will include disabilities, access, and functional needs issues given the recent string of Americans with Disabilities Act lawsuits taking place around the country.

Debris Management Plan

Jessica introduced the SC to the debris management planning initiative. She provided the SC with an overview of debris management operations and stressed the need for a strong plan that follows recently updated Public Assistance Program and Policy Guide 10-point Debris Management Plan Checklist. Paul and Mike volunteered to serve on the debris management planning committee given their advanced knowledge of hazardous materials and debris management practices.

Jessica to send out the 10-point Debris Management Checklist for SC review and reference.

Jason to include Paul and Mike in the debris management planning process.

Item	Action
As a final action before meeting adjournment, Rick requested a copy of the SC contact information.	Carl to send Rick SC contact information

The meeting adjourned at 7:47 PM

The next Steering Committee meeting is:

February 2nd from 6:00 PM to 8:00 PM
Roseville City Hall
311 Vernon St., Roseville, CA 95678

TETRA TECH

MEETING SUMMARY

Date of Meeting:	February 2, 2016
Subject:	4th Steering Committee (SC) meeting
Project Name:	City of Roseville Multi-Hazard Mitigation Plan –Update
In Attendance:	**Steering Committee**- Grace Keller (Chair), Jason Rizzi, Wayne Wiley, Carl Walker, Helen Dyda, Brenette Macintosh, Mark Lacher, Joe Van Zant, Rick Stalker, Michael Algots, Jim Williams, Paul Holt, Jaime Garret **Planning Team**- Rob Flaner, Jessica Cerutti
Not Present:	Rob Jensen, Rod Rodriguez, Erik Angle, Dom Casey
Summary Prepared by:	Jessica Cerutti – 02/08/16
Project No.:	103S4157
Quorum- Yes or No	Yes

Item	Action

Welcome and Introductions

- Chair Grace Keller opened the meeting with a brief group introduction.
- Agenda was reviewed with no request for changes.
- Meeting summary for Steering Committee (SC) Meeting #3 were reviewed and approved.
- There were no members of the public present and no public comment received by the SC.
- Handouts provided included: Agenda, Meeting #3 summary, Debris Management Plan Checklist, Risk Assessment Update, 2016 Roseville Public Questionnaire, PPI Overview, 2011 Mitigation Catalog.

Risk Assessment Update

Rob opened the discussion on the risk assessment (RA) update by thanking Carl for the receipt of additional data, including flood data that provided the missing links on the assessor's data. Rob indicated that this missing data provides a key for making the overall RA more robust.

Next, Rob mentioned that there were previous issues with the LiDAR data, stating that the data received was not based on a bare earth model. He then said that Carl was able to acquire the formatted bare earth LiDAR model that FEMA is using for the Preliminary DFRIM, which will further strengthen the RA.

Rob next stated that the RA results will be available by the next SC meeting. During the next meeting, these results will be reviewed for the earthquake, flood, and dam failure hazards with all updated inventories. He said that

Rob to provide RA results by Feb. 26th

Item	Action
review of this information is key, as it will be the primary deliverable to share with the public. Rob said that Tetra Tech will work towards getting the SC the RA data by Friday, February 26th in order to provide an opportunity for SC review prior to the next meeting. He said that this data will come from Hazus and explained that the RA used a user defined, more specific model than simply using the Hazus pre-identified data. He requested that the SC review the RA methodology from the previous plan in preparation of reviewing the 2016 RA data.	SC to review the previous plan methodology for RA in preparation of 2016 RA review.
Next, Rob talked about the hazard layers, saying that some datasets were provide by the California Geological Survey. He also spoke about the dam failure hazard, reminding the SC that this profile was originally developed during the previous planning process. He said that this hazard focused on analysis and results, but did not include specific mapping due to operational security. The SC agreed that general evacuation and inundation maps with arrows are permissible, but no specific mapping should be used that identifies definitive locations of the dam failure hazard due to security concerns.	
Public Involvement Strategy	
Survey	
The SC reviewed the final survey for distribution and discussed the timeline for deploying the survey in relation to the remaining timeline for the project. Jason recommended that communications should take the lead on deploying the survey through various means. Helen suggested running the survey for approximately 2 weeks. She also indicated that they would provide a follow up email and post to potential respondents before the survey is closed to remind potential participants to take the survey.	Helen and Jaime to deploy the survey via social media platforms and other channels.
Public Meeting	
Rob then began a discussion on the public meeting. He said that the public meeting is dependent upon the availability of RA data. Grace recommended the use of the Utility Center. Jason said that he would check with the Parks and Rec Department to find out Center availability, but recommended against late March due to Spring Break, noting that many residents will likely be out of town during this time. Helen and Jaime recommended adding an option at the end of the survey where residents could provide their email address to remain informed on upcoming public meetings.	Jessica to add email option to end of survey.
Rob requested information regarding the potential format of the public meeting. The SC agreed that an open house format would be the best. Potential booth participants could include RCONA, Union Pacific, Red Cross, CERT, and others. Jason mentioned the Saturday open houses for the fire department as a potential vehicle for a captive audience. Helen recommended the Earth Day festivities on April 16th as a possible vehicle for the public meeting. In addition, she indicated that the Food Truck Mania event would be an ideal time to advertise for the public meeting	SC will provide input regarding the Planning Team's recommendations for a tentative schedule and begin preliminary event planning in March.

Item	Action

Public Involvement - PPI

Carl started the conversation about the PPI by saying that the City would like to make the PPI more of an all hazards program that fulfills CRS requirements while simultaneously providing additional outreach considerations on other hazard issues. Jessica indicated that this is an ideal program, noting that a PPI allows for CRS credit based on topics outside of the six priority topics. She said that these additional topics can be general preparedness, all-hazards based.

Jessica then took the SC through an overview of the PPI development process. She reviewed each of the seven steps, beginning with the establishment of a PPI Committee. She noted that at the previous SC meeting, a list of tentative PPI committee members was discussed. From this list, the final committee will be selected based on CRS requirements.

Jess and Carl to discuss final PPI committee.

Jessica then discussed Step 2 of the process, drawing attention to the need to identify target areas and target audiences. She noted that this next step can only be conducted after the development of the RA which will allow the PPI committee to make a data-based determination on what specific areas to target. She reviewed the rest of the requirements of the PPI, including a reiteration on topics and annual review requirements

Alternatives Analysis

Rob next discussed the alternatives analysis, bringing the SC's attention to the previous Mitigation Catalog. Rob reminded the SC that this catalog development is part of the statutory requirement to develop a comprehensive range of alternatives considered for actions in the plan. He noted that the catalog separates actions into a personal, corporate, and governmental scale and identifies opportunities to reduce risk.

Rob mentioned that the SC did not perform a Strengths, Weaknesses, Opportunities, and Obstacles (SWOO) session during the last planning process (2011 MHMP Update) and asked the SC if they would like to conduct a SWOO session for the 2016 initiative. He reminded the SC that they last SWOO session was held nearly 10 years ago, and that some risks have changed. For example, he noted that during the initial planning process, dam risk was unknown. New RA results will provide a better understanding of the dam hazard and how they relate to SWOO.

Jason requested best practices from other jurisdictions and their SWOO results as a reference, noting that while some risks need to be reassessed as part of the catalog process, others have remained the same. Rob recommended an abbreviated SWOO session during the next SC meeting,

Item	Action

for all-hazards, but specifically recommended focusing on newly identified risks, such as dam failure and cyber threats.

Grace asked Rob to conduct a sample SWOO to give the SC an idea of what to expect during the next meeting. Rob used Health Hazards as a sample:

- Strengths
  - Active community, parks and rec, available health programs
- Weaknesses
  - Homeless population
  - Elderly population – unable to call for help, alone in houses
- Opportunities
  - Change in potential funding to establish a program
  - Identify new opportunities to reduce risk
  - Seniors First – visitors already trained, opportunity for coordination
- Obstacles
  - Limited funding
  - Organizational resources lacking

With no further comments, the meeting adjourned at 8:00 PM

The next Steering Committee meeting is:

March 1st from 5:30 PM to 8:00 PM

Roseville City Hall
311 Vernon St., Roseville, CA 95678

TETRA TECH

MEETING SUMMARY

Date of Meeting:	March 1, 2016
Subject:	5th Steering Committee (SC) meeting
Project Name:	City of Roseville Multi-Hazard Mitigation Plan –Update
In Attendance:	**Steering Committee**- Grace Keller (Chair), Jason Rizzi, Wayne Wiley, Carl Walker, Erik Angle, Helen Dyda, Brenette Macintosh, Mark Lacher, Joe Van Zant, Rick Stalker, Michael Algots, Jim Williams, Jaime Garret **Planning Team**- Rob Flaner, Jessica Cerutti
Not Present:	Rob Jensen, Rod Rodriguez, Dom Casey
Summary Prepared by:	Jessica Cerutti – 03/10/16
Project No.:	103S4157
Quorum- Yes or No	Yes

Item	Action

Welcome and Introductions

- Chair Grace Keller opened the meeting with a brief group introduction.
- Agenda was reviewed with no request for changes.
- Meeting summary for Steering Committee (SC) Meeting #4 were reviewed and approved.
- Two members of the public were presented and invited to comment at this time.
    - Both members of the public expressed interest in the planning process. On indicated an increased interest in understanding the concept of the plan, including how manmade hazard such as cyber are terrorism will be incorporated. SC members offered additional information regarding the background of hazard mitigation planning, including the emphasis on natural hazards.
- Handouts provided included: Agenda, Meeting #4 Summary, Preliminary Risk Assessment Results, and Preliminary Public Information Survey Results.

Risk Assessment Update

Rob opened the discussion on the risk assessment (RA) update by reviewing the essential terminology regarding the risk assessment data provided in the handout. He reminded the SC that FEMA is looking to quantify risk and avoided loss in monetary amounts. He reviewed the definition of assets in General Building Stock and Critical facilities. He noted that general building stock is where residents live and shop on a daily basis while critical infrastructure refers to the definition decided upon by the SC during SC Meeting #2.

Item	Action

Next, Rob reviewed the purpose of HAZUS – the program used to conduct the Roseville risk assessment. He noted that the updated risk assessment used HAZUS 5.1 and updated inventory, including new LiDAR data based on terrain and an updated value of identified assets. Additionally, Rob noted that the updated risk assessment contains new loss estimations for dam failure, earthquake, and flood. Rob said that expected changes occurred with the inclusion of better data, specifically regarding an increased floodplain due to the annexation of Sierra Vista and Creekview and new shake maps for seismic assessment.

From there, Rob explained that the actual risk ranking is based on HAZUS outputs on a level 2-user defined level. He explained that this meant that the assessment was conducted on a property-specific level instead of a general block level. Rob noted that this granular level of assessment provides increased capability for informed hazard ranking and overall mitigation planning.

Rob next reviewed the results of each hazard run, noting that the assessment is not complete for all anticipated models – particularly for landslide due to soil class discrepancies and the 10-, 50-, and 500-year flood scenarios. Rob noted that outside of flood and earthquake, the other hazards are given an estimate on potential damages in table format due to existing limitations in the HAZUS program.

Rob said that the April 16th Earth Day HAZUS work stations will rely on correct information in order to provide information to the public.

Public Involvement Strategy

Earth Day

Next, Rob reviewed the public outreach strategy, noting that Roseville's April 16th Earth Day event at Mahany Park will be the foundation for the first public meeting. He explained the format, saying that there will be two HAZUS workstations, easels displaying maps, and hard copies of the survey available for attendees to complete. Carl and Jason discussed the issues associated with displaying information related to the dam failure hazard. Carl noted that the public survey results indicated a need to provide some information on dam failure, but consideration must be made regarding the exposure of potentially sensitive information.

Carl to confirm SC participation in Earth Day activities.

Additionally, Rob requested the involvement of the SC as support staff during the Earth Day activities from 10:00am to 3:00pm. Carl requested that the SC sign up for times in which they would be available to support the initiative. The SC provided an initial schedule to Carl at this time. Carl also suggested the possibility of including a raffle giveaway to encourage participation, noting that an emergency preparedness Go-Bag would be a beneficial prize.

Rob closed the discussion on Earth Day by noting that the SC would not meet during the month of April due to the Earth Day event.

Survey Results

Item	Action
Jessica reviewed the initial survey results. She stressed that the purpose of this survey was twofold: to assess the understanding of hazards at a community level and to assess the specific concerns for the community. She drew attention to the associated handout and noted that Jaime and Helen's public outreach resulted in 653 responses. First, Jessica reviewed the respondent top choices for receiving news and information about the City, noting that email and text messaging was the top selection for information, next was the social media platform, Nextdoor, followed Facebook, and Alert Roseville. Next, Jessica noted that nearly 98% of respondents live in Roseville, and over half of the respondents work outside of Roseville. Jessica explained that this is a key factor in outreach, as families may be separated during a disaster. Jessica noted that while most respondents were aware of their location within or outside of a floodplain, approximately 40% were not sure. She described this as an indication of a need for additional outreach that can be targeted during the development of the PPI. Likewise, a large percentage (approximately 38%) indicated that they were unsure whether their residence was located in a dam failure zone or not. Jessica reviewed the assessment of the public top natural hazard threats. Drought was the top hazard threat, followed by extreme temperatures, epidemic, severe weather, earthquake, flood, wildfire, freeze and other hazards. She noted that multiple respondents cited radon as a natural hazard of concern. The SC agreed to take this information into consideration during the next LHMP update and possible include radon exposure as a future hazard of concern.	Tetra Tech to update hazard mitigation Best Practices based on SWOO results.

SWOO Session

Rob led the SC in the conduction of the SWOO Session. He began the session by explaining that the SC will focus on an overall programmatic assessment of Roseville, followed by a hazard specific assessment for the hazards of dam failure and cyber threats.

With no further comments, the meeting adjourned at 8:00 PM

The next Steering Committee meeting is:

August 2nd from 6:00 PM to 8:00PM
Roseville City Hall
311 Vernon St., Roseville, CA 95678

TETRA TECH

MEETING SUMMARY

Date of Meeting:	August 2, 2016
Subject:	6th Steering Committee (SC) meeting
Project Name:	City of Roseville Multi-Hazard Mitigation Plan –Update
In Attendance:	**Steering Committee**- Grace Keller (Chair), Jason Rizzi, Wayne Wiley, Carl Walker, Helen Dyda, Erik Angle, Brenette Macintosh, Mark Lacher, Joe Van Zant, Rick Stalker, Michael Algots, Jim Williams, **Public:** Michael Zasso **Planning Team**- Rob Flaner, Jessica Cerutti
Not Present:	Rob Jensen, Rod Rodriguez, Dom Casey, Jaime Garret
Summary Prepared by:	Jessica Cerutti – 08/17/2016
Project No.:	103S4157
Quorum- Yes or No	Yes

Item	Action

Welcome and Introductions

- Chair Grace Keller opened the meeting with a brief group introduction.
- Agenda was reviewed with no request for changes.
- Meeting summary for Steering Committee (SC) Meeting #5 were reviewed and approved.
- There were no public comment received by the SC.
- Handouts provided included: Agenda, Meeting #3 summary, Draft RMHMP.

Project Overview

Rob Flaner began the discussion by indicating that the SC Meeting 6 doubled as a public meeting to review the Draft RMHMP. Carl stated that the public review period started on July 18th and would end on August 19th with an anticipated submittal to CalOES and FEMA by August 29th. From there, Carl said that Approval Pending Adoption is expected by October 18, with a target date to present the plan before City Council on November 2nd.

From there, Rob, provided an overview of the entire process and plan. He noted that this plan is a requirement to apply for certain federal funding programs – namely mitigation programs. Rob noted that the specific process undertaken by the City was driven by Community Rating System (CRS) requirements.

Item	Action

Rob continued by explaining that the risk assessment conducted as part of this process is the hub of the mitigation wheel. He said that risk is probability multiplied by impact, and that the resulting ranking allowed the City to compare results and categorize hazards as high, medium, or low risk,

Rob next described the capability assessment. He said that the capability assessment serves a dual purpose. One purpose is to identify existing drivers and support for implementing mitigation strategies. The second purpose is to identify potential deficiencies that could be remedied as a mitigation item. He noted debris management as an example. He explained that the City identified the need for a debris management plan as a result of the previous capability assessment. As a result, a debris management plan was recommended and subsequently completed by the City.

Next, Rob described the importance of goals and objectives. He reminded the SC that this initiative is the third comprehensive update undertaken by the City. He noted that the goals and objectives from the previous plan were carried over into the 2016 plan with some minor adjustments to focus on climate change.

Finally, Carl and Wayne described the process for CEQA, namely the initial study/mitigated negative declaration designation (IS/MND). They indicated that pursuit of the IS/MND was based on the expectation that projects identified in the Plan would undergo a full CEQA review once they are initiated.

Public Involvement Strategy

During the discussion on public engagement, Jessica noted that a large part of the success of Roseville's 2016 public engagement strategy was due to the successful implementation of Nextdoor as an outreach tool. She noted that the survey received a strong response in correlation with Nextdoor releases. Carl thanked the efforts of Helen and Jaime in coordinating the public outreach efforts.

Action Items/Next Steps

- Finalize plan based on public comments
- Submit to CalOES/FEMA for Review

With no further comments, the meeting adjourned at 7:00pm

Exhibit B – City of Roseville Municipal Code 14.09

Roseville Municipal Code

Title 14 PUBLIC UTILITIES

Chapter 14.09 WATER CONSERVATION

14.09.010 Short title.

This chapter may be cited as the Water Conservation and Drought Mitigation Ordinance. (Ord. 5311 § 2, 2014; Ord. 2413 § 2, 1991.)

14.09.020 General provisions.

A. Purpose. The purpose of this chapter is to ensure compliance with all federal, state and local requirements relating to water conservation and drought mitigation for the protection of public health, safety and welfare by:

1. Reducing the per capita water consumption throughout the City of Roseville (the "city") during years of normal precipitation and during years of drought;

2. Protecting and conserving the city's supply of water during specified times of emergency and/or crisis;

3. Minimizing and/or eliminating the waste of water through voluntary compliance or punitive action, if necessary;

4. Promoting the use of drip irrigation and other low volume irrigation methods that reduce outdoor water use by applying water more efficiently than traditional irrigation methods;

5. No person shall use, or cause to be used, any city water for landscape irrigation between the hours of 10:00 a.m. and 8:00 p.m., unless the city manager, or designee provides prior written consent to a different time limitation. A waiver may be granted for turf areas if the landscape contains too many irrigation valves to complete an irrigation event within the watering window.

6. Upon city declaration of a water shortage, the city manager, or designee, may impose revised and/or additional limitations on outdoor water use, as specified in Section 14.09.040, and no person shall use, or cause to be used, city water in violation of such limitations while the water shortage remains in effect.

B. Scope. The provisions of this chapter shall apply to all customers, users and/or recipients (hereinafter "users") of the city's potable and recycled water service within the city's territorial limits.

C. Administration and Enforcement. The city manager, or designee, including, but not limited to, an enforcement officer as defined herein, shall administer, implement, and enforce the provisions of this chapter. For purposes of this chapter an "enforcement officer" means any city employee or agent of the city with the authority to enforce any provision of this chapter and the authority to make any decision on behalf of the city manager required or called for by this chapter.

D. Compliance. All provisions of this chapter are subject to the compliance procedures set forth in this chapter unless otherwise expressly stated herein.

E. Notification. The city manager, or designee, shall determine the means by which the city shall notify its water users of drought stage determinations and any applicable upgrade or downgrade of such determinations or restrictions. Notification may be achieved through mass media, newspaper, public notice, mailings, utility billings or by any combination of such notice, or by other means as determined by

the city manager, or designee. (Ord. 5491 § 1, 2015; Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.030 Definition of water waste.

Any of the following acts or omissions, whether willful or negligent, shall constitute the waste of water:

A. Causing or permitting water to leak, discharge, flow or run to waste into any gutter, sanitary sewer, watercourse or public or private storm drain, or to any adjacent property, from any tap, hose, faucet, pipe, sprinkler, pond, pool, waterway, fountain or nozzle. In the case of irrigation, "discharge," "flow" or "run to waste"

means that the earth intended to be irrigated has been saturated with water to the point that excess water flows over or through the earth to waste. In the case of washing, "discharge," "flow" or "run to waste" means that water in excess of that necessary to wash, wet or clean the dirty or dusty object, such as an automobile, sidewalk, or parking area, flows to waste.

B. Allowing water fixtures (including, but not limited to, toilets, faucets, shower heads) or heating or cooling devices to leak or run to waste.

C. Maintaining ponds, waterways, decorative basins or swimming pools without water recirculation devices.

D. Backwashing so as to discharge to waste swimming pools, decorative basins or ponds in excess of the frequency necessary to ensure the healthful condition of the water or in excess of that required by standards for professionally administered maintenance or to address structural considerations, as determined by the city manager, or designee.

E. Operation of an irrigation system that applies water to an impervious surface or that is in disrepair.

F. Use of a water hose not equipped with a control nozzle capable of completely shutting off the flow of water except when positive pressure is applied.

G. Irrigation of landscaping during rainfall or 48 hours after a measurable rain event.

H. Overfilling of any pond, pool or fountain which results in water discharging to waste. (Ord. 5491 § 2, 2015; Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 3834 § 3, 2002; Ord. 2413 § 2, 1991.)

14.09.040 Water conservation and drought stages.

The following water conservation and drought stages are hereby established:

A. Basic Water Conservation Stage ("Basic Stage"). The basic stage shall exist when the city's water supply is adequate to meet all projected demands as determined by the city manager, or designee.

B. Stage One Drought. A stage one drought shall exist when the city's water supply is adequate to meet 90 percent of projected demands as determined by the city manager, or designee. An objective of a stage one drought condition is to reduce water usage up to 10 percent. Water shortage surcharges shall be implemented as set forth in Section 14.08.095.

C. Stage Two Drought. A stage two drought shall exist when the city's water supply is adequate to meet 80 percent of projected demands as determined by the city manager, or designee. An objective of a stage two drought condition is to reduce water usage up to 20 percent. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095.

D. Stage Three Drought. A stage three drought shall exist when the city's water supply is adequate to meet 70 percent of projected demands as determined by the city manager or designee. An objective of a stage three drought condition is to reduce water usage up to 30 percent. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095.

E. Stage Four Drought. A stage four drought shall exist when the city's water supply is adequate to meet 60 percent of projected demands as determined by the city manager or designee. An objective of a stage four drought condition is to reduce water usage up to 40 percent. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095.

F. Stage Five Drought. A stage five drought shall exist when the city's water supply is adequate to meet 50 percent or less of projected demands as determined by the city manager, or designee. An objective of a stage five drought condition is to reduce water usage up to 50 percent. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095. (Ord. 5491 § 3, 2015; Ord. 5311 § 2, 2014; Ord. 4724 § 3, 2009; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.050 Determination of drought staging—Effect of well water.

In determining the water conservation and drought stage in effect, the city manager, or designee, shall take into account only surface water available and able to be delivered from the Bureau of Reclamation and the Placer County Water Agency. Well water shall not be considered. In the event that this would result in a determination of a stage three drought or higher, groundwater wells may be activated to increase the supply to a stage two drought level. However, in no case shall well water be considered as an alternative to declaration of a stage one or stage two drought. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.060 Basic stage restrictions.

During the basic water conservation stage, the following restrictions shall be in force:

Water shall be used for beneficial purposes only; all unnecessary and wasteful uses (as defined in Section 14.09.030) of water are prohibited.

A. Water shall be confined to the user's property and shall not be allowed to run off to adjoining properties, or to the roadside or to the gutter. Care shall be taken not to water past the point of saturation.

B. Free-flowing hoses for all uses are prohibited. Automatic shut-off devices shall be attached on any hose or filling apparatus in use.

C. All leaks (including irrigation systems, pipes, fixtures, pools, ponds, fountains and waterways) shall be repaired within five calendar days or less if warranted by the severity of the problem as determined in the discretion of the city manager, or designee.

D. All pools, spas, and ornamental fountains/ponds shall be equipped with a recirculation pump and shall be constructed to be leak-proof. Pool draining and refilling shall be allowed only to the extent

required for health, maintenance, or structural considerations, and must otherwise comply with all applicable federal, state and local stormwater management program requirements, including, but not limited to, the urban stormwater quality management and discharge control ordinance set forth in Chapter 14.20 of Title 14 of the City of Roseville Municipal Code.

E. Landscaping.

1. All landscaping installed in the City of Roseville shall comply with the water efficient landscape requirements adopted by resolution of the city council.

2. Irrigation of new landscaping shall be allowed on any day of the week for a period of 30 days after the new landscaping is planted, unless the city manager, or designee, provides prior written consent to extend this time period based on plant type and the season when the new landscaping is planted. After the 30 days, irrigation days and run times should be decreased to settings appropriate for an established landscape.

3. Upon city declaration of a water shortage, the city manager may impose revised and/or additional limitations on the irrigation of new landscaping, as specified in Sections 14.09.060 through 14.09.100, and no person shall use, or cause to be used, city water in violation of such limitations while the water shortage remains in effect. A waiver may be granted to irrigate during an establishment period for actively used turf areas and/or sports fields. Allowance shall also be made for irrigation testing and repairs.

F. All site reviews shall include an evaluation of using recycled water. Recycled water shall be required if economically feasible. (Ord. 5491 § 4, 2015; Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2762 § 1, 1993; Ord. 2413 § 2, 1991.)

14.09.070 Stage one drought restrictions.

During a stage one drought, the following restrictions may be required, as determined by the city manager and upon notification pursuant to Section 14.09.020(E):

A. All basic stage restrictions required by Sections 14.09.030 and 14.09.060 shall continue in place, except to the extent they are replaced by more restrictive conditions imposed by this section.

B. Residential users and non-residential users shall reduce water usage up to 10 percent.

C. Residential water users shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of November – last day of February: up to one day per week irrigation on Monday of each week, if needed.

2. 1st day of March – last day of April and 1st day of September – last day of October: up to two days per week irrigation on Monday and Friday of each week, if needed.

3. 1st day of May – last day of August: up to three days per week irrigation on Monday, Wednesday and Friday of each week, if needed.

D. Nonresidential water users (including without limitation, commercial, industrial, church, cemeteries, and publicly owned users) shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of November – last day of February: up to one day per week irrigation on Monday of each week, if needed.

2. 1st day of March – last day of April and 1st day of September – last day of October: up to two days per week irrigation on Monday and Thursday of each week, if needed.

3. 1st day of May – last day of August: up to three days per week irrigation on Monday, Thursday and Saturday of each week, if needed.

E. The limitations specified in subsections C and D shall not apply to a properly functioning low volume landscape irrigation system, the irrigation on container plants, or to the irrigation of new landscaping that is subject to the provisions of Section 14.09.060(E). Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

F. References in this section to any day of the week shall mean the period beginning at 12:00 a.m. on that day and ending 24 hours later.

G. City park sites shall, as an aggregate, reduce usage up to 10 percent.

H. Washing streets, parking lots, driveways, sidewalks or buildings, except as necessary for health or sanitary purposes or pursuant to a term or condition in a permit issued by a state or federal agency, is prohibited.

I. Water shall not be served at restaurants except by request.

J. Water shortage surcharges shall be implemented as set forth in Section 14.08.095. (Ord. 5491 § 5, 2015; Ord. 5311 § 2, 2014; Ord. 4724 § 3, 2009; Ord. 4629 § 1, 2008; Ord. 2817 § 1, 1994; Ord. 2636 § 1, 1992; Ord. 2413 § 2, 1991.)

14.09.080 Stage two drought restrictions.

During a stage two drought, the following restrictions may be required, as determined by the city manager and upon notification pursuant to Section 14.09.020(E):

A. All basic stage and stage one restrictions required by Sections 14.09.060 and 14.09.070 shall continue in place, except to the extent they are replaced by more restrictive conditions imposed by this section.

B. Residential users and non-residential landscapes shall reduce water usage up to 20 percent.

C. City park sites shall, as an aggregate, reduce usage up to 20 percent.

D. Residential water users shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of November – last day of February: up to one day per week irrigation on Monday of each week, if needed.

2. 1st day of March – last day of April and 1st day of September – last day of October: up to two days per week irrigation on Monday and Friday of each week, if needed.

3. 1st day of May – last day of August: up to three days per week irrigation on Monday, Wednesday and Friday of each week, if needed.

E. Nonresidential water users (including without limitation, commercial, industrial, church, cemeteries, and publicly owned users) shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of November – last day of February: up to one day per week irrigation on Monday of each week, if needed.

2. 1st day of March – last day of April and 1st day of September – last day of October: up to two days per week irrigation on Monday and Thursday of each week, if needed.

3. 1st day of May – last day of August: up to three days per week irrigation on Monday, Thursday and Saturday of each week, if needed.

F. The limitations specified in subsections D and E shall not apply to a properly functioning low volume landscape irrigation system, the irrigation on container plants, or to the irrigation of new landscaping that is subject to the provisions of Section 14.09.060(E). Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

G. References in this section to any day of the week shall mean the period beginning at 12:00 a.m. on that day and ending 24 hours later.

H. Washing of vehicles or boats is prohibited except:

1. When using a hose that is equipped with a control nozzle capable of completely shutting off the flow of water except when positive action or pressure to maintain the flow of water is applied; or

2. When washed in either an automatic or manual commercial car wash that recirculates its water and uses high pressure/low volume wash systems.

3. Temporary car washes, held for fundraising purposes, are encouraged to partner with an automatic commercial car wash that recirculates its water and uses high pressure/low volume wash systems. If run independently, the participants must use a hose nozzle that completely shuts off the flow of water when not in use and must comply with all applicable federal, state and local stormwater management program requirements, including, but not limited to, the urban stormwater quality management and discharge control ordinance set forth in Chapter 14.20 of Title 14 of the City of Roseville Municipal Code.

I. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095. (Ord. 5491 § 6, 2015; Ord. 5311 § 2, 2014; Ord. 4724 § 3, 2009; Ord. 4629 § 1, 2008; Ord. 2611 § 1, 1992.)

14.09.090 Stage three drought restrictions.

During a stage three drought, the following restrictions may be required, as determined by the city manager and upon notification pursuant to Section 14.09.020(E):

A. All basic stage, stage one, and stage two restrictions required by Sections 14.09.060, 14.09.070 and 14.09.080 shall continue in place, except to the extent they are replaced by more restrictive conditions imposed by this section.

B. Residential users and non-residential landscapes are to reduce water usage up to 30 percent.

C. City park sites shall, as an aggregate, reduce usage up to 30 percent.

D. Residential water users shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of September – last day of April: up to one day per week irrigation on Monday of each week, if needed.

2. 1st day of May – last day of August: up to two days per week irrigation on Monday and Friday of each week, if needed.

E. Nonresidential water users (including without limitation, commercial, industrial, church, cemeteries, and publicly owned users) shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of September – last day of April: up to one day per week irrigation on Monday of each week, if needed.

2. 1st day of May – last day of August: up to two days per week irrigation on Monday and Thursday of each week, if needed.

F. The limitations specified in subsections D and E shall not apply to a properly functioning low volume landscape irrigation system, the irrigation on container plants, or to the irrigation of new landscaping that is subject to the provisions of Section 14.09.060(E). Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

G. References in this section to any day of the week shall mean the period beginning at 12:00 a.m. on that day and ending 24 hours later.

H. New or expanded landscaping is limited to drought-tolerant trees, shrubs, and ground-cover and be irrigated using a low volume irrigation system. No new turf shall be planted, hydroseeded, or laid, unless prior written consent is received from the city manager. Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

I. Except where recycled water is used, golf courses shall reduce irrigation up to 30 percent.

J. All decorative fountains, decorative (i.e., nonswimming) pools, and decorative waterways shall be drained and made dry. Such fountains, pools, and waterways shall not be refilled until the city has returned to the basic water conservation stage. Fountains, ponds or pools that are filled with recycled water are not subject to this provision. Decorative ponds that contain fish as a feature shall be exempt from this restriction as long as the system is maintained in good working order with measures taken to reduce the volume of makeup water required for evaporative losses.

K. Except where recycled or other non-potable water is used or as otherwise provided in this subsection, use of water for dust control is prohibited. Dust control shall be augmented by hardened, temporary travel routes with materials that are accepted by the city manager, city engineer, or designee. Potable water is allowed for construction water only where and to the extent required for public health and safety reasons.

L. New swimming pools and spas may be filled after construction using customer's metered water at then existing water rates. All new pools must include a means for minimizing evaporative loss, such as a pool cover, at time of final inspection by the city. After being filled with water for the first time, all pools and spas shall be subject to the requirements of Section 14.09.060(D).

M. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095. (Ord. 5491 § 7, 2015; Ord. 5311 § 2, 2014; Ord. 4724 § 3, 2009; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.100 Stage four drought restrictions.

During a stage four drought, the following restrictions may be required, as determined by the city manager and upon notification pursuant to Section 14.09.020(E):

A. All basic stage, stage one, stage two, and stage three restrictions required by Sections 14.09.060, 14.09.070, 14.09.080 and 14.09.090 shall continue in place, except to the extent they are replaced by more restrictive conditions imposed by this section.

B. Residential customers and non-residential landscapes are to reduce water usage up to 40 percent.

C. City park sites shall, as an aggregate, reduce usage up to 40 percent.

D. Residential water users shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of September – last day of April: No irrigation allowed.

2. 1st day of May – last day of August: up to one day per week irrigation on Monday, if needed.

E. Nonresidential water users (including without limitation, commercial, industrial, church, cemeteries, and publicly owned users) shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of September – last day of April: No irrigation allowed.

2. 1st day of May – last day of August: up to one day per week irrigation on Monday of each week, if needed.

F. The limitations specified in subsections D and E shall not apply to a properly functioning low volume landscape irrigation system, the irrigation on container plants, or to the irrigation of new landscaping that is subject to the provisions of Section 14.09.060(E). Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

G. References in this section to any day of the week shall mean the period beginning at 12:00 a.m. on that day and ending 24 hours later.

H. Installation of any new landscaping is prohibited unless irrigation is provided through connection to an active recycled water system. In the case of new construction, the city's building official will issue a temporary final upon completion of the structural development of the property. When the city has returned to a stage two drought restriction, landscaping installation can be completed and a building final will become available upon inspection by the city.

I. Except where recycled water is used, golf courses shall reduce irrigation up to 40 percent.

J. Automobiles or equipment shall be washed only at commercial establishments that recycle their water or by equipment and means that separates debris and recycles wash water for continual use.

K. Existing pools shall not be emptied and refilled using city water unless required for health or safety reasons until the city has returned to a stage two drought restriction. Pools may be re-filled only to the extent necessary to replace evaporative losses.

L. No commitments shall be made to provide water service as part of any new land use entitlement (general plan, specific plan or amendments requesting new water allocations) until the city has returned to a stage two drought restriction. Currently approved specific plans with accompanying development agreements and projects or properties that have received water allocations in advance of full entitlements may be issued building permits so long as they comply with the remainder of this chapter.

M. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095. (Ord. 5491 § 8, 2015; Ord. 5311 § 2, 2014; Ord. 4724 § 3, 2009; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.110 Stage five drought restrictions.

During a stage five drought, the following restrictions may be required, as determined by the city manager and upon notification pursuant to Section 14.09.020(E):

A. All basic stage, or stage one, stage two, stage three and stage four restrictions required by Sections 14.09.060, 14.09.070, 14.09.080, 14.09.090 and 14.09.100 shall continue in place, except to the extent they are replaced by more restrictive conditions imposed by this section.

B. Residential users are to reduce water usage up to 50 percent.

C. Except where recycled water is used, water users shall reduce landscape irrigation as follows:

1. Turf shall not be irrigated.

2. Trees and shrubs may be irrigated with a properly functioning low volume landscape irrigation system or by use of a handheld hose equipped with a nozzle capable of completely shutting off the flow of water except when positive action or pressure to maintain the flow of water is applied. Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

D. Filling new or existing swimming pools and spas with city water is prohibited.

E. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095. (Ord. 5491 § 9, 2015; Ord. 5311 § 2, 2014; Ord. 4724 § 3, 2009; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.120 Determination of drought tolerance.

Where this chapter permits or prohibits acts based upon whether or not a planting, tree, shrub, or groundcover is “drought tolerant” the determination shall be made based upon Sunset’s *Western Garden Book* (most recent edition), or UC Davis Arboretum’s “All Stars” plant database (www.arboretum.ucdavis.edu). Where this chapter permits or prohibits acts based upon whether a form of

irrigation is “low volume drip irrigation” the determination shall be made by the director, or designee, whose determination shall be final. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.130 Determination of landscape water consumption reductions.

Whenever this chapter requires a reduction in consumption of water for irrigation purposes, the base year for measurement shall be the last year that the basic water conservation stage was in effect or a date specified by the Governor or state agency. If that data is not available for a property, allocations will be based on water use for similar properties. The city manager or designee may elect to base a reduction on the base year or on a landscape water consumption calculation if use was, in the city manager’s or designee’s, sole opinion, either excessive or extraordinarily low. For landscaping installed subsequent to the base year, the calculations shall be based on landscape water consumption calculations submitted with the landscape plan, or water consumption the previous year, whichever is less. (Ord. 5491 § 10, 2015; Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2817 § 1, 1994; Ord. 2413 § 2, 1991.)

14.09.140 Violations.

It is unlawful for any user and/or person to violate any provision or fail to comply with any of the requirements of this chapter. Causing, permitting, aiding, abetting or concealing a violation of any provision of this chapter shall constitute a violation of this chapter. A violation of the provisions of this chapter shall occur irrespective of the negligence or intent of the violator and a violation of or failure to comply with any of the requirements of this chapter may be charged as either an infraction or a misdemeanor in the discretion of the city attorney. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 3834 § 3, 2002; Ord. 2413 § 2, 1991.)

14.09.150 Enforcement authority.

A. Whenever the city manager, or designee (including, but not limited to, an enforcement officer), determines that a user and/or person has violated any provision of, or failed to meet a requirement of, this chapter, an administrative citation pursuant to Chapter 2.50 or a written compliance order pursuant to Chapter 2.52 may be issued to any user and/or person responsible for the violation.

B. Any compliance order issued may require without limitation any or all of the following:

1. The allocation of a particular amount of water to a given user and/or person responsible for the violation;
2. The issuance of a fine;
3. The installation of a flow restriction device;
4. The performance of monitoring, analyses, and reporting;
5. That violations shall cease and desist; and/or
6. The discontinuation of water service.

The compliance order shall set forth a deadline within which the requirements of the compliance order must be completed. Said compliance order shall further advise that, should the violator fail to comply with the compliance order within the established deadline, a hearing on the compliance order shall be set.

(Ord. 5491 § 11, 2015; Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 3034 § 3, 2002; Ord. 2817 § 1, 1994; Ord. 2413 § 2, 1991.)

14.09.160 Hearing.

If full compliance is not achieved within the time specified in the compliance order, a hearing on the compliance order shall be set pursuant to Chapter 2.52. All penalties and remedies authorized by Chapter 2.52 shall apply to violations of this chapter. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.170 Appeal.

Any user and/or person receiving a compliance order under Section 14.09.150 may appeal the determination of the director, or designee, to a hearing panel drawn from the membership of the board of appeals. The notice of appeal must be received by the city's environmental utilities department within 10 days from the date of the compliance order. Notice of hearing and hearing on the appeal will be conducted pursuant to the requirements of Chapter 2.52. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.180 Separate offense for each day.

Any user and/or person that violates any provision of this chapter shall be guilty of a separate offense for each and every day during any portion of which any such user and/or person commits, continues, permits, or causes a violation thereof, and shall be punished accordingly. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.190 Public nuisance.

In addition to the enforcement processes and penalties hereinbefore provided, any condition caused or permitted to exist in violation of any of the provisions of this chapter is a threat to public health, safety, and welfare, and is declared and deemed a nuisance, and may be summarily abated or restored by the city at the violator's expense, and/or a civil action to abate, enjoin, or otherwise compel the cessation of such nuisance may be initiated and/or taken by the city. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.200 Remedies not exclusive.

Remedies under this chapter are in addition to and do not supersede or limit any and all other remedies, civil or criminal. The remedies provided for herein shall be cumulative and not exclusive. (Ord. 5311 § 2, 2014; Ord. 4629 § 2, 2008.)

14.09.210 Judicial review.

Any decision of the hearing panel shall be final. Any user and/or person aggrieved by an order of the hearing panel may obtain review of the order in the Superior Court by filing with the Court a petition for

writ of mandate within 90 days pursuant to California Code of Civil Procedure Section 1094.6. (Ord. 5311 § 2, 2014; Ord. 4629 § 2, 2008.)

14.09.220 Chapter severable.

The provisions of this chapter are severable. The city council declares that it would have adopted the remainder of this chapter even if any of its provisions are declared unlawful or unenforceable. (Ord. 5311 § 2, 2014; Ord. 4629 § 2, 2008.)

Exhibit C – Adoption Resolution

A copy of the adoption resolution will be included in the adopted version of the Water Shortage Contingency Plan.

COUNCIL COMMUNICATION

CC #: 1550
File #: 0800-02

Title:	Draft Water Shortage Contingency Plan – Public Hearing for Consideration of Adoption
Contact:	Trevor Joseph 916-746-1708 tjoseph@roseville.ca.us

Meeting Date: 6/16/2021
Item #: 10.4.

RECOMMENDATION TO COUNCIL

Staff recommends City Council hold a public hearing and consider the adoption of the Draft Water Shortage Contingency Plan (WSCP). If found acceptable, City Council shall adopt a resolution approving the plan and authorize staff to include the WSCP as Chapter 8 in the 2020 Urban Water Management Plan (UWMP).

As described above, the WSCP is ultimately included in Chapter 8 of the UWMP but must be presented and considered separately from the UWMP; however, it is staff's recommendation that this agenda item should be considered with and presented concurrently with a public hearing to review and consider the adoption of a Draft 2020 UWMP. For this reason, the Draft 2020 UWMP has been placed as a separate agenda item as documented in a separate Council Communication (CC).

Staff recommend ordering these items as follows:

1. Public Hearing – Draft 2020 UWMP (described within a separate CC)
2. Public Hearing – Draft WSCP (described within a separate CC)
3. **Adoption Hearing – Draft WSCP (described within this CC)**
4. Adoption Hearing – Draft 2020 UWMP (described within a separate CC)

Specifically these public hearings allow for 1) community input regarding the urban retail water supplier's implementation for complying with the requirements of the California Water Code (CWC), 2) consider of the economic impacts of the urban retail water supplier's implementation plan for complying with the CWC, and 3) City provided information on their baseline values, water use targets and compliance, and implementation plan.

After the public hearing, the WSCP may be adopted as prepared or as modified after the hearing or hearings.

BACKGROUND

Beginning in 1985, the California Department of Water Resources (DWR) has required water purveyors delivering water to at least 3,000 customers to prepare an UWMP and update the plan at five-year intervals. The last plan was developed and approved for 2015 and included all City boundaries as they existed at that time.

With ongoing and recent updates to the DWR Guidebook for Urban Water Suppliers, it was determined that City staff would collaborate with a consultant, Waterworks Engineers, Inc., on the development of the 2020 document update. Effort began in December 2020 with collection of significant quantity of information, continuing through a staff review process, and resulting in the proposed plan.

Following the severe drought of 2012-2016, the State of California Legislature sought to expand the water shortage contingency analysis under former law and mandated that a WSCP be adopted by suppliers. The California Water Code recognizes WSCPs as a critical tool during a drought emergency and grants that the State defer to locally adopted WSCPs, to the extent practicable.

The WSCP is the City of Roseville Water Utility's operational plan in the event of a water shortage. Water shortage would occur when available water supplies are insufficient to meet normal customer water demands. Various causes can bring about a water shortage including, population growth, climate change, drought, natural disasters, and catastrophic events.

The WSCP shall address the ten following elements:

- Water supply reliability assessment analysis
- Annual assessment procedures
- Six standard shortage stages
- Shortage response actions
- Communication protocols
- Compliance and enforcement
- Legal authorities
- Financial consequences of WSCP
- Monitoring and reporting
- WSCP refinement procedures

FISCAL IMPACT

Conservation programs are a condition of City water contracts, regional agreements, and a matter of State law with the passage of SB X7-7 in 2009. Planning continues to be done on an annual basis and is included in all rate analyses and proposed budgets.

ENVIRONMENTAL REVIEW

The proposed activity is statutorily exempt from the California Environmental Quality Act (CEQA). CEQA does not apply to the preparation and adoption of Urban Water Management plans (California Water Code §10652). The proposed plan would not affect water supplies for fish and wildlife, or expand or add water supplies, and therefore no further environmental review is required.

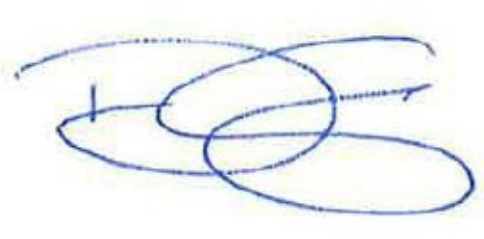
CITY COUNCIL STRATEGIC PLAN/OVERARCHING GOALS

Goal F - Invest in well-planned infrastructure and growth

Respectfully Submitted,

Trevor Joseph, Hydrogeologist

Richard Plecker, Environmental Utilities Director



_____

Dominick Casey, City Manager

ATTACHMENTS:

Description

Resolution 21-281

Attachment A – Draft Water Shortage Contingency Plan

RESOLUTION NO. 21-281

ADOPTING THE WATER SHORTAGE CONTINGENCY PLAN AND AUTHORIZING STAFF TO SUBMIT TO THE CALIFORNIA DEPARTMENT OF WATER RESOURCES

WHEREAS, the Urban Water Management Plan (UWMP) Act requires every urban water supplier providing water for municipal purposes to more than 3,000 customers to develop and submit a Water Shortage Contingency Plan (WSCP) as part an UWMP every five years to the California Department of Water Resources (DWR); and

WHEREAS, with ongoing and recent updates to the DWR Guidebook for Urban Water Suppliers, staff collaborated with a consultant on the development of the 2020 WSCP; and

WHEREAS, the City has prepared and circulated for public review the WSCP, and a properly noticed public hearing regarding said Plan was held by the City Council on June 16, 2021.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Roseville that the WSCP is hereby adopted and ordered filed with the City Clerk; and

BE IT FURTHER RESOLVED that the Mayor is hereby authorized and directed to file the WSCP with the California Department of Water Resources within 30 days after this date.

PASSED AND ADOPTED by the Council of the City of Roseville this____day of _____, 20_, by the following vote on roll call:

AYES COUNCILMEMBERS:

NOES COUNCILMEMBERS:

ABSENT COUNCILMEMBERS:

_____
MAYOR

ATTEST:

_____
City Clerk



DRAFT WATER SHORTAGE CONTINGENCY PLAN

CITY OF ROSEVILLE CALIFORNIA

City of Roseville
Draft Water Shortage Contingency Plan

May 2021

Prepared by Water Works Engineers, LLC
Colleen Boak, PE
Esmeralda Diego

Checked by:
Tim Durbin, PE
Cindy Bertsch, PE

Table of Contents

Water Shortage Contingency Plan 1
1.1 Water Supply Reliability Analysis 1
1.1.1 Constraints on Water Supply 1
1.1.2 Drought Risk Assessment 2
1.1.3 Seismic Risk Analysis 4
1.2 Legal Authorities 4
1.3 Standard Water Shortage Levels 5
1.4 Annual Water Supply and Demand Assessment Procedures 5
1.5 Supply Augmentation and Operational Changes 12
1.6 Compliance and Enforcement 12
1.7 Financial Consequences 13
1.8 Plan Adoption, Submittal, and Availability 14

Tables

WSCP Table 1 Available Surface Water Supply Under Differing Hydrologic Conditions 2
WSCP Table 2 Near-Term Five-Year Drought Risk Assessment 3
WSCP Table 3 Long-Term Single and Five-Year Drought Risk Assessment 3
WSCP Table 4 Relation Between Standard Water Shortage Levels and Existing Stages 5
WSCP Table 5 Water Supply and Demand Assessment Procedure 5
WSCP Table 6 Demand Reduction Actions to be Implemented at Each Shortage Level 8
WSCP Table 7 Supply Augmentation During Stage 3 Droughts and Higher 12

Exhibits

Exhibit A – City of Roseville 2016 Multi-Hazard Mitigation Plan
Exhibit B – City of Roseville Municipal Code 14.09
Exhibit C – Adoption Resolution

Water Shortage Contingency Plan

Following the severe drought of 2012-2016, the State of California Legislature sought to expand the water shortage contingency analysis under former law and mandated that a water shortage contingency plan (WSCP) be adopted by suppliers. The California Water Code (CWC) recognizes WSCPs as a critical tool during a drought emergency and grants that the State defer to locally adopted WSCPs, to the extent practicable.

> *California Water Code Section 10632.3*
>
> *It is the intent of the Legislature that, upon proclamation by the Governor of a state of emergency under the California Emergency Services Act (Chapter 7 (commencing with Section 8550) of Division 1 of Title 2 of the Government Code) based on drought conditions, the board defer to implementation of locally adopted water shortage contingency plans to the extent practicable.*

The WSCP is the City of Roseville Water Utility's (City's) operational plan in the event of a water shortage. Water shortage would occur when available water supplies are insufficient to meet normal customer water demands. Various causes can bring about a water shortage including population growth, climate change, drought, natural disasters, and catastrophic events.

The WSCP shall address the ten following elements:

1. Water supply reliability assessment analysis
2. Annual assessment procedures
3. Six standard shortage stages
4. Shortage response actions
5. Communication protocols
6. Compliance and enforcement
7. Legal authorities
8. Financial consequences of WSCP
9. Monitoring and reporting
10. WSCP refinement procedures

1.1 Water Supply Reliability Analysis

Pursuant to 10632(a)(1) of the CWC, a near-term (5years) and long-term (20 years) water supply reliability analysis is provided herein. The water supply reliability analysis consists of a water service reliability assessment and drought risk assessment (DRA).

1.1.1 Constraints on Water Supply

Most of the City's water is surface water received from Folsom Lake. The City's existing surface water contracts with the U.S. Bureau of Reclamation (USBR), Placer County Water Agency (PCWA), and San Juan Water District (SJWD) are received through the Folsom Dam Diversion, making this a critical facility for the reliability of Roseville's surface water supply. Under normal conditions, the capacities of the Folsom Dam Diversion, Roseville Water Treatment Plant, and distribution network are sufficient to meet the City's water demands. However, the water that the City receives is subject to reductions during dry years pursuant to the Water Forum Agreement, the USBR

Operations Criteria and Plan (OCAP), and the Central Valley Project Municipal and Industrial Water Shortage Policy (CVP M&I WSP).

Although Roseville's annual water contract entitlements total 66,000-acre feet (AF), the City along with other Sacramento-area water suppliers are signatory to the January 2000 Water Forum Agreement (updated in 2015), which includes Purveyor Specific Agreements. The City's Purveyor Specific Agreement includes limitations on City surface water diversions from the American River under different hydrologic conditions. The hydrologic conditions are characterized by three categories of year type and the corresponding limitations for the City are given in WSCP Table 1.

WSCP Table 1 Available Surface Water Supply Under Differing Hydrologic Conditions

Year Type	Unimpaired Flow into Folsom Reservoir	Roseville Available Supply
Normal/ Average or Wet Year	Greater or equal to 950,000 AF	Maximum of 58,900 AF
Drier Year	Between 400,000 and 950,000 AF	Between 43,800 and 58,900 AF
Driest/ Critically Dry Year	Less than 400,000 AF	Maximum of 43,800 AF

In addition to the impacts of the contractual agreements, the reliability of surface water is also subject to physical constraints. In the event that the water level at Folsom Lake drops close to or below the intake elevation, without additional infrastructure, the City would be unable to divert water. The severe drought of 2015, which was preceded by multiple consecutive dry years, demonstrated the vulnerability of the City's surface water as the water elevation did come close to the intake elevation.

Though the City has begun the process of expanding its groundwater program, under current operations the groundwater is not a major source of water for the City. The City has 4 existing wells with aquifer storage recovery (ASR) injection capability. The City's strategy in normal years is to not pump groundwater from the wells in excess of what was injected, thus creating a bank of water for future use. If a significant drought stage is reached the City can pump additional water to augment its water supply and make up for deficits of the surface water supply. The City continues to invest in development of groundwater infrastructure to increase supply reliability in times of drought, however in any given year type, the City must make determinations of drought stage without consideration of groundwater supplies, per the terms of the municipal code. This is further discussed in Section 1.5. For the purpose of this WSCP, only the resources available to the City in determination of a drought stage are included in calculations of the surplus or shortfall for the DRA shown in WSCP Table 2 and WSCP Table 3.

1.1.2 Drought Risk Assessment

The near-term and long-term drought risk assessment was performed by comparing the unconstrained potable water demands to the water supply availability for a single dry year and 5 consecutive dry years. The near-term DRA for a five-year drought is provided in WSCP Table 2. The long-term single and five-year DRA is provided in WSCP Table 3. Note that while typical groundwater supplies are not considered in the calculations of Total Supplies shown in WSCP Table 2 and WSCP Table 3, the volume of groundwater that the City intends to use for each year type is listed separately.

WSCP Table 2 Near-Term Five-Year Drought Risk Assessment

Category	2021	2022	2023	2024	2025
Total Supplies	62,719	57,870	57,920	49,971	42,022
Total Gross Water Use	39,172	42,276	45,380	48,484	51,589
Surplus/ Shortfall absent of WSCP Action	23,547	15,593	12,540	1,487	-9,567
Total Right/ Safe Yield Groundwater Supplies	1,560	1,560	1,560	1,560	7,920
NOTES: All values are in AF. Groundwater supplies are not included in calculation of surplus/ shortfall.					

WSCP Table 3 Long-Term Single and Five-Year Drought Risk Assessment

Drought Type/ Year	Category	2025	2030	2035	2040	2045
Single Year	Total Supplies	42,022	42,435	46,293	46,293	46,293
	Total Gross Water Use	51,589	56,990	62,547	62,547	62,547
	Surplus/ Shortfall absent of WSCP Action	-9,567	-14,555	-16,254	-16,254	-16,254
	Total Right/ Safe Yield Groundwater Supplies	7,920	12,570	14,430	14,430	14,430
Year 1	Total Supplies	62,922	63,335	67,193	67,193	67,193
	Total Gross Water Use	51,589	56,990	62,547	62,547	62,547
	Surplus/ Shortfall absent of WSCP Action	11,333	6,345	4,646	4,646	4,646
	Reasonably Available Groundwater Supplies	1,560	2,720	3,350	3,350	3,350
Year 2	Total Supplies	58,022	58,435	62,293	62,293	62,293
	Total Gross Water Use	51,589	56,990	62,547	62,547	62,547
	Surplus/ Shortfall absent of WSCP Action	6,433	1,445	-254	-254	-254
	Reasonably Available Groundwater Supplies	1,560	2,720	3,350	3,350	3,350
Year 3	Total Supplies	58,022	58,435	62,293	62,293	62,293
	Total Gross Water Use	51,589	56,990	62,547	62,547	62,547
	Surplus/ Shortfall absent of WSCP Action	6,433	1,445	-254	-254	-254
	Reasonably Available Groundwater Supplies	1,560	2,720	3,350	3,350	3,350
Year 4	Total Supplies	50,022	50,435	54,293	54,293	54,293
	Total Gross Water Use	51,589	56,990	62,547	62,547	62,547
	Surplus/ Shortfall absent of WSCP Action	-1,567	-6,555	-8,254	-8,254	-8,254
	Reasonably Available Groundwater Supplies	1,560	2,720	3,350	3,350	3,350
Year 5	Total Supplies	42,022	42,435	46,293	46,293	46,293
	Total Gross Water Use	51,589	56,990	62,547	62,547	62,547
	Surplus/ Shortfall absent of WSCP Action	-9,567	-14,555	-16,254	-16,254	-16,254
	Total Right/ Safe Yield Groundwater Supplies	7,920	12,570	14,430	14,430	14,430
NOTES: All values are in AF. Groundwater supplies are not included in calculation of surplus/ shortfall.						

1.1.3 Seismic Risk Analysis

Seismic risk in California can pose a significant threat to facilities and infrastructure. The City of Roseville 2016 Multi-Hazard Mitigation Plan addresses the seismic risk at critical facilities including those dedicated to water supply and is provided in Exhibit A.

1.2 Legal Authorities

Chapter 14.09 Water Conservation of the Roseville Municipal Code (Municipal Code) also cited as Water Conservation and Drought Mitigation Ordinance (Ordinance 5311 § 2, 2014; Ordinance 2413 § 2, 1991), grants the City the authority to declare a water shortage in the City. Chapter 14.09 of the Municipal Code is provided in Exhibit B.

The purpose and scope of the Water Conservation and Drought Mitigation Ordinance as stated in the Municipal Code is provided below:

14.09.020 General provisions

A. Purpose. The purpose of this chapter is to ensure compliance with all federal, state and local requirements relating to water conservation and drought mitigation for the protection of public health, safety and welfare by:

1. Reducing the per capita water consumption throughout the City of Roseville (the "city") during years of normal precipitation and during years of drought;

2. Protecting and conserving the city's supply of water during specified times of emergency and/or crisis;

3. Minimizing and/or eliminating the waste of water through voluntary compliance or punitive action, if necessary;

4. Promoting the use of drip irrigation and other low volume irrigation methods that reduce outdoor water use by applying water more efficiently than traditional irrigation methods;

5. No person shall use, or cause to be used any city water for landscape irrigation between the hours of 10:00 a.m. and 8:00 p.m., unless the city manager, or designee provides prior written consent to a different time limitation. A waiver may be granted for turf areas if the landscape contains too many irrigation valves to complete an irrigation event within the watering window.

6. Upon city declaration of a water shortage, the city manager, or designee, may impose revised and/or additional limitations on outdoor water use, as specified in Section 14.09.040, and no person shall use, or cause to be used, city water in violation of such limitations while the water shortage remains in effect.

B. Scope. The provisions of this chapter shall apply to all customers, users and/or recipients (hereinafter "users") of the city's potable and recycled water service within the city's territorial limits.

The City's development and adoption of the WSCP upholds 14.09.020 General Provisions of the Municipal Code by ensuring compliance with state requirements.

All components of the WSCP comply with Chapter 14.09 of the Municipal Code. Any actions to be taken under the WSCP not explicitly stated in Chapter 14.09 of the Municipal Code are a further refinement of the existing ordinance.

1.3 Standard Water Shortage Levels

The California Water Code Section 10632(a)(3) defines six standard water shortage levels. Standardization of water shortage levels provide a consistent regional and statewide approach to characterizing and conveying the severity of a water shortage. However, Chapter 14.09 of the City's Municipal Code defines water shortage stages that are different from those listed in CWC. Pursuant to 10632(a)(3)(B), the six standard water shortage levels are related to the existing shortage stages in the Municipal Code in WSCP Table 4.

WSCP Table 4 Relation Between Standard Water Shortage Levels and Existing Stages

CWC Shortage Level Description	CWC Shortage Level	Municipal Code Shortage Stage	Municipal Code Water Conservation and Drought Stage Description
Up to 10%	1	Basic Stage	City's water supply is adequate to meet all projected demands
		Stage One Drought	City's water supply is adequate to meet 90% of projected demands
Up to 20%	2	Stage Two Drought	City's water supply is adequate to meet 80% of projected demands
Up to 30%	3	Stage Three Drought	City's water supply is adequate to meet 70% of projected demands
Up to 40%	4	Stage Four Drought	City's water supply is adequate to meet 60% of projected demands
Up to 50%	5	Stage Five Drought	City's water supply is adequate to meet 50% or less of projected demands
Greater than 50%	6		

1.4 Annual Water Supply and Demand Assessment Procedures

Pursuant to CWC 10632.1, all water suppliers are required to conduct an annual water supply and demand assessment on or before July 1 of each year beginning in 2022. If the supplier receives imported water from the State Water Project or the U.S. Bureau of Reclamation (USBR) they shall submit the report within 14 days of receiving final allocations or by July 1 of each year, whichever is later. The steps for conducting the Annual Water Supply and Demands Assessment are outlined in WSCP Table 5.

WSCP Table 5 Water Supply and Demand Assessment Procedure

Step	Description	Timeframe	Participants
Step 1	Request water utility data from all departments.	Jan 1 - Jan 31	Water Conservation Administrator
Step 2	Coordinate with Planning Division for any significant planned developments and project those water demands.	Jan 15 - Jan 31	Water Conservation Administrator Planning Division
Step 3	Compile water utility data into Water Utility Reporting Master spreadsheet.	Feb 1 - Feb 14	Water Conservation Administrator
Step 4	Calculate total projected unconstrained water demands for current year.	Feb 15-Feb 28	Senior Engineer – Water Utility

Step 5	Identify any constraints on facilities or infrastructure that could impact the supply of water such as planned maintenance that would take facilities offline or known damage to facilities/ infrastructure.	Feb 15-Feb 28	Hydrogeologist Senior Engineer – Water Utility Water Distribution Superintendent Water Treatment Plant Chief Operator
Step 6	Commence preparation of Annual Water Shortage Assessment Report.	March-April	Water Conservation Administrator Senior Engineer – Water Utility
Step 7	Receive final allotments from USBR for current year.	April	EU Assistant Director-Water Utility
Step 8	Subtract current year projected water demand from final allotment volume to determine shortage percentage and volume.	2 Days after notification from USBR	Senior Engineer – Water Utility
Step 9	If a shortage is identified Environmental Utilities (EU) Department is to hold an internal meeting to inform participants that a water shortage for the current year is anticipated and the extent of that shortage. Review the WSCP and Chapter 14.09 of the Roseville Municipal Code. Identify any concerns from the group regarding the ability to carry out the actions described in the WSCP and Chapter 14.09 of the Municipal Code. Assign an individual or group, among the participants, the responsibility of resolving the concern.	Within 7 days of notification from USBR	EU Director EU Assistant Director – Water Utility Hydrogeologist Water Distribution Super Intendent Water Treatment Plant Chief Operator Senior Engineer – Water Utility Water Conservation Administrator Additional participants as needed
Step 10	Inform City Manager of water shortage emergency condition.	Within 14 days of notification from USBR	City Manager EU Director EU Assistant Director – Water Utility Additional participants as needed
Step 11	Finalize and submit Annual Water Shortage Assessment Report to DWR.	By July 1 or 14 days after receiving final allocations	EU Assistant Director – Water Utility Water Conservation Administrator Senior Engineer – Water Utility
Step 11	The City Manager shall inform City Council of the water shortage emergency condition and the "Drought stage," under which the emergency falls. City Council shall declare a water shortage emergency condition to prevail within the area served by the City of Roseville Water Utility.	Within 28 days of notification from USBR	City Manager City Council Public Information Officer
Step 12	The City of Roseville shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency.	Within 28 days of notification from USBR	City Manager City Council Public Information Officer

Step 13	The public, interested parties, and local, regional, and state governments shall be noticed of the water shortage emergency condition and of all water shortage response actions triggered by the emergency declaration. Pursuant to Municipal Code Section 14.09.020(E), the City Manager, or assigned designee, shall be responsible for determining the means by which water users shall be notified. Possible means for notification include mass media, newspaper, public notice, mailings, utility billings, or by any combination of such notice.	Beginning 2 business days after declaration of emergency condition and continuing for as long as the emergency condition persists.	Water Conservation Administrator Senior Engineer – Water Utility Public Information Officer
Step 14	The appropriate Water Shortage Response Actions for the drought stage, outlined in WSCP Table 6 and 7, will be carried out by the public and water utility. The City will enforce compliance in accordance with Roseville Municipal Code 14.09.	Duration of emergency condition	EU – Water Utility Water Users City Manager or designee
Step 15	Track customer water use at a minimum on a monthly basis. Ensure that total gross water use for that month, or more frequent tracking period, is reduced by the necessary percentage when compared to that same tracking period of the last normal supply year.	Duration of emergency condition	Water Conservation Administrator Senior Engineer – Water Utility
Step 16	If the needed water use reduction percentage is not met for any month determine which additional strategies or actions would result in the needed reduction.	Upon determination of insufficient water use reduction	EU Director EU Assistant Director – Water Utility Hydrogeologist Senior Engineer – Water Utility Water Conservation Administrator Additional participants as needed
Step 17	The EU Department management shall propose to the City Manager additional shortage response actions and whether or not those actions would require the WSCP and Chapter 14.09 of the Roseville Municipal Code to be changed.	Upon determination of insufficient water use reduction	City Manager EU Director EU Assistant Director – Water Utility Additional participants as needed
Step 18	If deemed necessary, the City Manager and City Council will revise the WSCP and Chapter 14.09 of the Roseville Municipal Code, observing all required procedures with such adoption.	Upon determination of insufficient water use reduction	City Manager City Council Additional participants as needed
NOTES: It is the intent of the WSCP that the Water Conservation Administrator and Water Utility Senior Engineer shall jointly be responsible for ensuring that the steps of this plan are carried out by noticing the necessary parties for data requests and facilitating meetings.			

WSCP Table 6 Demand Reduction Actions to be Implemented at Each Shortage Level

Standard Shortage Level	Roseville Municipal Code Stage	Demand Reduction Actions	Estimated Percent Reduction	Section of Water Conservation and Drought Mitigation Ordinance corresponding to Demand Reduction Action *Explanations provided as needed*	Penalty, Charge, or Other Enforcement?
1	Basic	Landscape - Restrict or prohibit runoff from landscape irrigation	0%	14.09.030(A)	Yes
1	Basic	Landscape - Limit landscape irrigation to specific times	0%	14.09.020(A)(1); No person shall use, or cause to be used, any city water for landscape irrigation between the hours of 10:00 a.m. and 8:00 p.m., unless the city manager, or designee provides prior written consent to a different time limitation. A waiver may be granted for turf areas if the landscape contains too many irrigation valves to complete an irrigation event within the watering window.	Yes
1	Basic	Landscape - Limit landscape irrigation to specific days	0%	14.09.060(E)(2); Irrigation of new landscaping shall be allowed on any day of the week for a period of 30 days after the new landscaping is planted, unless the city manager, or designee, provides prior written consent to extend this time period based on plant type and the season when the new landscaping is planted. After the 30 days, irrigation days and run times should be decreased to settings appropriate for an established landscape.	Yes
1	Basic	Landscape - Prohibit certain types of landscape irrigation	0%	14.09.030(E); Prohibit operation of an irrigation system that applies water to an impervious surface or that is in disrepair.	Yes
1	Basic	Landscape - Other landscape restriction or prohibition	0%	14.09.030(G); Prohibit irrigation of landscaping during rainfall or 48 hours after a measurable rain event.	Yes
1	Basic	Landscape - Other landscape restriction or prohibition	0%	14.090.060(E)(1); All landscaping installed in the City of Roseville shall comply with the water efficient landscape requirements adopted by resolution of the city council.	Yes
1	Basic	Other water feature or swimming pool restriction	0%	14.09.030(C); Prohibit maintaining ponds, waterways, decorative basins, or swimming pools without water recirculation devices.	Yes
1	Basic	Other water feature or swimming pool restriction	0%	14.09.030(D); Prohibit backwashing so as to discharge to waste swimming pools, decorative basins or ponds in excess of the frequency necessary to ensure the healthful condition of the water or in excess of that required by standards for professionally administered maintenance or to address structural considerations, as determined by the city manager, or designee.	Yes
1	Basic	Other water feature or swimming pool restriction	0%	14.09.030(H); Prohibit overfilling of any pond, pool or fountain which results in water discharging to waste.	Yes

1	Basic	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	0%	14.09.060(C)	Yes
1	Basic	Other - Require automatic shut off hoses	0%	14.09.060(B); Free-flowing hoses for all uses are prohibited. Automatic shut-off devices shall be attached on any hose or filling apparatus in use.	Yes
1	Basic	Other	0%	14.09.030(B); Prohibit water fixtures (including, but not limited to, toilets, faucets, shower heads) or heating or cooling devices to leak or run to waste.	Yes
1	Basic	Other	0%	14.09.030(A); Prohibit water use for washing in excess of that necessary to wash, wet or clean the dirty or dusty object, such as an automobile, sidewalk, or parking area, flows to waste.	Yes
1	Basic	Other	0%	14.09.060(A); Water shall be confined to the user's property and shall not be allowed to run off to adjoining properties, or to the roadside or to the gutter. Care shall be taken not to water past the point of saturation.	Yes
1	Basic	Other	0%	14.09.060(F); All site reviews shall include an evaluation of using recycled water. Recycled water shall be required if economically feasible.	Yes
1	Stage 1	Landscape - Limit landscape irrigation to specific days	1%	14.09.070(C) and 14.09.070(D); Residential and non-residential water users shall be permitted to irrigate with city water according to the schedule provided in 14.09.070(C) and 14.09.070(D), respectively.	Yes
1	Stage 1	Landscape - Other landscape restriction or prohibition	1%	14.09.070(G); City park sites shall, as an aggregate, reduce usage up to 10 percent.	Yes
1	Stage 1	CII - Restaurants may only serve water upon request	1%	14.09.070(I)	Yes
1	Stage 1	Other - Prohibit use of potable water for washing hard surfaces	1%	14.09.070(H); Washing streets, parking lots, driveways, sidewalks or buildings, except as necessary for health or sanitary purposes or pursuant to a term or condition in a permit issued by a state or federal agency, is prohibited.	Yes
1	Stage 1	Other	10%	14.09.070(B); Residential users and non-residential users shall reduce water usage up to 10 percent.	Yes
2	Stage 2	Landscape - Other landscape restriction or prohibition	1%	14.09.070(C); City park sites shall, as an aggregate, reduce usage up to 20 percent.	Yes
2	Stage 2	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	1%	14.09.080(H)	Yes
2	Stage 2	Other	10-18%	14.09.080(B); Residential users and non-residential landscapes shall reduce water usage up to 20 percent.	Yes

3	Stage 3	Landscape - Limit landscape irrigation to specific days	1%	14.09.090(D) and 14.09.090(E); Residential and non-residential water users shall be permitted to irrigate with city water according to the schedule provided in 14.09.090(D) and 14.09.090(E), respectively.	Yes
3	Stage 3	Landscape - Other landscape restriction or prohibition	1%	14.09.090(C); City park sites shall, as an aggregate, reduce usage up to 30 percent.	Yes
3	Stage 3	Landscape - Other landscape restriction or prohibition	1%	14.09.090(H); New or expanded landscaping is limited to drought-tolerant trees, shrubs, and groundcover and be irrigated using a low volume irrigation system. No new turf shall be planted, hydroseeded, or laid, unless prior written consent is received from the city manager. Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.	Yes
3	Stage 3	Water Features - Restrict water use for decorative water features, such as fountains	1%	14.09.090(I)	Yes
3	Stage 3	Pools - Allow filling of swimming pools only when an appropriate cover is in place.	1%	14.09.090(L)	Yes
3	Stage 3	Other - Prohibit use of potable water for construction and dust control	1%	14.09.090(K)	Yes
3	Stage 3	Other	1%	14.09.090(I); Except where recycled water is used, golf courses shall reduce irrigation up to 30 percent.	Yes
3	Stage 3	Other	18-27%	14.09.090(B). Residential users and non-residential landscapes are to reduce water usage up to 30 percent.	Yes
4	Stage 4	Landscape - Limit landscape irrigation to specific days	2%	14.09.100(D) and 14.09.100(E); Residential and non-residential water users shall be permitted to irrigate with city water according to the schedule provided in 14.09.100(D) and 14.09.100(E), respectively.	Yes
4	Stage 4	Landscape - Other landscape restriction or prohibition	1%	14.09.100(C); City park sites shall, as an aggregate, reduce usage up to 40 percent.	Yes
4	Stage 4	Landscape - Other landscape restriction or prohibition	1%	14.09.100(H); Installation of any new landscaping is prohibited unless irrigation is provided through connection to an active recycled water system. In the case of new construction, the city's building official will issue a temporary final upon completion of the structural development of the property. When the city has returned to a stage two drought restriction, landscaping installation can be completed, and a building final will become available upon inspection by the city.	Yes

4	Stage 4	Other water feature or swimming pool restriction	1%	14.09.100(K); Existing pools shall not be emptied and refilled using city water unless required for health or safety reasons until the city has returned to a stage two drought restriction. Pools may be re-filled only to the extent necessary to replace evaporative losses.	Yes
4	Stage 4	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	1%	14.09.100(J); Automobiles or equipment shall be washed only at commercial establishments that recycle their water or by equipment and means that separates debris and recycles wash water for continual use.	Yes
4	Stage 4	Other	1%	14.09.100(I); Except where recycled water is used, golf courses shall reduce irrigation up to 40 percent.	Yes
4	Stage 4	Other	0%	14.09.100(L); No commitments shall be made to provide water service as part of any new land use entitlement (general plan, specific plan or amendments requesting new water allocations) until the city has returned to a stage two drought restriction. Currently approved specific plans with accompanying development agreements and projects or properties that have received water allocations in advance of full entitlements may be issued building permits so long as they comply with the remainder of this chapter.	Yes
4	Stage 4	Other	27-35%	14.09.100(B); Residential users and non-residential landscapes are to reduce water usage up to 40 percent.	Yes
5 & 6	Stage 5	Landscape - Other landscape restriction or prohibition	5%	14.09.110(C); Except where recycled water is used, water users shall reduce landscape irrigation as follows: 1. Turf shall not be irrigated. 2. Trees and shrubs may be irrigated with a properly functioning low volume landscape irrigation system or by use of a handheld hose equipped with a nozzle capable of completely shutting off the flow of water except when positive action or pressure to maintain the flow of water is applied. Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.	Yes
5 & 6	Stage 5	Other water feature or swimming pool restriction	1%	14.09.110(D); Filling new or existing swimming pools and spas with city water is prohibited.	Yes
5 & 6	Stage 5	Other	33%	14.09.110(B); Residential users are to reduce water usage up to 50 percent.	Yes
NOTES: For each successive drought level all preceding restrictions shall continue in place, except to the extent they are replaced by more restrictive conditions.					

1.5 Supply Augmentation and Operational Changes

Under normal operational conditions the City's groundwater strategy is to not pump well water in excess of the potable water that is injected annually. At this time, the City's injection volume of groundwater is planned to exceed extraction volume over time, as the groundwater program is still in development. The positive difference between the injection and extraction volume is the net volume of water that the City places into long-term storage or makes available for other users. Per Section 14.09.050 of the Municipal Code, when determining drought staging, the City cannot consider the effect of well water reducing the need for conservation until a stage three drought level is reached. Specifically, the code mentions that well water cannot be considered as an alternative to declaration of a stage one or stage two drought level. The City may choose to operationalize groundwater infrastructure in any year type based on water supply conditions and/or operations and maintenance strategies for infrastructure, however this shall not be determined to reduce or alleviate the appropriate drought stage given hydrologic conditions and surface water allocations for that year. The percent reduction that could result from this supply augmentation action for the different stages is provided in WSCP Table 7. Note that there are no supply augmentation actions for drought stages 1 and 2.in accordance with the provisions of the Municipal code.

WSCP Table 7 Supply Augmentation During Stage 3 Droughts and Higher

Standard Shortage Level	Roseville Municipal Code Stage	Supply Augmentation Methods and Other Actions by Water Supplier	Percent Reduction	Additional Explanation
3	3	Stored Emergency Supply	0-10%	Groundwater Pumped
4	4	Stored Emergency Supply	0-20%	Groundwater Pumped
5 & 6	5	Stored Emergency Supply	0-30%	Groundwater Pumped

The water utility would need to adjust its operations to support a drought stage that would prompt increased reliance on well water. Tasks for operations may include more frequent maintenance of well pumps and chemical injection pumps, monitoring of ground water level, and filter backwashing.

1.6 Compliance and Enforcement

The Water Conservation and Drought Mitigation ordinance grants the City the authority to enforce compliance with the water use limitations outlined in WSCP Table 6. The sections of the Water Conservation and Drought Mitigation Ordinance, detailing compliance and enforcement authority and measures are provided below.

14.09.020 General provisions

C. Administration and Enforcement. The city manager, or designee, including, but not limited to, an enforcement officer as defined herein, shall administer, implement, and enforce the provisions of this chapter. For purposes of this chapter an "enforcement officer" means any city employee or agent of the city with the authority to enforce any provision of this chapter and the authority to make any decision on behalf of the city manager required or called for by this chapter.

D. Compliance. All provisions of this chapter are subject to the compliance procedures set forth in this chapter unless otherwise expressly stated herein.

14.09.140 Violations

It is Unlawful for any user and/or person to violate any provision or fail to comply with any of the requirements of this chapter. Causing, permitting, aiding, abetting or concealing a violation of any provision of this chapter shall constitute a violation of this chapter. A violation of the provisions of this chapter shall occur irrespective of the negligence or intent of the violator and a violation of or failure to comply with any of the requirements of this chapter may be charged as either an infraction or a misdemeanor in the discretion of the city attorney. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 3834 § 3, 2002; Ord. 2413 § 2, 1991.)

14.09.150 Enforcement authority

A. Whenever the city manager, or designee (including, but not limited to, an enforcement officer), determines that a user and/or person has violated any provision of, or failed to meet a requirement of, this chapter, an administrative citation pursuant to Chapter 2.50 or a written compliance order pursuant to Chapter 2.52 may be issued to any user and/or person responsible for the violation.

B. Any compliance order issued may require without limitation any or all of the following:

1. The allocation of a particular amount of water to a given user and/or person responsible for the violation;
2. The issuance of a fine;
3. The installation of a flow restriction device;
4. The performance of monitoring, analyses, and reporting;
5. That violations shall cease and desist; and/or
6. The discontinuance of water service

The compliance order shall set forth a deadline within which the requirements of the compliance order must be completed. Said compliance order shall further advise that, should the violator fail to comply with the compliance order within the established deadline, a hearing on the compliance order shall be set. (Ord. 5491 § 11, 2015; Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 3034 § 3, 2002; Ord. 2817 § 1, 1994; Ord. 2413 § 2, 1991.)

14.090.180 Separate offense for each day.

Any user and/or person that violates any provision of this chapter shall be guilty of a separate offense for each and every day during any portion of which any user and/or person commits, continues, permits, or causes a violation thereof, and shall be punished accordingly. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

1.7 Financial Consequences

During times of an emergency condition, the City is expected to see significant revenue reduction as a result of demand reduction actions lowering total gross water use. Additionally, enforcement of demand reduction actions, which could include investigating water waste complaints, follow ups to check for compliance, administering warnings or fines, and installation of flow restriction devices, would incur additional expenses that would not be present during non-emergency conditions.

Revenue loss percentage for each drought stage is anticipated to be approximately equal to the demand reduction percentage for each respective shortage level. Enforcement expenses will vary based on customer compliance and drought stage. For instance, at the onset of demand reduction action implementation, resources needed for enforcement may be high as customers adjust to altering their use or compliance from customers could vary seasonally with customers finding it more difficult to comply during warmer months.

The City plans to mitigate the financial consequences associated with water shortage response actions primarily through their recently adopted water rate structure, which allows for adequate reserves to accommodate reductions in revenue and increases in cost due to drought. If the water shortage rate charges are insufficient to make up for the loss in revenue, the City will use financial reserves to mitigate remaining financial consequences.

1.8 Plan Adoption, Submittal, and Availability

The Water Shortage Contingency Plan will be included as an appendix in the 2020 Urban Water Management Plan (UWMP) and will be introduced and discussed with the public and City Council in the same meetings but as separate agenda items. The WSCP is intended to be a stand-alone document and as such will be adopted by the City independently of the UWMP. The WSCP may be updated as needed between the regular 5-year updates of the UWMP and no required WSCP update shall necessitate an update of the UWMP.

The City has encouraged community and public interest involvement in the WSCP using public meetings and web-based communication. A public meeting will be held on June 16, 2021 and will provide an opportunity for the general public to ask questions and raise concerns regarding the WSCP. Prior to the public hearing the draft WSCP was made available for public inspection on the City's website: www.roseville.ca.us/WSCP/.

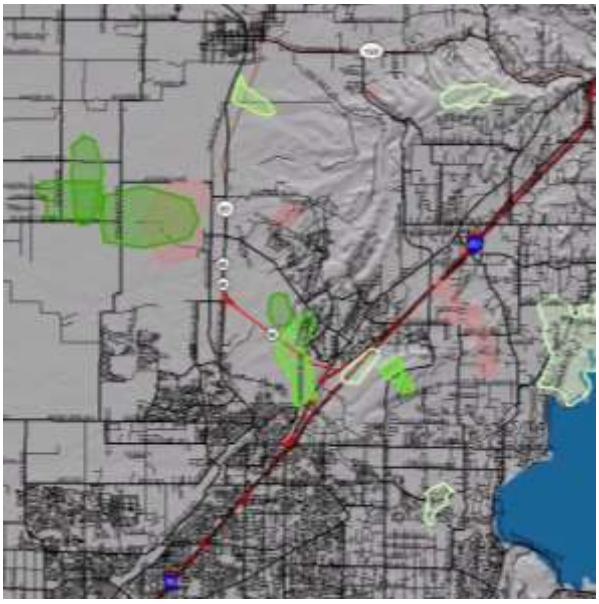
The WSCP will be presented to City Council on June 16, 2021 for adoption. Copies of the adoption resolutions will be provided as Exhibit C. A copy of this WSCP will be submitted to DWR within 30 days of adoption and by July 1, 2021. The adopted WSCP will be submitted electronically to DWR. A CD or hardcopy of the adopted WSCP will also be submitted to the California State Library. No later than 30 days after submittal to DWR, copies of the adopted WSCP will be available for public review at the City's public offices. An electronic copy of this plan will also be available for review and download on the City's website: www.roseville.ca.us/WSCP/.

Exhibit A – City of Roseville 2016 Multi-Hazard Mitigation Plan

CITY OF ROSEVILLE CALIFORNIA

2016 Multi-Hazard Mitigation Plan



TETRA TECH

September 2016

CONTENTS

Executive Summary xvi
Plan Update xvi
Plan Update Methodology xvii
Phase 1—Organize Resources xvii
Phases 2 —Update the Risk Assessment xviii
Phase 3—Engage the Public xviii
Phase 4—Assemble the Updated Plan xviii
Phase 5—Plan Adoption/Implementation xviii
Mitigation Guiding Principle, Goals, and Objectives xix
Guiding Principle xix
Goals xix
Objectives xix
Mitigation Action Plan xx
Implementation xx
1. Introduction to Hazard Mitigation Planning 1-1
1.1 Why Prepare This Plan? 1-1
1.1.1 The Big Picture 1-1
1.1.2 Roseville's Response to the DMA 1-1
1.2 Who Will Benefit From This Plan? 1-2
1.3 Contents of This Plan 1-2
2. Plan Update—What Has Changed 2-1
2.1 The Previous Plan 2-1
2.2 Mitigation Success Stories 2-1
2.3 Why Update? 2-2
2.3.1 Federal Eligibility 2-2
2.3.2 Changes in Development 2-2
2.4 The Updated Plan—What Is Different? 2-2
3. Plan Update Approach 3-1
3.1 Planning Resource Organization 3-1
3.1.1 Internal Funding 3-1
3.1.2 Formation of the Planning Team 3-1
3.1.3 The Steering Committee 3-2
3.1.4 Coordination with Other Agencies 3-2
3.1.5 Review of Existing Programs 3-3
3.2 Risk Assessment Update 3-4
3.3 Public Involvement 3-4
3.3.1 Strategy 3-4
3.3.2 Public Involvement Results 3-7
3.4 Assemble the Updated Plan 3-9
3.5 Plan Development Chronology/Milestones 3-10
4. City of Roseville Profile 4-1
4.1 Geographic Profile 4-1
4.2 Historical Overview 4-3

4.2.1 Pre-Development 4-3
4.2.2 Founding of the Community 4-3
4.2.3 Post-Incorporation Development 4-3
4.2.4 Current Conditions 4-4
4.3 Major Past Hazard Events 4-4
4.4 Physical Setting 4-4
4.4.1 Geology 4-4
4.4.2 Soils 4-4
4.4.3 Climate 4-5
4.5 Development Profile 4-5
4.5.1 Land Use Policies 4-5
4.5.2 Residential Development 4-8
4.5.3 Non-Residential Development 4-8
4.5.4 Critical Facilities and Infrastructure 4-10
4.5.5 Future Trends in Development 4-14
4.6 Open Space and Habitat 4-14
4.6.1 Grasslands 4-14
4.6.2 Oak Woodlands and Riparian Areas 4-14
4.6.3 Seasonal Wetlands 4-15
4.6.4 Sensitive Species 4-15
4.7 Demographics 4-16
4.7.1 Population Trends 4-16
4.7.2 Age Distribution 4-17
4.7.3 Race, Ethnicity and Language 4-19
4.7.4 Individuals with Disabilities and Others with Access and Functional Needs 4-20
4.8 Economy 4-20
4.8.1 Income 4-20
4.8.2 Industry, Businesses and Institutions 4-21
4.8.3 Employment Trends and Occupations 4-22
4.9 Laws and Ordinances 4-23
4.9.1 Federal 4-23
4.9.2 State 4-28
4.9.3 City Plans and Programs 4-32
4.10 Capability Assessment 4-36

5. Identified Hazards of Concern and Risk Assessment Methodology 5-1

5.1 Identified Hazards of Concern 5-1
5.2 Methodology 5-2
5.3 Risk Assessment Tools 5-2
5.3.1 Dam Failure, Earthquake and Flood—Hazus-MH 5-2
5.3.2 Landslide, Severe Weather, and Wildfire 5-3
5.3.3 Drought 5-3
5.3.4 Climate Change 5-4
5.3.5 Health Hazards and Human-Caused Hazards 5-4
5.4 Mapping 5-4
5.4.1 Building and Cost Data 5-4
5.4.2 Hazus-MH Data Inputs 5-4
5.4.3 Other Local Hazard Data 5-5
5.4.4 Data Source Summary 5-5
5.4.5 Limitations 5-5

6. Climate Change Considerations for Hazard Mitigation 6-1
6.1 California Senate Bill No. 379 6-1
6.2 What is Climate Change? 6-2
6.3 How Climate Change Affects Hazard Mitigation 6-3
6.4 Current Indications of Climate Change 6-3
6.5 Projected Future Impacts 6-4
6.5.1 Precipitation 6-4
6.5.2 Temperature 6-5
6.5.3 Snow Pack 6-5
6.5.4 Wildfire 6-5
6.6 Responses to Climate Change 6-6
6.6.1 Mitigation and Adaptation 6-6
6.6.2 Ecosystem-Based Adaptation 6-6
6.6.3 City of Roseville Sustainability Efforts 6-6
6.7 Climate Change Impacts on Hazards 6-7
6.7.1 Drought 6-7
6.7.2 Earthquake 6-8
6.7.3 Flood 6-8
6.7.4 Landslide 6-9
6.7.5 Severe Weather 6-10
6.7.6 Wildfire 6-11
7. Dam Failure 7-1
7.1 General Background 7-1
7.1.1 Causes of Dam Failure 7-1
7.1.2 Regulatory Oversight 7-2
7.2 Hazard Profile 7-3
7.2.1 Past Events 7-3
7.2.2 Location 7-4
7.2.3 Frequency 7-4
7.2.4 Severity 7-4
7.2.5 Warning Time 7-4
7.2.6 Folsom Dam Containment Dike Failure Risk Assessment 7-5
7.3 Secondary Hazards 7-6
7.4 Exposure 7-8
7.4.1 Population 7-8
7.4.2 Property 7-8
7.4.3 Critical Facilities 7-8
7.4.4 Environment 7-8
7.5 Vulnerability 7-9
7.5.1 Population 7-9
7.5.2 Property 7-9
7.5.3 Critical Facilities 7-9
7.5.4 Environment 7-10
7.6 Future Trends in Development 7-10
7.7 Review of Existing Ordinances, Programs and Plans 7-10
7.8 Scenario 7-10
7.9 Issues 7-11
8. Drought 8-1

8.1 General Background 8-1
8.1.1 Water Supply Strategy 8-1
8.1.2 Water Supply Infrastructure 8-2
8.1.3 The Water Forum 8-3
8.1.4 Local Water Contracts—Definition of Drought 8-3
8.2 Hazard Profile 8-4
8.2.1 Past Events 8-4
8.2.2 Location 8-5
8.2.3 Frequency 8-9
8.2.4 Severity 8-9
8.2.5 Warning Time 8-9
8.3 Secondary Hazards 8-10
8.4 Exposure 8-10
8.5 Vulnerability 8-10
8.5.1 Population 8-10
8.5.2 Property 8-10
8.5.3 Critical Facilities 8-10
8.5.4 Environment 8-11
8.5.5 Economic Impact 8-11
8.6 Future Trends in Development 8-11
8.7 Review of Existing Ordinances, Programs and Plans 8-12
8.8 Scenario 8-13
8.9 Issues 8-13

9. Earthquake 9-1

9.1 General Background 9-1
9.1.1 Damage from Earthquakes 9-1
9.1.2 Earthquake Classifications 9-1
9.1.3 Ground Motion 9-3
9.1.4 Effect of Soil Types 9-3
9.2 Hazard Profile 9-4
9.2.1 Past Events 9-4
9.2.2 Location 9-5
9.2.3 Frequency 9-12
9.2.4 Severity 9-12
9.2.5 Warning Time 9-12
9.3 Secondary Hazards 9-13
9.4 Exposure 9-13
9.4.1 Population 9-13
9.4.2 Property 9-13
9.4.3 Critical Facilities 9-13
9.4.4 Environment 9-14
9.5 Vulnerability 9-15
9.5.1 Population 9-15
9.5.2 Property 9-15
9.5.3 Critical Facilities 9-18
9.5.4 Environment 9-18
9.6 Future Trends in Development 9-19
9.7 Review of Existing Ordinances, Programs and Plans 9-19
9.7.1 International Building Codes 9-19

9.7.2 Improvement Standards 9-20
9.7.3 Geotechnical Studies 9-20
9.8 Scenario 9-20
9.9 Issues 9-20

10. Flooding 10-1

10.1 General Background 10-1
10.1.1 Measuring Floods and Floodplains 10-1
10.1.2 Effects of Human Activities 10-1
10.1.3 Floodplain Ecosystems 10-1
10.1.4 Federal Flood Programs 10-2
10.2 Hazard Profile 10-3
10.2.1 Flooding Types 10-3
10.2.2 Past Events 10-4
10.2.3 Location 10-7
10.2.4 Frequency 10-8
10.2.5 Severity 10-10
10.2.6 Warning Time 10-10
10.3 Secondary Hazards 10-12
10.4 Exposure 10-12
10.4.1 Population 10-12
10.4.2 Property 10-12
10.4.3 Critical Facilities and Infrastructure 10-14
10.4.4 Environment 10-15
10.5 Vulnerability 10-15
10.5.1 Population 10-15
10.5.2 Property 10-16
10.5.3 Critical Facilities and Infrastructure 10-19
10.5.4 Environment 10-19
10.6 Future Trends in Development 10-19
10.7 Review of Existing Ordinances, Programs, and Plans 10-21
10.7.1 Structural Mitigation 10-21
10.7.2 Non-Structural Mitigation 10-22
10.7.3 Regulations 10-22
10.7.4 Stormwater Management 10-26
10.7.5 Outreach and Public Education 10-28
10.8 Scenario 10-28
10.9 Issues 10-28

11. Landslide 11-1

11.1 General Background 11-1
11.1.1 Landslide Types 11-1
11.1.2 Landslide Modeling 11-3
11.2 Hazard Profile 11-3
11.2.1 Past Events 11-3
11.2.2 Location 11-3
11.2.3 Frequency 11-4
11.2.4 Severity 11-4
11.2.5 Warning Time 11-6
11.3 Secondary Hazards 11-6

11.4 Exposure 11-6
11.4.1 Population 11-6
11.4.2 Property 11-6
11.4.3 Critical Facilities and Infrastructure 11-7
11.4.4 Environment 11-7
11.5 Vulnerability 11-7
11.5.1 Population 11-7
11.5.2 Property 11-8
11.5.3 Critical Facilities and Infrastructure 11-8
11.5.4 Environment 11-8
11.6 Future Trends in Development 11-8
11.7 Review of Existing Ordinances, Programs, and Plans 11-8
11.8 Scenario 11-10
11.9 Issues 11-10

12. Severe Weather 12-1

12.1 General Background 12-1
12.1.1 Tornadoes 12-2
12.1.2 Windstorms 12-2
12.1.3 Fog 12-5
12.1.4 Heavy Rains, Thunderstorms and Lightning 12-6
12.1.5 Ice and Freezing Rain 12-7
12.2 Hazard Profile 12-7
12.2.1 Past Events 12-7
12.2.2 Location 12-7
12.2.3 Frequency 12-7
12.2.4 Severity 12-9
12.2.5 Warning Time 12-9
12.3 Secondary Hazards 12-9
12.4 Exposure 12-9
12.4.1 Population 12-9
12.4.2 Property 12-9
12.4.3 Critical Facilities and Infrastructure 12-9
12.4.4 Environment 12-10
12.5 Vulnerability 12-10
12.5.1 Population 12-10
12.5.2 Property 12-10
12.5.3 Critical Facilities and Infrastructure 12-11
12.5.4 Environment 12-11
12.6 Future Trends in Development 12-11
12.7 Review of Existing Ordinances, Programs, and Policies 12-11
12.8 Scenario 12-11
12.9 Issues 12-12

13. Wildfire 13-1

13.1 General Background 13-1
13.1.1 Contributing Factors 13-1
13.1.2 Local Conditions Related to Wildfire Hazard 13-1
13.2 Hazard Profile 13-3
13.2.1 Past Events 13-3

13.2.2 Location 13-4
13.2.3 Frequency 13-8
13.2.4 Severity 13-9
13.2.5 Warning Time 13-11
13.3 Secondary Hazards 13-11
13.4 Exposure 13-11
13.4.1 Population 13-11
13.4.2 Property 13-11
13.4.3 Critical Facilities and Infrastructure 13-11
13.4.4 Environment 13-12
13.5 Vulnerability 13-12
13.5.1 Population 13-12
13.5.2 Property 13-13
13.5.3 Critical Facilities and Infrastructure 13-13
13.6 Future Trends in Development 13-13
13.7 Review of Existing Programs, Plans and Ordinances 13-14
13.7.1 Fire Prevention Programs and Standards 13-14
13.7.2 Adopted Service Levels for Response Time 13-15
13.7.3 Annual Monitoring of Fire Department Service Levels 13-16
13.7.4 Personnel Training 13-17
13.7.5 Fire Investigation 13-17
13.7.6 Comprehensive Emergency Medical Services 13-18
13.7.7 Accreditation Recommendation 13-17
13.8 Scenario 13-18
13.9 Issues 13-19

14. Human Health Hazards 14-1

14.1 General Background 14-1
14.1.1 Influenza 14-1
14.1.2 Smallpox 14-3
14.1.3 Viral Hemorrhagic Fevers 14-3
14.1.4 Plague 14-5
14.1.5 Tick-Borne Disease 14-5
14.1.6 Mosquito-Borne Disease 14-7
14.1.7 Anthrax 14-10
14.1.8 Severe Acute Respiratory Syndrome 14-10
14.1.9 Extreme Weather 14-11
14.2 Hazard Profile 14-12
14.2.1 Past Events 14-13
14.2.2 Location 14-13
14.2.3 Frequency 14-14
14.2.4 Severity 14-14
14.3 Secondary Hazards 14-14
14.4 Exposure and Vulnerability 14-14
14.4.1 Population 14-14
14.4.2 Property 14-15
14.4.3 Critical Facilities and Infrastructure 14-15
14.4.4 Environment 14-15
14.4.5 Economy 14-15
14.5 Future Trends in Development 14-15

14.6 Review of Existing Ordinances, Programs and Plans 14-15
14.6.1 Hospital Expansions to Care for Growing Populations 14-15
14.6.2 Memorandums of Agreement 14-16
14.6.3 Integrated Emergency Response 14-17
14.7 Scenario 14-17
14.8 Issues 14-17

15. Human-Caused Hazards 15-1

15.1 General Background 15-1
15.1.1 Man-Made Hazards 15-2
15.1.2 Technological Hazards 15-7
15.1.3 Civil Disorder 15-10
15.2 Hazard Profile 15-10
15.2.1 Past Events 15-10
15.2.2 Location 15-16
15.2.3 Frequency 15-20
15.2.4 Severity 15-20
15.2.5 Warning Time 15-21
15.3 Secondary Hazards 15-21
15.4 Exposure 15-21
15.4.1 Population 15-22
15.4.2 Property 15-23
15.4.3 Critical Facilities and Infrastructure 15-23
15.4.4 Environment 15-24
15.5 Vulnerability 15-25
15.5.1 Population 15-25
15.5.2 Property 15-25
15.5.3 Critical Facilities and Infrastructure 15-25
15.5.4 Environment 15-25
15.5.5 Economic impacts 15-25
15.6 Future Trends in Development 15-26
15.7 Review of Existing Ordinances, Programs, and Plans 15-26
15.7.1 City of Roseville Emergency Response Plan 15-26
15.7.2 City of Roseville Terrorism Contingency Plan 15-26
15.7.3 City of Roseville Hazardous Materials Contingency Plan 15-27
15.7.4 State of California Certified Unified Program Agency 15-27
15.7.5 Roseville Police Department 15-28
15.7.6 Roseville Public Safety Communications 15-28
15.7.7 Roseville Fire Department 15-28
15.8 Scenario 15-31
15.9 Issues 15-31

16. Planning Area Risk Ranking 16-1

16.1 Probability of Occurrence 16-1
16.2 Impact 16-1
16.3 Risk Rating and Ranking 16-3

17. Guiding Principle, Goals and Objectives 17-1

17.1 Guiding Principle 17-1
17.2 Goals 17-1

17.3 Objectives 17-2

18. Mitigation Alternatives 18-1

19. Action Plan and Implementation 19-1

19.1 Hazard Mitigation Action Plan 19-1
19.1.1 Benefit-Cost Review 19-7
19.1.2 Action Plan Prioritization 19-8
19.1.3 Analysis of Mitigation Actions 19-8
19.2 Adoption 19-8
19.3 Plan Maintenance Strategy 19-13
19.3.1 Plan Implementation 19-14
19.3.2 Steering Committee 19-14
19.3.3 Annual Progress Report 19-15
19.3.4 Plan Update 19-15
19.3.5 Continuing Public Involvement 19-16
19.3.6 Incorporation into Other Planning Mechanisms 19-16

References

Glossary

Appendices

Appendix A. Public Outreach Materials
Appendix B. 2015 Progress Report
Appendix C. Steering Committee Participation Documentation

Tables

Table 2-1. Plan Changes Crosswalk 2-3
Table 3-1. Steering Committee Members 3-2
Table 3-2. Summary of Public Meetings 3-7
Table 3-3. Plan Development Chronology/Milestones 3-11
Table 4-1. Presidential Major Disaster, Emergency, and Fire Management Assistance Declarations 4-5
Table 4-2. Roseville Climate 4-6
Table 4-3. Non-Residential Land Uses 4-9
Table 4-4. Non-Residential Development Profile as of July 2016 4-10
Table 4-5. Planning Area Critical Facilities 4-10
Table 4-6. Planning Area Critical Infrastructure 4-10
Table 4-7. General Plan Projections of Residential Units and Population by Specific Plan Area 4-18
Table 4-8. Status of Non-Institutionalized Population with Disabilities 4-20
Table 4-9. Population Under the Poverty Level 4-21
Table 4-10. Legal and Regulatory Capability 4-37
Table 4-11. Administrative and Technical Capability 4-39
Table 4-12. Fiscal Capability 4-39
Table 4-13. National Flood Insurance Program Compliance 4-40

Table 4-14. Education and Outreach 4-40
Table 4-15. Community Classifications 4-41
Table 5-1. Hazus-MH Model Data Documentation 5-6
Table 7-1. Dams in Placer and Sacramento Counties With Potential to impact Roseville 7-4
Table 7-2. Hazard Potential Classification 7-5
Table 7-3. Value of Property Exposed to Dam Failure 7-8
Table 7-4. Critical Facilities in Dam Failure Inundation Areas in Roseville 7-8
Table 7-5. Loss Estimates for Dam Failure 7-9
Table 8-1. City of Roseville Water Supply Contracts and Resources 8-2
Table 8-2. Dry Year Flows into Folsom Lake 8-3
Table 8-3. Water Supply Reliability by 2040 8-11
Table 8-4. City of Roseville Past, Current, and Projected Water Use 8-12
Table 9-1. Richter Magnitude Scale 9-2
Table 9-2. Moment Magnitude Scale 9-2
Table 9-3. Mercalli Scale and Peak Ground Acceleration Comparison 9-3
Table 9-4. NEHRP Soil Classification System 9-4
Table 9-5. Recent Earthquakes Magnitude 5.0 or Larger Within 100-mile radius 9-4
Table 9-6. Critical Facilities Exposed to the Earthquake Hazard 9-13
Table 9-7. Critical Infrastructure Exposed to the Earthquake Hazard 9-13
Table 9-8. Age of Structures in the City of Roseville 9-16
Table 9-9. Building Type 9-16
Table 9-10. Damage Probability (Vulnerability) of Critical Facilities from a 100-Year Earthquake Event 9-18
Table 9-11. Damage Probability (Vulnerability) of Critical Facilities from the Great Valley 3 Scenario 9-18
Table 9-12. Functionality of Critical Facilities, 100-Year Earthquake 9-19
Table 9-13. Functionality of Critical Facilities, Great Valley 3 Scenario 9-19
Table 10-1. Reported Damage from Major Flooding in Roseville (1973 to 2009) 10-4
Table 10-2. Observed Characteristics of Flooding 10-10
Table 10-3. Structures Within the SFHA and the Roseville Regulatory Floodplain 10-12
Table 10-4. Value of Exposed Buildings Within the FEMA SFHA 10-13
Table 10-5. Value of Exposed Buildings Within the Roseville Regulatory Floodplain 10-13
Table 10-6. Critical Facilities in Flood Area 10-14
Table 10-7. Critical Infrastructure in Flood Areas 10-14
Table 10-8. Flood Insurance Statistics for the City of Roseville 10-16
Table 10-9. Estimated Flood Loss for the 10-Year Flood Event (Preliminary FIRM) 10-17
Table 10-10. Estimated Flood Loss for the 100-Year and 500-Year Flood Events (Preliminary FIRM) 10-18
Table 10-11. Estimated Flood Loss for the Regulatory Floodplain 10-18
Table 11-1. Loss Estimates for Buildings Vulnerable to High Landslide Hazard 11-8
Table 11-2. Loss Estimates for Buildings Vulnerable to Moderate Landslide Risk Hazard 11-8
Table 12-1. Monthly Wind Records for Sacramento, California 12-5
Table 12-2. Monthly Dense Fog Occurrence 12-6
Table 12-3. Frequency of Thunderstorms in Sacramento, California, 1948 – 2008 12-6
Table 12-4. Severe Weather Events in Placer County since 1958 (NOAA 2015) 12-8
Table 12-5. Loss Potential for Roseville Buildings Vulnerable to Severe Weather Hazard 12-10
Table 13-1. Wildfire Incident Counts—2011 to 2015 13-8
Table 13-2. Critical Facilities and Infrastructure Adjacent to Potential Wildfire Areas 13-12
Table 13-3. Potential Loss Estimates for the Wildfire Hazard 13-13
Table 15-1. Event Profiles for Terrorism 15-3
Table 15-2. Common Mechanisms for Cyber Attacks 15-6
Table 15-3. Accidents Responded to by McClellan Fire Department, 1950-1980s 15-11

Table 15-4. Traffic Accident Counts—2009 to 2014 15-16
Table 15-7. Criticality Factors 15-21
Table 15-8. Vulnerability Criteria 15-22
Table 15-9. Residential Dwelling Units in the City of Roseville as of 2012 15-23
Table 16-1. Probability of Hazards 16-1
Table 16-2. Impact on People from Hazards 16-2
Table 16-3. Impact on Property from Hazards 16-3
Table 16-4. Impact on Economy from Hazards 16-3
Table 16-5. Hazard Risk Rating 16-3
Table 16-6. Hazard Risk Ranking 16-4
Table 17-1. Objectives for 2011 Multi-Hazard Mitigation Plan 17-2
Table 18-1. Alternatives to Mitigate the Dam Failure Hazard 18-2
Table 18-2. Alternatives to Mitigate the Drought Hazard 18-3
Table 18-3. Alternatives to Mitigate the Earthquake Hazard 18-4
Table 18-4. Alternatives to Mitigate the Flooding Hazard 18-5
Table 18-5. Alternatives to Mitigate the Landslide Hazard 18-6
Table 18-6. Alternatives to Mitigate the Severe Weather Hazard 18-7
Table 18-7. Alternatives to Mitigate the Wildfire Hazard 18-8
Table 18-8. Alternatives to Mitigate Health Hazards 18-9
Table 18-9. Alternatives to Mitigate Human-Cause Hazards 18-9
Table 19-1. Action Plan 19-2
Table 19-2. Prioritization of Mitigation Actions 19-9
Table 19-3. Analysis of Mitigation Actions 19-11

Figures

Figure 3-1. Hazard Mitigation Booth 3-6
Figure 3-2. City of Roseville Earth Day Festival 3-6
Figure 3-3. Hazus-MH Work Station 3-6
Figure 3-4. Sample Printout from Work Station 3-6
Figure 3-5. Twitter Survey Announcement 3-8
Figure 3-6. Facebook Survey Announcement 3-8
Figure 3-7. Nextdoor Survey Announcement 3-8
Figure 3-8. Sample Page from Hazard Mitigation Plan Website 3-9

Figure 4-1. Roseville Planning Area 4-2
Figure 4-2. Total Land Use Allocation in Roseville 4-7
Figure 4-3. Critical Facilities in the Planning Area 4-11
Figure 4-4. Critical Infrastructure in the Planning Area—Transportation 4-12
Figure 4-5. Critical Infrastructure in the Planning Area—Utilities 4-13
Figure 4-6. Placer County and Roseville Population Growth 4-17
Figure 4-7. Planning Area Age Distribution 4-18
Figure 4-8. Planning Area Race Distribution 4-19
Figure 4-9. Industry in the Planning Area 4-21
Figure 4-10. California and Roseville Unemployment Rate (U.S. Census, 2009 – 2014) 4-22
Figure 4-11. Occupations in the Planning Area 4-23

Figure 6-1. Global Carbon Dioxide Concentrations Over Time 6-2

Figure 6-2. Observed and Projected Average Temperatures in the Roseville Area 6-5
Figure 6-3. Projected Future Fire Risk in Placer County Relative to 2010 Levels 6-5

Figure 7-1. Folsom Dam and Folsom Lake on the American River, Looking Northeast 7-6
Figure 7-2. Folsom Dam Containment Dike Failure Flow Direction and Evacuation Routes 7-7

Figure 8-1. Palmer Crop Moisture Index for Week Ending January 30, 2016 8-6
Figure 8-2. Palmer Z Index Short-Term Drought Conditions (December 2015) 8-6
Figure 8-3. Palmer Drought Severity Index (December 2015) 8-7
Figure 8-4. Palmer Hydrological Drought Index Long-Term Hydrologic Conditions (December 2015) 8-8
Figure 8-5. 24-Month Standardized Precipitation Index (January 2013 – December 2015) 8-8

Figure 9-1. Location of Recent Earthquakes in Roseville Vicinity 9-5
Figure 9-2. 100-Year Probabilistic PGA 9-8
Figure 9-3. Concord-Green Valley Fault Scenario PGA 9-9
Figure 9-4. Great Valley 3 Fault Scenario PGA 9-10
Figure 9-5. National Earthquake Hazard Reduction Program Soil Classification 9-11
Figure 9-6. Age of Construction of Structures in Roseville 9-17

Figure 10-1. CRS Communities by Class as of May 1, 2016 10-3
Figure 10-2. Dry Creek Flooding, January 1995 10-6
Figure 10-3. Business Flooding, February 1998 10-7
Figure 10-4. Floodplains 10-9
Figure 10-5. Example of Stream Gauge Graphic Display 10-11
Figure 10-6. Repetitive Loss Area 10-20
Figure 10-7. Floodplain Designation Cross-Sections for Infill Areas 10-23
Figure 10-8. Floodplain Designation Cross-Sections for Areas Other Than Infill Areas 10-23
Figure 10-9. Updated Floodplain Mapping 10-26

Figure 11-1. Deep Seated Slide 11-2
Figure 11-2. Shallow Colluvial Slide 11-2
Figure 11-3. Bench Slide 11-2
Figure 11-4. Large Slide 11-2
Figure 11-5. Typical Debris Avalanche Scar and Track 11-2
Figure 11-6. Roseville Area Landslide Hazard Map 11-5

Figure 12-1. Roseville Regional Surface Elevation 12-1
Figure 12-2. Potential Impact and Damage from a Tornado 12-3
Figure 12-3. Tornado Risk Areas in the Coterminous United States 12-4

Figure 13-1. CAL FIRE FRAP Map for Placer County 13-5
Figure 13-2. View of Ravine, Tree Canopy and Stoneridge Development 13-6
Figure 13-3. Stoneridge Specific Plan Wildfire Threat Areas 13-8
Figure 13-4. Fire Hazard Severity Zones in the Planning Area 13-10
Figure 13-5. City of Roseville Fire Training Center 13-17

Figure 14-1. Areas with Confirmed H5N1 2003-2013 14-2
Figure 14-2. 2014 Distribution of Ebola Virus Outbreaks in Humans and Animals 14-4
Figure 14-3. California 2014 *Yersinia Pestis* Results in Tested Mammals by County 14-6

Figure 15-1. Pop-Up Message Indicating Ransomware Infection 15-6
Figure 15-2. February 12, 2006 Aircraft Crash into Residence 15-12
Figure 15-3. October 21, 2010 Arson Fire at Galleria Mall 15-13
Figure 15-4. 1973 Roseville Rail Yard Disaster 15-14

Figure 15-5. 1997 Bomb Discovery 15-15
Figure 15-6. The J.R. Davis Yard in Roseville, the Largest Train Yard West of the Mississippi..... 15-17
Figure 15-7. Roseville Truck Routes with High Potential for Hazardous Materials Incidents 15-18
Figure 15-8. Kinder Morgan National Pipeline Map 15-19
Figure 15-9. Roseville Civic Center..... 15-24

Figure 19-1. Resolution Adopting the Roseville Hazard Mitigation Plan..... 19-12

ACKNOWLEDGMENTS

City of Roseville

Rob Jensen, City Manager
Wayne Wiley, Associate Planner
Jason Rizzi, Roseville Fire Department
Carl Walker, Senior Civil Engineer
Helen Dyda, Marketing & Communications Analyst

Consultants

Rob Flaner, CFM, Lead Project Planner, Tetra Tech, Inc.
Carol Baumann, Hazus/GIS lead, Tetra Tech, Inc.
Jessica Cerutti, CFM, Planner, Tetra Tech, Inc.
Stephen Veith, GIS Analyst, Tetra Tech, Inc.

Stakeholders

Erik Angle, Sutter Roseville Medical Center
Michael Algots, Union Pacific Railroad
Rick Stalker, Placer County Association of Realtors

Special Acknowledgments

The development of this Plan would not have been possible without the dedication and commitment to this process by the Roseville Hazard Mitigation Plan Steering Committee. The dedication of this volunteer committee to allocate their time to this process is greatly appreciated. Also, the citizens of Roseville are commended for their participation in the outreach strategy identified by the Steering Committee. This outreach success will set the course to the successful implementation of this Plan during its next performance period.

- Grace Keller
- Wayne Wiley
- Rob Jensen
- Jason Rizzi
- Carl Walker
- Helen Dyda
- Erik Angle
- Brenette Macintosh
- Mark Lacher
- Jaime Garrett
- Joseph Van Zant
- Rod Rodriguez
- Rick Stalker
- Michael Algots
- Jim Williams

EXECUTIVE SUMMARY

The Disaster Mitigation Act (DMA; Public Law 106-390) is the latest federal legislation enacted to encourage and promote proactive, pre-disaster planning as a condition of receiving financial assistance under the Robert T. Stafford Act. The DMA emphasizes planning for disasters before they occur. Under the DMA, a pre-disaster hazard mitigation program and new requirements for the national post-disaster hazard mitigation grant program were established.

The DMA encourages state and local authorities to work together on pre-disaster planning and it promotes sustainability as a strategy for disaster resistance. The intent is three-fold:

- To gather hazard, vulnerability, and mitigation information at the local level for use in state-level planning
- To ensure that state and local hazard mitigation planning is coordinated to the greatest extent practical
- To ensure that local jurisdictions are made aware of the hazards and vulnerabilities within their jurisdiction and to develop strategies to reduce those vulnerabilities.

This process ensures that mitigation actions are based on sound planning processes that account for the risks and capabilities of California communities. "Sustainable hazard mitigation" includes the sound management of natural resources, local economic and social resiliency, and the recognition that hazards and mitigation must be understood in the largest possible social and economic context. The enhanced planning network called for by the DMA helps local governments articulate accurate needs for mitigation, resulting in faster allocation of funding and more cost-effective risk reduction projects.

Using this initiative as a foundation for proactive planning, the City of Roseville has developed and maintained a hazard mitigation plan in an effort to reduce future loss of life and property resulting from disasters. It is impossible to predict exactly when and where disasters will occur or the extent to which they will impact the City. However, with careful planning and collaboration among public agencies, stakeholders, and citizens, it is possible to minimize losses that can occur from disasters.

Hazard mitigation is a way to reduce or alleviate the loss of life, personal injury, and property damage that can result from a disaster through long- and short-term strategies. It involves strategies such as planning, policy changes, programs, projects, and other activities that can mitigate the impacts of hazards on the City of Roseville. The responsibility for hazard mitigation lies with many, including private property owners; business and industry; and local, state, and federal government.

PLAN UPDATE

Federal regulations stipulate that hazard mitigation plans must describe the method and schedule for monitoring, evaluating, and updating the Plan. Prescribing an update schedule establishes an opportunity to reevaluate recommendations, monitor the impacts of actions that have been accomplished, and determine if there is a need to change the focus of mitigation strategies. DMA compliance is contingent on meeting the plan update requirement. A jurisdiction covered by a plan that has expired is not able to pursue elements of federal funding afforded under the Robert T. Stafford Act for which a current hazard mitigation plan is a prerequisite. The California Office of

Emergency Services (Cal OES) reviews all local hazard mitigation plans in accordance with DMA 2000 regulations and coordinates with local jurisdictions to ensure compliance with state requirements and the Code of Federal Regulations (Title 44 Section 201.6). Once Cal OES planning staff find the local hazard mitigation plan to be approvable, the Plan is forwarded to mitigation planning staff at Region IX of the Federal Emergency Management Agency (FEMA). FEMA performs final review and designates compliant plans as "approved pending adoption."

The City of Roseville used the plan update process to comprehensively revise its initial hazard mitigation plan, which was adopted in 2005. Due to the success of the initial plan, no major changes were made to the plan's approach and function. The subsequent 2011 Plan was enhanced using recent best available data and technology, especially in the risk assessment. For this 2016 planning effort, the enhanced format of the 2011 Plan has been retained in order to ensure the consistency of discussion points on each hazard of concern and address required elements for plan updates. The Plan update followed the same basic planning process as was followed under the initial effort and subsequent update. A Steering Committee was once again the critical component in the process. The Steering Committee consisted of 14 members of the community representing the public, private industry, and government. The Steering Committee met six times between November 2015 and August 2016 to provide recommendations and support throughout the planning process.

PLAN UPDATE METHODOLOGY

Development of the hazard mitigation plan included five phases:

- Phase 1—Organize resources
- Phase 2—Update the risk assessment
- Phase 3—Engage the public
- Phase 4—Assemble the updated Plan
- Phase 5—Plan adoption

Phase 1—Organize Resources

The City hired Tetra Tech, Inc. as a consultant to assist with development and implementation of the 2016 Plan. The Tetra Tech project manager assumed the role of the lead project planner and reported directly to a City project manager. Once the technical assistance was secured, a planning team was formed to lead the planning effort. The Steering Committee that oversaw the development of the initial plan remained intact during the initial performance period of the Plan and then provided oversight for the 2016 Plan. For the update process, some new members were added and some previous members left the committee. The planning team facilitated each Steering Committee meeting, which addressed a set of objectives based on the work plan established for the update. The Steering Committee met six times from November 2015 through August 2016. Coordination with other local, state and federal agencies involved in hazard mitigation in the region helped to ensure consistency with other ongoing efforts.

One of the Steering Committee's first action items was to review the State of California Hazard Mitigation Plan, the Roseville 2011 Hazard Mitigation Plan and all of the progress reports completed since the 2011 Plan. The Steering Committee identified hazards listed in the state plan to which Roseville is susceptible, in order to determine if there was a need to expand the scope of the risk assessment. Each annual progress report for the initial plan contains a section that recommends changes or enhancements to the Plan or plan development process. These reports effectively completed a key step of the plan update process before the update process began—identifying needs for changes or enhancements.

Phase 2 —Update the Risk Assessment

Federal planning guidance specifies comprehensive updates to the risk assessment portion of local hazard mitigation plans if there have been new technical data pertaining to a hazard developed by a creditable source since the Plan's previous development. Updated risk assessment efforts for the 2016 Plan included the following:

- The latest version of the Federal Emergency Management Agency's Hazus-MH risk assessment software was used to enhance the risk assessments for flood, dam failure and earthquake.
- All hazards of concern were updated with new relevant data.
- The Hazus default general building stock was updated using current address point, building footprint, parcel and tax assessor data.

Phase 3—Engage the Public

The Steering Committee drafted a comprehensive public involvement strategy for this update using multiple media sources. This strategy was built upon the Steering Committee's previous public engagement strategy and enhanced with social media and non-traditional outreach initiatives not regularly employed during the previous planning processes. The planning team identified stakeholders to target through the multi-disciplinary public involvement strategy.

Phase 4—Assemble the Updated Plan

The base format of the 2011 Plan was maintained in the 2016 Plan. However, enhancements were made to include the following components:

- The update describes the process used to review and analyze each section of the Plan.
- The update provides a discussion on how the public was kept apprised of the Plan's actions during the initial performance period.
- The update describes the need for changes to the risk assessment and what changes were made from the previous update.
- The update describes changes to risk exposure due to either of the following:
  - Successful mitigation projects
  - Changes in land use due to annexation or new development.
- The update describes changes to the action plan and the reasons for them.
- The update identifies completed, deleted, or deferred actions or activities from the previously approved plan as a benchmark for progress in the form of the 2015 Progress Report located in Appendix B. It also includes in its evaluation and prioritization new mitigation actions identified since the previous plan

Phase 5—Plan Adoption/Implementation

This Plan details a formal process for implementing and maintaining the Plan so that it remains an active and relevant document. The plan maintenance process includes a schedule for monitoring and evaluating the Plan's progress annually and producing a plan revision every five years. This process seeks to keep a steering body that meets the criteria of the original steering committee intact to perform this annual review. This phase includes strategies for continued public involvement and incorporation of the recommendations of this Plan into other planning mechanisms of the City, such as the comprehensive plan, capital improvement plan, building code, and development design guidelines.

MITIGATION GUIDING PRINCIPLE, GOALS, AND OBJECTIVES

Guiding Principle

The following guiding principle was identified for this hazard mitigation plan:

> Through community partnerships, establish a plan to reduce vulnerability to hazards in order to protect the health, safety, welfare, and economy of the City.

Goals

The Steering Committee established the following goals for the Plan update:

- G-1: Protect lives and reduce injury.
- G-2: Promote hazard mitigation as an integrated policy.
- G-3: Protect the continuity of local government to ensure no significant disruption of services during or due to a disaster.
- G-4: Improve community emergency management preparedness, collaboration and outreach.
- G-5: Minimize or reduce damage to property, including critical facilities.
- G-6: Develop and implement mitigation strategies that optimize public funds in an efficient and cost-effective way.
- G-7: Monitor and support the natural environment's capacity to deal with the impacts of natural hazards, taking into account the potential impacts of global climate change.

Objectives

Plan objectives were developed via a facilitated exercise that focused on finding objectives that meet multiple goals. During this exercise, Steering Committee members were requested to review the 2011 objectives in addition to newly proposed objectives. The selected objectives are listed in Table ES-1.

Table ES-1. Objectives for 2016 Multi-Hazard Mitigation Plan

Objective Number	Objective Statement	Goals for which it can be applied
O-1	Consider the impacts of hazards on future land uses in the City of Roseville by coordinating with other planning mechanisms such as the General Plan and land-use code development.	1, 2, 5, 7
O-2	Protect and sustain reliable local emergency operations and communication facilities during and after disasters.	1, 3, 4
O-3	Develop new or enhance existing early warning response systems and plans.	1, 3, 4, 5
O-4	Seek to enhance emergency response capabilities through improvements to infrastructure and City programs.	1, 4, 5
O-5	Enhance the understanding of all present and future hazards that impact the City of Roseville and the risk they pose.	1, 3, 4, 5, 7
O-6	Seek mitigation projects that provide the highest degree of hazard protection at the least cost.	1, 5, 6
O-7	Seek to update information on natural, environmental, and human-caused hazards, vulnerabilities, and mitigation measures by coordinating planning efforts and creating partnerships with appropriate local, private, county, state, and federal agencies.	1, 2, 3, 4, 5, 7
O-8	Seek to implement codes, standards, and policies that will protect life and property, including natural habitat, from the impacts of hazards within the City of Roseville.	1, 2, 3, 5, 6
O-9	Educate the public on preparedness for and mitigation of potential impacts of hazards on the City of Roseville.	1, 2, 4
O-10	Support efforts to retrofit, purchase, or relocate structures in high hazard areas, including those known to be repetitively damaged.	3, 5, 6

MITIGATION ACTION PLAN

The hazard mitigation action plan is a key element of this Plan. It is through the implementation of this action plan that the City of Roseville can strive to become disaster-resilient through sustainable hazard mitigation. This action plan includes an assessment of the capabilities of the City to implement hazard mitigation actions, a review of alternatives, a prioritization schedule, and a mitigation strategy matrix that identifies the following:

- Description of recommended actions
- Hazards addressed
- Objectives addressed
- Lead implementation agency (or agencies)
- Estimated benefits
- Estimated costs
- Timeframe for implementation
- Funding sources

For the purposes of this document, mitigation actions are defined as activities designed to reduce or eliminate losses resulting from the impacts of natural hazards of concern. Table ES-2 summarizes the hazard mitigation actions identified by this Plan update.

IMPLEMENTATION

Full implementation of the recommendations of this Plan will require time and resources. This Plan reflects an adaptive management approach in that specific recommendations and plan review protocols are provided to evaluate changes in vulnerability and action plan prioritization after the Plan is adopted. Funding resources are always evolving, as are requirements under state or federal mandates, and the true measure of the Plan's success will be its ability to adapt to the ever-changing climate of hazard mitigation.

Roseville has a long-standing tradition of progressive, proactive response to issues that may impact its citizens. This tradition is reflected in the development of this Plan. The Roseville City Council will assume responsibility for adopting the recommendations of this Plan and committing City resources toward its implementation. The City's track record in the mitigation of hazards impacting its citizens is exemplary. The framework established by this Plan will help maintain this tradition in that it identifies a strategy to maximize the potential for implementation based on available and potential resources. It commits the City to pursue actions when the benefits of a project exceed its costs. Most important, the City developed this Plan with extensive public input, which sets the stage for acceptance of the actions recommended for implementation in this Plan.

Table ES-2. Hazard Mitigation Action Plan Matrix

Action Number and Description	Timeframe
DAM FAILURE	
DF-1—Create a dam failure element for the City's emergency response plan that includes a phased warning protocol in response to the findings of the Folsom Dam Containment Dike Risk Assessment.	Short-term
DROUGHT	
D-1—Perform a groundwater recharge feasibility study to determine the most cost-effective way to replenish groundwater resources within Roseville.	Ongoing
D-2—Implement aquifer storage and recovery program that uses direct injection technique in areas identified as appropriate.	Ongoing
D-3—Continue to implement the Environmental Utility Department's recycled water program and seek all opportunities to expand its coverage, focusing first on the Sunset Industrial area. The City pumps recycled water through a system of purple pipes completely separate from potable (drinking water) pipes. The City pumps the recycled water to customers such as streetscapes, golf courses and parks, where it irrigates turf and shrubs. Using recycled water for uses such as landscape irrigation reduces demand on the potable water system, creating a more reliable water supply for the entire City. Recycled water is not subject to the effects of drought.	Ongoing
D-4—Promote active water conservation techniques and strategies to private property owners through Roseville-sponsored outreach projects such as printed media and the City's website.	Ongoing
EARTHQUAKE	
EQ-1—Perform building-specific, structural seismic vulnerability assessment of City-owned critical facilities constructed prior to 1980 (including infrastructure). Included in this assessment will be recommended mitigation alternatives that meet goals and objectives of this Plan.	Short-term; Ongoing
EQ-2—Incorporate earthquake mitigation measures for private property into existing City-sponsored outreach programs such as printed media and the City's website.	Short-term
EQ-3—Reassess the overall vulnerability to the earthquake hazard using the best available science and technology as it becomes available. State-sponsored programs, Seismic Hazards Mapping Act, and future FEMA-sponsored initiatives are anticipated to create a wealth of knowledge regarding this hazard that did not exist during the preparation of this Plan update	Short-term; Ongoing
FLOOD	
F-1—The City shall designate all areas identified as the 100-year floodplain. The boundaries of the 100-year floodplain shall be as specified in the floodplain designations section of this component of the City's general plan. Floodplain areas shall be preserved as specified in the open space and conservation element. Such preservation may include required dedication to the City. If needed, modify the City's ordinances to include floodplain use regulations consistent with the goals, policies, and implementation measures of the safety, land use, open space and conservation, and parks and recreation elements of the City's general plan.	Ongoing
F-2—Refer any development proposal that has a direct or indirect impact on flood protection to Public Works for comment. In addition, forward such proposals to other agencies as applicable, including the U.S. Army Corps of Engineers, California Reclamation Board, FEMA, California Department of Fish and Wildlife, Placer County Resource Conservation District, and Placer County Flood Control District. Consider the comments of the agencies during the development review process.	Ongoing
F 3—Continue City participation in the National Flood Insurance Program and the Community Rating System (CRS). Maintain the City's current CRS status as the nation's only Class 1 CRS community.	Ongoing
F 4—Maintain Roseville's compliance and good standing under the National Flood Insurance program	Ongoing
F 5—Continue the City's outreach program to flood-prone property owners and the citizens of Roseville to program is to help make them aware of the flood threat and how best to deal with them.	Ongoing
F 6—Continue to pursue a regional approach to flood issues by remaining actively involved in the Placer Co Flood Control District. This involvement includes cooperation in the development of a comprehensive regional database. Continue to participate in regional flooding studies, including the Auburn Creek/Coon Creek/Pleasant Grove Creek flood mitigation plan and the Dry Creek watershed flood control plan.	Ongoing

Action Number and Description	Timeframe
F 7—Continue City coordination with other agencies on issues of flood control. Coordination between the City and adjacent jurisdictions occurs through several mechanisms, including distribution of development proposals for review and comment. Continue City cooperation with federal, state, and local agencies, including the U.S. Army Corps of Engineers, California Reclamation Board, FEMA, California Department of Fish and Wildlife, Placer County Resource Conservation District, and Placer County Flood Control District.	Ongoing
F 8—Continue to develop, implement, and expand the Flood Alert and Early Warning Program systems and integrate the systems with other local jurisdictions to form a regional warning program.	Ongoing
F 9—Ensure that future specific plans and specific plan amendments are consistent with the goals and policies of the general plan. The specific plans shall include the designation and preservation of floodplain areas and adjacent habitat. Provisions shall be incorporated to ensure that public infrastructure, utilities, and emergency services remain functional during flood conditions. Such infrastructure and facilities include water, sewer and gas mains, telephone and electric lines, streets and bridges, hospitals, and fire and police stations. Financing mechanisms shall be explored to fund necessary flood protection improvements and maintenance. Development agreements may be used to secure implementation and funding provisions. (Specific plans have 100% cost recovery by developers).	Short -term
F 10—Monitor and regularly update City flood studies, modeling, and associated land use, zoning, and other development regulations at a minimum of every 5 years or whenever information becomes available that would significantly modify previous data. New information could include new studies, change in City policy, consideration of a major development project or specific plan, or implementation of a flood control project.	Short-term; Ongoing
F 11-Require a master drainage plan as part of the approval process for all specific plans and large development projects as determined by the Public Works director. The master drainage plan should consider cumulative regional drainage and flooding mitigation. The plan's intent is to ensure that the overall rate of runoff from a project does not exceed predevelopment levels. If necessary, this objective shall be achieved by incorporating run-off control measures to minimize peak flows and/or assistance in financing or otherwise implementing comprehensive drainage plans.	Short-term
F-12—Continue the Department of Parks, Recreation and Libraries' regular creek maintenance program within the City's creeks and floodplain areas. This program clears and removes debris that could contribute to blockage and flooding and may include the removal of silt. This is only done in areas of high risk to flood damage or where property or facilities are threatened by flooding.	Ongoing
F 13—Continue annual inspection and maintenance program of City storm drain systems. Review after every major storm system function and performance. This program removes debris that could contribute to blockage of the storm drain system.	Ongoing
F 14—Complete the final two phases of the Cirby/Linda/Dry Creek flood control project (Phase 1 and 2). Five of the seven phases of this project have been completed at a cost of about $18,000,000. The basis for determining viability of this project will be a benefit /cost analysis to determine if project meets federal grant eligibility requirements.	Long-term
F 15—Analyze alternative improvements to the Cirby/Linda/Dry Creek flood control project that may be cost effective in the flood-prone areas of Roseville: • Dry Creek from Darling Way to Riverside Avenue • Area on Dry Creek upstream of Folsom Road in the Columbia Avenue/Marilyn Avenue/Bonita Street area • Linda Creek near Samoa Way/Hurst Way area • Cirby Creek in the Trimble Way/Zien Court area	Long –term; depends on funding
F 16—Replace the Huntington Drive/Cirby Creek culvert with a bridge to protect Queens Court/Huntington Drive area. This project is overseen by Public Works department.	Long-term; depends on funding
F 17—Divert the main drainage storm drain system down Crestmont Avenue to Cirby Way and then into Dry Creek so that the existing system will not exceed capacity. If system capacity is exceeded, the intersection on Cirby Way and Crestmont Avenue and nearby homes will flood during major flood events.	Short-term
F 18—Continue to promote and sponsor programs to buy out, relocate, and flood-proof existing flood-prone structures within Roseville.	Long-term; depends on funding
F-19—Implement recommendation of Downtown Roseville Specific Plan to relocate the Public safety Building.	Long-term
F-20—Retrofit the City's Downtown library by sealing the exterior and installing a flood door to protect against flood damage should Dry Creek overspill the existing floodwall.	Short-term; Ongoing

Action Number and Description	Timeframe
F-21—Continue the Tree Mitigation Fund program administered by the Open Space Division in conjunction with non-profit organizations. The planting of oak trees in the open spaces adjacent to riparian zones increases infiltration and slows storm water surges.	Ongoing
F-22—Manage beaver dam sites for flood control protection and habitat restoration after dam removal. One primary issue is impacts to floodwater capacity of creeks. Part of the desired comprehensive approach to beaver management includes establishment of quantitative and qualitative "carrying capacity," including acre-feet of flood capacity lost. Implement a standard monitoring and reporting process to track beaver dam locations, population, and impacts. Gain regulatory approval for beaver management techniques such as biological control and habitat manipulation using the most benign options first.	Ongoing
F-23 – Develop the City's multi-use, multi-benefit stormwater retention project within the Pleasant Grove Creek Watershed, the Reason Farms Stormwater Retention Project.	Long-term
LANDSLIDE	
LS-1—Once California Geological Survey completes soils mapping for the Roseville vicinity under the Seismic Hazards Mapping Act, reassess landslide hazard using best available data to gauge the true vulnerability to this hazard.	Long-term
LS-2—Continue to implement policies adopted by the general plan that promote open space land uses within identified steep slope areas of Roseville. The City of Roseville Northeast Roseville Specific Plan and Stoneridge Specific Plans include the identified steep slope areas within Roseville. Both Plan Areas have continuing development. When individual projects are submitted,	Ongoing
SEVERE WEATHER	
SW-1—Continue the Shade Tree Program, an energy conservation rebate program provided by Roseville Electric	Ongoing
SW-2—Continue ongoing line clearing and weed abatement of electrical utilities to reduce exposure to severe weather hazards.	Ongoing
SW-3—Continue education/outreach programs to improve winter preparedness and minimize loss of life or injury.	Short-term, ongoing
SW-4—Enhance and implement strategies for debris management and removal during severe weather events.	Ongoing
SW 5-Continue to operate the Roseville Energy Park to support the City's electrical requirements and maintain service continuity during severe weather events.	Ongoing
SW 6-Take over ownership and operation of the Roseville Combustion Turbines from Northern CA Power Agency to support the City's electrical requirements and maintain service continuity during severe weather events.	Ongoing
WILDFIRE	
WF-1—Continue "Goat Grazing" program for removal of grassland in areas of Roseville potentially vulnerable to wildfire. Implement goat grazing in City open space and preserve areas for fire and invasive plant species management and native plant restoration.	Ongoing
WF-2—Enhance existing City public outreach programs to include information on fire safety, defensible spaces, and areas of concern.	Short-term; Ongoing
MULTIPLE HAZARDS	
MH-1—Continue to maintain Cal OES certification of all City inspectors for post-disaster damage assessment.	Ongoing
MH-2—Continue to maintain the hazard mitigation page on City website that provides following types of information: • The Hazard Management Plan and its progress reports • Hazard-specific information • Mitigation information by hazard, with specific emphasis on private property • Emergency response and warning information • Links to county, state, and federal related agencies	Ongoing

Action Number and Description	Timeframe
MH-3—Establish/maintain a post-disaster action plan to be part of the City Emergency operations plan that will include following elements: • Procedures for public information • Post-disaster damage assessment • Grant writing • Code enforcement • Redundant operations	Ongoing
MH-4—Implement an "Adopt an Open Space" program in coordination with the open space management program. Develop "adoption contracts" with neighborhoods, organizations, businesses, etc., describing the level of stewardship and the terms of the "adoption." Publicize these activities through online resource directory and other media to encourage participation.	Long--term
MH-5—Develop and disseminate best practices information to private property owners whose land is adjacent to open space areas describing stewardship opportunities and owners' role in preserving beneficial uses of open space areas (including vernal pool grassland and creek or riparian uses). Offer classes to provide in-depth information, such as demonstration projects, techniques for ecologically friendly weed abatement and vegetation control, and creating a backyard habitat compatible with open space areas.	Short-term; Ongoing
MH-6—Work with the Roseville City School District, local high school districts, and non-profit organizations to promote ecology-oriented curricula and stewardship activities. Identify resource and administrative barriers that may be limiting schools' abilities to more actively participate in stewardship, and work collaboratively to identify solutions.	Short-term; Ongoing
MH 7—Strive to maintain high availability of essential communication services	Ongoing
MH 8-Secure the City's physical locations that contain technology infrastructure	Ongoing
HUMAN-CAUSED	
HC 1-Commit support to initiatives within the Sacramento-Roseville-Arden-Arcade Metropolitan Statistical Area; continue to seek funding from other federal sources to fund its initiatives	Short-term
HC-2—Enhance emergency response capability of City by contingency planning for specific events based on identified vulnerabilities.	Short-term, ongoing
HC-3— Seek to establish appropriate staffing levels of public safety personnel to address vulnerabilities identified through an incremental targeted study that provides immediate needs as well as anticipated needs in 1 year, 5 years, and 10 years.	Short Term; depends on funding
HC-4—Prepare a site-specific vulnerability assessment of City-owned critical facilities that use the best available science and technology with regards human-caused hazards.	Long-term
HC-5—Address vulnerabilities identified in vulnerability assessment of water facilities performed by Environmental Utilities Department in response to EPA initiative.	Long-term
HC 6-Maintain compliance with California Energy Commission license conditions for the operations of the Roseville Energy Park with respect to Hazardous Material Management	Ongoing
HC 7-Establish and maintain compliance with state and local laws and regulations for the operation of the Roseville Combustion Turbines upon transfer of ownership from Northern CA Power Agency to City.	Ongoing
HC-8-Maintain compliance with North American Electric Reliability Corporation mandatory reliability standards related to plant operation, sabotage reporting and critical infrastructure protection (cyber security.	Ongoing
HC 9—Protect the City's data, technology infrastructure and staff against Cyber terrorism such as but not limited to: • Identity Theft • Virus/Malware/Ransomware/Spyware/Spam/Phishing • Network and system attacks • Web site hacking	Short Term; depends on funding
HC-10: Improve evacuation transportation routes within the City of Roseville by removing traffic constrictions.	Long-term
HUMAN HEALTH	
HH-1—Continue to collaborate with the Placer County Health Department to ensure the health and welfare of the community	Ongoing

Action Number and Description	Timeframe
HH-2—Support the public education efforts of the Placer County Health Department and the Placer Mosquito Abatement District	Ongoing
HH-3—Collaborate with the Placer County Mosquito Abatement District to review resource protection policies that conflict with human health protection in the City of Roseville and work to resolve these policy issues	Short-term; Ongoing

Part 1. Planning Process and Community Profile

1. INTRODUCTION TO HAZARD MITIGATION PLANNING

1.1 WHY PREPARE THIS PLAN?

1.1.1 The Big Picture

Hazard mitigation is defined as any action taken to reduce or alleviate the loss of life, personal injury, and property damage that can result from a disaster. It involves long- and short-term actions implemented before, during and after disasters. Hazard mitigation activities include planning efforts, policy changes, programs, studies, improvement projects, and other steps to reduce the impacts of hazards.

For many years, federal disaster funding focused on relief and recovery after disasters occurred, with limited funding for hazard mitigation planning in advance. The Disaster Mitigation Act (DMA; Public Law 106-390), passed in 2000, shifted the federal emphasis toward planning for disasters before they occur. The DMA requires state and local governments to develop hazard mitigation plans as a condition for federal disaster grant assistance. Regulations developed to fulfill the DMA's requirements are included in Title 44 of the Code of Federal Regulations (44 CFR).

The responsibility for hazard mitigation lies with many, including private property owners, commercial interests, and local, state and federal governments. The DMA encourages cooperation among state and local authorities in pre-disaster planning. The enhanced planning network called for by the DMA helps local governments articulate accurate needs for mitigation, resulting in faster allocation of funding and more cost-effective risk-reduction projects.

The DMA also promotes sustainability in hazard mitigation. To be sustainable, hazard mitigation needs to incorporate sound management of natural resources and address hazards and mitigation in the largest possible social and economic context.

1.1.2 Roseville's Response to the DMA

Roseville has a long-standing reputation as a national leader in risk reduction through proactive mitigation. This reputation has been built through innovative planning and a commitment to protecting its citizens from the impacts of natural disasters. Embracing the goals of the DMA, Roseville created an initial hazard mitigation plan that became a model nationally and has been touted by the Federal Emergency Management Agency (FEMA) as a "mitigation success story." The *City of Roseville Hazard Mitigation Plan* was adopted by the Roseville City Council on July 20, 2005, and was formally approved by FEMA Region IX on August 10, 2005. The initial plan was developed with the following objectives:

- Meet or exceed program requirements specified under the DMA, thereby enabling the City of Roseville to continue using federal grant funding to reduce risk through mitigation.
- Meet not only state and federal requirements but also the needs of the City (this Plan addresses human-caused hazards, which are not required to be addressed under the DMA).
- Develop the Plan according to FEMA's Community Rating System (CRS) guidelines so that Roseville can meet requirements to become the nation's first CRS Class 1 community.

- Create a risk assessment that focuses on the City of Roseville hazards of concern.
- Coordinate existing plans and programs so that high-priority actions and projects to mitigate possible disaster impacts are funded and implemented.

The initial plan was developed according to the requirements of 44 CFR, qualifying the City to pursue funding under the Robert T. Stafford Act. The City has achieved numerous objectives identified in the Plan. Local hazard mitigation plans must be regularly updated to comply with the DMA. The City responded to this requirement with a plan update process that resulted in the 2011 Multi-Hazard Mitigation Plan, and now this 2016 Multi-Hazard Mitigation Plan.

This hazard mitigation plan update identifies resources, information, and strategies for reducing risk from natural hazards. Elements and strategies in the Plan were selected because they meet a program requirement and because they best meet the needs City residents. The Plan will help guide and coordinate mitigation activities throughout the planning area. It also will meet the planning requirements of the CRS, allowing the City of Roseville to maintain its CRS Class 1 rating.

1.2 WHO WILL BENEFIT FROM THIS PLAN?

All residents and businesses of the City of Roseville are the ultimate beneficiaries of this hazard mitigation plan update. The Plan reduces risk for those who live in, work in, and visit the City. It provides a viable planning framework for all foreseeable natural hazards. Participation in development of the Plan by key stakeholders helped ensure that outcomes will be mutually beneficial. The Plan's goals and recommendations can lay groundwork for the development and implementation of local mitigation activities and partnerships.

1.3 CONTENTS OF THIS PLAN

This hazard mitigation plan is organized into three primary parts:

- Part 1—Planning Process and Community Profile
- Part 2—Risk Assessment
- Part 3—Mitigation Strategy.

Each part includes elements required under federal guidelines. DMA compliance requirements are cited at the beginning of subsections as appropriate to illustrate compliance.

The following appendices provided at the end of the Plan include information or explanations to support the main content of the Plan:

- Appendix A—Public outreach information used in preparation of this update
- Appendix B—The 2015 Progress Report.

2. PLAN UPDATE—WHAT HAS CHANGED

2.1 THE PREVIOUS PLAN

Several factors initiated the first hazard mitigation planning effort for the City of Roseville:

- The Roseville area has significant exposure to numerous natural hazards that have caused millions of dollars in past damage.
- Limited local resources make it difficult to be pre-emptive in risk reduction actions. Being able to leverage federal financial assistance is paramount to successful hazard mitigation in the area.
- The City wanted to be proactive in its preparedness for natural hazards.

With these factors in mind, the City of Roseville committed to the preparation of its initial plan by attaining grant funding for the effort and then securing technical assistance to complete a planning process that complied with all requirements. Five years later, the City followed a similar process to update the Plan.

Due to the success of the 2005 effort, no major changes were made to the Plan's approach and function during the 2011 planning process. The 2011 update enhanced the 2005 effort but remained consistent on discussion points for each hazard of concern. The 2011 Plan format changed to address required elements for plan updates. A major addition to the 2011 Plan, per recommendations from FEMA Region IX, was the inclusion of dam failure as a hazard of concern.

The 2011 Plan update followed a phased approach to planning per FEMA's July 2008 *Local Hazard Mitigation Planning Guidance*.

2.2 MITIGATION SUCCESS STORIES

One of the principal objectives of the initial plan was to create a plan that would help the City achieve the highest possible rating under FEMA's Community Rating System (CRS) program. The CRS program has stringent requirements for Classes 4 or better, and especially for Class 1. Several of these requirements are related to planning, and the initial plan was developed to meet these requirements. The Insurance Services Office (ISO), which performs classification reviews for the CRS, determined that the initial plan met the Class 1 requirements. In December 2005, the City was verified with sufficient credit to become the nation's first and only CRS Class 1 community. This classification went into effect on October 1, 2006, and was confirmed again during the re-verification process in 2008, and most recently in 2014. As of the writing of this Plan, the City of Roseville maintains its status as the nation's only CRS Class 1 community.

Detailed accounts of other successful mitigation actions completed by the City during each reporting period are included in the progress reports on the previous hazard mitigation plan, including the 2015 Progress Report contained in Appendix B of this Plan.

2.3 WHY UPDATE?

2.3.1 Federal Eligibility

Under 44 CFR, hazard mitigation plans must present a schedule for monitoring, evaluating, and updating the Plan. This provides an opportunity to reevaluate recommendations, monitor the impacts of actions that have been accomplished, and determine if there is a need to change the focus of mitigation strategies. A jurisdiction covered by a plan that has expired is not able to pursue elements of federal funding under the Robert T. Stafford Act for which a current hazard mitigation plan is a prerequisite.

2.3.2 Changes in Development

Hazard mitigation plan updates must be revised to reflect changes in development within the planning area during the previous performance period of the Plan (44 CFR Section 201.6(d)(3)). The Plan must describe changes in development in hazard-prone areas that increased or decreased vulnerability since the last plan was approved. If no changes in development impacted the jurisdiction's overall vulnerability, then plan updates may validate the information in the previously approved plan. The intent of this requirement is to ensure that the mitigation strategy continues to address the risk and vulnerability of existing and potential development and takes into consideration possible future conditions that could impact vulnerability.

The Roseville planning area experienced a 31-percent increase in population between 2003 and 2013, an average annual growth rate of 3.1 percent per year (Placer County Office of Economic Development, 2014). The City has adopted a comprehensive plan that governs land-use decisions and policy-making, as well as a building code and specialty ordinances based on state and federal mandates. This Plan update assumes that some new development triggered by the increase in population occurred in hazard areas. Because all such new development would have been regulated pursuant to local programs and codes, it is assumed that vulnerability did not increase even if exposure did.

2.4 THE UPDATED PLAN—WHAT IS DIFFERENT?

The updated Plan differs from the initial plan in a variety of ways:

- **Climate Change Impacts**—The most recent version of the California hazard mitigation plan noted specific hazards that are created or augmented by the environmental impacts of climate change. Additionally, the recent passage of Senate Bill 379 brings the effects of climate change into focus as it relates to mitigation and general planning. As a result, instead of briefly reviewing the impact of climate change in each individual hazard profile, this 2016 Plan update dedicates a comprehensive chapter to the issue of climate change and its effects on the state-identified climate-related hazards.
- **Drought Chapter Enhancements**—Enhancements to the drought Chapter were made to reflect current, historic drought conditions of the stat, region, and city. This information was supplemented with new information provided by the City's 2015 Urban Water Management Plan (UWMP) update.
- **Public Engagement Enhancements through Social Media** —Social media platforms not available during the previous planning initiative were used to enhance public outreach capabilities.
- **Planning Area Changes**—The City adopted 3 new Specific Plans since the previous plan update. As such, all development and demographic information will include data pertaining to these new Specific Plan Areas of Sierra Vista, Creekview, and Amaruso Ranch.
- **Separation of Natural from Non-natural Hazards**—In an effort to draw distinction from the natural hazards from the non-natural hazards, the non-natural hazards (Human Caused and Human Health Hazards) are placed after the natural hazards instead of listed alphabetically with the natural hazards.

- **Human-Caused Hazards**—The human-caused hazards noted in the 2011 effort were updated for the 2016 Plan. These human-caused hazards were moved within the document to after the natural hazards due to the difference in assessing risk. Cyber threat was included as a new human-caused hazard, due to the increase in connectivity, technological advances, and emergence of "hacktivist" groups.
- **Human Health Hazards**—The human health hazards noted in the 2011 effort were updated for the 2016 Plan. These human health hazards were moved within the document to after the natural hazards due to the difference in assessing risk. Ebola was included as a new human health hazard due to the 2014 West Africa Ebola outbreak that threatened the United States, though that threat never fully materialized. Zika virus is included in the discussion, as well.
- **Additional Demographic Information**—Additional demographic data are included—beyond age and disability/access and function need—addressing Roseville's industry, business and institutional footprint. Employment trends and occupations are included to develop a fuller understanding of the population of Roseville.
- **Disabilities, Access and Functional Need Language Revision**—The entire Plan was updated to reflect appropriate references when discussing individuals with disabilities and others with access and functional needs. This includes person-first language and references to individuals instead of the more general term of populations.
- **Guiding Principle**—A guiding principle for the hazard mitigation plan was developed. The goals and objectives of the Plan support the guiding principle.

Table 2-1 indicates the major changes between the 2011 and 2016 plans as they relate to 44 CFR planning requirements.

Table 2-1. Plan Changes Crosswalk

44 CFR Requirement	Previous Plan (2011)	Updated Plan (2016)
§201.6(b): In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include: • **An opportunity for the public to comment on the Plan during the drafting stage and prior to Plan approval;** • **An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and** • **Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.**	The plan development process deployed under this update was similar to the 2005 Plan. Chapters 1, 2, and 3 describe the planning process for the 2011 updated Plan.	The plan development process deployed under this update was similar to the 2011 Plan; however, additional public outreach initiatives were conducted through new social media platforms. Chapters 1, 2, and 3 describe the planning process for the 2016 updated Plan.

44 CFR Requirement	Previous Plan (2011)	Updated Plan (2016)
§201.6(c)(2): The Plan shall include a risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.	Chapters 6 through 15 presents a risk assessment of eight hazards of concern: Climate change, dam failure, drought, earthquake, flood, landslide, severe weather, and wildfire. These hazards are profiled as they impact Roseville. Additionally, human-caused and health hazards were qualitatively assessed to develop a more complete picture of the hazards facing the county.	The 2016 Plan presents a risk assessment of the same hazards as the 2011 Plan—in Chapters 6 through 16. Each hazard was updated with new occurrence information from 2011 through 2015 where applicable, and a new comprehensive risk assessment was conducted using updated building stock, demographics, and land use information.
§201.6(c)(2)(i): [The risk assessment shall include a] description of the … location and extent of all natural hazards that can affect the jurisdiction. The Plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.	Chapters 6 through 15 presents a risk assessment of each hazard of concern. Each chapter includes the following components: • Hazard profile-including maps of extent and location, historical occurrences, frequency, severity and warning time. • Secondary hazards • Climate change impacts • Exposure of people, property, critical facilities and environment. • Vulnerability of people, property, critical facilities and environment. • Future trends in development • Scenarios • Issues	The 2016 Plan presents a risk assessment of the same hazards as the 2011 Plan—from Chapters 6 through 16. Each hazard was updated with new occurrence information from 2011 through 2015 where applicable, and a new comprehensive risk assessment was conducted using updated building stock, demographics, and land use information. Climate change impacts were omitted from the individual hazards of concern, as the new climate change chapter provides a more detailed and comprehensive overview of climate change impacts for identified hazards.
§201.6(c)(2)(ii): [The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i). This description shall include an overall summary of each hazard and its impact on the community	Vulnerability was assessed for all hazards of concern. The Hazus-MH computer model was used for the dam failure, earthquake and flood hazards. These were Level 2 user-defined analyses using City data. Site-specific data on City-identified critical facilities was entered into the Hazus model. Hazus outputs were generated for other hazards by applying an estimated damage function to an asset inventory was extracted from Hazus-MH.	Vulnerability was again assessed for all hazards of concern using the Hazus-MH computer model for dam failure, earthquake, and flood hazards. Level 2 analysis was again conducted for these hazards. Site-specific data on City-identified critical facilities was entered into the Hazus model. Hazus outputs were generated for other hazards by applying an estimated damage function to an asset inventory extracted from Hazus-MH. All assets were updated using current available data.
§201.6(c)(2)(ii): [The risk assessment] must also address National Flood Insurance Program insured structures that have been repetitively damaged floods	The Plan includes a comprehensive analysis of repetitive loss areas that includes an inventory of the number and types of structures in the repetitive loss area. Repetitive loss areas are delineated, causes of repetitive flooding are cited, and these areas are reflected on maps	The Plan includes a comprehensive analysis of repetitive loss areas that includes an inventory of the number and types of structures in the repetitive loss area. Repetitive loss areas are delineated, causes of repetitive flooding are cited, and these areas are reflected on maps.

44 CFR Requirement	Previous Plan (2011)	Updated Plan (2016)
§201.6(c)(2)(ii)(A): The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard area.	A complete inventory of the numbers and types of buildings exposed was generated for each hazard of concern. The Steering Committee defined "critical facilities" for the planning area, and these were inventoried by exposure. Each hazard chapter provides a discussion on future development trends.	Building inventory was updated and the Steering Committee revised the critical facilities definition to reflect 2016 priorities. Each hazard chapter again provides a discussion on future development trends.
§201.6(c)(2)(ii)(B): [The plan should describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) and a description of the methodology used to prepare the estimate.	Loss estimations in terms of dollar loss were generated for all hazards of concern. These were generated by Hazus-MH for the dam failure, earthquake and flood hazards. For the other hazards, loss estimates were generated by applying a regionally relevant damage function to the exposed inventory. In all cases, a damage function was applied to an asset inventory. The asset inventory was the same for all hazards and was generated in Hazus.	Loss estimates were recalculated using new data and the new asset inventory.
§201.6(c)(2)(ii)(C): [The plan should describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.	There is a discussion on future development trends as they pertain to each hazard of concern. This discussion looks predominantly at the existing land use and the current regulatory environment that dictates this land use.	The Plan contains a discussion on development trends from the previous planning period, through future trends anticipated in the next five years as they pertain to each hazard.
§201.6(c)(3): The plan shall include a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.	The Plan contains a guiding principal, goals, objectives and actions. The actions strive to meet multiple objectives. The objectives are broad and overarching; each meets multiple goals and stands alone as a component of the Plan. The City of Roseville completed a capability assessment that looks at its regulatory, technical and financial capabilities.	The Steering Committee reviewed the 2011 guiding principle, goals, objectives, and actions and made minor adjustments to reflect 2016 priorities. The City of Roseville updated its capability assessment to reflect regulatory revisions and new initiatives.
§201.6(c)(3)(i): [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.	The Steering Committee identified a guiding principal, goals and objectives.	The Steering Committee reviewed the 2011 guiding principle, goals, objectives, and actions and made minor adjustments to reflect 2016 priorities.
§201.6(c)(3)(ii): [The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.	Chapter 18 includes a hazard mitigation catalog that was developed through a facilitated process. This catalog identifies actions that manipulate the hazard, reduce exposure to the hazard, reduce vulnerability, or increase mitigation capability. The catalog further segregates actions by scale of implementation. A table in the action plan section analyzes each action by mitigation type to illustrate the range of actions selected.	The hazard mitigation catalog developed in 2011 was enhanced with results of the 2016 planning effort focusing on updated program capabilities and the dam failure and cyber threat hazards.
§201.6(c)(3)(ii): [The mitigation strategy] must also address the jurisdiction's participation in the National Flood Insurance Program, and continued compliance with the program's requirements, as appropriate.	The City of Roseville has identified an action stating its commitment to maintain compliance and good standing under the National Flood Insurance Program. Additionally, the City identified multiple actions to maintain its Class 1 standing under the CRS program.	The City of Roseville has identified an action stating its commitment to maintain compliance and good standing under the National Flood Insurance Program. Additionally, the City identified multiple actions to maintain its Class 1 standing under the CRS program.

44 CFR Requirement	Previous Plan (2011)	Updated Plan (2016)
§201.6(c)(3)(iii): [The mitigation strategy shall describe] how the actions identified in Section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.	Each recommended initiative is prioritized using a qualitative methodology that looked at the objectives the project will meet, the timeline for completion, how the project will be funded, the impact of the project, the benefits of the project and the costs of the project. This prioritization scheme is detailed in Chapter 19.	The updated Plan uses the same qualitative approach to prioritization as used for the 2011 Plan.
§201.6(c)(4)(i): [The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.	Chapter 7 details a plan maintenance strategy	Chapter 19 retains the plan maintenance strategy developed in 2011.
§201.6(c)(4)(ii): [The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.	Chapter 7 details recommendations for incorporating the Plan into other planning mechanisms such as: • General plan • Emergency response plan • Capital improvement programs • Municipal code • Stormwater Master Plan This chapter additionally discusses current and future integration opportunities.	Recommendations are provided for incorporating the Plan into other planning mechanisms. This update additionally discusses current and future integration opportunities.
§201.6(c)(4)(iii): [The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.	Chapter 7 details a comprehensive strategy for continuing public involvement.	A comprehensive strategy is provided for continuing public involvement with additional information regarding social media.
§201.6(c)(5): [The local hazard mitigation plan shall include] documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, County Commission, Tribal Council).	Chapter 6 contains the resolution for adoption of this Plan.	The implementation chapter for this update contains the resolution of adoption.

3. PLAN UPDATE APPROACH

Local governments are required to review and revise their hazard mitigation plans and resubmit them for approval within five years in order to remain eligible for mitigation project grant funding (44 CFR §201.6(d)(3)). FEMA's July 2008 *Local Hazard Mitigation Planning Guidance* outlines five phases for updates:

- Phase 1—Organize resources
- Phase 2—Update the risk assessment
- Phase 3—Engage the public
- Phase 4—Assemble the updated Plan
- Phase 5—Plan adoption/implementation.

Phases 1 through 4 are discussed in the following sections. The elements of Phase 5 are described in Chapter 19.

3.1 PLANNING RESOURCE ORGANIZATION

The first phase of planning was to organize needed resources. This phase had the following primary objectives:

- Secure grant funding
- Form a planning team
- Confirm political support for the process
- Establish a steering committee
- Coordinate with other agencies
- Review existing programs.

3.1.1 Internal Funding

The planning effort was made possible through local funds for the City of Roseville.

3.1.2 Formation of the Planning Team

The City hired Tetra Tech, Inc. as a consultant to assist with the 2016 Plan update. The Tetra Tech project manager acted as lead project planner, reporting directly to a City project manager. Once the technical assistance was secured, a planning team made up of the following members was formed to lead the planning effort:

- Rob Jensen (Roseville City Manager's Office)—City Manager, project oversight
- Carl Walker (City of Roseville Department of Public Works)—Floodplain management
- Jason Rizzi (City of Roseville Fire Department)—Emergency preparedness
- Wayne Wiley (City of Roseville Development Services Department)-City planning lead
- Rob Flaner (Tetra Tech)—Lead project planner
- Carol Baumann (Tetra Tech)—Hazus-MH/GIS lead
- Jessica Cerutti (Tetra Tech)—Hazard Identification and profiling
- Dan Portman (Tetra Tech)—Lead editor.

3.1.3 The Steering Committee

Hazard mitigation planning is one of the best ways to enhance collaboration and gain support among the parties whose interests might be affected by hazard losses. By working together, a broad range of stakeholders can identify and create partnerships that pool resources to achieve a common vision for the community. The Steering Committee that oversaw development of the initial plan remained intact during the performance period of that plan and subsequently provided oversight for the 2011 Plan. For this 2016 update process, some new members were added and some previous members left the committee. Table 3-1 lists the 2016 Steering Committee members.

Table 3-1. Steering Committee Members

Name	Title	Jurisdiction/Agency
Grace Keller[a]	Citizen	Community Emergency Response Team
Wayne Wiley[b]	Associate Planner	The City of Roseville Development Services
Rob Jensen	City Manager	The City of Roseville City Manager's Office
Jason Rizzi	Emergency Preparedness Manager	City of Roseville Fire Department
Carl Walker	Senior Civil Engineer	The City of Roseville Public Works
Helen Dyda	Public Information Specialist	City of Roseville Communications
Jaime Garrett	Fire Department Public Information Officer	City of Roseville Fire Department
Erik Angle	Emergency Preparedness Manager	Sutter Roseville Medical Center
Brenette Macintosh	Safety Officer	Consolidated Communications
Mark Lacher	Risk Manager	Consolidated Communications
Jim Williams	Citizen	Meadow Oaks Neighborhood Association
Joseph Van Zant	Citizen/Hazardous Materials Consultant	Roseville Coalition of Neighborhood Associations
Rod Rodriguez	Senior Emergency Services Specialist	Placer County Office of Emergency Services
Rick Stalker	Stalker & Burnett RE Group	Placer County Association of Realtors
Michael Algots	Manager, Hazardous Materials	Union Pacific Railroad

a. Steering Committee Chairperson
b. Steering Committee Vice Chairperson

Leadership roles and ground rules were reconfirmed during the Steering Committee's initial meeting for the plan update on November 3, 2015. The Steering Committee agreed to meet on the first Tuesday of every month as needed throughout the course of the 2016 Plan's development. The planning team facilitated each Steering Committee meeting, which addressed a set of objectives based on the work plan established for the update. The Steering Committee met six times from November 2015 through June 2016. Meeting agendas, minutes and attendance logs are available for review. All Steering Committee meetings were open to the public, and agendas and meeting minutes were posted to the internet.

3.1.4 Coordination with Other Agencies

Coordination with other local, state and federal agencies involved in hazard mitigation in the region helped to ensure consistency with other ongoing efforts. 44 CFR requires that opportunities for involvement in the planning process be provided to neighboring communities, local and regional agencies involved in hazard mitigation, agencies with authority to regulate development, businesses, academia, and other interests (Section 201.6.b.2). Agency coordination was accomplished as follows:

- **Steering Committee Involvement**—Agency representatives were invited to participate on the Steering Committee.

- **Coordination with Placer County**—Placer County had recently finished updating its multi-jurisdictional hazard mitigation plan and was invited to join the Steering Committee. County staff were able to provide insight into lessons learned through the County's update process. The County's involvement also allowed for integration between the two plan updates.
- **Agency Notification**—The following agencies were invited to participate in the process and were kept apprised of plan development milestones:

  - FEMA Region IX
  - California Governor's Office of Emergency Services (Cal OES)
  - California Department of Water Resources
  - Placer County Office of Emergency Services
  - Placer County Flood Control District
  - Placer County Office of Education
  - Sacramento County Department of Water Resources
  - City of Rocklin
  - City of Citrus Heights
  - Roseville City School District
  - Eureka School District
  - Dry Creek School District
  - Center School Districts
  - Roseville Joint Union High School District
  - U.S. Bureau of Reclamation

  All of these agencies received meeting announcements, meeting agendas, and meeting minutes by e-mail throughout the plan development process. This approach proved to be beneficial when these agencies supported the effort by attending meetings or providing feedback on issues. All of these agencies were also informed about the plan update web page for up-to-date information.

- **Pre-Adoption Review**—All the agencies listed above were provided means to review and comment on the mitigation action plan for the 2016 Plan. The predominant means for this review was through the project web page. Each agency was sent an e-mail informing them that draft portions of the update were available for review. In addition, the complete draft plan was sent for a pre-adoption review to FEMA Region IX, the ISO, and the Placer County Office of Emergency Services. No immediate comments were received from these agencies during the pre-adoption public review period.

3.1.5 Review of Existing Programs

Hazard mitigation planning must include review and incorporation, if appropriate, of existing plans, studies, reports and technical information (44 CFR Section 201.6.b(3)). Chapter 4 of this Plan provides a review of laws and ordinances in effect within the planning area that can affect hazard mitigation actions, as well as an assessment of the City's regulatory, technical and financial capabilities to implement hazard mitigation actions.

Of particular interest for the plan update effort are the City of Roseville General Plan, the City of Roseville Emergency Response Plan (an emergency support function-based plan that directs emergency response actions in the planning area), and the State of California 2013 Enhanced Hazard Mitigation Plan.

One of the Steering Committee's first action items was to review the State of California Enhanced Hazard Mitigation Plan and all of the progress reports completed during the performance period for the initial plan. The Steering Committee identified hazards listed in the state plan to which the Roseville area is susceptible, in order to determine if there was a need to expand the scope of the risk assessment. The committee also reviewed the goals, objectives and strategies of the state plan in order to select goals, objectives, and actions for the City's Plan that are consistent with those of the state.

Each annual progress report for the initial plan contains a section that recommends changes or enhancements to the Plan or plan development process. These reports effectively completed a key step of the plan update process before the update process began—identifying needs for changes or enhancements.

3.2 RISK ASSESSMENT UPDATE

Local hazard mitigation plans must provide sufficient hazard and risk information to identify and prioritize appropriate actions to reduce hazard-related losses. This includes detailed descriptions of all the hazards that could affect the jurisdiction, along with an analysis of the jurisdiction's vulnerability to those hazards. The update of the risk assessment is typically the most involved part of the plan update process.

FEMA planning guidance specifies comprehensive updates to the risk assessment portion of local hazard mitigation plans if there have been new technical data pertaining to a hazard developed by a creditable source since the plan's initial development or previously completed update. Updated risk assessment efforts for the 2016 Plan included the following:

- The latest version (2.2) of FEMA's Hazus-MH risk assessment software was used to enhance the risk assessments for the flood, dam and earthquake hazards.
- All hazards of concern were updated with new relevant data.
- The Hazus default general building stock was updated using current address point, building footprint, parcel and tax assessor data.

A detailed description of the methodology deployed in the update of the risk assessment is provided in Chapter 5.

3.3 PUBLIC INVOLVEMENT

Broad public participation in the planning process helps ensure that diverse points of view about the planning area's needs are considered and addressed. The public must have opportunities to comment on disaster mitigation plans during the drafting stages and prior to plan approval (44 CFR, Section 201.6(b)(1)). The Community Rating System expands on these requirements by making CRS credits available for optional public involvement activities.

3.3.1 Strategy

The Steering Committee drafted a comprehensive public involvement strategy for this update using multiple media sources. This strategy was built upon the Steering Committee's perception of what was effective during development of the update, in addition to the use of social media as a major message distribution vehicle. The planning team identified stakeholders to target through the multi-disciplinary public involvement strategy. The strategy for involving the public in the development of the Plan emphasized the following elements:

- Include members of the public on the Steering Committee.
- As was done for the previous update, use a survey to reassess the public's perception of risk and support of hazard mitigation and to get direction on alternatives.
- Hold public meetings to describe the plan update process and progress and to collect input from a wide range of the public.
- Develop a unified message for distribution on social media platforms.
- Attempt to reach as many citizens in the planning area as possible through the use of multiple media, including websites and brochures.

Steering Committee

Eleven of the fourteen members of the Steering Committee live or work in the City of Roseville. This body has provided a mechanism for continuing public involvement in the maintenance of the Plan by meeting annually to monitor the progress of the plan implementation and creating annual progress reports. The ongoing participation of some members from the time that the initial plan was developed provided a valuable historical perspective for

the committee during the update process. All Steering Committee meetings were open to the public and advertised on the City's hazard mitigation plan website. The Steering Committee met six times during the course of the plan update process. One of the meetings was attended by two members of the public. Steering Committee documentation can be found in Appendix C.

Survey

The Steering Committee elected to use a survey for the update process to collect new information from the public about household preparedness for hazards, the level of knowledge about tools and techniques for reducing loss from hazards, and areas of public concern about hazards.

The Steering Committee reviewed the previous survey and requested a simplification of the process to keep residents engaged while ensuring the collection of useful information. The survey asked 26 quantifiable questions and provided opportunities for written comment. The final survey used some of the same questions asked on the initial survey, which helped to show whether citizens' perception of risk and vulnerability has changed over the last five years. The survey also revised some questions to support the plan update process and fulfill the Steering Committee's request for simplification.

The web-based survey tool "Survey Monkey" was used to set up and deploy the survey. The survey was made available to all citizens of Roseville via a web-link posted on the City's website, advertised via press releases, sent via e-mail to community residents, and linked through various forms of social media, including Nextdoor, a geographically based social media website. Over 670 surveys were completed during the course of the plan update process. These results were distributed to the Steering Committee during the strengths, weaknesses, obstacles and opportunities session to inform the Steering Committee of public concerns and opportunities for new public engagement strategies. Multiple survey respondents indicated concern about radon, which the Steering Committee will consider adding as a hazard of concern during the next plan update. The survey and a summary of its findings are provided in Appendix A.

Public Meetings

Participation in a well-attended community event was used as the vehicle to introduce the plan update process, to share the results of the revised risk assessment, and to gauge the public's perception of risk. A final public hearing was held at the end of the process to provide the public an opportunity to comment on the draft Plan.

Community Event Participation—Public Meeting

A public meeting was held as part of the City of Roseville's Earth Day celebration on Saturday, April 16, 2016 from 10 a.m. to 3 p.m. at the Utility Exploration Center, 1501 Pleasant Grove Boulevard (see Figure 3-1 through Figure 3-4). The public meeting was an open-house-format meeting, allowing citizens to come and go as they pleased during the meeting time frame.

The principal objective of the meeting was to share the results of the revised risk assessment with the public, then gage their perception of risk by having them complete a survey. Multiple members of the Steering Committee and planning team were present to speak with residents and answer questions about the process and their risk. Hazus-MH work stations were set up, allowing citizens to see information on their property, including exposure and damage estimates for earthquake and flood events. The 20 property owners who elected to receive a risk assessment were provided printouts of this information for their properties. This tool was highly effective in illustrating risk to the public. This Earth Day event was well attended, with thousands in attendance. During this event, the planning team recorded direct contact and discussion regarding the Plan with 50 event attendees. One resident, a local veterinarian, requested additional information to share with her clients which was later provided to her in electronic form by the City.



Figure 3-1. Hazard Mitigation Booth



Figure 3-2. City of Roseville Earth Day Festival



Figure 3-3. Hazus-MH Work Station

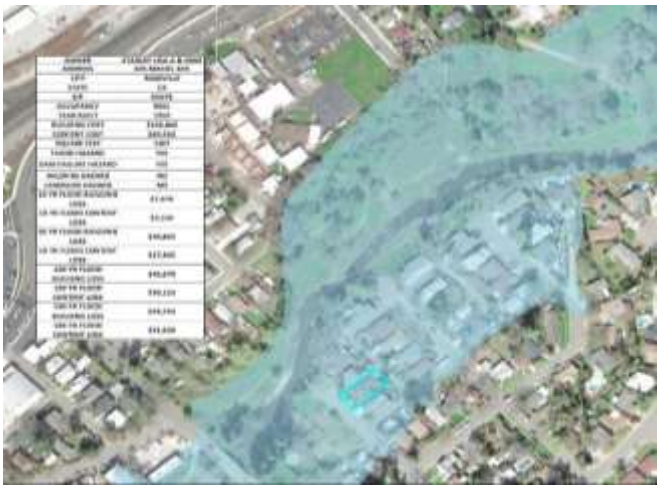


Figure 3-4. Sample Printout from Work Station

Public Comment Period

Once the draft updated Plan was assembled, a comment period for public input was open from August 2, 2016 through August 19, 2016. The public comment period was advertised via the City website, a press-release, and through the use of social media. A public comment link was established on the City's Hazard Mitigation Plan website. During this public comment period, the City received one comment from the public on the Draft Plan regarding the dam failure chapter. This comment requested additional information regarding exposure and vulnerability to the hazard. The City of Roseville decided to address the comment directly with the individual with no change to the plan for dam facility operational security and safety. A copy of the exchange is available upon request.

Use of Media

Press Releases

Press releases were distributed over the course of the 2016 Plan's development as key milestones were achieved and prior to each public meeting.

Social Media

Social media was identified by the Steering Committee as an appropriate method for spreading public messages. The Steering Committee decided to use multiple platforms to reach a variety of audiences:

- Twitter is a messaging platform that allows users to send brief messages to followers (Figure 3-5).
- Facebook is a social network that connects friends, businesses, and governments. The City of Roseville shared messages on its Public Safety Facebook page, allowing other government pages to share (Figure 3-6).
- Nextdoor is a neighborhood social network launched in 2013. On this platform, users must be confirmed members of a community. Once verified, neighbors can receive community updates from local government, share or sell unused goods, or coordinate community events. The City's public information specialists regularly used Nextdoor to engage Roseville's neighborhoods (Figure 3-7).

Internet

The City used its web-based capabilities to keep the public apprised of the plan update process. Upon completion of the initial Plan, a permanent hazard mitigation plan website was established on the Roseville website (see Figure 3-8):

www.roseville.ca.us/HazardPlan

This page can be accessed from the City's home page using the site's search engine. This page housed all pertinent information on the hazard mitigation plan, its progress, and its implementation status. This site has proven to be a highly effective measure for ongoing public access to the Plan. The update scope of work was posted on the website during the update process, along with announcements of all key milestones of the plan update development. Steering Committee meeting announcements, agendas and meeting minutes were also made available on the site. This website also was the principal means of disseminating the survey for the 2016 Plan.

3.3.2 Public Involvement Results

The public involvement strategy used for the plan update introduced the concept of mitigation to the public and provided the Steering Committee with feedback to use in developing the Plan. All citizens of Roseville were provided ample opportunities to provide comment during all phases of this plan update process. Details of attendance and comments received from the public meeting are provided in Appendix A and summarized in Table 3-2. Detailed analysis of the survey findings from the 671 electronically submitted surveys is presented in Appendix A.

Table 3-2. Summary of Public Meetings

Date	Location	Number of Citizens in Attendance	Number of Contacts Made
April 16, 2016	City of Roseville Earth Day	5,000	Over 50
August 2, 2016	Steering Committee Meeting – Public Draft	1	1



Figure 3-5. Twitter Survey Announcement



Figure 3-6. Facebook Survey Announcement

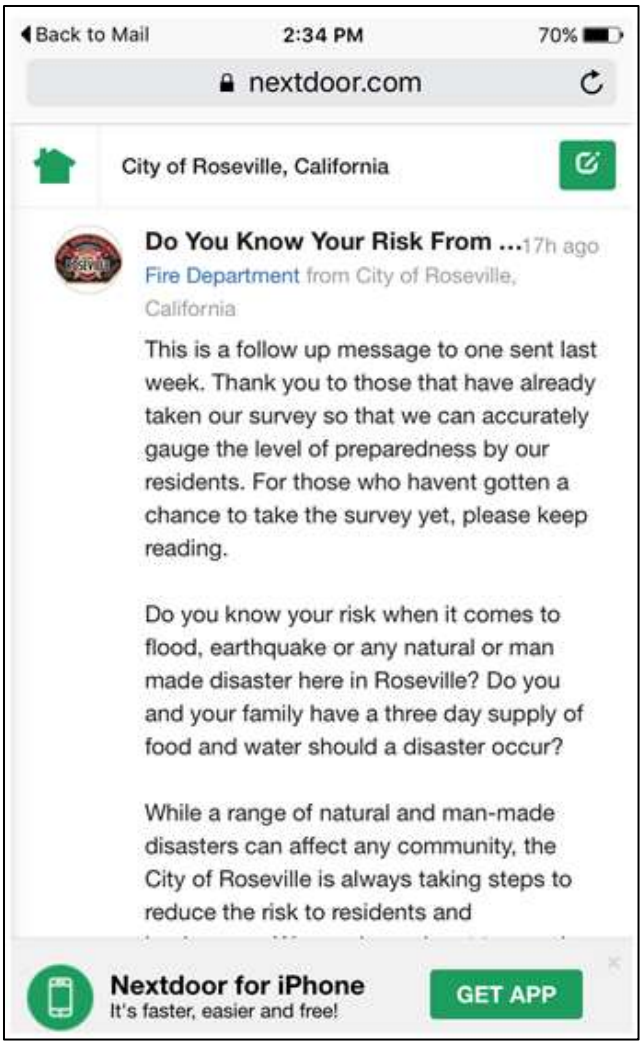


Figure 3-7. Nextdoor Survey Announcement

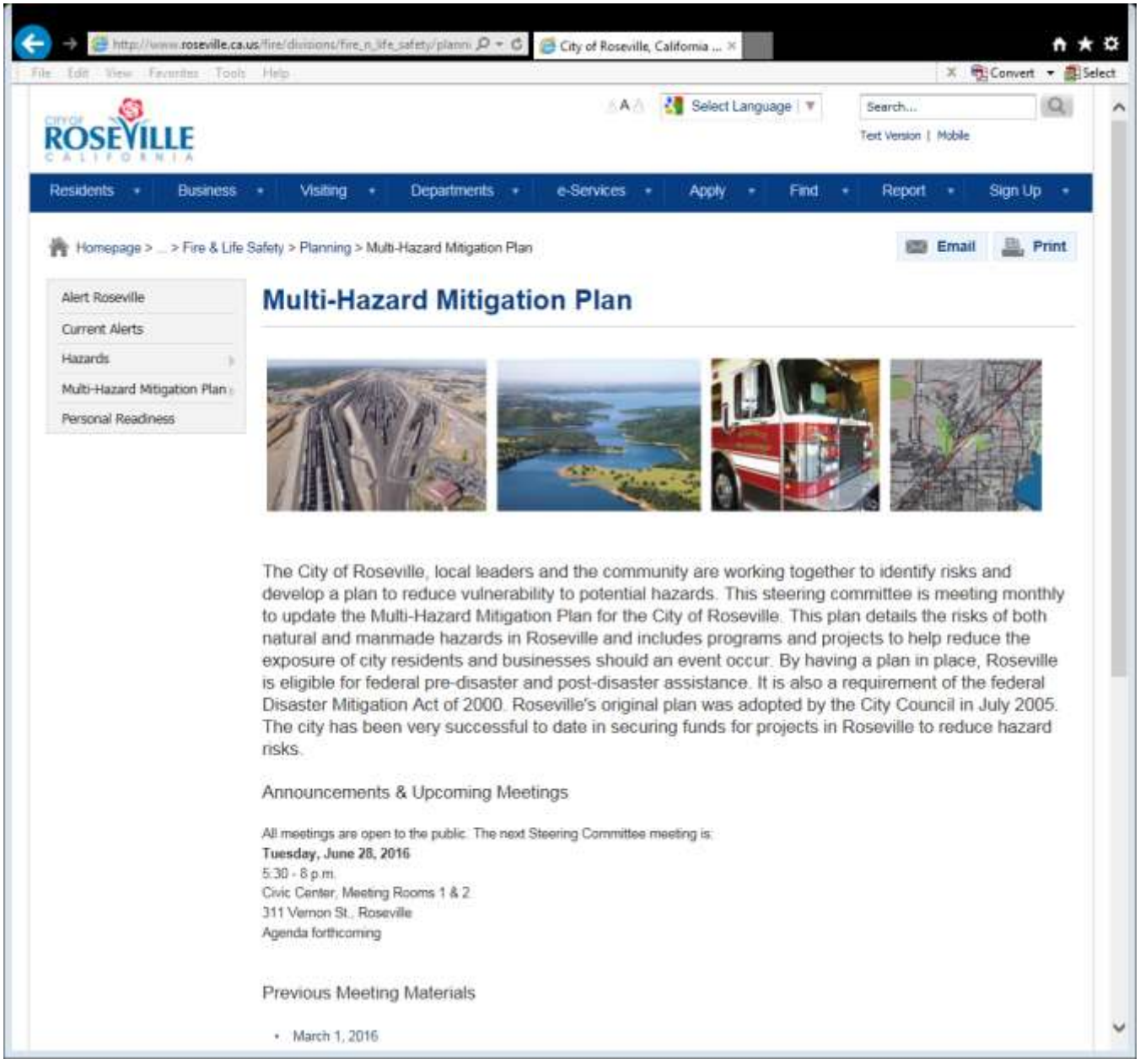


Figure 3-8. Sample Page from Hazard Mitigation Plan Website

3.4 ASSEMBLE THE UPDATED PLAN

The base format of the 2011 Plan was retained for the 2016 Plan. Enhancements were made to include the following components:

- The 2016 update provides a discussion on new mediums used to keep the public apprised of the Plan's actions during the project performance period.
- The 2016 update describes the need for changes to the risk assessment and what changes were made in comparison to the previous plan update.
- The update describes changes to risk exposure due to either of the following:

  - Successful mitigation projects
  - Changes in land use due to annexation or new development.

- The 2016 update describes changes to the action plan and the reasons for them.
- The 2016 update identifies completed, deleted, or deferred actions or activities from the previously approved plan as a benchmark for progress.
- The 2016 Plan includes in its evaluation and prioritization new mitigation actions identified since the previous plan update.
- To be compliant with California Senate Bill 379, the 2016 hazard mitigation plan includes linkage with the City's General Plan. The bill requires the update to include a set of goals, policies, and objectives based on a vulnerability assessment, identification of the risks that climate change poses to the local jurisdiction and the geographic areas at risk from climate change impacts, and specified information from federal, state, regional, and local agencies.

3.5 PLAN DEVELOPMENT CHRONOLOGY/MILESTONES

Table 3-3 summarizes important milestones in the plan update process.

Table 3-3. Plan Development Chronology/Milestones

Date	Event	Description	Attendance
2014			
9/23	CRS re-verification visit	City undergoes its re-verification visit as the nation's only CRS Class 1 community. The Class 1 is re-verified by this process.	N/A
2015			
10/18	Selection of Tetra Tech as plan facilitation consultant through sole source contract	Technical assistance secured	N/A
11/3	1st Steering Committee meeting	Reconfirm Steering Committee organization/ground rules Review the plan update work plan Risk assessment update Review progress reports and state plan	13
11/30	2nd Steering Committee meeting	Progress Report Recommendations Hazards of Concern Confirmation Guiding Principle/Vision/Mission Statement Confirm Goals and Objectives Public Involvement Strategy	14
2016			
1/5	3rd Steering Committee Meeting	Risk Assessment Update Public Involvement Strategy Critical Facilities Definition General Plan Update Emergency Operations Plan Review Debris Management Plan	17
2/2	4th Steering Committee Meeting	Risk Assessment Update Public Involvement Strategy, Survey Finalization Public Involvement, PPI Alternatives Analysis	15
2/8	Survey Deployment	The public survey was deployed via multiple platforms including City websites, Facebook, Nextdoor, Twitter, and public announcement.	N/A
3/1	5th Steering Committee meeting	Risk assessment update Public Involvement Strategy Update, Public Meeting (Strengths, weaknesses, obstacles and opportunities)	16
4/16	Public information open house—Roseville Earth Day	Public open house held at the Roseville Earth Day Festival at Mahany Park outside of the Roseville Utility Exploration Center, 1501 Pleasant Grove Boulevard, Roseville from 10:00 AM to 4:00 PM. Risk assessment data shared with the public as well as distribution of hazard specific information.	50
8/2	6th Steering Committee meeting/Public Review Meeting	Review the public draft and launch the public comment period for the 2016 Plan	13
8/19	Public Comment Period Ends	Draft Plan posted on Hazard Mitigation Plan website. Press release advertising public comment period	N/A
9/01	Plan review	Plan sent to Cal OES and ISO for review and approval pending adoption (APA)	N/A
TBD	Final public meeting and Plan adoption	APA Plan presented to City Council for adoption. The public was provided opportunity to provide comment prior to formal adoption.	##
TBD	CRS approval	Plan was approved by ISO for CRS credit at ___ points	N/A
TBD	Final approval	FEMA granted final approval of the adopted plan	N/A

4. CITY OF ROSEVILLE PROFILE

4.1 GEOGRAPHIC PROFILE

The City of Roseville lies to the west of the foothills of the Sierra Nevada Range, about 16 miles northeast of downtown Sacramento. It is the largest city in Placer County and has experienced considerable residential and commercial growth in the past two decades.

The focus of this Hazard Mitigation Plan is the primary planning area defined in the *City of Roseville General Plan 2035*. The planning area includes 43.39 square miles of incorporated lands and an additional 796 acres making up the City's sphere of influence, as shown in Figure 4-1. It is divided into smaller areas called "Specific Plan Areas" for which more detailed individual plans have been developed to implement the General Plan. The City of Roseville is unusual in that 14 specific plans have been adopted. These Plan Areas contain detailed design guidelines and development agreements to guide development and ensure that development is funded and built as planned.

Roseville is largely urbanized. The greatest area of undeveloped property is in the western portion of the City, which includes the remainder of the developing West Roseville Specific Plan, as well as planned specific Plan Areas including Sierra Vista, Creekview and Amoruso Ranch. The incorporated area and sphere of influence are the primary focus of General Plan policies, but "secondary planning areas" also bear relationship to Roseville planning efforts, depending on the planning issue. For example:

- For the issue of air quality, the secondary planning area includes the City and all areas outside the City that are within the associated Sacramento Valley air basin.
- For flood protection, the secondary planning area encompasses the complete drainage basins of surface waters that flow through Roseville.
- Other secondary planning areas encompass varying boundaries beyond the primary planning area for issues such as solid waste, recycling, transportation and wastewater treatment.

The City's area is characterized by gently sloping terrain with areas of steep ravines in the northeast, and relatively flat valley on the western portion of the City. It is segmented by topographical and physical features, including streams, natural parkways, open space, Interstate 80 and Highway 65, the Union Pacific railroad, and industrial facilities. Traffic is directed around several of these topographical features by bridges and an underpass. These limitations may create traffic congestion and delay emergency response. Heavy traffic congestion at peak commute times on the City's major roadways acts as a barrier to timely response for emergency services. In the event of an accident or other emergency at one of the key intersections between a road and a stream, freeway, or railway, sections of the City could be isolated or have response time slowed.

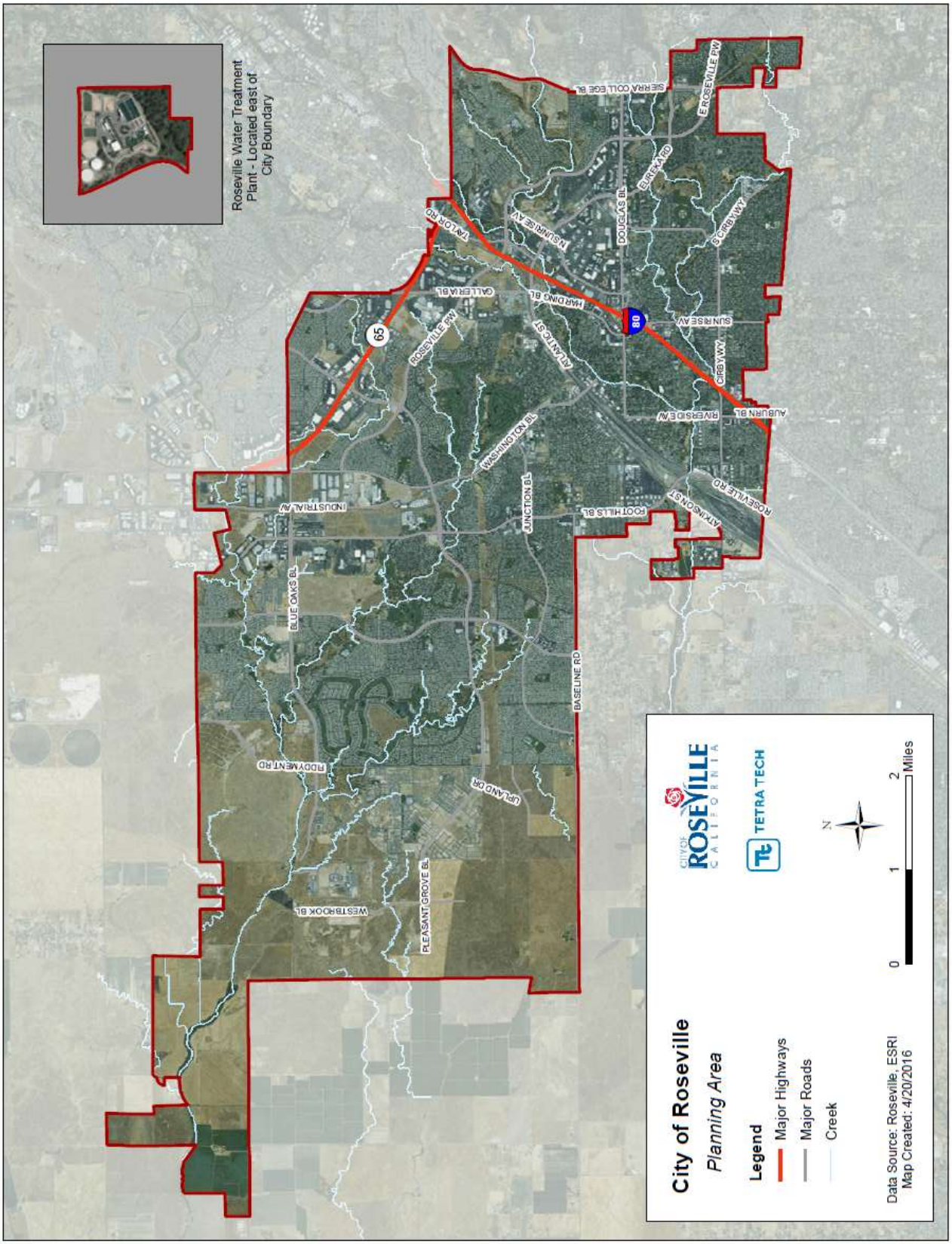


Figure 4-1. Roseville Planning Area

4.2 HISTORICAL OVERVIEW

4.2.1 Pre-Development

The Placer County region was first inhabited by the Maidu Indians, whose territory extended from the Sacramento River Valley to the Sierra Nevada Range. The Southern Maidu occupied the American River basin, along with the Bear and Yuba River basins in the area now recognized as the City of Roseville. An abundance of plants and animals supported the Maidu tribes' large population. Evidence of the Maidu communities still exists along the banks of Strap Ravine and Dry Creek.

4.2.2 Founding of the Community

Fur trapping expeditions came to the area in the early 1800s, and James Marshall discovered gold in the region in 1848. Some of the miners who came in search of gold became the area's first pioneers, taking up farming along the fertile creeks. Eventually, disease, gold miners and early settlers killed or forcibly removed the Maidu from their traditional lands. By 1864, track-laying crews from the Central Pacific Railroad had pushed eastward from Sacramento building the western half of the nation's first transcontinental railroad line. At the site of today's Roseville, the rails of the Central Pacific intersected with those of the California Central, a small line which then linked the towns of Folsom and Lincoln. The place where the two lines joined was labeled on railroad maps as "The Junction." The small freight and passenger center called Roseville developed around the junction.

For many years, Roseville remained a small railroad shipping point of about 250 inhabitants, centered on the train depot and a few small businesses and houses lining the two principal streets, Atlantic and Pacific. This changed between 1906 and 1908, when railroad roundhouse and repair facilities were moved to Roseville from nearby Rocklin. By 1908, the population increased to 2,000. New subdivisions were laid out to accommodate newcomers, many of whom moved from Rocklin. The business district expanded along Lincoln, Main, Church, and Vernon Streets. A chamber of commerce was organized to provide municipal services such as water, electricity, police and fire protection. In April 1909, the town incorporated and began to grow until it became Placer County's largest city.

4.2.3 Post-Incorporation Development

Railroad expansion continued, and local businesses grew as well. In the 1920s, the Pacific Fruit Express ice plant was the world's largest artificial ice plant. Also by the 1920s, the Southern Pacific Railroad boasted the largest freight marshaling yards west of the Mississippi River at Roseville. By the start of the Great Depression in 1929, Roseville's population had risen to 6,425.

During World War II, thousands of troop and munitions trains made their way through Roseville. The City continued to boom as a railroad center into the post-war years, but by the 1950s it faced competition from airlines and interstate trucking. The introduction of jet aircraft and the construction of Interstate 80 through Roseville caused the once-booming passenger train service to decline abruptly. The local depot was closed in 1972 and razed the following year. The Pacific Fruit Express ice plant closed in 1974, rendered obsolete by the introduction of self-refrigerating shipping options.

Completion of Roseville Community Hospital in 1952, the Folsom Dam in 1955, and the Roseville Freeway (Interstate 80) in 1956 gradually shifted the population away from downtown Roseville to what would become known as East Roseville. Roseville Square, the town's first shopping complex, was completed in 1961. Today, Roseville has more than 28 million square feet of commercial, office, and industrial floor space, and is ranked 10th statewide in total taxable retail sales.

In 1964, Roseville was selected as one of Look magazine's All America Cities. Roseville experienced a population surge in the 1980s as developers built up its broad expanses of cheap open land with easy transportation access. As the population expanded, so did the need for water, electrical, sewage, police, fire protection, recreational and educational services.

4.2.4 Current Conditions

The City has continued to grow outward. An expansive industrial zone lies north of Roseville adjacent to Highway 65, along with numerous corporate headquarters along Douglas Boulevard and the Johnson Ranch Road area. Although Roseville is no longer just a railroad town, the railroad remains a major factor in the local economy, and Roseville is still one of the principal railroad centers of the West. Passenger service was reintroduced in 1987 and a new intermodal depot facility was completed.

Today Roseville is an emerging urban center with a mix of residential and employment uses. The center of the City is typified by the downtown and small lot, single-family residences, while newer commercial and office development and larger suburban-type residences characterize the edges of town. As of January 2016, the California Department of Finance estimated the City's population to be 134,073—a 61-percent increase since 2000. It is anticipated that Roseville, along with the remainder of the South Placer/Sacramento Region, will continue to be the focus of significant development. Currently, the focus of new development is along the eastern, western, and northern portions of the community.

4.3 MAJOR PAST HAZARD EVENTS

Presidential disaster declarations are typically issued for hazard events that cause more damage than state and local governments can handle without assistance from the federal government, although no specific dollar loss threshold has been established for these declarations. A presidential disaster declaration puts federal recovery programs into motion to help disaster victims, businesses and public entities. Some of the programs are matched by state programs. Table 4-1 lists the presidential major disasters and other federal declarations since 1950 that have affected Placer County, according to Placer County's Multi-Hazard Mitigation Plan, Cal OES, and FEMA.

Review of these events helps identify targets for risk reduction and ways to increase a community's capability to avoid large-scale events in the future. Many natural hazard events do not trigger federal disaster declaration protocol but have significant impacts on their communities. These events are also important to consider in establishing recurrence intervals for hazards of concern.

4.4 PHYSICAL SETTING

4.4.1 Geology

Roseville is within the Great Valley and Sierra Nevada geomorphic provinces of California. Located on the east side of the Sacramento Valley, Roseville's geology consists of water deposited (alluvial) sediments from the erosion of the Sierra Nevada mountain range.

4.4.2 Soils

Soils in Roseville include some Quaternary (less than 1.8 million years old) sands, sandstones and mudstones, some Upper Tertiary (1.8 to 24 million years old) sandstones, mudstones and limestone, some Lower Tertiary (24 to 64 million years old) mudstones and sandstones, and Franciscan melange and serpentinite. These soils tends to be very dense or in some areas, soft rock. Some Quaternary muds, sands, gravels, silts and mud are located along 100-year floodplains. Soils in Roseville also include mehrten lava flow, which restricts permeability.

Table 4-1. Presidential Major Disaster, Emergency, and Fire Management Assistance Declarations

Type of Event	FEMA Disaster #	Date
Flooding	DR-47	12/23/1955
Flooding	DR-82	4/4/1958
Flooding	DR-138	10/24/1962
Late Winter Storms/Flooding	DR-145	2/7/1963
Late Winter Storms/Flooding	DR-183	12/28/1964
1969 Storms	DR-253	1/26/1969
Winter storms	DR-682	2/9/1983
Spring Storms/Flooding	DR-758	2/18/1986
Severe Winter Storms	DR-1044	1/10/1995
Late Winter Storms	DR-1046	1/13/1995
Winter Storms/Flooding	DR-1155	1/4/1997
Sierra Fire	FM-2463	9/19/2002
Stevens Fire	FM-2541	8/8/2004
Hurricane Katrina Evacuations: Economic	EM-3248	9/13/2005
Severe Rainstorms, Flooding, Landslides, and Mudslides	DR-1628	2/3/2006
Severe Storms, Flooding, Landslides, and Mudslides	DR-1646	6/5/2006
Wildfire	FM-2786	9/1/2008
Wildfire	FM-2832	8/31/2009

Source: FEMA, Placer County Multi-Hazard Mitigation Plan, 2016

4.4.3 Climate

Roseville and the northern Central Valley have a Mediterranean climate with warm, dry days and cool nights during the summer, when the average temperature is 93ºF during the day and 57ºF at night. In 2001, the California Energy Commission developed climate zones based on energy use, temperature, and other factors and created representative temperature data for each zone. Roseville is located in Zone 11: Red Bluff. As a whole, Zone 11 experiences sharply defined seasons with summers consisting of almost constant sunshine and dry air and winters with piercing winds and thick ground fog.

Table 4-2 presents a summary of annual climate conditions. Precipitation from May through October is rare, with most of the rainfall in the Greater Sacramento area, including Roseville, occurring between November and April. Prevailing winds in the summer can be light to gusty from the south. In the late summer and early fall, several wind events typically occur, with northerly winds that cause critical fire weather conditions in the City and surrounding areas.

4.5 DEVELOPMENT PROFILE

4.5.1 Land Use Policies

In addition to a considerable jump in residential growth, Roseville has experienced considerable growth in commercial and industrial development. Based on growth projections and current land use allocations in the General Plan, the City has sufficient development potential through 2035 for both residential and commercial uses. Typically residential land uses will be built out well before complete buildout of nonresidential land could occur, anticipated after 2050.

Table 4-2. Roseville Climate

	Average High Temperature (°F)	Average Low Temperature (°F)	Record High Temperature (°F)	Record Low Temperature (°F)	Total Inches of Precipitation
January	54	39	73	17	4.5
February	61	42	78	19	4.5
March	65	45	86	26	4.3
April	72	47	106	60	1.8
May	80	52	112	35	0.5
June	89	57	115	43	0.3
July	95	61	115	50	0.1
August	94	60	114	45	0.1
September	89	58	108	46	0.5
October	79	53	102	32	1.3
November	64	45	86	26	3.5
December	55	39	74	16	3.4
Annual Average or Total	**77**	**51**	**100**	**36**	**24.8**

Source: The Weather Channel

Numerous factors will influence growth throughout the South Placer County/Sacramento region:

- General economic conditions of the state
- Federal and state budget issues and cutbacks
- Competition from other growth areas
- Perceptions about the quality of life
- Housing costs and availability
- Employment opportunities
- Infrastructure and resource availability.

Management of the City's growth is guided by the Land Use Element of Roseville's General Plan, which consists of a land use map and land use policies. The overall goal of the Land Use Element is to promote a balanced and innovative land use pattern that retains and enhances the distinct character and identity of Roseville. It is organized into the following six components:

- **Existing Conditions and Projections—**Provides a description of the planning area, an existing land use inventory, and future projections.
- **Land Use Designations, Definitions and Standards—**Identifies and defines the City's land use categories, incorporating general use, development, intensity, siting, and compatibility standards.
- **Community Form—**Provides goals and policies to define and direct the future form and pattern of the City. Issues addressed include community character; relationship to transit and pedestrian uses; air quality; downtown and neighborhoods; jobs and housing; economic development; community involvement; and inter-jurisdictional coordination.
- **Community Design—**Includes goals and policies that address aesthetics and function; the integration of the built and natural environment; and community character. Emphasis is on the development of a design framework that reflects the City's goal of high quality, community-wide design.
- **Growth Management—**Focuses on the proactive management of growth in the community. Included is the identification of performance standards to regulate potential future growth areas. Policies addressing annexations and expansion of the City's sphere of influence are also included.

- **Relationship to Specific Plans—**Discusses the interrelationship between the General Plan and the City's Specific Plans.

The land use map included in the Land Use Element generally shows the City's existing and planned land use mix and pattern. The total land use allocation at buildout is shown in Figure 4-2. The land use map reflects only those policies that can be graphically shown. Land use decision-making is guided not only by the land use map but also by the goals, policies and implementation measures in the Land Use Element.

Source: City of Roseville, General Plan, 2015

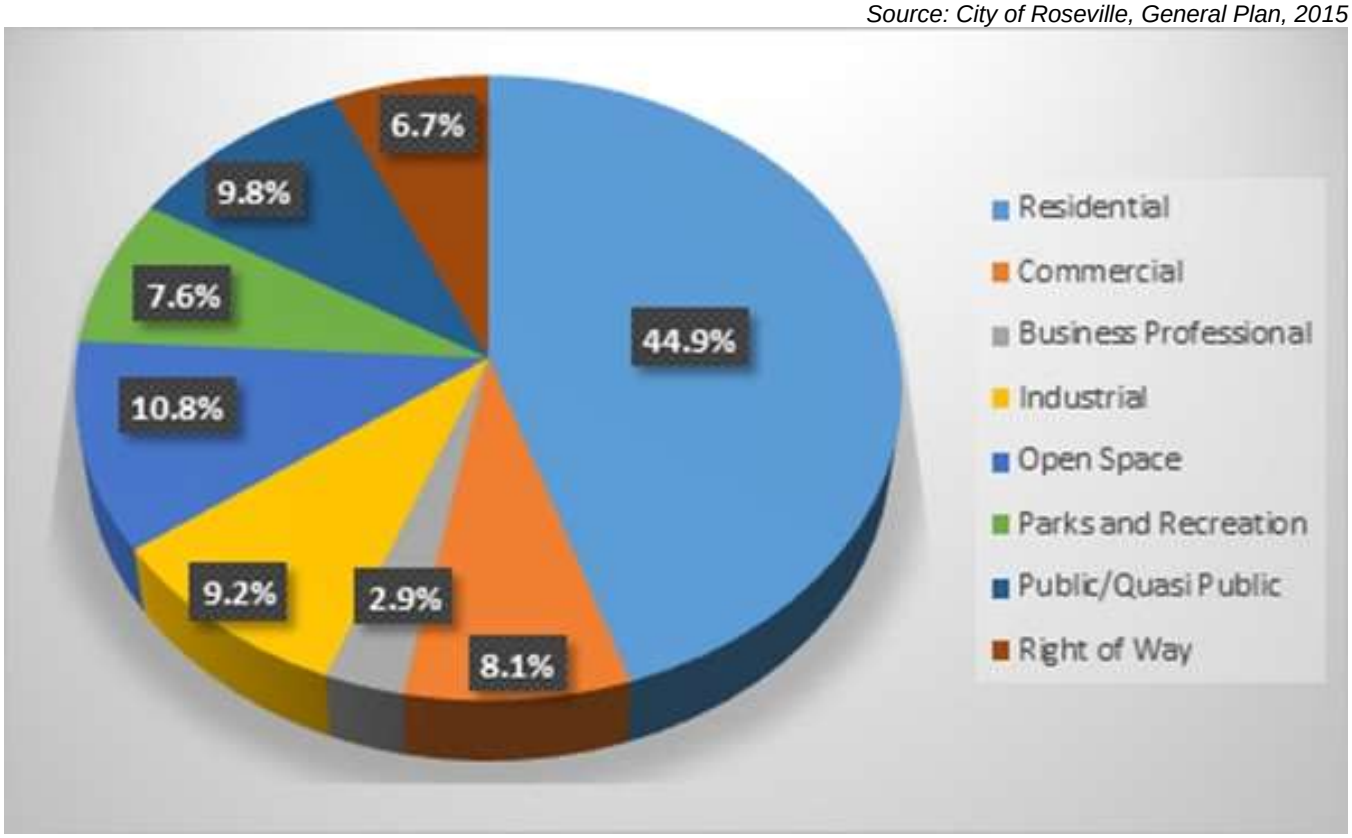


Figure 4-2. Total Land Use Allocation in Roseville

The City's land use policies are built upon underlying principles that were established based on input the City received from its residents and the Growth Management Committee established in 2005. These principles have impacted the overall policy direction and land use pattern in the City of Roseville. They include the following:

- Promote and enhance Roseville's unique character and identity.
- Distinguish Roseville from adjacent communities through the quality of development and design, and the level of public services and facilities provided.
- Protect and enhance Old Town/ Downtown and the City's established neighborhoods.
- Promote new development as an integrated and connected part of the City's land use pattern.
- Provide a variety of housing types and opportunities, including those for all income groups.
- Create a balanced land use pattern with an appropriate mix of uses to accommodate resident employment, service, and social needs within the community.
- Promote a land use pattern that provides a high level of open space and recreational amenities and is sensitive to the natural environment.

- Create a land use mix and pattern that accommodates and promotes alternative transportation modes for ease of access and improved air quality.
- Proactively manage and plan for growth.
- Ensure that new development is fiscally neutral, and does not impact existing residents.

State, regional and local growth projections indicate that Roseville and the South Placer County/Sacramento region will continue to draw residential and employment growth. Much of this attraction can be attributed to desirable location and access, availability of an educated and skilled workforce, land costs and overall quality of life. Local and regional economic conditions will drive the local growth potential, and existing land use allocations may require modification in the near future.

4.5.2 Residential Development

The Land Use Element of the General Plan identifies three primary residential land uses:

- **Low-Density Residential**—The low-density residential land use category is for development of the single-family dwelling units that make up the majority of Roseville's housing supply. The lower densities are assigned to lands that require flexibility to accommodate development constraints (e.g., slopes, trees, etc.). Typically, low-density residential lands should require minimal grading or disturbance of natural features.
- **Medium-Density Residential**—The medium-density residential land use category is for small-lot single-family detached dwelling units and attached patio homes, half-plexes, townhouses, condominiums, and mobile home parks. This residential land use accommodates a variety of housing types and designs, and is often used as a transition or buffer between higher intensity land uses and low-density residential land use. It may also be applied as a transition between higher volume roadways and lower density residential uses.
- **High-Density Residential**—The high-density residential land use category is normally developed with multiple-story apartment or condominium structures containing multiple attached dwelling units. The broad range of densities in this category yields a variety of design options. In some areas, this land use category may be combined with commercial uses to form a mixed-use development where higher densities are desirable and beneficial.

According to the State Department of Finance, there are 51,590 housing units in the City. Single-family detached homes made up over 75 percent of the housing stock as of January 2016. Multi-family homes made up 24 percent, and mobile homes accounted for less than 1 percent. Residential construction valuation reached $208,581,000 in 2015. The Building Division reported that $19,111,000 in new construction was completed during the 2015 – 2016 fiscal year. The Placer County Association of Realtors provided statistics indicating that the median purchase price of single-family houses and condominiums in Roseville rose approximately 9 percent between May 2015 and May 2016, from $391,500 to $425,000 and $168,500 to $178,300, respectively. As indicated by the increase in housing prices, the demand for single-family homes continues and available land for single-family homes is ample.

4.5.3 Non-Residential Development

Roseville's non-residential land use designations include areas designated for commercial, office, industrial uses, special areas, and combining districts. Special designations include Central Business District, Public and Quasi-Public uses, Parks and Recreation, Open Space, and Urban Reserve. Like the residential designations, each non-residential designation includes a purpose statement, primary and secondary uses, and development standards, including a floor area ratio. Unlike the specific secondary uses listed for residential designations, which are intended to be subordinate and may be permitted only to support neighborhood convenience, the non-residential land use designations permit secondary land uses that are supportive and complementary of the primary uses, not

necessarily subordinate. Typically, the size of secondary uses is limited and therefore does not warrant a separate land use designation. Table 4-3 summarizes the non-residential land uses. A summary of non-residential development in Roseville is given in Table 4-4.

Table 4-3. Non-Residential Land Uses

Land Use	Purpose
Neighborhood Commercial	The neighborhood commercial land use designation is intended to provide basic commercial services for the convenience of surrounding neighborhoods within walking distance of major residential areas.
Community Commercial	The community commercial land use designation is distinguished from the neighborhood commercial designation by providing a broader range of goods and services to an expanded service area.
Regional Commercial	The regional commercial land use designation is intended to accommodate larger shopping centers and commercial activities where uses provide goods and services to a citywide and regional service area.
Business Professional	The business professional land use designation provides areas for small and large office uses, including uses supportive of offices.
Light Industrial	The light industrial land use designation is applied to lands reserved for office, industrial, and research and development uses that generate very limited noise, vibration, odor, dust, smoke, light, or other pollutants, and are either integrated or compatible with surrounding uses.
General Industrial	The general industrial land use designation is intended to provide areas for industrial uses that tend to generate noise, vibration, odor, dust, smoke, light, and an aesthetic appearance not compatible with residential and other sensitive receptors. The intent of this category is to provide a place for industrial uses within the City that is properly buffered from other uses.
Central Business District	The Central Business District is a distinct land use category that acknowledges land use patterns of significantly greater intensities and traditional mixed uses of retail, office, and apartment. The district is limited in its application to Central Roseville, the West Roseville Village Center, and areas of greater urban intensity.
Open Space	The open space land use designation is used to preserve and protect public and private lands that are significant due to wildlife habitat, natural features, or flood hazard. Within new development areas, the 100-year floodplain boundaries will be designated as Open Space. In addition, sensitive or unique natural features, including, but not limited to, wetlands, vernal pools, and oak woodlands, are to be designated as open space as part of specific plans and other major development review processes.
Public/Quasi-Public	The public/quasi-public land use designation is used to establish areas for education, religious assembly, governmental offices, municipal corporation yards, and water treatment plants.
Urban Reserve	The urban reserve land use designation is applied to lands that are anticipated to receive urban land entitlements, but at the present time are constrained by growth management policies, availability of services or other limitations.
Park/ Recreation	The park and recreation designation is used to identify public parks in Roseville
Floodplain	The floodplain designation identifies lands that are within the 100-year floodplain boundaries as defined in the Safety Element of the General Plan. Development of lands with a floodplain land use designation is strictly regulated by the City of Roseville. In areas with existing development, the floodplain designation is an overlay or combining land use. As part of a specific plan, the land use designation may be combined with an open space or parks designation, if found consistent with the policies of the Safety Element.
Study Area	The study area land use designation is used as a combining land use to identify future General Plan or neighborhood study areas. This combining designation may be applied to any area where the City believes that additional land use analysis and amendment of the General Plan may be desirable to resolve specific neighborhood or land use issues.
Village Center	The Village Center land use designation is intended allow for a mix and density of land uses common to a traditional downtown, urban setting. It allows for flexibility and deviation from the standards and permitted uses contained in the primary land use designation for which it is combined.
Transfer Station	The transfer station land use designation is intended to preserve and protect industrial areas suitable for a solid waste transfer station.

Table 4-4. Non-Residential Development Profile as of July 2016

Activity/Use	Total Developed Building Area (square feet)	Total Area Zoned for Use (acres)
Commercial	11,249,499	2,249
Office	8,080,479	802.69
Industrial	8,997,392	2,369
Public/Quasi Public	2,037,310	2,702

4.5.4 Critical Facilities and Infrastructure

Critical and essential facilities and infrastructure are those that are critical to the health and welfare of the population. These become especially important after a hazard event. The Steering Committee created the following definition specific to Roseville, regarding which facilities are considered critical:

> *A structure or other improvement, public or private, that, because of its function, size, service area, or uniqueness, has the potential to cause serious bodily harm, extensive property damage, or disruption of vital socioeconomic activities if it is destroyed or damaged or if its functionality is impaired. Critical facilities may include, but are not limited to, health and safety facilities, utilities, government facilities, hazardous materials facilities, and transportation infrastructure.*

The location of critical facilities and infrastructure in the planning area is shown on Figure 4-3 through Figure 4-5. Due to the sensitivity of this information, a detailed list of facilities is not provided. The list is on file with the City of Roseville. Table 4-5 and Table 4-6 provide summaries of the general types of critical facilities and infrastructure, respectively.

Table 4-5. Planning Area Critical Facilities

Facility Type	Number in Planning Area
Medical and Health	2
Government Functions	27
Protective Functions	10
Schools	49
Hazmat	6
Other Critical Functions	78
Total	**172**

Table 4-6. Planning Area Critical Infrastructure

Facility Type	Number in Planning Area
Bridges	68
Water Supply	11
Wastewater	23
Power	18
Communications	98
Other	6
Total	**224**

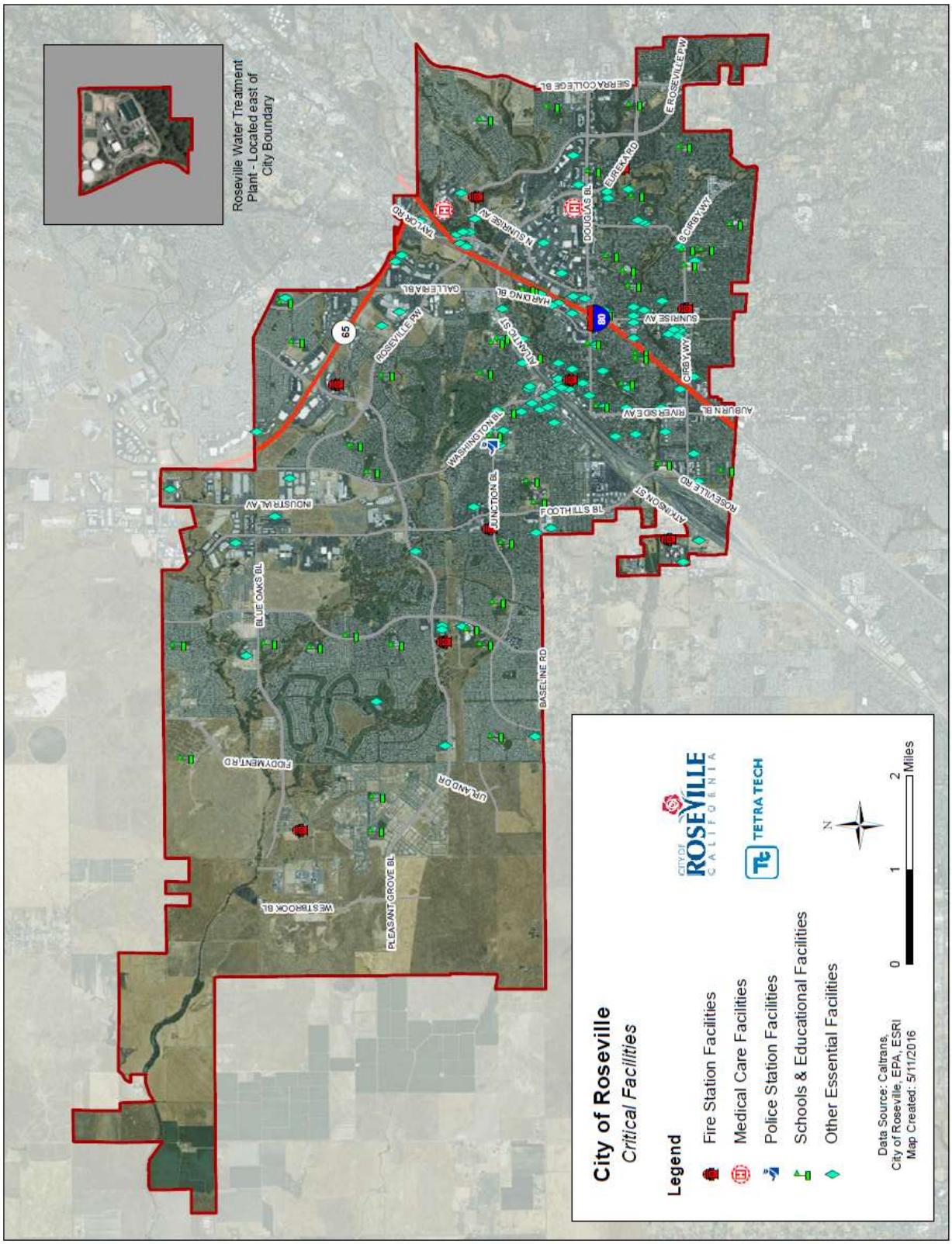


Figure 4-3. Critical Facilities in the Planning Area

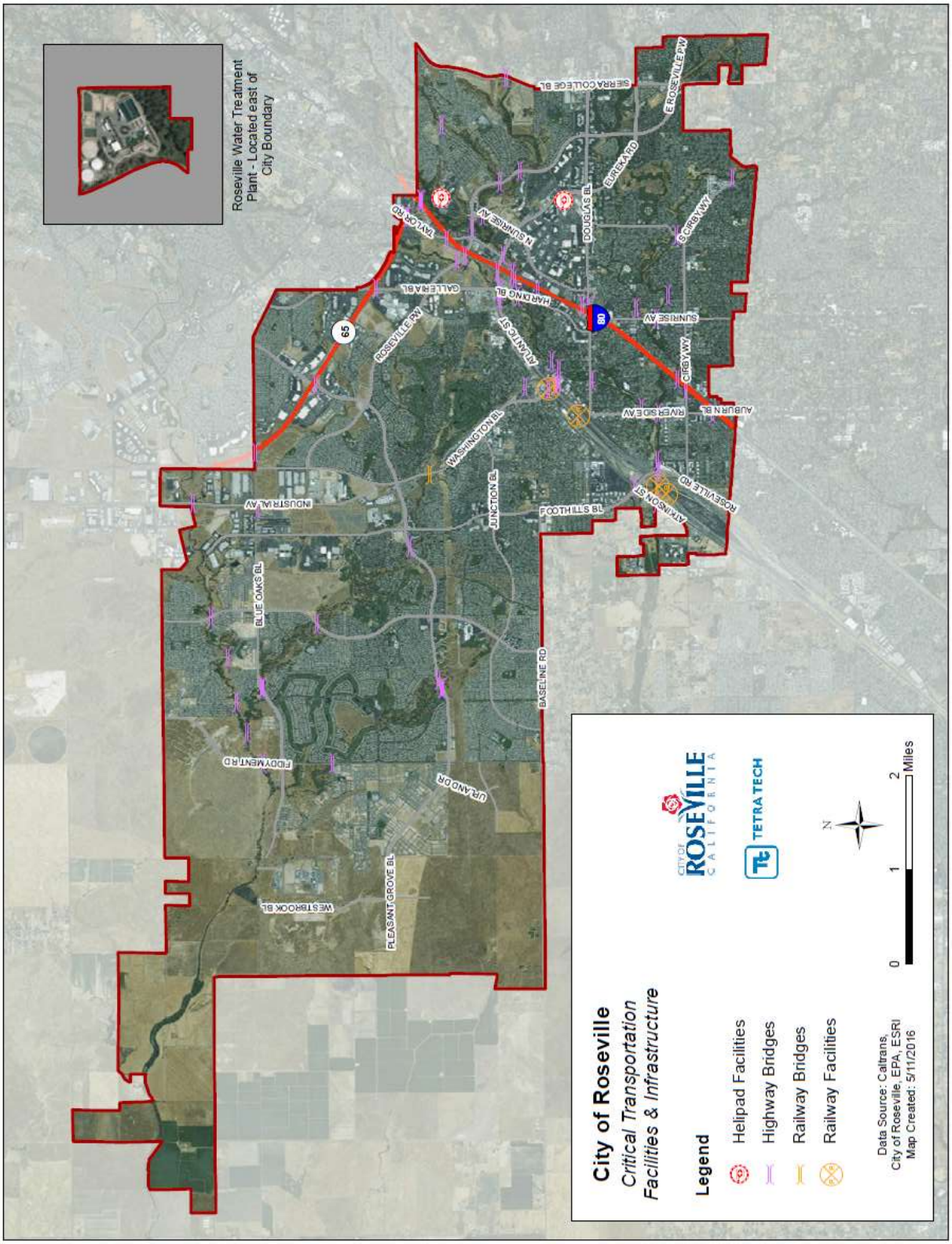


Figure 4-4. Critical Infrastructure in the Planning Area—Transportation

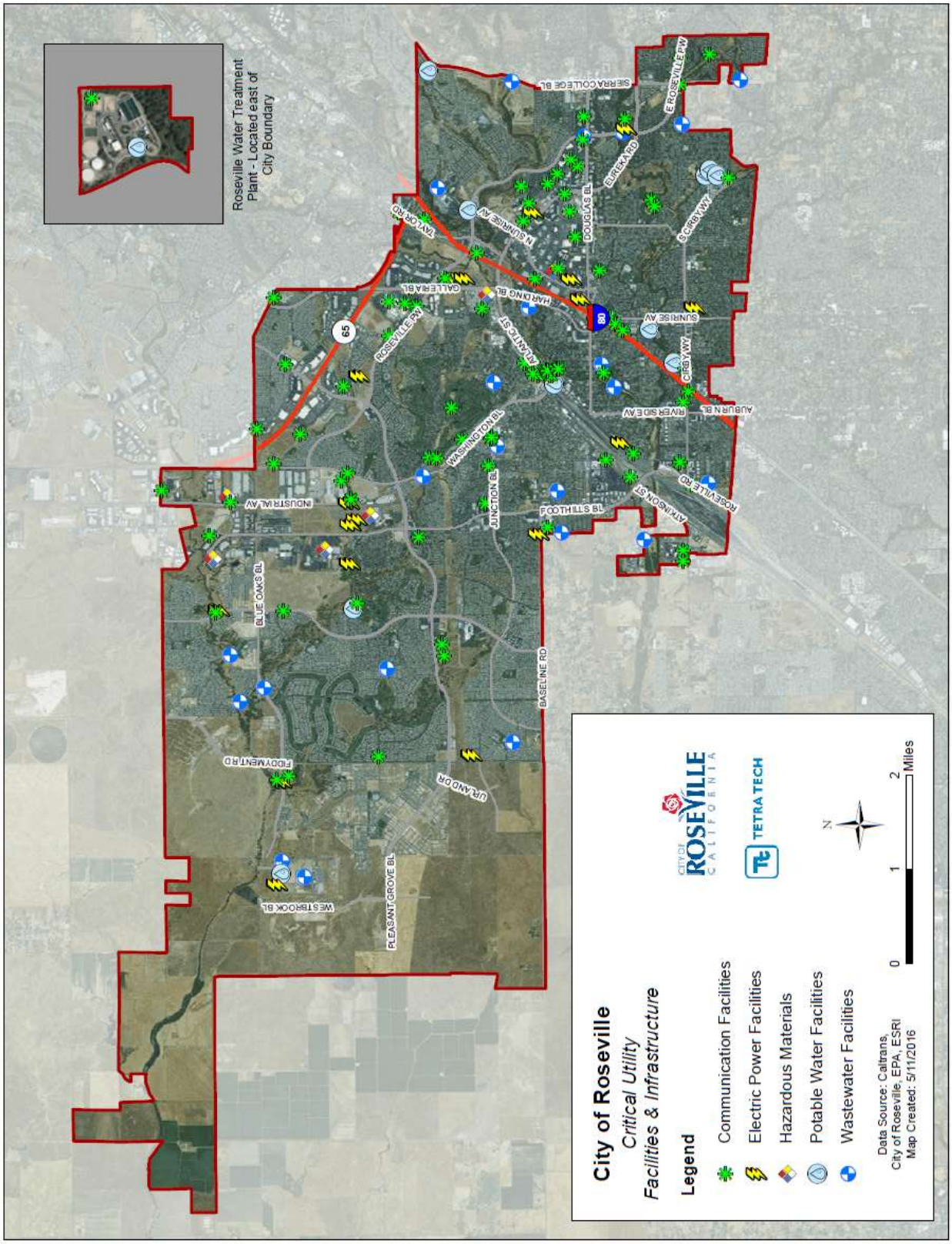


Figure 4-5. Critical Infrastructure in the Planning Area—Utilities

4.5.5 Future Trends in Development

The Roseville General Plan and associated specific area plans govern land use decision and policy-making. Decisions on land use will be governed by these programs. This Plan will work together with these programs to support wise land use in the future by providing vital information on the risk associated with natural hazards in the planning area. The City of Roseville will incorporate by reference the updated Hazard Mitigation Plan in the Safety Element of its General Plan. In addition to proactively planning for the implementation of Senate Bill (SB) 379 upon the next plan update process (see Section 4.9 for a discussion of this state law), this incorporation will ensure that all future trends in development can be established with the benefits of the information on risk and vulnerability to natural hazards identified in this Plan.

4.6 OPEN SPACE AND HABITAT

The City recognizes that open space land is limited and that valuable resources must be conserved wherever possible. For many, the City's open space setting is a highly valued natural resource. Given the strong interrelationship between open space and conservation issues, the City of Roseville has chosen to address these issues in a single element of its General Plan: the Open Space and Conservation Element. Vegetation and wildlife resources and corridors are an important component of the overall open space system and have been the historical focus of preservation efforts in Roseville. If future generations are to enjoy and benefit from the resources available to the present generation, these finite and fragile resources must be preserved and managed.

The vegetation and wildlife resources of Roseville can be broadly classified by habitat type—grasslands, oak woodlands, riparian areas, and seasonal wetlands—as discussed below. Whenever possible, the focus of preservation efforts is multipurpose. It is therefore preferred, for example, to preserve woodlands, grasslands, and wetlands in combined rather than separate and unconnected settings.

4.6.1 Grasslands

Relatively small amounts of self-sustaining grasslands remain in the northern and western undeveloped edges of Roseville. Less extensive areas of grassland are present in smaller undeveloped areas scattered throughout the City. Before Spanish and later settlers arrived in the Central Valley, the grasslands contained native species. The effects of grazing and clearing of large tracts for agriculture resulted in the decline of native species. Today, most of the grasslands in the region contain non-native species. These areas do, however, provide important habitat for birds and other wildlife.

4.6.2 Oak Woodlands and Riparian Areas

Oak woodlands are generally present near the City's major stream channels. The microclimates and alluvial soils in the woodlands provide ideal conditions for deep-rooting shrubs and trees. Most woodland areas are relatively open, with little shrub growth.

Riparian areas support a much wider biological diversity. Situated along and within the City's creeks and watercourses, riparian corridors are a source of food and water and provide cover, nesting sites, and migration and dispersal corridors for wildlife. Riparian areas are also important in flood protection and improve air and water quality through natural filtering.

Oak woodland and riparian areas are City resources not only because of the diversity of species they support but also because they provide natural open space and aesthetic value. The City's creek systems are described in detail in the groundwater recharge and water quality component of the Open Space and Conservation Element. The City regulates the protection of native oak trees through the Tree Preservation Ordinance, which includes standards that limit disturbance within protected zones of oaks and emphasizes avoidance of tree removal. Where avoidance

is not feasible and tree removal is authorized by the City, mitigation is required on an inch-for-inch basis. The Tree Preservation Ordinance is a valuable tool in protecting Roseville's oak trees and habitats. A creek and riparian management and restoration plan is being developed that will provide standards for riparian area management and enhancement. Additionally, the City maintains an overarching management plan for upholding the City's requirements in maintaining open space.

4.6.3 Seasonal Wetlands

Many of the wetland areas in Roseville are seasonal and therefore receive, retain, and transport water only during the wet season. Wetlands are subject to the regulations of the U.S. Army Corps of Engineers under the provisions of Section 404 of the Clean Water Act. Two primary types of seasonal wetlands are present in the City: intermittent drainage and vernal pool wetlands.

Intermittent drainage wetlands typically consist of channels 1 to 10 feet wide that flow over a variety of substrata. Most are wet only during winter and transport runoff. They are typically dry during summer, with scattered ponds, but they may contain water from adjacent urban runoff.

Vernal pools represent a significant seasonal wetland resource in Roseville. Although relatively abundant in Roseville and the Sacramento/Placer County region, they are considered rare statewide for their limited natural occurrence and distribution and for the unique native plant and animal species they support. Found in valley grassland areas, vernal pools are typically small, shallow, hardpan-floored depressions that fill with water during the winter wet season, gradually drying by late spring or early summer. Several plant species occur only in association with these special habitats, which has triggered concern about their inventory and preservation. Two types of vernal pools are present in the Roseville area:

- Northern volcanic mud flow vernal pools occur in shallow depressions on Mehrten mud flow formations where the slope is generally less than 2 percent.
- Northern hardpan pools generally occur on the Inks or Cometa soil series at the lower basin portions of creek floodplains. During the wet season, the pools provide special habitat for unique plant and animal species whose germination, growth, and reproductive cycles coincide with the availability of collected water. Individual pools vary significantly in the length of time they remain wet and in the diversity of plant species present.

4.6.4 Sensitive Species

The California Department of Fish and Wildlife maintains the California Natural Diversity Data Base, which includes known locations of state and federally listed endangered, rare, and threatened plant and animal species, including species considered by the scientific community to be deserving of such listing.

The sensitive plant species that may be present in Roseville are primarily associated with vernal pool environments and include the following: Bogg's Lakehedge Hyssop (*Gratiola heterosepala*), Dwarf Downingia *(Downingia humilis*), and Vernal Pool Brodiaca (*Dichelostemma lacunavernalis*). Bogg's Lake Hyssop is listed as endangered by the state and California Native Plant Society. Dwarf Downingia and Vernal Pool Brodiaca are both included on the California Native Plant Society "watch list" and have sufficiently limited distribution to warrant continued monitoring. Vernal pools in the City may also contain federally listed, endangered vernal pool tadpole shrimp (*Lepidurus packardi*) and federally listed threatened vernal pool fairy shrimp (*Branchinecta lynchi*).

Anadromous chinook salmon (*Oncorhynchus tshawytscha*) and Central Valley steelhead (*Oncorhynchus mykiss*) are known to be present seasonally in Dry Creek and its upper tributaries. Steelhead is listed by the U.S. Fish and Wildlife Service as a threatened species under the Endangered Species Act. Chinook salmon within the Central Valley Fall/Late Fall Run are listed as a candidate species. In addition to the federal and state classified rare or

endangered wildlife species known to inhabit Roseville, favorable habitats for other listed species are present in the area. Other special status species potentially present in Roseville include Cooper's Hawk, Swainson's Hawk, Valley Elderberry, Longhorn Beetle, Sanford's Arrowhead, and the Northwestern Pond Turtle. Bald eagles have been sighted near Folsom Lake, and the American peregrine falcon is present in the Sacramento Valley. All of these species thrive in the riparian habitats of floodplain environments.

Preservation of habitat for sensitive species benefits from the City of Roseville's Open Space Preserve Overarching Management Plan, as described in Section 4.9.3.

4.7 DEMOGRAPHICS

Some populations are at greater risk from hazard events because of decreased resources or physical abilities. Elderly people, for example, may be more likely to require additional assistance. Research has shown that people living near or below the poverty line, the elderly (especially older single men), individuals with disabilities, individuals with access and functional needs, women, children, ethnic minorities and renters all experience, to some degree, more severe effects from disasters than the general population. These vulnerable populations may vary from the general population in risk perception, living conditions, access to information before, during and after a hazard event, capabilities during an event, and access to resources for post-disaster recovery. Indicators of vulnerability often overlap spatially and often in the geographically most vulnerable locations. Detailed spatial analysis to locate areas where there are higher concentrations of vulnerable community members would help to extend focused public outreach and education to these most vulnerable citizens.

4.7.1 Population Trends

According to the California Department of Finance, Roseville's estimated population for 2015 was 134,073 and the estimated daytime population, which includes those coming into Roseville to work, shop, and do business, was 145,000. Roseville is the 45th largest of California's 482 cities. The City has been striving to accommodate growth while retaining and enhancing its distinct character.

The full-time population increased by 38,223 from 2000 to 2010, a 31.9-percent increase (see Figure 4-6). The 2010 population was more than four times that of 1982, when the City had 26,127 residents. The 2.6-percent growth rate from 2009 to 2010 was comparable to average annual growth rates of the past decade. This rate exceeded annual growth rates for Placer County (1.7 percent) and California (1.0 percent) for the same time period.

Between 2010 and the end of 2015, Roseville experienced an estimated 10.9 percent increase in population—averaging 2.2 percent per year. This trend indicates that the population of Roseville will continue to grow through the end of the decade, albeit more slowly than the population boom experienced between 2000 and 2010.

The average household size in Roseville is 2.61 persons, according to U.S. Census Bureau American Community Survey estimates for 2010-2014. This household average may vary by land use and location in the City. For example, the 3,814 age-restricted low-density residential units in the Del Webb and West Roseville planning areas have an estimated average household size of 1.8.

The General Plan's estimates of when Roseville will achieve buildout (the maximum development allowed by zoning) vary based on the methodology used. Under all scenarios, however, Roseville and the Placer County/Sacramento Metropolitan region are expected to remain attractive to both residential and commercial development. As growth rates continue to climb in the region, the City of Roseville has captured an increasing share of that growth. Considerable recent growth in Roseville is attributed to the annexation of the Sierra Vista Specific Plan Area of 2,064 acres and the Creekview Specific Plan of 500 acres in 2012.

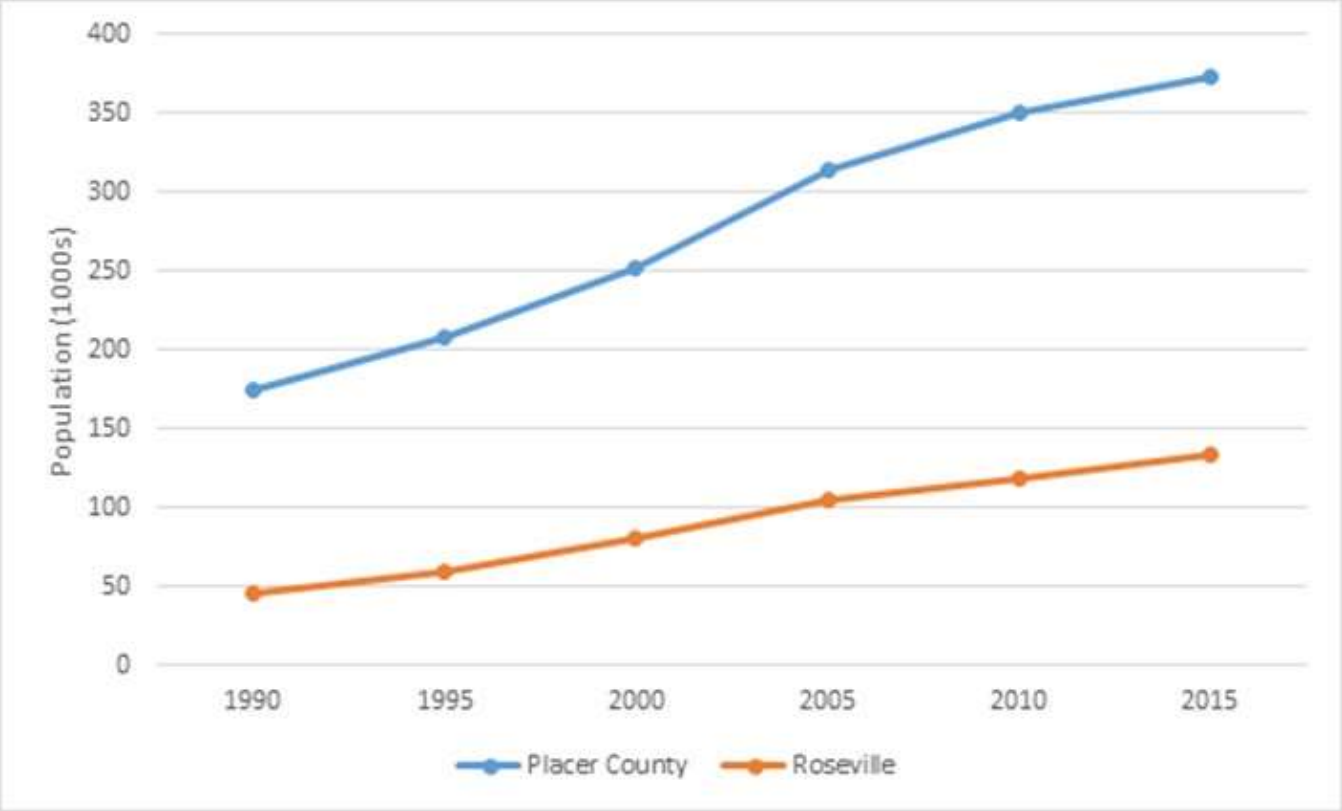


Figure 4-6. Placer County and Roseville Population Growth

Additionally, the City is in the process of annexing the 694-acre Amoruso Ranch Specific Plan, located on the northwest boundary of the City. Through buildout, these western specific Plan Areas are projected to experience the highest increase in population. The overall population, when all residential property is developed, is projected to be over 185,000. Table 4-7 shows the General Plan's population forecasts by Specific Plan Area.

4.7.2 Age Distribution

The vulnerability of elderly citizens can vary significantly based on health, age, and economic security. However, as a group, the elderly are more apt to lack the physical and economic resources necessary for response to hazard events and are more likely to suffer health-related consequences making recovery slower. They are more likely to be vision, hearing, and/or mobility impaired, and more likely to experience mental impairment.

Additionally, the elderly are more likely to live in assisted-living facilities where emergency preparedness occurs at the discretion of facility operators. These facilities are typically identified as "critical facilities" by emergency managers because they require extra notice to implement evacuation. Elderly residents living in their own homes may have more difficulty evacuating their homes and could be stranded in dangerous situations. This population group is more likely to need special medical attention, which may not be readily available during natural disasters due to isolation caused by the event. Specific planning attention for the elderly is an important consideration given the current aging of the American population.

Children under 14 are particularly vulnerable to disaster events because of their young age and dependence on others for basic necessities. Very young children may additionally be vulnerable to injury or sickness; this vulnerability can be worsened during a natural disaster because they may not understand the measures that need to be taken to protect themselves from hazards.

Table 4-7. General Plan Projections of Residential Units and Population by Specific Plan Area

	Dwelling Units			Population		
Specific Plan Area	2016	2035	Buildout	2016	2035	Buildout
Infill	15,409	16,349	16,349	40,217	42,671	42,671
Southeast Roseville	3,047	3,163	3,163	7,953	8,255	8,255
Northeast Roseville	933	1,514	1,514	2,435	3,952	3,952
Northwest Roseville	8,941	9,068	9,068	23,336	23,667	23,667
North Central Roseville	4,247	4,487	4,711	11,085	11,711	12,296
North Industrial	1,043	1,043	1,043	2,722	2,722	2,722
Del Webb	3,210	3,210	3,210	5,895	5,859	5,895
Highland Reserve North	1,669	1,669	1,669	4,356	4,356	4,356
North Roseville	4,887	6,072	6,072	12,755	15,848	15,848
Stoneridge	2,446	2,861	2,861	6,384	7,467	7,467
West Roseville	2,899	10,478	10,478	6,996	26,651	26,651
Riverside Gateway	204	456	456	532	1,190	1,190
Downtown	255	638	2,272	666	1,665	5,930
Sierra Vista	0	5,905	8,679	0	15,412	22,652
Creekview	0	2,011	2,011	0	5,249	5,249
Amoruso Ranch	0	2,827	2,827	0	7,379	7,379
Total	**49,190**	**71,751**	**76,383**	**125,332**	**184,054**	**196,180**

According to the 2010-2014 U.S. Census American Community Survey estimates, 14.3 percent of Roseville's population is 65 or older, 21.1 percent of the population is under the age of 14 and the median age is 37.5. Figure 4-7 shows the age distribution for Roseville.

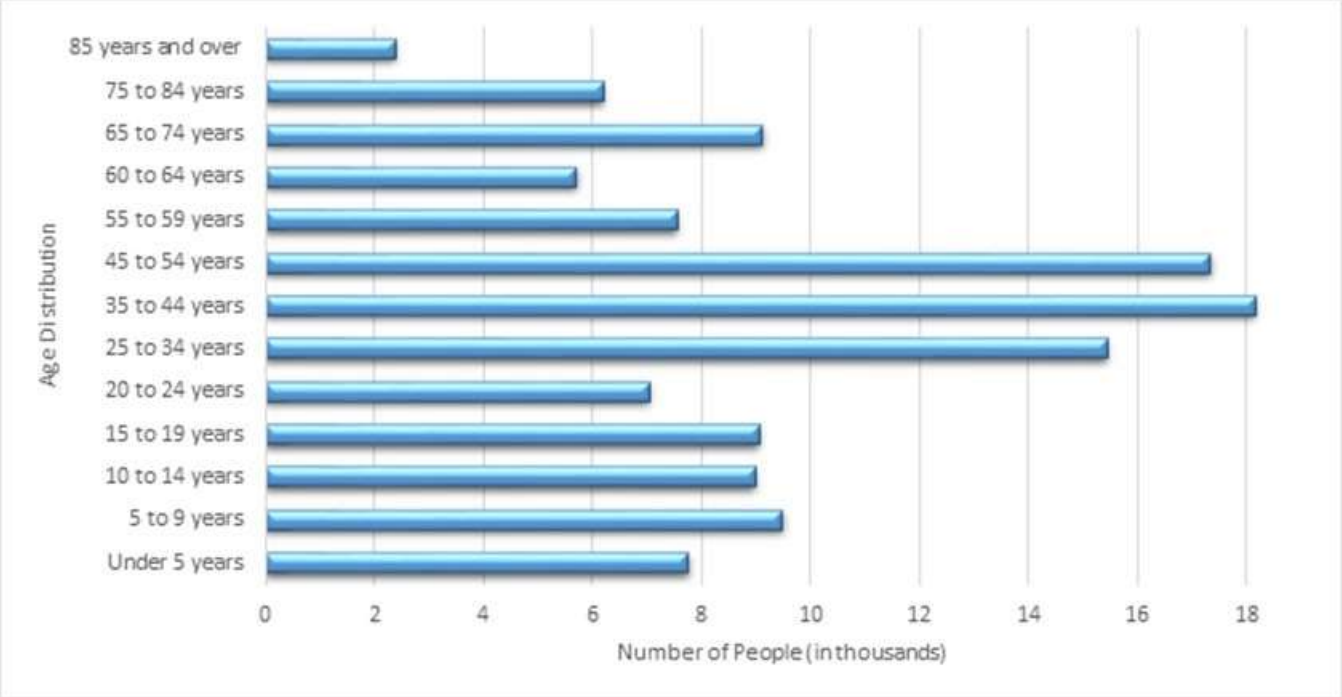


Figure 4-7. Planning Area Age Distribution

4.7.3 Race, Ethnicity and Language

Many disaster researchers have focused on the increased vulnerability that ethnic minorities experience in the United States. Research shows that minorities are less likely to be involved in pre-disaster planning and experience higher mortality rates during a disaster event. Post-disaster recovery can be ineffective and is often characterized by cultural insensitivity. Since higher proportions of ethnic minorities live below the poverty line than the majority white population, poverty can compound vulnerability.

According to the U.S. Census, Roseville's racial composition is predominately white, at about 80 percent of the City population. The largest minority population in Roseville is Hispanic, followed by Asian. Figure 4-8 shows the racial distribution of Roseville.

About 12 percent of Roseville's population is foreign-born, with the majority born in Latin America, according to 2014 U.S. Census estimates. Other than English, the most commonly spoken language in the City is Spanish. In the U.S. Census estimates, 5.6 percent of the City's residents reported speaking English "less than very well." Of the foreign born population, 38.5 percent speak English "less than very well." This has important implications for emergency managers, who must get crucial information out to all members of the population before, during and after emergency events.

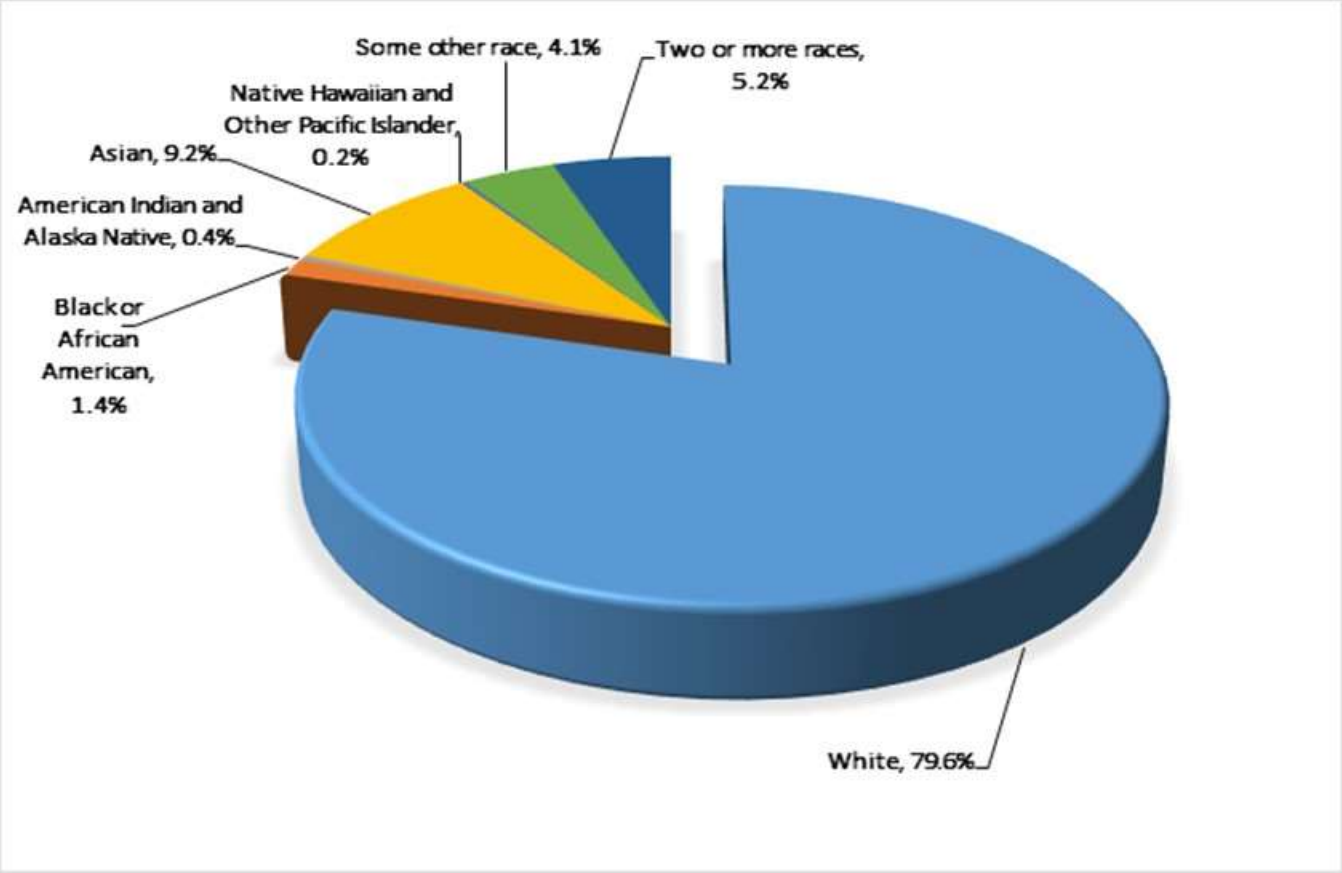


Figure 4-8. Planning Area Race Distribution

4.7.4 Individuals with Disabilities and Others with Access and Functional Needs

Individuals with disabilities and others with access and functional needs have a special stake in emergency planning because they are more likely to have difficulty responding to a hazard event than the general population. According to the 2010 U.S. Census, 12.3 percent of the U.S. noninstitutionalized population lives with a disability. As individuals with disabilities and others with access and functional needs are increasingly integrated into society, relatively large segments of the population may require assistance during the first 72 hours post-disaster, the period generally reserved for self-help.

Disabilities and access/functional needs can vary greatly in severity and permanence, making these individuals difficult to define and track. There is no "typical" disability or need, which can complicate disaster-planning processes that attempt to incorporate them. Furthermore, disabilities and access/functional needs are likely to be compounded with other vulnerabilities, such as age, economic disadvantage and ethnicity, all of which mean that housing is more likely to be substandard.

While the City of Roseville's percentage of individuals with disabilities and others with access and functional needs does not differ much from that of the state as a whole, the overall numbers are significant and warrant attention from planners and emergency managers (see Table 4-8). According to 2014 U.S. Census data, 10.3 percent of the City's population over the age of 5 has a disability.

Table 4-8. Status of Non-Institutionalized Population with Disabilities

Age	Individuals with Disabilities and Others with Access and Functional Needs	% of Age Group Population
5-17 years	1,065	4.7
18-64 years	5,038	7.2
65+ years	5,979	34.9

4.8 ECONOMY

4.8.1 Income

In the United States, individual households are expected to use some private resources to prepare for, respond to and recover from disasters. This means that households living in poverty are automatically disadvantaged when confronting hazards. Additionally, the poor typically occupy more poorly built and inadequately maintained housing. Mobile or modular homes, for example, are more susceptible to damage in earthquakes and floods than other types of housing. In urban areas, the poor often live in older houses and apartment complexes, which are more likely to be made of un-reinforced masonry, a building type that is particularly susceptible to damage during earthquakes. Furthermore, residents below the poverty level are less likely to have insurance to compensate for losses incurred from natural disasters. This means that residents below the poverty level have a great deal to lose during an event and are the least prepared to deal with potential losses. The events following Hurricane Katrina in 2005 illustrated that personal household economics significantly impact people's decisions on evacuation. Individuals who cannot afford gas for their cars will likely decide not to evacuate.

Based on U.S. Census American Community Survey estimates for 2014, per capita income in Roseville was $34,6514, and the median household income was $76,712. Table 4-9 compares the income and poverty estimates at the city, county, and state level. About 8.6 percent of Roseville residents are below the poverty level (meaning they spend more than a third of income on an economy food budget); this includes 10.2 percent of those under the age of 18 and 7.4 percent of those 65 or older.

Table 4-9. Population Under the Poverty Level

	Median Household Income	Percent of Total Population Below Poverty Level	Percent of Children (18 and Under) Below Poverty Level	Percent of Elderly (65 and Older) Below Poverty Level
City of Roseville	$76,712	8.6	10.2	7.4
Placer County	$73,747	8.9	11.2	6.8
California	$61,489	16.4	22.7	10.2

4.8.2 Industry, Businesses and Institutions

The planning area's economy is strongly based in the educational/healthcare/social service industry (22 percent), followed by the retail trade and professional/scientific industries. Information, wholesale trade, and agriculture make up the smallest sources of the local economy, with less than 1 percent of local economy driven by agriculture. Figure 4-9 shows the breakdown of industry types in the planning area.

The planning area benefits from a variety of business activity. Major businesses include Kaiser Permanente, Union Pacific Railroad, Adventist Health and Sutter Roseville Medical Center.

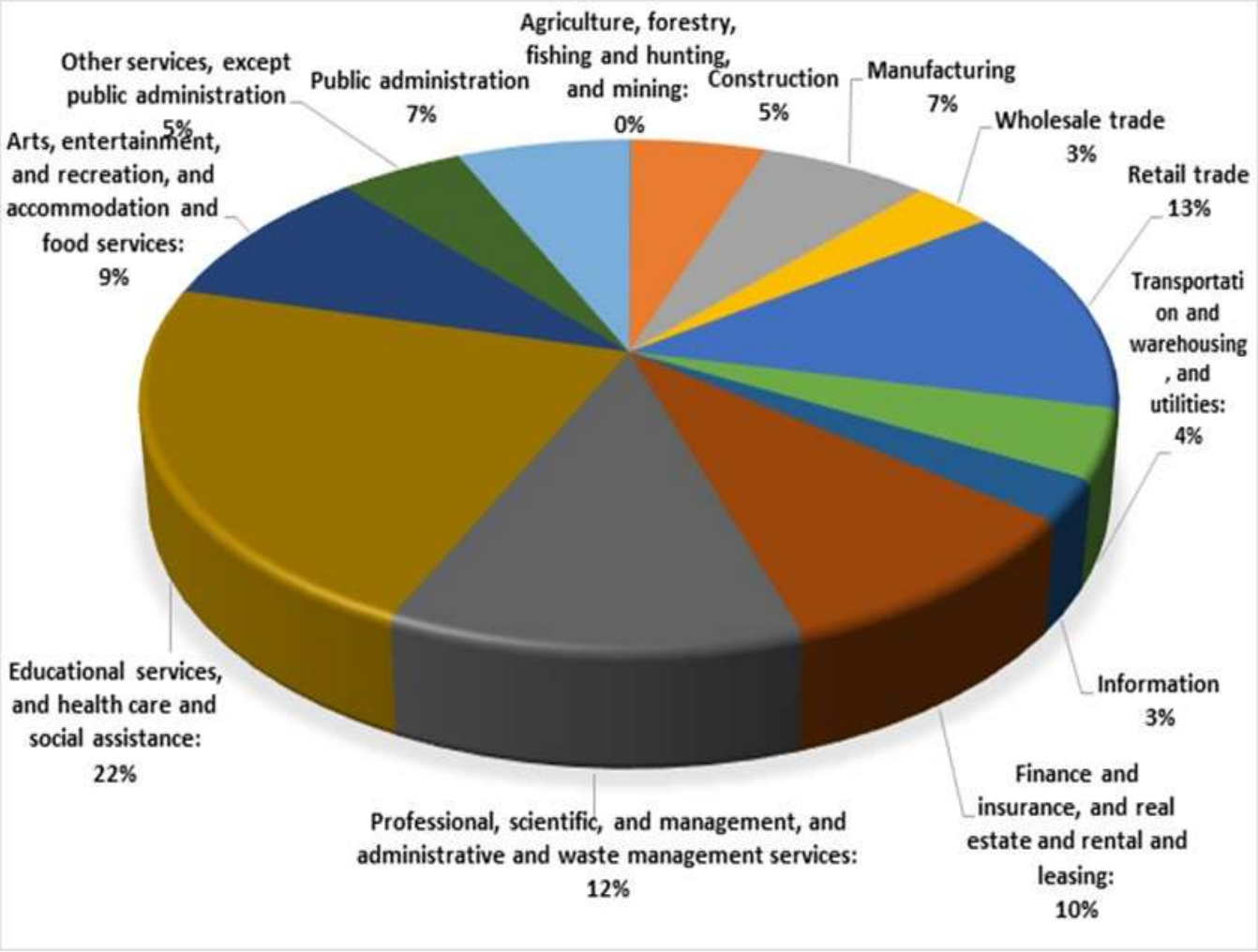


Figure 4-9. Industry in the Planning Area

4.8.3 Employment Trends and Occupations

According to the American Community Survey, about 48.4 percent of the planning area's population is in the labor force. Of the working-age population group (ages 20 – 64), 88.5 percent of men and 75.6 percent of women are in the labor force. Figure 4-10 compares California's and Roseville's unemployment trends from 2009 through 2014. Roseville's unemployment rate was lowest in 2009, at 5.9 percent. Unemployment rates significantly dropped from 9.5 percent to 8.3 percent between 2013 and 2014.

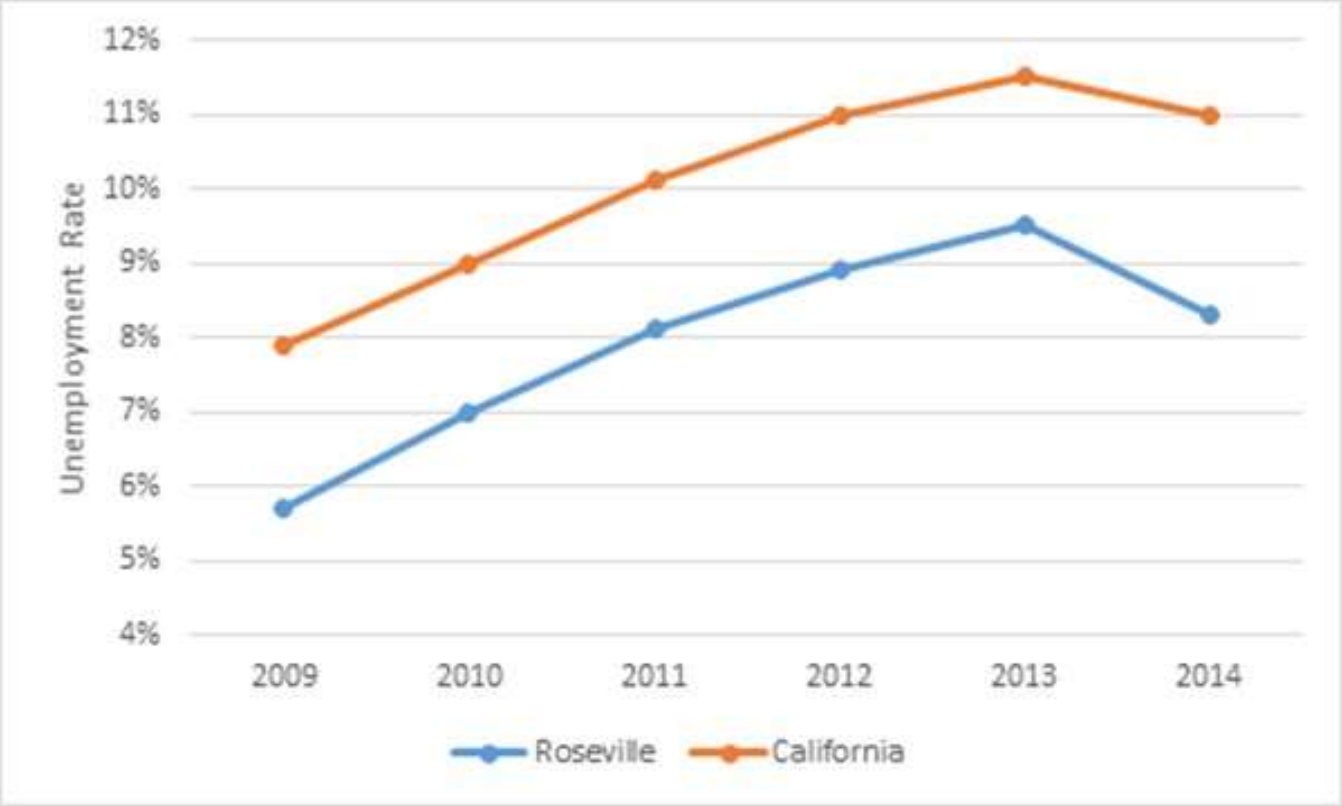


Figure 4-10. California and Roseville Unemployment Rate (U.S. Census, 2009 – 2014)

Management, business, science and arts occupations and sales and office occupations make up 72 percent of the jobs in the planning area (see Figure 4-11). Service occupations make up 16 percent of the local working population.

As of October 2014, the largest employer is Kaiser Permanente, with 3,231 employees, followed by Hewlett-Packard, which employs 2,132. Other major employers include the following:

- Sutter-Roseville Medical Group
- Roseville Joint Union High School District
- Union Pacific Railroad Company
- Adventist Health System West
- Roseville City School District
- City of Roseville
- Wal-Mart Superstore (PG Blvd)
- LB Construction, Inc.

The U.S. Census estimates that over 79.6 percent of workers in the planning area commute alone (by car, truck or van) to work, and mean travel time to work is 26.1 minutes (the state average is 27.6 minutes).

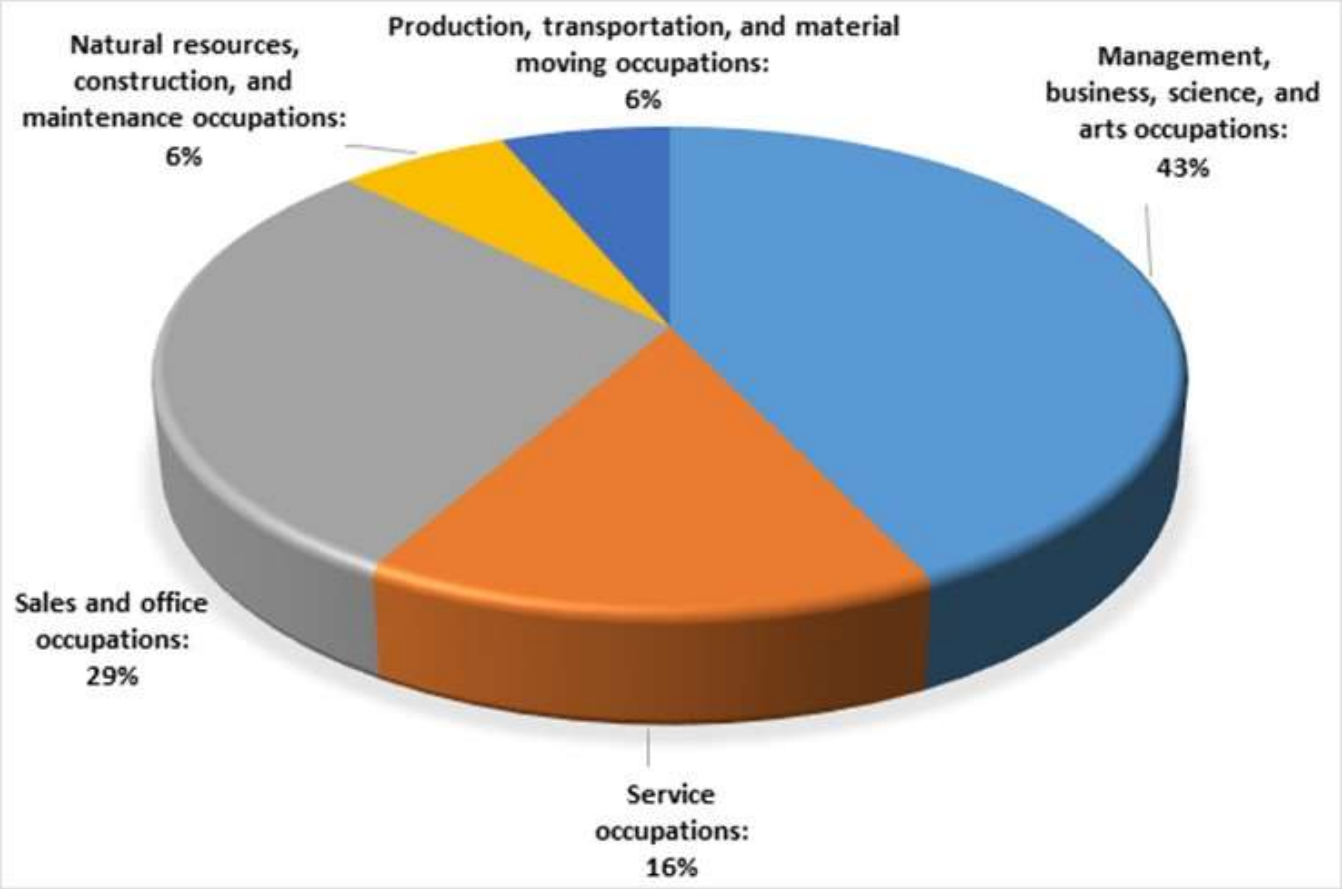


Figure 4-11. Occupations in the Planning Area

4.9 LAWS AND ORDINANCES

Existing laws, ordinances and plans at the federal, state and local level can support or impact hazard mitigation actions identified in this Plan. Hazard mitigation plans are required by 44 CFR to include a review and incorporation, if appropriate, of existing plans, studies, reports, and technical information as part of the planning process (Section 201.6.b(3)). The following federal, state, and local laws described below were reviewed to inform this plan update process. Not all laws and ordinances reviewed during this process are relevant to the immediate process of plan development. In such instances, the City will assure compliance, where relevant, upon implementation of programs that overlap with the requirements of the following programs at project implementation.

4.9.1 Federal

Disaster Mitigation Act of 2000

The DMA is the latest federal legislation addressing hazard mitigation planning. It reinforces the importance of mitigation planning and emphasizes planning for disasters before they occur. It specifically addresses planning at the local level, requiring plans to be in place before Hazard Mitigation Grant Program funds are available to communities. The 2016 Plan is designed to meet the requirements of the DMA.

Endangered Species Act

The Endangered Species Act (ESA) was enacted in 1973 to conserve species that are facing depletion or extinction and the ecosystems that support them. The act sets forth a process for determining which species are threatened and endangered and requires the conservation of the critical habitat in which those species live. The ESA provides broad protection for species of fish, wildlife and plants that are listed as threatened or endangered. Provisions are made for listing species, as well as for recovery plans and the designation of critical habitat for listed species. The ESA outlines procedures for federal agencies to follow when taking actions that may jeopardize listed species and contains exceptions and exemptions. It is the enabling legislation for the Convention on International Trade in Endangered Species of Wild Fauna and Flora. Criminal and civil penalties are provided for violations of the ESA and the Convention.

The purposes of the ESA are to provide a means of conserving the ecosystems upon which endangered and threatened species depend; to provide a program for conserving those species; and to take steps necessary to achieve the purposes of international treaties and conventions. The policy of Congress is that federal agencies must seek to conserve endangered and threatened species and use their authorities in furtherance of the ESA's purposes. The ESA defines three fundamental terms:

- **Endangered** means that a species of fish, animal or plant is "in danger of extinction throughout all or a significant portion of its range." (For salmon and other vertebrate species, this may include subspecies and distinct population segments.)
- **Threatened** means that a species "is likely to become endangered within the foreseeable future." Regulations for a threatened species may be less restrictive than if it were endangered.
- **Critical habitat** means "specific geographical areas that are…essential for the conservation and management of a listed species, whether occupied by the species or not."

Five sections of the ESA are of critical importance to understanding it:

- **Section 4: Listing of a Species**—The National Oceanic and Atmospheric Administration Fisheries Service (NOAA Fisheries) is responsible for listing marine species; the U.S. Fish and Wildlife Service is responsible for listing terrestrial and freshwater aquatic species. The agencies may initiate reviews for listings, or citizens may petition for them. A listing must be made "solely on the basis of the best scientific and commercial data available." After a listing has been proposed, agencies receive comment and conduct further scientific reviews for 12 to 18 months, after which they must decide if the listing is warranted. Economic impacts cannot be considered in this decision, but it may include an evaluation of the adequacy of local and state protections. Critical habitat for the species may be designated at the time of listing.
- **Section 7: Consultation**—Even when a listing has only been proposed, all federal agencies must ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed species or adversely modify its critical habitat. This includes private and public actions that require a federal permit. Once a final listing is made, non-federal actions are subject to the same review, termed a "consultation." If the listing agency finds that an action will "take" a species, it must propose mitigations or "reasonable and prudent" alternatives to the action; if the proponent rejects these, the action cannot proceed.
- **Section 9: Prohibition of Take—**It is unlawful to "take" an endangered species, including killing or injuring it or modifying its habitat in a way that interferes with essential behavioral patterns, including breeding, feeding or sheltering.
- **Section 10: Permitted Take**—Through voluntary agreements with the federal government that provide protections to an endangered species, a non-federal applicant may commit a take that would otherwise be prohibited as long as it is incidental to an otherwise lawful activity (such as developing land or building a road). These agreements often take the form of a "Habitat Conservation Plan."

- **Section 11: Citizen Lawsuits**—Civil actions initiated by any citizen can require the listing agency to enforce the ESA's prohibition of taking or to meet the requirements of the consultation process

The Clean Water Act

The Clean Water Act (CWA) is the cornerstone of surface water quality protection in the United States. (The Act does not deal directly with groundwater or with water quantity issues.) The statute employs a variety of regulatory and non-regulatory tools to sharply reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff. These tools are employed to achieve the broader goal of restoring and maintaining the chemical, physical, and biological integrity of the nation's waters so that they can support "the protection and propagation of fish, shellfish and wildlife and recreation in and on the water."

Evolution of CWA programs over the last decade has included a shift from a program-by-program, source-by-source, pollutant-by-pollutant approach to more holistic watershed-based strategies. Under the watershed approach, equal emphasis is placed on protecting healthy waters and restoring impaired ones. A full array of issues are addressed, not just those subject to CWA regulatory authority. Involvement of stakeholder groups in the development and implementation of strategies for achieving and maintaining state water quality and other environmental goals is another hallmark of this approach.

National Flood Insurance Program

The National Flood Insurance Program (NFIP) provides federally backed flood insurance in exchange for communities enacting and enforcing floodplain regulations. Since its inception in 1968, the NFIP has been successful in requiring new buildings to be protected from probable damage by 100-year flood events. Requirements for participation in this program are stipulated in Parts 59 through 79 of 44 CFR. At the time of the preparation of this Plan, the City is in good standing with the requirements of the NFIP. Participation and good-standing under NFIP are prerequisites for funding eligibility under the Robert T. Stafford Act.

National Incident Management System

The National Incident Management System (NIMS) is a systematic approach for government, nongovernmental organizations, and the private sector to work together to manage incidents involving hazards. The NIMS provides a flexible but standardized set of incident management practices. Incidents typically begin and end locally, and they are managed at the lowest possible geographical, organizational, and jurisdictional level. In some cases, success depends on the involvement of multiple jurisdictions, levels of government, functional agencies, and emergency responder disciplines. These cases necessitate coordination across a spectrum of organizations. Communities using NIMS follow a comprehensive national approach that improves the effectiveness of emergency management and response personnel across the full spectrum of potential hazards (including natural hazards, terrorist activities, and other human-caused disasters) regardless of size or complexity.

Americans with Disabilities Act and Amendments

The Americans with Disabilities Act (ADA) seeks to prevent discrimination against people with disabilities in employment, transportation, public accommodation, communications, and government activities. Title II of the ADA deals with compliance with the Act in emergency management and disaster-related programs, services, and activities. It applies to state and local governments as well as third parties, including religious entities and private nonprofit organizations.

The ADA has implications for sheltering requirements and public notifications. During an emergency alert, officials must use a combination of warning methods to ensure that all residents have all necessary information. Those with hearing impairments may not hear radio, television, sirens, or other audible alerts, while those with visual impairments may not see flashing lights or visual alerts. Two technical documents issued for shelter

operators address physical accessibility needs of people with disabilities as well as medical needs and service animals.

The ADA intersects with disaster preparedness programs in regards to transportation, social services, temporary housing, and rebuilding. Persons with disabilities may require additional assistance in evacuation and transit (e.g., vehicles with wheelchair lifts or paratransit buses). Evacuation and other response plans should address the unique needs of residents. Local governments may be interested in implementing a special-needs registry to identify the home addresses, contact information, and needs for residents who may require more assistance.

Civil Rights Act of 1964

The Civil Rights Act of 1964 prohibits discrimination based on race, color, religion, sex or nation origin and requires equal access to public places and employment. The Act is relevant to emergency management and hazard mitigation in that it prohibits local governments from favoring the needs of one population group over another. Local government and emergency response must ensure the continued safety and well-being of all residents equally, to the extent possible.

Rural Development Program

The mission of the U.S. Department of Agriculture (USDA) Rural Development Program is to help improve the economy and quality of life in rural America. The program provides project financing and technical assistance to help rural communities provide the infrastructure needed by rural businesses, community facilities, and households. The program addresses rural America's need for basic services, such as clean running water, sewage and waste disposal, electricity, and modern telecommunications and broadband. Loans and competitive grants are offered for various community and economic development projects and programs, such as the development of essential community facilities including fire stations (USDA, 2015b).

Community Development Block Grant Disaster Resilience Program

In response to disasters, Congress may appropriate additional funding for the U.S. Department of Housing and Urban Development Community Development Block Grant programs to be distributed as Disaster Recovery grants (CDBG-DR). These grants can be used to rebuild affected areas and provide seed money to start the recovery process. CDBG-DR assistance may fund a broad range of recovery activities, helping communities and neighborhoods that otherwise might not recover due to limited resources. CDBG-DR grants often supplement disaster programs of the Federal Emergency Management Agency, the Small Business Administration, and the U.S. Army Corps of Engineers. Housing and Urban Development generally awards noncompetitive, nonrecurring CDBG-DR grants by a formula that considers disaster recovery needs unmet by other federal disaster assistance programs. To be eligible for CDBG-DR funds, projects must meet the following criteria:

- Address a disaster-related impact (direct or indirect) in a presidentially declared county for the covered disaster
- Be a CDBG-eligible activity (according to regulations and waivers)
- Meet a national objective.

Incorporating preparedness and mitigation into these actions is encouraged, as the goal is to rebuild in ways that are safer and stronger.

Emergency Watershed Program

The USDA Natural Resources Conservation Service (NRCS) administers the Emergency Watershed Protection (EWP) Program, which responds to emergencies created by natural disasters. Eligibility for assistance is not dependent on a national emergency declaration. The program is designed to help people and conserve natural

resources by relieving imminent hazards to life and property caused by floods, fires, wind-storms, and other natural occurrences. EWP is an emergency recovery program. Financial and technical assistance are available for the following activities (Natural Resources Conservation Service, 2016):

- Remove debris from stream channels, road culverts, and bridges
- Reshape and protect eroded banks
- Correct damaged drainage facilities
- Establish cover on critically eroding lands
- Repair levees and structures
- Repair conservation practices.

Presidential Executive Orders 11988 and 13690

Executive Order 11988 requires federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of flood plains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. In accomplishing this objective, "each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by flood plains in carrying out its responsibilities" for the following actions:

- Acquiring, managing, and disposing of federal lands and facilities
- Providing federally-undertaken, financed, or assisted construction and improvements
- Conducting federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulation, and licensing activities (FEMA, 1982).

Executive Order 13690 amends and expands Executive Order 11988, acknowledging that the impacts of flooding are anticipated to increase over time due to the effects of climate change and other threats. It mandates a Federal Flood Risk Management Standard, which is a flexible framework to increase resilience against flooding and help preserve the natural values of floodplains. This standard expands management of flood issues from the current base flood level to a higher vertical elevation and corresponding horizontal floodplain to address current and future flood risk and ensure that projects funded with taxpayer dollars last as long as intended (Office of the Press Secretary, 2015).

Presidential Executive Orders 11990

Executive Order 11990 requires federal agencies to provide leadership and take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands. The requirements apply to the following activities (National Archives, 2016):

- Acquiring, managing, and disposing of federal lands and facilities
- Providing federally undertaken, financed, or assisted construction and improvements
- Conducting federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulation, and licensing.

Emergency Relief for Federally Owned Roads Program

The U.S. Forest Service's Emergency Relief for Federally Owned Roads Program was established to assist federal agencies with repair or reconstruction of tribal transportation facilities, federal lands transportation facilities, and other federally owned roads that are open to public travel and have suffered serious damage by a natural disaster over a wide area or by a catastrophic failure. The program funds both emergency and permanent repairs (Office of Federal Lands Highway, 2016).

4.9.2 State

California General Planning Law

California state law requires that every county and city prepare and adopt a comprehensive long-range plan to serve as a guide for community development. The general plan expresses the community's goals, visions, and policies relative to future land uses, both public and private. The general plan is mandated and prescribed by state law (Cal. Gov. Code §65300 et seq.), and forms the basis for most local government land use decision-making.

The plan must consist of an integrated and internally consistent set of goals, policies, and implementation measures. In addition, the plan must focus on issues of the greatest concern to the community and be written in a clear and concise manner. City actions, such as those relating to land use allocations, annexations, zoning, subdivision and design review, redevelopment, and capital improvements, must be consistent with the plan.

California Environmental Quality Act

The California Environmental Quality Act (CEQA) was passed in 1970, shortly after the federal government passed the National Environmental Policy Act, to institute a statewide policy of environmental protection. CEQA requires state and local agencies in California to follow a protocol of analysis and public disclosure of the potential environmental impacts of development projects. CEQA makes environmental protection a mandatory part of every California state and local agency's decision making process.

CEQA establishes a statewide environmental policy and mandates actions all state and local agencies must take to advance the policy. For any project under CEQA's jurisdiction with potentially significant environmental impacts, agencies must identify mitigation measures and alternatives by preparing an environmental impact report and may approve only projects with no feasible mitigation measures or environmentally superior alternatives.

The Roseville City Council certified a mitigated negative declaration (MND) for the initial City of Roseville hazard plan on July 20, 2005. The MND evaluated potential environmental effects associated with adoption and implementation of the initial hazard plan. It was circulated for a 20-day public review and comment period (per CEQA Guidelines Section 15073(a)), and no comments were received.

Under CEQA guidelines (Section 15164), an addendum to an adopted MND shall be prepared if only minor technical changes or additions are necessary and none of the conditions have occurred calling for the preparation of a new negative declaration or Environmental Impact Report (as described in CEQA Section 15162). The addendum need not be circulated for public review; however, an addendum is to be considered by the decision-making body prior to making a decision on the project.

The City has determined that the 2016 Plan required a new Initial Study/Mitigated Negative Declaration (IS/MND).The public comment period for the IS/MND ran concurrently with the public comment period for the plan update. During this time, no comments were received on the IS/MND. The results of this study were presented to the Council for consideration prior to their consideration of the revised Plan.

AB 52: Addition of Tribal Cultural Resources CEQA

This bill adds "tribal cultural resources" to the categories of cultural resources in CEQA, which had formerly been limited to historic, archeological, and paleontological resources. Recognizing that tribes may have expertise with regard to their tribal history and practices, AB 52 requires lead agencies to provide notice to tribes that are traditionally and culturally affiliated with the geographic area of a proposed project if they have requested notice of projects proposed within that area. If the tribe requests consultation within 30 days upon receipt of the notice, the lead agency must consult with the tribe.

In accordance with AB 52, in July 2016 the City of Roseville provided certified mail notification of the proposed hazard mitigation plan update to tribes that requested such notification. The City's notice included a summary project description, a location map and request for written response should the tribe desire formal AB 52 consultation on tribal cultural resources. Many of the hazard mitigation alternatives and selected actions contained in Chapter 19 are ongoing City activities and programs, some of which were previously subject to CEQA and do not require further CEQA compliance for continued implementation. However future action plan items that still require Council approval would also require future project-level CEQA compliance and therefore an additional opportunity for AB 52 consultation prior to implementation.

AB 162: Flood Planning, Chapter 369, Statutes of 2007

This California State Assembly bill passed in 2007 requires cities and counties to address flood-related matters in the land use, conservation, and safety and housing elements of their general plans. The land use element must identify and annually review the areas covered by the general plan that are subject to flooding as identified in floodplain mapping by either FEMA or the state Department of Water Resources (DWR). Upon the next revision of the housing element on or after January 1, 2009, the conservation element of the general plan must identify rivers, creeks, streams, flood corridors, riparian habitat, and land that may accommodate floodwater for the purposes of groundwater recharge and stormwater management. The safety element must identify information regarding flood hazards including:

- Flood hazard zones
- Maps published by FEMA, DWR, the U.S. Army Corps of Engineers, the Central Valley Flood Protection Board, Cal OES, etc.
- Historical data on flooding
- Existing and planned development in flood hazard zones.

The general plan must establish goals, policies and objectives to protect from unreasonable flooding risks including:

- Avoiding or minimizing the risks of flooding new development
- Evaluating whether new development should be located in flood hazard zones
- Identifying construction methods to minimize damage.

AB 162 establishes goals, policies and objectives to protect from unreasonable flooding risks. It establishes procedures for the determination of available land suitable for urban development, which may exclude lands where FEMA or DWR has determined that the flood management infrastructure is not adequate to avoid the risk of flooding.

AB 2140: General Plans: Safety Element, Chapter 739, Statutes of 2006

This bill provides that the state may allow for more than 75 percent of public assistance funding under the California Disaster Assistance Act only if the local agency is in a jurisdiction that has adopted a local hazard mitigation plan as part of the safety element of its general plan. The local hazard mitigation plan needs to include elements specified in this legislation. In addition this bill requires Cal OES to give federal mitigation funding preference to cities and counties that have adopted local hazard mitigation plan. The intent of the bill is to encourage cities and counties to create and adopt hazard mitigation plans. The City of Roseville linked the Roseville Hazard Mitigation Plan to the Safety Element of the General Plan by City Council resolution on May 10, 2010. The 2016 Roseville Hazard Mitigation Plan will continue to link to the Roseville General Plan.

AB 70: Flood Liability, Chapter 367, Statutes of 2007

This bill provides that a city or county may be required to contribute a fair and reasonable share to compensate for property damage caused by a flood to the extent that it has increased the state's exposure to liability for property damage by unreasonably approving new development in a previously undeveloped area that is protected by a state flood control project, unless the city or county meets specified requirements.

AB 32: The California Global Warming Solutions Act

This bill addresses greenhouse gas emissions. It identifies the following potential adverse impacts of global warming:

> "… the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems."

AB 32 establishes a state goal of reducing greenhouse gas emissions to 1990 levels by 2020 (a reduction of approximately 25 percent from forecast emission levels) with further reductions to follow. The law requires the state Air Resources Board to do the following:

- Establish a program to track and report greenhouse gas emissions.
- Approve a scoping plan for achieving the maximum technologically feasible and cost-effective reductions from sources of greenhouse gas emissions.
- Adopt early reduction measures to begin moving forward.
- Adopt, implement and enforce regulations—including market mechanisms such as "cap and-trade" programs—to ensure that the required reductions occur.

The Air Resources Board recently adopted a statewide greenhouse gas emissions limit and an emissions inventory, along with requirements to measure, track, and report greenhouse gas emissions by the industries it determined to be significant sources of greenhouse gas emissions.

Senate Bill 97

Senate Bill 97, enacted in 2007, amended the California Environmental Quality Act (CEQA) to clearly establish that greenhouse gas emissions and the effects of greenhouse gas emissions are appropriate subjects for CEQA analysis. It directed the Governor's Office of Planning and Research to develop draft CEQA guidelines for the mitigation of greenhouse gas emissions or their effects by July 1, 2009 and directed the California Natural Resources Agency to certify and adopt the CEQA Guidelines by January 1, 2010.

Senate Bill 5: Central Valley Flood Protection Act of 2008

The fundamental change imposed through this legislation was the directive for local agencies to revise their general plans no later than July 2, 2015 to address flood risk for affected land use decisions based on an Urban Level of Flood Protection. The legislation also requires local agencies to revise their zoning codes to reflect this new standard within one year following the adoption of their revised general plans. In areas not subject to the Urban Level of Flood Protection standards, the 100-year floodplain standards will continue to apply.

Senate Bill 1241: General Plans: Safety Element—Fire Hazard Impacts

In 2012, Senate Bill 1241 passed requiring that all future general plans address fire risk in state responsibility areas and very high fire hazard severity zones in their safety element. In addition, the bill requires cities and

counties to make certain findings regarding available fire protection and suppression services before approving a tentative map or parcel map.

Senate Bill 379: General Plans: Safety Element—Climate Adaptation

Senate Bill 379 builds upon the flood planning inclusions into the safety and housing elements and the hazard mitigation planning safety element inclusions in general plans outlined in AB 162 and AB 2140, respectively. SB 379 focuses on a new requirement that cities and counties include climate adaptation and resiliency strategies in the safety element of their general plans beginning January 1, 2017. In addition, this bill requires general plans to include a set of goals, policies and objectives, and specified implementation measures based on the conclusions drawn from climate adaptation research and recommendations. In anticipation of the implementation of this bill in 2017, the 2016 Hazard Mitigation Plan includes relevant information regarding climate adaptation and resiliency strategies for incorporation into the Roseville General Plan through existing linkage resulting from AB 2140.

California State Building Code

California Code of Regulations Title 24 (CCR Title 24), also known as the California Building Standards Code, is a compilation of building standards from three sources:

- Building standards that have been adopted by state agencies without change from building standards contained in national model codes
- Building standards that have been adopted and adapted from the national model code standards to meet California conditions
- Building standards authorized by the California legislature that constitute extensive additions not covered by the model codes adopted to address particular California concerns.

The state Building Standards Commission is authorized by California Building Standards Law (Health and Safety Code Sections 18901 through 18949.6) to administer the processes related to the adoption, approval, publication, and implementation of California's building codes. These building codes serve as the basis for the design and construction of buildings in California. The national model code standards adopted into Title 24 apply to all occupancies in California except for modifications adopted by state agencies and local governing bodies. Since 1989, the Building Standards Commission has published new editions of Title 24 every three years.

On January 1, 2014, California Building Code Accessibility Standards found in Chapter 11B incorporated the 2010 Americans with Disabilities Act (ADA) Standards as the model accessibility code for California. The purpose for this incorporation was to ensure consistency with federal guidelines. As a result of this incorporation, the California standards will fully implement and include 2010 ADA Standards within the California Building Code while maintaining enhanced levels of accessibility already provided by existing California accessibility regulations.

Standardized Emergency Management System

CCR Title 19 establishes the Standardized Emergency Management System (SEMS) to standardize the response to emergencies involving multiple jurisdictions. SEMS is intended to be flexible and adaptable to the needs of all emergency responders in California. It requires emergency response agencies to use basic principles and components of emergency management. Local governments must use SEMS by December 1, 1996 in order to be eligible for state funding of response-related personnel costs under CCR Title 19 (Sections 2920, 2925 and 2930). Individual agencies' roles and responsibilities contained in existing laws or the state emergency plan are not superseded by these regulations.

California State Hazard Mitigation Plan

Under the DMA, California must adopt a federally approved state multi-hazard mitigation plan in order to be eligible for certain disaster assistance and mitigation funding. The intent of the California State Hazard Mitigation Plan is to reduce or prevent injury and damage from hazards in the state through the following:

- Documenting statewide hazard mitigation planning in California
- Describing strategies and priorities for future mitigation activities
- Facilitating the integration of local and tribal hazard mitigation planning activities into statewide efforts
- Meeting state and federal statutory and regulatory requirements.

The plan is an annex to the State Emergency Plan. It identifies past and present mitigation activities, current policies and programs, and mitigation strategies for the future. It also establishes hazard mitigation goals and objectives. The plan will be reviewed and updated annually to reflect changing conditions and new information, especially information on local planning activities.

Governor's Executive Order S-13-08

Governor's Executive Order S-13-08 enhances the state's management of climate impacts from sea level rise, increased temperatures, shifting precipitation and extreme weather events. It required the following key actions:

- Initiate California's first statewide climate change adaptation strategy to assess expected climate change impacts, identify where California is most vulnerable, and recommend adaptation policies by early 2009. This effort will improve coordination within state government so that better planning can more effectively address climate impacts on human health, the environment, the state's water supply and the economy.
- Request that the National Academy of Science establish an expert panel to report on sea level rise impacts in California, to inform state planning and development efforts.
- Issue interim guidance to state agencies for how to plan for sea level rise in designated coastal and floodplain areas for new projects.
- Initiate a report on critical infrastructure projects vulnerable to sea level rise.

4.9.3 City Plans and Programs

General Plan

The City of Roseville General Plan 2035 was developed concurrently with the mitigation planning effort. Roseville proactively addresses problems through the General Plan, which includes a Safety Element designed to address hazards. The 2016 General Plan and the 2016 Hazard Mitigation Plan will work together to achieve the goal of hazard risk reduction. Many of the action items identified in this 2016 Plan are recommendations of the General Plan. Updating the General Plan will serve as a trigger for future updates of the hazard mitigation plan.

Purpose

The General Plan is a long-term policy guide for the City's physical, economic, and environmental growth. City actions, such as those relating to land use allocations, annexations, zoning, subdivision, design review, redevelopment and capital improvements, must be consistent with the General Plan. The General Plan emphasizes performance policies or standards that define levels of service and other less tangible factors that the City is seeking to achieve. It also designates land use categories for the entire City. Land use category definitions in the General Plan include information on general uses, development, intensity, siting and compatibility standards. The General Plan serves these purposes:

- It enables the Roseville City Council and Planning Commission to establish long-range development policies.
- It provides a basis for judging whether private development proposals and public projects are in harmony with the policies.
- It guides public agencies and private developers in designing projects consistent with City policies.

The General Plan is designed to be:

- **Long-range**—Most development decisions have effects lasting more than 20 years. In order to create a useful context for development decisions, the General Plan looks toward 2035 and beyond.
- **Comprehensive**—The General Plan provides direction to coordinate all major components of the community's physical development.
- **General**—The General Plan's purpose is to serve as a framework for detailed public and private development proposals. It establishes requirements for additional planning studies that must be completed before modifying land-use allocations.

Contents

Two primary components constitute the City of Roseville General Plan:

- The General Plan document, which presents goals, policies, and implementation measures
- The land use map, which graphically represents the City's existing and planned land use mix and pattern.

The General Plan document is organized into nine elements. The state-mandated elements are land use, circulation, open space and conservation, safety, housing, and noise. The optional elements are air quality, parks and recreation, and public facilities. Each element includes a brief setting and outlook section describing existing conditions and critical issues for the topic area, followed by goals, policies and implementation measures. The goals state the overall desired conditions that the City would like to achieve. The policies indicate an action or direction that the City must take as a step toward achieving the goals. The implementation measures include precise actions to achieve the stated policies. The general content of each element is as follows:

- **Land Use Element** discusses existing and projected land-use conditions, land-use designations and standards, community form, community design, and growth management. The goals and policies are intended to promote a balanced land-use pattern that supports innovative land-use approaches and retains and enhances the distinct character and identity of Roseville.
- **Circulation Element** identifies the general locations and extent of existing and proposed roadways, highways, railroads, and transit routes. The element identifies policies and programs to reduce traffic congestion, promote alternative forms of transportation, and provide safe travel throughout the City.
- **Air Quality and Climate Change Element** integrates related land-use, transportation and circulation, transit, and energy issues. The policies and implementation measures are intended to improve air quality and encourage cooperation among the jurisdictions involved in regional air quality efforts.
- **Open Space and Conservation Element** provides for the conservation, development, and use of natural resources; details plans and measures for the preservation of open space; and provides for outdoor recreation, public health and safety. It is the overall goal of the element to preserve a comprehensive interconnected system of open space encompassing preservation and enhancement of natural habitat areas for the use and enjoyment of the community.
- **Parks and Recreation Element** provides goals and policies for both traditional "active" park lands and non-traditional "open space recreational" park lands. It specifies standards and conditions as guidelines for planning parks and recreation facilities, including size, type, and location.
- **Public Facilities Element** identifies facility and service needs of the community and performance standards to ensure that desired service levels are maintained. Discussed under this element are civic

facilities, libraries, schools, electric and privately owned utilities, water and wastewater systems, solid waste and recycling, water and energy conservation, and the extension of City services. Emphasis is placed on the fair-share contribution of new development toward the provision of services and facilities.

- **Safety Element** establishes standards and plans for the protection of the community from a variety of hazards, including earthquakes, flooding, crime, fire, hazardous materials, and electromagnetic fields.
- **Noise Element** establishes standards for transportation and fixed noise sources to protect the health and welfare of the community.
- **Housing Element** identifies the existing and projected housing needs and establishes goals, policies, and implementation measures for the preservation, improvement and development of housing to meet the needs of all economic sectors of the community.

Specific Plans

Roseville's specific plans are comprehensive planning documents that guide the development of defined geographic areas. Specific plans typically include more detailed information than the General Plan about land use, traffic circulation, affordable housing programs, resource management strategies, development standards and a comprehensive infrastructure plan. Specific plans currently exist for the Amoruso Ranch, Creekview, Del Webb, Downtown, Highland Reserve North, North Central Roseville, Northeast Roseville, North Industrial, North Roseville, Northwest Roseville, Riverside Gateway, Sierra Vista, Southeast Roseville, Stoneridge, West Roseville, and the Infill Area. All of these specific plans were adopted by the City Council after extensive review by City staff, commissions and the public. Specific plans contain detailed regulations, conditions, programs and design criteria unique to specific areas of the City and serve to implement the General Plan. Each specific plan includes a menu of strategies.

Development Agreements

California planning law authorizes cities and developers to enter into contracts to lock in regulations and policies governing a property. Development agreements benefit the City and its residents by detailing the developer's responsibilities for public improvements and infrastructure, such as street lights and roads. Development agreements also give developers the certainty they need to develop their property. With the obligations of both the City and the developer detailed and in writing, the project is able to move ahead smoothly with few obstacles.

Community Design Guidelines

Community design guidelines identify the City's expectations for planning, designing and reviewing development proposals in Roseville. They establish standards for high quality development and design. The community design guidelines provide design professionals, property owners, commissioners, staff, and residents with a clear and common understanding of the City's expectations for the planning, design, and review of development proposals in Roseville. They also increase the community's awareness and appreciation of design considerations.

Open Space Preserve Overarching Management Plan

In August 2011, the City of Roseville adopted an Open Space Preserve Overarching Management Plan (OSPOMP), which provides a City-wide approach to open space management, maintenance, and monitoring of the City's open space preserves. The OSPOMP also provides the same approach for the management and maintenance of open space areas outside of a preserve areas. Prior to adoption of the OSPOMP, the City managed, monitored, and provided reports to the U.S. Army Corps of Engineers for over 30 individual preserve management plans regulated by natural resource agencies, with various requirements for management and monitoring that had evolved in comprehensiveness and complexity since the 1990s. Adoption of the OSPOMP eliminates the need for additional management plans when new open space is dedicated through the development process or habitat conservation efforts.

Urban Water Management Plan

The City of Roseville Urban Water Management Plan assumes an important role in water supply planning and management. Current drought conditions have resulted in unprecedented State mandates for water conservation, and the 2015 UWMP serves as the primary compliance document for interim water use targets required by the Water Conservation Act of 2009. The primary objective of the UWMP is to provide a framework for long term water supply planning and document how urban water suppliers carry out long term resource planning responsibilities.

The 2015 UWMP describes City water system, historical and projected use, water supply sources, and a comparison of projected water supply to water demands during normal, single-dry, and multiple dry years in 5 year increments from 2020 to 2040.

Emergency Operations Plan

The City of Roseville Emergency Operations Plan (EOP) establishes an emergency management organization and assigns functions and tasks consistent with California's Standardized Emergency Management System. It provides for the integration and coordination of planning efforts of multiple jurisdictions. This plan was reviewed and approved by representatives from each City of Roseville department, local special districts with emergency services responsibilities in the City, and the Placer County Office of Emergency Services. The content is based on guidance approved and provided by the State of California and FEMA. The EOP provides direction on how to respond to an emergency from the initial onset, through an extended response, and into the recovery process.

A key element of the update process for this hazard mitigation plan was the simultaneous review of the EOP. The Steering Committee remained informed of major review findings of the EOP with an eye toward integration with key components of the hazard mitigation plan. Updates to the EOP will continue to coincide with the future updates of the multi-hazard mitigation plan.

4.9.4 Incorporation of Information into the 2016 Planning Process

Pursuant to 44 CFR §201.6(b)(3), the City of Roseville specifically reviewed certain plans and programs for inclusion into this update for the purpose of planning consistency among documents. The full capability assessment includes these reviewed plans, as well as additional regulatory, administrative, fiscal, and NFIP compliance information. Relevant information from reviewed plans, studies, reports, and technical information incorporated into the mitigation plan includes:

- **State Hazard Mitigation Plan** – The State Hazard Mitigation Plan was reviewed for recent updates on state-wide hazard events and hazard information.

- **Placer County Hazard Mitigation Plan** – The Placer County Hazard Mitigation Plan was reviewed for planning consistency and augmented hazard event history for hazards that extend beyond Roseville city limits, such as drought and severe weather.
- **General Plan and Specific Plans** – General Plan demographics and land use was cross referenced for inclusion into this Plan as part of the overall community profile. Additionally, area vulnerabilities identified in Specific Plan Areas were included as part of the vulnerability and risk assessment for wildfire, landslide, and flood. The General Plan and Specific Plans were also included as part of the capability inventory for the City's capability assessment.
- **Urban Water Management Plan** – the information provided in the City's UWMP provided the main resource for illustrating the historical and current conditions for the drought chapter. The UWMP was also included as part of the capability inventory for the City's capability assessment.
- **Open Space Preserve Overarching Management Plan** – This plan was reviewed in reference to the open space policies regarding the City's floodplain management program and the flood chapter of this Plan.
- **Emergency Operations Plan** – The EOP was reviewed to augment hazard information as it relates to response to the assessed natural hazards. Additionally, the EOP underwent a gap analysis review in coordination with the Plan development so as to identify further consistency opportunities among documents. The EOP was also included as part of the capability inventory for the City's capability assessment.
- **Additional Resources and Technical Information** – A complete listing of technical reports, research materials, and articles used during development of this Plan is found in the References section.

4.10 CAPABILITY ASSESSMENT

The planning team performed an inventory and analysis of existing authorities and capabilities called a "capability assessment." A capability assessment creates an inventory of an agency's mission, programs and policies, and evaluates its capacity to carry them out. An assessment of legal and regulatory capabilities is presented in Table 4-10. An assessment of administrative and technical capabilities is presented in Table 4-11. An assessment of fiscal capabilities is presented in Table 4-12. Information on National Flood Insurance Program compliance is presented in Table 4-13. An assessment of education and outreach capabilities is presented in Table 4-14. Classifications under various community mitigation programs are presented in Table 4-15.

Table 4-10. Legal and Regulatory Capability

	Local Authority	State or Federal Prohibitions	Other Jurisdiction Authority	State Mandated
Codes, Ordinances & Requirements				
Building Code	Y	NA	N	Y
Comments: *The 2013 California Building Standards Code was adopted by the City of Roseville and incorporated by reference into the City of Roseville Municipal Code.*				
Zoning Code	Y	NA	N	N
Comments: *RMC, Title 19*				
Subdivisions	Y	NA	N	Y
Comments: *RMC, Title 18*				
Stormwater Management	Y	NA	N	Y
Comments: *RMC, Chapter 14.20*				
Post-Disaster Recovery	N	NA	N	N
Comments: *None at this time.*				
Real Estate Disclosure	N	NA	Y	N
Comments: *California Civil Code 1102 governs real estate and various disclosure laws. It does not mandate disclosure at the local government level but does require local governments to make known information on natural hazards available to the real estate community.*				
Growth Management	Y	NA	N	Y
Comments: *Growth management strategies are incorporated into the Land Use Element of the General Plan.*				
Site Plan Review	Y	NA	N	N
Comments: *The Zoning Ordinance (RMC 19.74.010.(C)) requires a design review permit for all new construction except single-family and two-family residences. Site design, building architecture, landscape design, and lighting are reviewed through the design review permit. Design review permits are reviewed and approved by the City's Design Committee or Planning Commission.*				
Flood Damage Prevention	Y	N/A	Y	Y
Comments: *The Roseville Zoning Ordinance incorporates combining or overlay of districts to regulate floodplain development, open space preservation, and other sensitive habitat. The Flood Damage Prevention Ordinance (RMC 9.80) regulates development in special flood hazard areas. Outside agencies with jurisdiction over sensitive habitats include the U.S. Army Corps of Engineers and California Department of Fish and Wildlife.*				
Public Health and Safety	Y	NA	N	N
Comments: *RMC, Title 9 includes multiple public health and safety regulations.*				
Environmental Protection	N	NA	N	N
Comments: *None at this time.*				
Planning Documents				
General or Comprehensive Plan	Y	NA	N	Y
Is the plan equipped to provide linkage to this mitigation plan? *Yes*				
Comments: *The City's General Plan was most recently updated in 2016 and is implemented through 14 specific plans (Amoruso Ranch, Sierra Vista, Creekview, Downtown, Riverside Gateway, Southeast Roseville, Northeast Roseville, Northwest Roseville, North Central Roseville, North Roseville, Highland Reserve North, Stoneridge, Del Webb, and West Roseville) and one other planning area (North Industrial).*				
Capital Improvement Plan	Y	NA	N	N
What types of capital facilities does the plan address? Roads, water, and sewer				
How often is the plan updated? Every 2-3 Years.				
Comments: *6-year CIP*				

	Local Authority	State or Federal Prohibitions	Other Jurisdiction Authority	State Mandated
Floodplain or Basin Plan	Y	NA	N	N
Comments: *RMC 9.80 and Safety Element of the General Plan*				
Stormwater Plan	Y	NA	Y	Y
Comments: *City of Roseville 2004 Stormwater Management Plan. The plan is required by the State of California as part of the federal National Pollution Discharge Elimination System program. Outside jurisdictional authority is through the State Water Resources Control Board and Regional Water Quality Control Board (Central Valley Region).*				
Habitat Conservation Plan	N	NA	N	N
Comments: *There are no Habitat Conservation Plans within the City. However, preserve areas have been established as a condition of Section 404 permits and biological opinions of the U.S. Fish and Wildlife Service and are regulated through the City's Overarching Open Space Preserve Management Plan approved by the U.S. Fish and Wildlife Service and U.S. Army Corps of Engineers. The Open Space and Conservation Element of the City's General Plan also contains policies relative to habitat conservation.*				
Economic Development Plan	Y	NA	N	N
Comments: *Current economic development strategy was adopted by the City Council on May 23, 2012. This document will guide the City for efforts related to business attraction, retention, expansion and creation.*				
Shoreline Management Plan	Y	NA	N	Y
Comments: *This is not applicable to Roseville. Shoreline management plans are applicable to coastal communities and are incorporated into local coastal plans reviewed and approved by the California Coastal Commission.*				
Community Wildfire Protection Plan	N	NA	Y	Y
Comments:				
Response/Recovery Planning				
Comprehensive Emergency Management Plan	Y	NA	N	Y
Comments: *The City of Roseville emergency operations plan was adopted by the City Council on July 21, 2004 (Resolution #04-301) and previously updated in conjunction with the 2011 hazard mitigation plan update. The EOP was subsequently reviewed parallel to the 2016 hazard mitigation plan update. The plan is mandated by the California Office of Emergency Services.*				
Threat & Hazard Identification & Risk Assessment	N	NA	N	N
Comments:				
Terrorism Plan	Y	NA	N	N
Comments: *Terrorism Contingency Plan, 2004*				
Hazard Mitigation Plan	Y	N	N	N
Comments: *The Roseville Multi-Hazard Mitigation Plan was adopted on January 19, 2011. The City received formal approval by FEMA on March 28, 2011.*				
Post-Disaster Recovery Plan	N	NA	N	N
Comments:				
Continuity of Operations Plan	Y (partial)	NA	N	N
Comments: *The EOP contains a general overview of continuity of government and continuity of operations guidelines. The City does not have a stand-alone plan for continuity of government or continuity of operations.*				
Public Health Plan	N	NA	N	N
Comments:				

Table 4-11. Administrative and Technical Capability

Staff/ Personnel Resources	Available (Y or N)	Department or Agency (Positions)
1. Planners or engineers with knowledge of land development and land management practices	Y	Departments of Development Services, Public Works, Environmental Utilities, Electric, and Parks, Recreation & Libraries (Planners, Engineers, Landscape Architect)
2. Engineers or professionals trained in construction practices related to buildings and/or infrastructure	Y	Public Works, Development Services Department- Engineering Division (Engineering Inspectors); Building Inspection Division (Building Inspectors); Environmental Utilities Department (Engineers and Inspectors for Water/Sewer/Storm water), Parks, Recreation & Libraries (Park Development)
3. Planners or engineers with an understanding of natural hazards	Y	Development Services Department (Planners, Engineering); Public Works (Engineers); Environmental Utilities (Engineers)
4. Floodplain manager	Y	Public Works, Floodplain Management Division (Engineer)
5. Surveyors	N	No licensed surveyors on City staff. City can and has contracted for survey work on as-needed basis.
6. Personnel skilled or trained in GIS Applications	Y	Development Services Department (Business Services Technicians); Public Works (Engineering Assistants); Fire Department (GIS Analysts); Environmental Utilities Department (Mapping Manager); Information Technology Division (GIS Manager)
7. Scientist familiar with local natural hazards	N	
8. Emergency manager	Y	Fire Department (Emergency Preparedness Manager)
9. Grant writers	Y	City Manager's Office (Government Relations Manager)
10. Staff with expertise or training in benefit/cost analysis	Y	Finance Department (administration and budget); City Manager's Office (Economic Development Team); Public Works; Environmental Utilities Department; Electric Department

Table 4-12. Fiscal Capability

Financial Resources	Accessible or Eligible to Use (Y or N)
1. Community Development Block Grants	Y
2. Capital Improvements Project Funding	Y
3. Authority to Levy Taxes for Specific Purposes	Y
4. User Fees For Water, Sewer, Gas or Electric Service	Y
5. Impact Fees for Buyers or Developers of New Development/Homes	Y
6. Incur Debt through General Obligation Bonds	Y
7. Incur Debt through Special Tax Bonds	Y
8. Incur Debt through Private Activity Bonds	N
9. Could Withhold Public Expenditures in Hazard-Prone Areas	N
10. State-Sponsored Grant Programs	Y
11. Other	NA

Table 4-13. National Flood Insurance Program Compliance

Compliance Issue	Local Response
What local department is responsible for floodplain management?	City of Roseville Public Works
Who is your floodplain administrator? (department/position)	Public Works/Senior Civil Engineer
Are any certified floodplain managers on staff in your jurisdiction?	Yes
What is the date of adoption of your flood damage prevention ordinance?	2006
When was the most recent Community Assistance Visit or Community Assistance Contact?	September 10, 2014.
Does your jurisdiction have any outstanding National Flood Insurance Program compliance violations that need to be addressed?	No
Do your flood hazard maps adequately address the flood risk within your jurisdiction?	Yes
Does your floodplain management staff need any assistance or training to support its floodplain management program?	The City's floodplain management is staff is always seeking ways to expand its nationally recognized subject matter expertise in the field of floodplain management.
• **If so, what type of assistance/training is needed? .....**	For this planning performance period, the training will focus on fundamental changes to the NFIP and CRS driven by flood insurance reform.
Does your jurisdiction participate in the Community Rating System?	Yes

Table 4-14. Education and Outreach

Criteria	Response
Do you have a Public Information Officer or Communications Office?	Yes – multiple communications specialists in multiple departments. The Public Works and Fire communications specialists are heavily involved in developing and distributing mitigation-specific information.
Do you have personnel skilled or trained in website development?	Yes
Do you have hazard mitigation information available on your website?	Yes
• **If yes, please briefly describe.**	Fire Department City website contains the maintained mitigation webpage. This page includes information on the Plan, meetings, and progress reports
Do you utilize social media for hazard mitigation education and outreach?	Yes
• **If yes, please briefly describe.**	Facebook, Twitter, Nextdoor
Do you have any citizen boards or commissions that address issues related to hazard mitigation?	Yes – the Roseville Coalition of Neighborhood Associations is an active neighborhood association that participated in the 2016 Plan Steering Committee.
Do you have any other programs already in place that could be used to communicate hazard-related information?	Yes
• **If yes, please briefly describe.**	Email distribution lists, annual events (e.g. Earth Day), Neighborhood Fire Station Tours
Do you have any established warning systems for hazard events?	Yes – Alert Roseville

Table 4-15. Community Classifications

	Participating?	Classification	Date Classified
Community Rating System	Yes	1	10/01/06
Building Code Effectiveness Grading Schedule	Yes	2/2	11/28/2011
Public Protection	Yes	2	May 2015
Storm Ready	Yes	Blue	N/A
Firewise	No	N/A	N/A

Part 2. Risk Assessment

5. IDENTIFIED HAZARDS OF CONCERN AND RISK ASSESSMENT METHODOLOGY

Risk assessment is the process of measuring the potential loss of life, personal injury, economic injury, and property damage resulting from natural hazards. It allows emergency management personnel to establish early response priorities by identifying potential hazards and vulnerable assets. The process focuses on the following elements:

- **Hazard identification**—Use all available information to determine what types of disasters may affect a jurisdiction, how often they can occur, and their potential severity.
- **Vulnerability identification**—Determine the impact of natural hazard events on the people, property, environment, economy and lands of the region.
- **Cost evaluation**—Estimate the cost of potential damage or cost that can be avoided by mitigation.

The risk assessment for this hazard mitigation plan update evaluates the risk of natural hazards prevalent in the planning area and meets requirements of the DMA (44 CFR, Section 201.6(c)(2)).

5.1 IDENTIFIED HAZARDS OF CONCERN

The Steering Committee considered the full range of natural and human-caused hazards that could impact the area, and then identified and ranked the hazards that present the greatest concern. The selection of hazards of concern was based on the following criteria:

- The California State Hazard Mitigation Plan identified Placer County as being susceptible to the hazard.
- Historical occurrence of the hazard within the City of Roseville has caused fatalities, injury, or property damage.
- There is local knowledge and perception that the hazard could significantly impact the planning area, regardless of past occurrence.

Based on review of all available resources, the following hazards of concern were identified for the 2016 Plan:

- Climate change
- Dam failure
- Drought
- Earthquake
- Flooding
- Landslide
- Severe weather
- Wildfire
- Health hazards
- Human-caused hazards.

The Steering Committee did not omit any hazard commonly recognized to affect the City of Roseville.

5.2 METHODOLOGY

The risk assessments in Chapters 6 through 15 describe the risks associated with each identified hazard of concern. Each chapter describes the hazard, the planning area's vulnerabilities, and probable event scenarios. The following steps were used to define the risk of each hazard:

- **Identify and profile each hazard**—The following information is given for each hazard:
  - Geographic areas most affected by the hazard
  - Event frequency estimates
  - Severity estimates
  - Warning time likely to be available for response.
- **Determine exposure to each hazard**—Exposure was determined by overlaying hazard maps with an inventory of structures, facilities, and systems to determine which of them are within the area affected by the hazard.
- **Assess the vulnerability of exposed facilities**—Vulnerability of exposed structures and infrastructure was determined by interpreting the probability of occurrence of each event and assessing structures, facilities, and systems that are exposed to each hazard. Tools such as geographic information systems (GIS) and FEMA's hazard-modeling program called Hazus-MH were used to perform this assessment for the flood, dam failure and earthquake hazards. Outputs similar to those from Hazus-MH were generated for other hazards, using maps generated by the Hazus program.

5.3 RISK ASSESSMENT TOOLS

5.3.1 Dam Failure, Earthquake and Flood—Hazus-MH

Overview

In 1997, FEMA developed the standardized Hazards U.S., or Hazus, model to estimate losses caused by earthquakes and identify areas that face the highest risk and potential for loss. Hazus was later expanded into a multi-hazard methodology, Hazus-MH, with new models for estimating potential losses from hurricanes and floods.

Hazus-MH is a GIS-based software program used to support risk assessments, mitigation planning, and emergency planning and response. It provides a wide range of inventory data, such as demographics, building stock, critical facility, transportation and utility lifeline, and multiple models to estimate potential losses from natural disasters. The program maps and displays hazard data and the results of damage and economic loss estimates for buildings and infrastructure. Its advantages include the following:

- Provides a consistent methodology for assessing risk across geographic and political entities.
- Provides a way to save data so that it can readily be updated as population, inventory, and other factors change and as mitigation planning efforts evolve.
- Facilitates the review of mitigation plans because it helps to ensure that FEMA methodologies are incorporated.
- Supports grant applications by calculating benefits using FEMA definitions and terminology.
- Produces hazard data and loss estimates that can be used in communication with local stakeholders.
- Is administered by the local government and can be used to manage and update a hazard mitigation plan throughout its implementation.

Levels of Detail for Evaluation

Hazus-MH provides default data for inventory, vulnerability and hazards; this default data can be supplemented with local data to provide a more refined analysis. The model can carry out three levels of analysis, depending on the format and level of detail of information about the planning area:

- **Level 1**—All of the information needed to produce an estimate of losses is included in the software's default data. This data is derived from national databases and describes in general terms the characteristic parameters of the planning area.
- **Level 2**—More accurate estimates of losses require more detailed information about the planning area. To produce Level 2 estimates of losses, detailed information is required about local geology, hydrology, hydraulics and building inventory, as well as data about utilities and critical facilities. This information is needed in a GIS format.
- **Level 3**—This level of analysis generates the most accurate estimate of losses. It requires detailed engineering and geotechnical information to customize it for the planning area.

Application for This Plan

The following hazards were evaluated using Hazus-MH:

- **Flood**—A Level 2, user-defined analysis was performed for general building stock in flood zones and for critical facilities and infrastructure. Preliminary planning area flood mapping was used to delineate flood hazard areas and estimate potential losses from the 10-, 100- and 500-year flood events. To estimate damage that would result from a flood, Hazus uses pre-defined relationships between flood depth at a structure and resulting damage, with damage given as a percent of total replacement value. Curves defining these relationships have been developed for damage to structures and for damage to typical contents within a structure. By inputting flood depth data and known property replacement cost values, dollar-value estimates of damage were generated.
- **Dam Failure**—A Level 2 analysis was run for Folsom Dam using the flood methodology described above.
- **Earthquake**—A Level 2 analysis was performed to assess earthquake exposure and vulnerability for two scenario events and one probabilistic event:
    - A Magnitude-6.8 event on the Concord-Green Valley Fault with an epicenter 56 miles southwest of Roseville
    - A Magnitude-7.1 event on the Great Valley Fault with an epicenter 58 miles west northwest of Roseville
    - The standard Hazus-MH 100-year probabilistic event.

5.3.2 Landslide, Severe Weather, and Wildfire

For most of the hazards of concern, historical data was not adequate to model future losses. However, areas and inventory susceptible to some of the hazards of concern were mapped, and exposure was evaluated. For other hazards, a qualitative analysis was conducted using the best available data and professional judgment.

5.3.3 Drought

The risk assessment methodologies used for the 2016 Plan focus on damage to structures. Because drought does not impact structures, the risk assessment for drought was more limited and qualitative than the assessment for the other hazards of concern.

5.3.4 Climate Change

Climate change was addressed to different standards than the above natural hazards for the following reasons:

- Specific data needed to assess risk, such as maps of extent and location and applied damage functions, are not readily available for climate change.
- Standardized climate change models based on greenhouse gas emissions do not currently exist, resulting in a high variation of scenarios that result in differing projections. Until a standardized model is identified, climate change assessment will remain subjective.

5.3.5 Health Hazards and Human-Caused Hazards

The non-natural hazards of concern were assessed to different standards than the natural hazards for the following reasons:

- The assessment of non-natural hazards is optional under federal hazard mitigation planning requirements (44 CFR Section 201.6).
- The data needed to assess risk, such as maps of extent and location and applied damage functions, are not readily available for these types of hazards.
- A key element of risk is the probability of occurrence. Probabilities are usually assigned based on past historical occurrences. While human-caused and human health hazards have had significant impacts on our nation as a whole, they have not impacted regions of the country uniformly as do natural hazard events. The lack of record of past occurrences within a planning area makes it difficult to assign probability of occurrence.

5.4 MAPPING

A review of national, state and county databases was performed to locate available spatially based data relevant to this planning effort. Maps were produced using GIS software to show the spatial extent and location of identified hazards when such data was available. These maps are included in the hazard profile chapters of this document. Information regarding the data sources and methodologies employed in these mapping efforts is provided in the sections below.

5.4.1 Building and Cost Data

Replacement cost values and detailed structure information derived from parcel and tax assessor data provided by the City of Roseville were loaded into Hazus-MH. When available, an updated inventory was used in place of the Hazus-MH defaults for critical facilities and infrastructure.

Replacement cost is the cost to replace the entire structure with one of equal quality and utility. Replacement cost is based on industry-standard cost-estimation models published in *RS Means Square Foot Costs* (RS Means, 2015). It is calculated using the RS Means square foot cost for a structure, which is based on the Hazus-MH occupancy class (e.g., multi-family residential, commercial retail trade), multiplied by the square footage of the structure from the tax assessor data. For single-family residential, the construction class and number of stories also factor into determining the square foot costs.

5.4.2 Hazus-MH Data Inputs

The following hazard data were used for the Hazus-MH Level 2 analysis conducted for the risk assessment:

- **Flood**—The preliminary Digital Flood Insurance Rate Map (DFIRM) for the planning area – dated December 28, 2015 – was used to delineate flood hazard areas and estimate potential losses from the

100-year, 500-year and 10-year flood events. Using the DFIRM floodplain boundaries and base flood elevation information, and the Central Valley Flood Delineation Project 3-foot digital elevation model data, flood depth grids were generated and integrated into the Hazus-MH model.

- **Dam Failure**—Inundation area data from the Folsom Dam Containment Dike Failure Risk Assessment Project, provided by the City of Roseville, and the 3-foot digital elevation model were used to develop depth grids that were integrated into the Hazus-MH model.
- **Earthquake**—Earthquake shake maps and probabilistic data prepared by the U.S. Geological Survey (USGS) were used for the analysis of this hazard. A National Earthquake Hazard Reduction Program (NEHRP) soils map from the California Department of Conservation was also integrated into the Hazus-MH model.

5.4.3 Other Local Hazard Data

Locally relevant information on hazards was gathered from a variety of sources. Frequency and severity indicators include past events and the expert opinions of geologists, emergency management specialists and others. Data sources for specific hazards were as follows:

- **Landslide**—A dataset for landslide probability was created by intersecting slope data with NEHRP soils data. Three landslide probability classifications were created: high (greater than 30 percent slope, D soils), moderate (15 to 30 percent slope, D type soils), and low (0 to 15 percent slope, D type soils). The slope data were generated from the 3-foot digital elevation model. The NEHRP soils data were provided by the California Department of Conservation.
- **Severe Storm**—No GIS format severe storm area data were identified for the City of Roseville.
- **Wildfire**—California Department of Forestry and Fire Protection (CAL FIRE) fire severity data was downloaded from the CAL FIRE website.

5.4.4 Data Source Summary

Table 5-1 summarizes the data sources used for the risk assessment for this project.

5.4.5 Limitations

Loss estimates, exposure assessments and hazard-specific vulnerability evaluations rely on the best available data and methodologies. Uncertainties are inherent in any loss estimation methodology and arise in part from incomplete scientific knowledge concerning hazards and their effects on the built environment. Uncertainties also result from the following:

- Approximations and simplifications necessary to conduct a study
- Incomplete or outdated inventory, demographic, or economic parameter data
- The unique nature, geographic extent and severity of each hazard
- Mitigation measures already employed
- The amount of advance notice residents have to prepare for a specific hazard event.

These factors can result in a range of uncertainty in loss estimates, possibly by a factor of two or more. Therefore, exposure and loss estimates are approximate. These results do not predict precise results and should be used only to understand relative risk. Over the long term, the City of Roseville will collect additional data to assist in estimating potential losses associated with other hazards.

Table 5-1. Hazus-MH Model Data Documentation

Data	Source	Date	Format
Property parcel data	City of Roseville	2016	Digital (GIS) format
Address points	City of Roseville	2016	Digital (GIS) format
Building footprints	City of Roseville	2016	Digital (GIS) format
Building information[a]	City of Roseville	2016	Digital (GIS) format
Building replacement cost	RS Means	2015	Printed. Updated RS Means values
Population data	Hazus-MH v2.2	2010	Digital (GIS and tabular) format
Flood hazard data	FEMA	2015	Digital (GIS) format
First floor elevation data	City of Roseville	2011	Digital (tabular) format
Earthquake shake maps	USGS Earthquake Hazards Program website	2012	Digital (GIS) format
NEHRP Soils	California Department of Conservation	2008	Digital (GIS) format
Dam inundation area	City of Roseville	2010	Digital (GIS) format
Landslide	Tetra Tech Inc.	2016	Digital (GIS) format
Wildfire	CAL FIRE	2008	Digital (GIS) format
Digital Elevation Model	City of Roseville	2015	Digital (GIS) format
CRITICAL FACILITIES AND ASSETS			
Landmarks[b]	City of Roseville	2015	Digital (GIS) format
State and local bridges	Caltrans	2015	Digital (GIS) forma
Rail facilities	Caltrans	2015	Digital (GIS) format
Telecommunications facilities	City or Roseville	2015	Digital (GIS) format
Consolidated communications facilities	Consolidated Communications (from 2011 Hazard Mitigation Plan)	2011	Digital (GIS) format
Hazardous material facilities	U.S. EPA Toxic Release Inventory	2016	Digital (GIS) format
Potable water facilities	City of Roseville	2015	Digital (GIS) format
Sewer facilities	City of Roseville	2015	Digital (GIS) format

a. Building information includes area, occupancy, date of construction, and stories
b. Landmarks include fire stations, police stations, schools, medical care facilities, helipads, rail facilities, electric power facilities, potable water facilities, sewer facilities, and various government facilities

6. CLIMATE CHANGE CONSIDERATIONS FOR HAZARD MITIGATION

6.1 CALIFORNIA SENATE BILL NO. 379

California Senate Bill 379, adopted October 8, 2015, requires that local hazard mitigation plans adopted on or after January 1, 2017 include all of the following:

- A vulnerability assessment that identifies the risks that climate change poses to the local jurisdiction and the geographic areas at risk from climate change impacts, including but not limited to flood and fire hazards. Information available from federal, state, regional and local agencies should be used in the development of this assessment, including the following:
  - Information from the Internet-based Cal-Adapt tool
  - Information from the most recent version of the California Adaptation Planning Guide
  - Information from local agencies on the types of assets, resources, and populations that will be sensitive to various climate change exposures
  - Information from local agencies on their current ability to deal with the impacts of climate change
  - Historical data on natural events and hazards, including locally prepared maps of areas subject to previous risk, areas that are vulnerable, and sites that have been repeatedly damaged
  - Existing and planned development in identified at-risk areas, including structures, roads, utilities, and essential public facilities
  - Federal, state, regional, and local agencies with responsibility for the protection of public health and safety and the environment, including special districts and local offices of emergency services
- A set of adaptation and resilience goals, policies, and objectives based on the available information
- A set of feasible implementation measures designed to carry out the goals, policies, and objectives including, but not limited to, all of the following:
  - Feasible ways to avoid or minimize climate change impacts associated with new uses of land
  - Siting new essential public facilities outside of at-risk areas when feasible (including, but not limited to, hospitals and health care facilities, emergency shelters, emergency command centers, and emergency communications facilities) or, if these facilities are located in at-risk areas, using construction or other methods to minimize damage
  - The designation of adequate and feasible infrastructure in an at-risk area
  - Guidelines for working cooperatively with relevant local, regional, state, and federal agencies.
  - The identification of natural infrastructure that may be used in adaptation projects, where feasible. Where feasible, the plan shall use existing natural features and ecosystem processes or restore natural features and ecosystem processes, when developing alternatives for consideration.

At the time of the development of this hazard mitigation plan, guidelines and resources are still being developed to assist local governments in meeting the intent of Senate Bill No. 379. Information in this chapter addresses the issues presented and the intent of the requirements using the best currently available information. It focuses on the

vulnerability assessment of climate change as it relates to the natural hazards of concern selected by the steering committee. Goals, policies, objectives and implementation measures for climate change are incorporated into this Plan's overall mitigation goals, objectives, and actions presented in Part 3.

6.2 WHAT IS CLIMATE CHANGE?

Climate, consisting of patterns of temperature, precipitation, humidity, wind and seasons, plays a fundamental role in shaping natural ecosystems and the human economies and cultures that depend on them. "Climate change" refers to changes over a long period of time. Worldwide, average temperatures have increased 1.4ºF since 1880 (NASA, 2015). Although this change may seem small, it can lead to large changes in climate and weather.

The warming trend and its related impacts are caused by increasing concentrations of carbon dioxide and other greenhouse gases in the earth's atmosphere. Greenhouse gases are gases that trap heat in the atmosphere, resulting in a warming effect. Carbon dioxide is the most commonly known greenhouse gas; however, methane, nitrous oxide and fluorinated gases also contribute to warming. Emissions of these gases come from a variety of sources, such as the combustion of fossil fuels, agricultural production, changes in land use and volcanic eruptions. According to the U.S. Environmental Protection Agency (EPA), carbon dioxide concentrations measured about 280 parts per million (ppm) before the industrial era began in the late 1700s and have risen 43 percent since then, reaching 399 ppm in 2014 (see Figure 6-1). Scientists are able to place this rise in carbon dioxide in a longer historical context through the measurement of carbon dioxide in ice cores. According to these records, carbon dioxide concentrations in the atmosphere are the highest that they have been in 800,000 years (NASA, 2016).

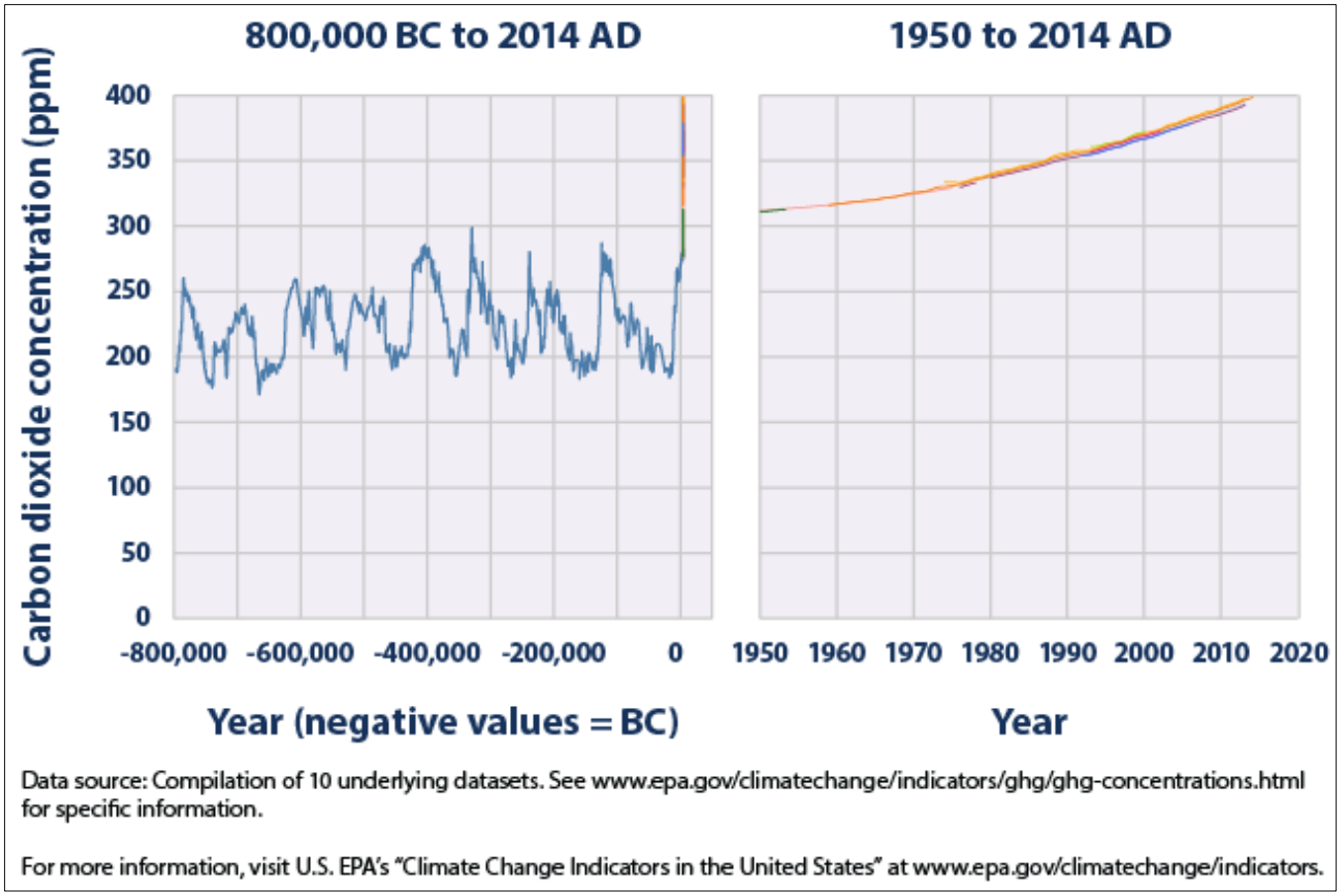


Figure 6-1. Global Carbon Dioxide Concentrations Over Time

According to NASA, most of this trend is very likely human-induced, and the rate of change has not been matched in the past 1,300 years (NASA, 2016). There is broad scientific consensus (97 percent of scientists) that climate-warming trends are very likely due to human activities (NASA, 2016). Unless emissions of greenhouse gases are substantially reduced, this warming trend and its associated impacts are expected to continue.

Climate change will affect the people, property, economy and ecosystems of the City of Roseville in a variety of ways. Climate change impacts are most frequently associated with negative consequences, such as increased flood vulnerability or increased heat-related illnesses and other public health concerns; however, other changes may present opportunities. The most important effect for the development of this Plan is that climate change will have a measurable impact on the occurrence and severity of natural hazards.

6.3 HOW CLIMATE CHANGE AFFECTS HAZARD MITIGATION

An essential aspect of hazard mitigation is predicting the likelihood of hazard events in a planning area. Typically, predictions are based on statistical projections from records of past events. This approach assumes that the likelihood of hazard events remains essentially unchanged over time. Thus, averages based on the past frequencies of, for example, floods are used to estimate future frequencies: if a river has flooded an average of once every 5 years for the past 100 years, then it can be expected to continue to flood an average of once every 5 years.

For hazards that are affected by climate conditions, the assumption that future behavior will be equivalent to past behavior is not valid if climate conditions are changing. As flooding is generally associated with precipitation frequency and quantity, for example, the frequency of flooding will not remain constant if broad precipitation patterns change over time. The risks of, landslide, severe storms, extreme heat and wildfire are all affected by climate patterns as well. For this reason, an understanding of climate change is pertinent to efforts to mitigate natural hazards. Information about how climate patterns are changing provides insight on the reliability of future hazard projections used in mitigation analysis. This chapter summarizes current understandings about climate change in order to provide a context for the recommendation and implementation of hazard mitigation measures.

6.4 CURRENT INDICATIONS OF CLIMATE CHANGE

The major scientific agencies of the United States and the world—including the National Aeronautics and Space Administration (NASA), the National Oceanic and Atmospheric Administration (NOAA) and the Intergovernmental Panel of Climate Change (IPCC)—agree that climate change is occurring. Multiple temperature records from all over the world have shown a warming trend, and the IPCC has stated that the warming of the climate system is unequivocal (IPCC, 2014). Of the 10 warmest years in the 134-year record, all but one (1998) occurred since 2000, and 2015 was the warmest year on record (NASA, 2016).

Rising global temperatures have been accompanied by other changes in weather and climate. Many places have experienced changes in rainfall resulting in more intense rain, as well as more frequent and severe heat waves (IPCC, 2014). The planet's oceans and glaciers have also experienced changes: oceans are warming and becoming more acidic, ice caps are melting, and sea levels are rising (NASA, 2016). Global sea level has risen 6.7 inches, on average, in the last 100 years (NASA, 2016). This has already put some coastal homes, beaches, roads, bridges, and wildlife at risk (USGCRP, 2009).

NASA currently maintains information on the vital signs of the planet and has identified the following trends as of the time of the development of this Plan (NASA, 2016):

- Carbon Dioxide—Increasing trend, currently at 403.28 parts per million
- Global Temperature—Increasing trend, increase of 1.4ºF since 1880
- Arctic Ice Minimum—Decreasing trend, 13.4 percent per decade

- Land Ice—Decreasing trend, 287.0 billion metric tons per year
- Sea Level—Increasing trend, 3.4 mm per year.

6.5 PROJECTED FUTURE IMPACTS

Climate change projections contain inherent uncertainty because they are dependent on future greenhouse gas emission scenarios. Different climate change models may assume different scenarios, resulting in differing projections. Generally, the uncertainty is addressed by developing projections for a range of scenarios: in low-emissions scenarios, greenhouse gas emissions are assumed to be reduced substantially from current levels; in high-emissions scenarios, they are assumed to increase or continue at current levels. Despite these uncertainties, climate change projections present valuable information to help guide decision-making for the future.

The Third National Climate Assessment Report for the United States indicates that impacts resulting from climate change will continue through the 21st century and beyond. Although not all changes are understood at this time and the impacts of those changes will depend on global emissions of greenhouse gases and sensitivity in human and natural systems, the following impacts are expected in the United States (NASA, 2016):

- Temperatures will continue to rise
- Growing seasons will lengthen
- Precipitation patterns will change
- Droughts and heat waves will increase
- Hurricanes will become stronger and more intense
- Sea level will rise 1 to 4 feet by 2100
- The Arctic may become ice free.

The California Climate Adaptation Planning Guide outlines the following climate change impact concerns for the North Sierra Region communities (Cal EMA et al., 2012):

- Increased temperature
- Decreased precipitation
- Reduced snowpack
- Reduced tourism
- Ecosystem change
- Sensitive species stress
- Increased wildfire.

Cal-Adapt, a publicly available resource, offers information on how climate change might impact local communities. It presents visualization tools that present the most current data available whenever possible. The following sections summarize projections by Cal-Adapt for the Roseville area's local climate.

6.5.1 Precipitation

According to Cal-Adapt, precipitation projections for California remain uncertain. Models show differing impacts from slightly wetter winters to slightly drier winters, with potential for a 10- to 20-percent decrease in total annual precipitation (Cal-Adapt, 2016). Changes in precipitation patterns, coupled with warmer temperatures, may lead to significant changes in hydrology. In high-emissions scenarios, more precipitation may fall as rain rather than snow, and snow may melt earlier in the season, impacting the timing of stream flow changes and floods (Cal-Adapt, 2016).

6.5.2 Temperature

The historical average (1961-1990) temperature in the Roseville area is 61.7ºF. By 2090, the average temperature in the City is expected to increase above this baseline in the low- and high-emissions scenarios by 3.8ºF and 6.5ºF, respectively, as shown in Figure 6-2.

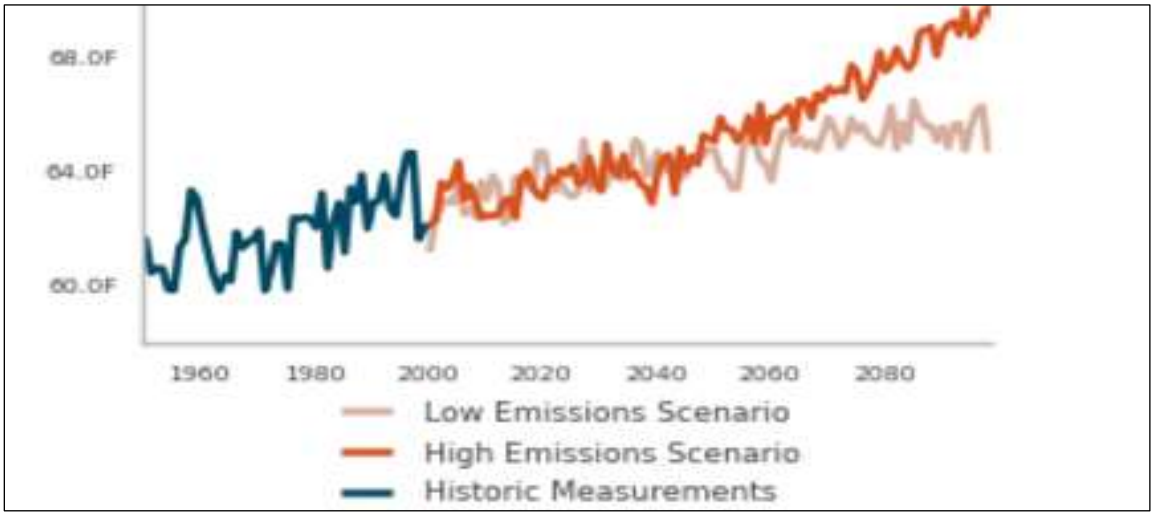


Figure 6-2. Observed and Projected Average Temperatures in the Roseville Area

6.5.3 Snow Pack

While there are no snow-water equivalency measurements for the Roseville area, Cal-Adapt indicates that some parts of California should expect snow pack levels to be reduced by up to 25 inches from the baseline (1961-1990) by 2090.

6.5.4 Wildfire

Wildfire risk is expected to change in the coming decades. Under the high-emissions scenario, the fire risk in Placer County may increase by 1.86 times the current risk by 2085, while the risk may be 1.31 times the current risk for the low-emissions scenario (see Figure 6-3).

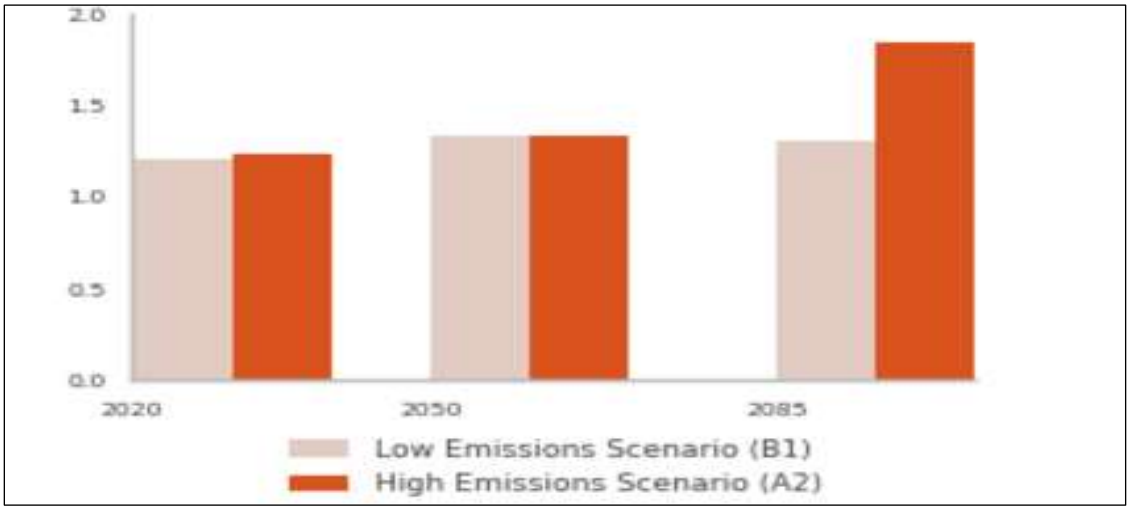


Figure 6-3. Projected Future Fire Risk in Placer County Relative to 2010 Levels

6.6 RESPONSES TO CLIMATE CHANGE

Communities and governments worldwide are working to address, evaluate and prepare for climate changes that are likely to impact communities in coming decades. Societies across the world are facing the need to adapt to changing conditions associated with natural disasters and climate change. Farmers are altering crops and agricultural methods to deal with changing rainfall and rising temperature; architects and engineers are redesigning buildings; planners are looking at managing water supplies to deal with droughts or flooding.

6.6.1 Mitigation and Adaptation

Generally, climate change discussions encompass two separate but inter-related considerations: mitigation and adaptation. The term "mitigation" can be confusing, because it's meaning changes across disciplines:

- Mitigation in climate change discussions is defined as "a human intervention to reduce the impact on the climate system." It includes strategies to reduce greenhouse gas sources and emissions and enhance greenhouse gas sinks (EPA, 2013).
- Mitigation in emergency management is typically defined as the effort to reduce loss of life and property by lessening the impact of disasters (FEMA, 2016a).
- Mitigation in restoration ecology and related fields generally refers to policies, programs or actions that are intended to reduce or to offset the negative impacts of human activities on natural systems. Generally, mitigation can be understood as avoiding, minimizing, rectifying, reducing or eliminating, or compensating for known impacts (U.S. DOT, n.d.).

In this chapter, mitigation is used as defined by the climate change community. In the other chapters of this Plan, mitigation is primarily used in an emergency management context.

Adaptation is defined by the IPCC as adjusting to actual or expected climate and its effects. It includes efforts to moderate or avoid harm to human systems or take advantage of beneficial opportunities. It also includes human intervention to help natural systems adjust to expected climate change (IPCC, 2014).

Mitigation and adaptation are related, as the world's ability to mitigate greenhouse gas emissions will affect the degree of adaptation that will be necessary. Some initiatives and actions can both reduce greenhouse gas emissions and support adaptation to likely future conditions.

6.6.2 Ecosystem-Based Adaptation

Ecosystem-based adaptation is the use of biodiversity and ecosystem services as part of an overall strategy to help people adapt to the adverse effects of climate change. This includes the sustainable management, conservation and restoration of specific ecosystems that provide key services. Most ecosystems show a remarkable ability to adapt to change and to buffer surrounding areas from the impacts of change. Forests can bind soils and hold large volumes of water during times of plenty, releasing it through the year; floodplains can absorb vast volumes of water during peak flows; coastal ecosystems can hold out against storms, attenuating waves and reducing erosion. Other ecosystem services—such as food provision, timber, materials, medicines and recreation—can provide a buffer to societies in the face of changing conditions.

6.6.3 City of Roseville Sustainability Efforts

The City of Roseville has taken steps to reduce the impacts of climate change through greenhouse gas mitigation and community sustainability efforts:

- The City of Roseville's general plan highlights existing policies and programs that either reduce greenhouse gas emissions or assist in protecting residents from the potential adverse impacts of climate change (City of Roseville, 2016).
- In 2009, the City Council adopted the City-operations Climate Action Plan, which set a greenhouse gas emission reduction goal of 22.8 percent (City of Roseville, n.d.).
- In 2010 the Community-wide Sustainability Action Plan was developed, recommending 11 steps to reach the greenhouse gas emission targets. (City of Roseville, 2010a).

6.7 CLIMATE CHANGE IMPACTS ON HAZARDS

The following sections provide information on how each identified hazard of concern for this planning process may be impacted by climate change. They describe how these impacts may alter current exposure and vulnerability to these hazards of the people, property, critical facilities and environment in the City of Roseville. Detailed hazard profiles and risk assessment information on each hazard of concern are presented in Chapters 7 through 15.

6.7.1 Drought

Impacts on Hazard

The long-term effects of climate change on regional water resources are unknown, but global water resources are already experiencing the following stresses without climate change:

- Growing populations
- Increased competition for available water
- Poor water quality
- Environmental claims
- Uncertain reserved water rights
- Groundwater overdraft
- Aging urban water infrastructure.

With a warmer climate, droughts could become more frequent, more severe, and longer-lasting. According to the National Climate Assessment Report, higher surface temperatures caused by global warming increase the potential for drought. Evaporation and the higher rate at which plants lose moisture through their leaves both increase with temperature. Unless higher evapotranspiration rates are matched by increases in precipitation, areas become more dry, promoting drought conditions (Globalchange.gov, 2014).

Because expected changes in precipitation patterns are still uncertain, the potential impacts and likelihood of drought are uncertain. California DWR has already noted the impact of climate change on statewide water resources by charting changes in snowpack, sea level, and river flow. As temperatures rise and more precipitation comes in the form of rain instead of snow, these changes will likely continue or grow even more significant. DWR estimates that the Sierra Nevada snowpack, which supplies water for the City of Roseville and other parts of the state, will experience a 48- to 65-percent loss by the end of the century, based on historical April 1 averages (CA DWR 2016). Increasing temperatures may also increase net evaporation from reservoirs by 15 to 37 percent (CA DWR 2013).

Population

Population exposure and vulnerability to drought are unlikely to increase as a result of climate change. While greater numbers of people may need to engage in behavior change, such as water saving efforts, significant life or health impacts are unlikely.

Property

Property exposure and vulnerability may increase as a result of increased drought resulting from climate change, although this would most likely occur in non-structural property such as landscaping. It is unlikely that structure exposure or vulnerability would increase as a direct result of drought, although secondary impacts of drought, such as wildfire, may increase and threaten structures.

Critical Facilities

Critical facility exposure and vulnerability are unlikely to increase as a result of increased drought resulting from climate change; however, critical facility operators may need to alter standard management practices and actively manage resources, particularly in water-related service sectors.

Environment

The vulnerability of the environment may increase as a result of increased drought resulting from climate change. Ecosystems and biodiversity in the Roseville area are already under stress from development and water diversion. Prolonged or more frequent drought resulting from climate change may further stress the ecosystems in the region, which include many special status species (Cal EMA et al., 2012).

6.7.2 Earthquake

Impacts on Hazard

The impacts of global climate change on earthquake probability are unknown. Some scientists say that melting glaciers could induce tectonic activity. As ice melts and water runs off, tremendous amounts of weight are shifted on the earth's crust. As newly freed crust returns to its original, pre-glacier shape, it could cause seismic plates to slip and stimulate volcanic activity, according to research into prehistoric earthquakes and volcanic activity. NASA and USGS scientists found that retreating glaciers in southern Alaska may be opening the way for future earthquakes (NASA, 2004).

Secondary impacts of earthquakes could be magnified by climate change. Soils saturated by repetitive storms or heavy precipitation could experience liquefaction or an increased propensity for slides during seismic activity due to the increased saturation. Dams storing increased volumes of water due to changes in the hydrograph could fail during seismic events.

Population, Property, Critical Facilities and the Environment

Because impacts of climate change on the earthquake hazard are not well understood, increases in exposure and vulnerability of the local resources are not able to be determined.

6.7.3 Flood

Impacts on Hazard

Use of historical hydrologic data has long been the standard of practice for designing and operating water supply and flood protection projects. For example, historical data are used for flood forecasting models and to forecast snowmelt runoff for water supply. This method of forecasting assumes that the climate of the future will be similar to that of the period of historical record. However, the hydrologic record cannot be used to predict changes in frequency and severity of extreme climate events such as floods. Going forward, model calibration or statistical relation development must happen more frequently, new forecast-based tools must be developed, and a standard of practice that explicitly considers climate change must be adopted. Climate change is already impacting water resources, and resource managers have observed the following:

- Historical hydrologic patterns can no longer be solely relied upon to forecast the water future.
- Precipitation and runoff patterns are changing, increasing the uncertainty for water supply and quality, flood management and ecosystem functions.
- Extreme climatic events will become more frequent, necessitating improvement in flood protection, drought preparedness and emergency response.

The amount of snow is critical for water supply and environmental needs, but so is the timing of snowmelt runoff into rivers and streams. Rising snowlines caused by climate change will allow more mountain areas, such as the Sierra Nevada watersheds, to contribute to peak storm runoff. High frequency flood events (e.g. 10-year floods) in particular will likely increase with a changing climate. Along with reductions in the amount of the snowpack and accelerated snowmelt, scientists project greater storm intensity, resulting in more direct runoff and flooding. Changes in watershed vegetation and soil moisture conditions will likewise change runoff and recharge patterns. As stream flows and velocities change, erosion patterns will also change, altering channel shapes and depths, possibly increasing sedimentation behind dams, and affecting habitat and water quality. With potential increases in the frequency and intensity of wildfires due to climate change, there is potential for more floods following fire, which increase sediment loads and water quality impacts.

As hydrology changes, what is currently considered a 1-percent-annual-chance (100-year) flood may strike more often, leaving many communities at greater risk. Planners will need to factor a new level of safety into the design, operation, and regulation of flood protection facilities such as dams, bypass channels and levees, as well as the design of local sewers and storm drains.

Population and Property

Population and property exposure and vulnerability may increase as a result of climate change impacts on the flood hazard. Runoff patterns may change, resulting in flooding in areas where it has not previously occurred.

Critical Facilities

Critical facility exposure and vulnerability may increase as a result of climate change impacts on the flood hazard. Runoff patterns may change, resulting in risk to facilities that have not historically been at risk from flooding. Additionally, changes in the management and design of flood protection critical facilities may be needed as additional stress is placed on these systems.

Environment

The exposure and vulnerability of the environment may increase as a result of climate change impacts on the flood hazard. Changes in the timing and frequency of flood events may have broader ecosystem impacts that alter the ability of already stressed species to survive.

6.7.4 Landslide

Impacts on Hazard

Climate change may impact storm patterns, increasing the probability of more frequent, intense storms with varying duration. Increase in global temperature is likely to affect the snowpack and its ability to hold and store water. Warming temperatures also could increase the occurrence and duration of droughts, which would increase the probability of wildfire, reducing the vegetation that helps to support steep slopes. All of these factors would increase the probability for landslide occurrences.

Population and Property

Population and property exposure and vulnerability would be unlikely to increase as a result of climate change impacts on the landslide hazard. Landslide events may occur more frequently, but the extent and location should be contained within mapped hazard areas.

Critical Facilities

Critical facility exposure and vulnerability would be unlikely to increase as a result of climate change impacts on the landslide hazard; however, critical facility owners and operators may experience more frequent disruption to service provision as a result of landslide hazards. For example, transportation systems may experience more frequent delays if slides blocking these systems occur more frequently.

Environment

Exposure and vulnerability of the environment would be unlikely to increase as a result of climate change, but more frequent slides in riverine systems may impact water quality and have negative impacts on already stressed species.

6.7.5 Severe Weather

Impacts on Hazard

Climate change presents a challenge for risk management associated with severe weather. The frequency of severe weather events has increased steadily over the last century. The number of weather-related disasters during the 1990s was four times that of the 1950s, and cost 14 times as much in economic losses. Historical data shows that the probability of severe weather events increases in a warmer climate.

An increase in average surface temperatures can also lead to more intense heat waves that can be exacerbated in urbanized areas by what is known as urban heat island effect. Evidence suggests that heat waves are already increasing, especially in western states. According to information on Cal-Adapt, extreme heat days in Roseville (103ºF is the extreme heat day threshold) are likely to increase from a historical average for four days annually. This increase would be coupled with an increase in heat waves and warm nights (67ºF threshold).

Population and Property

For the most part, population and property exposure and vulnerability would be unlikely to substantially increase as a direct result of climate change impacts on the severe weather hazard. Severe weather events may occur more frequently. Disproportionately impacted populations such as the elderly or disadvantaged communities that have substandard living arrangements (homeless populations, etc.) would have a potential for increased exposure and vulnerability from severe weather. Secondary impacts, such as the extent of localized flooding, may increase, thus impacting greater numbers of people and structures.

Critical Facilities

Critical facility exposure and vulnerability would be unlikely to increase as a result of climate change impacts on the severe weather hazard; however, critical facility owners and operators may experience more frequent disruption to service provision. For example, more frequent and intense storms may cause more frequent disruptions in power service.

Environment

Exposure and vulnerability of the environment would be unlikely to increase as a result of climate change impacts on the severe weather hazard; however, more frequent storms and heat events and more intense rainfall may place additional stressors on already stressed systems.

6.7.6 Wildfire

Impacts on Hazard

Wildfire is determined by climate variability, local topography, and human intervention. Climate change has the potential to affect multiple elements of the wildfire system: fire behavior, ignitions, fire management, and vegetation fuels. Hot dry spells create the highest fire risk. Increased temperatures may intensify wildfire danger by warming and drying out vegetation. Additionally, changes in climate patterns may impact the distribution and perseverance of insect outbreaks that create dead trees (increase fuel). When climate alters fuel loads and fuel moisture, forest susceptibility to wildfires changes. Climate change also may increase winds that spread fires. Faster fires are harder to contain, and thus are more likely to expand into residential neighborhoods.

Population, Property and Critical Facilities

According to the Cal-Adapt projections, wildfire risk in the areas surrounding the City of Roseville is expected to increase by 2085. Larger, more frequent fires may impact people, property and critical facilities by increasing the risk of ignition from nearby fire sources. Additionally, secondary impacts such as air quality issues may increase.

Environment

It is possible that the exposure and vulnerability of the environment will be impacted by impacts on wildfire risk from climate change. Natural fire regimes may change, resulting in more frequent or higher intensity burns. These impacts may alter the composition of the ecosystems in areas in and around Roseville.

7. DAM FAILURE

7.1 GENERAL BACKGROUND

7.1.1 Causes of Dam Failure

Dam failures can be catastrophic to human life and property downstream. Dam failures in the United States typically occur in one of four primary ways:

- Overtopping of the primary dam structure, which accounts for 34 percent of all dam failures, can occur due to inadequate spillway design, settlement of the dam crest, blockage of spillways, and other factors.
- Foundation defects due to differential settlement, slides, slope instability, uplift pressures, and foundation seepage can also cause dam failure. These account for 30 percent of all dam failures.
- Failure due to piping and seepage accounts for 20 percent of all failures. These are caused by internal erosion due to piping and seepage, erosion along hydraulic structures such as spillways, erosion due to animal burrows, and cracks in the dam structure.
- Failure due to problems with conduits and valves, typically caused by the piping of embankment material into conduits through joints or cracks, constitutes 10 percent of all failures.

The remaining 6 percent are due to other miscellaneous causes. Many of the historical dam failures in the United States have been secondary results of other disasters. The prominent causes are earthquakes, landslides, extreme storms, massive snowmelt, equipment malfunction, structural damage and foundation failures.

The most likely disaster-related causes of dam failure in Placer County and the Roseville vicinity are earthquakes, excessive rainfall, and landslides. Poor construction, lack of maintenance and repair, and deficient operational procedures are preventable or correctable by a program of regular inspections. Terrorism and vandalism are serious concerns that all operators of public facilities must plan for; these threats are under continuous review by public safety agencies.

DEFINITIONS

Dam—Any artificial barrier, together with appurtenant works, that does or may impound or divert water, and that either (a) is 25 feet or more in height from the natural bed of the stream or watercourse at the downstream toe of the barrier (or from the lowest elevation of the outside limit of the barrier if it is not across a stream channel or watercourse) to the maximum possible water storage elevation; or (b) has an impounding capacity of 50 acre-feet or more. (CA Water Code, Division 3.)

Dam Failure—An uncontrolled release of impounded water due to structural deficiencies in dam.

Emergency Action Plan—A formal document that identifies potential emergency conditions at a dam and specifies actions to be followed to minimize property damage and loss of life. The plan specifies actions the dam owner should take to alleviate problems at a dam. It contains procedures and information to assist the dam owner in issuing early warning and notification messages to responsible downstream emergency management authorities of the emergency situation. It also contains inundation maps to show emergency management authorities the critical areas for action in case of an emergency. (FEMA 2013)

High Hazard Dam—Dams where failure or improper operation will probably cause loss of human life. (FEMA 2004)

Significant Hazard Dam—Dams where failure or improper operation will result in no probable loss of human life but can cause economic loss, environmental damage or disruption of lifeline facilities, or can impact other concerns. Significant hazard dams are often located in rural or agricultural areas but could be located in areas with population and significant infrastructure. (FEMA 2004)

7.1.2 Regulatory Oversight

The potential for catastrophic flooding due to dam failures led to passage of the National Dam Safety Act (Public Law 92-367). The National Dam Safety Program requires a periodic engineering analysis of every major dam in the country. The goal of this FEMA-monitored effort is to identify and mitigate the risk of dam failure so as to protect the lives and property of the public.

National Dam Safety Act

The potential for catastrophic flooding due to dam failures led to passage of the National Dam Safety Act (Public Law 92-367). The National Dam Safety Program requires a periodic engineering analysis of every major dam in the country. The goal of this FEMA-monitored effort is to identify and mitigate the risk of dam failure so as to protect the lives and property of the public. The National Dam Safety Program is a partnership between the states, federal agencies, and other stakeholders that encourages individual and community responsibility for dam safety. Under FEMA's leadership, state assistance funds have allowed all participating states to improve their programs through increased inspections, emergency action planning, and the purchase of needed equipment. FEMA has also expanded existing training programs and initiated new ones. Grant assistance from FEMA provides support for improvement of dam safety programs that regulate most of the dams in the United States (FEMA 2015).

California Division of Safety of Dams

California's Division of Safety of Dams (a division of the Department of Water Resources) monitors dam safety at the state level. When a new dam is proposed, Division engineers and geologists inspect the site and the subsurface. Upon submittal of an application, the Division reviews the plans and specifications prepared by the owner to ensure that the dam is designed to meet minimum requirements and that the design is appropriate for the known geologic conditions. After approval of the application, the Division inspects all aspects of the construction to ensure that the work is done in accordance with the approved plans and specifications. After construction, the Division inspects each dam on an annual basis to ensure that it is performing as intended and is not developing problems. Roughly a third of these inspections include in-depth instrumentation reviews. The Division periodically reviews the stability of dams and their major appurtenances in light of improved design approaches and requirements, as well as new findings regarding earthquake hazards and hydrologic estimates in California (CA DWR, 2016a).

U.S. Army Corps of Engineers Dam Safety Program

The U.S. Army Corps of Engineers is responsible for safety inspections of some federal and non-federal dams in the United States that meet the size and storage limitations specified in the National Dam Safety Act. The Corps has inventoried dams; surveyed each state and federal agency's capabilities, practices and regulations regarding design, construction, operation and maintenance of the dams; and developed guidelines for inspection and evaluation of dam safety (U.S. Army Corps of Engineers, 2011).

Federal Energy Regulatory Commission Dam Safety Program

The Federal Energy Regulatory Commission (FERC) has the largest dam safety program in the United States. The FERC cooperates with a large number of federal and state agencies to ensure and promote dam safety and, more recently, homeland security. Approximately 3,000 dams that are part of regulated hydroelectric projects are in the FERC program. Two-thirds of these dams are more than 50 years old. As dams age, concern about their safety and integrity grows, and oversight and a regular inspection program are extremely important. FERC staff inspects hydroelectric projects on an unscheduled basis to investigate the following:

- Potential dam safety problems
- Complaints about constructing and operating a project

- Safety concerns related to natural disasters
- Issues concerning compliance with the terms and conditions of a license.

Every five years, an independent consulting engineer, approved by the FERC, must inspect and evaluate projects with dams higher than 32.8 feet, or with a total storage capacity of more than 2,000 acre-feet.

FERC staff monitors and evaluates seismic research in geographic areas such as California where there are concerns about possible seismic activity. This information is applied in investigating and performing structural analyses of hydroelectric projects in these areas. FERC staff also evaluates the effects of potential and actual large floods on the safety of dams. During and following floods, FERC staff visits dams and licensed projects, determines the extent of damage, if any, and directs any necessary studies or remedial measures the licensee must undertake. The FERC publication *Engineering Guidelines for the Evaluation of Hydropower Projects* guides the FERC engineering staff and licensees in evaluating dam safety. The publication is frequently revised to reflect current information and methodologies.

The FERC requires licensees to prepare emergency action plans and conducts training sessions on how to develop and test these plans. The plans outline an early warning system if there is an actual or potential sudden release of water from a dam due to failure or accident. The plans include operational procedures that may be used, such as reducing reservoir levels and reducing downstream flows, as well as procedures for notifying affected residents and agencies responsible for emergency management. These plans are frequently updated and tested to ensure that everyone knows what to do in emergency situations.

7.2 HAZARD PROFILE

7.2.1 Past Events

According to the Placer County Multi-Hazard Mitigation Plan, there have been five dam failures in Placer County (none are known to have impacted the Roseville planning area):

- **Hell Hole Dam Failure**—In 1964, construction of the Hell Hole Dam was underway and the contractor had stopped operations for the winter. A major storm event in December caused the Hell Hole Reservoir to fill, and since the dam was not completed, it failed, sending a considerable amount of water toward Auburn. The water washed out a bridge on Highway 49 over the American River at the confluence of the North and Middle Forks and flooded a quarry. Due to the way the construction contract was worded, the contractor had to rebuild the dam at his own expense. As a result, Placer County incurred no costs related to this event. No claims for damage were filed against the Placer County Water Agency (PCWA) by either the quarry owner or the state.
- **1986 Auburn Coffer Dam Failure**—As a result of area flooding, the Coffer Dam at Auburn breached and partially washed away. The U.S. Bureau of Reclamation had designed the Coffer Dam for a controlled failure by building a soft earthen plug into the dam for this purpose. It appears the dam failed as designed.
- **August 2004 Ralston Dam Release Gate Break—**A broken release gate on Ralston Dam in the Middle Fork of the American River prompted the National Weather Service to issue a flash flood warning in Placer County. According to the PCWA, the gate near the Ralston Powerhouse malfunctioned, and the sudden release of water from Ralston Reservoir south of Auburn sent a wall of water 3 to 4 feet high down the river. The volume of water released was 800 to 1,000 acre-feet. Sheriff's deputies and California Highway Patrol officers alerted campers in the Auburn State Recreation Area to move to higher ground. The CHP monitored the muddy water as it approached Highway 49. There were no reports of injuries or damage along the river, which is popular with rafters, kayakers and residents during summer.

- **August 2009 Cottonwood Dam**—A privately owned and constructed dam on Miners Ravine in the Hidden Valley Estates subdivision (the Auburn Folsom Road and Twin Rocks Road area of Granite Bay), failed and leached flows and sediment into Miners Ravine. NOAA Fisheries quickly became involved because of the impacts on critical fish species. A temporary fix—a notch in the concrete portion of the dam—was approved and made while the homeowners association and interested agencies determined next steps. A dam removal project with creek restoration is now being proposed.
- **January 2016 Folsom Dam**—Seepage occurred at the Folsom cofferdam during final construction of the new Folsom Dam Auxiliary Spillway on January 20, 2016. The seepage was in the spillway basin. At no time was there a threat of a dam failure.

7.2.2 Location

According to the California Division of Safety of Dams, as of 2014 there are 45 dams in Placer County. Of these, the western levees along Folsom Lake, which is a reservoir lined by a series of containment dikes, have the potential to significantly impact the City of Roseville in the event of a failure. Another dam, the Miners Ravine Detention Facility located near Roseville's eastern boundary, has the potential to adversely impact Roseville should it fail. Table 7-1 provides summary information about these two facilities.

Table 7-1. Dams in Placer and Sacramento Counties With Potential to impact Roseville

Name	Hazard Class[a]	Water Course	Owner	Year Built	Dam Type	Crest Length (feet)	Height (feet)	Storage Capacity (acre-feet)	Drainage area (sq. mi.)
Folsom	1A	American River	US Bureau of Reclamation	1956	Gravity	102,000	275	975,000	1,885
Miners Ravine Detention Facility	1B	Dry Creek	Placer County Flood & Water Conservation District	2007	Earthen	2000	22.5	120	14

a. Downstream Hazard Class 1A: > 300 lives at risk, 1B: 31 to 300 lives at risk, 1C: 7 to 30 lives at risk

7.2.3 Frequency

Dam failure events are infrequent and usually coincide with the events that cause them, such as earthquakes, landslides and excessive rainfall and snowmelt. There is a "residual risk" associated with dams; residual risk is the risk that remains after safeguards have been implemented. For dams, the residual risk is associated with events beyond those that the facility was designed to withstand. However, the probability of occurrence of any type of dam failure event is considered to be low in today's regulatory and dam safety oversight environment.

7.2.4 Severity

Dam failure can be catastrophic to all life and property downstream. The U.S. Army Corps of Engineers developed the classification system shown in Table 7-2 for the hazard potential of dam failures.

7.2.5 Warning Time

Warning time for dam failure varies depending on the cause of the failure. In events of extreme precipitation or massive snowmelt, evacuations can be planned with sufficient time. In the event of a structural failure due to earthquake, it is possible that there would be no warning time.

Table 7-2. Hazard Potential Classification

Hazard Category[a]	Direct Loss of Life[b]	Lifeline Losses[c]	Property Losses[d]	Environmental Losses[e]
Low	None (rural location, no permanent structures for human habitation)	No disruption of services (cosmetic or rapidly repairable damage)	Private agricultural lands, equipment, and isolated buildings	Minimal incremental damage
Significant	Rural location, only transient or day-use facilities	Disruption of essential facilities and access	Major public and private facilities	Major mitigation required
High	Certain (one or more) extensive residential, commercial, or industrial development	Disruption of essential facilities and access	Extensive public and private facilities	Extensive mitigation cost or impossible to mitigate

a. Categories are assigned to overall projects, not individual structures at a project.
b. Loss of life potential based on inundation mapping of area downstream of the project. Analyses of loss of life potential should take into account the population at risk, time of flood wave travel, and warning time.
c. Indirect threats to life caused by the interruption of lifeline services due to project failure or operational disruption; for example, loss of critical medical facilities or access to them.
d. Damage to project facilities and downstream property and indirect impact due to loss of project services, such as impact due to loss of a dam and navigation pool, or impact due to loss of water or power supply.
e. Environmental impact downstream caused by the incremental flood wave produced by the project failure, beyond what would normally be expected for the magnitude flood event under which the failure occurs.

Source: U.S. Army Corps of Engineers, 1995

A dam's structural type also affects warning time. Earthen dams do not tend to fail completely or instantaneously. Once a breach is initiated, discharging water erodes the breach until either the reservoir water is depleted or the breach resists further erosion. Concrete gravity dams also tend to have a partial breach as one or more monolith sections formed during dam construction are forced apart by the escaping water. The time for breach formation ranges from a few minutes to a few hours (U.S. Army Corps of Engineers, 2011).

The City has established protocols for flood warning and response to imminent dam failure in the flood warning portion of its adopted emergency operations plan.

7.2.6 Folsom Dam Containment Dike Failure Risk Assessment

During the 2005 review of the initial Roseville Hazard Mitigation Plan, FEMA Region IX plan reviewers indicated that there was sufficient risk of dam failure of the western dikes on Folsom Lake (see Figure 7-1) to warrant treating dam failure as a stand-alone hazard in the City's next hazard mitigation plan update. Six dikes, increasing in size and numeric designation (from 1 to 6) from north to south, fill gaps along the western edge of Folsom Lake.

Because there was insufficient data to assess risk to the standards established for the other hazards in the hazard mitigation plan, the City developed a comprehensive, scenario-based risk assessment of the western dikes on the Folsom Dam complex during the 2011 Plan update. Detailed inundation modeling and mapping performed as part of this assessment are available to inform the City's preparedness and response to a dam breach of the Folsom Lake containment dike system. The maps are not presented in this Plan for security purposes. Figure 7-2 shows mapping that has been created by the City to inform citizens of the direction of flow and possible routes for evacuation during a dam failure event.

Source: United States Army Corps of Engineers, Michael Nevins [Public domain], via Wikimedia Commons

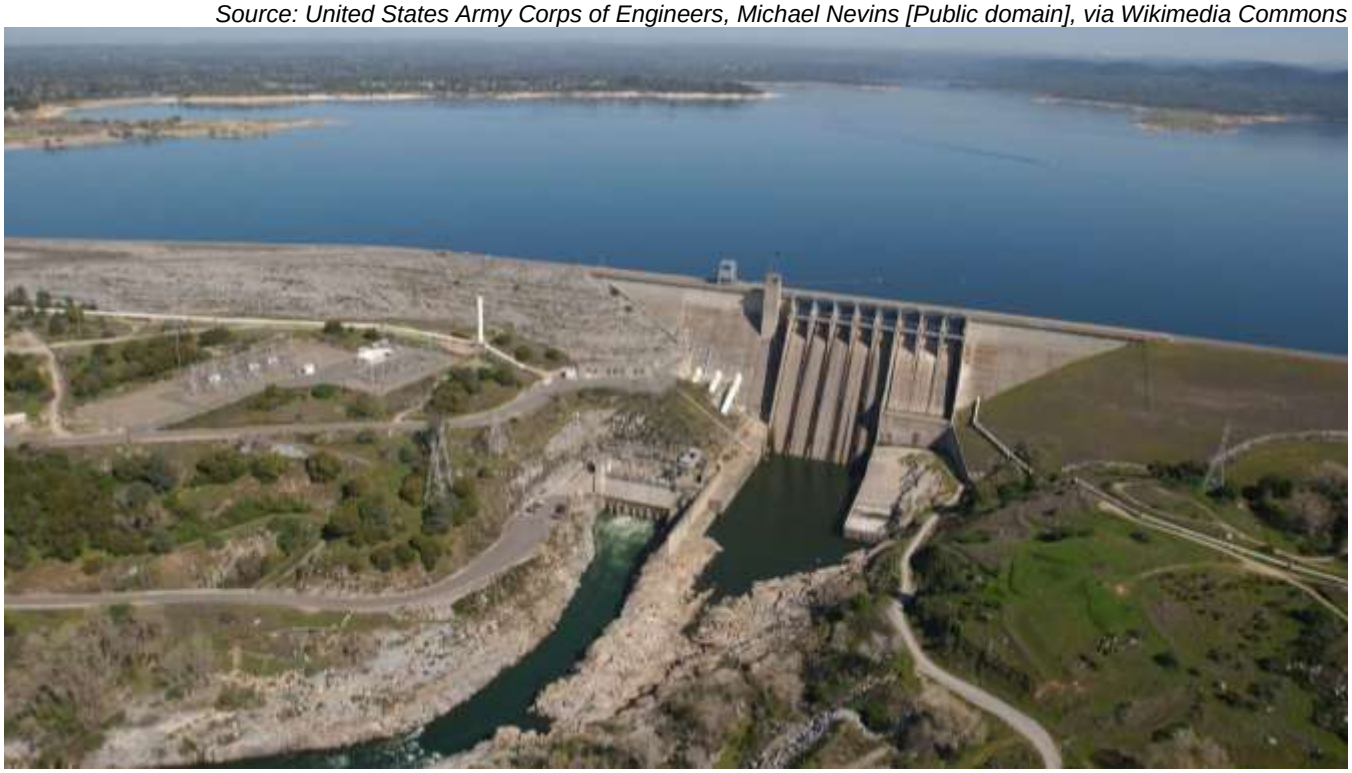


Figure 7-1. Folsom Dam and Folsom Lake on the American River, Looking Northeast

The study provided inundation mapping to determine the probable impact of flooding in Roseville if any of the western dikes were to fail. It addressed the relative risk of failure of each dike based on the frequency with which the dikes impound water, the potential for overtopping, the recent and in-progress work to upgrade the dikes to reduce the risk of failure due to piping, and a new reservoir spillway that is under construction. Models were prepared to simulate dike failures and resulting inundation. These simulations provide the basis for inundation area mapping and other emergency management tools such as maps that illustrate the time from failure to flooding.

The northernmost dikes are relatively low height embankments above the normal operating range of the lake. Though the occurrence of inundation due to dam failure is based on extremely remote conditions, failure of these facilities has the potential to cause significant property damage and loss of life in the City. The degree of impact would be affected by the water level of the lake at the time of failure, which could be just above the top of the dikes in the case of failure by overtopping. The study mapped the maximum depth of flooding and the timing of the flood wave from the time of failure for various scenarios. The study found that flood depths could reach as much as 58 feet in parts of the City.

7.3 SECONDARY HAZARDS

Dam failure can cause severe downstream flooding depending on the magnitude of the failure. Other potential secondary hazards of dam failure include landslides around the reservoir perimeter, bank erosion on the rivers, and destruction of downstream habitat.

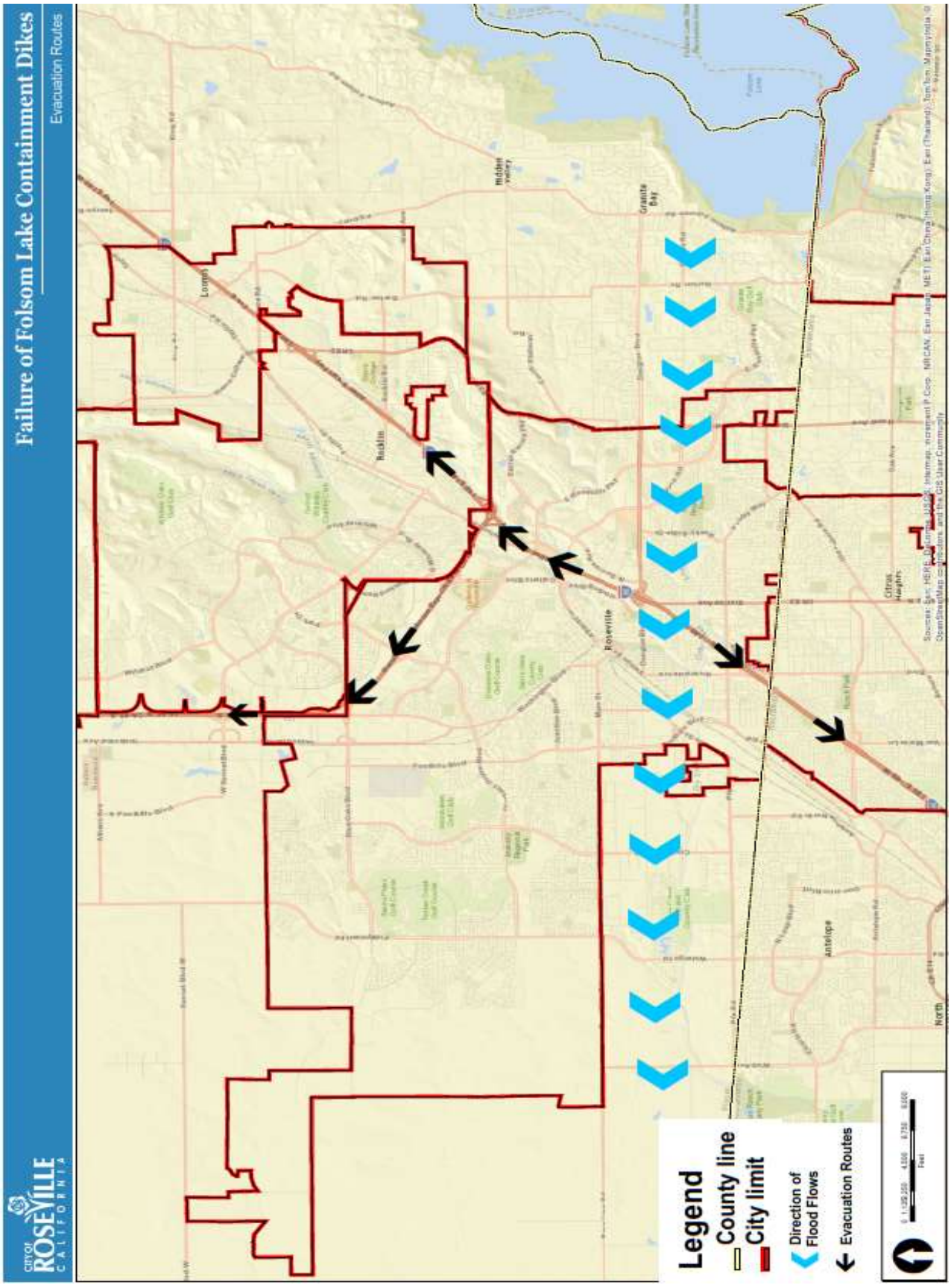


Figure 7-2. Folsom Dam Containment Dike Failure Flow Direction and Evacuation Routes

7.4 EXPOSURE

The flood module of HAZUS-MH was used for a Level 2 assessment of dam failure risk exposure and vulnerability for facilities in Roseville with sufficient data to support modeling. HAZUS-MH uses census data at the block level and FEMA floodplain data, which has a level of accuracy acceptable for planning purposes. Where possible, the HAZUS-MH data for this risk assessment was enhanced using GIS data from county, state and federal sources. The exposure and vulnerability analyses focused on inundation data from the Folsom Dam Containment Dike Failure Risk Assessment.

7.4.1 Population

All populations located in a dam failure inundation zone would be exposed to the risk of a dam failure. The estimated population living in the Folsom Dam failure inundation area is 55,858, or 43.4 percent of the City's population.

7.4.2 Property

The HAZUS-MH model estimated that there are 20,303 structures within the Folsom Dam failure inundation areas. It is estimated that 18,746 or 92 percent, of these structures are residential. The value of exposed buildings in the planning area was generated using HAZUS-MH and is summarized in Table 7-3. This methodology estimated $11 billion worth of building-and-contents exposure to Folsom Dam failure inundation, representing 37.1 percent of the total assessed value of the planning area.

Table 7-3. Value of Property Exposed to Dam Failure

Type	Number of Buildings Exposed	Value Exposed			% of Total Assessed Value
		Building	Contents	Total	
Residential	18,746	$4,877,113,351	$2,438,892,264	$7,316,005,614	39.13%
Commercial	1,017	$1,197,859,838	$1,253,661,717	$2,451,521,555	29.63%
Industrial	260	$210,792,151	$239,393,311	$450,185,463	38.79%
Religion	53	$86,626,396	$86,626,396	$173,252,792	69.13%
Government	18	$19,135,549	$19,135,549	$38,271,098	22.66%
Education	209	$284,707,447	$284,707,447	$569,414,895	52.17%
Total	**20,303**	**$6,676,234,732**	**$4,322,416,685**	**$10,998,651,417**	**37.11%**

7.4.3 Critical Facilities

GIS analysis was used to determine the number of critical facilities in the mapped dam failure inundation areas. As Table 7-4 shows, 96 of the planning area's critical facilities (55.8 percent) are in the inundation areas.

Table 7-4. Critical Facilities in Dam Failure Inundation Areas in Roseville

Medical & Health Services	Government Function	Protective Function	Schools	Hazmat	Other Critical Function	**Total**
0	17	8	25	0	46	**96**

7.4.4 Environment

Reservoirs held behind dams affect many ecological aspects of a river. River topography and dynamics depend on a wide range of flows, but rivers below dams often experience long periods of very stable flow conditions or saw-

tooth flow patterns caused by releases followed by no releases. Water releases from a reservoir, including those exiting a turbine, usually contain very little suspended sediment; this can lead to scouring of river beds and loss of riverbanks.

The environment would be exposed to a number of risks in the event of dam failure. The inundation could introduce many foreign elements into local waterways. This could result in destruction of downstream habitat and could have detrimental effects on many species of animals, especially endangered species such as salmon.

7.5 VULNERABILITY

7.5.1 Population

Vulnerable populations are all populations downstream from dam failures that are incapable of escaping the area within the allowable time frame. This population includes the elderly and young who may be unable to get themselves out of the inundation area. The vulnerable population also includes those who would not have adequate warning from a television or radio emergency warning system. The potential for loss of life is affected by the capacity and number of evacuation routes available to populations living in areas of potential inundation.

7.5.2 Property

Vulnerable properties are those closest to the dam failure inundation area. These properties would experience the largest, most destructive surge of water. Low-lying areas are also vulnerable since they are where the dam waters would collect. Transportation routes are vulnerable to dam failure inundation and have the potential to be wiped out, creating isolation issues. This includes all roads, railroads and bridges in the path of the dam failure inundation. Those that are most vulnerable are those that are already in poor condition and would not be able to withstand a large water surge. Utilities such as overhead power lines, cable and phone lines could also be vulnerable. Loss of these utilities could create additional isolation issues for the inundation areas.

It is estimated that there could be up to $4.46 billion of loss from a dam failure affecting the planning area. This represents 40.5 percent of the total exposure within the inundation area, or 15.0 percent of the total assessed value of the planning area. Table 7-5 summarizes the loss estimates for dam failure.

Table 7-5. Loss Estimates for Dam Failure

	Value Exposed			% of
	Building Loss	Contents Loss	**Total Loss**	Total Assessed Value
Residential	$1,550,424,727	$933,258,844	$2,483,683,571	13.28%
Commercial	$456,285,740	$844,987,114	$1,301,272,854	15.73%
Industrial	$84,633,925	$203,408,629	$288,042,554	24.82%
Religion	$34,364,944	$72,524,654	$106,889,598	42.65%
Government	$11,072,696	$16,609,362	$27,682,057	16.39%
Education	$82,091,723	$166,677,363	$248,769,086	22.79%
Total	**$2,218,873,754**	**$2,237,465,967**	**$4,456,339,721**	**15.03%**

7.5.3 Critical Facilities

HAZUS estimated that critical facilities would receive an average of 40 percent damage to the structure and an average 70 percent damage to the contents during a dam failure event. The estimated functional down-time to restore these facilities to 100 percent of their functionality is 700 days.

7.5.4 Environment

The environment would be vulnerable to a number of risks in the event of dam failure. The inundation could introduce foreign elements into local waterways, resulting in destruction of downstream habitat and detrimental effects on many species of animals, especially endangered species such as coho salmon. The extent of the vulnerability of the environment is the same as the exposure of the environment.

7.6 FUTURE TRENDS IN DEVELOPMENT

All land use decision-making is guided by the goals, policies and implementation measures contained in the Land Use Element of Roseville's General Plan. The Safety Element of the General Plan establishes standards and plans for the protection of the community from hazards. Dam failure is currently not addressed as a stand-alone hazard in the Safety Element, but flooding is. The City has established comprehensive policies regarding sound land use in identified flood hazard areas. Most of the areas vulnerable to the more severe impacts from the bank-full Folsom Dam failure scenario intersect the City's flood hazard areas. Flood-related policies in the General Plan will help to reduce the risk associated with the dam failure hazard for all future development within the City.

The dam failure risk exposure with in the planning area increased by 22% at an increase in value of over $2 billion dollars. This increase in risk exposure can be attributed to the vast extent and location of the dam failure hazard, and a population growth rate of 14.5% over the performance period of the prior plan. The planning area also saw in increase in assessed valuation of real property of over 34%. This increase in value can be attributed to the continued economic recovery from the 2008 economic down turn that had a significant impact on the State of California as well as the City of Roseville. Any increase in asset value will increase risk quotient when risk is being measured by looking at assets exposed as is with this plan.

While the exposure went up within the dam failure inundation area, the loss estimation from Hazus decreased by over 28%. This decrease in vulnerability could be attributed to 2 factors. The first factor is that the new construction that has occurred during the performance period for the plan was built to high code standards that reduce the risk. While the City of Roseville does not have specific standards adopted specifically for the dam failure inundation area, their adopted improvements standards applied city-wide do include several higher standards that would reduce flood risk within a dam failure inundation area. The second factor could be due to the increased accuracy of the Hazus model. For this update, the digital elevation model used in Hazus was developed using LiDAR data available to the City. The accuracy of the Digital Elevation Model (DEM) for this update should be cons9dered more accurate than the DEM from the last update. It is logical to assume that both of these factors plan a role in the reduced vulnerability for the planning area.

7.7 REVIEW OF EXISTING ORDINANCES, PROGRAMS AND PLANS

Since most of the dam failure inundation areas overlay the regulated floodplain within the planning area, ordinances and programs in Chapter 4 are applicable to this hazard. The extent of dam failure inundation as well as the estimated flood depths significantly exceed those projected for flooding. Future revisions to the flood programs may want to consider the potential impacts of dam failure in their scope, even though the statistical probability of such an event is low.

7.8 SCENARIO

According to the 2011Folsom Dam Containment Dike Failure Risk Assessment Project, the worst-case scenario would be a bank-full failure of Dikes 4, 5 and 6 due to overtopping. Overtopping flows may quickly erode the top and downstream portions of the dikes, causing failure. Therefore, there is a possibility of simultaneous failure due to overtopping. However, the likelihood of reservoir inflows that could cause overtopping is extremely low. The

completion of the new Folsom Dam spillway in early 2016 decreased the likelihood even further. Failure from piping could occur at any water surface elevation within the reservoir.

An earthquake within the region could lead to liquefaction of soils around the dams. This could occur without warning during any time of the day. A human-caused failure such as a terrorist attack also could trigger a catastrophic failure of a dam that impacts the planning area.

7.9 ISSUES

The most significant issue associated with dam failure involves the properties and populations in the inundation zones. Flooding as a result of a dam failure would significantly impact these areas. There is often limited warning time for dam failure. These events are frequently associated with other natural hazard events such as earthquakes, landslides or severe weather, which limits their predictability and compounds the hazard. Another significant issue is the loss of the City's primary potable water supply source if the dam were to fail (not overtop). The City would have to rely on significant water demand reductions, interties with other water agencies not dependent on Folsom and groundwater wells to provide some level of water supply to the community. Other important issues associated with dam failure include the following:

- Federally regulated dams have an adequate level of oversight and sophistication in the development of emergency action plans for public notification in the unlikely event of failure. However, the protocol for notification of downstream citizens of imminent failure needs to be tied to local emergency response planning.
- Mapping for federally regulated dams is already required and available; however, mapping that estimates inundation depths is needed for dams that are not federally regulated, in order to better assess the risk associated with failure of these facilities.
- Most dam failure mapping required at federal levels requires determination of the probable maximum flood. While the probable maximum flood represents a worst-case scenario, it is generally the event with the lowest probability of occurrence. For dams that are not federally regulated, mapping of failure scenarios that are less extreme than the probable maximum flood but have a higher probability of occurrence can be valuable to downstream community officials and emergency managers. This type of mapping can illustrate areas potentially impacted by more frequent events to support emergency response and preparedness actions.
- The concept of residual risk associated with structural flood control projects should be considered in the design of capital projects and the application of land use regulations.
- Addressing security concerns and the need to inform the public of the risk associated with dam failure is a challenge for public officials.

8. DROUGHT

8.1 GENERAL BACKGROUND

Most of California's precipitation comes from storms moving across the Pacific Ocean. The path followed by the storms is determined by the position of an atmospheric high pressure belt that normally shifts southward during the winter, allowing low-pressure systems to move into the state. On average, 75 percent of California's annual precipitation occurs between November and March, with 50 percent occurring between December and February. If a persistent Pacific high-pressure zone takes hold over California mid-winter, there is a tendency for the water year to be dry.

DEFINITIONS

Drought—The cumulative impacts of several dry years on water users. It can include deficiencies in surface and subsurface water supplies and generally impacts health, well being, and quality of life.

Hydrological Drought—Deficiencies in surface and subsurface water supplies.

A typical water year produces about 100 inches of rainfall over the North Coast, 50 inches of precipitation (combination of rain and snow) over the Northern Sierra, 18 inches in the Sacramento area, and 15 inches in the Los Angeles area. In extremely dry years, these annual totals can fall to as little as half, or even one-third of these amounts.

Rain and snowfall in the American River watershed eventually flow into Folsom Lake, a reservoir within the U.S. Central Valley Project. These flows directly affect water availability for Roseville water users. The City of Roseville owns the Roseville water system and water treatment plant and has negotiated contracts with the U.S. Bureau of Reclamation, the Placer County Water Agency (PCWA), and the San Juan Water District (SJWD) to ensure that water needs are met for existing and future growth.

Roseville is largely urbanized with little agricultural interests remaining. Lack of sufficient water supply would affect residents and businesses that rely on water for their daily household, employee, and industrial needs.

8.1.1 Water Supply Strategy

The water supply strategy for the City of Roseville uses a comprehensive approach to ensure water reliability for customers. The City has a diverse set of water supply options—including surface water contracts, recycled water, and groundwater wells—to ensure that even following a period of dry years, a combination of available water supplies and water conservation measures will meet the community's water needs. The City has contracts for surface water with three agencies (see Table 8-1):

- The primary water contract is with the U.S. Bureau of Reclamation (USBR) for 32,000 acre-feet per year of surface water from Folsom Lake.
- The City also has a contract with PCWA for 30,000 acre-feet of water from PCWA's American River Middle Fork Project. The City has a long-term agreement with the USBR to wheel PCWA water supplies through Folsom Reservoir for delivery to the City's water treatment plant.

Table 8-1. City of Roseville Water Supply Contracts and Resources

Source	Contract Amount (acre-feet per year) [a]	Supply Projections [b]				
		2020	2025	2030	2035	2040
U.S. Bureau of Reclamation	32,000	32,000	32,000	32,000	32,000	32,000
San Juan Water District	4,000	4,000	4,000	4,000	4,000	4,000
Placer County Water Agency		20,000	30,000	30,000	30,000	30,000
Treated Water (Additional Future Purchase)	N/A	0	0	1,500	1,500	1,500
Exercised	10,000					
Two additional options	20,000					
Placer County Water Agency Total	***30,000***					
Recycled Water	N/A	*4,421*	*4,791*	*5,259*	*5,643*	*5,958*
Total	**66,000**	**60,421**	**70,791**	**72,759**	**73,143**	**73,458**

a. N/A = Not Applicable based on future contract or existing recycled resources
b. Based on reasonable available volume.

- The third source of surface water for the City of Roseville is an additional 4,000 acre-feet of PCWA water transferred through SJWD. SJWD is a water district in Sacramento and Placer Counties that draws water from Folsom Lake. SJWD also wholesales water to Citrus Heights Water District, Fair Oaks Water District and Orangevale Water Company in Sacramento County. The City of Roseville has entered into a reallocation agreement with SJWD for this 4,000 acre-feet per year, which is a normal-year water supply only—it is not available for use during drought conditions.
- With the approval of the Amoruso Ranch Specific Plan, the City is pursuing an additional contract through PCWA, through its planned Ophir Water Treatment Plant facility. This new source and supply of water will not be dependent on Folsom Lake deliveries and will increase water reliability citywide. It is not subject to cutbacks during dry or driest years, and is estimated to provide 1,500 acre-feet of additional supply once the plant is on line.
- The City maintains six groundwater wells for emergency and dry-year supply, with plans to install 10 more in coming years as new development progresses. All wells are equipped for aquifer storage and recovery.

8.1.2 Water Supply Infrastructure

The City of Roseville Water Treatment Plant is on Barton Road east of Roseville. Constructed in 1971, the plant treats water from Folsom Lake to Environmental Protection Agency (EPA) domestic drinking water standards. The City owns a water system network consisting of water mains ranging from 4 to 66 inches in diameter. The system is designed to deliver an adequate supply of water throughout the community at an acceptable pressure level for domestic and fire flow purposes. A booster pump station near East Roseville Parkway and North Sunrise Boulevard is designed to provide sufficient water pressure to the higher elevations of the City and to fill and manage reservoirs in the system. Some areas within the Roseville city limits are served by PCWA, SJWD, or the City of Citrus Heights where topography and facility locations make it beneficial to do so.

The City maintains the capability to supplement its water supply in drought conditions with groundwater wells. These wells are planned to be used primarily to offset surface water cutbacks in times of drought or other emergencies. The City's groundwater wells are equipped to implement aquifer storage and recovery, in which potable water can be injected into the underground aquifers in wet years and recovered in dry years for public use. In addition, the City operates a recycled water system to lessen the use of potable water for irrigating landscaped areas.

8.1.3 The Water Forum

The Water Forum is a group of business and agricultural leaders, citizens groups, environmentalists, water managers, and local governments originally formed in Sacramento County. Water managers in Placer and El Dorado Counties joined the group in 1995. The City of Roseville is a member of the Water Forum and a signatory to the January 2000 Water Forum Agreement. The agreement provides a framework for how future surface water and groundwater supplies will be used in the region through 2040.

Although Roseville's water contract entitlements total 66,000 acre-feet per year, the City's diversions from the American River are limited by the Water Forum Agreement. In normal/wet years, the City has agreed to limit diversions from the American River to 58,900 acre-feet per year. In driest years (also called critically dry years), the maximum diversion from the American River is 39,800 acre-feet. In drier years, the City may divert between 39,800 and 54,900 acre-feet, depending on the unimpaired flow into Folsom Lake.

During the drier and driest years, the City agreed to have PCWA release an additional 20,000 acre-feet per year of water down the American River on the City's behalf through re-operation of PCWA's American River Middle Fork Project. This is not part of the City's contracted supply of 66,000 acre-feet per year. The intent of Middle Fork Project re-operational releases during drier and driest years is to mitigate environmental impacts resulting from increased diversions above 1995 baseline levels.

Roseville's water supply contracts, in combination with future planned supply sources, base level conservation measures, and groundwater resources, ensure that the City is well positioned to meet projected water needs.

8.1.4 Local Water Contracts—Definition of Drought

Roseville's drought levels are defined by the 2000 Water Forum agreement. The definition is based on the type of hydrologic year for inflow to Folsom Lake, as defined by 70 years of hydrologic data into the lake. The hydrological year types are as follows:

- **Baseline**—Baseline means the maximum amount of water that suppliers diverted from the American River in any one year through 1995 or, in certain instances, other amounts specified in a Purveyor Specific Agreement. For the City of Roseville, the baseline amount is 19,800 acre-feet per year.
- **Normal/Wet Years**—When the projected unimpaired flow into Folsom Reservoir is greater than or equal to 950,000 acre-feet
- **Drier Years**—When the projected unimpaired flow into Folsom Reservoir is between 400,00 acre-feet and 950,000 acre-feet
- **Driest Years**—When the projected unimpaired flow into Folsom Reservoir is less than 400,000 acre-feet.

Dry years over the 85-year hydrologic record are listed in Table 8-2, excluding the driest years. The driest years for American River flows in the Folsom Lake vicinity were 1924, with 379,000 acre-feet of unimpaired inflow to Folsom Lake, 1977, with 332,000 acre-feet, and 2015, with 321,000 acre-feet.

Table 8-2. Dry Year Flows into Folsom Lake

Year	Unimpaired Inflow to Folsom Lake (acre-feet)	Year	Unimpaired Inflow to Folsom Lake (acre-feet)
1931	571,000	1987	705,000
1934	690,000	1988	545,000
1939	873,000	1990	873,000
1959	872,000	1992	631,000
1961	854,000	1994	649,000
1976	518,000	2013	778,000
1981	881,000	2014	682,000

8.2 HAZARD PROFILE

Droughts originate from a deficiency of precipitation resulting from an unusual weather pattern. If the weather pattern lasts a short time (a few weeks or a couple months), the drought is considered short-term. If the weather pattern becomes entrenched and the precipitation deficits last for several months or years, the drought is considered long-term. It is possible for a region to experience a long-term pattern that produces drought, and to have short-term changes that result in wet spells within the long-term pattern. Likewise, it is possible for a long-term wet pattern to be interrupted by weather spells that result in short-term drought. Droughts typically occur after two or three years of below-average rainfall for the period from November to March.

8.2.1 Past Events

State of California

The California Department of Water Resources has state hydrologic data back to the early 1900s (http://watersupplyconditions.water.ca.gov). The hydrologic data show multi-year droughts from 1912 to 1913, 1918 to 1920 and 1922 to 1924. Since then, three prolonged periods of drought occurred in California:

- **1929 to 1934 Drought**—The 1929 to 1934 drought established the criteria for designing the supply and yield of many large Northern California reservoirs. The Sacramento Valley runoff was 55 percent of average for the time period from 1901 to 1996, with only 9.8 million acre-feet received.
- **1975 to 1977 Drought**—California had one of its most severe droughts due to lack of rainfall during the winters of 1976 and 1977. 1977 was the driest period on record in California, with the previous winter recorded as the fourth driest in California's hydrological history. The cumulative impact led to widespread water shortages and severe water conservation measures throughout the state. Only 37 percent of the average Sacramento Valley runoff was received, with just 6.6 million acre-feet recorded. Over $2.6 billion in crop damage was recorded in 31 counties. A federal disaster declaration was declared in Placer County and surrounding counties.
- **1987 to 1992 Drought**—California received precipitation well below average levels for four consecutive years. While the Central Coast was most affected by the lack of rainfall and low runoff, the Sierra Nevada range in Northern California and Central Valley counties including Placer County were also affected. During this drought, only 56 percent of average runoff for the Sacramento Valley was received, totaling just 10 million acre-feet. By February 1991, all 58 counties in California were suffering from drought conditions. Urban areas as well as rural and agricultural areas were impacted.
- **2012 to 2016 (Ongoing) Drought**—California's current drought has set several records for the state:
  - The period from 2012 to 2014 ranked as the driest three consecutive years for statewide precipitation.
  - 2014 set new climate records for statewide average temperatures and for record-low water allocations in the State Water Project and federal Central Valley Project.
  - 2013 set minimum annual precipitation records for many communities.

  On January 17, 2014 the governor declared a state of emergency for drought throughout California. This declaration followed release of a report that stated that California had had the least amount of rainfall in its 163-year history. Californians were asked to voluntarily reduce their water consumption by 20 percent. Drought conditions worsened into 2015. On April 1, 2015, following the lowest snowpack ever recorded, the governor announced actions to save water, increase enforcement to prevent wasteful water use, streamline the state's drought response, and invest in new technologies to make California more drought-resilient. The governor directed the State Water Resources Control Board to implement mandatory water reductions in cities and towns across California to reduce water usage by 25 percent on average. The City of Roseville was assigned a 28-percent water conservation target by the State Water Resources Control

Board. The City exceed its water conservation goal. Total impacts of the drought cannot be determined until after its conclusion.

Placer County

The following additional drought impacts have affected Placer County:

- **1977**—A federal disaster declaration was made as a result of a drought affecting Placer and surrounding counties. The PCWA declared a water shortage and restricted water use for both irrigation and treated water users. The restrictions included a 50-percent reduction in water usage by customers and rate increases. This shortage lasted until January 1978 when the PCWA terminated its restrictions.
- **1988**—Again the PCWA declared a water emergency. All customers had their water use reduced by 25 percent, and rates were again increased for excessive usage. The countywide emergency prohibited washing of sidewalks, driveways, parking lots and other hard surfaces, restricted the washing of vehicles, airplanes, and trailers to 3 gallons of water, prohibited fire hydrant flushing and drills, prohibited filling of pools, and prohibited new agricultural land irrigation.
- **1991—**Raw water customers had their water usage reduced by 50 percent annually and by 25 percent seasonally. Treated water users were given most of the same restrictions and prohibitions as in 1988. Due to a very late storm season, the emergency was lifted by April 1991.
- **2008—**The Governor of California declared a drought on June 4, 2008. In July 2009, PCWA reported the implementation of normal ongoing conservation measures.
- **2014—**On February 6, 2014, PCWA adopted a resolution declaring a water shortage emergency. This is the most recent declaration from PCWA. It was rescinded in February 2016.

Roseville Drought History

Roseville's drought history parallels the water shortages for the State of California and Placer County. The Roseville City Council has declared official drought alerts three times:

- From April 1991 to March 1993 when Stage 2 drought water restrictions were in effect and enforced through full-time water patrols
- In May 2008 when the City of Roseville's Environmental Utilities Department activated a Stage 1 drought alert
- In 2014, when the City enacted a Stage 3 drought alert asking residents to reduce water demand by 28 percent compared to 2013 water use.

In response to the 2014 drought, the City of Roseville took a proactive approach to water conservation. The City enacted water waste patrols, limited watering for residential and non-residential customers to specific days of the week depending on the time of year, and enacted funding for utility support. With a 2015 reduction target of 278 gallons per capital per day, Roseville's conservation efforts resulted in an actual accomplishment of 165 gallons per capital per day, far exceeding goals and expectations (Roseville, 2015a).

8.2.2 Location

The National Oceanic and Atmospheric Administration (NOAA) has developed several indices to measure drought impacts and severity and to map their extent and locations:

- The ***Palmer Crop Moisture Index*** measures short-term drought on a weekly scale and is used to quantify drought's impacts on agriculture during the growing season. Figure 8-1 shows this index for the week ending January 30, 2016.
- The ***Palmer Z Index*** measures short-term drought on a monthly scale. Figure 8-2 shows this index for December 2015.

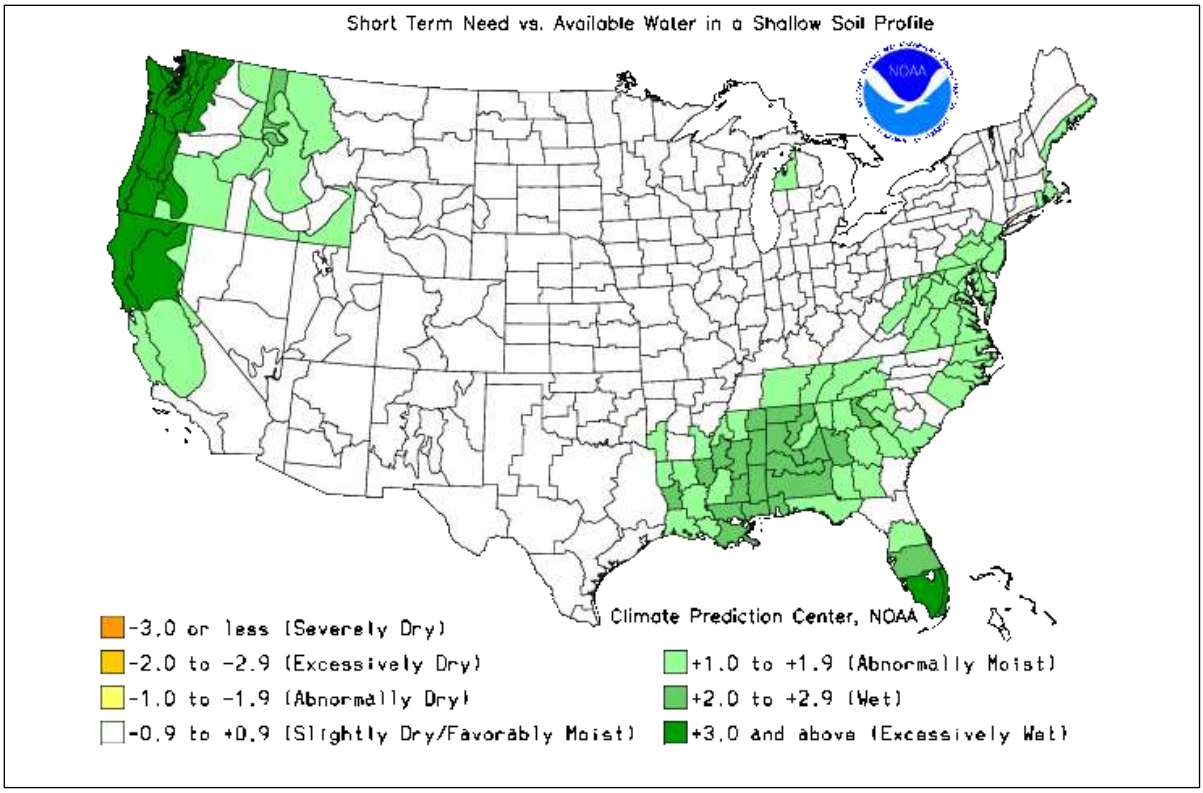


Figure 8-1. Palmer Crop Moisture Index for Week Ending January 30, 2016

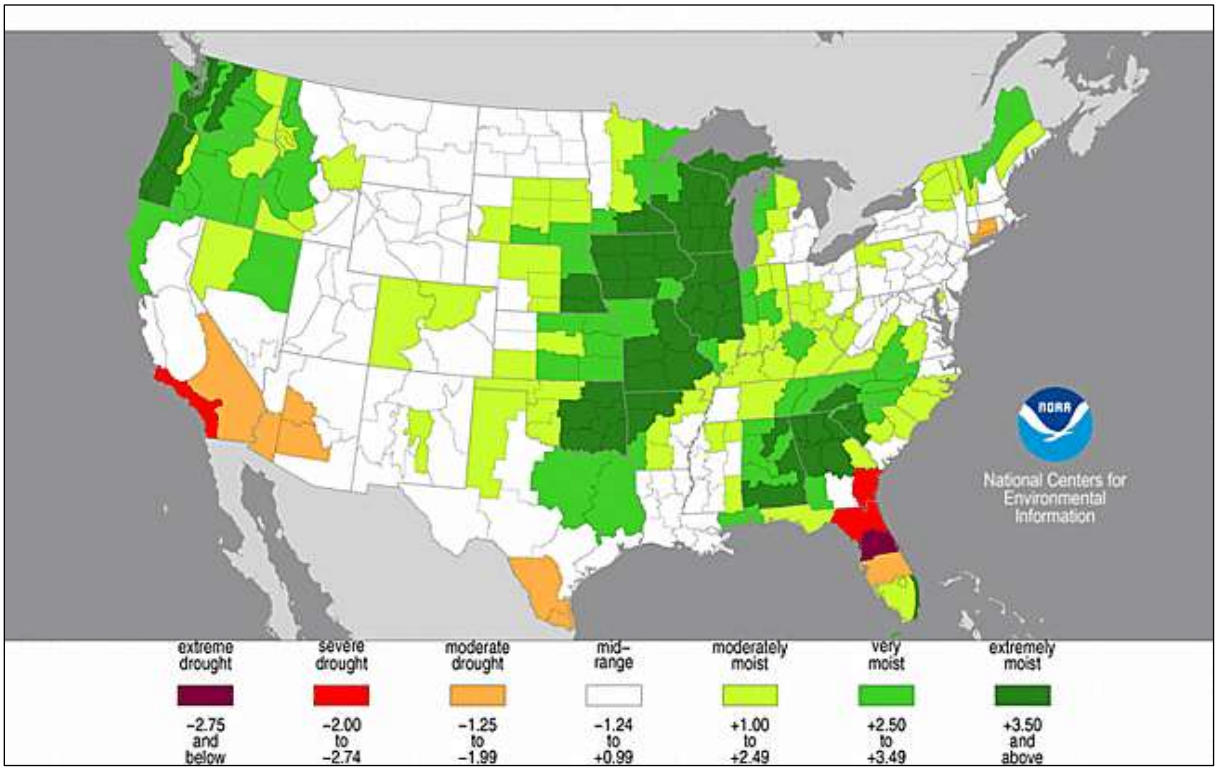


Figure 8-2. Palmer Z Index Short-Term Drought Conditions (December 2015)

- The ***Palmer Drought Index*** measures the duration and intensity of long-term drought-inducing circulation patterns. Long-term drought is cumulative, so the intensity of drought during a given month is dependent on the current weather patterns plus the cumulative patterns of previous months. Weather patterns can change quickly from a long-term drought pattern to a long-term wet pattern, and the Palmer Drought Index can respond fairly rapidly. Figure 8-3 shows this index for January 2016.
- The hydrological impacts of drought (e.g., reservoir levels, groundwater levels, etc.) take longer to develop and it takes longer to recover from them. The ***Palmer Hydrological Drought Index***, another long-term index, was developed to quantify hydrological effects. The Palmer Hydrological Drought Index responds more slowly to changing conditions than the Palmer Drought Index. Figure 8-4 shows this index for January 2013.
- While the Palmer indices consider precipitation, evapotranspiration and runoff, the ***Standardized Precipitation Index*** considers only precipitation. In the Standardized Precipitation Index, an index of zero indicates the median precipitation amount; the index is negative for drought and positive for wet conditions. The Standardized Precipitation Index is computed for time scales ranging from one month to 24 months. Figure 8-5 shows the 24-month Standardized Precipitation Index map for February 2011 through January 2013.

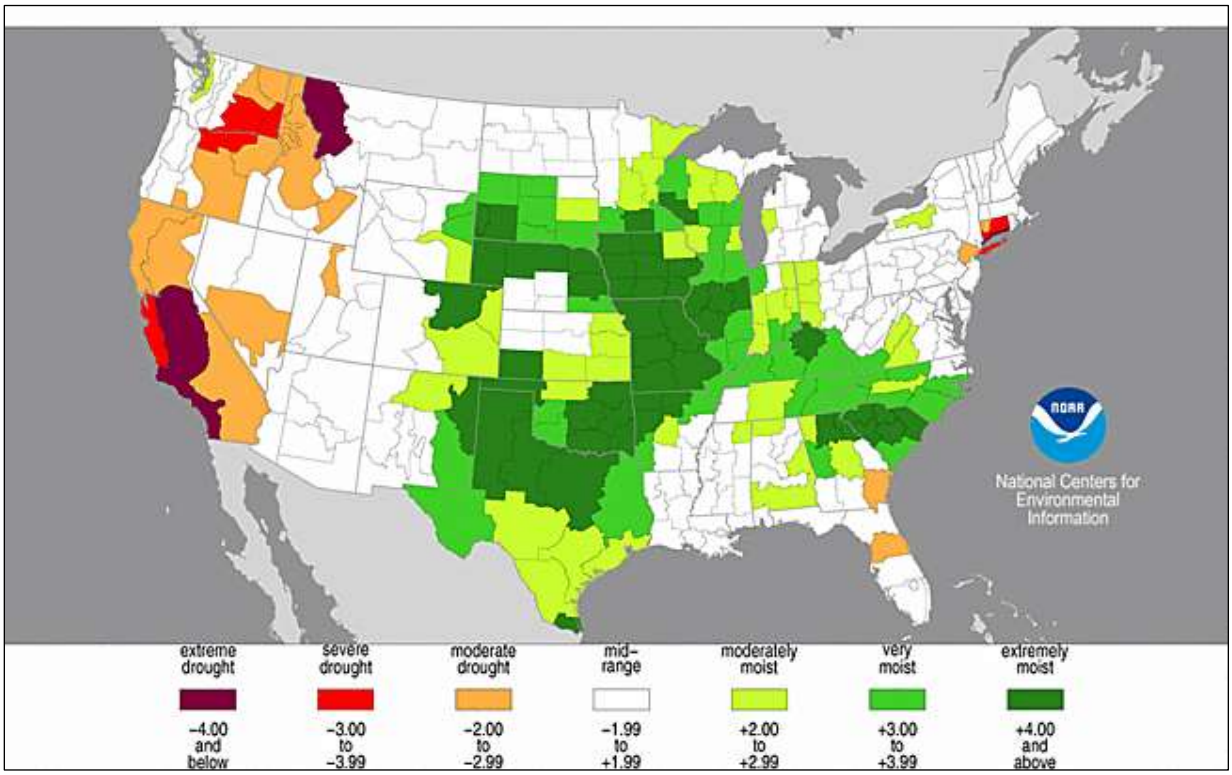


Figure 8-3. Palmer Drought Severity Index (December 2015)

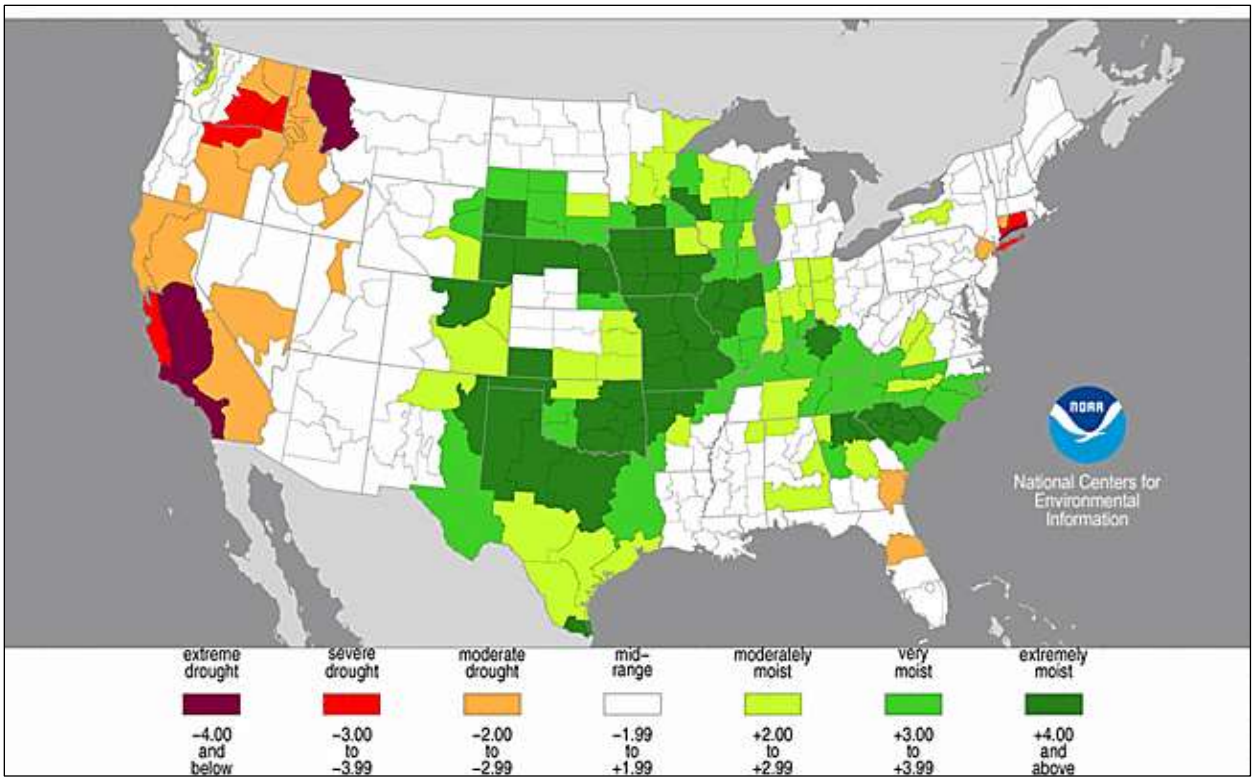


Figure 8-4. Palmer Hydrological Drought Index Long-Term Hydrologic Conditions (December 2015)

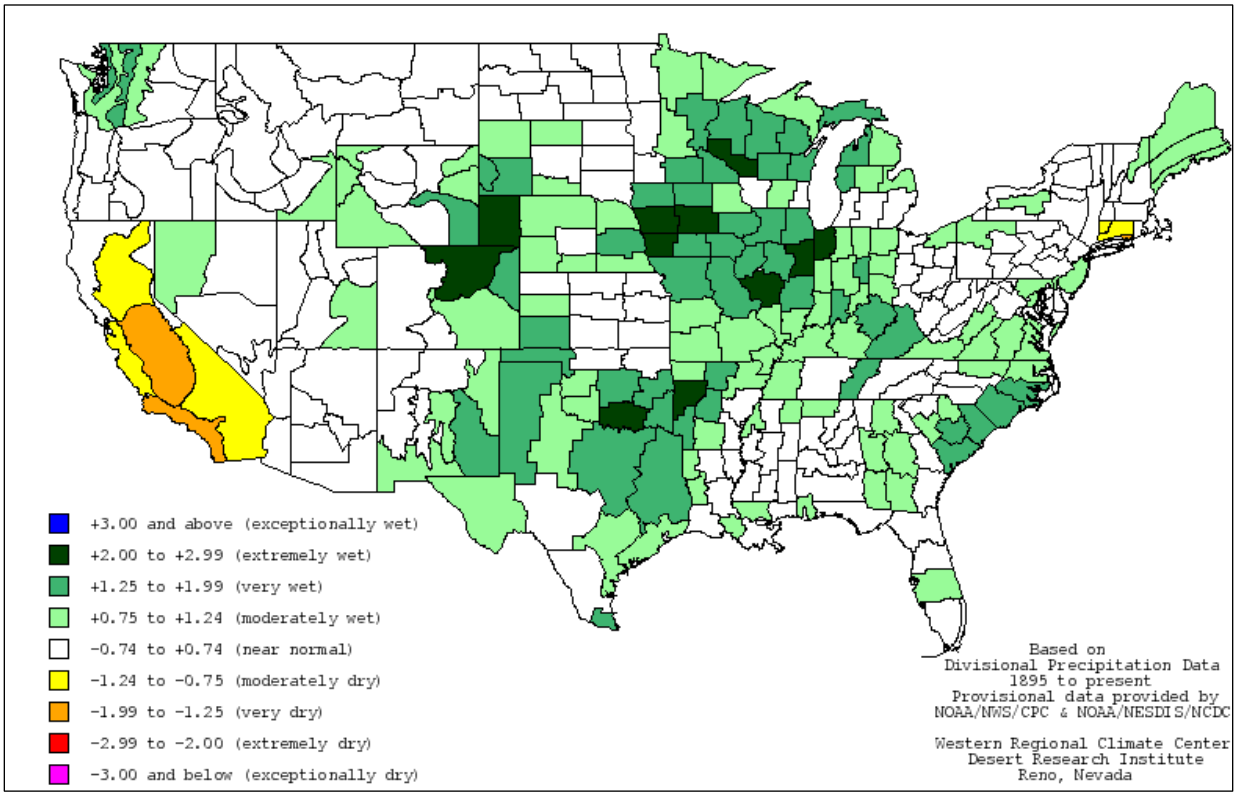


Figure 8-5. 24-Month Standardized Precipitation Index (January 2013 – December 2015)

8.2.3 Frequency

Historical drought data for the Placer County region indicate that, in the 88 years from 1929 through 2016, four multi-year droughts have spanned a total of 20 years. This averages to a five-year drought every 22 years, or a 22 percent chance of a drought in any given year.

8.2.4 Severity

Drought can have a widespread impact on the environment and the economy, although it typically does not result in loss of life or damage to property, as do other natural disasters. Nationwide, the impacts of drought occur primarily in the agriculture, transportation, recreation and tourism, forestry, and energy sectors. Social and environmental impacts are also significant, although it is difficult to put a precise cost on these impacts. The National Drought Mitigation Center uses three categories to describe likely drought impacts:

- Water supply—Drought threatens supplies of water for irrigated crops and for communities.
- Fire hazard—Drought increases the threat of wildfires from dry conditions in forest and rangelands.

The severity of a drought depends on the degree of moisture deficiency, the duration, and the size and location of the affected area. The longer the duration of the drought and the larger the area impacted, the more severe the potential impacts. When measuring the severity of droughts, analysts typically look at economic impacts. All people could pay more for water if utilities increase their rates due to shortages. Other water- or electricity-dependent industries are commonly forced to shut down all or a portion of their facilities, resulting in further layoffs. A drought can harm recreational companies that use water (e.g., swimming pools, water parks, and river rafting companies) as well as landscape and nursery businesses.

Drought generally does not affect groundwater sources as quickly as surface water supplies, but groundwater supplies generally take longer to recover. Reduced precipitation during a drought means that groundwater supplies are not replenished at a normal rate. This can lead to a reduction in groundwater levels and problems such as reduced pumping capacity or wells going dry. Shallow wells are more susceptible than deep wells. Reduced replenishment of groundwater affects streams. Much of the flow in streams comes from groundwater, especially during the summer when there is less precipitation and after snowmelt ends. Reduced groundwater levels mean that even less water will enter streams when steam flows are lowest.

8.2.5 Warning Time

Droughts are climatic patterns that occur over long periods of time. Only generalized warning can take place due to the numerous variables that scientists have not pieced together well enough to make accurate and precise predictions.

Empirical studies conducted over the past century have shown that meteorological drought is never the result of a single cause. It is the result of many causes, often synergistic in nature; these include global weather patterns that produce persistent, upper-level high-pressure systems along the West Coast with warm, dry air resulting in less precipitation.

Scientists at this time do not know how to predict drought more than a month in advance for most locations. Predicting drought depends on the ability to forecast precipitation and temperature. Anomalies of precipitation and temperature may last from several months to several decades. How long they last depends on interactions between the atmosphere and the oceans, soil moisture and land surface processes, topography, internal dynamics, and the accumulated influence of weather systems on the global scale.

8.3 SECONDARY HAZARDS

The secondary hazard most commonly associated with drought is wildfire. A prolonged lack of precipitation dries out vegetation, which becomes increasingly susceptible to ignition as the duration of the drought extends. Millions of board feet of timber have been lost, and in many cases erosion occurred, which caused serious damage to aquatic life, irrigation, and power production by heavy silting of streams, reservoirs, and rivers.

Drought also is often accompanied by extreme heat, exposing people to the risk of sunstroke, heat cramps and heat exhaustion. Pets and livestock are also vulnerable to heat-related injuries.

8.4 EXPOSURE

All people, property and environments within the City of Roseville would be exposed to some degree to the impacts of moderate to extreme drought conditions.

8.5 VULNERABILITY

Based on hydrologic data for the American River, there is a probability that rainfall will be insufficient once every 17 years to supply Folsom Lake and guarantee the City of Roseville its existing contract amounts. In these years, the City by agreement is required to find alternate sources of supply.

Having the flexibility to use both the USBR and PCWA contractual supplies during a drier year or driest year enables the City to provide a reliable surface water supply for municipal and industrial uses. Any shortages can easily be compensated for by water use reductions through conservation (implementation of drought stages as outlined in the Roseville Municipal Code). By incorporating emergency groundwater reserves into the water supply strategy, the City's reliability is increased further still.

The City's 2015 Urban Water Management Plan outlines the potable water supply reliability for normal and dry years, as well as for a three-year drought. Water would be supplied by the American River through Folsom Lake, with conservation measures and groundwater reserves implemented as needed. Roseville's recycled water utility is expected to provide an offset to demand for irrigation supply, thereby reducing the demand for potable water. A summary of the water supply reliability until 2040 for multiple dry water years is provided in Table 8-3.

8.5.1 Population

The City of Roseville, regional water purveyors, members of the Water Forum, and the USBR have spent considerable time and effort to protect life, safety and health should several consecutive dry years occur. Provisions and measures have been taken to analyze and account for anticipated water shortages. The City has the ability to minimize any impacts on residents and water consumers in Roseville. No significant life or health impacts are anticipated as a result of drought in Roseville.

8.5.2 Property

No structures will be directly affected by drought conditions in Roseville, though some structures may become vulnerable to wildfires, which are more likely following years of drought.

8.5.3 Critical Facilities

Critical facilities as defined for this Plan will continue to be operational during a drought. Critical facility elements such as landscaping may not be maintained due to limited resources, but the risk to the City's critical facilities inventory will be largely aesthetic. These aesthetic impacts are not considered significant.

Table 8-3. Water Supply Reliability by 2040

	Normal Water Year	Single Dry Water Year	Multiple Dry Water Years		
			Year 1	Year 2	Year 3
Surface Water (acre-feet)	60,400[a]	39,500[b]	52,894[b]	55,500	46,926[c]
Groundwater (acre-feet)	0	6569	0	0	0
Recycled Water (acre-feet)	4,838	4,838	4,838	4,838	4,838
Projected Demand (acre-feet)	50,907[d]	50,907[d]	50,907 [d]	50,907 [d]	50,907 [d]
Surplus or (Deficit) (acre-feet)[e]	4,655	0	6,826	8,931	857

a. Although additional water is under contract, surface water supplies are available based on Water Forum agreement diversion commitments. This projection includes anticipated PCWA supply from the future Ophir Water Treatment Plant project.
b. Although contracts are in place for normal water year supplies of 67,500 acre-feet, the supply shown is consistent with Water Forum agreement diversion limits and the limitation that 4,000 acre-feet of SJWD supplies are only available for use in normal years.
c. Surface supply reduction is consistent with Water Forum supply agreement anticipating worst case shortage (driest years).
d. No conservation measures are assumed for any year type.
e. Assume full use of available recycled water to offset potable demand for landscape irrigation.

Source: Roseville, 2015a

8.5.4 Environment

Environmental losses are the result of damage to plants, animals, habitat, and air and water quality; wildfires; degradation of landscape; loss of biodiversity; and soil erosion. Some of the effects are short-term and conditions quickly return to normal following the end of the drought. Other environmental effects linger for some time or may even become permanent. Wildlife habitat, for example, may be degraded through the loss of wetlands, lakes, and vegetation. However, many species will eventually recover from this temporary aberration. The degradation of landscape quality, including increased soil erosion, may lead to a more permanent loss of biological productivity. Although environmental losses are difficult to quantify, growing public awareness and concern for environmental quality has forced public officials to focus greater attention and resources on these effects.

8.5.5 Economic Impact

Economic impact will be largely associated with industries that use water or depend on water for their business. For example, landscaping businesses were affected in the droughts of the past as the demand for service significantly declined because landscaping was not watered. The City's Environmental Utilities Department, through the water conservation programs, works to ensure that businesses that rely on water receive allotments to continue operating.

There is always the possibility of some financial exposure for the City as a result of drought conditions. The Environmental Utilities Department plans proactively for this possibility in order to mitigate these impacts to the greatest extent possible.

8.6 FUTURE TRENDS IN DEVELOPMENT

Table 8-4 lists past, current, and projected water use from 2010 to 2040. Water use projections for 2020 through 2040 are based on land use-based water demand projections documented in the City's General Plan.

The general building stock within the planning area increased by 17.7% with an increase in valuation from $21.967 billion to $29.641 billion (34.9%). This increase in valuation of the planning area was impacted by the areas recovery from the economic downturn of 2008. Since the entire planning area would be considered susceptible to drought, it would be perceived that there was an increase in drought exposure over the performance

period of the 2011 plan. However, since droughts typically do not kill or injure people or damage structures, there would be no increase in vulnerability to drought from this increased exposure.

Table 8-4. City of Roseville Past, Current, and Projected Water Use

	Water Use (acre-feet/year)						
	2010	2015	2020	2025	2030	2035	2040
Single family residential	15,836	11,680	21,262	22,425	23,862	25,254	26,365
Multi-Family residential	2,196	1,464	2,399	2,530	2,692	2,849	2,974
Commercial	2,042	1,930	3,402	3,588	3,818	4,041	4,219
Industrial	891	934	1,699	1,792	1,907	2,018	2,107
Institutional and Governmental	667	561	1,001	1,056	1,123	1,189	1,241
Landscape	5,534	4,152	7,559	7,973	8,483	8,978	9,373
Losses[a]	1,195	2,160	3,732	3,936	4,189	4,433	4,628
Total	**28,361**	**22,881**	**41,054**	**43,300**	**46,074**	**48,762**	**50,907**

a. Losses include unbilled/unmetered losses for 2010 and 2015
Source: Roseville, 2015a

8.7 REVIEW OF EXISTING ORDINANCES, PROGRAMS AND PLANS

Since California's 1975 to 1977 drought, Roseville has had a policy of no water waste supported by City ordinances. The City adopted a "No Waste" ordinance in 1989 and updated the Water Conservation Ordinance (Roseville Municipal Code Chapter 14.09—Water Conservation) to include drought mitigation measures in April 1991. The ordinance provides conservation measures for shortages in water supply due to drought. Drought mitigation is achieved through a tiered approach that is based on the surface water available to Roseville. As water supplies decrease, additional restrictions are imposed. Conservation measures (water use restrictions) have been established to address conditions from adequate water supplies to conditions in which surface water supplies are capable of meeting only 50 percent of Roseville's water needs.

A significant portion of Roseville's water is used for landscape irrigation. Landscape irrigation also accounts for a large portion of water wasted in Roseville. Conservation patrols are used to enforce City ordinances restricting water waste. These patrols generally consist of existing service workers that identify and document water waste during daily travels or when responding to complaints. Evening calls are made in response to resident complaints.

In times of reduced water availability, higher drought stages are implemented. In summer 1991, Roseville hired temporary employees to serve as the first dedicated water patrol. This patrol supplemented existing service crew coverage and provided 24-hour-per-day capability. These patrols led to the issuance of over 500 water waste citations that greatly decreased water wasted through malfunctioning irrigation systems and/or excessive watering. In response to the current drought, Roseville instituted these water patrols once more.

Roseville has a number of programs and policies that are implemented as early as possible to reduce water use in the event of a prolonged water shortage. As a USBR contractor, Roseville is required to develop and maintain a water conservation plan consistent with the requirements of the Central Valley Project Improvement Act of 1992. In addition, Roseville is a member and signatory to the American River Water Forum, which also includes requirements for water conservation programs.

To proactively promote water conservation and to be prepared in the event of a water shortage, the City implements demand management (conservation) measures, is developing supplemental water supplies, and has a water shortage contingency plan. These are summarized in the City of Roseville 2010 Urban Water Management Plan Update and detailed in the work programs for the Environmental Utilities Department Water Division.

Given recent legislation and state oversight of the City's water conservation efforts, the Roseville City Council adopted a revised Water Efficient Landscape Ordinance on March 16, 2016. The revised ordinance, effective on April 16, 2016, responds to state legislation mandating stricter requirements for reducing landscape irrigation, water consumption and waste. The revised ordinance addresses the objectives of the Department of Water Resources model ordinance by incorporating the new water efficient landscape requirements into Chapter 14.18 of the Roseville Municipal Code.

8.8 SCENARIO

An extreme multi-year drought can impact the region with little warning. Combinations of low precipitation and unusually high temperatures could occur over several consecutive years. Intensified by such conditions, extreme wildfires could break out throughout Placer County, increasing the need for water. Surrounding communities, also in drought conditions, could increase their demand for water supplies relied upon in the City of Roseville, causing social and political conflicts. If such conditions persisted for several years, the economy of Placer County and Roseville could experience setbacks, especially in water dependent industries.

8.9 ISSUES

The planning team has identified the following drought-related issues:

- Identification and development of alternative water supplies
- Utilization of groundwater recharge techniques to stabilize the groundwater supply
- The probability of increased drought frequencies and durations due to climate change
- The promotion of active water conservation even during non-drought periods.

9. EARTHQUAKE

9.1 GENERAL BACKGROUND

California is seismically active because of movement of the North American Plate, on which everything east of the San Andreas Fault sits, and the Pacific Plate, which includes coast communities west of the fault. The Pacific Plate is constantly moving northwest past the North American Plate, at a relative rate of movement of about 2 inches per year (SHMP 2013). The movement of the tectonic plates creates stress released as energy that moves through the earth as waves called earthquakes.

DEFINITIONS

Earthquake—The shaking of the ground caused by an abrupt shift of rock along a fracture in the earth or a contact zone between tectonic plates. Earthquakes are typically measured in both magnitude and intensity.

Liquefaction—A condition in which water-saturated sands, silts or gravelly soils are shaken so violently that the individual grains lose contact with one another and "float" freely in the water, turning the ground into a pudding-like liquid.

9.1.1 Damage from Earthquakes

Earthquakes can last from a few seconds to over 5 minutes; they may also occur as a series of tremors over a period of several days. The actual movement of the ground in an earthquake is seldom the direct cause of injury or death. Casualties generally result from falling objects and debris, because the shocks shake, damage or demolish buildings and other structures. Disruption of communications, electrical power supplies and gas, sewer and water lines should be expected. Earthquakes may trigger fires, dam failures, landslides or releases of hazardous material, compounding their disastrous effects.

9.1.2 Earthquake Classifications

Earthquakes are typically classified in one of two ways: By the amount of energy released, measured as magnitude; or by the impact on people and structures, measured as intensity.

- Magnitude represents the amount of seismic energy released at the hypocenter of the earthquake. It is based on the amplitude of the earthquake waves recorded on instruments. Magnitude is thus represented by a single, instrumentally determined value.
- Intensity represents the observed effects of ground shaking at any specified location. The intensity of earthquake shaking lessens with distance from the earthquake epicenter. Tabulated peak ground accelerations for a listed "maximum credible earthquake" are a measure of how a site will be affected by seismic events on distant faults.

Magnitude

An earthquake's magnitude is a measure of the energy released at the source of the earthquake. It is commonly expressed by ratings on either of two scales (Michigan Tech University 2016):

- The Richter scale measures magnitude of earthquakes based on the amplitude of the largest energy wave released by the earthquake. Richter scale readings are suitable for smaller earthquakes; however, because

it is a logarithmic scale, the scale does not distinguish clearly the magnitude of large earthquakes above a certain level. Table 9-1 presents the Richter scale magnitudes and corresponding earthquake effects.

- A more commonly used magnitude scale today is the moment magnitude (M_w) scale, with classifications as shown in Table 9-2. The moment magnitude scale is based on the total moment release of the earthquake (the product of the distance a fault moved and the force required to move it). Moment magnitude roughly matches the Richter scale but provides more accuracy for larger magnitude earthquakes.

Table 9-1. Richter Magnitude Scale

Richter Magnitude	Earthquake Effects
2.5 or less	Usually not felt, but can be recorded by seismograph
2.5 to 5.4	Often felt, but causes only minor damage
5.5 to 6.0	Slight damage to buildings and other structures
6.1 to 6.9	May cause a lot of damage in very populated areas
7.0 to 7.9	Major earthquake; serious damage
8.0 or greater	Great earthquake; can totally destroy communities near the epicenter

Source: Michigan Tech University n.d.

Table 9-2. Moment Magnitude Scale

Magnitude Class	Magnitude Range
Great	$M_w \geq 8$
Major	M_w =7.0 - 7.9
Strong	M_w =6.0 - 6.9
Moderate	M_w =5.0 - 5.9
Light	M_w =4.0 - 4.9
Minor	M_w =3.0 - 3.9
Micro	M_w =< 3

Intensity

Currently the most commonly used intensity scale is the modified Mercalli intensity scale, with ratings defined as follows (USGS, 1989):

I. Not felt except by a very few under especially favorable conditions
II. Felt only by a few persons at rest, especially on upper floors of buildings.
III. Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it is an earthquake. Standing cars may rock slightly. Vibrations similar to the passing of a truck.
IV. Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like a heavy truck striking building. Standing cars rocked noticeably.
V. Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI. Felt by all; many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII. Damage negligible in buildings of good design and construction; slight in well-built ordinary structures; considerable in poorly built or badly designed structures. Some chimneys broken.

VIII. Damage slight in specially designed structures; considerable damage in ordinary buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.

IX. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.

X. Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

XI. Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.

XII. Damage total. Lines of sight and level are distorted. Objects thrown into the air.

9.1.3 Ground Motion

Earthquake hazard assessment is also based on expected ground motion. This involves determining the annual probability that certain ground motion accelerations will be exceeded, then summing the annual probabilities over the time period of interest. The most commonly mapped ground motion parameters are the horizontal and vertical peak ground accelerations (PGA) for a given soil or rock type. Instruments called accelerographs record levels of ground motion due to earthquakes at stations throughout a region. These readings are recorded by state and federal agencies that monitor and predict seismic activity.

Maps of PGA values form the basis of seismic zone maps that are included in building codes such as the International Building Code. Building codes that include seismic provisions specify the horizontal force due to lateral acceleration that a building should be able to withstand during an earthquake. PGA values are directly related to these lateral forces that could damage "short period structures" (e.g. single-family dwellings). Longer period response components determine the lateral forces that damage larger structures with longer natural periods (apartment buildings, factories, high-rises, bridges). Table 9-3 lists damage potential and perceived shaking by PGA factors, compared to the Mercalli scale.

Table 9-3. Mercalli Scale and Peak Ground Acceleration Comparison

Modified Mercalli Scale	Perceived Shaking	Potential Structure Damage		Estimated PGA[a] (%g)
		Resistant Buildings	Vulnerable Buildings	
I	Not Felt	None	None	<0.17%
II-III	Weak	None	None	0.17% - 1.4%
IV	Light	None	None	1.4% - 3.9%
V	Moderate	Very Light	Light	3.9% - 9.2%
VI	Strong	Light	Moderate	9.2% - 18%
VII	Very Strong	Moderate	Moderate/Heavy	18% - 34%
VIII	Severe	Moderate/Heavy	Heavy	34% - 65%
IX	Violent	Heavy	Very Heavy	65% - 124%
X - XII	Extreme	Very Heavy	Very Heavy	>124%

a. PGA measured in percent of g, where g is the acceleration of gravity

Sources: USGS, 2008; USGS, 2010

9.1.4 Effect of Soil Types

The impact of an earthquake on structures and infrastructure is largely a function of ground shaking, distance from the source of the quake, and liquefaction, a secondary effect of an earthquake in which soils lose their shear strength and flow or behave as liquid, thereby damaging structures that derive their support from the soil. Liquefaction generally occurs in soft, unconsolidated sedimentary soils. A program called the National Earthquake Hazard Reduction Program (NEHRP) creates maps based on soil characteristics to help identify

locations subject to liquefaction. Table 9-4 summarizes NEHRP soil classifications. NEHRP Soils B and C typically can sustain ground shaking without much effect, dependent on the earthquake magnitude. The areas that are commonly most affected by ground shaking have NEHRP Soils D, E and F. In general, these areas are also most susceptible to liquefaction.

Table 9-4. NEHRP Soil Classification System

NEHRP Soil Type	Description	Mean Shear Velocity to 30 m (m/s)
A	Hard Rock	1,500
B	Firm to Hard Rock	760-1,500
C	Dense Soil/Soft Rock	360-760
D	Stiff Soil	180-360
E	Soft Clays	< 180
F	Special Study Soils (liquefiable soils, sensitive clays, organic soils, soft clays >36 m thick)	

9.2 HAZARD PROFILE

9.2.1 Past Events

The last seismic event recorded in the Roseville vicinity measuring at least 4.0 on the Richter scale occurred between Placerville and Roseville in 1908 on a north-south fault line between Folsom and Auburn. No significant seismic events in the Roseville vicinity have been recorded since then. Significant recent earthquakes in California include the 1906 earthquake in San Francisco, the 1971 San Fernando Earthquake, the 1989 Loma Prieta Earthquake, and the 1994 Northridge earthquake. Table 9-5 lists recent earthquakes with a magnitude of 5.0 or greater within a 100-mile radius of Roseville. Figure 9-1 shows the location of the most recent four events in relation to Roseville.

Table 9-5. Recent Earthquakes Magnitude 5.0 or Larger Within 100-mile radius

Date	Magnitude	Epicenter Location
8/24/2014	6.0	6 miles southwest of Napa, CA
5/24/2013	5.7	12 miles southeast of Chester, CA
4/26/2008	5.1	6 miles west of Reno, NV
10/31/2007	5.6	10 miles northeast of San Jose, CA
8/10/2001	5.5	9 miles west of Portola, CA
9/3/2000	5.17	8 miles northwest of Napa, CA
10/30/1998	5.35	4 miles south-southeast of Truckee, CA
12/28/1995	5.33	7 miles east-northeast of Markleeville, CA
12/23/1995	5.08	8 miles east of Markleeville, CA
9/12/1994	5.95	7 miles north-northeast of Markleeville, CA
9/12/1994	5.12	7 miles north-northeast of Markleeville, CA
3/31/1986	5.70	12 miles east-northeast of Milpitas, CA

Source: Earthquake Catalogs, Northern California Earthquake Data Center, USGS

Source: NCEDC, 2014; Google Earth

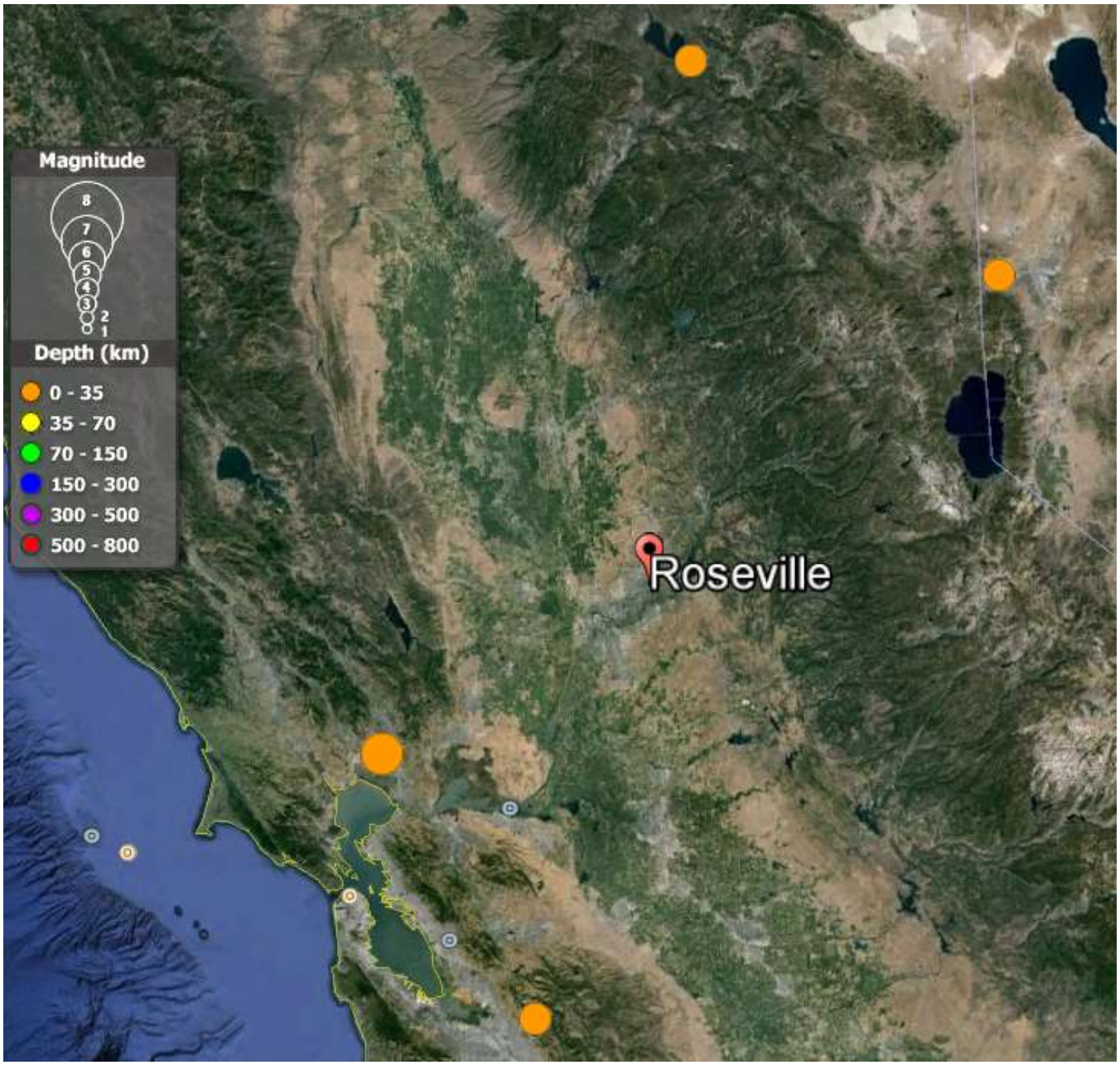


Figure 9-1. Location of Recent Earthquakes in Roseville Vicinity

9.2.2 Location

A direct relationship exists between a fault's length and location and its ability to generate damaging ground motion at a given site. Small, local faults produce lower magnitude quakes, but ground shaking can be strong and damage can be significant in areas close to the fault. Large regional faults can generate earthquakes of great magnitudes but, because of their distance and depth, they may result in only moderate shaking in an area. The City of Roseville is in a region of moderate seismicity between the seismically active Coast Ranges and the historically seismic Foothills Fault Zone in the Sierra Nevada. The primary seismic hazard for the City is potential ground shaking from distant large faults.

East of Roseville

The Great Valley Fault Zone is the geomorphic boundary of the Coast Ranges and the Central Valley. It is underlain by a 300-mile long seismically active fold-and-thrust belt that has been the source of recent earthquakes, such as the 1983 Magnitude-6.5 Coalinga and the 1985 Magnitude-6.1 Kettleman Hills earthquakes. Nearly the entire thrust system is concealed (Krazan & Associates, 2011). The Great Valley fault system consists of 14 segments, named numerically based on location along the fault system from north (1) to south (14).

The Foothill Fault Zone, a complex series of northwest trending-faults that are related to the Sierra Nevada uplift, runs from about Oroville in the north to east of Fresno in the south. This was the source of Oroville's 1975 earthquake and an event in the 1940s. Subsequent research of these events led to the identification and naming of the zone. Earthquakes on fault segments in the zone could be a source of ground shaking in Placer County.

The closest potentially active faults in the near vicinity of Roseville are the Bear Mountain and Melones Faults. The closest recently active fault in the western Sierra Nevada foothills is the Cleveland Hills Fault, about 36 miles northwest of Auburn.

Eastern Placer County borders the Basin and Range geological province, which includes most of Nevada and western Utah. This area is riddled with active faults that form the boundary between each basin or valley and the neighboring mountain range.

The Lake Tahoe Basin is seismically active with earthquakes greater than 7.0 that have occurred beneath Lake Tahoe. According to the Placer County Multi-Hazard Mitigation Plan, a series of small earthquakes also occurred in late 2003 and early 2004 due to volcanic magma (molten rock) moving 20 miles below the Sierra Nevada Mountains. The earthquakes reflect the movement of the Sierra Nevada range to the northwest at a rate of about half an inch per year.

West of Roseville

Tectonic stresses associated with the North American-Pacific Plate boundary can generate damaging earthquakes along faults 30 to 100 miles west of Placer County. Both the San Andreas fault (source of the estimated 8.0-Richter magnitude San Francisco earthquake that caused damage in Sacramento in 1906) and the closer Hayward fault have the potential for experiencing major to great events. Another potential earthquake source is the Midland Fault Zone on the western side of the Sacramento Valley. This was the source of the 1892 Vacaville-Winters earthquake.

The Petrolia (coastal Humboldt County) earthquake increased concern about how amplified long-period motions from much closer major events, such as on the San Andreas Fault or the Hayward Fault, might reach damaging levels and affect Sacramento.

Other potential earthquake sources are the faults associated with the western edge of the Central Valley, recently defined as the Coast Range Central Valley Boundary Thrust Fault System. Various documents define portions of this little known system as the Midland Fault Zone or the Dunnigan Hills fault, where the 1892 Vacaville-Winters earthquake occurred. A southern part of the system may have been the source of the 1983 Coalinga earthquake.

Inactive Faults

Active faults are those that have experienced displacement in historical time. However, inactive faults, for which no such displacements have been recorded, also have the potential to reactivate or experience displacement along a branch sometime in the future. An example of a fault zone that has been reactivated is the Foothills Fault Zone. The zone was considered inactive until evidence of an earthquake (approximately 1.6 million years ago) was found near Spenceville, California. Then, in 1975, an earthquake occurred on another branch of the zone near Oroville, California (now known as the Cleveland Hills Fault). The State Division of Mines and Geology

indicates that increased earthquake activity throughout California may cause tectonic movement along currently inactive fault systems.

No active faults are known to exist in Placer County. The following inactive faults have been identified within the city limits:

- The Volcano Hill fault extends northwest from Volcano Hill for a distance of 1 mile, terminating near Eureka Road. No activity has been recorded along this fault; therefore, it is considered inactive.
- Identified in 1973, the Linda Creek fault is located along Linda Creek in Roseville and Sacramento County. No activity has been recorded along this fault.
- The Willows Fault and Stockton Fault are in the Roseville vicinity and are considered inactive as displacement occurred greater than 1.8 million years ago.
- An unnamed fault extends east to west between Folsom Lake and the City of Rocklin. Segments of the fault are concealed and therefore unmapped. However, the east/west alignment suggests that the fault could connect to the Bear Mountain Fault, branches of which are located beneath Folsom Lake. The Bear Mountain Fault is a fault that could be undergoing reactivation as a result of continental tectonic activity. However, no evidence has been identified along the unnamed fault alignment of such reactivation.

Maps of Earthquake Impact in Roseville

A probabilistic seismic hazard map shows the hazard from earthquakes that seismologists agree could occur. It is probabilistic in the sense that the analysis takes into consideration the uncertainties in the size and location of earthquakes and the resulting ground motions that can affect a particular site. The maps are expressed in terms of probability of exceeding a certain ground motion, such as the 10-percent probability of exceedance in 50 years. This level of ground shaking has been used for designing buildings in high seismic areas. Figure 9-2 shows the estimated ground motion for a 100-year probabilistic earthquake.

Earthquake scenarios describe the expected ground motions and effects of specific hypothetical large earthquakes for a region. Maps of these scenarios can be used to support all phases of emergency management. Two such scenarios were evaluated for this Plan:

- A Magnitude-6.8 event on the Concord-Green Valley Fault with an epicenter 56 miles southwest of Roseville near Vallejo, California (see Figure 9-3)
- A Magnitude-7.1 event on the Great Valley Fault with an epicenter 58 miles west northwest of Roseville (see Figure 9-4)

NEHRP Soil Maps

NEHRP soil types define locations that will be significantly impacted by an earthquake. NEHRP Soils B and C typically can sustain low-magnitude ground shaking without much effect. Areas with NEHRP Soils D, E and F are most commonly affected by ground shaking. Figure 9-5 shows NEHRP soil classifications in the county.

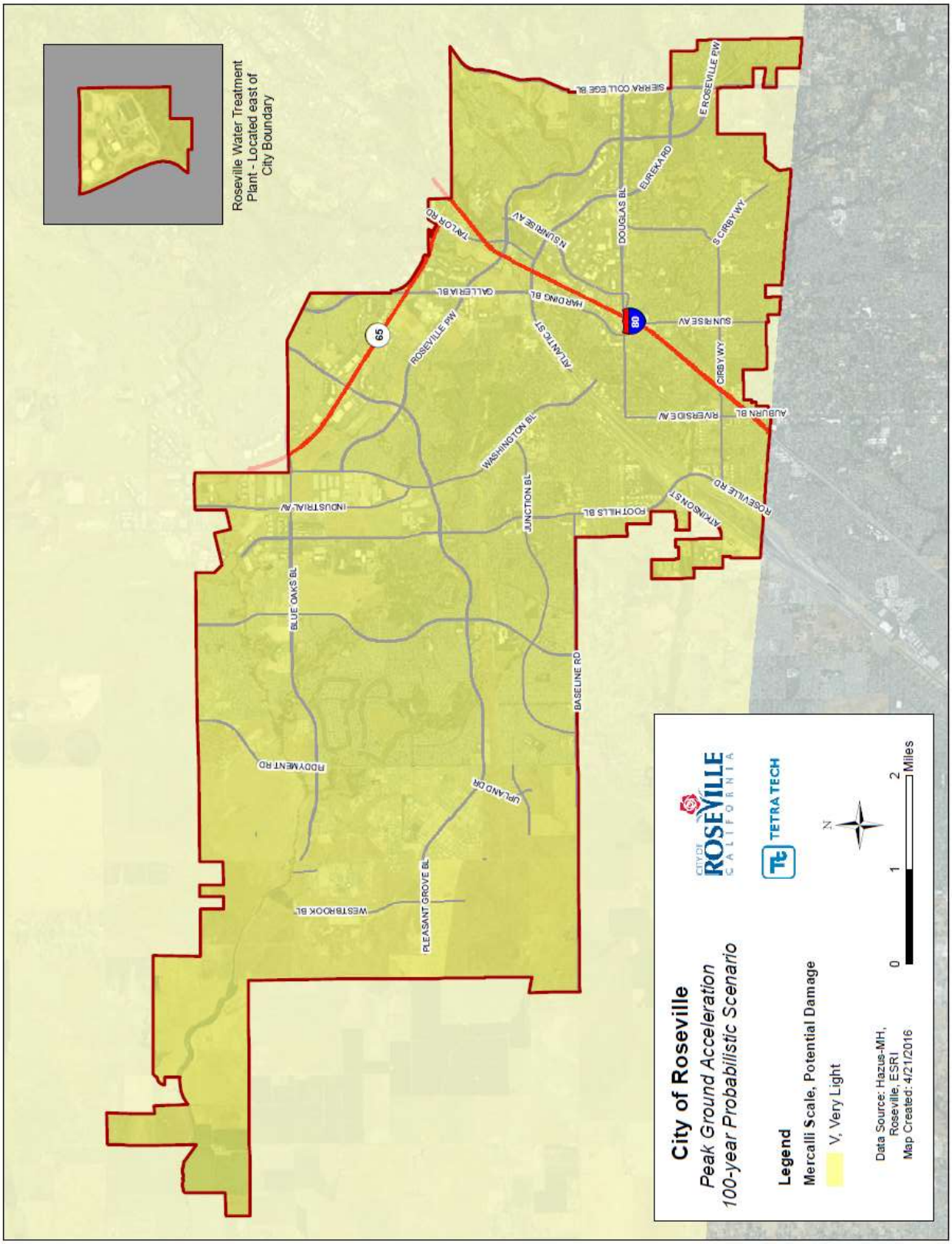


Figure 9-2. 100-Year Probabilistic PGA

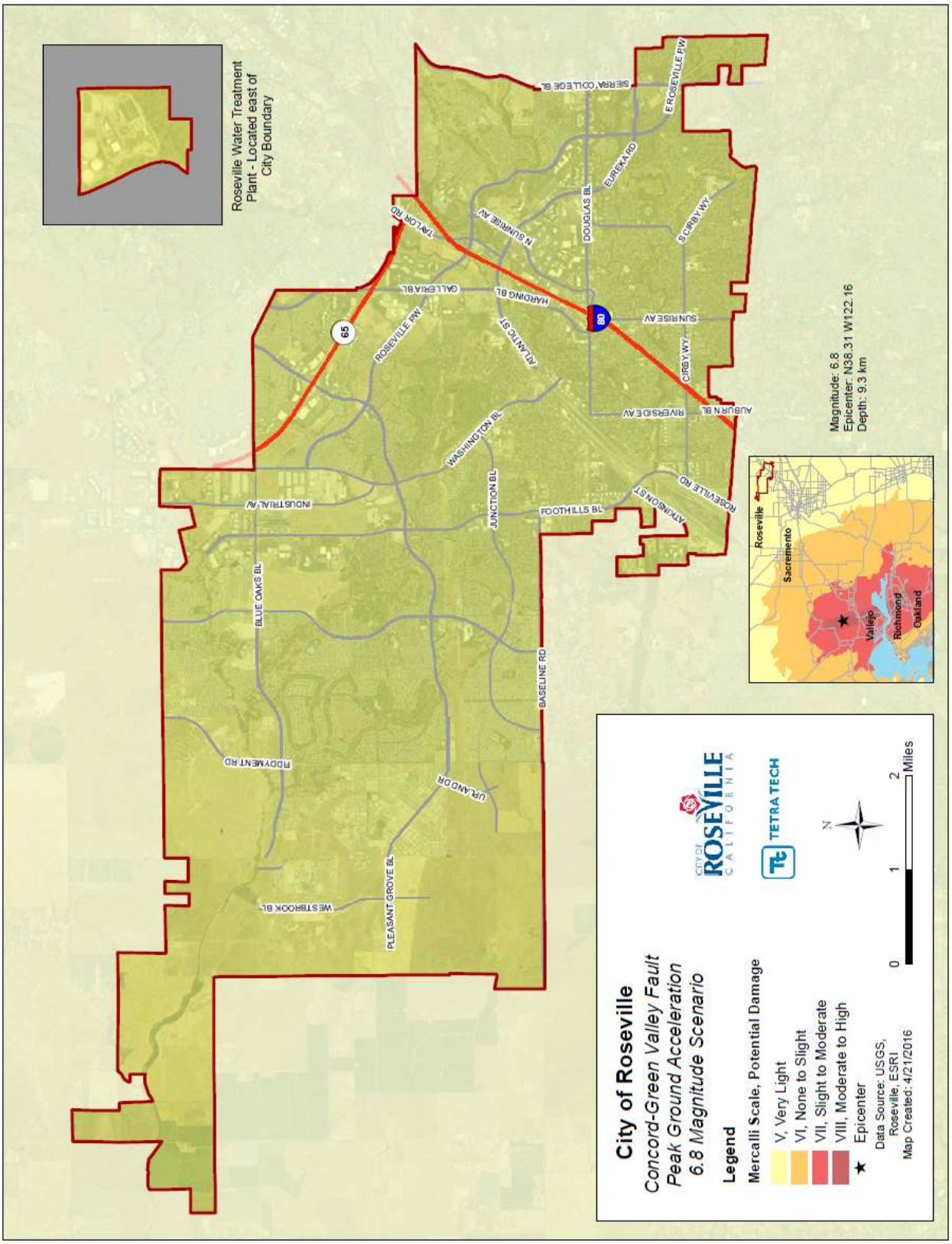


Figure 9-3. Concord-Green Valley Fault Scenario PGA

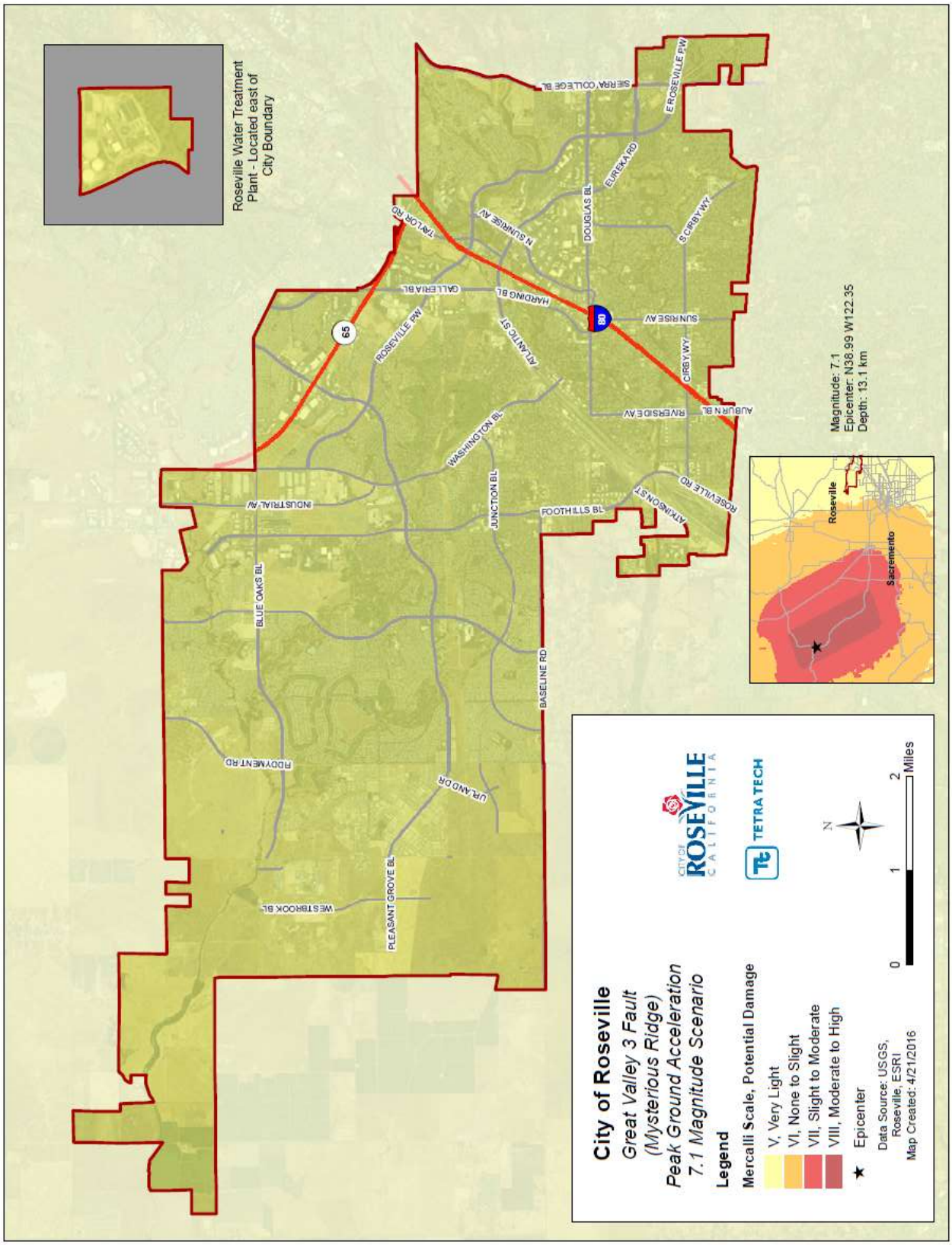


Figure 9-4. Great Valley 3 Fault Scenario PGA

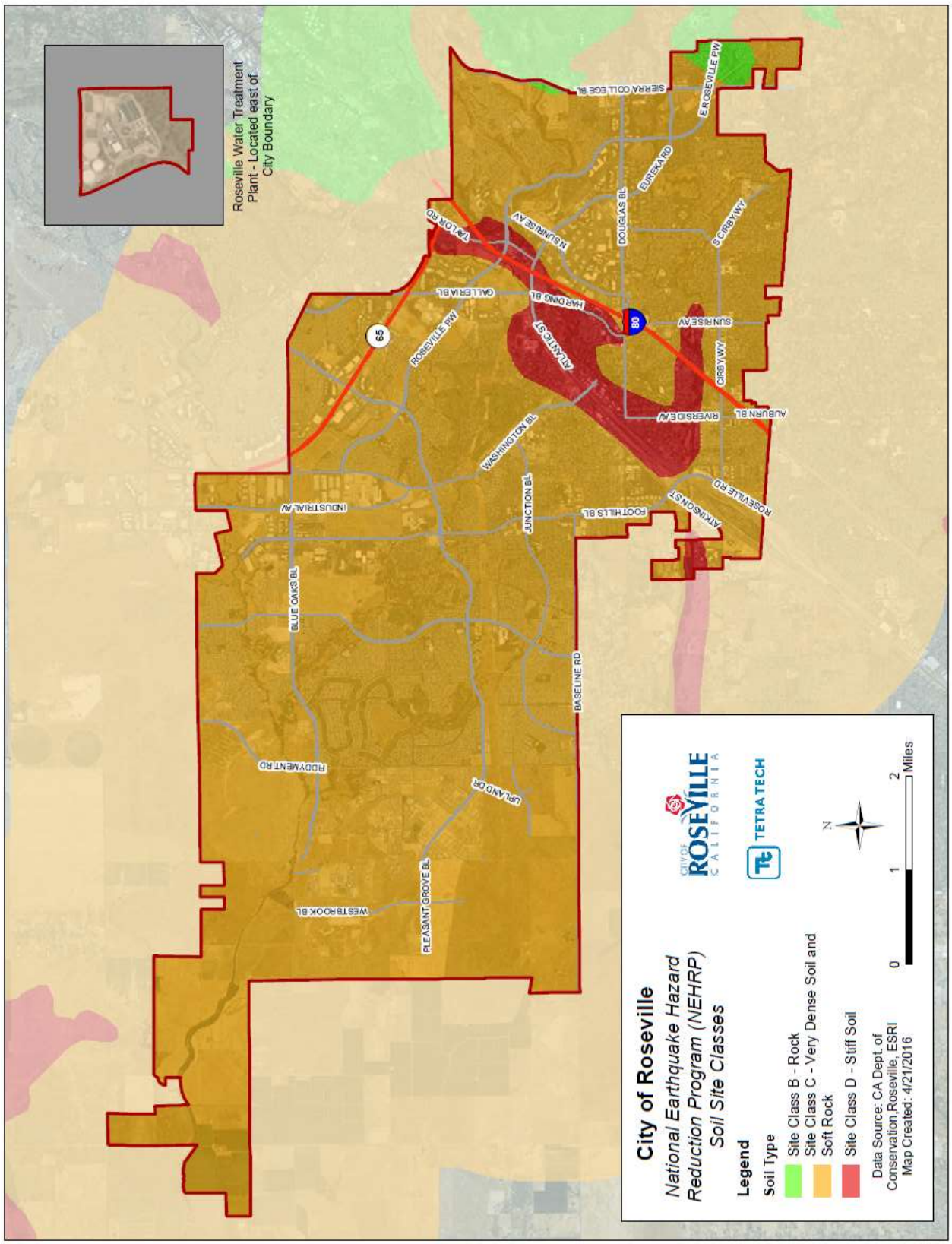


Figure 9-5. National Earthquake Hazard Reduction Program Soil Classification

9.2.3 Frequency

California experiences hundreds of earthquakes each year, most with minimal damage and magnitudes below 3.0 on the Richter Scale. Earthquakes that cause moderate damage to structures occur several times a year. According to the USGS, a strong earthquake measuring greater than 5.0 on the Richter Scale occurs every two to three years and major earthquakes of more than 7.0 on the Richter Scale occur once a decade. Both the San Andreas Fault and the closer Hayward Fault have the potential for experiencing major to great events. The State Hazard Mitigation Plan indicates that in the next 30 years in California there is over a 99-percent probability of a magnitude 6.7 earthquake and a 94-percent probability of a magnitude 7.0 earthquake.

9.2.4 Severity

Placer County and Roseville are identified as a low-severity zone. While there are several faults with the potential for large-magnitude earthquakes in the vicinity, the distance between those faults and the City of Roseville would result in very low, peak-ground accelerations in the City. The biggest contributor to potential intensity of shaking in Roseville is the Foothills Fault Zone.

Liquefaction

Liquefaction of loose sandy soil with a high water content during an earthquake undermines the ground's ability to solidly support building structures. Foundations supported on liquefiable soils can lose their ability to support load, and can experience settlement on the order of several inches or more. Differential settlement can cause significant damage to buildings, lifelines, and transportation structures, with partial or total collapse.

The City of Roseville is not specifically addressed in currently available State Division of Mines and Geology liquefaction risk data. No determination has been made as to whether liquefaction potential exists in Roseville. Based on project-specific analysis that has been done for many of Roseville's development projects, liquefaction has not been identified as a significant problem in Roseville.

The prevailing water table in the vicinity of Roseville is approximately 80 feet below grade. Without water to saturate the soil, liquefaction is not possible. The liquefaction potential in Roseville is, therefore, considered to be very low. The most likely location for liquefaction would be along the City's creek beds. The City's policy of protecting floodplain areas has avoided development in many of the most susceptible areas.

Ground Failure

Roseville's geographic location, soil conditions, and surface terrain combine to minimize risk of major damage from landslides, subsidence (gradual shrinking of the earth's surface due to underground resource extraction), or other geologic hazards resulting from seismic activity and related natural forces.

Slopes

Roseville is located on relatively level terrain, with slopes that gradually increases to the north and east. Recent development in the Stoneridge Specific Plan and Northeast Roseville Specific Plan is adjacent to ravine areas and developed property would be more susceptible in the event of seismic activity due to steep slopes in some areas.

9.2.5 Warning Time

There is no current reliable way to predict the day or month that an earthquake will occur at any given location. Research is being done with warning systems that use the low energy waves that precede major earthquakes. These potential warning systems would give approximately 40 seconds notice that a major earthquake is about to occur. The warning time is very short but it could allow for someone to get under a desk, step away from a hazardous material they are working with or shut down a computer system.

9.3 SECONDARY HAZARDS

Earthquakes can cause large and sometimes disastrous landslides and mudslides. River valleys are vulnerable to slope failure, often as a result of loss of cohesion in clay-rich soils. When soil liquefaction occurs, building and road foundations can lose load-bearing strength and may sink quicksand-like into what was previously solid ground. Unless properly secured, hazardous materials can be released during earthquakes, causing significant damage to the environment and people. Earthen dams and levees are highly susceptible to seismic events and the impacts of their eventual failures can be considered secondary earthquake hazards.

The City of Roseville faces potential social impacts in the wake of mass evacuations should a large seismic event occur in the San Francisco Bay area. As the first major metropolitan city along Interstate 80 east of Sacramento, the City's services and infrastructure could be strained as evacuating populations seek shelter close to home. Evacuees could need shelter for long periods, depending on the magnitude of the event. This could significantly tax hospitals, schools and services in the City, causing significant economic impacts.

9.4 EXPOSURE

9.4.1 Population

All of the population of Roseville, both residents and visitors, would be directly or indirectly exposed to the potential impacts of an earthquake.

9.4.2 Property

All structures within Roseville are exposed to the potential impacts of an earthquake.

9.4.3 Critical Facilities

Since the entire planning area has exposure to the earthquake hazard, all critical facilities and infrastructure components are exposed to the earthquake hazard, as summarized in Table 9-6 and Table 9-7.

Table 9-6. Critical Facilities Exposed to the Earthquake Hazard

Facility Type	Number in Planning Area
Medical and Health	2
Government Functions	27
Protective Functions	10
Schools	49
Hazmat	6
Other Critical Functions	78
Total	**172**

Table 9-7. Critical Infrastructure Exposed to the Earthquake Hazard

Facility Type	Number in Planning Area
Bridges	68
Water Supply	11
Wastewater	23
Power	18
Communications	98
Other	6
Total	**224**

The City's Water Treatment Plant on Barton Road is the only critical facility located near an identified local inactive fault. All other City facilities are within Roseville and are not located near an inactive local fault. However, all are considered to be exposed to the same earthquake risk as the general building stock.

Most of the City's critical facilities have been built since the Uniform Building Code (UBC) was amended to include provisions for seismic safety. For example, the two major hospitals—Sutter Roseville Medical Center and Kaiser Permanente—were both constructed in the 1990s, as were the Roseville Police Department and Roseville Civic Center. The movement of the California Building Code to the International Building Code standard in 2013 has upheld seismic standards previously established by the UBC.

Critical industrial facilities are of concern because of potential hazardous materials spills or the potential for critical employment centers to continue operating. Many forms of hazardous materials are present in Roseville at private businesses, in permanent storage locations, along the Union Pacific Railroad, and on Interstate 80 and Highway 65.

Hazardous Materials

Hazardous material releases from fixed facilities and transportation-related releases can occur during an earthquake event. Roseville's location at the junction of two major rail lines with two freeways increases the potential for a hazardous materials event should a major earthquake occur. Facilities holding hazardous materials are of particular concern because of possible isolation of surrounding populations.

Roads

Roads have the potential to be significantly damaged during an earthquake. Access to major roads is crucial to life and safety after a disaster event as well as to response and recovery operations.

Bridges

Earthquake events can significantly impact bridges, which often provide the only access to some neighborhoods. Since soft soil regions generally follow floodplain boundaries, bridges that cross water courses are considered vulnerable. Since most of the City's bridges provide access across water courses, most are at least somewhat vulnerable to earthquakes. Key factors in the degree of vulnerability are the facility's age and type of construction, which indicate the standards to which the facility was built.

Water and Sewer Infrastructure

Water and sewer infrastructure would likely suffer considerable damage in the event of an earthquake. This is hard to analyze due to the amount of infrastructure and the fact that water and sewer infrastructure are usually linear easements. Without further analysis of individual system components, it should be assumed that these systems are exposed to breakage and failure.

9.4.4 Environment

Environmental problems as a result of an earthquake can be numerous. Secondary hazards will likely have some of the most damaging effects on the environment. Earthquake-induced landslides in landslide prone areas can significantly impact surrounding habitat. It is also possible for streams to be rerouted after an earthquake. This can change the water quality, possibly damaging habitat and feeding areas. There is a possibility of streams fed by groundwater wells drying up because of changes in underlying geology.

9.5 VULNERABILITY

The data in this section was generated using the HAZUS-MH program for earthquakes. Once the location and size of a hypothetical earthquake are identified, HAZUS-MH estimates the intensity of the ground shaking, the number of buildings damaged, the number of casualties, the amount of damage to transportation systems and utilities, the number of people displaced from their homes, and the estimated cost of repair and clean up.

Although Roseville is in California and has three faults documented in the City's General Plan, the seismic hazard is not considered to be a serious risk to life or property. Studies have not identified the Sierra Foothills, including Placer County, as a likely location for a significant seismic event. Roseville is fortunate in that more than three-quarters of the development in the City has occurred in the past two decades and all applicable seismic building codes have been enforced through the planning and development process.

9.5.1 Population

The measurable impact of earthquake on loss of life is minimal in Roseville and has not been estimated for this Plan. The life-safety exposure to earthquake in Roseville is low and would most likely occur in buildings as a result of damage to structures. To prevent damage to structures that could lead to loss of life, the City has a strict code enforcement policy to prevent improper alterations to original buildings. The City has funded façade grants to renovate older commercial structures, and has established an infill development team to work with property owners to upgrade and add value to older properties.

The City encourages residents to be prepared through public education and training via the Roseville Fire Department and local non-profits. Local employers such as Union Pacific, Sutter Roseville Medical Center, Kaiser Hospital, HP and NEC maintain emergency response plans that include earthquake preparedness and response training to protect life and property. Earthquake preparedness and response training prepares employees to continue service to the community in the event of a seismic event.

The vulnerable populations are those living in economically disadvantaged households, those over 65 and those under 16.

9.5.2 Property

Loss Potential

An earthquake would cause property damage in a small percentage of the City's buildings built prior to 1933 and structures such as manufactured homes and older homes that have not been well maintained. Loss estimates for the planning area were generated for the 100-year earthquake event as well as the Concord-Green Valley Fault scenario event and the Great Valley 3 Fault scenario event, through a Level 2 analysis using HAZUS-MH. A summary of results is as follows:

- For a 100-year earthquake, the estimated damage potential is $43.37 million, or 0.15 percent of the total assessed value for the planning area.
- For a 6.8-magnitude event on the Concord-Green Valley Fault, the estimated damage potential is $1.7 million, or 0.01 percent of the total assessed value for the planning area.
- For a 7.1-magnitude event on the Great Valley 3 Fault, the estimated damage potential is $21.3 million, or 0.07 percent of the total assessed value for the planning area.

Age of Structures

The City of Roseville is a relatively new community, with most of its development occurring since 1976. The California Multi-Hazard Mitigation Plan identifies significant milestones in building and seismic code

requirements that affect the structural integrity of development in California. Table 9-8 lists the City's structures by the time period in which they were built, based on age-of-structure data from the City's land inventory database. The number of structures is approximate and is based on best available data currently entered into Roseville and Placer County databases. The number of structures does not reflect the number of total housing units, as many multi-family units and attached housing units are reported as one structure.

Table 9-8. Age of Structures in the City of Roseville

Time Period	Number of Structures in Roseville	Significance of Time Period
Pre-1933	540	Before 1933, there were no explicit requirements for earthquakes in building codes. State law did not require local governments to have building officials or issue building permits.
1933-1940	608	In 1940, the first strong motion recording was made in El Centro.
1941-1960	2,526	In 1960, the Structural Engineers Association of California reached the first statewide consensus on recommended earthquake provisions and published the guidelines.
1961-1975	3,029	In 1975, significant improvements were made to lateral force requirements that were then enforced throughout the state.
1976-1994	12,932	In 1994, the Uniform Building Code was amended to include provisions for seismic safety.
1994 to present	26,423	Seismic code is currently enforced.
Total	**46,058**	

Just over 57 percent of the City's structures were constructed since the UBC was amended in 1994 to include seismic safety provisions. Approximately 1 percent of the City's structures were built before 1933 when there were no building permits, inspections, or seismic standards. Figure 9-6 shows the distribution of structures across the City by age.

Construction Materials

The type of construction is a factor in a building's ability to withstand shaking and liquefaction should an earthquake occur. Developers in Roseville have built primarily wood frame structures. The tallest building in Roseville is currently three stories. HAZUS-MH generated the percentages of each building type in Roseville as shown in Table 9-9.

Table 9-9. Building Type

Building Type	Percent of Total
Wood	96.67%
Reinforced Masonry	<1%
Manufactured Homes	<1%
Concrete	1.2%
Un-reinforced Masonry	<1%
Steel	<1%
Total	**100%**

Sources: HAZUS – MH (Occupancy Class Data)

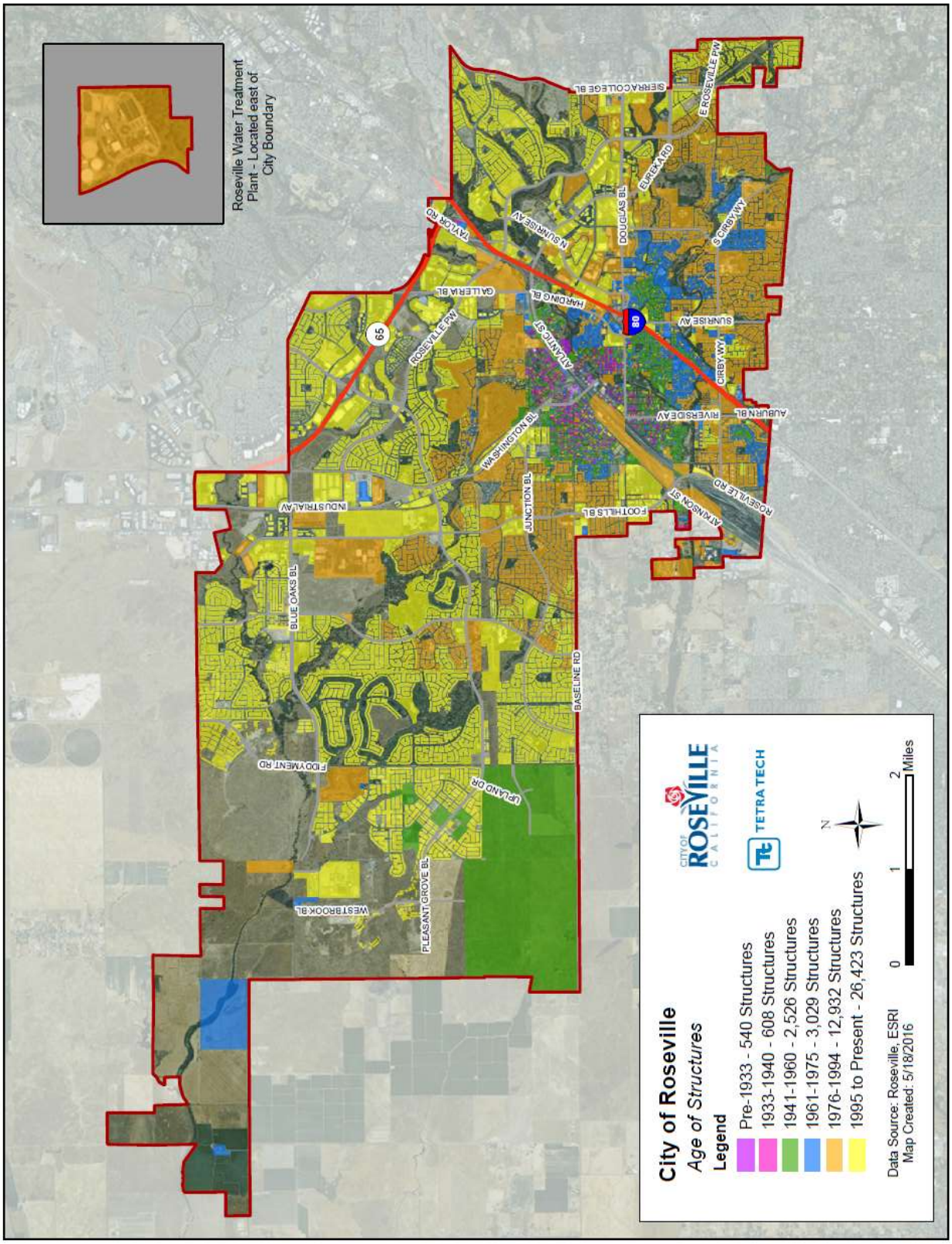


Figure 9-6. Age of Construction of Structures in Roseville

9.5.3 Critical Facilities

Roseville's utilities all have funded rehabilitation programs that identify and replace worn infrastructure to ensure continuous service. The latest technologies, including computerized alarms, video inspections, and mapping of all of the City's water, wastewater, recycled water and electric systems, would identify damaged sections in the event of a seismic event. Private utilities in Roseville also use modern technology to monitor their infrastructure in Roseville and respond quickly to service interruptions.

Level of Damage

The inventory of critical facilities was entered into HAZUS-MH to determine the vulnerability of these facilities to earthquake damage. Critical facilities were categorized into the following levels of damage probability: no damage, slight damage, moderate damage, extensive damage, or complete damage. HAZUS-MH calculated the probability of damage under each of these categories for the 100-year event and the Great Valley 3 Fault Scenario. The results are summarized in Table 9-10 and Table 9-11. The impact on critical facilities for the Concord-Green Valley Fault scenario was not run due to the limited impacts of this event identified by the general building stock analysis.

Table 9-10. Damage Probability (Vulnerability) of Critical Facilities from a 100-Year Earthquake Event

Category	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage
Medical and Health	99.8	0.2	0	0	0
Government Functions	93.4	5.0	1.5	0.1	0
Protective Functions	97.4	2.4	0.2	0	0
Schools	97.3	2.5	0.2	0	0
Other Critical Functions	95.4	4.0	0.6	0	0
Average	**96.7**	**2.8**	**0.5**	**0**	**0**

Table 9-11. Damage Probability (Vulnerability) of Critical Facilities from the Great Valley 3 Scenario

Category	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage
Medical and Health	100	0	0	0	0
Government Functions	99.3	0.7	0	0	0
Protective Functions	99.7	0.3	0	0	0
Schools	99.8	0.2	0	0	0
Other Critical Functions	99.6	0.4	0	0	0
Average	**99.7**	**0.3**	**0**	**0**	**0**

Time to Return to Functionality

HAZUS-MH estimates the expected time required to restore critical facilities to full functional use, in the form of percent probability of being functional at specified time increments post-event: 1, 3, 7, 14, 30 and 90 days after the event occurs. For example, HAZUS-MH may estimate that a facility has 5-percent chance of being fully functional at Day 3, and a 95-percent chance of being fully functional at Day 90. The functionality analysis was performed for all critical facilities and infrastructure components in the planning area for both the 100-year event and the Great Valley 3 Scenario. Results are summarized in Table 9-12 and Table 9-13.

9.5.4 Environment

The environment vulnerable to earthquake hazard is the same as the environment exposed to the hazard.

Table 9-12. Functionality of Critical Facilities, 100-Year Earthquake

Planning Unit	# of Critical Facilities	Probability of Being Fully Functional (%)					
		at Day 1	at Day 3	at Day 7	at Day 14	at Day 30	at Day 90
Medical and Health	2	99.7	99.7	99.9	99.9	99.9	99.9
Government Functions	27	93.4	93.6	98.3	98.3	99.8	99.9
Protective Functions	10	97.3	97.3	99.7	99.8	99.9	99.9
Schools	49	97.2	97.2	99.7	99.8	99.9	99.9
Other Critical functions	78	95.3	95.5	99.3	99.3	99.9	99.9
Total/Average	**166**	**96.6**	**96.7**	**99.4**	**99.4**	**99.9**	**99.9**

Table 9-13. Functionality of Critical Facilities, Great Valley 3 Scenario

Planning Unit	# of Critical Facilities	Probability of Being Fully Functional (%)					
		at Day 1	at Day 3	at Day 7	at Day 14	at Day 30	at Day 90
Medical and Health	2	100	100	100	100	100	100
Government Functions	27	99.2	99.2	99.9	99.9	99.9	99.9
Protective Functions	10	99.7	99.7	99.9	99.9	99.9	99.9
Schools	49	99.8	99.8	99.9	99.9	99.9	99.9
Other Critical functions	78	99.5	99.5	99.9	99.9	99.9	99.9
Total/Average	**166**	**99.6**	**99.6**	**99.9**	**99.9**	**99.9**	**99.9**

9.6 FUTURE TRENDS IN DEVELOPMENT

The general building stock within the planning area increased by 17.7% with an increase in valuation from $21.967 billion to $29.641 billion (34.9%). This increase in valuation of the planning area was impacted by the areas recovery from the economic downturn of 2008. Since the entire planning area would be considered susceptible to earthquake, there was an increase in earthquake exposure over the performance period of the 2011 plan. However, the vulnerability of this new exposure should be considered to be low due to the application of strong seismic building code standards that are contained within the International Building Code.

Roseville is expected to grow considerably in the next 10 years. The moderate potential for earthquake in Roseville is not likely to lessen or prohibit development in the City.

The City's development departments will strictly enforce all seismic building codes and design standards to prevent loss of life and property due to earthquake. Public education, cooperation with the development community, and individual preparedness are essential as Roseville welcomes thousands of new residents and hundreds of new businesses to the City each year.

9.7 REVIEW OF EXISTING ORDINANCES, PROGRAMS AND PLANS

9.7.1 International Building Codes

The State of California provides minimum standards for structural design and site development through the California Building Standards Code (California Code of Regulations (CCR), Title 24). The California Building Code (CBC) is based on the International Building Code (IBC), which is widely used throughout the United States and has been modified for California conditions with numerous more detailed and stringent regulations.

Chapter 18 of the IBC/CBC regulates the excavation of foundations and retaining walls and regulates grading activities, including drainage and erosion control, and construction on expansive soils (soils that expand when

water is added, and shrink when they dry out). Specific minimum seismic safety and structural design requirements are set forth in Chapter 16 of the IBC/CBC. The IBC/CBC requires a site-specific geotechnical study to address seismic issues and identifies seismic factors that must be considered in structural design.

The following uniform codes have been adopted in Chapter 16 of the Roseville Zoning Ordinance to ensure that buildings are designed and sited properly to protect against seismic and unstable soil conditions: CBC (2013), California Plumbing Code (2013), California Green Building Standards (2013), and the California Mechanical Code (2013).

To reduce the risk of seismic-related safety hazards and structural damage to pipelines, roads, and residential homes to an acceptable level, the City of Roseville conditions of approval for development projects require that at the time of tentative map approval, construction be in accordance with the IBC and local building standards, as administered by the Roseville Building Division. Regular monitoring and enforcement through the building permit and plan check process ensures that new development and construction meet all seismic and geologic safety standards, reducing the risk of building damage.

9.7.2 Improvement Standards

The City of Roseville Improvement Standards require the development of a grading plan, an erosion and sedimentation control plan, and mitigation monitoring requirements to reduce the exposure of people and structures to seismic hazards.

9.7.3 Geotechnical Studies

The City of Roseville requires the preparation of site-specific geotechnical studies as part of the building permit process. The technical information that must be compiled for these studies, which address both seismic hazards and soil conditions, is specified in Chapters 16 and 18 of the CBC. The studies provide recommendations to address slope and foundation instability, stream bank protection, and slope evaluation, as well an evaluation of expansive soils and differential settlement. Implementation of recommendations minimizes impacts associated with the exposure of people and structures to seismic hazards, the development of structures on expansive soils, grading that increases slope instability, increased erosion along stream channels, and soil erosion from grading.

9.8 SCENARIO

Inactive faults in the region could significantly impact the City of Roseville should they reactivate, but modeling such impact is difficult due to the lack of data. The direct earthquake risk in Roseville is considered to be low to moderate, but indirect impacts from a significant event in the region could be significant. The City would most likely experience impacts from a large seismic event in the Bay Area. As a large metropolitan center with easy access to transportation corridors, the City would likely become a major evacuation center in response to such an event. This could significantly tax City resources.

9.9 ISSUES

Important issues associated with an earthquake in Roseville include but are not limited to the following:

- Planning is required for mass evacuations into the City of Roseville.
- There is enough older building stock in the City featuring un-reinforced masonry construction to warrant structural and non-structural mitigation.
- There is a need for better comprehensive soils data to better identify the probable earthquake risks in the City.

- A large seismic event in the Sacramento Region could trigger a dam failure on Folsom Lake, causing significant impacts.
- The perceived lack of risk can lead to complacency. Earthquakes provide a significant risk to all populations in California, whether the impacts are direct or indirect.
- There is still much to learn about the impacts of climate change on seismic activity.

10. FLOODING

10.1 GENERAL BACKGROUND

A floodplain is the area adjacent to a river, creek or lake that becomes inundated during a flood. Floodplains may be broad, as when a river crosses an extensive flat landscape, or narrow, as when a river is confined in a canyon.

10.1.1 Measuring Floods and Floodplains

The frequency and severity of flooding are measured using a discharge probability, which represents the probability that a certain discharge level will be equaled or exceeded in a given year. Discharge is the volume of water flowing in a stream or river and over its banks during a given time. Flood studies use historical records to determine the probability of occurrence for different discharge levels. The flood frequency equals 100 divided by the discharge probability. For example, the 100-year discharge has a 1 percent chance of being equaled or exceeded in any given year. The "annual flood" is the greatest flood event expected to occur in a typical year.

The extent of flooding associated with a 1-percent annual probability of occurrence (the base flood or 100-year flood) is commonly used as the regulatory boundary. This boundary is also referred to as the special flood hazard area (SFHA). Many communities have maps that show the extent and likely depth of flooding for the base flood. The base flood elevation is computed using discharge probabilities. The corresponding water-surface elevations describe the exact elevation of water that will result from a given discharge level, which is one of the most important factors used in estimating the potential flood damage in a given area.

10.1.2 Effects of Human Activities

Throughout history, humans have developed settlements in floodplains to take advantage of the benefits of being near the water bodies, but such settlements have always been susceptible to damage from flooding. Human activities concentrate in floodplains for a number of reasons: water is readily available; land is fertile; transportation by water is easily accessible; and land is flatter and easier to develop. But human activity in floodplains frequently interferes with natural processes. It can affect the distribution and timing of drainage, thereby increasing flood problems. Human development creates local flooding problems by altering or confining drainage channels. This increases flood potential in two ways: it reduces the stream's capacity to contain flows, and it increases flow rates or velocities downstream during all stages of a flood event.

10.1.3 Floodplain Ecosystems

Floodplains can support ecosystems that are rich in biological quantity and diversity. Wetting of the floodplain soil releases a surge of nutrients: those left over from the last flood, and those that result from the rapid decomposition of organic matter that has accumulated since then. Microscopic organisms thrive and larger species enter a rapid breeding cycle. Opportunistic feeders—particularly birds—move in to take advantage. The production of nutrients peaks and falls away quickly, but the surge of new growth endures for some time. This makes floodplains particularly valuable for agriculture. Riparian zone species have significant differences from those outside of floodplains. For instance, riparian trees tend to be very tolerant of root disturbance and tend to be very quick-growing compared to non-riparian trees.

10.1.4 Federal Flood Programs

National Flood Insurance Program

The NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in participating communities. For most communities participating in the NFIP, FEMA has prepared a detailed Flood Insurance Study. The study presents water surface elevations for floods of various magnitudes, including the 1-percent annual chance flood and the 0.2-percent annual chance flood (the 500-year flood). Base flood elevations and the boundaries of the 100- and 500-year floodplains are shown on Flood Insurance Rate Maps (FIRMs).

Roseville entered the NFIP on December 15, 1983. The date of the City's current effective FIRM is November 21, 2001. As a participant in the NFIP, the City must, at a minimum, regulate development in its floodplain areas in accordance with NFIP criteria. Before a permit to build in a floodplain area is issued, the City must ensure that two basic criteria are met:

- All new buildings and developments undergoing substantial improvements must, at a minimum, be elevated to protect against damage by the 100-year flood.
- New floodplain development must not worsen existing flood problems or increase damage to other properties.

Properties constructed after a FIRM has been adopted are eligible for reduced flood insurance rates. Such structures are less vulnerable to flooding since they were constructed after regulations and codes were adopted to decrease vulnerability. Properties built before the FIRM was adopted may be more vulnerable to flooding and related damage because they do not meet code or are located in hazardous areas. The first FIRMs for Roseville were available at the end of 1983. According to Placer County Assessor records, 131 of the 154 structures located in the City's regulated floodplain were constructed prior to January 1984 and are therefore considered pre-FIRM under the NFIP. The number of post-FIRM structures in the regulatory floodplain is extremely low because of the City's proactive floodplain management policy of not allowing new development in the floodplain.

The Community Rating System

The Community Rating System (CRS) is a voluntary incentive program within the NFIP. The CRS encourages floodplain management activities that exceed the minimum NFIP requirements (FEMA 2002). Flood insurance premium rates are discounted to reflect the reduced flood risk resulting from community actions meeting the following three goals of the CRS:

- Reduce flood losses.
- Facilitate accurate insurance rating.
- Promote awareness of flood insurance.

For participating communities, flood insurance premium rates are discounted in increments of 5 percent. For example, a Class 1 community would receive a 45 percent premium discount, and a Class 9 community would receive a 5 percent discount. (Class 10 communities are those that do not participate in the CRS; they receive no discount.) The CRS classes for local communities are based on 18 creditable activities in the following categories:

- Public Information
- Mapping and Regulations
- Flood Damage Reduction
- Flood Preparedness

Figure 10-1 shows the nationwide number of CRS communities by class as of May 1, 2016, when there were 1,391 communities receiving flood insurance premium discounts under the CRS program. Although insurance

premium discounts are one benefit of participation in the CRS, more important benefits result from activities that save lives and reduce property damage. Communities participating in the CRS represent a significant portion of the nation's flood risk as evidenced by the fact that over 68 percent of the NFIP's policy base is located in these communities. Communities receiving premium discounts through the CRS range from small to large and represent a broad mixture of flood risks, including both coastal and riverine flood risks.

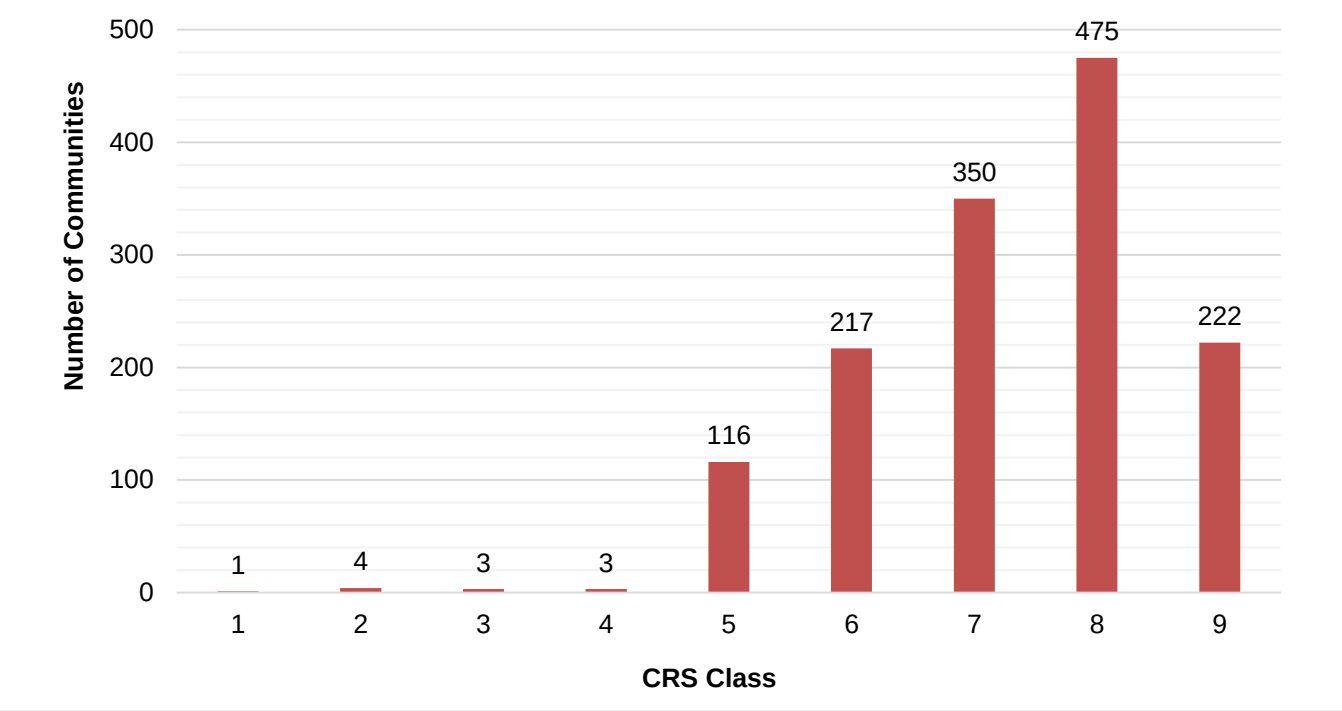


Figure 10-1. CRS Communities by Class as of May 1, 2016

The City of Roseville participated as a pilot-test community during CRS development in the late 1980s. The City began its official participation in the CRS program in 1991 and became the nation's first and only Class 1 community on October 1, 2006. This classification provides flood insurance policy holders in Roseville up to a 45-percent reduction in flood insurance premiums and represents an annual savings of $101,858 in flood insurance premiums; an average of $172 per year for each policy in force.

10.2 HAZARD PROFILE

10.2.1 Flooding Types

Flooding in Roseville is typically caused by high-intensity storms of relatively short duration (1 to 3 hours) concentrated on a stream reach with already saturated soil. In Roseville, two types of flooding typically occur:

- Flash floods that occur suddenly after a brief but intense and concentrated downpour. They move rapidly, end suddenly, and can occur in areas not generally associated with flooding (such as subdivisions not adjacent to a water body and areas serviced by underground drainage systems). Although the duration of these events is usually brief, the damage they cause can be severe. Flash floods cannot be predicted accurately and happen whenever there are heavy storms.

- Riverine floods, which are described in terms of their extent (including the horizontal area affected and the vertical depth of floodwater) and the related probability of occurrence (expressed as the percentage chance that a flood of a specific extent will occur in any given year).

Some localized flooding not associated with creek or stream overflow occurs in Roseville when rainfall runoff volumes exceed the design capacity of drainage facilities or when there are no drainage facilities to control flows. The City has attempted to address this type of flooding with regulations that require an "overland release" of stormwater generated at a site to a recognized stormwater facility. The City also requires mitigation of any increase in runoff generated from new development. However, some developments and facilities in the City were put in place before these policies were adopted.

10.2.2 Past Events

Correspondence from the 1930s between the U.S. Army Corps of Engineers and the City of Roseville indicated a need for establishing flood control measures along Dry, Cirby, and Linda Creeks. The flood of February 1986 was the largest flood on record at its time. This flood caused substantial property damage and was considered to be a 70- to 100-year event, depending on location. In January 1995, the City was subject to flooding that exceeded the 1986 flood event in most streams in Roseville, and that flood is now considered to be the flood of record.

Based on data from the National Climactic Data Center and the University of South Carolina's Spatial Hazard Events and Losses Database for the United States, 16 major flood events were reported in Placer County between January 1950 and December 2009, with an estimated $49,115,460 in property damage. Table 10-1 shows the estimated damage from flooding in Placer County that impacted Roseville from 1973 to 2009.

Table 10-1. Reported Damage from Major Flooding in Roseville (1973 to 2009)

Date	Reported Damage (not adjusted for inflation)
January 1973	$86,207
March 1983	Not Available
February 1986	$5,000,000 (Roseville only)
January 1995	$8,000,000 Total ($4.4 million structural)
January 26,1997	$43,600 (structural)
February 1998	$20,000 (structural)
December 17, 2005	$2,000,000 (county-wide)

Significant flood events impacting the City of Roseville are discussed below with respect to damage, frequency, injuries and fatalities. Unreported injury or illness may be associated with each event. In addition to the events discussed below, flooding occurred during other storms in 1950, 1952 and 1963. However, little information is available to define the extent and impacts of these flooding events.

December 1955

Flooding occurred primarily along Dry Creek. Homes in the Douglas Boulevard area were surrounded by floodwater, and one family was evacuated. Douglas Boulevard was impassable, and pavement was damaged. Royer Park was inundated, and floodwater extended across Park Drive. No injuries or fatalities were reported.

April 1958

This flood, which continued for at least 12 hours, was the second largest event on record at the time. Flooding was most severe on Sunrise Avenue in the southeast portion of the City, on Douglas Boulevard, in the Royer Park area, and on Riverside Avenue at Dry Creek. Agricultural damage occurred along Dry Creek immediately west of

the City. Many homes and businesses were surrounded by floodwater. Several families were evacuated by boat from homes in the Columbia Street and Douglas Boulevard areas. At Royer Park, floodwater covered the ball field and extended across Park Drive. Part of the sewage treatment plant was flooded, but the plant remained operational. No injuries or fatalities were reported.

October 1962

This flood was considered the flood of record at the time. Over 9 inches of rain fell. Creeks overflowed their banks throughout the City, but the areas most affected were along Linda Creek in the Sierra Gardens Subdivision and along Dry Creek. A number of families were evacuated from their homes on Lee Way and Douglas Boulevard. Royer Park was completely inundated for a time, and one deer in the zoo was drowned before animals could be evacuated. Other flood losses in the park included bank erosion, destruction of fencing, damage to a footbridge, and damage to a recreation building and the park office. Restoration of the park required two weeks. Water mains were damaged in the Cresthaven and Atlantic Street areas. The Dry Creek Bridge on Riverside Avenue and the Antelope Creek Bridge on Atlantic Street were damaged. No injuries or fatalities were reported.

December 1964

During this flood event, the fire and police departments evacuated four families when floodwater from Linda Creek surrounded their homes on Champion Oaks Drive and Lee Way. Dry Creek overflowed its banks in several locations, and flood-borne debris was removed in an effort to keep the stream flowing at Booth Road and the Southern Pacific railroad tracks. Floodwater at this location was deep enough to submerge a car stalled in the underpass. Stream-bank erosion occurred along the east bank of Dry Creek behind the Campfire Girls lodge on Sutter Avenue. No injuries or fatalities were reported.

January 1969

A series of downpours beginning on January 16, 1969 caused flooding along Dry Creek, affecting Royer Park, the Champion Oaks area, and the intersection of Cirby Way and Old Auburn Road. Rising water from Linda Creek crested at the doorsteps of five homes along Champion Oaks Drive. City crews prepared to load belongings into vehicles if floodwater entered the homes. A second storm during the week of January 25, caused rising water in Linda Creek that led to the evacuation of five homes on Champion Oaks Drive. Dry Creek Bridge on Douglas Boulevard at Royer Park was closed when Dry Creek washed out fill placed by City crews in response to an earlier washout. No injuries or fatalities were reported.

January 1970

Heavy rains and severe winds caused flooding in Roseville and throughout northern California. High water levels were reported on Champion Oaks Way, Subway Road, and Royer Park. No injuries or fatalities were reported.

January 1973

Heavy rain and high winds impacted northern California border during the week of January 16, 1973. City crews kept watch on Linda Creek at Champion Oaks Drive and closed Subway Road because of flooding. Royer Park flooded after Dry Creek overflowed its banks. No injuries or fatalities were reported.

March 1983

This flood damaged approximately 25 residences along Linda and Cirby Creeks. Portions of Royer Park and areas in the Sierra Lakes Mobile Home Park were inundated. Dry Creek overflowed the Darling Way and Riverside Avenue bridges and flooded six businesses along Riverside Avenue. No injuries or fatalities were reported.

February 1986

This flood caused widespread damage in most of the Dry Creek basin. Nearly all bridges and culverts were overtopped, with 30 sustaining embankment damage. The crossing at Rocky Ridge Drive washed out. Two bridges over Dry Creek were damaged, and street cave-ins occurred at a number of locations. Approximately 209 homes along Dry, Linda, and Cirby Creeks reported flood damage, with water levels up to 5 feet above finished floor levels. The Roseville City Library was closed due to flooding. Floodwaters reached the foundation of the Public Safety Building but did not cause any damage. One fatality associated with this flood event was reported.

January 1995

The January 1995 flood event (Figure 10-2) exceeded the flood event of 1986 on Cirby and Linda Creeks. This event is now considered the flood of record for Dry Creek based on flood heights. The flood was calculated to be a 100-year event. This flood resulted in 358 structures in the Dry Creek Basin being inundated by floodwaters. No injuries or fatalities were reported.



Figure 10-2. Dry Creek Flooding, January 1995

January 1997

Flood events in 1997 were some of the most severe on record for the region. An isolated storm event typical for the Roseville area occurred on soils saturated from repetitive storm events, causing a flash flood. This flooding resulted in 21 structures being inundated with floodwater. The impact of this event was significantly reduced by the partially completed Cirby, Linda, and Dry Creek flood control project. No injuries or fatalities were reported.

February 1998

A small flood occurred on February 3, 1998, resulting in eight structures being inundated by floodwater in the Dry Creek Basin (Figure 10-3). This event was caused by an isolated storm event centered over the basin. No injuries or fatalities were reported.



Figure 10-3. Business Flooding, February 1998

10.2.3 Location

Primary Flood Sources

Upstream flows generated in Placer County enter the City of Roseville's creeks and tributaries from the east and north. Picking up additional stormwater runoff, the creek systems flow west-southwest through Roseville. These flows continue to move west-southwest, passing through Placer, Sacramento, and Sutter Counties to their ultimate destination, the Sacramento and American Rivers.

Roseville is located in portions of two major drainage basins: the Pleasant Grove Creek Basin and the Dry Creek Basin. Pleasant Grove Creek and its tributaries drain most of the western and central areas of the City, and the Dry Creek Basin and its tributaries drain the rest of the City.

The Dry Creek system has year-round flow in its major water courses, and the Pleasant Grove system is intermittent, with only seasonal flow. Since 1950, there have been no reports of structural flood damage along Pleasant Grove Creek. Due to the City's floodplain management policies, no structures in the Pleasant Grove Creek Basin are presently subject to flooding. The focus of flood hazard management is the Dry Creek Basin.

Seven creeks and streams that drain the 80-square-mile Upper Dry Creek Basin pass through and join within the city limits of Roseville. Three of these creeks have primary flooding impacts on the City: Cirby, Dry, and Linda Creeks.

Regulatory Floodplain

The science available at the time that most of the City of Roseville was developed did not accurately project flood heights that could occur from typical rainfall events in the region. Development therefore occurred in areas needed for stormwater conveyance, with insufficient levels of flood protection. Development now exists in low-lying areas adjacent to creek or stream systems needed to convey the over-bank flooding that can occur during storm events.

The City eventually modeled flooding using the best available hydrologic and hydraulic science to better reflect actual rainfall events that can impact the City. This modeling generated a projection of flood heights and areas of inundation that is well supported by conditions observed during the 1986 flood. The City has since used this information to create and enhance its floodplain management program to minimize flood risk to all new developments. Based on the detailed modeling, the City identified a regulatory floodplain that exceeds the SFHA mapped by FEMA. Figure 10-4 shows FEMA's mapped floodplain and the City's regulatory floodplain, as authorized by the Roseville City Code. The City has mapped and regulates 2,372 acres as floodplain, which includes the 1,529 acres of floodplain identified by FEMA on the current effective FIRM for the City. The regulatory floodplain is the area susceptible to risk from flooding based on City-approved studies. These areas are based on detailed hydrologic and hydraulic floodplain modeling that meets or exceeds FEMA criteria for mapping and modeling floodplains. The flood event used to delineate these boundaries is referred to as "the regulatory flood" to differentiate it from the "base flood" used by FEMA.

In many portions of the City, the Nolte Future Floodplain has been used to designate floodplain boundaries. The Nolte Future Floodplain defines floodway and floodway fringe boundaries within the floodplain. The floodway fringe is an area along the boundary of the floodplain that, if totally obstructed, would not result in more than a 1-foot rise in the water surface elevation. The floodway constitutes the remainder of the floodplain area and is typically where floodwaters have the most velocity.

10.2.4 Frequency

Flood magnitude measurements reflect statistical averages only; it is possible for two or more rare floods (with a 100-year or higher recurrence interval) to occur within a short time period. Assigning recurrence intervals to historical floods on different streams can help indicate the intensity of a storm over a large area. For example, the 1995 flood event was determined to be a 100-year flood on Dry Creek and a 50-year flood on Linda Creek.

Recent history has shown that Roseville can expect an average of one episode of minor river flooding each winter. Recent flooding resulting in property damage has occurred about every 3 to 5 years since 1950, except for the period from 1973 to 1981, when no significant flooding occurred. The frequency of flood events that cause significant damage has decreased significantly over the past 10 years due to City efforts to mitigate flood risk. Exposure to events that could cause significant flooding can be expected every 5 to 10 years. Additionally, the City can expect what is often referred to as "nuisance" flooding annually in the historic core due to urban drainage issues.

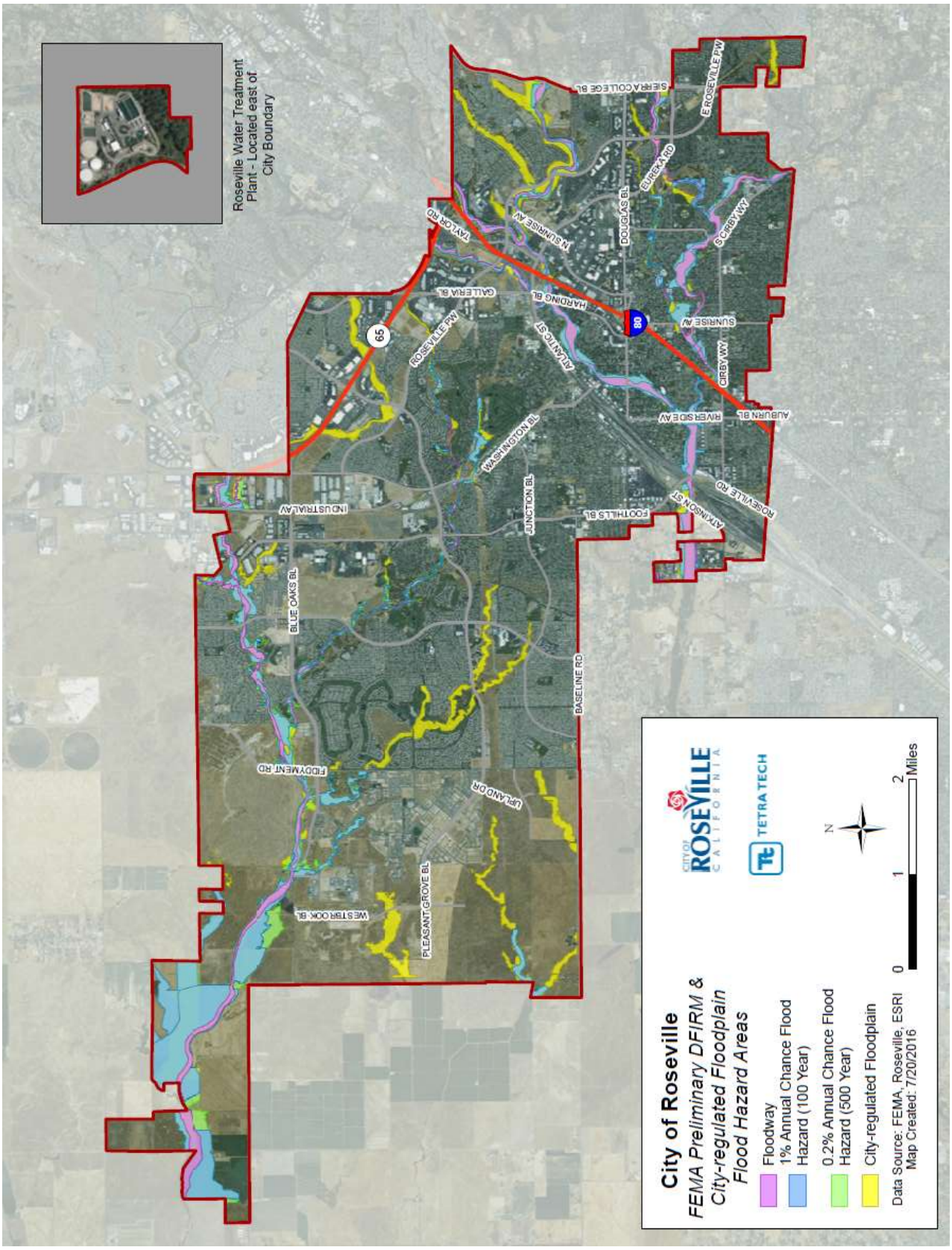


Figure 10-4. Floodplains

10.2.5 Severity

Table 10-2 shows observed flooding characteristics for the Pleasant Grove and Dry Creek basins, based on measurements made during past flood events.

Table 10-2. Observed Characteristics of Flooding

	Pleasant Grove Creek Basin	Dry Creek Basin
Approximate Base Flood Velocity (feet/second)[a]	0.5 to 8.0	2.0 to 14.0
Flow Rate (cubic feet per second)[b]	1,100 to 5,000	900 to 15,000
Base Flood Elevation (feet, National Geodetic Vertical Datum)		
Downstream limit	89.7	79.7
Upstream limit	150.0	210.0
Approximate Depth of Overbank Flooding (feet above existing grade)	0 to 2	0 to 3
Approximate Warning Time (hours)	3	3

a. Higher velocities were observed in the channel; lower velocities were observed in the overbank area
b. 1 cubic foot is about 7.5 gallons

The City recently completed five phases of the seven-phase "Cirby-Linda-Dry Creek Flood Control Project." The purpose of this project is to reduce stormwater backup at constrictions and increase the overall capacity of the floodplain during storm conditions. Project structures were designed to provide 1 foot of freeboard above the projected 500-year flood elevation. This project significantly reduced the flood risk exposure for this area, but did not eliminate it.

10.2.6 Warning Time

Due to the extended precipitation needed to cause serious flooding, it is unusual for a flood to occur without warning. Flash flooding can be less predictable, but hazard areas can be warned in advanced of potential flash flooding. Typical warning times for Roseville range from 1 to 3 hours. The City's flood warning system has four ways to warn the public of potential flooding:

- A comprehensive graphical display of stream levels, broadcast on Channel 14 or 73, with the status of the warning
- The "Stream Level" link on the City of Roseville home web page (www.roseville.ca.us)
- An automatic telephone dialing system to problem areas
- Flooding status broadcasted on radio station 530 AM.

Numerous stream flow and rain gauges form the City's stream monitoring system for the Upper Dry Creek Drainage Basin. These stations are placed at strategic locations throughout the drainage basin. For example, one is mounted on the floodwall just upstream from the pedestrian bridge that crosses between Tina Way and Marlin Drive and another is on Dry Creek at the Vernon Street Bridge. Each station transmits information via radio antenna to a central computer. Stream level information from five of the most critical stream level gauges is broadcasted on cable Channel 14/73 and on the City's web page during significant storm events. City staff uses this information in deciding whether to advise residents to evacuate. The goal is to provide up to 3 hours of advance warning. The continuously changing variables of precipitation, stream levels, and forecasts have a major effect on meeting this goal. The display shown on Channel 14/73 consists of a set of basic graphics shown in 15-second intervals:

- The first, which is shown only once for every complete cycle, is a City of Roseville map that includes major roadways (Vernon Street, Douglas Boulevard, Cirby Way, etc.), the three major streams (Dry Creek, Linda Creek, and Cirby Creek) and the five stream level gauge locations. Residents living in a

designated floodplain can determine which of the five stream gauges best represents their neighborhood. Once this is established, it is important to focus on how the streams are reacting to the weather conditions.

- Following this display, a more specific map identifies a single stream gauge's location in relation to nearby roadways and streams.
- Transmitted information from the gauges is presented in visual formats that include the current stream depth and the stream depth over the past six hours.

The stream level graph is divided into four colored categories of flood depth stages (see Figure 10-5):

- Blue (Normal Stage)—Stream level conditions are normal and safe.
- Green (Advisory Stage)—City staff is continuously monitoring creek levels and weather conditions. Residents should be closely watching for further information about flooding in their area.
- Yellow (Warning Stage)—There is a possibility of flooding in this area. Necessary precautions need to be taken to secure personal property and safety.
- Red (Critical Stage)—Flooding appears imminent in this area. Residents should evacuate their homes.

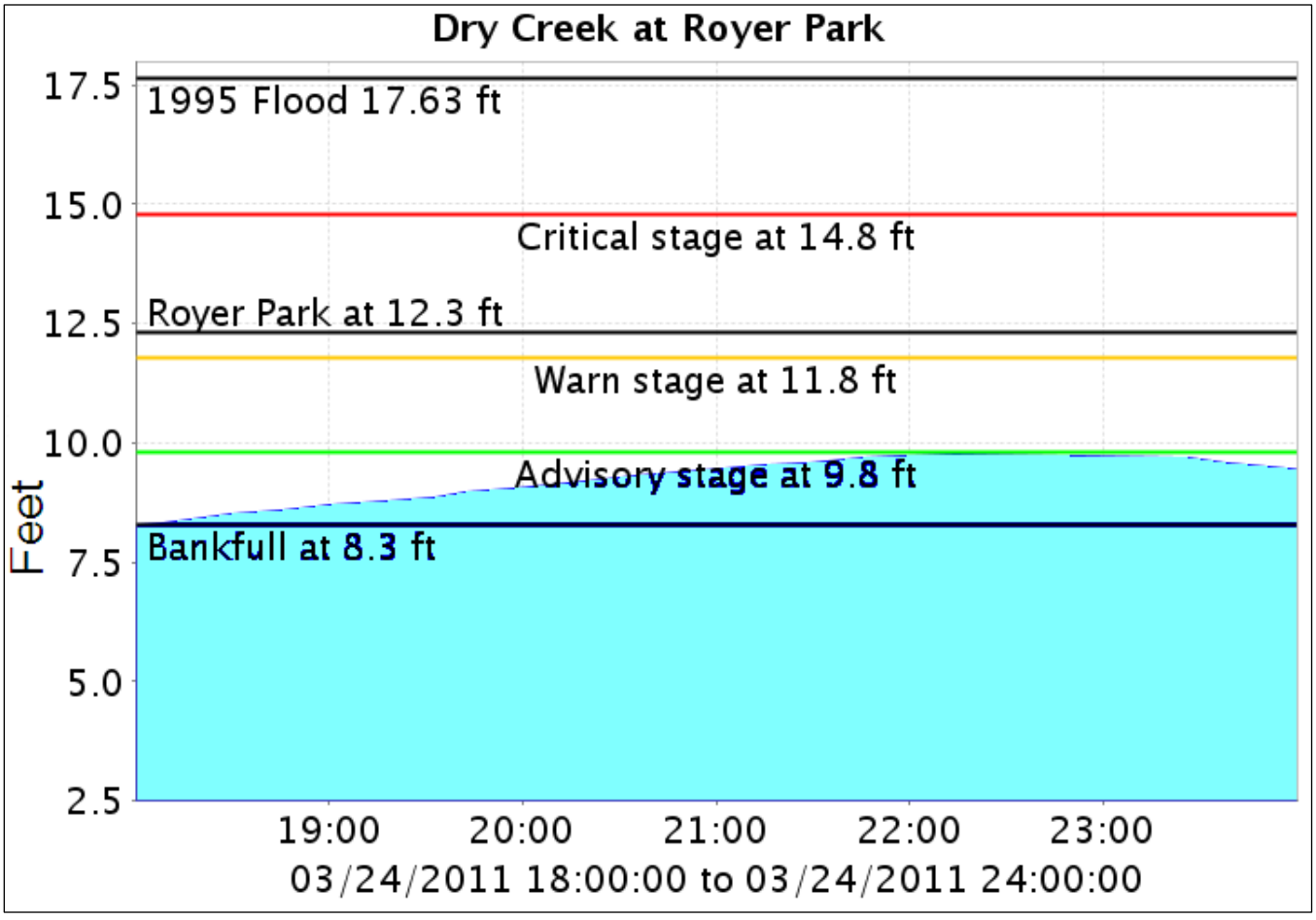


Figure 10-5. Example of Stream Gauge Graphic Display

The numeric values of the stream depths associated with the flood depth stages are shown on the vertical bar graph for all five of the stream level gauges, and reference stream levels are identified for each gauge. For example, the stream level during the 1995 flood is marked for each location. Also identified are other reference

points such as roadway surface, bridge and/or top of berm levels. This enables viewers to identify and understand the present stage of the stream in relation to known benchmarks.

The City of Roseville also has an automated telephone dialing system. During significant storm events, this system is used to phone residents and businesses in the floodplain and provide recorded messages containing important information. The message to be played will depend on the flood threat in the area at that time.

10.3 SECONDARY HAZARDS

The most significant secondary hazard for flooding in Roseville is bank erosion. The dangers of bank erosion often are greater than those of flooding. Flooding is responsible for landslides when high flows over-saturate soils on steep slopes, causing them to fail. Hazardous materials spills are also a secondary hazard of flooding if storage tanks rupture and spill into streams, rivers or drainage sewers.

10.4 EXPOSURE

The Level 2 HAZUS-MH protocol was used to assess the risk and vulnerability to flooding in the planning area. HAZUS-MH uses census data at the block level, FEMA floodplain data, and GIS data for the City's regulatory floodplain. Where possible, the HAZUS-MH data for this risk assessment was enhanced using GIS data from the City and from county, state and federal sources. The following sections describe risk exposure and vulnerability of the general building stock, critical facilities and infrastructure, land use, and environment within the City's mapped regulatory floodplain.

10.4.1 Population

Estimates of the population living in the floodplain in the planning area were generated by analyzing census blocks that intersect with the City's regulatory floodplain. Census blocks do not follow the same boundaries as the floodplain. Therefore, the methodology used to generate these estimates counted census block groups whose centers are in the floodplain or where the majority of the population most likely lives in or near the floodplain. HAZUS-MH estimated the number of buildings within the floodplain in each block, and then estimated the total population by multiplying the number of residential structures by the City average of 2.54 persons per household. Using this approach, the exposed population within the regulatory floodplain was estimated to be 330 (0.25 percent of the total City population). This is only slightly greater than the estimated 322 people exposed in the SFHA.

10.4.2 Property

Structures in the Floodplain

Table 10-3 summarizes the number and type of structures in the floodplain, as calculated from the Level 2 HAZUS-MH analysis. There are 210 structures in the City of Roseville regulatory floodplain. This represents less than 1 percent of the total structures in the City. It includes the 200 buildings identified within FEMA's SFHA.

Table 10-3. Structures Within the SFHA and the Roseville Regulatory Floodplain

	# of Structures in Mapped Floodplain						
	Residential	Commercial	Industrial	Religion	Government	Education	Total
FEMA-Preliminary Mapped SFHA	157	34	7	1	0	1	**200**
Roseville Regulatory Floodplain	156	38	11	2	2	1	210

Exposed Value

The value of exposed buildings within the City's regulated floodplain area and the SFHA was generated using HAZUS-MH and is summarized in Table 10-4 and Table 10-5. This methodology estimated $289 million worth of building-and-contents exposure, representing 0.97 percent of the total building-and-contents value in the City.

Table 10-4. Value of Exposed Buildings Within the FEMA SFHA

	Value of Exposed Property in the Mapped Floodplain			% of Total Value in the City
	Buildings	Contents	**Total**	
Residential	$24,700,000	$12,400,000	$37,000,000	0.2%
Commercial	$75,600,000	$77,000,000	$152,600,000	1.8%
Industrial	$2,400,000	$2,600,000	$5,000,000	0.4%
Religion	$0	$0	$0	0.00%
Government	$0	$0	$0	0.00%
Education	$1,200,000	$1,200,000	$2,500,000	0.2%
Total	**$103,900,000**	**$93,200,000**	**$197,100,000**	**0.7%**

Table 10-5. Value of Exposed Buildings Within the Roseville Regulatory Floodplain

	Value of Exposed Property in the Mapped Floodplain			% of Total Value in the City
	Buildings	Contents	**Total**	
Residential	$39,719,211	$19,859,606	$59,578,817	0.32%
Commercial	$84,278,680	$87,860,805	$172,139,485	2.08%
Industrial	$24,855,494	$25,109,167	$49,964,662	4.30%
Religion	$1,337,875	$1,337,875	$2,675,749	1.07%
Government	$1,032,368	$1,032,368	$2,064,736	1.22%
Education	$1,231,683	$1,231,683	$2,463,365	0.23%
Total	$152,455,311	$136,431,504	$288,886,814	0.97%

Land Use in the Floodplain

To preserve the natural and beneficial functions of open space resource areas adjacent to the floodplain areas of Roseville, the City has adopted policies under the Open Space and Conservation Element of its General Plan that include the following:

- Preserve and rehabilitate continuous riparian corridors and adjacent habitat along the City's creeks and waterways.
- Require dedication of the 100-year floodplain or comparable mechanism to protect habitat and wildlife values in perpetuity.
- Restrict development within the 200-year floodplain subject to the State of California Urban Level of Flood Protection Criteria.
- Require preservation of contiguous areas outside the 100-year floodplain as merited by special resources or circumstances, which may include, but are not limited to, sensitive wildlife or vegetation, wetland habitat, oak woodland areas, grassland connections in association with other habitat areas, slope or topographical considerations, recreation opportunities, and maintenance access requirements.
- Limit recreation activities within the 100-year floodplain and require additional setback areas for trails and other recreation uses so that natural resource areas are not adversely impacted.
- Provide protection and enhancement of fishery resources, including continued coordination with the California Department of Fish and Wildlife to release water to Linda Creek.

Because of these policies, a large portion of the floodplains within Roseville is held for open space use, much of it in a natural or beneficial state. Currently, 1,491.4 acres (97 percent) of the regulatory floodplain within Roseville is designated for open space use, as defined in the Open Space and Conservation Element of the General Plan.

10.4.3 Critical Facilities and Infrastructure

Flooding poses numerous risks to critical facilities and infrastructure:

- Roads or railroads that are blocked or damaged can prevent access throughout the area and can isolate residents and emergency service providers needing to get to vulnerable populations or to make repairs.
- Bridges washed out or blocked by floods or debris from floods also can cause isolation.
- Creek or river floodwaters can back up drainage systems, causing localized flooding.
- Culverts can be blocked by debris from flood events, also causing localized urban flooding.
- Floodwaters can get into drinking water supplies, causing contamination.
- Sewer systems can be backed up, causing waste to spill into homes, neighborhoods, rivers and streams.
- Underground utilities can also be damaged.

The inventory of critical facilities in Roseville's SFHA and regulatory floodplain is shown in Table 10-6 and Table 10-7.

Table 10-6. Critical Facilities in Flood Area

	Critical Facilities within the SFHA	Critical Facilities within the City of Roseville Regulated Floodplain
Medical & Health Services	0	0
Government Function	0	0
Protective Function	0	0
Schools	0	0
Societal Function	2	2
Hazmat	0	0
Other Critical Function	17	1
Total	**19**	**3**

Table 10-7. Critical Infrastructure in Flood Areas

	Critical Infrastructure within the SFHA	Critical Infrastructure within the City of Roseville Regulated Floodplain
Water Supply	0	4
Wastewater	5	4
Power	0	0
Fuel Storage	0	0
Communications	1	2
Bridges	11	27
Total	**17**	**18**

The City of Roseville has determined that the following major roadways and stream crossings (bridges or culverts) would be impassable during a 100-year flood event:

- Dry Creek Road Crossings
- Cirby Creek Road Crossings

  - Vernon Street
  - Riverside Avenue
  - Darling Way
  - Douglas Boulevard
  - Folsom Road
- Linda Creek Road Crossings
  - Rocky Ridge Drive
  - Champion Oaks Drive
  - Sierra College Boulevard
  - Sunrise Avenue
  - Coloma Way
  - Oakridge Road
  - Sierra Gardens Drive
  - Huntington Drive
- Miners Ravine
  - Sierra College Boulevard

10.4.4 Environment

Flooding is a natural event, and floodplains provide many natural and beneficial functions. Nonetheless, with human development factored in, flooding can impact the environment in negative ways:

- Migrating fish can wash into roads or over dikes into flooded fields, with no possibility of escape.
- Pollution from roads, such as oil, and hazardous materials can wash into rivers and streams.
- Pollutants carried by floodwaters can settle onto normally dry soils, polluting them for agricultural uses.
- Human development, such as bridge abutments and levees, and logjams from timber harvesting can increase streambank erosion, causing rivers and streams to migrate into non-natural courses.

With much of Roseville's regulatory floodplain zoned for open space use, the City has taken significant steps to preserve the natural and beneficial functions of the floodplain, while at the same time reducing the risk exposure to the built environment. Still, all vegetation and wildlife resources and corridors in the floodplain open space system—grasslands, oak woodlands, riparian areas, and seasonal wetlands—are exposed to the flood risk.

10.5 VULNERABILITY

10.5.1 Population

Flooding can be a deadly hazard. Roads running through low-lying areas prone to sudden and frequent flooding are a serious threat. Motorists often attempt to drive through barricaded or flooded roadways. Because as little as 18 to 24 inches of water moving across a roadway can carry away most vehicles, floods can present significant potential safety risks. The second largest potential for injuries from flooding results from people walking or playing in or near flooded areas. Generally, floods kill people in one of two situations: when people ignore basic safety precautions (such as evacuations and warnings), and when a flash flood hits an area with no warning.

Although it is possible to analyze life and safety impacts resulting from the flood hazard, injuries and casualties were not estimated for this hazard. One flood-related fatality in Roseville has been recorded, but the flood hazard is not generally considered to pose a serious risk to life in this area, for the following reasons:

- Flooding in Roseville tends to be rapid in terms of the rise and fall of floodwaters. Because of the City's geographical location in the watershed, floods tend to come and go quickly as they move toward their drainage endpoints, thereby decreasing the threat that people become trapped by floodwaters.
- The City has made it a priority to warn and educate its citizens on the dangers and impacts of flooding. The City implements public outreach programs that provide information on flood warnings, property protection, flood safety, and flood insurance. The City also has developed a comprehensive flood warning program that can deliver real-time data to citizens and emergency management personnel through cable

television and the Internet. The program can provide a warning up to 3 hours before a flood event occurs in the 100-year floodplain. The City's approach has resulted in an educated and well-informed constituency.

The June 2004 City of Roseville Emergency Operations Plan, most recently updated in 2010, directs the City of Roseville Emergency Management Organization, coordinates the actions of emergency operations center staff, establishes operational priorities, ensures development and implementation of strategies to meet the needs of the emergency, works with local elected officials on issues related to emergency response and recovery, identifies procedures for evacuation, communicates with the media, coordinates response with outside agencies, and ensures the safety of responders. The Emergency Operations Plan follows California's Standardized Emergency Management System (SEMS) format (see Section 4.9.2).

Regarding health concerns, one of Roseville's sewage treatment facilities is located on the downstream end of Dry Creek. This facility is located above the 100-year floodplain but has overflow ponds within the floodplain. When plant influent loads exceed the plant capacity, untreated sewage is discharged to the overflow ponds. If this scenario occurred simultaneously with a 100-year flood, floodwaters could be contaminated. This situation has not occurred during past flood events, and its probability of occurrence is low. Therefore, its potential impacts on health were not estimated as part of this assessment.

10.5.2 Property

Flood Insurance

Flood insurance statistics help identify vulnerability by showing where there is claim activity, where there is a high rate of flood insurance in force, and where flooding may be occurring in areas not identified as flood-prone. Table 10-8 lists flood insurance statistics for the City of Roseville. The total of $9.9 million paid on 292 claims through July 31, 2010 represents an average of $33,923 per claim.

Table 10-8. Flood Insurance Statistics for the City of Roseville

Date of Entry Initial FIRM Effective Date	December 15, 1983
Current FIRM Effective Date	November 21, 2001
Number of flood insurance policies in force as of 3/31/2016	591
Total annual premium	$311,643
Average policy cost	$527 (national average = $412)
Total insurance coverage	$176,339,200
Total claims filed (1978 to 11/30/2009)	292
Value of claims paid	$9,905,478
Average claim paid	$33,923
Number of flood insurance policies in force within the SFHA	111
X Standard/AR/A99 policies	18
Preferred Risk Policies	462

Flood insurance statistics relevant to reducing flood hazard are as follows:

- Approximately 76 percent of the insurable structures in the SFHA are currently covered by a flood insurance policy. This is well above the national average. According to a study conducted for the NFIP, about 49 percent of single-family homes in special flood hazard areas nationwide are covered by flood insurance.
- 81.2 percent of the current policies in force are for properties outside the SFHA.

- The high percentage of policies outside the SFHA is probably due to the impact of the Cirby-Linda-Dry Creek Flood Control Project and resulting remapping.

Flood Loss Potential of Structures

The HAZUS-MH program calculates losses to structures from flooding by looking at depth of flooding and type of structure. Using historical flood insurance claim data, HAZUS-MH estimates the percentage of damage to structures and their contents by applying established damage functions to an inventory. This inventory comes pre-loaded within the HAZUS-MH model and is based on data from the U.S. Census, state databases, the U.S. Highway Administration, and other sources. Default values can be overridden with locally generated data if available. For this analysis, local data on facilities was used to assess flood risk in the City of Roseville. The City has created a flood inventory database of site-specific information for each property in the regulatory floodplain. This database includes information for the following basic categories:

- Buildings in the regulatory floodplain
- Building use
- Building area
- Building value
- Permit history
- Flood loss history
- Regulatory flood elevation
- Base flood elevation
- Pre- and post-FIRM structures
- Elevation of lowest adjacent grade
- Finished floor elevation

The HAZUS-MH analysis is summarized in Table 10-9 through Table 10-11. It is estimated that there would be up to $2.16 million of flood loss from a 10-year flood event. This represents less than 0.01 percent of the total assessed value of the City. It is estimated that there would be up to $7.04 million of flood loss from a 100-year flood event. This represents 3.6 percent of the total value exposed to the flood hazard in the regulatory floodplain and 0.02 percent of the total assessed value of the City. It is estimated that there would be $7.14 million of flood loss from a 500-year flood event, representing 3.4 percent of the total value exposed to the flood hazard in the regulatory floodplain and 0.02 percent of the total assessed value for the City.

Table 10-9. Estimated Flood Loss for the 10-Year Flood Event (Preliminary FIRM)

	Estimated Flood Loss			% of Total
	Buildings	Contents	**Total**	Assessed Value
Residential	$1,275,990	$609,637	$1,885,627	<0.01%
Commercial	$70,143	$172,585	$242,727	<0.01%
Industrial	$16,759	$21,065	$37,825	<0.01%
Agricultural	$0	$0	$0	0.00%
Religion	$0	$0	$0	0.00%
Government	$0	$0	$0	0.00%
Education	$0	$0	$0	0.00%
Total	**$1,362,892**	**$803,287**	**$2,166,179**	**<0.01%**

Table 10-10. Estimated Flood Loss for the 100-Year and 500-Year Flood Events (Preliminary FIRM)

	Estimated Flood Loss						% of Total Assessed Value	
	Buildings		Contents		**Total**			
	100-year	500-year	100-year	500-year	**100-year**	**500-year**	100-year	500-year
Residential	$2,253,989	$2,253,989	$1,257,030	$1,257,030	$3,511,019	$3,511,019	0.02%	0.02%
Commercial	$686,896	$704,051	$2,366,376	$2,452,152	$3,053,271	$3,156,203	0.04%	0.04%
Industrial	$107,228	$107,228	$375,139	$375,139	$482,368	$482,368	0.04%	0.04%
Agricultural	$0	$0	$0	$0	$0	$0	0.00%	0.00%
Religion	$0	$0	$0	$0	$0	$0	0.00%	0.00%
Government	$0	$0	$0	$0	$0	$0	0.00%	0.00%
Education	$0	$0	$0	$0	$0	$0	0.00%	0.00%
Total	**$3,048,113**	**$3,065,269**	**$3,998,545**	**$4,084,321**	**$7,046,658**	**$7,149,590**	**0.02%**	**0.02%**

Table 10-11. Estimated Flood Loss for the Regulatory Floodplain

	Estimated Flood Loss			% of Total Assessed Value
	Buildings	Contents	**Total**	
Residential	$2,096,568	$944,975	$3,041,544	0.02%
Commercial	$1,322,410	$3,044,262	$4,366,672	0.05%
Industrial	$87,710	$254,384	$342,094	0.03%
Agricultural	$33,023	$240,436	$273,459	0.11%
Religion	$1,603	$9,617	$11,220	0.01%
Government	$0	$0	$0	0.00%
Education	$3,541,314	$4,493,675	$8,034,988	0.03%
Total	**$2,096,568**	**$944,975**	**$3,041,544**	**0.02%**

Repetitive Loss

Several federal government programs encourage communities to identify and mitigate "repetitive loss" properties. Nationwide, repetitive loss properties make up only 1 to 2 percent of the flood insurance policies currently in force, yet they account for 40 percent of the flood insurance claim payments. A report on repetitive loss structures by the National Wildlife Federation found that 20 percent of these structures are listed as outside the 100-year floodplain. In 1998, FEMA reported that the NFIP's 75,000 repetitive loss structures had already cost $2.8 billion in flood insurance payments.

FEMA identifies repetitive loss structures based on flood insurance payments. A repetitive loss area is the portion of the floodplain where numerous buildings have been subject to repetitive flooding. The purpose of identifying repetitive loss areas is to identify structures that are subject to the same risk but are not on FEMA's list because a flood insurance policy was not in force at the time of loss.

The list of repetitive loss properties maintained by FEMA identifies one commerical repetitive loss property within the City's regulatory floodplain. When Roseville first began its participation in the CRS program in 1991, the list of repetitive loss properties totaled 27 locations. Since then, flood protection and mitigation projects (including purchase and relocation of structures) have occurred at 23 repetitive loss locations and all 23 locations are no longer subject to repetitive flood losses. This represents an 85 percent reduction in exposure of insured properties to repetitive flood losses. This reduction is a prime example of how the City of Roseville's proactive flood mitigation practices have decreased the exposure of its citizens to the flood hazard, reduced the number of repetitive loss properties, and minimized reliance on post-disaster assistance provided by the federal government and the nation's taxpayers.

Figure 10-6 shows the location of Roseville's single remaining repetitive loss area. The City is required to address its repetitive loss area as a condition of its participation in the CRS program. This hazard mitigation plan meets this CRS requirement.

10.5.3 Critical Facilities and Infrastructure

HAZUS-MH was used to estimate the flood loss potential of critical facilities exposed to the flood risk. The model uses depth/damage function curves to estimate the percent of damage to a building and its contents and correlates that with an estimate of functional downtime (the time it will take to restore a facility to 100 percent of its functionality). The findings were as follows:

- On average, critical facilities would receive 5 percent damage to the structure and 19 percent damage to the contents during a 100-year flood event, and the estimated time to restore these facilities to full functionality would be 90 days.
- On average, critical facilities would receive 8 percent damage to the structure and 31 percent damage to the contents during a 500-year flood event, and the estimated time to restore these facilities to full functionality would be 160 days.

Six critical facilities are exposed and vulnerable to flooding in Roseville. A detailed vulnerability analysis of all critical facilities is on file with appropriate City staff and will not be published for public review. Of these six critical facilities, two have sufficient vulnerability to flooding to warrant mitigation strategies. Flood protection has been provided to the two churches identified, although it is not 100-year flood protection. The estimated depth of flooding for these two facilities is minimal and there have been no reports of flood damage. The County courthouse has been elevated to above the 100-year flood level. Mitigation strategies outlined in this Plan will mitigate the impact of flooding on the remaining facilities, including retrofitting the floodwall that protects the library and public safety building.

Of Roseville's two wastewater treatment plants, only the Dry Creek Plant is partially located in the floodplain. The storm sewer system is separate from the sanitary sewer system, so the sanitary sewers are not significantly affected by storm events.

10.5.4 Environment

The environment vulnerable to the flood hazard is the same as the environment exposed to the hazard. While flood events have historically caused significant damage to the environment, estimating damage can be difficult. Loss estimation platforms such as HAZUS-MH are not currently equipped to measure environmental impacts of flood hazards. The best gauge of vulnerability of the environment would be a review of damage from past flood events. Loss data that segregates damage to the environment were not available at the time of this Plan. Capturing this data from future events could be beneficial in measuring the vulnerability of the environment for future updates to this Plan.

10.6 FUTURE TRENDS IN DEVELOPMENT

Increased urbanization of western Placer County within the Pleasant Grove and Dry Creek Basins has resulted in the potential for increased flooding problems in Roseville. Land development typically results in increased hard surfaces and decreased vegetation, conditions that limit infiltration opportunities and, without adequate mitigation, can increase stormwater runoff rates and volumes and decrease the time required to reach peak discharge.

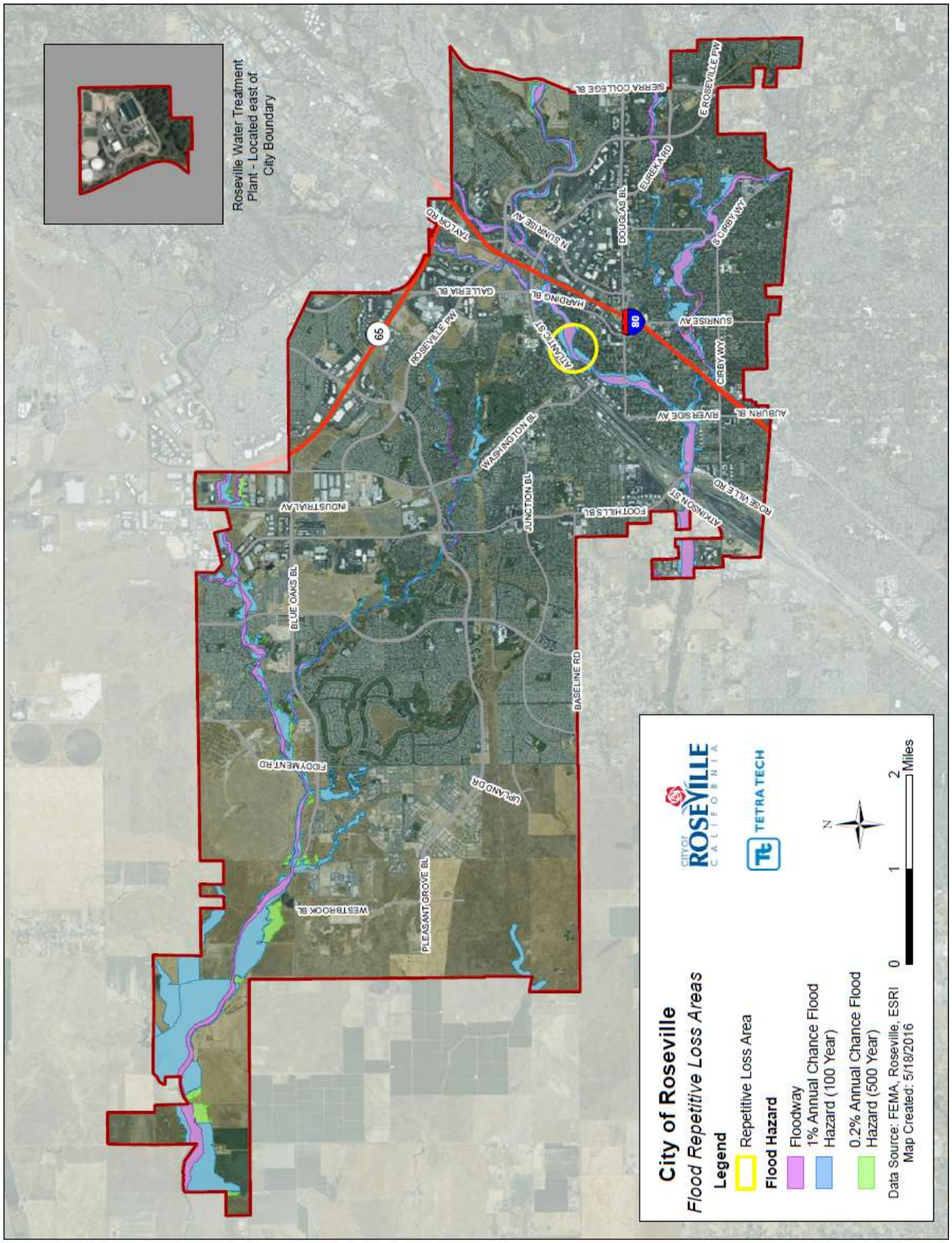


Figure 10-6. Repetitive Loss Area

Recognizing that typical growth patterns in California would impact and exacerbate the flood hazard problem, the City of Roseville took an aggressive, proactive approach to managing its floodplains through the development of its General Plan in 1992. Land-use categories are defined in the General Plan, with information on general uses, development, intensity, siting, and compatibility standards in relation to the flood hazard. City actions, such as land-use allocation, annexations, zoning, subdivision and design review, redevelopment and capital improvements, must be consistent with the General Plan.

Only three parcels in Roseville's regulatory floodplain are in the current buildable lands inventory. These parcels were all created before the City's flood-protection policies were enacted. Any new development on these parcels would be subject to strict regulations.

Because of policies, activities and mitigation measures in place in Roseville, it can be concluded that future land development trends will not impact or be impacted by flooding in Roseville as long as existing policies remain in force.

10.7 REVIEW OF EXISTING ORDINANCES, PROGRAMS, AND PLANS

The City of Roseville has a long-standing policy to proactively manage its floodplains. Under the guidance of the General Plan and its Safety Element, Roseville has been able to decrease the exposure of its citizens to flooding with a comprehensive approach that includes the following measures:

- Structural mitigation (flood control)
- Non-structural mitigation (elevation or acquisition)
- Regulations
- Stormwater management
- Flood warning
- Outreach and public education.

This section discusses each element except flood warning, which is discussed in Section 10.2.6).

10.7.1 Structural Mitigation

The following major flood control improvements have been accomplished by the City of Roseville since the January 1995 flood event:

- **Tina Way/Elisa Way Area—**Completed in 1996 at the cost of $3 million (100 percent City-funded), this project included channel excavation and construction of berms and floodwalls. The project removed 40 structures from the floodplain. Based on the pre-project location and construction of these structures, the entire area would have flooded during the 1997 flood if the improvements had not been implemented.
- **Riverside Avenue/Vernon Street Area—**Completed in 1996 at the cost of $2 million (90 percent funded by the Union Pacific Railroad and 10 percent funded by the City), the construction project included replacing culverts with a new bridge over Dry Creek. The net effect of this project lowered flood elevations for the reach by 5 to 7 feet and removed 150 structures from the floodplain.
- **Sunrise Avenue/Oakridge Drive and Champion Oaks Areas—**Completed in 2001 at the cost of $16.1 million ($8.7 million from FEMA and $7.4 million from the City), this project replaced culverts with a new bridge over Linda Creek at Sunrise Avenue. Twin 9-foot-diameter bypass pipes were installed in the Oakridge Drive area. The project included channel excavation and berm and floodwall construction. The project removed 233 structures from the floodplain; 44 structures remained in the floodplain, but these structures were less likely to be flooded. Features included maintaining a channel in

as natural a state as possible; planting over 500 oak trees; assigning biologists, ornithologists, and arborists to minimize environmental impacts; and monitoring fish passage and plantings for 5 years.

The City has spent more than $22 million on flood mitigation since the January 1995 flood event and has eliminated 445 flood-prone structures from the floodplain.

10.7.2 Non-Structural Mitigation

Structural mitigation projects reduced the flood exposure of property by 91 percent. Roseville offered mitigation through acquisition or home elevation to the remaining 9 percent of properties exposed to flooding. Completed in 2001 at the cost of $1 million (50 percent funded by FEMA, 40 percent funded by the property owners, and 10 percent funded by the City), the project included elevating 27 homes and acquiring (buying out) 4 homes. This effort resulted in 22 flood-prone homes with post-project floor levels higher than the floodplain level.

10.7.3 Regulations

The City of Roseville regulates its floodplain areas through land use, zoning, and other development restrictions, including a policy that prohibits most development within the 100-year floodplain area. Development in floodplain areas in Roseville is restricted by the following:

- 2035 General Plan, Safety Element, Flood Protection Component
- Improvement Standards
- Flood Damage Prevention Ordinance (Roseville Municipal Code [RMC] Chapter 9.80)
- Zoning Ordinance (RMC Chapter 19.18)
- State of California Urban Level of Flood Protection Legislation.

2035 General Plan, Safety Element, Flood Protection Component

The Safety Element of Roseville's General Plan sets forth goals and policies to address community safety concerns. The flood protection component identifies nine policies and 12 measures to achieve the following goals:

- Minimize the potential for loss of life and property due to flooding.
- Pursue flood control solutions that are cost-effective and minimize environmental impacts.

The policies and implementation measures are incorporated into the City's area-specific plans and are legally enforceable. Key to the City's flood-protection effort is the clear definition and application of floodplain boundaries. The flood protection component of the Safety Element establishes policies prohibiting new development in an identified floodplain or requiring an appropriate level of flood protection in design and construction for any development that does occur in the floodplain:

- **Infill Areas**—No development is permitted in the future floodway. Development may be permitted within the future floodway fringe. In accordance with the Nolte Future Floodplain definition, such development is limited to areas within the assumed cumulative 1-foot rise in water surface elevation, if it can be demonstrated that the development will not impact flood levels (see Figure 10-7).
- **Remainder of the City (specific plans and north industrial area)**—No development is permitted within the future floodplain (floodway and floodway fringe). Exceptions may be considered by the City on a case-by-case basis if encroachment is limited to only the future floodway fringe and would not result in any off-site increase in the water surface elevation (see Figure 10-8).

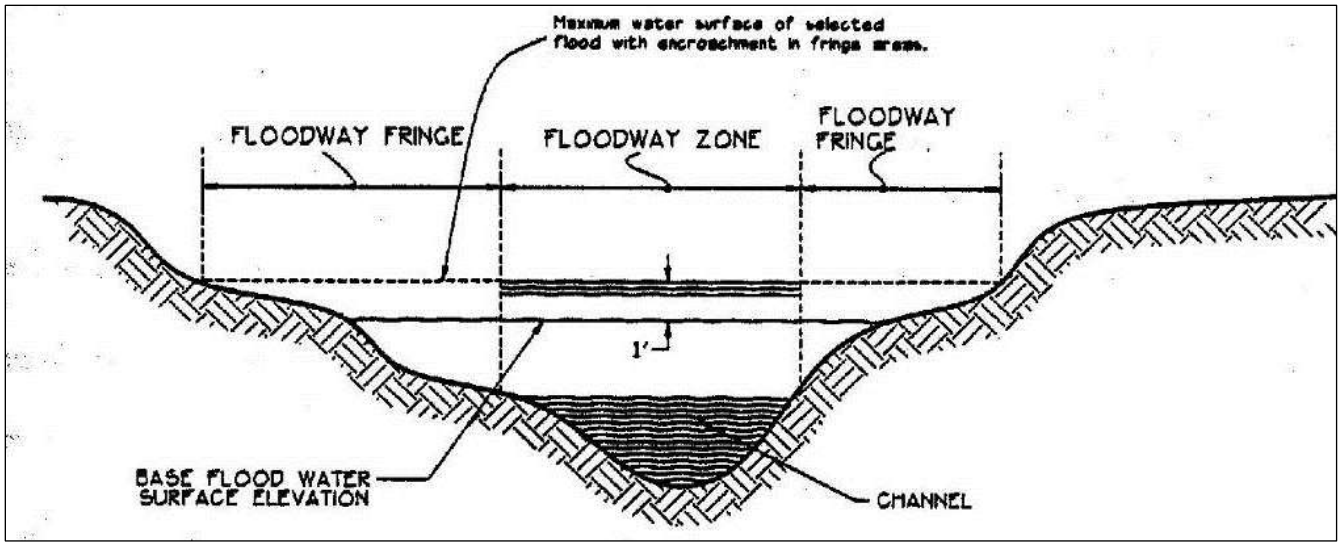


Figure 10-7. Floodplain Designation Cross-Sections for Infill Areas

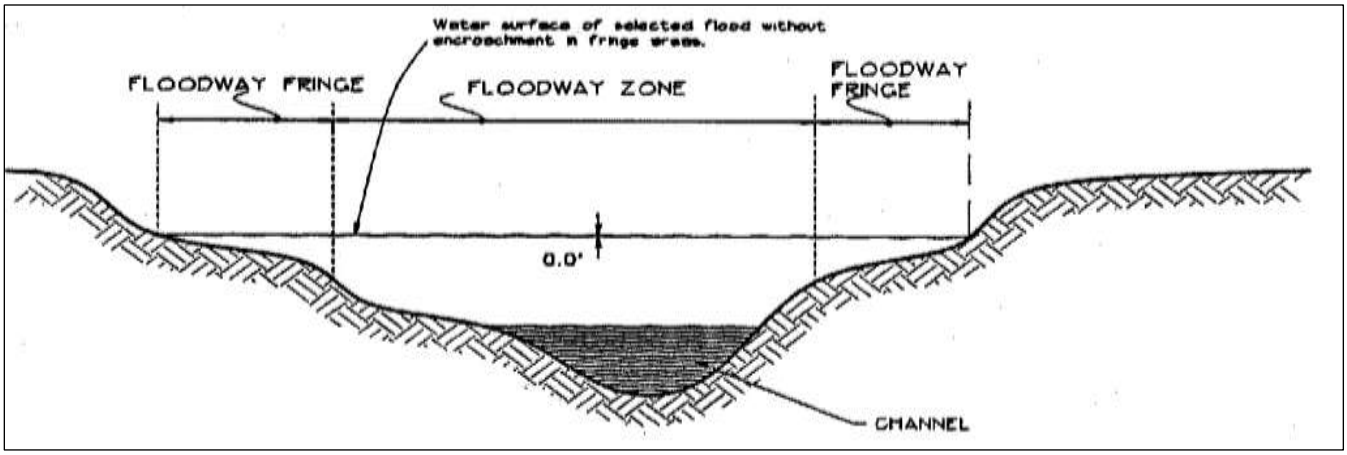


Figure 10-8. Floodplain Designation Cross-Sections for Areas Other Than Infill Areas

The City is committed to exploring environmentally sensitive flood control solutions, so this component is intended to be used in combination with the goals, policies, and implementation measures contained in the Open Space and Conservation Element of the General Plan. Emphasis is placed on protecting floodplain areas and on pursuing regional cooperation on flooding issues.

Improvement Standards

Roseville's improvement standards provide minimum standards for the following:

- Improvements dedicated to the public and accepted by the City for maintenance or operation
- Certain private works
- Improvements to be installed within existing rights-of-way and easements.

Improvement standards provide coordinated development of required facilities used by and for the protection of the public. They apply to, regulate, and guide preparation of traffic impact studies and the design and preparation of plans for construction of streets, highways, alleys, drainage systems, sewage systems, traffic signals, site access structures, water supply facilities and related public improvements. The standards also set guidelines for private

works that involve drainage, grading, tree removal, and related improvements. Section 10 of the improvement standards deals with drainage as follows:

- Requires residential lots developed in and adjacent to a designated floodplain to have a pad elevation a minimum of 2 feet above the regulatory flood elevation.
- Establishes stormwater management provisions that require mitigation of the increase in runoff generated by new development.
- Establishes provisions that require the building pads of structures built outside the regulatory floodplain to be a minimum of 1 foot above the 100-year water surface elevation for the site, assuming total blockage of drainage facilities.

Flood Damage Prevention Ordinance (RMC Chapter 9.80)

The flood damage prevention ordinance provides regulatory provisions for the floodplains of Roseville and is a requirement for participation in the NFIP. Chapter 9.80 of the RMC meets the NFIP requirements (44 CFR, Section 60.3) and includes the following standards that exceed those requirements:

- Adoption of a regulatory floodplain that includes areas not mapped by FEMA for application
- Requirement for elevation to 2 feet above the regulatory flood elevation for all structures within the flood hazard area
- Provisions to track substantial improvements to structures over a period of 10 years.

Zoning Ordinance (RMC Chapter 19.18)

Updated in September 2010, the zoning ordinance implements the City's general and specific plans and establishes regulations governing the use, placement, spacing and size of land and buildings. The zoning ordinance describes permits available through the Planning Division, when permits are needed, and the process for obtaining permits. This ordinance includes policy that prohibits most development within the 100-year floodplain. Exceptions to this policy exist primarily within the infill area and for the maintenance of essential services. Where encroachments may be permitted, improvements are required to minimize cumulative upstream and downstream effects.

The zoning ordinance identifies floodway and floodway fringe zoning districts. The floodway zoning district is not synonymous with FEMA's defined floodway. Development is generally prohibited in the floodway zone, with some level of development allowed in the floodway fringe zones with restrictions. The floodway fringe and floodway zone boundaries are based on previous hydraulic modeling conducted by the U.S. Army Corps of Engineers. The floodplain boundaries have changed over time since this modeling, but the zone district boundaries have not changed. The zone boundaries are updated on a parcel-by-parcel basis at a landowner's request using best available data.

State of California Urban Level of Flood Protection Legislation

The Central Valley Flood Protection Act of 2008 (SB 5) and its subsequent amendments (SB 1278, AB 1965 and AB 1259) include requirements and standards for flood protection that relate to land use planning. The legislation defines the Urban Level of Flood Protection (ULOP) as the level of protection necessary to withstand flooding that has a 1-in-200 (0.5-percent) chance of occurring in any given year (also referred to as the 200-year flood). This legislation directed local agencies to revise their general plans no later than July 2, 2015 to address flood risk for affected land use decisions based on an ULOP. It also required local agencies to revise their zoning codes to reflect the new standard within one year after the adoption of their revised general plans. In areas not subject to the ULOP standards, the 100-year floodplain standards will continue to apply.

The legislation defines five locational criteria that determine whether the ULOP applies. All areas of the City of Roseville meet two of the criteria (the City is an urban area of more than 10,000 people and the City is within the Sacramento-San Joaquin Valley), but only certain areas of the City meet the remaining three criteria:

- Areas mapped as either a special hazard area or an area of moderate hazard on FEMA's official (i.e., effective) Flood Insurance Rate Map
- Areas with a potential flood depth above 3 feet from sources other than localized conditions
- Areas within a watershed with a contributing area of more than 10 square miles.

As required by SB 5 as amended, the City of Roseville will implement the following:

- Updating the General Plan to define the City's regulatory floodplain as the combination of the City's mapped 100-year floodplain, the ULOP floodplain, and the FEMA floodplain.
- Amendment of the Land Use Element to include a reference to the Safety Element map identifying existing and planned development areas within the regulated floodplain as defined above.
- Amendment of the Open Space and Conservation Element setting and background to reflect the current regulatory environment.
- Amendment of the Safety Element to identify and revise flood hazard information and policies which protect communities from flooding risks as follows:

    - Revise the setting, outlook, and floodplain designations portions of the flood protection section to reflect the updated regulatory environment and to identify sources of floodplain mapping and hazard data.
    - Revise the floodplain designation policy and the implementation measures sections to include definitions and floodplain development regulations and implementation for the ULOP floodplain.
    - Provide new floodplain maps showing the extent of the FEMA 100-year, City's regulatory 100-year, and ULOP floodplains.

As required by adopted State law, the various City regulations requiring preservation of the floodplain and elevation of structures above the floodplain will include the ULOP floodplain, which is shown on Figure 10-9. After the modeling analysis was completed by the City, staff examined the data to determine the effect on land uses. Both the ULOP and the 100-year floodplains along Pleasant Grove Creek are almost entirely contained within existing or planned open space and recreation areas. This is generally because these areas of Roseville were planned or developed relatively recently in the City's history, and in compliance with the City's current General Plan goals and objectives restricting development in the floodplain.

The areas where the ULOP floodplain extends into residential or commercial areas are older areas of the City along Dry Creek, where development was planned and implemented prior to Roseville's initial participation in the NFIP in 1983 and prior to adoption of the City's current General Plan. These infill areas are already affected by the FEMA 100-year floodplain, and a few areas will now also be affected by the ULOP.

According to the City's GIS database, 4 of 11 vacant parcels affected by the ULOP are privately owned. The remaining 7 parcels are City-owned. In the future, any new habitable structure along streams affected by the ULOP floodplain will need to be elevated slightly higher (less than 1 foot) than would have been required prior to the legislation. For existing structures, additional elevation would only be required if the owner undertook a "substantial improvement" to the structure (defined within the City's Flood Damage Prevention Ordinance as any work in a 10-year period that is worth 50 percent or more of the value of the structure).

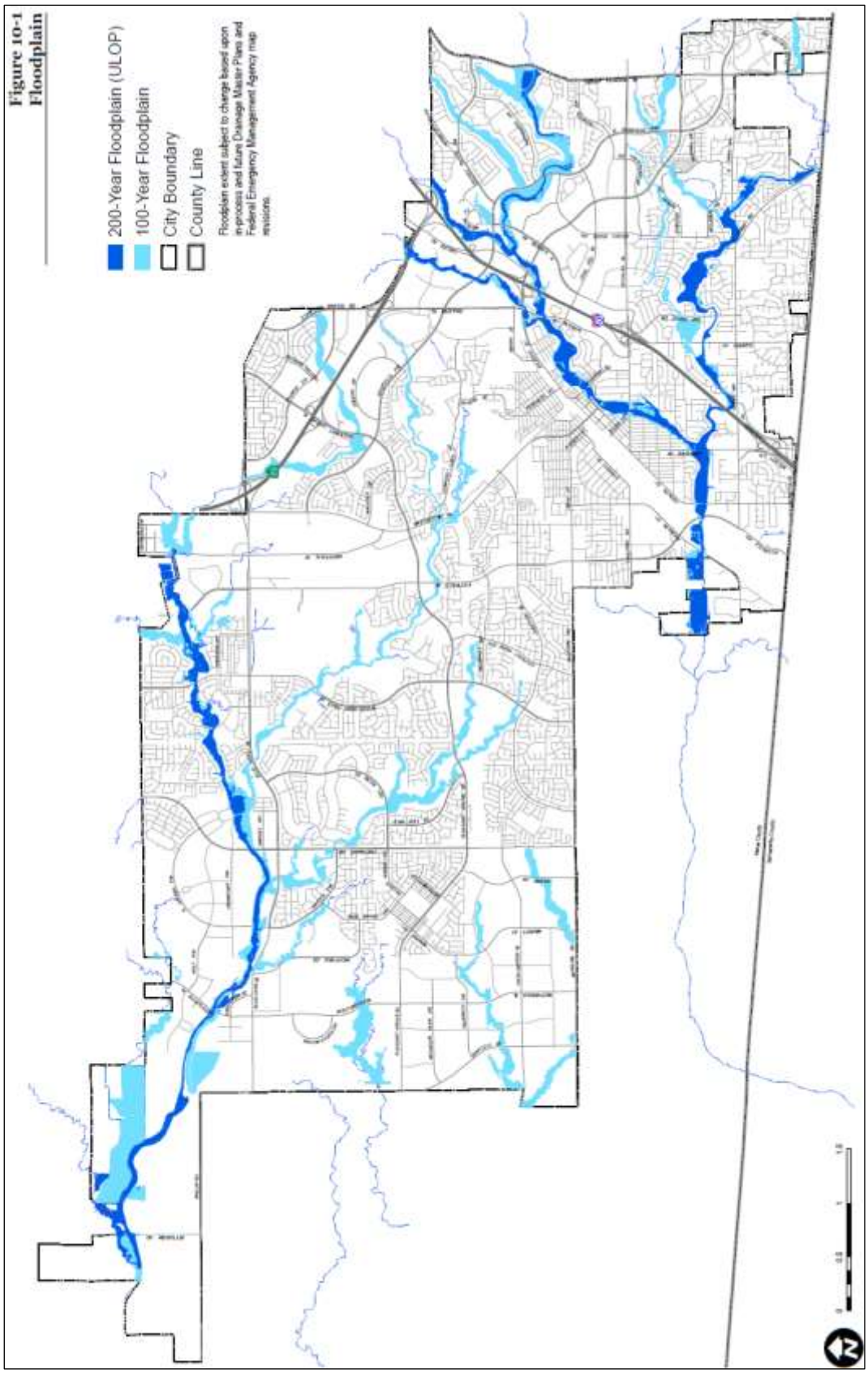


Figure 10-9. Updated Floodplain Mapping

10.7.4 Stormwater Management

Stormwater management in the City of Roseville is accomplished through a multi-tiered approach. The City uses a combination of regional development impact studies, sub-regional impact studies, the City of Roseville improvement standards, the City of Roseville grading ordinance, and the Placer County stormwater management manual. All of these tools manage the City's stormwater system at different levels. The Roseville General Plan is the principal planning document that lays out goals for managing the flooding hazard. Each update to the General Plan reviews these goals to determine their effectiveness in managing watershed characteristics. Regional master planning, sub-regional master planning, and project drainage design are discussed below.

Regional Master Planning

City ordinances establish developer fees to pay for mitigation projects that will reduce development impacts on flooding on major streams in the Dry Creek and Pleasant Grove Creek basins. Regional master planning for each basin has been conducted through the Placer County Flood Control District (PCFCD). Seven communities, including the City of Roseville, are members of this district.

The Dry Creek and Pleasant Grove Creek basins each have a detailed hydrology report that calculates the 5-, 10-, 50-, and 100-year storm frequencies based on total buildout of the basin:

- **Dry Creek Basin Report—**The *Final Report for the Dry Creek Flood Control Plan*, adopted by the Roseville City Council in April 1992, was co-sponsored, supported, and approved by the PCFCD and the Sacramento County flood control agency that oversees floodplains downstream of Placer County.
- **Pleasant Grove Creek Basin Report—**Pleasant Grove Creek Basin hydrology is included in the *Cross Canal Study*. Pleasant Grove Creek is one of several major streams that flow to a reclamation district canal; overflow is stored behind levees during Sacramento River flooding. Except for the PCFCD, this report was supported, sponsored, and approved by all agencies within the basin, in particular Sutter County and State Reclamation Board Districts 1001 and 1000.

Each report defines development impacts on the basin and specifies mitigation procedures and improvements to developers' mitigation. Both reports indicate a strategy for mitigation of floods resulting from new development on a regional scale. The reports indicate that most of Roseville is in the part of the watershed where detention is not recommended. These studies have been submitted to FEMA for approval, and FEMA is currently using the hydrology and hydraulics information provided in the reports to update FIRMs for the region.

Sub-Regional Master Planning

The City requires each sub-region to develop a master plan and mitigation strategy in a specific plan. Specific plans currently exist for Amoruso Ranch, Creekview, Del Webb, Downtown, Highland Reserve North, North Central Roseville, Northeast Roseville, North Industrial, North Roseville, Northwest Roseville, Riverside Gateway, Sierra Vista, Southeast Roseville, Stoneridge, West Roseville, and the Infill Area. Before zoning and development rights are issued for these newly developing areas, a detailed hydrology and hydraulic study dealing with that sub-region's concerns is required, in order to examine local drainage problems, define flood levels based on total buildout of the watershed, and set aside floodplain areas as open space. Floodplains are defined on swales with drainage areas greater than 300 acres. The City of Roseville and PCFCD review and approve each specific plan.

Major drainage infrastructure in the specific plans is designed as part of the infrastructure of the sub-regions and is constructed prior to development in the area; this eliminates the need for on-site detention requirements because regional detention, if required, is built into the infrastructure for the entire specific plan and not on a project-by-project basis. This approach allows for more control of the design and easier maintenance of the facility. In

addition, in newly developing areas, hydraulic requirements used to define floodplains assume well-vegetated swales and creeks, which reduces the need to provide constant cleaning of these streams by maintenance crews.

Project Drainage Design

As each project in the specific plan is developed, the City requires the project to meet drainage improvement standards. The standards require storm drain systems that support more than one parcel to be dedicated to the City for maintenance or that project owners maintain the system. In both cases, the storm drain system is reviewed by the City's Public Works Department to meet the same hydraulic standards. Project owners must demonstrate that in the case of total system failure, surface water would be able to exit the project area without causing damage. For example, if drain inlets are not maintained on a commercial site and water ponds, surface water should be able to discharge into the public drainage system without entering any on- or off-site buildings. This requirement eliminates the need for the City to monitor private storm drain systems to verify that they are adequately maintained.

10.7.5 Outreach and Public Education

The City of Roseville makes a concerted effort to educate and inform its citizens on the impacts of flooding and how to prepare for flooding impacts. The ongoing outreach and public education program uses multiple media:

- Floodplain information is published in "Roseville Reflections," a City-sponsored newsletter sent to all citizens.
- Flood information is published on the City's website and includes real-time flood warning and flood threat recognition information. The website is www.roseville.ca.us/flood/alert/floodalert.html.
- On-line surveying is used to identify public perception of flood risk and support of mitigation.
- An informational brochure, "Weathering the Storm," is available to the public.
- Literature on flood warning, property protection, and flood safety is mailed annually to Roseville residents.

10.8 SCENARIO

The City of Roseville has made great strides to reduce the risk from flooding. Events like those that caused past flooding will continue to occur, but impacts will be significantly less than in the past. Intense isolated rainstorms over the region will cause creeks and streams to overflow their banks, causing road closures and power outages. However, structure damage to personal property will be limited to the few properties that have exposure to significant depths of flooding. Flash flooding caused by rainfall runoff exceeding the capacity of stormwater systems will also continue to occur. However, potential personal property damage will be limited to structures constructed prior to building and stormwater standards adopted by the City to remediate these impacts.

10.9 ISSUES

Important issues associated with flood hazard in Roseville include but are not limited to the following:

- The boundaries of the 100-year floodplain could be as specified in the floodplain designations section of the flood-protection component of the City's General Plan. Floodplain areas shall be preserved as specified in the Open Space and Conservation Element. Preservation may include required dedication to the City. If needed, the City's ordinances can be modified to include floodplain use regulations consistent with the goals, policies, and implementation measures of the Safety Element, Land Use Element, Open Space and Conservation Element, and Parks and Recreation Element of the City's General Plan. This effort would be overseen by the Planning Division and would require no special funding.

- The development, implementation, and expansion of the Flood Alert and Early Warning Program systems should be continued, and the systems should be integrated with other local jurisdictions to form a regional warning program. This effort is overseen by the Public Works Department. Annual funding is provided through the City's general fund and is about $100,000 per year.
- By remaining actively involved in the PCFCD, the City of Roseville should continue to pursue a regional approach to flood issues. Involvement includes cooperation in the development of a comprehensive regional database. Regional drainage planning and design for all individual developments in the Placer County Flood Control District should be encouraged to address cumulative flooding impacts. The City should also continue to participate in regional flooding studies, including the Auburn Creek/Coon Creek/Pleasant Grove Creek flood mitigation plan and the Dry Creek Basin flood control plan. Efforts would be overseen by the Public Works Department. Annual funding for membership to the PCFCD is currently provided by the City's General Fund and is about $90,000 per year.
- The City should continue coordination with other agencies on issues of flood control. Coordination between the City and adjacent jurisdictions occurs through several mechanisms, including the distribution of development proposals for review and comment. The City should also continue its cooperation with federal, state, and local agencies, including the U.S. Army Corps of Engineers, California Reclamation Board, FEMA, California Department of Fish and Wildlife, Placer County Resource Conservation District, and PCFCD. This effort would be overseen by the Community Development Department, Planning Division, and Public Works Department as appropriate and should not require special funding.
- The final two phases of the Cirby-Linda-Dry Creek Flood Control Project should be completed. Five of the seven phases of this project have been completed at a cost of about $18,000,000. This project is overseen by the Public Works Department. The cost for the last two phases would be about $3,000,000. Funding could be from City, state, federal, or private developer sources.
- Alternative improvements to the Cirby-Linda-Dry Creek Flood Control Project could be analyzed. These improvements may be cost-effective in the following flood-prone areas of Roseville:

  - Dry Creek from Darling Way to Riverside Avenue
  - The area on Dry Creek upstream of Folsom Road in the Columbia Avenue, Marilyn Avenue, Bonita Street area
  - The Linda Creek area near Champion Oaks Drive, Samoa Way, and Hurst Way
  - Cirby Creek in the Trimble Way and Zien Court area.

- The existing wood flood wall along Dry Creek that is protecting the City's Main Library and Public Safety Building could be replaced. The wood wall allows floodwater to leak through, and constant pumping is required. This effort would be overseen by the Public Works Department and cost about $300,000. Funding could be from City, state, federal, private developer, property owner sources.
- How will the potential impacts of climate change impact flood conditions in the City of Roseville?

11. LANDSLIDE

11.1 GENERAL BACKGROUND

According to the U.S. Geological Survey (USGS), the term landslide includes a wide range of ground movement, such as rock falls, deep failure of slopes, and shallow debris flows. Although gravity acting on an over-steepened slope is the primary reason for a landslide, there are other contributing factors (USGS, n.d.).

Landslides and mudslides can be initiated by storms, earthquakes, fires, volcanic eruptions or human modification of the land. They can move rapidly down slopes or through channels, and can strike with little or no warning at avalanche speeds.

Landslides can pose a serious hazard to properties on or below hillsides. When landslides occur—in response to such changes as increased water content, earthquake shaking, addition of load, or removal of downslope support—they deform and tilt the ground surface. The result can be destruction of foundations, offset of roads, breaking of underground pipes, or overriding of downslope property and structures.

DEFINITIONS

Landslide—The movement of masses of loosened rock and soil down a hillside or slope. Slope failures occur when the strength of the soils forming the slope is exceeded by the pressure, such as weight or saturation, acting upon them.

Mass Movement—A collective term for landslides and mudslides.

Mudslide (or Debris Flow)—A river of rock, earth, organic matter and other materials saturated with water. Mudslides develop in the soil overlying bedrock on sloping surfaces when water rapidly accumulates in the ground, such as during heavy rainfall or rapid snowmelt. Water pressure in the pore spaces of the material increases to the point that the internal strength of the soil is drastically weakened. The soil's reduced resistance can then easily be overcome by gravity, changing the earth into a flowing river of mud or "slurry."

11.1.1 Landslide Types

Landslides are commonly categorized by the type of initial ground failure. Common types of slides are shown on Figure 11-1 through Figure 11-4 (Ecology 2014). The most common is the shallow colluvial slide, occurring particularly in response to intense, short-duration storms. The largest and most destructive are deep-seated slides, although they are less common than other types.

Mudslides (or debris flows) are rivers of rock, earth, organic matter and other soil materials saturated with water. They develop in the soil overlying bedrock on sloping surfaces when water rapidly accumulates in the ground, such as during heavy rainfall or rapid snowmelt. Water pressure in the pore spaces of the material increases to the point that the internal strength of the soil is drastically weakened. The soil's reduced resistance can then easily be overcome by gravity, changing the earth into a flowing river of mud.

A debris avalanche (Figure 11-5) is a fast-moving debris flow that travels faster than about 10 miles per hour (mph). Speeds in excess of 20 mph are not uncommon, and speeds in excess of 100 mph, although rare, can occur. The slurry can travel miles from its source, growing as it descends, picking up trees, boulders, cars, and anything else in its path. Although these slides behave as fluids, they pack many times the hydraulic force of water due to the mass of material included in them. They can be among the most destructive events in nature.

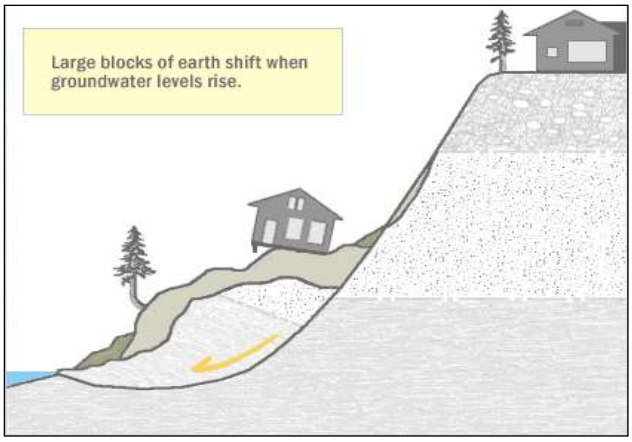


Figure 11-1. Deep Seated Slide

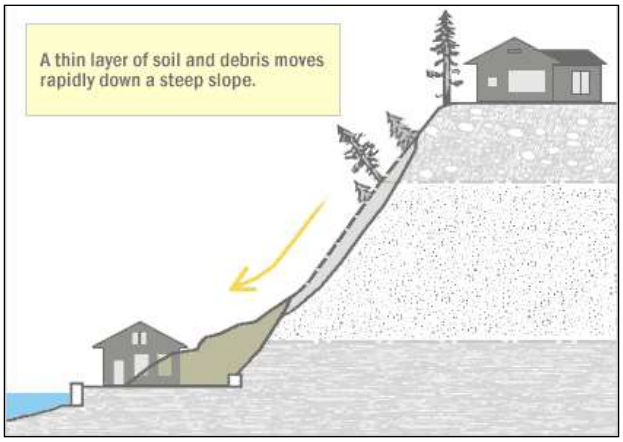


Figure 11-2. Shallow Colluvial Slide

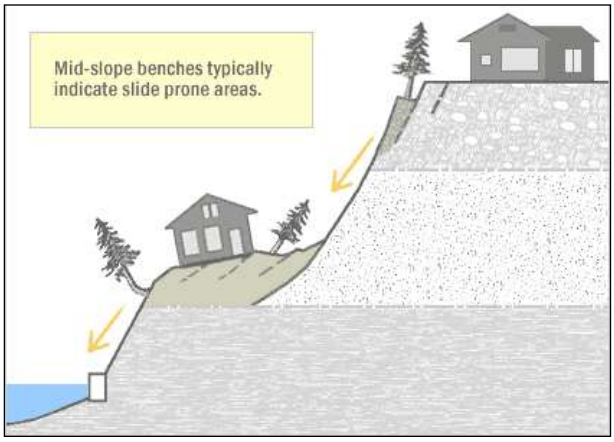


Figure 11-3. Bench Slide

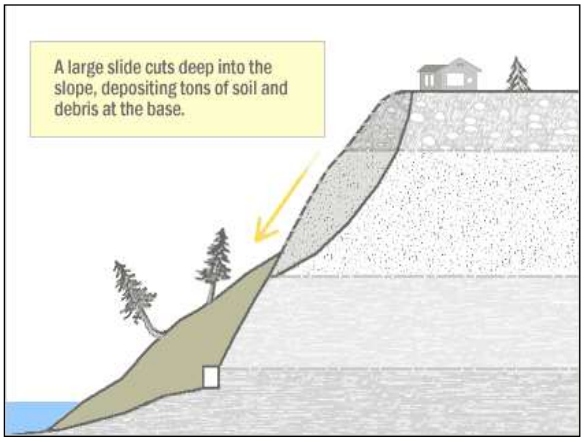


Figure 11-4. Large Slide

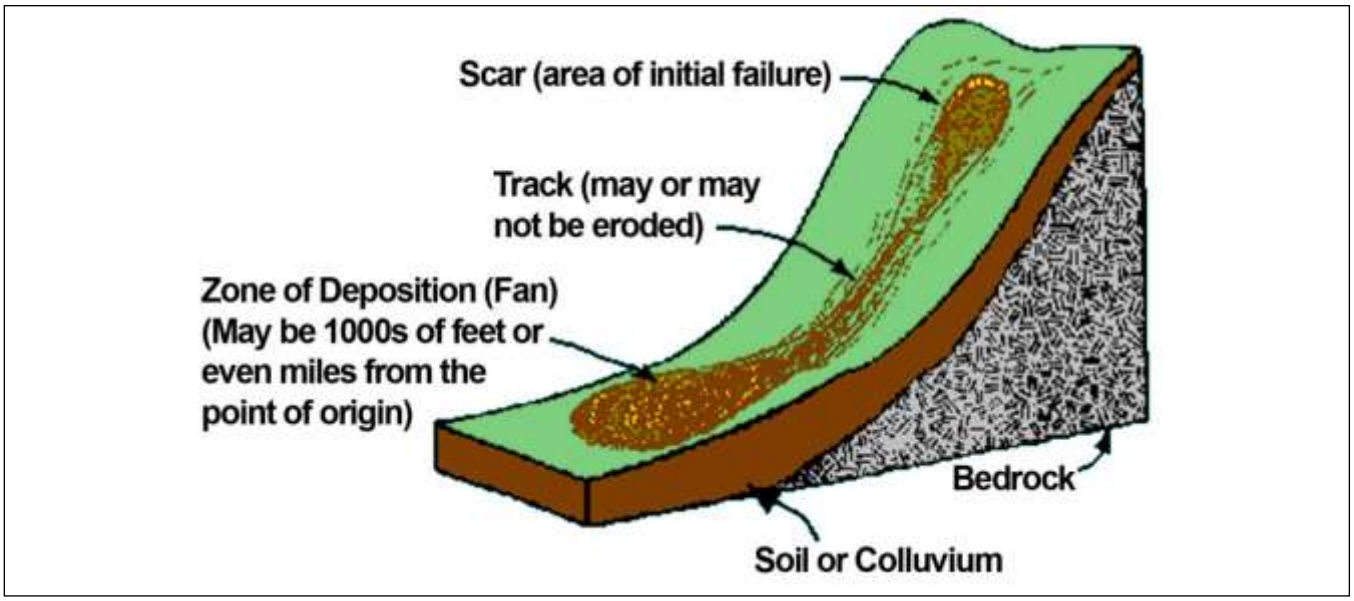


Figure 11-5. Typical Debris Avalanche Scar and Track

Landslides also include the following:

- Rock Falls—blocks of rock that fall away from a bedrock unit without a rotational component
- Rock Topples—blocks of rock that fall away from a bedrock unit with a rotational component
- Rotational Slumps—blocks of fine-grained sediment that rotate and move down slope
- Transitional Slides—sediments that move along a flat surface without a rotational component
- Earth Flows—fine-grained sediments that flow downhill and typically form a fan structure
- Creep—a slow-moving landslide often only noticed through crooked trees and disturbed structures
- Block Slides—blocks of rock that slide along a slip plane as a unit down a slope

11.1.2 Landslide Modeling

Two characteristics are essential to conducting an accurate risk assessment of the landslide hazard:

- The type of initial ground failure that occurs, as described above
- The post-failure movement of the loosened material ("run-out"), including travel distance and velocity.

All current landslide models—those in practical applications and those more recently developed—use simplified hypothetical descriptions of mass movement to simulate the complex behavior of actual flow. The models attempt to reproduce the general features of the moving mass of material through measurable factors, such as base shear, that define a system and determine its behavior. Due to the lack of experimental data and the limited current knowledge about the behavior of the moving flows, landslide models use simplified parameters to account for complex aspects that may not be defined. These simplified parameters are not related to specific physical processes that can be directly measured, and there is a great deal of uncertainty in their definition. Some, but not all, models provide estimates of the level of uncertainty associated with the modeling approach.

Run-out modeling is complicated because the movement of materials may change over the course of a landslide event, depending on the initial composition, the extent of saturation by water, the ground shape of the path traveled and whether there is additional material incorporated during the event (Savage and Hutter 1991; Rickenmann & Weber 2000; Iverson 2004).

11.2 HAZARD PROFILE

11.2.1 Past Events

There is little or no record of landslides occurring in Roseville that caused damage to property. Three notable landslide events have been recorded in Placer County, according to the Placer County Hazard Mitigation Plan. These events occurred in the eastern portion of the county, which is significantly different from Roseville in geologic terms. Therefore, no parallel can be drawn from these events for Roseville.

11.2.2 Location

Landslide hazard areas are areas where characteristics such as the following indicate a landslide risk:

- A slope greater than 15 percent
- A history of landslide activity during the last 10,000 years
- Stream or wave activity that has caused erosion or cut into a bank to cause the surrounding land to be unstable
- The presence of an alluvial fan, which indicates vulnerability to the flow of debris or sediments
- The presence of impermeable soils, such as silt or clay, mixed with granular soils such as sand and gravel.

The California Landslide Hazard Identification Act directs the State Geologist to identify and map hazardous landslide areas for use by municipalities in planning and decision-making on grading and building permits. Three factors that characterize landslide hazard areas include significant slope, weak rocks, and heavy rains. This program focuses on urban areas and growth areas that exhibit these characteristics.

Roseville and the surrounding Sacramento region are not identified as areas prone to landslide hazards. The City's geographic location, soil conditions, and surface terrain combine to minimize risk of major damage from landslides, subsidence (gradual shrinking of the earth's surface due to underground resource extraction), or other geologic hazards resulting from seismic activity and related natural forces. Therefore, the region has not been included as a part of the state's study program. The USGS, in its identification of geologic hazard areas and their susceptibility and rate of incidence, has classified Placer County and the Roseville vicinity as a low rate of incidence, with less than 1.5 percent of the area susceptible to landslides.

Little scientific analysis is available about landslide hazards in Roseville. Assessment of the risk from this hazard is based on past occurrences, observed conditions, and guidance from state and federal agencies. However, with slopes steeper than 15 percent and the frequent occurrence of multiple intense storms that can saturate the soil, there is an exposure to landslides. Future risk assessment of landslides could be enhanced with better data specific to the hazard.

While Roseville is located on relatively level terrain, the slope gradually increases to the east and north. The most significant slopes are along creeks and ravines. The soil in ravine areas is a Mehrten soil typically associated with post-volcanic activity. It is very dense and not considered to be erosion prone.

Areas with slopes greater than 15 percent in the Stoneridge Specific Plan Area exhibit characteristics of potential landslide hazard areas. Landsliding in these areas has likely occurred numerous times in the past, as evidenced by past deposits exposed in erosion gullies. The timeframe for these past occurrences is probably over the last several hundred years, if not thousands.

Due to the lack of available data on this hazard, the extent and location of the hazard has been estimated with an emphasis on steepness of slopes. Figure 11-6 shows the estimated landslide hazard areas in Roseville, based on slopes of 15 to 30 percent (moderate risk) and 30 percent and higher (high risk). The map represents a general assessment of citywide exposure; it does not apply on a site-specific basis and should be used with caution.

11.2.3 Frequency

Landslides are often triggered by other natural hazards such as earthquakes, heavy rain, floods or wildfires, so the frequency of landslides is related to the frequency of these other hazards. In the Roseville vicinity, landslides are most likely to occur during and after major storms. Due to the soil types in the steep slope areas of Roseville and the lack of historical occurrence of significant landslide events, the frequency of occurrence of landslide events in Roseville is considered to be low.

11.2.4 Severity

Landslides destroy property and infrastructure and can take the lives of people. Slope failures in the United States result in an average of 25 lives lost per year and an annual cost of about $1.5 billion. Due to the lack of exposure to this hazard in Roseville, the severity of the impacts of landslides on the people, property and economy of Roseville is considered to be low.

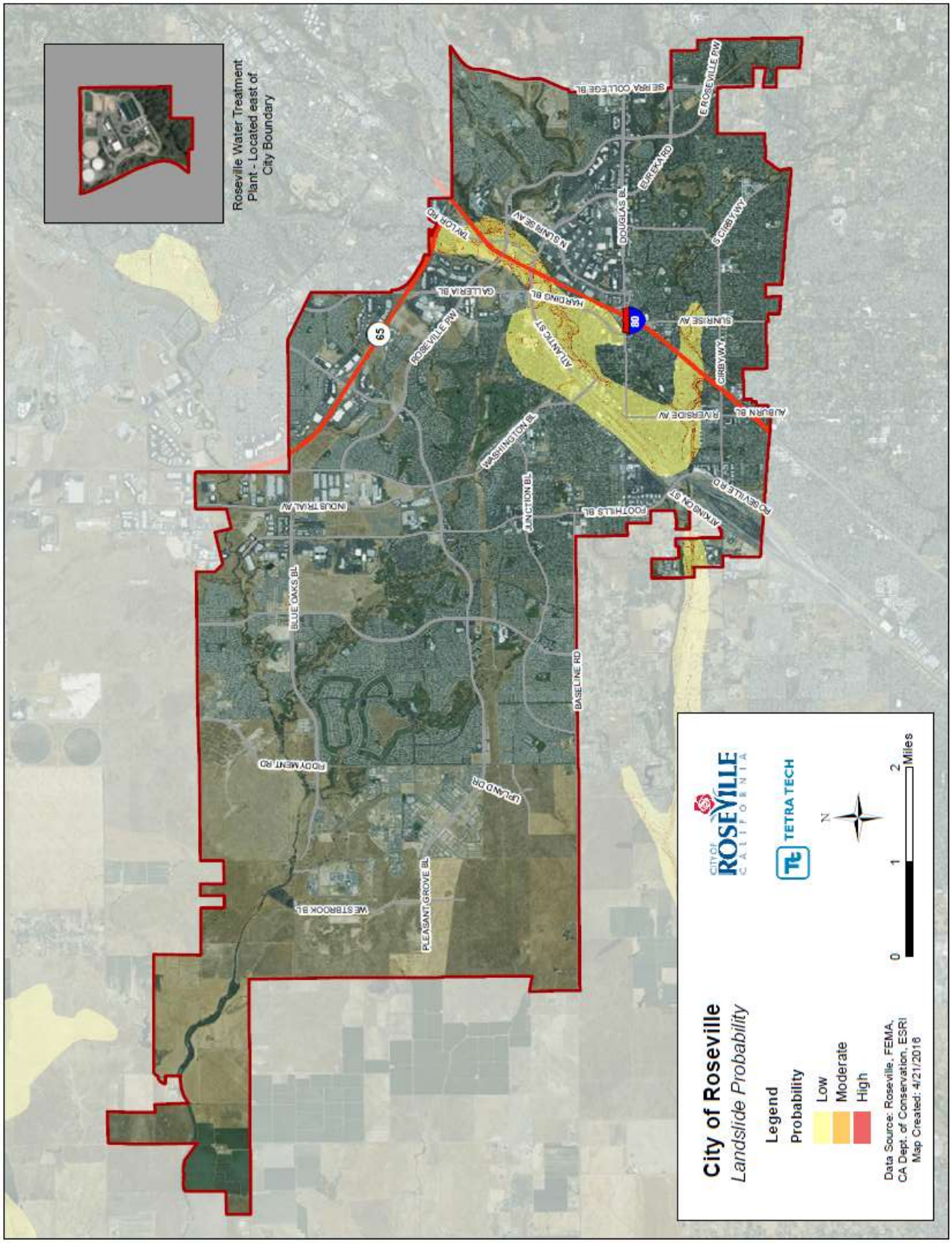


Figure 11-6. Roseville Area Landslide Hazard Map

11.2.5 Warning Time

Mass movements can occur suddenly or slowly. Some methods used to monitor mass movements can provide an idea of the type of movement and the amount of time prior to failure. It is also possible to determine what areas are at risk during general time periods. Assessing the geology, vegetation, and amount of predicted precipitation for an area can help in these predictions. However, there is no practical warning system for individual landslides. Correlations can be made based on soil type, slope and rainfall amount. No known correlations have been made for the Roseville planning area. The current procedure is to monitor situations on a case-by-case basis, and respond after an event has occurred. Generally accepted warning signs for landslide activity include the following:

- Springs, seeps, or saturated ground in areas that have not typically been wet before
- New cracks or unusual bulges in the ground, street pavements or sidewalks
- Soil moving away from foundations
- Ancillary structures such as decks and patios tilting and/or moving relative to the main house
- Tilting or cracking of concrete floors and foundations
- Broken water lines and other underground utilities
- Leaning telephone poles, trees, retaining walls or fences
- Offset fence lines
- Sunken or down-dropped road beds
- Rapid increase in creek water levels, possibly accompanied by increased turbidity (soil content)
- Sudden decrease in creek water levels though rain is still falling or just recently stopped
- Sticking doors and windows, and visible open spaces indicating jambs and frames out of plumb
- Unusual sounds, such as trees cracking or boulders knocking together
- A faint rumbling sound that increases in volume as a landslide nears.

11.3 SECONDARY HAZARDS

Landslides can cause several types of secondary effects, such as blocking access to roads, which can isolate residents and businesses and delay emergency response or commercial, public and private transportation. This could result in economic losses for businesses. Other potential problems resulting from landslides are power and communication failures. Utility poles on slopes can be knocked over, resulting in losses to power and communication lines. Landslides also have the potential of destabilizing the foundation of structures, which may result in monetary loss for residents. They also can damage rivers or streams, potentially harming water quality, fisheries and spawning habitat.

11.4 EXPOSURE

Figure 11-6 was used to estimate the exposure of population and structures to the landslide hazard.

11.4.1 Population

Using the percent of residential buildings exposed, multiplied by the estimated per-household population in 2014, it is estimated that there are 36 persons living in households exposed to the high landslide risk hazard and 140 persons exposed to the moderate landslide risk hazard. This represents 0.03 percent and 0.11 percent of the total population of the City, respectively.

11.4.2 Property

An estimated 12 structures are exposed to high landslide risk and 57 structures to moderate landslide risk. These high landslide risk structures have a total replacement cost value of $3,691,741, or 0.01 percent of the total

replacement cost value of the City. The moderate landslide risk structures have a total value of $49,714,043, or 0.17 percent of the total value of the City. These are residential, commercial and educational structures. These results are based on a spatial GIS exercise identifying all structure locations that intersect the high and moderate risk hazard zones.

11.4.3 Critical Facilities and Infrastructure

Facilities

An analysis of critical facilities inventory to determine exposure to the landslide hazard determined that two of the City's critical facilities are exposed to the landslide hazard.

Infrastructure

Roads and Bridges

A significant amount of infrastructure (roads, bridges and utilities) can be exposed to mass movements. Access to major roads is crucial to life-safety after a disaster event and can help to provide resilience during response and recovery operations. Landslides have the potential to block roads, causing isolation of all or part of the City. Roadway blockages caused by landslides can create traffic problems resulting in delays for emergency vehicles and public and private transportation. This could result in economic losses for businesses.

Landslide events can significantly impact bridges. They can knock out bridge abutments or significantly weaken the soil supporting a bridge, obstructing the bridge or making it hazardous for use. Bridges in areas of high landslide risk often provide the only ingress and egress to large areas and in some cases to isolated areas. None of the City bridges are considered to have exposure to the landslide hazard. However, bridges outside the City within the County are susceptible to landslides. Damage to one of these facilities could close off an access route to the City. These facilities have not been inventoried for this assessment.

Power Lines

Other potential problems resulting from landslides are power and communication failures creating problems for vulnerable populations or businesses and potential loss of life in emergency situations. Power lines are generally elevated above steep slopes, but the towers supporting them can be subject to landslides. A landslide could cause the soil underneath a tower to fail, causing it to collapse, and ripping down the lines. An inventory of these types of facilities was not available for this assessment.

11.4.4 Environment

Environmental problems as a result of mass movements can be numerous. Landslides fall into streams and significantly impact fish and wildlife habitat, as well as affecting water quality.

11.5 VULNERABILITY

11.5.1 Population

Due to the nature of census block group data, it is difficult to determine demographics of populations vulnerable to mass movements. In general, all persons exposed to landslides hazards are considered to be vulnerable.

11.5.2 Property

Loss estimates for the landslide hazard are not based on modeling using damage functions, because no such damage functions have been generated. Instead, loss estimates were developed representing 10 percent, 30 percent and 50 percent of the assessed value of exposed structures. This allows emergency managers to evaluate a range of potential economic impacts based on an estimate of the percent of damage to the building stock. Damage in excess of 50 percent is considered to be substantial by most building codes and typically requires total reconstruction of the structure. Table 11-1 and Table 11-2 list loss estimates to the general building stock in moderate and high landslide hazard areas.

Table 11-1. Loss Estimates for Buildings Vulnerable to High Landslide Hazard

Building Count	Assessed Value	10% Damage	30% Damage	50% Damage
12	$3,691,741	$369,174	$1,107,522	$1,845,871

Table 11-2. Loss Estimates for Buildings Vulnerable to Moderate Landslide Risk Hazard

Building Count	Replacement Cost	10% Damage	30% Damage	50% Damage
57	$49,714,043	$4,971,404	$14,914,212	$24,857,022

11.5.3 Critical Facilities and Infrastructure

Two identified critical facilities are exposed to the landslide hazard, based on the best available data. Several types of infrastructure are exposed to mass movements, including transportation, water and sewer and power infrastructure. At this time, all infrastructure and transportation corridors identified as exposed to the landslide hazard are considered vulnerable until more information becomes available.

11.5.4 Environment

The environment vulnerable to landslide hazard is the same as the environment exposed to the hazard.

11.6 FUTURE TRENDS IN DEVELOPMENT

The areas that are most vulnerable to the landslide hazard make up a small portion of the City of Roseville. Because these ravine areas in the southeastern portion of the City are considered to be non-developable and the probability of occurrence of this type of hazard is low due to the soil type in this region, this hazard should have little or no impact on future development and redevelopment trends. The City's current land use policies should also ensure that no future development or re-development would be impacted by this hazard.

The landslide risk exposure with in the planning did not increase over the performance period of the 2011 Plan. The value of the properties exposed to steep slope hazards increased by 12% which can be attributed to normal appreciation in property values observed for the Roseville planning area. Since there are currently no nationally recognized damage functions for landslide risk modeling, a comparative analysis of vulnerability was not performed. However, since there was no increase in risk exposure, the increase in vulnerability should coincide with the increase in value of the assets at risk.

11.7 REVIEW OF EXISTING ORDINANCES, PROGRAMS, AND PLANS

Since 1975, state law has required that a safety element be included as part of all general plans. In 1984, the state consolidated the safety and seismic elements into one element that includes seismic safety, geologic hazards, fire safety, and flooding. The seismic and geologic hazards component includes goals and policies to protect the

City's residents from danger associated with active faults, liquefaction, ground failure (landslides), and steep slopes.

The Safety Element of the Roseville General Plan includes components that address geologic hazards such as landslides. While the potential for geologic hazards such as landslides in Roseville is not high, the soil and geologic characteristics of the City continue to play an important role in determining safety procedures. Current policies and ordinances reflect the City's ongoing obligations to protect lives and property and include ongoing monitoring of seismic activity and periodic updating of plans for emergency events. Continued implementation of these polices and enforcement of City ordinances and General Plan policies will ensure that efforts are maximized for protecting the safety of Roseville's citizens from potential geologic safety hazards. The following policies identified in the Seismic and Geologic component of the Safety Element will mitigate the potential exposure to geologic hazards within Roseville:

- Continue to mitigate the potential impacts of geologic hazards through building plan review.
- Minimize soil erosion and sedimentation by maintaining compatible land uses, suitable to the existing environment.
- Develop appropriate building designs and implement appropriate construction techniques to decrease the impact of a landslide.
- Create and adopt slope development standards prior to or as part of the planning process for any area identified as having significant slope.
- Require contour grading, where feasible, and re-vegetation to mitigate the appearance of engineered slopes and to control erosion.

These policies are implemented through existing, ongoing programs that include the following:

- **California Building Code**—Through the Building Division of the Development Services Department, continue to enforce and keep abreast of the most recent updates to the CBC that include construction standards for seismic and geologic safety.
- **Development Review Process**—Refer any development proposal that may be impacted by grading, soil, or geologic issues to the Public Works Department. Consider the comments of the Public Works Department in the development review process. The environmental review for projects shall include a full inventory of potential grading impacts and any potential soil or geologic concerns, assessment of potential project impacts, and identification of mitigation and monitoring measures. Issues relating to slopes, liquefaction, ground failure and erosion shall be addressed. Project design, grading, and building construction techniques shall be used to minimize impacts. Sites that are determined to have significant slope shall be identified, and appropriate design restrictions shall be implemented to avoid the risk of erosion or landslide. Graded slopes shall be limited to 2:1 where feasible. Slopes that are less than 2:1 should be encouraged. The use of retaining walls or stepped building designs should be pursued as an alternative to high or steep slopes where feasible and desirable.
- **Grading Ordinance**—Enforce and regularly evaluate the Grading Ordinance. The Grading Ordinance includes standards for project construction and erosion control. This ordinance requires prompt re-vegetation of disturbed areas, avoidance of grading activities during wet weather, avoidance of disturbance in drainage ways, and other erosion control measures.
- **Specific Plans**—Ensure that specific plans are consistent with the goals and policies of the General Plan. Specific plans shall identify potential geologic, soil, and seismic hazards in the planning area and shall include measures to reduce the risk of such hazards. Proposed specific plans shall identify criteria for development on steep slope areas, as applicable, in order to ensure public safety and minimize environmental and aesthetic impacts.

- **Land Use Designation**—In areas where potentially significant soil and erosion impacts are identified, the City should consider open space or other appropriate land use designations, as specified in the Land Use Element, to minimize potential impacts.

11.8 SCENARIO

Due to the lack of significant exposure to this hazard, a scenario where a landslide would have a significant impact on the City of Roseville is currently unlikely. Mass movements are becoming more of a concern as development moves outside of city centers and into areas less developed in terms of infrastructure. Major mass movements in Placer County and areas surrounding Roseville occur as a result of soil conditions that have been affected by severe storms, groundwater or human development activities. After heavy rains, soils become saturated with water. As water seeps downward through upper soils that may consist of permeable sands and gravels and accumulates on impermeable silt, it will cause weakness and destabilization in the slope. As rains continue, the groundwater table rises, adding to the weakening of the slope. Gravity, poor drainage, a rising groundwater table and poor soil exacerbate hazardous conditions.

Roseville's most likely risk exposure to landslides is as a secondary risk associated with an earthquake or wildfire. The ground shaking that could occur during an earthquake could trigger landslides in the steep slope areas. This scenario could be further enhanced should an earthquake occur during a time when the soils are saturated due to repeated storm events. After a wildfire, the landscape becomes denatured and unable to absorb the impacts of repeated intense rainfall. This can cause the soil to become saturated and vulnerable to sliding.

11.9 ISSUES

Important issues associated with landslide hazards in Roseville include but are not limited to the following:

- The data and science regarding the mapping and assessment of landslide hazards is constantly evolving. As new data and science become available, assessments of landslide risk should be re-evaluated.
- The impact of climate change on landslides is uncertain. If climate change impacts atmospheric conditions, the exposure to landslide risks in Roseville could increase.

12. SEVERE WEATHER

12.1 GENERAL BACKGROUND

Most of the federal and state disaster declarations for the Roseville area and Placer County are related to severe weather conditions. Severe weather conditions vary greatly from the western portion of Placer County to the eastern portion, primarily due to variation in topography and elevation across the county. Heavy rainfall and snowfall result when humid air masses blow in from the ocean and move up the mountain ranges. Moist air, traveling inland on prevailing westerly winds, pushes up against the Sierra Nevada mountains, which wrings moisture out of the air as it rises, cools and condenses.

Roseville's location in the western, low-lying portion of the county helps explain why, at well below the 4,000 foot snowfall region, the City avoids the harshest of winter conditions that occur in eastern Placer County. Figure 12-1 shows Roseville's elevation of approximately 165 feet above sea level. Although the climate of Roseville is relatively mild, with an average of 257 sunny days each year, the City is near the foothills of the Sierra Nevada range and can experience severe weather resulting from rapid changes in topography.

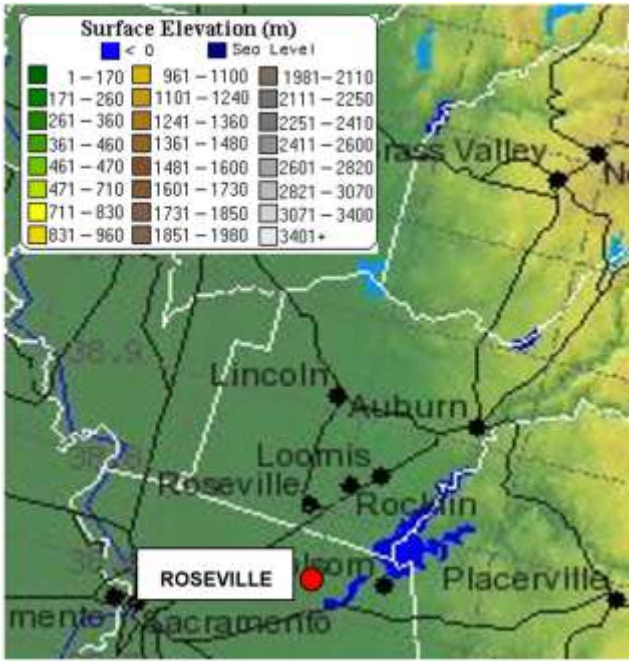


Figure 12-1. Roseville Regional Surface Elevation

DEFINITIONS

Thunderstorm—Typically 15 miles in diameter and lasting about 30 minutes, thunderstorms are underrated hazards. Lightning, which occurs with all thunderstorms, is a serious threat to human life. Heavy rains over a small area in a short time can lead to flash flooding. Strong winds, hail and tornadoes are also dangers associated with thunderstorms.

Tornado—Tornadoes are funnel clouds of varying sizes that generate winds more than 300 miles per hour. A tornado is formed by the turbulent mixing of layers of air with contrasting temperature, moisture, density and wind flow. The mixing layers of air account for most of the tornadoes occurring in April, May and June, when cold, dry air meets warm, moister air moving up from the south. They can affect an area up to a mile wide, with a path of varying length. Tornadoes can come from lines of cumulonimbus clouds or from a single storm cloud. They are measured using the Fujita Scale ranging from F0 to F6.

Windstorm—A storm featuring violent winds. Southwesterly winds are associated with strong storms moving onto the coast from the Pacific Ocean. Southern winds parallel to the coastal mountains are the strongest and most destructive winds. Windstorms tend to damage ridgelines that face into the winds.

12.1.1 Tornadoes

A tornado is a violently rotating column of air extending between, and in contact with, a cloud and the surface of the earth. Tornadoes are often (but not always) visible as a funnel cloud. On a local-scale, tornadoes are the most intense of all atmospheric circulations and wind can reach destructive speeds of more than 300 mph. A tornado's vortex is typically a few hundred meters in diameter, and damage paths can be up to 1 mile wide and 50 miles long. Figure 12-2, adapted from FEMA, illustrates the potential impacts and damage from tornadoes of different magnitude. Tornadoes can occur throughout the year at any time of day but are most frequent in the spring during the late afternoon. As shown in Figure 12-3, California has a relatively low risk compared to states in the Midwestern and Southern U.S.

12.1.2 Windstorms

Windstorms are generally short-duration events involving straight-line winds or gusts of over 50 mph, strong enough to cause property damage. Windstorms are especially dangerous in areas with significant tree stands and areas with exposed property, poorly constructed buildings, mobile homes (manufactured housing units), major infrastructure, and above-ground utility lines. A windstorm can topple trees and power lines, cause damage to residential, commercial and critical facilities, and leave tons of debris in its wake. There are seven types of damaging winds:

- **Straight-line winds—**Any thunderstorm wind that is not associated with rotation; this term is used mainly to differentiate from tornado winds. Most thunderstorms produce some straight-line winds as a result of outflow generated by the thunderstorm downdraft.
- **Downdrafts—**A small-scale column of air that rapidly sinks toward the ground.
- **Downbursts—**A strong downdraft with horizontal dimensions larger than 2.5 miles resulting in an outward burst or damaging winds on or near the ground. Downburst winds may begin as a microburst and spread out over a wider area, sometimes producing damage similar to a strong tornado. Although usually associated with thunderstorms, downbursts can occur with showers too weak to produce thunder.
- **Microbursts—**A small concentrated downburst that produces an outward burst of damaging winds at the surface. Microbursts are generally less than 2.5 miles across and short-lived, lasting only 5 to 10 minutes, with maximum wind speeds up to 168 mph. There are two kinds of microbursts: wet and dry. A wet microburst is accompanied by heavy precipitation at the surface. Dry microbursts, common in places like the high plains and the intermountain west, occur with little or no precipitation reaching the ground.
- **Gust front—**A gust front is the leading edge of rain-cooled air that clashes with warmer thunderstorm inflow. Gust fronts are characterized by a wind shift, temperature drop, and gusty winds out ahead of a thunderstorm. Sometimes the winds push up air above them, forming a shelf cloud or detached roll cloud.
- **Derecho—**A derecho is a widespread thunderstorm wind caused when new thunderstorms form along the leading edge of an outflow boundary (the boundary formed by horizontal spreading of thunderstorm-cooled air). The word "derecho" is of Spanish origin and means "straight ahead." Thunderstorms feed on the boundary and continue to reproduce. Derechos typically occur in summer when complexes of thunderstorms form over plains, producing heavy rain and severe wind. The damaging winds can last a long time and cover a large area.
- **Bow Echo—**A bow echo is a linear wind front bent outward in a bow shape. Damaging straight-line winds often occur near the center of a bow echo. Bow echoes can be 200 miles long, last for several hours, and produce extensive wind damage at the ground.

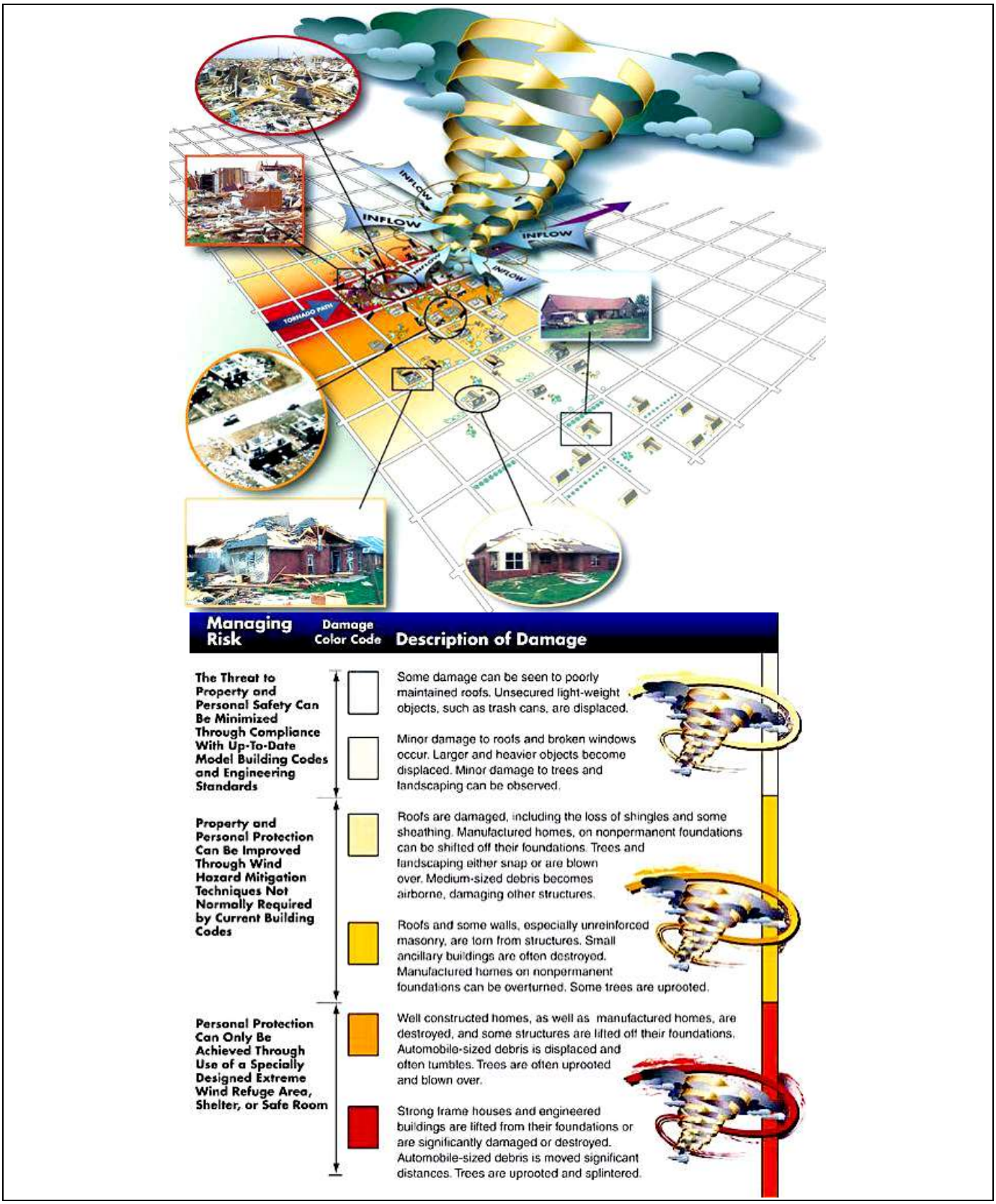


Figure 12-2. Potential Impact and Damage from a Tornado

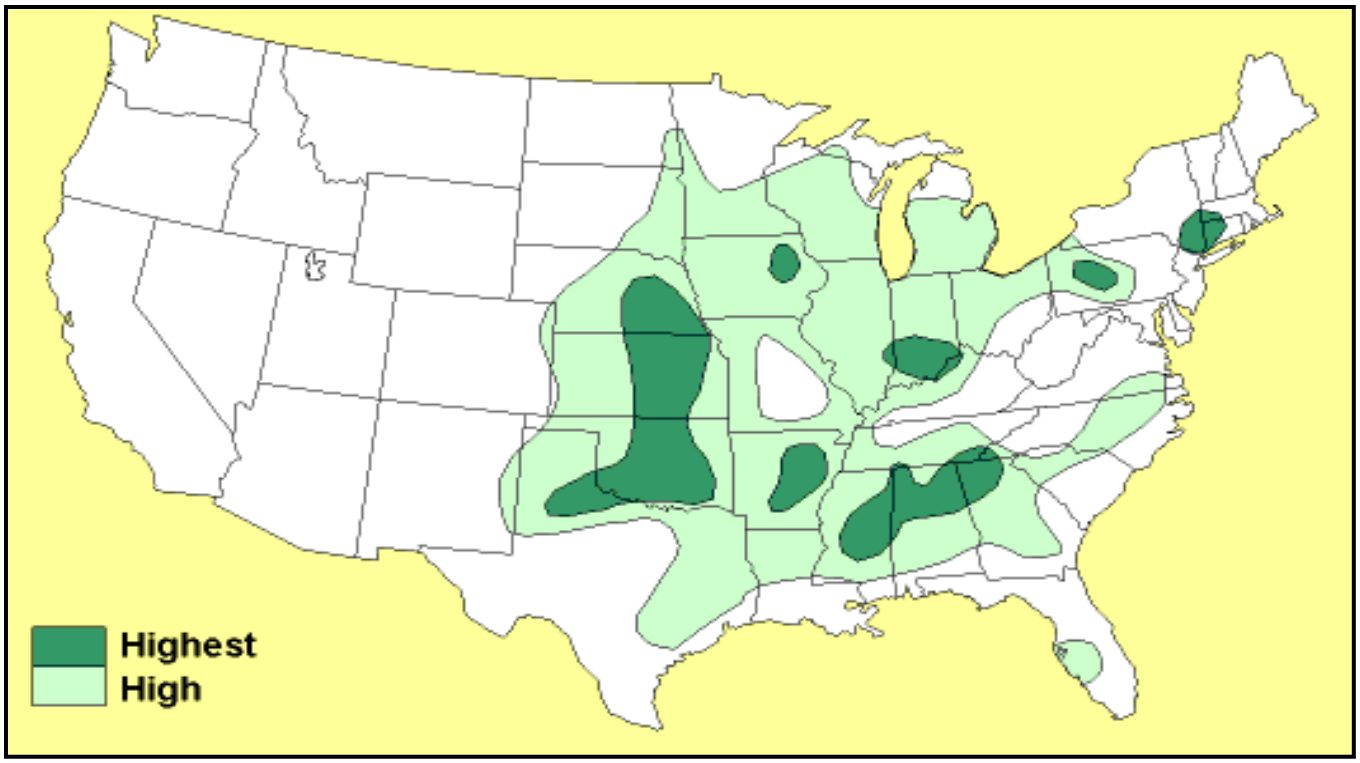


Figure 12-3. Tornado Risk Areas in the Coterminous United States

Windstorms can result in collapsed or damaged buildings, damaged or blocked roads and bridges, damaged traffic signals, streetlights and parks, and other damage. Wind speeds as low as 32 mph can cause structural damage, and winds of 100 mph can actually destroy wood-frame structures (Seattle Office of Emergency Management 2014). High winds can also cause direct losses to buildings, people, and vital equipment. There are direct consequences to the local economy resulting from windstorms related to both physical damage and interrupted services.

Wind pressure can create a direct and frontal assault on a structure, pushing walls, doors, and windows inward. Conversely, passing winds can create lift and suction forces that act to pull building components and surfaces outward. As positive and negative forces impact a building's doors, windows and walls, the result can be roof or building component failures and considerable structural damage. The effects of winds are magnified in the upper levels of multi-story structures.

Debris carried along by extreme winds can contribute directly to loss of life and indirectly to the failure of protective building envelopes. Falling trees and branches can damage buildings, power lines, and other property and infrastructure. Tree limbs breaking in winds of only 45 mph can be thrown over 75 feet, so overhead power lines can be damaged even in relatively minor windstorm events. During wet winters, saturated soils cause trees to become less stable and more vulnerable to uprooting from high winds. Utility lines brought down by summer thunderstorms have also been known to cause fires, which start in dry roadside vegetation. Electric power lines falling down to the pavement create the possibility of lethal electric shock.

Downed trees and power lines, and damaged property also can be major hindrances to emergency response and disaster recovery. Emergency response operations can be complicated when roads are blocked or when power supplies are interrupted. Industry and commerce can suffer losses from interruptions in electric service and from extended road closures.

Windstorms in Placer County are more probable during the fall through early spring. Because of the shape and orientation of the Sacramento Valley, prevailing winds are southerly. When atmospheric conditions are favorable, usually in conjunction with a significant storm tracking along the coast, these winds may combine and become strong enough to cause property damage and personal injury. The most significant windstorm in Northern California was the Columbus Day storm of 1962. Significant damage occurred along the coast and in the far northern part of the Sacramento Valley. Because Roseville lies far enough south in the valley, windstorms such as those during the 1962 Columbus Day Storm, typically do not intensify to damaging levels. It is rare for southwesterly winds flowing parallel to the Sierra Nevada Mountains to reach sustained gusts above 60 mph in the valley floor. The predicted wind speed given in wind warnings issued by the National Weather Service is for a one-minute average; gusts may be 25 to 30 percent higher.

Site-specific data on windstorms in Roseville are incomplete. Regionally, a few windstorm events have resulted in significant damage. The impacts of these events were felt to the north and east of Roseville. There have been a couple of instances of unusual wind bursts that resulted in some property damage. December 1993 saw a downburst of wind that did significant damage to a sound wall that was under construction. Another event occurred on January 1, 1995, when a wind gust through northwest Roseville snapped several power poles. Table 12-1 shows monthly wind records for Sacramento.

Table 12-1. Monthly Wind Records for Sacramento, California

Month	Year of Record	Fastest Wind Speed (miles per hour)	Month	Year of Record	Fastest Wind Speed (miles per hour)
January	1954	60	July	1956	36
February	1938	58	August	1954	38
March	1952	66	September	1965	42
April	1955	45	October	1950	68
May	1912	40	November	1953	70
June	1950	47	December	1952	70

Source: Masters-Bevan 2001.

12.1.3 Fog

Fog is a cloud near the ground that forms when air close to the ground can no longer hold all the moisture it contains. This occurs either when air is cooled to its dew point or the amount of moisture in the air increases. Heavy fog is hazardous because it can restrict surface visibility. Severe fog incidents can close roads, cause vehicle accidents, cause airport delays, and impair the effectiveness of emergency response. Financial losses associated with transportation delays caused by fog have not been calculated in the United States, but they are known to be substantial. Fog can occur almost anywhere during any season and is classified based on how it forms, which is related to where it forms. Certain seasons are more likely to have foggy days or nights based on a number of factors, including topography.

In Placer County, heavy fog occurs mostly during the midwinter. A low-lying, early morning “tule fog” can occur anytime during the wet, cold season. Tule fog or radiation (ground) fog is common on clear nights with little or no wind. It is caused by the rapid cooling of the Earth and corresponding drop in air temperature to the dew point. This type of fog is known as “valley fog” when it persists throughout the day and is thick. Table 12-2 summarizes dense fog events in the southern Sacramento valley. Given the nature of fog in the Roseville area, future severe or dense fog events are expected to happen on an annual basis, but are not expected to occur frequently.

Table 12-2. Monthly Dense Fog Occurrence

Month	Year of Record	Mean Number of Days	Maximum Number of Days
January	1961	9.9	23
February	1963[a]	5.3	13
March	1986	1.7	6
October	1962	1.4	11
November	1982	5.3	11
December	1989*	9.5	22
Annual	1962	33.8	64

a. Also occurred in previous years.
Source: Masters-Bevan 2001.

12.1.4 Heavy Rains, Thunderstorms and Lightning

Severe weather in the City of Roseville generally includes heavy rains and is periodically accompanied by strong winds, lightning, or hail. Heavy rains coupled with low temperatures or other severe weather conditions can result in increases in traffic accidents, disruptions in transportation, commerce, government, and education. Severe weather incidents can also cause utility outages due to falling trees or other debris, as well as injuries.

Roseville's Mediterranean type of climate is typified by nearly 90 percent of the annual precipitation occurring during a window of about 16 weeks. The most severe storms occur during the late fall to early spring. The climate pattern, coupled with the onshore flow of warm, moist Pacific air during the winter, can generate severe and prolonged periods of heavy rain.

Roseville experiences heavy rains every year. Some of these events may include thunderstorms. Thunderstorms are typically few in number and are more likely to appear in spring or late fall. Table 12-3 shows the average and record occurrence of thunderstorms in Sacramento between 1948 and 2008.

Table 12-3. Frequency of Thunderstorms in Sacramento, California, 1948 – 2008

Month	Year of Record	Number of Days with Thunderstorms	
		Average	Maximum
January	1970	0.4	3
February	1970	0.5	4
March	1992	0.8	4
April	1983	0.7	3
May	1967	0.3	3
June	1956	0.2	2
July	1989	0.2	2
August	1991[a]	0.2	2
September	1989[a]	0.5	2
October	1989[a]	0.3	2
November	1979*	0.3	3
December	1970	0.2	2
Annual	**1970**	**4.7**	**10**

a. Also occurred in previous years between January 1948 and December 2000.
Source: Masters-Bevan 2008.

NOAA classifies a thunderstorm as a storm with lightning and thunder produced by cumulonimbus clouds, usually producing gusty winds, heavy rain, and sometimes hail. Thunderstorms are usually short in duration (seldom more than 2 hours). Heavy rains associated with thunderstorms can lead to flash flooding during the wet or dry season.

According to the American Meteorological Society *Glossary of Meteorology*, thunderstorms are reported as light, medium, or heavy according to the following characteristics:

- Nature of the lightning and thunder
- Type and intensity of the precipitation, if any
- Speed and gustiness of the wind
- Appearance of the clouds
- Effect on surface temperature.

Lightning is an electrical discharge that results from the buildup of positive and negative charges within a thunderstorm. When the buildup becomes strong enough, lightning appears as a "bolt." This flash of light usually occurs within the clouds or between the clouds and the ground. A bolt of lightning reaches temperatures approaching 50,000ºF instantaneously. The rapid heating and cooling of air near the lightning causes thunder. Lightning is a major threat during a thunderstorm. In the United States, between 75 and 100 Americans are killed by lightning each year.

12.1.5 Ice and Freezing Rain

Ice and freezing rain are not part of the climate pattern in southern Sacramento valley. Periods have occurred where the daily minimum temperature has been at or below 32°F for several days. Yet the low temperatures reflect diurnal variations with clear skies, not part of a synoptic feature generating any precipitation. The bitterest cold snap on record, occurring December 9 to 15, 1935, was ended by the onset of a Pacific storm bringing warmer air. Although ice storms and freezing rains are a significant natural hazard, the extremely remote possibility of their occurrence in Roseville precludes any further discussion in this analysis.

12.2 HAZARD PROFILE

12.2.1 Past Events

Table 12-4 summarizes past severe weather events in Roseville and Placer County as recorded by the National Oceanic and Atmospheric Administration since 1958.

12.2.2 Location

Severe weather events have the potential to happen anywhere in Placer County. Communities in low-lying areas next to streams or lakes are more susceptible to flooding. Mountainous regions experience heavier snowfall and a greater risk of road closures. Wind events are most damaging to areas that are heavily wooded.

12.2.3 Frequency

The planning area can expect to experience exposure to some type of severe weather event at least annually.

Table 12-4. Severe Weather Events in Placer County since 1958 (NOAA 2015)

Location	Date	Type	Magnitude	Deaths or Injuries	Property Damage
Placer County	01/13/1957	Tornado	F0	0	0
Placer County	04/22/1967	Hail	0.00 Inches	0	0
Placer County	10/15/1972	Tornado	F0	0	0
Placer County	03/03/1983	Tornado	F0	0	0
Placer County	03/22/1983	Tornado	F1	0	$250,000
Placer County	04/23/1990	Tornado	F0	0	$2,500
Placer County	12/30/1992	Hail	0.50 inches	0	0
Description: *Severe thunderstorms produced golf ball-sized hail. Damage occurred at several auto dealers in Roseville.*					
Roseville	12/22/1996	Thunder Storm/Wind	0	0	0
Description: *Downburst winds snapped five 75-foot-high power poles into several pieces.*					
Roseville	01/22/1997	Flash Flood	0	0	0
Description: *Heavy rains on saturated soil caused flooding on Dry Creek and Linda Creek, damaging 21 homes.*					
Roseville	01/26/1997	Flash Flood	0	0	0
Description: *Heavy rain caused flooding on Dry Creek and Linda Creek, damaging 21 buildings.*					
Placer County	01/12/1998	Heavy Rain	N/A	0	0
Description: *Heavy rains caused widespread but minor flooding across the Sacramento Valley and nearby foothills.*					
Placer County	01/18/1998	Heavy Rain	N/A	2	0
Description: *A Pacific storm brought brief but heavy rain to the Sacramento Valley and surrounding foothills. 27,000 customers lost power at some time during the storm. Two teens were drowned when their car flipped into a flooded ditch near Loomis.*					
Roseville	01/22/2000	Heavy Rain	N/A	0	0
Description: *Rainfall totaling 5.43 inches fell in just over 48 hours.*					
Roseville	02/11/2000	Heavy Rain	N/A	0	$10,000
Description: *Heavy rain that persisted for nearly 72 hours was responsible for the closure of Granite Bay High School. The school lost power and phone service. Local businesses were affected by the flooding and closed as well.*					
Placer County	12/17/2005	Heavy Rain	N/A	0	0
Description: A series of storms brought heavy rainfall to Northern California. Five-day rainfall for Roseville was 2.99 inches.					
Placer County	01/01/2006	Severe Storm/Flood	N/A	0	$2,000,000
Description: *Storms brought heavy rain, mudslides, flooding, and high winds to Northern California. Levee overtopping, breaching, and river flooding occurred along numerous rivers, creeks, and streams. Several urban areas had significant street flooding. The Sacramento weir was opened for the first time since 1997. Airports were closed due to high winds and major road closures resulted from flooding and mudslides. Interstate 80 between Sacramento and Reno, NV, was closed for more than a day due to a mudslide, as were both directions of U.S. Highway 50 between Sacramento and South Lake Tahoe. Place County was among the counties declared in need of federal disaster assistance.*					
Placer County	07/25/2013	Hail	N/A	0	0
Description: *Strong to severe thunderstorms affected the Sierra and northeast California.*					
Roseville	03/36/2014	Tornado	EF0	0	0
Description: *EF0 tornado began in a field southwest of Roseville, but did not cause damage until it reached the Pleasant Grove Blvd housing developments in West Roseville. The winds were estimated to be 75 to 85 mph. Several windows were blown out from houses, 25 to 30 feet of fence was blown down, projectile damage to stucco occurred. The tornado lasted 5 to 10 minutes.*					
Roseville	05/14/2015	Heavy Rain	N/A	0	0
Description: *Thunderstorms brought local heavy rain and minor flooding. Unusually late winter snow fell in the Sierra, causing travel delays and chain controls over passes. Funnel clouds were reported with thunderstorms, but no touchdowns were confirmed. Street flooding was reported at Martin Road and East Roseville Parkway from a thunderstorm.*					

12.2.4 Severity

Severe weather disaster declarations for Placer County, as shown in Table 12-4, are often related to heavy rains, thunderstorms, and freezing temperatures. The most common problems associated with severe storms are immobility and loss of utilities. Fatalities are uncommon, but can occur. Roads may become impassable due to flooding, downed trees, or a landslide. Power lines may be downed due to high winds, and services such as water or phone may not be able to operate without power. Lightning can cause severe damage and injury. Windstorms have been known to cause damage to utilities.

Tornadoes are potentially the most dangerous of local storms, but they are not common in the Roseville vicinity. If a major tornado were to strike a populated area such as Roseville, damage could be widespread. Businesses could be forced to close for an extended period or permanently, fatalities could be high, many people could be homeless for an extended period, and routine services such as telephone or power could be disrupted. Buildings may be damaged or destroyed. Compared with other states, California ranks 32nd for frequency of tornadoes, last for number of deaths, 36th for injuries, and 31st for cost of damage. California ranks 44th for the frequency of tornados per square mile.

12.2.5 Warning Time

A meteorologist can often predict the likelihood of a severe storm. This can give several days of warning time. However, meteorologists cannot predict the exact time of onset or the severity of the storm. Some storms come on more quickly and have only a few hours of warning time.

12.3 SECONDARY HAZARDS

The most significant secondary hazards associated with severe weather are floods, falling and downed trees, landslides and downed power lines. Rapidly melting mountain snow combined with heavy rain can overwhelm natural and man-made drainage systems, causing overflow and property destruction. Landslides occur when the soil on slopes becomes oversaturated and fails.

12.4 EXPOSURE

12.4.1 Population

A lack of data separating severe weather damage from flooding and landslide damage prevented a detailed analysis for exposure and vulnerability. However, it can be assumed that the entire Roseville planning area is exposed to severe weather events. Certain areas are more exposed due to geographic location and localized weather patterns. Populations living at higher elevations with large stands of trees or power lines may be more susceptible to wind damage and black out, while populations living in low lying areas are at risk for flooding.

12.4.2 Property

All structures within Roseville are exposed to the potential impacts of severe weather.

12.4.3 Critical Facilities and Infrastructure

All critical facilities exposed to flooding are also likely exposed to severe weather. Additional facilities on higher ground may also be exposed to wind damage or damage from falling trees. The most common problem associated with severe weather is the loss of utilities. Downed power lines can cause blackouts, leaving large areas isolated. Phone, water and sewer systems may not function. Roads may become impassable due to ice or snow or from a secondary hazard such as landslides.

12.4.4 Environment

Severe storm events can drastically affect the physical environment, changing natural landscapes. Natural habitats such as streams and trees risk major damage and destruction during a severe storm. Prolonged rains can saturate soils and lead to slope failure. Flooding caused by severe weather can cause stream channel migration.

12.5 VULNERABILITY

There are currently no loss estimation tools with uniform damage functions for severe weather events. This can be attributed to the variety of impacts that severe weather events generate. Also, the severity of severe weather events varies by location. Since secondary effects of severe weather events include flooding, landslides or even wildfires in drier climates, the vulnerability assessments under those hazards can provide emergency managers a gage of the economic impact of severe weather events. For this section, the vulnerability to severe weather events is discussed qualitatively. Where possible, damage estimates are made using reasonable assumptions and best available data.

12.5.1 Population

Particularly vulnerable populations are the elderly, low income or linguistically isolated populations, people with life-threatening illnesses, and residents living in areas that are isolated from major roads. Power outages can be life threatening to those dependent on electricity for life support. These populations face isolation and exposure during severe weather events and could suffer more secondary effects of the hazard.

12.5.2 Property

All property is vulnerable during severe weather events, but structures in poor condition or constructed to low building code standards risk the most damage. The frequency and degree of damage will depend on specific locations. Those in higher elevations and on ridges may be more prone to wind damage. Those that are located under or near overhead lines or near large trees may be damaged in the event of a collapse.

Estimates of potential loss for the severe weather hazard are not based on damage functions, because no such damage functions have been generated. Instead, estimates were developed representing 10 percent, 30 percent and 50 percent of the assessed value of exposed structures. This allows emergency managers to select a range of potential economic impact based on an estimate of the percent of damage to the general building stock. Damage in excess of 50 percent is considered to be substantial by most building codes and typically requires total reconstruction of the structure. Table 12-5 lists the potential loss estimates to the general building stock.

Table 12-5. Loss Potential for Roseville Buildings Vulnerable to Severe Weather Hazard

	Building Count	Assessed Value	10% Damage	30% Damage	50% Damage
Residential	43,163	$18,695,442,494	$1,869,544,249	$5,608,632,748	$9,347,721,247
Commercial	1,811	$8,274,963,659	$827,496,366	$2,482,489,098	$4,137,481,830
Industrial	475	$1,160,642,905	$116,064,290	$348,192,871	$580,321,452
Agricultural	1	$28,530	$2,853	$8,559	$14,265
Religion	71	$250,600,927	$25,060,093	$75,180,278	$125,300,463
Government	92	$168,856,266	$16,885,627	$50,656,880	$84,428,133
Education	445	$1,091,399,472	$109,139,947	$327,419,842	$545,699,736
Total	**46,058**	**$29,641,934,254**	**$2,964,193,425**	**$8,892,580,276**	**$14,820,967,127**

12.5.3 Critical Facilities and Infrastructure

Incapacity and loss of roads are the primary transportation failures, most of which are associated with secondary hazards. Landslides that block roads are caused by heavy prolonged rains. High winds can cause significant damage to trees and power lines, with obstructing debris blocking roads, incapacitating transportation, isolating population, and disrupting ingress and egress. Of particular concern are roads providing access to isolated areas and to the elderly.

Prolonged obstruction of major routes due to landslides, debris, or floodwaters can disrupt the shipment of goods and other commerce. Large and prolonged storms can have negative economic impacts for an entire region.

Severe windstorms and downed trees or power lines can create serious impacts on power and above-ground communication lines. Broken power and communication lines would result in isolation because some residents would be unable to call for assistance.

12.5.4 Environment

The environment vulnerable to the severe weather hazard is the same as the environment exposed to the hazard.

12.6 FUTURE TRENDS IN DEVELOPMENT

The general building stock within the planning area increased by 17.7% with an increase in valuation from $21.967 billion to $29.641 billion (34.9%). This increase in valuation of the planning area was impacted by the areas recovery from the economic downturn of 2008. Since the entire planning area would be considered susceptible to earthquake, there was an increase in earthquake exposure over the performance period of the 2011 plan. However, the vulnerability of this new exposure should be considered to be low due to the application of strong building code standards that are contained within the International Building Code.

Many of the impacts associated with severe weather hazards can be addressed through proactive planning and the use of best available information in making land use decisions. Roseville has and will achieve this goal through the implementation of its General Plan. The General Plan serves as a long-term policy guide for the physical, economic, and environmental growth of the City. It includes a statement of the community's vision of its ultimate physical growth. Implementation of the General Plan, along with other programs such as Building Code enforcement, public information and early warning, will help Roseville to manage the probable impacts of severe weather hazards as the City grows in the future.

12.7 REVIEW OF EXISTING ORDINANCES, PROGRAMS, AND POLICIES

Roseville implements numerous programs and policies that can impact severe whether hazards. Like most programs and policies sited in this Plan, these are tied to the City's general plan. Maintenance of these existing programs is included in the action plan for this hazard mitigation plan.

12.8 SCENARIO

A worst-case event would involve prolonged high winds during an extreme rainstorm. Such an event would have both short-term and long-term effects. Initially, schools and roads would be closed due to flooding, downed tree obstructions, and downed power lines. Power outages would be common throughout the City. Some subdivisions in the City could experience limitations on ingress and egress. Continuing rains could produce flooding, overtopped culverts with ponded water on roads, and landslides on steep slopes. Flooding and landslides could further obstruct roads and bridges, further isolating residents.

12.9 ISSUES

In general, every household and resident in the City is likely to be exposed to severe weather, but some are more likely than others to experience isolation as a result. Those residing in higher elevations with limited transportation routes may have the greatest vulnerability to isolation from storms. Another group at risk is the portion of the population that is over the age of 65.

13. WILDFIRE

13.1 GENERAL BACKGROUND

13.1.1 Contributing Factors

A wildfire is any uncontrolled fire occurring on undeveloped land that requires fire suppression. Wildfires can be ignited by lightning or by human activity such as smoking, campfires, equipment use, and arson. The potential for wildfire is primarily influenced by the following factors:

- Fuel, which may include living and dead vegetation on the ground, along the surface as brush and small trees, and above the ground in tree canopies.
- Topography, which includes both slope and elevation.
- Air conditions, including temperature, relative humidity, wind speed and direction, cloud cover, precipitation amount and duration, and the stability of the atmosphere.

DEFINITIONS

Wildland-Urban Interface Area—An area susceptible to wildfires where wildland vegetation and urban or suburban development occur together. Examples include dispersed rural housing in forested areas.

Wildfire—A fire that causes uncontrolled destruction of forests, brush, field crops, grasslands, and real and personal property in non-urban areas.

How a fire behaves primarily depends on the following:

- Fuel—Lighter fuels such as grasses, leaves and needles quickly expel moisture and burn rapidly, while heavier fuels such as tree branches, logs and trunks take longer to warm and ignite. Trees killed or defoliated by forest insects and diseases are more susceptible to wildfire.
- Weather—Strong, dry winds produce extreme fire conditions. Such winds generally reach peak velocities during the night and early morning hours.
- Thunderstorm activity—The thunderstorm season typically begins in June with wet storms, and turns dry with little or no precipitation reaching the ground as the season progresses into July and August.
- Terrain—The topography of a region influences the amount and moisture of fuel; the impact of weather conditions such as temperature and wind; potential barriers to fire spread, such as highways and lakes; and elevation and slope of land forms (fire spreads more easily uphill than downhill).
- Time of Day—A fire's peak burning period generally is between 1 p.m. and 6 p.m.

Short-term loss caused by a wildfire can include the destruction of timber, wildlife habitat, scenic vistas, and watersheds. Long-term effects include smaller timber harvests, reduced access to affected recreational areas, and destruction of cultural and economic resources and community infrastructure. Vulnerability to flooding increases due to the destruction of watersheds. The potential for significant damage to life and property exists in areas designated as "wildland-urban interface areas," where development is adjacent to densely vegetated areas.

13.1.2 Local Conditions Related to Wildfire Hazard

Vegetation

The vegetation in Roseville can be broadly classified in three categories:

- There are large tracts of self-sustaining grasslands in the northern and western undeveloped edges of Roseville. Less extensive areas of grassland can be found in smaller, undeveloped areas scattered throughout the City. Most of the grasslands are non-native, following the effects of grazing and clearing for agricultural uses.
- Oak woodland, riparian and creek areas are found in proximity to Roseville's major stream channels where microclimates and alluvial soils provide ideal conditions for the deeper rooting shrubs and trees found in these habitats. Most woodland areas are relatively open, with little shrub growth.
- Seasonal wetlands in Roseville include intermittent drainages and vernal pools. Intermittent drainages are wet only in winter and dry during the summer, with scattered ponds; they may contain water from adjacent urban runoff. Vernal pools represent a significant seasonal wetland resource in Roseville.

Undeveloped Areas

The U.S. Army Corps of Engineers has required developers in Roseville to preserve areas of vernal pools that are dedicated to the City and maintained in perpetuity. These areas are to be left undisturbed and are typically open grassy areas during the hot summer months when the vernal pools are dry.

Preservation of open space, wetlands, natural parkways, riparian corridors along the City's watersheds, vernal pools and endangered species habitat have added to the inventory of vegetation susceptible to wildfire. The City of Roseville has 2,600 acres of dedicated open space within the city limits. Nearly 740 acres will be added on dedication of properties in the West Roseville Specific Plan. The City recently acquired the Reason Farms property in unincorporated Placer County, which will be the site for a retention basin projected to have water only eight days per year. The property will be preserved in perpetuity as open space with passive recreational uses planned, including biking, hiking, camping, and boating on a man-made lake. The Roseville Fire Department will assume fire protection duties for this significant piece of open space at a future date.

Fire-Fighting and Fire Prevention

Federal, state, county, city, and private agencies provide fire protection and firefighting services in California. Wildfires usually are extinguished while smaller than 1 acre, but they can spread to more than 100,000 acres and may require thousands of firefighters and several months to extinguish.

Roseville Fire Protection Services

The Roseville Fire Department is a fully functional agency that primarily provides fire suppression and emergency medical services for the urban environment of the City. The department operates eight stations. The department has eight paramedic engine companies, with a minimum staffing of three, two paramedic truck companies with a minimum staffing of four, and one battalion chief. The department also operates a hazardous materials response unit (cross-staffed the truck company); five grass/wildland units, and one technical rescue unit (cross-staffed by engine companies). The department maintains four reserve engines and one reserve truck.

Regional Services

Regional fire protection is provided by municipal fire departments and those assigned to specially designated lands outside city boundaries. The Placer County Fire Department provides fire protection to much of Placer County including west of the Roseville city limits. The South Placer Fire District serves unincorporated Placer County east of Roseville. The City of Rocklin Fire Department provides services within the City of Rocklin to the north and east of Roseville. The Sacramento Metropolitan Fire District provides fire protection to the City of Citrus Heights and the unincorporated Sacramento County areas to the south of Roseville.

State of California

The California Department of Forestry and Fire Protection (CAL FIRE) is charged with both assessing the threat of fire in California and suppressing fires on state and federal lands, while providing mutual aid if needed to communities that do not include public lands. The California Fire Plan formalizes much of the work that has been done to assess the threat of wildfire statewide. CAL FIRE's Fire and Resource Assessment Program (FRAP) assesses the amount and extent of California's forests and rangelands, analyzes their conditions and identifies alternative management and policy guidelines.

Firewise Communities

The national Firewise Communities program is a multi-agency effort involving homeowners, community leaders, planners, developers, and others to protect people, property and natural resources from the risk of wildfire before a fire starts. The program emphasizes community responsibility for planning a safe community and effective emergency response, and individual responsibility for safer home construction and design, landscaping and maintenance. Firewise Communities is directed and sponsored by the National Wildfire Coordinating Group, a consortium of organizations and federal agencies responsible for wildfire management in the U.S.

13.2 HAZARD PROFILE

13.2.1 Past Events

Fire history shows multiple wildfires in or near Roseville since the 1950s:

- In the 1950s, one fire occurred just east of the current location of Interstate 80 on the Roseville/Rocklin border, including parts of the Stoneridge area. A second fire occurred south of Douglas Boulevard where Roseville Parkway is now located.
- In the 1970s, a significant fire occurred in undeveloped grasslands along what is now Galleria Boulevard and Harding Boulevard in north central Roseville. Another fire occurred just outside the city limits on both sides of Cavitt-Stallman in the Loomis area.
- In the 1980s, five wildfires were mapped, including one in the grasslands of the North Central Roseville Specific Plan just north of Highway 65, where Pleasant Grove Boulevard is now located. Three grassland fires occurred west of Roseville, one just west of Fiddyment Road and two west of Fiddyment Road and south of Athens Road. A major fire occurred in 1983 where Baseline Road and Country Club Drive now intersect. The fire scorched 1,500 acres north past the current Blue Oaks Boulevard, stopping at Pleasant Grove Creek. The area is now developed with urban uses.
- The 2002 Sierra Fire in Loomis and Granite Bay was the largest in recent history near Roseville. The fire charred 900 acres of grass, brush and oaks in the area between Interstate 80 and Cavitt-Stallman Road. The fire destroyed six structures and threatened two schools. One hundred homes were evacuated, and more than 1,000 homes in both communities were threatened.
- On May 17, 2016, a grass fire broke out near Highway 65 north of Roseville. The fire, located at Athens Avenue and Industrial Boulevard, south of Lincoln in Placer County stretched to 169 acres.

Statewide, California experiences frequent significant wildfires. Most recently, the following two fires occurred:

- The 2003 Cedar fire in San Diego County burned 273,246 acres, destroyed 2,820 structures and directly resulted in 15 deaths. The fire was caused by human ignition.
- The 2015 Valley Fire in Lake County is considered the third worst fire in history, based on the number of structures damaged or destroyed. The fire consumed 75,781 acres and killed four people.

CAL FIRE maintains a website (http://www.calfire.ca.gov/general/firemaps/) with interactive maps that detail the fire history in California since 2011.

13.2.2 Location

State

CAL FIRE also developed an estimate of fire risk in designated wildland-urban interface areas, based on a variety of factors affecting fire frequency and fire behavior. The results are combined into a single assessment called fire threat. A significant fire threat is found throughout California, with 48 percent of the state's wildland area ranked as high, very high or extremely high. About 37 percent of the state has a moderate fire threat. Large areas of high threat are found in Southern California, the central coast, the lower elevations of the Sierra Nevada and much of the interior of northern California. Much of the fire threat is near densely populated areas and new development.

Regional

Wildfire safety is an increasing concern in the western Sierra foothills and valley as development continues in rural areas while grasslands and open space border urban areas. The potential for wildfire and urban wildfire is always present, with fire conditions from a combination of hot weather, an accumulation of vegetation, and low moisture content typically present in the warm fire season within the Central Valley and Sierra Nevada foothills. Wildfire risk in Placer County is primarily in the wildland-urban interface areas. A majority of Placer County is deemed to be a high or very high fire threat risk based on analysis by CAL FIRE, as shown on Figure 13-1. These are areas with dense vegetation, increasing elevation, and steep slopes in the foothills and the mountains of the Sierra Nevada Mountain Range.

CAL FIRE's FRAP website (http://frap.cdf.ca.gov/) includes maps of the communities most at risk for wildfire that are within 1.5 miles of a high or very high wildfire threat on federal or non-federal lands. The threat is based on the FRAP fuels and hazard data. The map identifies seven communities in Placer County not adjacent to federal lands that are at risk for wildfire, including the City of Roseville and communities adjacent to or within the Tahoe National Forest.

Local

The City of Roseville does not include any designated wildland-urban interface areas. A significant portion of the area around the City is developed. State maps show that the City has a moderate fire threat. While the City rarely has critical fire weather conditions, a combination of dry grasslands, the topography in northeast Roseville, and hot temperatures with limited rainfall could result in a risk of wildfire on occasion. The following are the most likely wildfire hazards in Roseville:

- Grassland fires on undeveloped properties in the West Roseville Specific Plan Area or west or north of Roseville
- Fires in northeast Roseville where significant slopes are adjacent to ravines and residential development
- Fires in open space and preserve areas within the developed sections of Roseville.

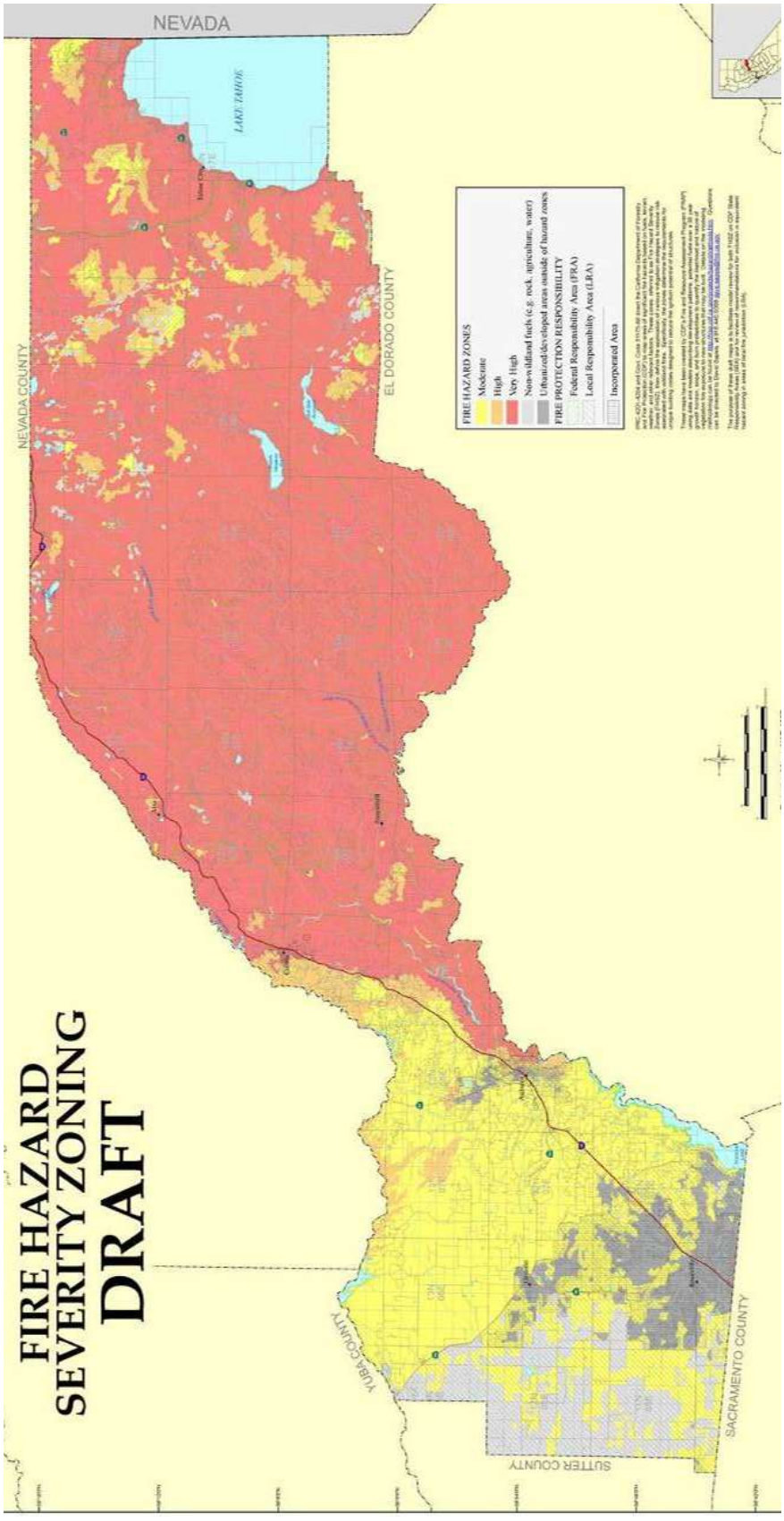


Figure 13-1. CAL FIRE FRAP Map for Placer County

Grassland Fires

Prior to August 2004, Roseville's northwestern boundary was Fiddyment Road. Since the annexation of 3,200 acres in West Roseville, the City now includes a significant amount of undeveloped non-native annual grassland with some riparian and oak woodland along Pleasant Grove Creek and Kaseberg Creek. The property to the west of Roseville along this border is also non-native annual grassland. The 2004 West Roseville Specific Plan Open Space Preserve Operations and Management Plan has provisions for reducing fire hazard if the preserve becomes a fire hazard. The preserve manager will work with the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service and the Roseville Fire Department to decide the best way to reduce the hazard. Fire breaks are allowed within the 50-foot buffer around the preserve. Fire breaks in other locations would require U.S. Army Corps of Engineers and U.S. Fish and Wildlife Service approval.

The Sierra Vista Specific Plan Area, annexed in January 2012, consists of largely nonnative, annual grasslands. The Sierra Vista Specific Plan Area will develop as urban uses, but will also contain 267 acres of preserve areas. A 50-foot wide open space buffer area is maintained at the perimeter of all open space preserves for fuel modification and fire management, among other uses. The Roseville Fire Department's Fire Station #5 serves as the primary responding area for this area.

Ravine Fires

The Stoneridge Specific Plan includes 1,089 acres of land that will include 2,882 dwelling units, along with office and commercial uses, schools, parks, and open space. Approximately 252 acres will be set aside as open space with an extensive network of bike trails. The main ingress and egress to the area is Secret Ravine Parkway, which will link Sierra College Boulevard with East Roseville Parkway. The ravines also border the Northeast Roseville Specific Plan Area, which is largely developed, with some construction continuing along the ravine edges.

The key topographic features in Stoneridge are the three ravines: Secret Ravine, False Ravine, and Miners Ravine. The creek at the base of Miner's Ravine flows year-round. The elevation of the property is among the highest in the City, ranging from 225 feet to 375 feet above sea level. Slopes in Miner's Ravine range from a 5-percent grade to a 26-percent grade.

Vegetation in the Stoneridge Specific Plan Area is primarily annual grasslands, oak woodlands, and oak riparian landscapes (see Figure 13-2). Annual grasses with scattered downed trees and limbs cover the ground. The overstory includes scattered oaks and a few other broad leaf trees. The riparian vegetation includes Blue Oak, Valley Oak and Interior Live Oak, along with willows, cottonwood, and ash trees. The vegetation on the plateaus between the three main ravines is primarily annual grasses. The ravines do not have a continuous fuel ladder from the ground vegetation to the overstory trees.



Figure 13-2. View of Ravine, Tree Canopy and Stoneridge Development

The 1999 Stoneridge Specific Plan Wildfire Safety Plan outlined the following risks resulting from development of the Plan Area (see Figure 13-3):

- Fire in the grass of the open space area was identified as the most serious wildfire threat for the Stoneridge Specific Plan. Extensive grass fuels in the open space areas will quickly ignite and fire will spread rapidly, especially in summer. The plan cites a fire history that has demonstrated that grass and other light fuels are a threat to fire risk for other vegetation types as well as people.
- Wildfire rate of spread can increase with steep slopes. The three ravines in the project area have moderate slopes that can cause a fast rate of wildfire spread.
- Risk of fire starts will increase with development. The greatest risk from fire ignitions will be in the open space areas as use of these areas by future residents and other members of the public increases. Bike trails, for example, will make open space areas more accessible than when the Plan Area was undeveloped.
- Initial work by the developer to reduce the amount of fuel in the area must be maintained over the long-term to keep fire risk in check.
- Home design and siting often do not adequately mitigate wildfire risk. Measures specific to development within the Plan Area have been adopted by the City and are being enforced at the building permit stage. Owners will be required to maintain a clearing of flammable vegetation around the structures, use only fire resistant materials for roofs and fences, and ensure adequate water for fire suppression.

The Stoneridge Wildfire Safety Plan outlines short and long-term mitigation measures to prevent or minimize the impact of wildfire in this area of Roseville. These are included in the mitigation section of this 2016 Plan.

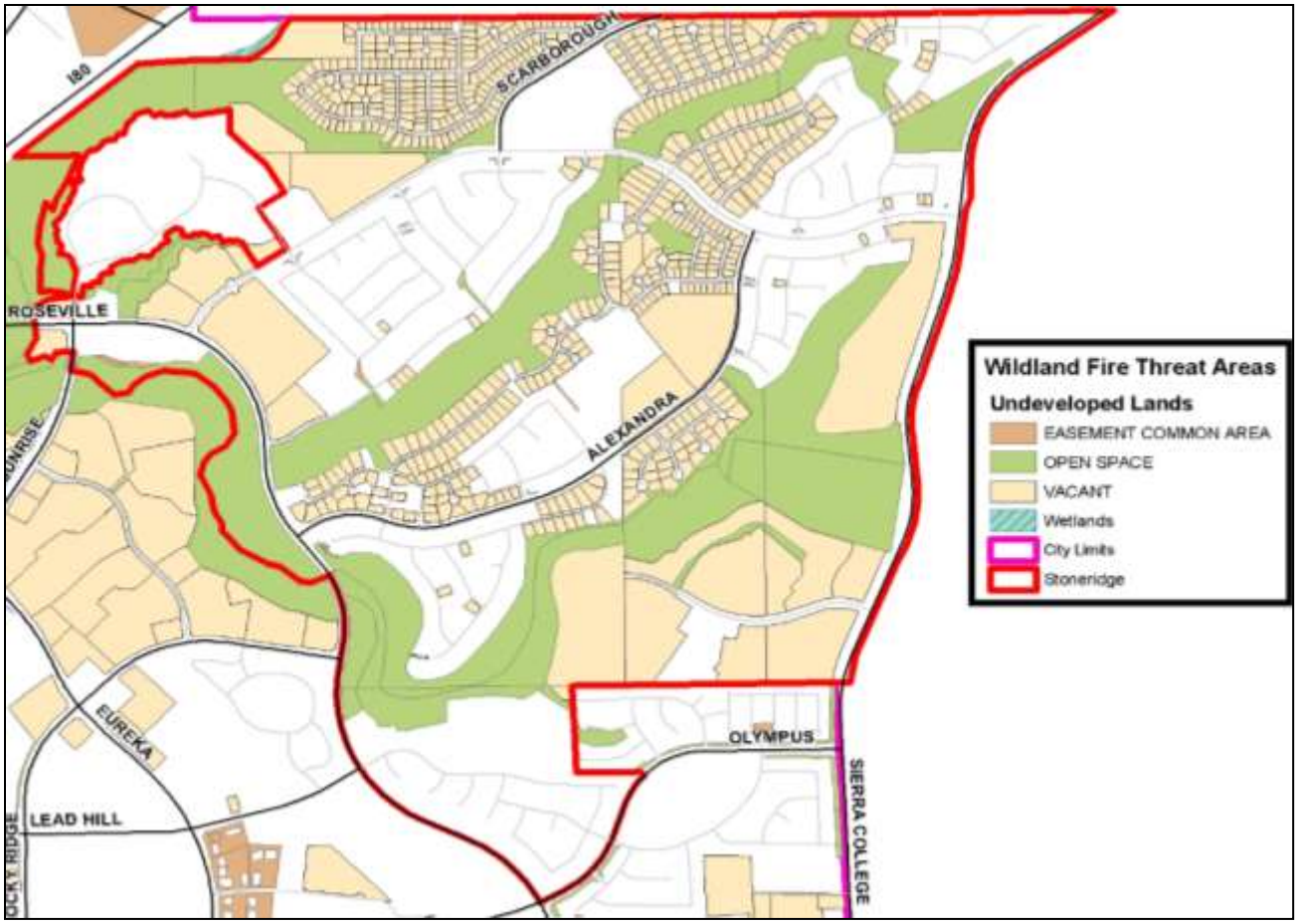


Figure 13-3. Stoneridge Specific Plan Wildfire Threat Areas

Open Space Fires

The City is adding new open space areas through dedication as part of the specific plan process. This will result in construction of new developments immediately adjacent to open space areas, which poses moderate risk to such developments. The Fire Department reviews these during the planning process, and fire safety provisions are accounted for in Specific Plan design guidelines and development agreements.

13.2.3 Frequency

The Roseville Fire Department maintains a database of every incident type responded to by Roseville fire personnel. Wildfires are tracked in four categories: natural or vegetation fire; forest, woods, or wildfire; brush or brush and grass fire; and grass fire. Table 13-1 provides the number of wildfire incidents recorded from 2011 to 2015. Placer County has had nearly 150 significant wildfires since 1908. In California, vegetation fires occur daily. Most are controlled and contained early, with limited damage.

Table 13-1. Wildfire Incident Counts—2011 to 2015

Incident Type	2011	2012	2013	2014	2015
Cultivated vegetation, crop fire	**–**	**1**	**3**	**3**	**2**
Cultivated trees or nursery stock fire	–	–	–	2	1
Cultivated vegetation, crop fire, other	–	1	3	1	1
Fire in mobile property used as fixed structure	**1**	**–**	**1**	**–**	**–**

Fire in mobile home used as fixed residence	–	–	1	–	–
Fire in portable building, fixed location	1	–	–	–	–
Natural Vegetation Fire	**47**	**54**	**70**	**62**	**53**
Brush, or brush and grass mixture fire	11	16	20	14	29
Forest, woods or wildland fire	–	1	2	1	–
Grass fire	24	23	26	29	18
Natural vegetation fire, other	12	14	22	18	6
Outside Rubbish Fire	**67**	**61**	**92**	**70**	**76**
Dumpster or other outside trash receptacle fire	16	8	9	12	17
Outside rubbish fire, other	18	19	39	34	27
Outside rubbish, trash or waste fire	32	34	44	23	32
Outside stationary compactor/compacted trash fire	1	–	–	1	–
Total	115	116	166	135	131

Source: City of Roseville Fire Department Incident Type Count Reports 2010-2015

13.2.4 Severity

Wildfires have never resulted in loss of life in Roseville, though some property damage has resulted from wildfire incidents, including some fences on occasion. CAL FIRE maps areas of significant fire hazard based on fuel, terrain, weather, and other relevant factors. The mapped fire hazard severity zones define the application of mitigation strategies to reduce risk associated with wildfires. Figure 13-4 shows fire hazard severity zones for the Roseville planning area. The City's wildfire hazard is rated as moderate. While the City is also a Community at Risk from Wildfire as designated on the State of California map, the Roseville Fire Department assessment in the General Plan concurs that wildfires in open space areas represent a moderate hazard. Most fires of this type are small and localized. The open space areas are typically easily accessible for fire suppression apparatus, and the response time is such that fires are suppressed rapidly.

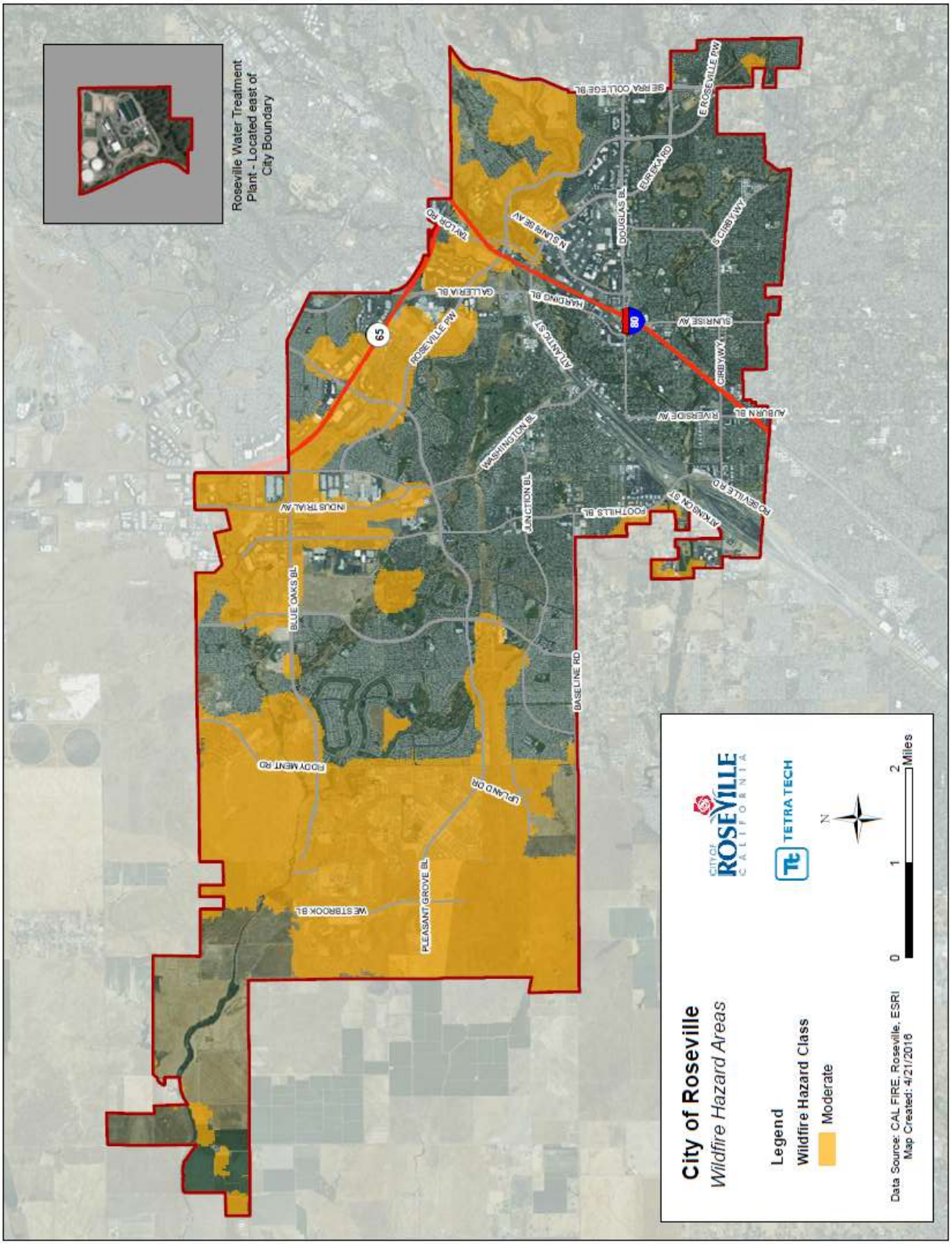


Figure 13-4. Fire Hazard Severity Zones in the Planning Area

13.2.5 Warning Time

Wildfires are typically caused intentionally or accidentally by humans. There is no way to predict when one might break out. Dry seasons and droughts greatly increase fire likelihood. If a fire breaks out and spreads rapidly, residents may need to evacuate within days or even hours. Once a fire has started, fire alerting is reasonably rapid in most cases. The spread of cellular and two-way radio communications has contributed to a significant improvement in warning time.

Since fireworks often cause brush fires, extra diligence can be taken around the Fourth of July when the use of fireworks is highest. Dry lightning may also trigger wildfires, so special attention can be paid during weather events that may trigger wildfires. Reliable National Weather Service lightning warnings are available on average 24 to 48 hours prior to a significant electrical storm. National Weather Service fire weather forecasts for the country (http://www.spc.noaa.gov/products/fire_wx) are monitored by local fire departments, including the City of Roseville Fire Department, to assess the risk for wildfire at any given time and enhance preparedness.

13.3 SECONDARY HAZARDS

Wildfires can generate a range of secondary effects, which in some cases may cause more widespread and prolonged damage than the fire itself. Fires can cause direct economic losses in the reduction of harvestable timber and indirect economic losses in reduced tourism. Wildfires cause the contamination of reservoirs, destroy transmission lines and contribute to flooding. They strip slopes of vegetation, exposing them to greater amounts of runoff. This in turn can weaken soils and cause major landslides several years after the wildfire. Most wildfires burn hot and for long durations that can bake soils, especially those high in clay content, thus increasing the imperviousness of the ground. This increases runoff generated by storm events, increasing the chance of flooding.

13.4 EXPOSURE

13.4.1 Population

Population could not be examined by fire hazard severity zone because census block group areas do not coincide with the fire risk areas. However, the planning team was able to create a population estimate using the structure count of buildings located within the highest-risk fire hazard severity zone for Roseville (moderate), and applying the census value for persons per household for Roseville (2.54). Using this approach, it is estimated that the population living within the moderate fire hazard severity zones is 29,178. This represents 22.7 percent of the total population for the City.

13.4.2 Property

Using the base mapping created to support the HAZUS-MH analyses, the planning team determined that there are 10,338 structures within the moderate fire hazard severity zones within the planning area, with the predominant use being residential. The total assessed value of these structures and their contents is $7.76 billion. This represents 26.2 percent of the total assessed value for the City.

13.4.3 Critical Facilities and Infrastructure

Critical facilities are public and private structures where vital community functions are conducted. If the facility is damaged or destroyed by wildfire, there could be severe consequences to public health and safety. The Roseville Fire Department, all first responders and mutual aid agencies would work to protect those facilities in areas where wildfire is a potential. Table 13-2 provides a list of critical facilities that are in potential wildfire areas.

Table 13-2. Critical Facilities and Infrastructure Adjacent to Potential Wildfire Areas

Facility Type	Number
Communications Facilities	29
Utilities	16
Fire Stations	4
Hazardous Materials Facilities	2
Bridges	21
Medical	1
Government	4
Religious	2
Schools	5

13.4.4 Environment

It can take decades or even centuries for ecosystems to recover from a wildfire, which can cause severe environmental impacts:

- **Damaged Fisheries**—Critical trout, salmon and steelhead fisheries can suffer from increased water temperatures, sedimentation, and changes in water quality.
- **Soil Erosion**—The protective covering provided by foliage and dead organic matter is removed, leaving the soil fully exposed to wind and water erosion. Accelerated soil erosion occurs, causing landslides and threatening aquatic habitats.
- **Spread of Invasive Plant Species**—Non-native woody plant species frequently invade burned areas. When weeds become established, they can dominate the plant cover over broad landscapes and become difficult and costly to control.
- **Disease and Insect Infestations**—Unless diseased or insect-infested trees are swiftly removed, infestations and disease can spread to healthy forests and private lands. Timely active management actions are needed to remove diseased or infested trees.
- **Destroyed Endangered Species Habitat**—Catastrophic fires can have devastating consequences for endangered species. For instance, the Biscuit Fire in Oregon destroyed 125,000 to 150,000 acres of spotted owl habitat.
- **Soil Sterilization**—Topsoil exposed to extreme heat can become water repellant, and soil nutrients may be lost. Some fires burn so hot that they can sterilize the soil.

13.5 VULNERABILITY

Structures, above-ground infrastructure, critical facilities and natural environments are all vulnerable to the wildfire hazard. There is currently no validated damage function available to support wildfire mitigation planning. Except as discussed in this section, vulnerable populations, property, infrastructure and environment are assumed to be the same as described in the section on exposure.

13.5.1 Population

There are no recorded incidents of loss of life from wildfires in Roseville, and the risk from wildfire has been deemed moderate by the State and the Roseville Fire Department. Given the immediate response times to reported fires, the likelihood of injuries and casualties is minimal; therefore, injuries and casualties were not estimated for the wildfire hazard.

Air pollution from wildfires can be a severe health hazard, especially for sensitive populations, including children, the elderly and those with respiratory and cardiovascular diseases. Smoke generated by wildfire consists of visible and invisible emissions that contain particulate matter (soot, tar and minerals), gases (carbon monoxide, carbon dioxide, nitrogen oxides), and toxics (formaldehyde, benzene). Emissions from wildfires depend on the type of fuel, the moisture content of the fuel, the efficiency of combustion, and the weather. Public health impacts associated with wildfire include difficulty in breathing, odor, and reduction in visibility.

Wildfire may also threaten the health and safety of those fighting the fires. First responders are exposed to the dangers from the initial incident and after-effects from smoke inhalation and heat stroke.

13.5.2 Property

Loss estimations for the wildfire hazard are not based on modeling utilizing damage functions, because no such damage functions have been generated. Instead, loss estimates were developed representing 10 percent, 30 percent and 50 percent of the assessed value of exposed structures. This allows emergency managers to select a range of economic impact based on an estimate of the percent of damage to the general building stock. Damage in excess of 50 percent is considered to be substantial by most building codes and typically requires total reconstruction of the structure. Table 13-3 lists the loss estimates for the exposed building stock.

Table 13-3. Potential Loss Estimates for the Wildfire Hazard

	Building Count	Assessed Value	10% Damage	30% Damage	50% Damage
Residential	9,792	$4,811,813,630	$481,181,363	$1,443,544,089	$2,405,906,815
Commercial	322	$2,309,864,426	$230,986,443	$692,959,328	$1,154,932,213
Industrial	108	$365,734,419	$36,573,442	$109,720,326	$182,867,209
Agricultural	0	$0	$0	$0	$0
Religion	5	$33,408,645	$3,340,865	$10,022,594	$16,704,323
Government	52	$79,624,825	$7,962,482	$23,887,447	$39,812,412
Education	59	$175,116,040	$17,511,604	$52,534,812	$87,558,020
Total	**10,338**	**$7,775,561,985**	**$777,556,198**	**$2,332,668,595**	**$3,887,780,992**

13.5.3 Critical Facilities and Infrastructure

Critical facilities of wood frame construction are especially vulnerable during wildfire events. A detailed vulnerability analysis for all critical facilities is on file with City staff and will not be published for review due to security reasons.

In the event of wildfire, there would likely be little damage to most infrastructure. Most roads and railroads would be without damage except in the worst scenarios. Power lines are the most at risk from wildfire because most poles are made of wood and susceptible to burning. Fires can create conditions that block or prevent access and can isolate residents and emergency service providers. Wildfire typically does not have a major direct impact on bridges, but it can create conditions in which bridges are obstructed. Many bridges in areas of high to moderate fire risk are important because they provide the only ingress and egress to large areas and in some cases to isolated neighborhoods.

13.6 FUTURE TRENDS IN DEVELOPMENT

Roseville is expected to grow considerably in the next 10 years. The moderate potential for wildfire in Roseville is not likely to lessen or prohibit development in Roseville.

The wildfire risk exposure with in the planning area increased by 54% at an increase in value of over $3 billion dollars. This increase in risk exposure can be attributed to the vast extent and location of the moderate fire severity zone within Roseville, and a population growth rate of 14.5% over the performance period of the prior plan. The planning area also saw in increase in assessed valuation of real property of over 34%. This increase in value can be attributed to the continued economic recovery from the 2008 economic down turn that had a significant impact on the State of California as well as the City of Roseville. Any increase in asset value will increase risk quotient when risk is being measured by looking at assets exposed as is with this Plan. However, the vulnerability of this new exposure should be considered to be low due to the application of strong building code standards that are contained within the California Fire Code.

13.7 REVIEW OF EXISTING PROGRAMS, PLANS AND ORDINANCES

The City of Roseville and Roseville Fire Department have adopted a number of policies, programs, plans and ordinances to meet the following fire protection goals detailed in the Roseville General Plan:

- Protect against the loss of life, property, and the environment by appropriate prevention and suppression measures.
- Provide emergency services in a well-planned, cost-effective, and professional manner through the best use of equipment, facilities and training available.

13.7.1 Fire Prevention Programs and Standards

Roseville Fire Prevention

Roseville fire prevention includes the fire marshal, hazardous materials officer, two senior fire inspectors, four fire inspectors and one public safety community relations coordinator (shared with the Police Department). The key role of these staff members is improving the safety and quality of life of the citizens of Roseville.

The Roseville Fire Department has an extensive work program to promote and implement fire prevention in developed and undeveloped areas of the City. These programs promote or provide the following services:

- Regular inspection and code enforcement
- Fire-safe roofing requirements
- Adequate access to and fire breaks adjoining open space areas
- Early warning devices such as automatic detection and reporting devices and smoke detectors
- Automatic fire suppression systems such as fire sprinkler systems
- Public education and information
- Code and ordinance development and updates
- Training and planning
- Fire investigation and data analysis
- Hazardous materials process and inspection.

Development Review Process

Section 16.16.050 of the Roseville Municipal Code specifies that all development plans be reviewed and approved by the Roseville Fire Department prior to construction. The code section states the following:

> "…complete plans, specifications, and information for new construction, remodeling, tenant improvements, or additions to buildings shall be submitted for review and approval prior to construction to the Chief or his/her designated representative having jurisdiction. Plan approval shall be required prior to the issuance of a Fire Department Inspection Record Card for those instances where such card may be

> required. In addition to the submittal of hard copy plan sets, a digitized copy of the approved drawings for new buildings shall be submitted to the Fire Department for pre-fire documentation purposes. Said copy shall be submitted in an approved format."

The Roseville Fire Department is an integral part of the development planning and review process, with specific emphasis on the provision of access to lands for firefighting purposes, street access to all structures, fire prevention programs, and the enforcement of building and fire codes and City ordinances. The Fire Department also evaluates water supply for firefighting and fire suppression systems.

California Building Code

Roseville Municipal Code Title 16 has been adopted to enforce the 2013 California Building Code for all construction in the City. Roofing and building materials, construction techniques, wiring standards, and fire detection/warning devices are defined and enforced to minimize the risk of structural fire damage.

California Fire Code

Chapter 16.16 of the Roseville Municipal Code includes adoption of, reference to and amendments to the Uniform Fire Code. Last amended in 2013, the code provides specifications and standards for fire safety. Early warning devices such as automatic sprinkler systems, automatic detection and reporting devices, and smoke detectors are required as preventative measures to reduce the risk of fire. The code also states the amount of water needed for fire protection.

Weed Abatement Ordinance

Chapter 9.20 of the Roseville Municipal Code includes provisions for the abatement of weeds, dirt, rubbish, and rank growths. The ordinance specifies that weeds be eradicated by property owners to prevent the presence of fire fuels. Properly implemented, the ordinance ensures accessibility of firefighters to open space areas and creation of firebreaks that slow the spread of fire.

13.7.2 Adopted Service Levels for Response Time

Specific Plans

Roseville's specific plan process is used by the Fire Department to plan future fire station locations and response times based on the circulation systems, and to ensure that revenues from the Fire Service Construction Tax and General Fund are sufficient to provide fire protection services to the area and cumulatively city-wide. The Fire Department is involved in every specific plan process from the initial planning process to adoption, construction, and ongoing inspections.

Should there be significant fire-related concerns, the Fire Department may require supplemental analysis as a condition of the specific plan. For example, a mitigation measure for adoption of the Stoneridge Specific Plan required the preparation of the Stoneridge Plan Wildfire Safety Plan. The Safety Plan analyzes the factors contributing to the risk of wildfire in Stoneridge and mitigation measures to enhance fire prevention.

Capital Improvement Program

The Capital Improvement Program is a five-year plan updated annually with the City's fiscal year budget that includes all public projects under construction and planned within the five-year time frame. The Capital Improvement Program allocates funds from each of the revenue sources collected to pay for City facilities, services, and programs. Fire Department stations and apparatus are included in the Capital Improvement Program along with the status of the Fire Service Construction Tax current and projected revenues to ensure that fire stations are built and apparatus is procured to keep pace with development.

Fire Service Construction Tax

The Fire Service Construction Tax, approved by Roseville voters in 1984, requires that 1/2 percent of the value of any new construction be collected as part of the building permit fee and designated for fire suppression and protection. The funds must be spent on capital improvements such as fire stations, fire apparatus, and other Fire Department equipment. The funds may not be allocated to expenses such as salaries or training. The City's newer Specific Plan Areas include provisions that extend this tax collection to the buildout of each Plan Area.

Dedications, Fees, and Exactions

The City of Roseville, through the specific plan process, and if necessary as part of individual project approvals, requires the dedication of property and payment of fees or exactions. The Fire Department reviews the project proposals and may require dedication of land or payment of appropriate fees and exactions to help offset municipal costs for fire-related facilities and services. The City of Roseville requires the dedication of fire station sites through the specific plan process. Should revenues be deemed insufficient to fully support fire services, additional assessments may be required to ensure adequate protection in the future. For example, recent specific plans through development agreements require owners to pay a special assessment for public safety, including fire protection, as part of their annual property tax bills.

Water System Master Plan

The City of Roseville Environmental Utilities Department maintains and updates a distribution system model to ensure adequate water sources, quantities and water pressure, along with emergency backup systems to ensure maximum firefighting capacity.

Interagency Agreements

The City of Roseville Fire Department participates in the statewide mutual aid agreement, whereby the Fire Department will respond to any other department or district should the need arise. In addition, the Department maintains mutual aid agreements with other agencies, including agreements through Cal OES Mutual Aid Region IV and the Placer County Operational Area.

13.7.3 Annual Monitoring of Fire Department Service Levels

Program Performance Measures

The Roseville Fire Department compiles program performance measures as part of the City's annual budget to monitor service levels and address deficiencies before they become serious. The annual evaluation includes establishment of goals and objectives, formulation of key indicators relating to activities, and efficiencies that can be monitored throughout the year, along with a line item cost for the programs and objectives. The Fire Department budget and program performance measures include a review of fire service levels and department goals.

National Fire Incident Reporting System

The National Fire Incident Reporting System requires local fire departments to report fire service data. Performance indicators are routinely reviewed to evaluate capability and coverage, demand for service and trends. Key components of the system include GIS and mapping, fire incident reporting, emergency medical management, personnel and training management, inspection management, and equipment and supplies inventory management. Fire Department incident data are input into a computer database and submitted to the State Fire Marshal's Office per state standards. The data are also used by the City of Roseville to evaluate operations and track trends in fire service within the City.

13.7.4 Personnel Training

The Roseville Fire Department Training program includes dedicated staff and facilities to ensure that personnel are properly trained and updated as new techniques and equipment become available. The Fire Training staff provides training for all firefighters within the department at the City's state of the art training center (Figure 13-5). This training is the most important ingredient to the readiness of Roseville firefighters and emergency responders to fulfill their assigned mission. The Training Center is also used by other fire departments and local agencies on a fee-for-use basis. The training staff consists of one fire training officer.



Figure 13-5. City of Roseville Fire Training Center

13.7.5 Fire Investigation

Fires in the City of Roseville are investigated by Roseville Fire Department investigators. The program ensures proper investigation of the cause, origin, and circumstances of each fire; collects and preserves evidence; coordinates with authorities in detection, apprehension and prosecution of arsonists; and pursues each investigation to conclusion. Information is reported to the State Fire Marshal for inclusion in annual state reports.

13.7.6 Comprehensive Emergency Medical Services

The state requires a Multi-Hazard Function Plan that details response strategies for all types of emergencies. The plan addresses interagency cooperation, emergency functions, continuity of government, and public awareness. In addition, the plan provides for the operation of police, fire and health services, as well as transportation alternatives in the event of a multi-hazard emergency. The City's Emergency Plan conforms with the Standardized Emergency Management System and is approved by the City Council and Cal OES.

13.7.7 Accreditation Recommendation

The Commission on Fire Accreditation International provides a comprehensive system of fire and emergency service evaluation that helps local governments determine their risks and fire safety needs, evaluate the performance of the organizations involved and provide a method for continuous improvement. The self-assessment process covers 10 categories: governance and administration; assessment and planning; goals and objectives; financial resources; programs; physical resources; human resources; training and competency; essential resources; and external systems relations. Within these categories are several related performance indicators and core competencies that the agency must address. In completing the self-assessment process, agencies must develop a strategic or master plan as well as a standard of response coverage document.

The Roseville Fire Department staff spent more than four years on the self-assessment and preparing the materials for the accreditation. In June 2005 the Commission on Fire Accreditation International recommended accreditation for the Roseville Fire Department. Reaccreditation was obtained in 2010. Only 220 departments in the world are accredited, and only 16 in California.

13.8 SCENARIO

As the future growth of Roseville expands into wildland-urban interface areas, a wildfire in Roseville has the potential to cause significant damage to exposed areas. A major wildfire might begin with a wet spring, adding to fuels already present on the forest floor. Flashy fuels would build throughout the spring. The summer could see the onset of insect infestation. A dry summer could follow the wet spring, exacerbated by dry hot winds. Carelessness with combustible materials or a tossed lit cigarette, or a lighting storm could trigger a multitude of small isolated fires.

The embers from these smaller fires could be carried miles by hot, dry winds. The deposition zone for these embers would be deep in the forests and wildland-urban interface zones. Fires that start in flat areas move more slowly, but wind still pushes them. It is not unusual for a wild fire pushed by wind to burn the ground fuel and later climb into the crown and reverse its track. This is one of many ways that fires can escape containment, typically during periods when response capabilities are overwhelmed. These new small fires would likely merge. Suppression resources would be redirected from protecting the natural resources to saving remote subdivisions.

The worst-case scenario would include an active fire season throughout the American west, spreading resources thin. Firefighting teams would be exhausted or unavailable. Many federal assets would be responding to other fires that started earlier in the season. While local fire districts would be useful in the wildland-urban interface areas, they have limited wildfire capabilities or experience, and they would have a difficult time responding to the ignition zones. Even though the existence and spread of the fire is known, it may not be possible to respond to it adequately, so an initially manageable fire can become out of control before resources are dispatched.

To further complicate the problem, heavy rains could follow, causing flooding and landslides and releasing tons of sediment into rivers, permanently changing floodplains and damaging sensitive habitat and riparian areas. Such a fire followed by rain could release millions of cubic yards of sediment into streams for years, creating new floodplains and changing existing ones. With forests removed from the watershed, stream flows could double.

Floods that had been expected every 50 years may occur every couple of years. With streambeds unable to carry the increased discharge because of increased sediment, floodplain elevations would increase.

13.9 ISSUES

The major issues for wildfire are as follows:

- Public education and outreach to people living in or near the fire hazard zones should include information about and assistance with mitigation activities such as defensible space, and advance identification of evacuation routes and safe zones.
- Wildfires could cause landslides as a secondary natural hazard.
- Climate change could affect the wildfire hazard.
- Future growth into wildland-urban interface areas should continue to be managed.
- The Fire Department needs to continue to train on wildland-urban interface type events.
- Expand the City's vegetation management activities. This would include enhancement through expansion of the target areas as well as additional resources.
- Expand certifications and qualifications for Fire Department personnel. Ensure that all firefighters are trained in basic wildfire behavior, basic fire weather, and that all company officer and chief level officers are trained in the wildland command and strike team leader level.

14. HUMAN HEALTH HAZARDS

14.1 GENERAL BACKGROUND

Human health hazards include transmittable diseases and environmental hazards such as extreme weather. The following sections describe commonly recognized human health hazards.

14.1.1 Influenza

Influenza, commonly called flu, is a viral infection that attacks the respiratory system. Epidemics of the flu typically occur in the fall and winter. The U.S. Centers for Disease Control and Prevention (CDC) estimates that the 2014-2015 flu season for California was moderately severe, with high levels of outpatient illness and influenza-associated hospitalizations, particularly among adults 65 and older. The California Department of Public Health received 42,812 reports of cases tested positive for influenza.

Laboratory-confirmed influenza-associated deaths among patients under 65 have been reportable in California since the 2009 influenza pandemic. For the 2014-2015 flu season, there were 78 fatal cases of influenza-related illness statewide among those under 65. This number is significantly down from the 404 fatal cases during the 2013-2014 influenza season.

H1N1

In April 2009, the World Health Organization (WHO) issued a health advisory on an outbreak of influenza-like illness caused by a new subtype of influenza A (A/H1N1) in Mexico and the United States.

The disease spread rapidly, with the number of confirmed cases rising to 2,099 by May 7, despite aggressive measures taken against the disease by the Mexican government. On June 11, the WHO declared an H1N1 pandemic, marking the first global pandemic since the 1968 Hong Kong flu. On October 25, the U.S. declared H1N1 a national emergency. On August 10,

DEFINITIONS

Anthrax—A disease caused by the bacteria *Bacillus anthracis*. Most forms of the disease are lethal, and it affects both humans and other animals. There are effective vaccines against anthrax, and some forms of the disease respond well to antibiotic treatment.

Epidemic—The spread of an infectious disease beyond a local population, reaching people in a wider geographical area. Several factors determine whether an outbreak will become an epidemic: the ease with which the disease spreads from vectors, such as animals, to people and the ease with which it spreads from person to person.

Influenza—A viral infection that attacks the respiratory system; commonly called flu.

H1N1 "Swine Flu"—A subtype of the Influenza A virus that has mutated into various strains including the Spanish Flu strain, mild human flu strains, endemic pig strains, and various strains found in birds.

H5N1/H7N9 "Bird Flu"—A subtype of the Influenza A virus that causes the flu commonly known as "avian influenza" or "bird flu.

Pandemic—A worldwide epidemic.

Vector—An organism (such as an insect or rodent) that transmits pathogens that cause disease

Vector-Borne Illness—Diseases transmitted to people from insects and other animals. These include, but are not limited to, Hanta Virus, Plague, Tularemia, Lyme Disease, West Nile Virus and the Zika Virus.

Viral Hemorrhagic Fever (VHF)-—A group of illnesses caused by a viral infection (usually restricted to a specific geographic area) resulting in fever and gastrointestinal symptoms followed by capillary hemorrhage. These include, but are not limited to, Ebola, Dengue Fever and Yellow Fever.

Severe Acute Respiratory Syndrome (SARS)-—An infectious respiratory illness characterized by fever, dry cough, and breathing difficulties, often accompanied by headache and body aches; believed to be caused by a coronavirus.

Smallpox—An infection caused by the variola virus, a member of the poxvirus family. Throughout history, smallpox has been responsible for epidemics that resulted in large numbers of deaths. The last outbreak was in 1977. The disease was declared eradicated in 1980.

2010, the WHO International Health Regulations Emergency Committee declared an end to the 2009 H1N1 pandemic globally.

H1N1 viruses and seasonal influenza viruses are co-circulating in many parts of the world. It is likely that the 2009 H1N1 virus will continue to spread for years to come, like a regular seasonal influenza virus.

H5N1/H7N9

The highly pathogenic H5N1avian influenza virus is an influenza A subtype that occurs mainly in birds, causing high mortality among birds and domestic poultry. Outbreaks of highly pathogenic H5N1 among poultry and wild birds are ongoing in a number of countries.

H5N1 virus infections of humans are rare and most cases have been associated with direct poultry contact during poultry outbreaks. Rare cases of limited human-to-human spread of H5N1 virus may have occurred, but there is no evidence of sustained human-to-human transmission. Nonetheless, because all influenza viruses have the ability to change and mutate, scientists are concerned that H5N1 viruses one day could be able to infect humans more easily and spread more easily from one person to another, potentially causing another pandemic.

While the H5N1 virus does not now infect people easily, infection in humans is much more serious when it occurs than is infection with H1N1. More than half of people reported infected with H5N1 have died. Figure 14-1 summarizes human cases of the virus through 2013.

Source: World Health Organization

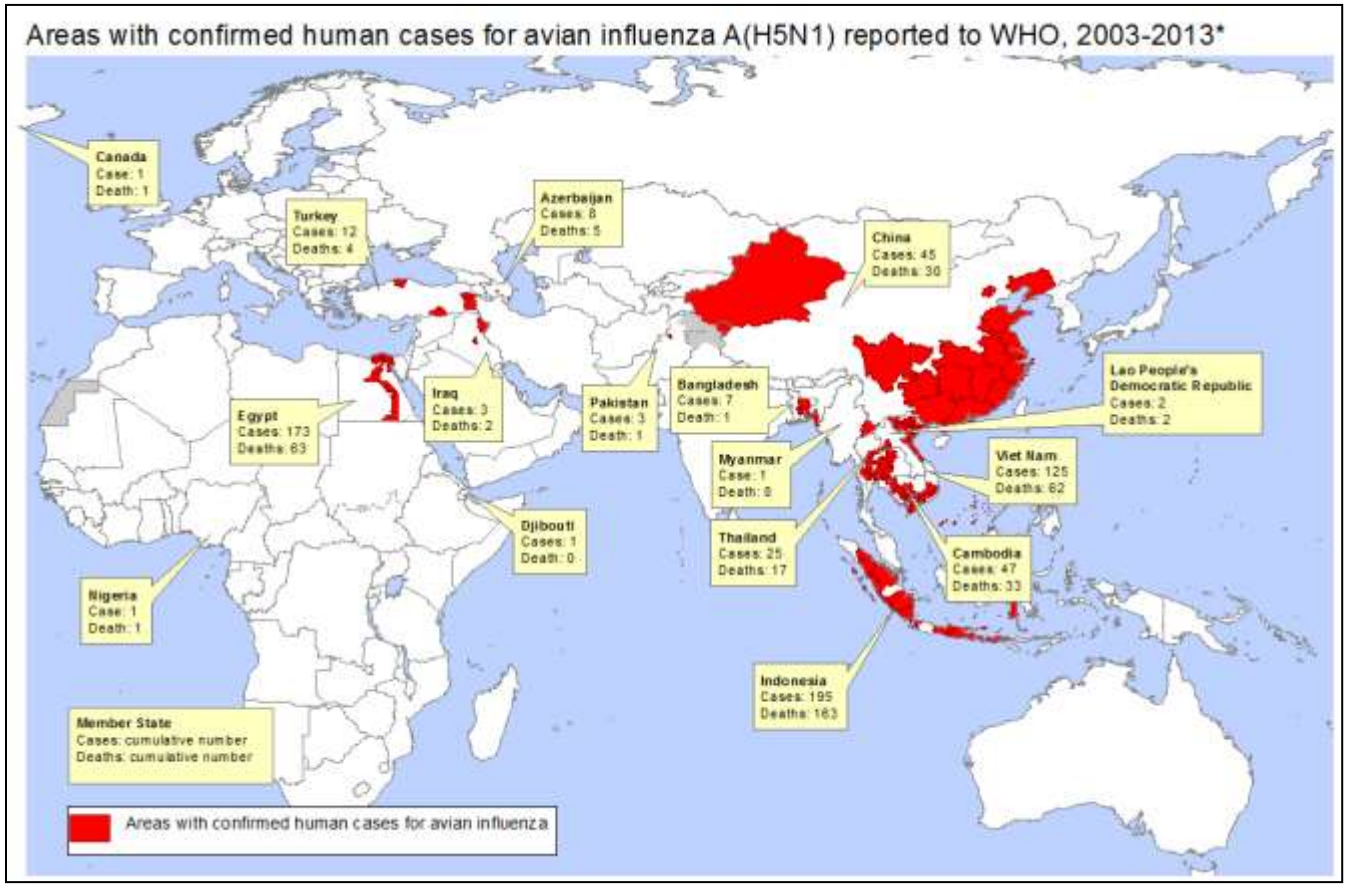


Figure 14-1. Areas with Confirmed H5N1 2003-2013

Infections in humans and poultry by a new avian influenza A virus (H7N9) continue to be reported in China. While mild illness in human cases has been seen, most patients have had severe respiratory illness and some have died. The only case identified outside of China was recently reported in Malaysia.

Source investigation by Chinese authorities is ongoing. Many of the people infected with H7N9 are reported to have had contact with poultry. However some cases reportedly have not had such contact. Close contacts of confirmed H7N9 patients are being followed to determine whether any human-to-human spread of H7N9 is occurring. No sustained person-to-person spread of the H7N9 virus has been found at this time. However, based on previous experience with avian flu viruses, some limited human-to-human spread of this the virus would not be surprising.

As of the publication of this document, H5N1 and the new H7N9 virus have not been detected in people or birds in the United States

14.1.2 Smallpox

Smallpox is a sometimes fatal infectious disease. There is no specific treatment, and the only prevention is vaccination. Symptoms include raised bumps on the face and body of an infected person. The oldest evidence of smallpox was found on the body of Pharaoh Ramses V of Egypt who died in 1157 BC.

Outbreaks have occurred from time to time for thousands of years, but the disease is now eradicated after a successful worldwide vaccination program. The last case of smallpox in the United States was in 1949. The last naturally occurring case in the world was in Somalia in 1977. As of the publication of this document, there are no cases of smallpox in the world. Currently only two locations in the world have samples of smallpox: the CDC in Atlanta and the Ivanovsky Institute of Virology in Russia.

After the disease was eliminated, routine vaccination among the general public was stopped. Therefore, any cases of smallpox in the world would be considered an immediate international emergency. In 2003, the Wisconsin Division of Public Health conducted an investigation of state residents who became ill after having contact with prairie dogs. The cases appeared in May and June of 2003, and symptoms in the human cases included fever, cough, pox-like rash and swollen lymph nodes. CDC laboratory test results indicated that the cause of the human illness was Monkeypox, an orthopox virus that could be transmitted by prairie dogs. This outbreak, and the potential use of smallpox as a weapon of bioterrorism, brought the fear of smallpox back to the forefront of the population. A detailed nationwide smallpox response plan created at the end of 2002 is designed to quickly contain a potential outbreak and vaccinate the population.

14.1.3 Viral Hemorrhagic Fevers

Viral hemorrhagic fevers (VHFs) are a group of illnesses caused by several distinct families of viruses. VHF describes a multisystem syndrome (multiple systems in the body are affected). Characteristically, the overall vascular system is damaged and the body's ability to regulate itself is impaired. These symptoms are often accompanied by hemorrhage (bleeding); however, the bleeding itself is rarely life-threatening. While some types of hemorrhagic fever viruses can cause relatively mild illnesses, many cause severe, life-threatening disease.

The viruses that cause VHFs are distributed over much of the globe. However, because each virus is associated with one or more particular host species, the virus and the disease it causes are usually seen only where the host species live. Some hosts, such as the rodent species carrying several of the New World arenaviruses, live in geographically restricted areas. Therefore, the risk of getting VHFs caused by these viruses is restricted to those areas. Other hosts range over continents, such as the rodents that carry viruses that cause the hantavirus pulmonary syndrome in North and South America, or the rodents that carry viruses that cause hemorrhagic fever with renal syndrome in Europe and Asia.

Ebola

The 2014 Ebola virus outbreak was unprecedented in geographical reach and impact on health care systems across the globe. This was the largest and deadliest Ebola virus outbreak ever recorded. It was the first time the West African countries of Guinea, Liberia, Sierra Leone, Nigeria, Mali, and Senegal saw the virus. Ebola is more common in Central African countries, such as the Democratic Republic of Congo and Sudan, where it was first discovered in 1976. It was also the first time that Ebola made it to the United States and Europe, prompting world-wide preparedness and response efforts. Figure 14-2 shows areas that ultimately were affected. The outbreak was closely monitored and traveler screenings were developed for those returning from West Africa.

Source: World Health Organization

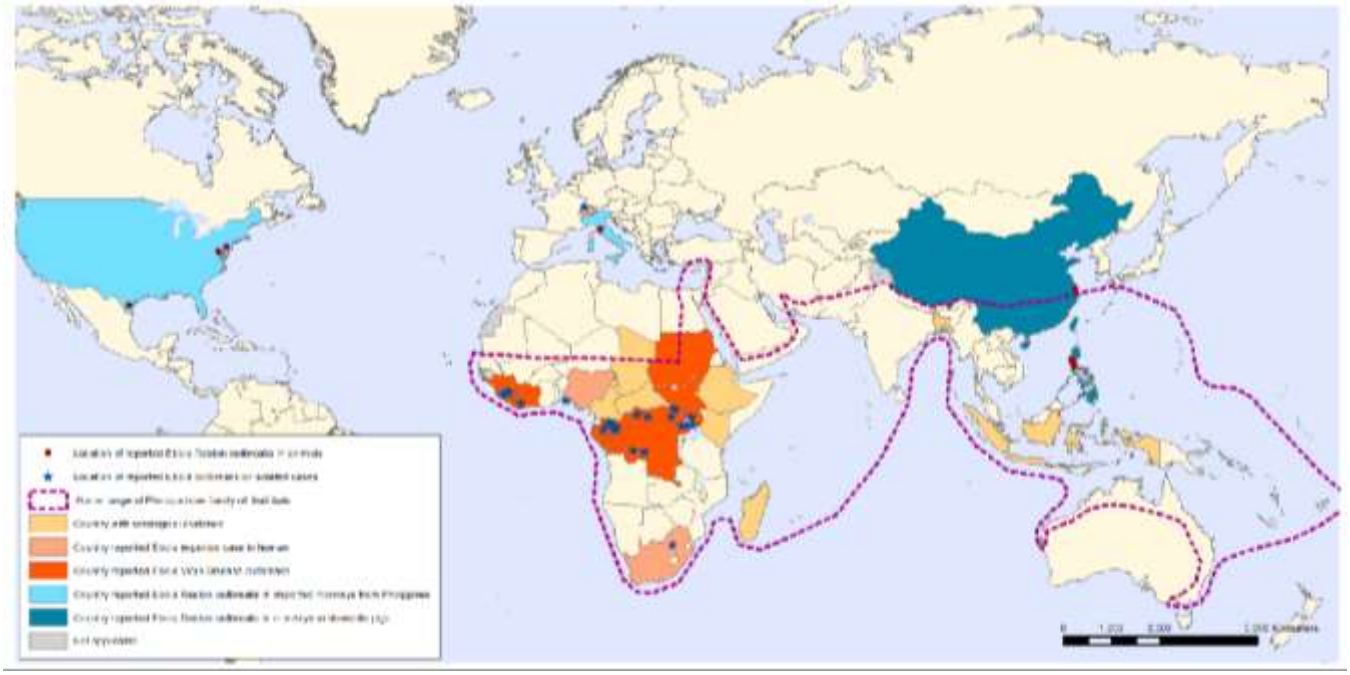


Figure 14-2. 2014 Distribution of Ebola Virus Outbreaks in Humans and Animals

In August 2014 two U.S. healthcare workers returned to the United States for treatment for Ebola. The case that most impacted the health care system in the United States was a patient diagnosed with Ebola in Dallas, Texas who died due to Ebola in October 2014. The nurse who provided care for him later tested positive for Ebola. This caused responses across the country from hospitals, emergency medical teams, fire departments and public health agencies to enhance isolation precautions, develop emergency policies, train with personal protective equipment and conduct multi-agency emergency exercises in case the spread of Ebola became a pandemic.

Before the 2014 outbreak, only 2,200 cases of Ebola had been recorded and 68 percent were fatal. Twenty percent of new Ebola infections were linked to burial traditions in which family and community members wash and touch dead bodies before burial. In Guinea, 60 percent of Ebola infections were linked to traditional burial practices. From 2014 to the publishing of this document, there have been no confirmed cases of Ebola in California.

Hantavirus

Hantavirus is a rodent-borne disease and one of the most important in California. It was discovered in 1993 in the southwestern U.S., and it has determined that the disease had been present, but unrecognized, at least as early as 1959. It has now been identified in over half of the states of the U.S. In 2013, seven cases of Hantavirus occurred in Yosemite National Park. Hantavirus has also been detected in the local Sierra Nevada region.

The hantavirus spreads when individuals touch or eat something contaminated with infected rodent urine, droppings or saliva. It can also be transmitted through aerosolization, which occurs when dried materials contaminated by infected rodent droppings or saliva are disturbed and brought up into the air and inhaled. Infected persons first develop symptoms one to two weeks, and up to five weeks, after exposure. Early symptoms include fever, headache, and muscle aches, especially in the thighs, hips, back, and shoulders. Other early symptoms include dizziness, chills, nausea, vomiting, diarrhea, and abdominal pain. After two to seven days of these symptoms, patients develop breathing difficulties that range from cough and shortness of breath to severe respiratory failure. Approximately 40 percent of hantavirus patients die from the disease.

From 2011 to the publishing of this document there have been 16 cases of hantavirus in California, including one case in Placer County.

14.1.4 Plague

Plague is a potentially fatal infectious disease of animals and humans caused by the *Yersinia pestis* bacterium. People usually get plague from being bitten by a flea that is carrying the plague bacterium or by handling an infected animal. Today, modern antibiotics are effective against plague, but if an infected person is not treated promptly, the disease is likely to cause illness or death.

Plague is an ancient disease but outbreaks throughout the world continue. Major plague epidemics occurred in the middle of the sixth century in Egypt, Europe and Asia; during the 14th century in Europe, following caravan routes; in the 18th century in Austria and the Balkans; and in the late 19th century worldwide (but mostly in China and India). Manchuria in 1910–1911 witnessed about 60,000 deaths due to pneumonic plague with a repeat in 1920–1921. A minor outbreak occurred as recently as the summer of 1994 in Surat, India, closely following an earthquake in September 1993. Globally, the WHO reports 1,000 to 3,000 cases of plague every year. Monitoring of mammals routinely occurs in California to mitigate potential plague (see Figure 14-3).

In North America, plague is found in certain animals and their fleas from the Pacific Coast to the Great Plains, and from southwestern Canada to Mexico. The last urban plague epidemic in the United States occurred in Los Angeles in 1924-25. Since then, human plague in the U.S. has occurred as mostly scattered cases in rural areas (an average of 10 to 15 persons each year per the CDC). Most human cases in the United States occur in northern New Mexico, northern Arizona, southern Colorado, California, southern Oregon, and far western Nevada.

From 2011 to the publishing of this document, there has been one case of plague in California, which occurred in Yosemite National Park.

14.1.5 Tick-Borne Disease

Ticks are small, insect-like creatures most often found in naturally vegetated areas. They feed by attaching to animals and humans, sticking their mouthparts into the skin, and sucking blood for up to several days. Ticks do not fall from trees, jump or fly. Most species are found on wild grasses and low plants. Adult ticks wait at the ends of grass or other foliage for a host to brush by so they may attach. Sometimes ticks carry bacteria or viruses that can be transmitted to a person while the tick is attached and feeding. There are 47 species of ticks in California, but only eight are known to commonly bite humans:

- Western blacklegged tick (*Ixodes pacificus*)
- American dog tick (*Dermacentor variabilis*)
- Pacific Coast tick (*Dermacentor occidentalis*)
- Wood tick (*Dermacentor andersoni*)
- Brown dog tick (*Rhipicephalus sanguineus*)
- *Ornithodoros hermsi*
- *Ornithodoros parkeri*
- *Ornithodoros coriaceus.*

Source: California Department of Public Health

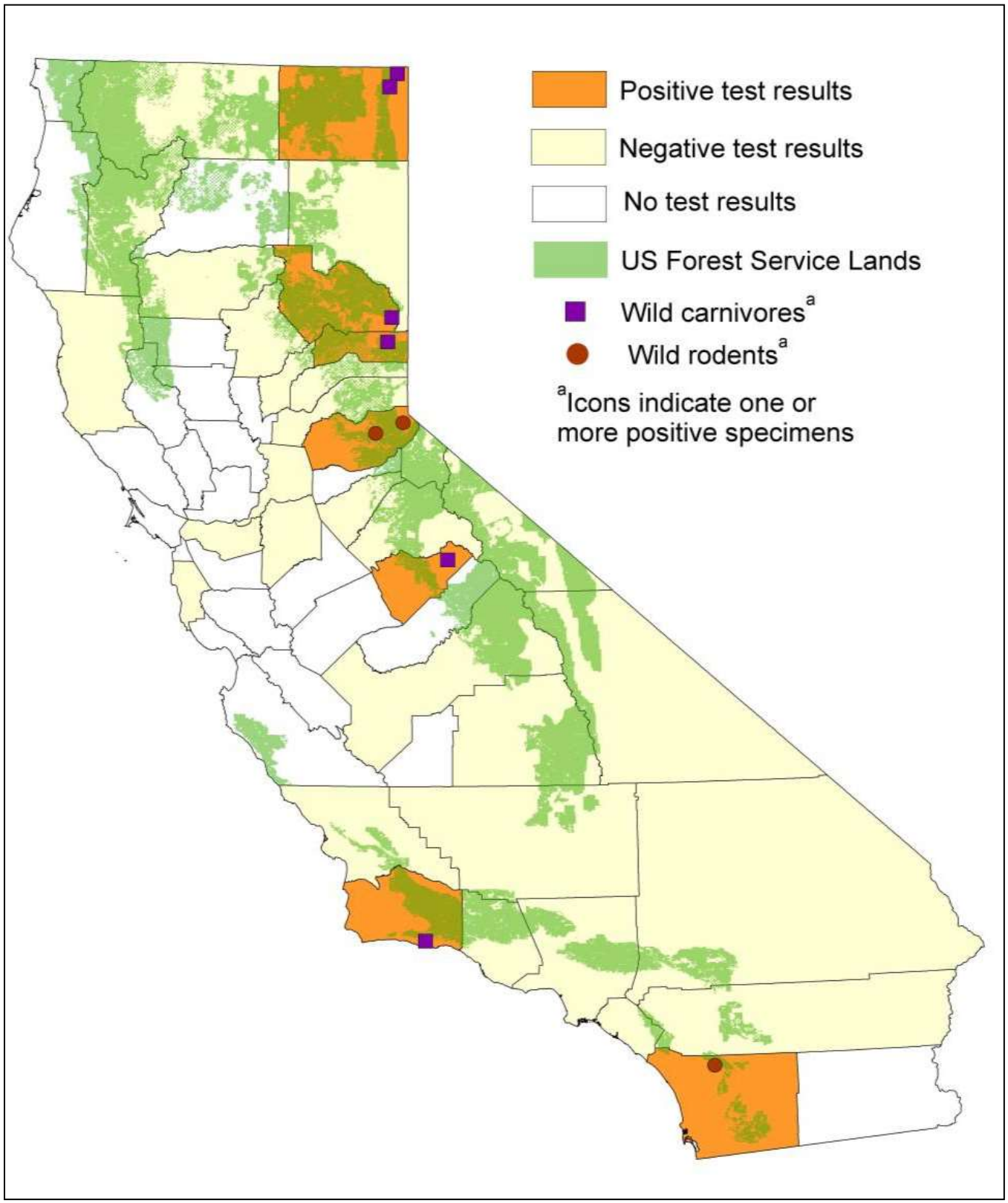


Figure 14-3. California 2014 *Yersinia Pestis* Results in Tested Mammals by County

Tularemia

Tularemia, named after Tulare County in California where it was first described in 1911, is a tick-borne disease of animals and humans caused by the bacterium *Francisella tularensis*. Tularemia is similar to plague, but is typically spread differently. While plague is usually spread to humans by fleas, humans usually become infected with Tularemia by tick and deer fly bites, skin contact with infected animals, ingestion of contaminated water or meat, or inhalation of contaminated dusts or aerosols. Symptoms vary depending upon the route of infection.

Rabbits, hares, and rodents are especially susceptible and often die in large numbers during outbreaks. Although Tularemia can be life-threatening, most infections can be treated successfully with antibiotics. Steps to prevent Tularemia include use of insect repellent, wearing gloves when handling sick or dead animals, and not mowing over dead animals. In the United States, naturally occurring infections have been reported from all states except Hawaii. From 2011to the publishing of this document there have been 11 cases of Tularemia in California.

Lyme Disease

Lyme disease, named after the city in Connecticut where it was first identified in 1975, is a tick-borne disease caused by the bacterium *Borrelia burgdorferi*, which normally lives in mice, squirrels and other small animals. It is transmitted among these animals and to humans through the bites of certain species of ticks. In the northeastern and north-central United States, the black-legged tick (or deer tick, *Ixodes scapularis*) transmits Lyme disease. In the Pacific coastal United States, the disease is spread by the western black-legged tick (*Ixodes pacificus*). Other major tick species found in the United States have not been shown to transmit the disease.

Typical symptoms include fever, headache, fatigue, and a skin rash. If left untreated, infection can spread to joints, the heart, and the nervous system. Lyme disease is diagnosed based on symptoms, physical findings (e.g., rash), and the possibility of exposure to infected ticks. Laboratory testing is helpful in later stages of the disease. Most cases of Lyme disease can be treated successfully with a few weeks of antibiotics. Steps to prevent Lyme disease include using insect repellent, removing ticks promptly, landscaping, and integrated pest management. The ticks that transmit Lyme disease can occasionally transmit other tick-borne diseases as well. From 2011 to the publishing of this document, there have been 458 cases of Lyme disease in California.

Rocky Mountain Spotted Fever

Rocky Mountain spotted fever is a potentially fatal tick-borne disease caused by the bacterium *Rickettsia rickettsii*. It is transmitted to humans by the bite of an infected American dog tick (*Dermacentor variabilis*), Rocky Mountain wood tick (*Dermacentor andersoni*), or brown dog tick (*Rhipicephalus sanguineus)*.

Typical symptoms include fever, headache, abdominal pain, vomiting, and muscle pain. A rash may also develop, but is often absent in the first few days, and in some patients, never develops. Rocky Mountain spotted fever can be a severe or even fatal illness if not treated in the first few days of symptoms. It can be treated successfully with a few weeks of antibiotics. Steps to prevent the disease include using insect repellent, removing ticks promptly, landscaping, and integrated pest management. The ticks that transmit Rocky Mountain spotted fever can occasionally transmit other tick-borne diseases as well. From 2011to the publishing of this document there have been 44 cases of Rocky Mountain spotted fever in California.

14.1.6 Mosquito-Borne Disease

Many of the 48 species of mosquitoes in California can carry disease. The City of Roseville actively supports the Placer County public outreach campaign and task force about the potential for mosquito-borne disease.

Malaria

Malaria is a sometimes fatal mosquito-borne disease caused by a parasite that commonly infects the *Anopheles* mosquito, which feeds on humans. People who contract malaria are typically very sick with high fevers, chills, and flu-like illness. Although malaria can be fatal, illness and death can usually be prevented.

On average 1,500 cases of malaria are diagnosed in the United States each year. The vast majority are in travelers and immigrants returning from countries where malaria transmission occurs, many from sub-Saharan Africa and South Asia. Although rare, cases of malaria have been reported in California. In many temperate areas, such as western Europe and the United States, economic development and public health measures have succeeded in eliminating malaria. However, most of these areas have *Anopheles* mosquitoes that can transmit malaria, and reintroduction of the disease is a constant risk.

Individuals in areas with malaria need to reduce their likelihood of being bitten by mosquitoes. Screens on windows and doors should be examined to confirm that they are in good repair. Repellents containing 20 to 30 percent DEET should be applied to exposed skin and clothing to keep mosquitoes from biting. From 2011to the publishing of this document there have been 44 cases of malaria in California.

West Nile Virus

West Nile virus (WNV) is a potentially serious mosquito-borne that may affect residents in the planning area. Experts believe WNV is established as a seasonal epidemic in North America that flares up in the summer and continues into the fall. WNV is a recent disease to affect California. Mosquitoes transmit the virus to birds, livestock and humans. As of January 2016, human-infection cases of the virus had been reported in all states of the continental U.S. except West Virginia, New Hampshire and Vermont, and those states had reported non-human infections. The Placer County West Nile Virus Task Force has had a strong and active role in the community since WNV arrived in 2004.

According to the CDC, approximately 80 percent of people who are infected with WNV will show no symptoms. Up to 20 percent have symptoms such as fever, headache, and body aches, nausea, vomiting, and sometimes swollen lymph glands or a skin rash on the chest, stomach and back. Symptoms can last for as short as a few days, though even healthy people have become sick for several weeks. About 1 percent of people infected with WNV will develop severe illness, with symptoms that can include high fever, headache, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, vision loss, numbness and paralysis. These symptoms may last several weeks, and neurological effects may become permanent. There is no specific treatment for WNV infection. In more severe cases, people may need to go to the hospital where they can receive supportive treatment including intravenous fluids, help with breathing and nursing care.

Individuals in areas with WNV need to reduce their likelihood of being bitten by mosquitoes. Screens on windows and doors should be examined to confirm that they are in good repair. Repellents containing 20 to 30 percent DEET should be applied to exposed skin and clothing to keep mosquitoes from biting.

From 2011 to the publishing of this document there have been 2,811 cases of WNV in California. Of those, 36 were from Placer County. Between 2005 and 2015, there were 5,205 cases of WNV in California, and Placer County had 82 cases, an average of 7.45 cases per year. Due to proactive mitigation of the hazard with mosquito abatement and education efforts, the number of confirmed cases has trended down. The first year the tracking began, there were 35 human cases of WNV in Placer County. In 2015, there were none. The agricultural nature of Placer County, with the potential for standing water to be present throughout the County, continues to put the planning area at risk from WNV and other mosquito-borne illnesses.

Dengue Fever

Dengue is a mosquito-borne disease caused by any of four closely related dengue viruses (DENV-1, DENV-2, DENV-3 and DENV-4). People get dengue from the bite of an infected mosquito. The mosquito becomes infected when it bites a person who has dengue virus in their blood. It takes a week or more for the dengue virus to replicate in the mosquito; then the mosquito can transmit the virus to another person when it bites. Dengue is transmitted by yellow fever mosquito (*Aedes aegypti)* and the Asian tiger mosquito *(Aedes albopictus)*. These mosquitoes are not native to California, but infestations have been reported in multiple counties in California. Dengue virus cannot be transmitted from person to person.

The main symptoms of dengue are high fever, severe headache, severe pain behind the eyes, joint pain, muscle and bone pain, rash, bruising, and sometimes mild bleeding from the nose or mouth. Generally, younger children and those with their first dengue infection have a milder illness than older children and adults. Severe dengue typically begins with signs and symptoms similar to dengue. Rather than recover, severe dengue patients proceed to experience more bleeding, severe pain in the abdomen, respiratory distress, and fluid accumulation in the abdomen and around the lungs as the smallest blood vessels (capillaries) begin to leak. If not treated, severe dengue can result in death. There is no specific treatment for dengue infection. Rest and fluids are generally sufficient for persons with dengue. Severe dengue may require hospitalization and intensive medical care.

Individuals in areas with dengue need to reduce their likelihood of being bitten by mosquitoes. Screens on windows and doors should be examined to confirm that they are in good repair. Repellents containing 20 to 30 percent DEET should be applied to exposed skin and clothing to keep mosquitoes from biting. From 2011 to the publishing of this document there have been 483 cases of dengue fever in California, with three of the cases in Placer County.

Zika Virus

Zika is a mosquito-borne disease. The most common symptoms of Zika are fever, rash, joint pain, and conjunctivitis (red eyes). The illness is usually mild, with symptoms lasting for several days to a week after being bitten by an infected mosquito. People usually do not get sick enough to go to the hospital, and they rarely die of Zika. For this reason, many people might not realize they have been infected. However, Zika virus infection during pregnancy can cause a serious birth defect called microcephaly, as well as other severe fetal brain defects. Once a person has been infected, he or she is likely to be protected from future infections.

Zika virus is transmitted by yellow fever mosquito (*Aedes aegypti)* and the Asian tiger mosquito *(Aedes albopictus)*. These mosquitoes are not native to California, but infestations have been reported in multiple counties in California. An *Aedes* mosquito can only transmit Zika virus after it bites a person who has this virus in their blood. Thus far in California, Zika virus infections have been documented only in people who were infected while traveling outside the United States or through sexual contact with an infected traveler. Zika virus is not spread through casual contact, but can be spread by infected men to their sexual partners. There is a growing association between Zika and microcephaly (abnormally small head and brain) in newborns, as well as Zika and Guillain-Barré Syndrome, a disease affecting the nervous system. Studies are ongoing to further evaluate these associations. From 2015 to the publishing of this document there has been no local mosquito-borne transmission of Zika virus in California.

Chikungunya

Chikungunya (pronounced chik-en-gun-ye) is an infectious mosquito-borne disease with symptoms that typically include fever and severe joint pain. It is caused by the chikungunya virus, which is transmitted by yellow fever mosquito (*Aedes aegypti)* and the Asian tiger mosquito *(Aedes albopictus)*. These mosquitoes are not native to California, but infestations have been reported in multiple counties in California. An *Aedes* mosquito can only transmit chikungunya virus after it bites a person who has this virus in their blood. A person with chikungunya is

not contagious. As of the publication of this document, chikungunya infections have been documented only in persons who were infected while traveling outside the United States.

14.1.7 Anthrax

Anthrax is a disease caused by *Bacillus anthracis*, a bacterium that forms spores (a spore is a cell that is dormant but may come to life with the right conditions). There are three forms of anthrax:

- **Cutaneous**—The first symptom is a small sore that develops into a blister. The blister then develops into a skin ulcer with a black area in the center. The sore, blister and ulcer do not hurt.
- **Gastrointestinal**—The first symptoms are nausea, loss of appetite, bloody diarrhea, and fever, followed by bad stomach pain.
- **Inhalation**—The first symptoms of inhalation anthrax are like cold or flu symptoms and can include a sore throat, mild fever and muscle aches. Later symptoms include cough, chest discomfort, shortness of breath, tiredness and muscle aches.

Anthrax is a naturally occurring illness and isolated cases occur all over the world yearly. Humans can become infected with anthrax by handling products from infected animals or by breathing in anthrax spores from infected animal products (such as wool). People can become infected with gastrointestinal anthrax by eating undercooked meat from infected animals. Anthrax does occur in California, and animals have tested positive; however, there have been no positive human cases of anthrax in California in the last 10 years. Anthrax can be treated successfully with antibiotics.

Anthrax can be used as a weapon, as happened in the United States in 2001, when anthrax was spread through the postal system by sending letters with powder containing anthrax spores. This caused 22 cases of anthrax infection and brought anthrax back into the public eye. From 2011 to the publishing of this document there have no cases of anthrax in California.

14.1.8 Severe Acute Respiratory Syndrome

Severe Acute Respiratory Syndrome (SARS) is a viral respiratory illness caused by a coronavirus (SARS-CoV). SARS was first reported in Asia in February 2003. Over the next few months, the illness spread to more than two dozen countries in North America, South America, Europe, and Asia before the global outbreak was contained. According to the WHO, 8,098 people worldwide became sick with SARS during the 2003 outbreak and 774 died. In the United States, only eight people had laboratory evidence of SARS-CoV infection. All of these people had traveled to parts of the world where SARS was present. SARS did not spread more widely in the United States.

In general, SARS begins with a high fever, headache, an overall feeling of discomfort and body aches. Some people also have mild respiratory symptoms at the outset. About 10 percent to 20 percent of patients have diarrhea. After two to seven days, SARS patients may develop a dry cough. Most patients develop pneumonia.

The main way that SARS seems to spread is by close person-to-person contact. The virus that causes SARS is thought to be transmitted most readily by respiratory droplets produced when an infected person coughs or sneezes. Droplet spread can happen when droplets from the cough or sneeze of an infected person are propelled a short distance (generally up to 3 feet) through the air and deposited on the mucous membranes of the mouth, nose, or eyes of persons nearby. The virus also can spread when a person touches a surface or object contaminated with infectious droplets and then touches his or her mouth, nose, or eyes. It is also possible that the SARS virus might spread more broadly through the air or by other ways that are not now known.

As of May 2005, according to the CDC, there was no remaining sustained SARS transmission anywhere in the world. However, CDC has developed recommendations and guidelines to help public health and healthcare

officials plan for and respond quickly to the reappearance of SARS if it occurs again. Lessons learned from the SARS outbreak helped healthcare facilities and communities successfully plan and respond to the 2009 H1N1 pandemic. The California Health and Safety Code lists SARS among the communicable diseases that must be reported to health authorities. Placer County is authorized to collect records and data, initiate disease control measures, control property and manage persons (including isolation and quarantine) for containment of communicable disease. From 2011 to the publishing of this document there have no cases of SARS in California.

14.1.9 Extreme Weather

From 2006 to 2010, more people in the U.S. died from extreme heat or extreme cold than from hurricanes, tornadoes, floods and earthquakes combined.The western United States is subject to many weather extremes. Severe spring storms can lead to risk of traumatic injuries, mudslides, flooding and property damage. Extreme heat can lead to dehydration and heat-related illness. Severe winter weather can lead to risk of traumatic injuries, hypothermia and icy conditions.

Severe Spring Storms

Thunderstorms cause most of the severe spring weather. Tornados are rare in California but can occur. Since 2011, a total of 44 tornadoes have occurred in California, one of them in Placer County. When these events occur unexpectedly, the risk of injury and death increases. Advance planning can decrease the risks. Citizens should pay close attention to changing weather conditions when there is a severe thunderstorm watch or warning.

Lightning strikes are a danger during thunderstorms. A lightning bolt is 6 to 8 centimeters in diameter, carrying between 10 and 100 million volts in 20 to 50 thousand amps of direct current. The duration is approximately one millisecond. Volts of 2 billion and 500 thousand amps have been measured. A lightning strike can cause death or injury to one or several persons. Long-term injuries from lightning strike can include memory and attention loss, chronic numbness, muscle spasm, stiffness, depression, hearing loss and sleep disturbance. Seventy percent of all lightning injuries and fatalities occur in the afternoon; 85 percent of victims are children and young men (age 10 to 35) engaged in outdoor recreation and work activities. Hikers, campers, backpackers, skiers, fishermen, and hunters are especially vulnerable.

Extreme Heat

California, Nevada and Arizona experience very high temperatures during the summer. Those susceptible to extreme heat may suffer heat-related illnesses:

- **Heat Exhaustion—**Heat exhaustion is a mild form of heat-related illness that can develop after several days of exposure to high temperatures and inadequate or unbalanced replacement of fluids. It is the body's response to an excessive loss of the water and salt contained in sweat. Those most prone to heat exhaustion are elderly people, people with high blood pressure, and people working or exercising in a hot environment.
- **Heat Cramps—**Heat cramps usually affect people who sweat a lot during strenuous activity. This sweating depletes the body's salt and moisture. The low salt level in the muscles may be the cause of heat cramps. Heat cramps may also be a symptom of heat exhaustion.
- **Heat Stroke—**Heat stroke is a severe, dangerous form of heat-related illness. It occurs when the body's temperature rises rapidly, the sweating mechanism fails, and the body is unable to cool down. Body temperature may rise to 106°F or higher within 10 to 15 minutes. Heat stroke can cause death or permanent disability if emergency treatment is not provided. This is a medical emergency.

Heat has caused 9,000 deaths in the United States from 1979 to 2013. Air-conditioning is the number one protective factor against heat-related illness and death. If a home is not air-conditioned, people can reduce their risk for heat-related illness by spending time in public facilities that are air-conditioned.

The California Office of Emergency Services has a comprehensive contingency plan for excessive heat emergencies. The plan describes state operations during heat-related emergencies and provides guidance for state agencies, local government, and non-governmental organizations in the preparation of heat emergency response plans and related activities. Placer County has an emergency contingency plan and participates in the opening of local cooling centers if extreme heat continues for an extended period of time.

Severe Winter Weather

When winter temperatures drop significantly below normal, staying warm and safe can become a challenge. Extremely cold temperatures often accompany a winter storm, which may also cause power failures and icy roads. Staying indoors as much as possible can help reduce the risk of car crashes and falls on the ice, but cold weather also can present hazards indoors. Many homes will be too cold, either due to a power failure or because the heating system is not adequate for the weather. When people must use space heaters and fireplaces to stay warm, the risk of residential fires increases, as well as the risk of carbon monoxide poisoning.

Extreme cold can bring on health emergencies in susceptible people, such as those without shelter or who are stranded, or who live in a home that is poorly insulated or without heat:

- **Hypothermia**—When exposed to cold temperatures, the body begins to lose heat faster than it can be produced. Prolonged exposure to cold will eventually use up the body's stored energy. The result is hypothermia, or abnormally low body temperature. Body temperature that is too low affects the brain, making the victim unable to think clearly or move well. This makes hypothermia particularly dangerous because a person may not know it is happening and will not be able to do anything about it. Warning signs of hypothermia include shivering, exhaustion, confusion, fumbling hands, memory loss, slurred speech, drowsiness, bright red cold skin, and very low energy.
- **Frostbite**—Frostbite is an injury to the body caused by freezing of the tissues. Frostbite causes a loss of feeling and color in affected areas. It most often affects the nose, ears, cheeks, chin, fingers, or toes. Frostbite can permanently damage the body, and severe cases can lead to amputation. The risk of frostbite is increased in people with reduced blood circulation and among people who are not dressed properly for extremely cold temperatures. A victim is often unaware of frostbite until someone else points it out because the frozen tissues are numb. Signs of frostbite may be a white or grayish-yellow skin area, skin that feels unusually firm or waxy and numbness.

Infants and the elderly are particularly at risk to cold temperatures, but anyone can be affected. If extreme winter weather conditions are expected for an extended period, Placer County has an emergency contingency plan to provide shelter and care areas to provide heating centers for those in need. Preventive action is the best defense against having to deal with extreme cold-weather conditions. Preparing homes and cars in advance for winter emergencies, and observing safety precautions during times of extremely cold weather can reduce the risk of weather-related health problems.

14.2 HAZARD PROFILE

The severity of human health hazards is dependent upon the hazard and the population exposed to it. As the population increases, so does the risk of exposure to hazards. The key to reducing the disease hazard is isolation so that the exposed population does not continue to spread the hazard to the uninfected population. For disease and weather-related human health hazards, promoting education and personal preparedness will help to mitigate and reduce the severity of the hazard.

14.2.1 Past Events

Communicable Diseases

The following is a summary of recent disease outbreak events:

- In the United States during the 2009 H1N1 influenza pandemic, there were 59,979,608 confirmed cases of the disease, 270,435 people hospitalized due to the illness and 12,271 deaths. In California, there were 4,134 people hospitalized due to the illness and 596 deaths. In Placer County, there were 45 confirmed cases, with 5 deaths due to the illness. The pandemic was mild compared to the Spanish Flu pandemic of 1918, which caused 100 million deaths worldwide—a total of 3 percent of the world's total population.
- West Nile Virus arrived in Placer County in July 2004. The first case was diagnosed in September 2004. The 56-year old patient was recovering from meningitis in the hospital when the test came back positive for WNV. From 2011 to the publishing of this document there have been 2,811 cases of WNV in California, 36 of them in Placer County
- There were two confirmed cases of SARS in California during the worldwide outbreak in 2002-2003, none of them in Placer County.
- From 2011 to the publishing of this document there have been 458 cases of Lyme disease in California, 4 of them in Placer County.
- From 2011 to the publishing of this document there have been 16 cases of hantavirus in California, including one in Placer County.
- As of the publishing of this document, no cases of tularemia or plague have been reported in Placer County, but cases of these diseases have been reported in California and nearby counties. Even though these hazards may not be endemic to the area, they can be brought into the planning region and are still considered to be a risk.

Extreme Weather

The following is a summary of recent extreme weather events that threatened human health:

- From 2006 to 2010, excessive heat exposure caused 3,332 deaths in the United States.
- In July 2006, California experienced a heat wave impacting the entire state. Coroners attributed 140 deaths to hyperthermia, and it has been estimated from other data that more than 600 heat-related deaths may have occurred over a 17-day period.
- From 2006 to 2010, hypothermia caused 6,660 deaths in the United States.
- From 2006 to 2010, lightning strikes caused 657 deaths in the United States.

14.2.2 Location

It is difficult to map the extent of human-health hazards compared to others, such as floods, wildfires and dam failures. All of the City of Roseville Planning Area is susceptible to the human health hazards discussed in this chapter. While some hazards, such as the West Nile Virus and Lyme disease, can have a geographic presence within the planning area, other diseases can cause exposure to the planning area from outside the local region. Roseville residents who travel can become exposed to diseases while abroad and bring the diseases back with them, potentially placing the region at risk for exposure. Extreme weather poses an equal human health hazard across the City.

14.2.3 Frequency

Communicable Disease

Due to increased air travel, the growing population and the country's aging population, the probability of a communicable disease epidemic or pandemic is a growing threat. Certain human health hazards, such as influenza, can be expected seasonably, with variations on specific strains year to year. Additionally, tick-borne diseases are likely to increase during spring and fall, when people participate in outdoor activities such as hiking. The frequency of other health hazards is difficult to establish and depends largely on the unique circumstances surrounding a localized outbreak and its subsequent expansion into epidemics and eventually pandemics.

Extreme Weather

Trauma due to injuries directly due to storms (such as motor vehicle collisions and falls), heat related illness and hypothermia are a factor of the weather and in some cases a technological hazard.

14.2.4 Severity

The severity of the human health hazard varies from individual to individual. Typically, young children and older adults are more susceptible to acquiring communicable diseases due to developing or diminishing immune systems or experiencing adverse effects to extreme weather conditions. These populations often experience the most severe of symptoms, as their immune systems are not capable of fighting off infection or efficiently regulating temperature. In general, severity varies depending on the pathology of the disease, the health of the infected, and the availability of treatments for alleviating symptoms or curing the disease.

14.3 SECONDARY HAZARDS

Human health hazards are not like natural hazards that have measurable secondary impacts, such as earthquakes, floods or wildfires. The largest secondary impact caused by human health hazards would be economic. Large outbreaks of any human health hazard could reduce the work force significantly, causing businesses and agencies to close or be greatly impacted.

Another secondary impact could be stigmatization. The fear of the human health hazard and fear of the unknown could lead to isolation, violence and self-inflicted injury. Hospitals and health care providers could be overwhelmed with the "worried well" seeking care and comfort. Providing key and critical information can reduce and mitigate this secondary risk.

14.4 EXPOSURE AND VULNERABILITY

14.4.1 Population

All citizens in the Roseville planning area could be susceptible to the human health hazards discussed in this chapter. A large outbreak or epidemic, a pandemic or a use of biological agents as a weapon of mass destruction could have devastating effects on the population of Roseville.

West Nile Virus and other mosquito-borne illnesses are a significant concern in the local wetlands and west of Roseville in the flooded rice fields. A concentrated at-risk population is on the western border of the city limits near the rice fields where the mosquitoes breed.

While all of the population in the planning area is considered at risk to the human health hazards discussed in this chapter, the young and the elderly, those with compromised immune systems, and those with special needs are

considered the most vulnerable. The City has a large elderly community with a concentration of older residents in areas such as Sun City Roseville. The introduction of a disease such as the plague or influenza could rapidly impact those at risk.

14.4.2 Property

None of the health hazards discussed in this chapter would have significant measurable impact on the structural environment or property of the planning area.

14.4.3 Critical Facilities and Infrastructure

None of the health hazards discussed in this chapter would have significant measurable impact on the critical facilities or infrastructure of the planning area. However, health care facilities (including long-term care and clinics and even veterinary offices) have adopted the recommended "all-hazards" approach to preparedness and have prepared for the health hazards addressed in this chapter.

The acute care hospitals in Roseville have collaborated, trained and planned on a local, regional, state and national level to provide immediate and comprehensive medical care to the citizens of Roseville and the greater western Placer County population. Emergency management and preparedness planning incorporates all response disciplines (fire, law, first responder ground and air ambulance agencies, public health, mental and spiritual health). Planning includes identifying shelters, alternate treatment facilities, isolation capacity and methods to immediately expand physical and human resources.

14.4.4 Environment

None of the health hazards discussed in this chapter would have significant measurable impact on the environment of the planning area. While many of the vectors of the health hazards discussed in this chapter (mosquitoes, rodents, fleas, ticks and deer flies) rely on local or regional environments for their survival, the human health hazard that they carry or potentially transmit would have no significant measurable impact on the environment.

14.4.5 Economy

The economic impact of a human health hazard could be localized to a single region or population, or could be widespread. The impact could be significant, depending on the hazard, number of cases and the availability of resources to care for those affected by the hazard. Other financial impacts could be absorbed or managed by the organization affected.

14.5 FUTURE TRENDS IN DEVELOPMENT

The potential for communicable diseases, vector-borne diseases or extreme weather in Roseville and the planning area is not likely to lessen or prohibit growth or development in Roseville.

14.6 REVIEW OF EXISTING ORDINANCES, PROGRAMS AND PLANS

14.6.1 Hospital Expansions to Care for Growing Populations

Kaiser Permanente operates medical facilities in Roseville as follows:

- In October 1998, Kaiser Permanente opened a 116-bed hospital on Eureka Road adjacent to its medical offices. Since then, the hospital increased the number of beds to 166 (not including the Women's and

Children's Center). In addition to the hospital, comprehensive outpatient, primary, and specialty care services are offered, as well as education, pharmacy, laboratory, radiology, optical, EKG, and physical therapy services at three sites in Roseville.
- Kaiser opened a 75,000 square-foot medical office building in Lincoln in October 2006.
- In December 2008, a $52 million expansion project was completed that quadrupled the size of the Kaiser Roseville emergency room and doubled the number of beds. The radiology department was tripled in size and provided with high tech rooms with advanced diagnostic tools.
- Kaiser Roseville's Women's and Children's Center opened in January 2009 and includes 174 beds, neonatal and pediatric intensive care units, and a second medical office building.
- Kaiser Roseville is a certified Stroke and STEMI (heart attack) Receiving Center.
- Kaiser's Roseville Medical Center was named as a "Top Hospital" on the 2015 Leapfrog Top Hospitals listing—a voluntary program recognizing hospitals that demonstrate success in minimizing mortality rates for high-risk procedures and preventing medical errors.

Sutter Roseville Medical Center operates medical facilities in Roseville as follows:

- The current Sutter Roseville Medical Center campus opened in 1997 and provides comprehensive community health and trauma care for more than seven counties.
- Sutter Roseville Medical Center provides critical care, cardiology, neurology, pulmonary and orthopedic services, a dedicated cancer center, a Family Birth Center, a Neo Natal Intensive Care Unit, wound care, a 24-hour emergency department and the Sutter Rehabilitation Institute, a 55-bed acute rehabilitation center with accreditation from the Commission on Accreditation of Rehabilitation Facilities
- Sutter Roseville Medical Center is an accredited regional Level II trauma center and designated disaster/medical control facility, as well as a certified Stroke Receiving Center, STEMI (heart attack) Receiving Center and National Disaster Medical Systems hospital.
- Sutter Roseville is in the process of expanding its emergency department, intensive care and trauma neuro intensive care units and inpatient and outpatient surgery programs.
- In 2015, Truven Health Analytics named Sutter Health and Sutter Health's Valley Area, which includes Sutter Roseville Medical Center, as two of the nation's top five performers among large health care systems in its 15 Top Health Systems study.

Past and future expansion of these medical centers will enhance the capacity and services offered to treat illness and injury in Roseville and the surrounding region.

14.6.2 Memorandums of Agreement

The following memorandums of agreement enhance Roseville's ability to respond to the human health hazard:

- Sutter Roseville Medical Center has a memorandum of agreement with the Department of Quarantine, a division of the CDC, to provide isolation treatment in the event of a highly contagious and virulent disease.
- Sutter Roseville Medical Center has cooperative memorandums of agreement with Beale Air Force Base and the Placer County Department of Health and Human Services to provide assistance and care in disaster and mass casualty incidents.
- Since 2013 Sutter Roseville Medical Center has been a designated one of the nation's 1,500 National Disaster Medical Systems Hospital by the Department of Defense, Department of Health and Human Services and the Department of Veteran's affairs. This designation can provide the facility and the region more rapid care and assistance if a catastrophe strikes.

- Kaiser Roseville and Sutter Roseville Medical Center are coalition members with Placer County Public Health in the Healthcare Emergency Coalition to prepare, train and exercise to provide services in mass casualty situations.

14.6.3 Integrated Emergency Response

FEMA and the Joint Commission for Accreditation of Healthcare Organizations (JCAHO) expect acute care facilities to provide planning for an "all hazard" disaster response and care for mass casualties, whether the incidents and events are naturally occurring, human caused, or a combination of both. JCAHO requires the integration of emergency response planning with local response agencies, ensuring that the community will receive the highest level of integrated response and protection available. These planning efforts are supported by local, regional, state and federal grant funding.

14.7 SCENARIO

A human health worst-case scenario for the planning area would be an epidemic or large-scale incident of any of the human health hazards discussed in this chapter. Medical treatment facilities in the planning area would be overwhelmed and taxed beyond their capabilities as the numbers of patients escalates. The impacts on the workforce within the planning area could have acute and long-term economic impacts on the primary employers in the planning area. First responders would be exposed to the human health hazards, which could deplete the medical workforce and could have profound impact on the potential escalation of the scenario.

14.8 ISSUES

Important issues associated with the human health hazards include but are not limited to the following:

- Prevention through vaccination and personal emergency and disaster preparation will help to reduce the impacts of human health hazards.
- Medical and response personnel need to be integrated in a unified command to provide care when needed in response to human health hazards.
- Medical and response personnel must be adequately trained and supplied.
- Up-to-date and functional all-hazard contingency planning should be carried out.
- A system needs to be in place for informing the public with a unified message about the human health hazard.
- Health agencies and facilities require surge capacity management and adaptation to the rising number and needs of the region.

15. HUMAN-CAUSED HAZARDS

15.1 GENERAL BACKGROUND

Although the DMA does not require an assessment of human-caused hazards, The City of Roseville is including human-caused hazards in this hazard mitigation plan for the following reasons:

- The City takes a proactive approach to disaster preparedness, especially in an effort to protect the public safety of all citizens.
- Preparation for and response to a human-caused disaster will involve many of the same staff training, critical decisions, and commitment of resources as for a natural hazard.
- The multi-hazard mitigation planning effort is an opportunity to inform the public about all hazards, including human-caused hazards.
- The likelihood of a human-caused hazard in Roseville is greater than several of the identified natural hazards in this Plan.
- The City has a Terrorism Contingency Plan (June 2004) and a Hazardous Materials Contingency Plan (September 2004) already in place with instructions for a response by City of Roseville first responders and staff of the emergency operations center.

Human-caused hazards fall into the following categories:

- Man-made hazards include acts of terrorism and cyber threats. These hazards are intentional, criminal, malicious acts.
- Technological hazards are incidents that arise from human activities such as the manufacture, transportation, storage and use of hazardous materials. These are accidental incidents with unintended consequences.

This report does not address human-caused hazards to the Roseville water treatment facilities, because the City evaluated those facilities in a separate report per EPA requirements. Information on that evaluation is available from the Roseville City Manager's office. In 2003, with input from the City of Roseville, Placer County conducted a State Homeland Security Assessment Survey to review terrorism vulnerabilities, personnel available to respond, and equipment needed. The resulting information is classified and available only to first responders at the time of an emergency (per state and federal laws).

DEFINITIONS

Acts of Terrorism—The unlawful use or threatened use of force or violence against people or property with the intention of intimidating or coercing societies or governments. Terrorism is either foreign or domestic, depending on the origin, base, and objectives of the terrorist or organization.

Technological Hazards—Hazards from accidents associated with human activities such as the manufacture, transportation, storage and use of hazardous materials.

Weapons of Mass Destruction—Chemical, biological, radiological, nuclear, and explosive weapons associated with terrorism.

Hazardous Material—A substance or combination of substances that, because of quantity, concentration, physical, chemical, or infectious characteristics, may cause or contribute to an increase in mortality or an increase in serious irreversible or incapacitating reversible illness, or pose a present or potential hazard to human life, property, or the environment. Hazardous waste is included in the City's working definition.

15.1.1 Man-Made Hazards

Terrorism and Weapons of Mass Destruction

The Federal Bureau of Investigation (FBI) categorizes terrorism in the United States as one of two types:

- Domestic terrorism involves groups or individuals whose terrorist activities are directed at elements of our government or population without foreign direction. The 1995 bombing of the Alfred P. Murrah federal building in Oklahoma City is an example of domestic terrorism. The FBI is the primary response agency for domestic terrorism. The FBI coordinates domestic preparedness programs and activities of the United States to limit acts posed by terrorists including the use of weapons of mass destruction (WMDs).
- International terrorism involves groups or individuals whose terrorist activities are foreign-based and/or directed by countries or groups outside the United States, or whose activities transcend national boundaries. Examples include the 1997 bombing of Mobil Oil's headquarters, the 1983 bombing of the U.S. Capitol, the 1993 bombing of the World Trade Center, and the September 11, 2001 attacks at the World Trade Center and the Pentagon.

The three key elements to defining a terrorist event are as follows:

- Activities involve the use of illegal force.
- Actions are intended to intimidate or coerce.
- Actions are committed in support of political or social objectives.

As detailed in the City's Terrorism Contingency Plan, at least three important considerations distinguish terrorism hazards from other types of hazards:

- In the case of chemical, biological and radioactive agents, their presence may not be immediately obvious, making it difficult to determine when and where they may have been released, who has been exposed, and what danger is present for first responders and emergency medical technicians.
- There is limited scientific understanding of how these agents affect the population at large.
- Terrorism evokes strong emotional reactions, ranging from anxiety to fear to anger to depression.

Those involved with terrorism response, including public health and public information staff, are trained to deal with the public's emotional reaction swiftly as response to the event occurs. The area of the event must be clearly identified in all emergency alert messages to prevent those not affected by the incident from overwhelming local emergency rooms and response resources, thereby reducing service to those actually affected. The public will be informed clearly and frequently about what government agencies are doing to mitigate the impacts of the event. The public will also be given clear directions on how to protect the health of individuals and families.

FEMA defines terrorism as the use of weapons of mass destruction, including biological, chemical, nuclear and radiological weapons; arson, incendiary, explosive and armed attacks; industrial sabotage and intentional hazardous materials releases; agro-terrorism; and cyber-terrorism (FEMA 386-7). The following are potential methods used by terrorists that could affect the City of Roseville as a direct target or collaterally:

- Conventional bomb
- Biological agent
- Chemical agent
- Nuclear bomb
- Radiological agent
- Arson/incendiary attack
- Armed attack
- Cyber-terrorism (see the cyber threats section of this profile)
- Agro-terrorism
- Intentional hazardous material release.

Table 15-1 provides a hazard profile summary for terrorism-related hazards. Most terrorist events in the United States have been bombing attacks, involving detonated or undetonated explosive devices, tear gas, pipe bombs, and firebombs.

Table 15-1. Event Profiles for Terrorism

Hazard	Application Mode[a]	Hazard Duration[b]	Static/Dynamic Characteristics[c]	Mitigating and Exacerbating Conditions[d]
Conventional Bomb	Detonation of explosive device on or near target; delivery via person, vehicle, or projectile.	Instantaneous; additional secondary devices, or diversionary activities may be used, lengthening the duration of the hazard until the attack site is determined to be clear.	Extent of damage is determined by type and quantity of explosive. Effects generally static other than cascading consequences, incremental structural failure, etc.	Overpressure at a given standoff is inversely proportional to the cube of the distance from the blast; thus, each additional increment of standoff provides progressively more protection. Terrain, forestation, structures, etc. can provide shielding by absorbing and/or deflecting energy and debris. Exacerbating conditions include ease of access to target; lack of barriers and shielding; poor construction; and ease of concealment of device.
Chemical Agent	Liquid/aerosol contaminants dispersed using sprayers or other aerosol generators; liquids vaporizing from puddles/ containers; or munitions.	Hours to weeks, depending on the agent and the conditions in which it exists.	Contamination can be carried out of the initial target area by persons, vehicles, water, and wind. Chemicals may be corrosive or otherwise damaging over time if not remediated.	Air temperature can affect evaporation of aerosols. Ground temperature affects evaporation of liquids. Humidity can enlarge aerosol particles, reducing inhalation hazard. Precipitation can dilute and disperse agents but can spread contamination. Wind can disperse vapors but also cause target area to be dynamic. The micro-meteorological effects of buildings and terrain can alter travel and duration of agents. Shielding in the form of sheltering in place can protect people and property from harmful effects.
Arson/ Incendiary Attack	Initiation of fire or explosion on or near target via direct contact or remotely via projectile.	Generally minutes to hours.	Extent of damage is determined by type and quantity of device, accelerant, and materials present at or near target. Effects generally static other than cascading consequences, incremental structural failure, etc.	Mitigation factors include built-in fire detection and protection systems and fire-resistive construction techniques. Inadequate security can allow easy access to target, easy concealment of an incendiary device, and undetected initiation of a fire. Non-compliance with fire and building codes, as well as failure to maintain existing fire protection systems, can substantially increase the effectiveness of a fire weapon.
Armed Attack	Tactical assault or sniping from remote location, or random attack based on fear, emotion, or mental instability.	Generally minutes to days.	Varies based on the perpetrators' intent and capabilities.	Inadequate security can allow easy access to target, easy concealment of weapons, and undetected initiation of an attack.
Biological Agent	Liquid or solid contaminants dispersed using sprayers/ aerosol generators or by point or line sources such as munitions, covert deposits, and moving sprayers.	Hours to years, depending on the agent and the conditions in which it exists.	Depending on the agent used and the effectiveness with which it is deployed, contamination can be spread via wind and water. Infection can spread via humans or animals.	Altitude of release above ground can affect dispersion; sunlight is destructive to many bacteria and viruses; light to moderate wind will disperse agents but higher winds can break up aerosol clouds; the micro-meteorological effects of buildings and terrain can influence aerosolization and travel of agents.

Hazard	Application Mode[a]	Hazard Duration[b]	Static/Dynamic Characteristics[c]	Mitigating and Exacerbating Conditions[d]
Agro-terrorism	Direct, generally covert contamination of food supplies or introduction of pests and/or disease agents to crops and livestock.	Days to months.	Varies by type of incident. Food contamination events may be limited to specific distribution sites, whereas pests and diseases may spread widely. Generally no effects on built environment.	Inadequate security can facilitate adulteration of food and introduction of pests and disease agents to crops and livestock.
Radiological Agent	Radioactive contaminants dispersed using sprayers/ aerosol generators, or by point or line sources such as munitions.	Seconds to years, depending on material used.	Initial effects will be localized to site of attack; depending on meteorological conditions, subsequent behavior of radioactive contaminants may be dynamic.	Duration of exposure, distance from source of radiation, and the amount of shielding between source and target determine exposure to radiation.
Nuclear Bomb	Detonation of nuclear device underground, at the surface, in the air, or at high altitude.	Light/heat flash and blast/shock wave last for seconds; nuclear radiation and fallout hazards can persist for years. Electromagnetic pulse from a high-altitude detonation lasts for seconds and affects only unprotected electronic systems.	Initial light, heat, and blast effects of a subsurface, ground or air burst are static and determined by the device's characteristics and employment; fallout of radioactive contaminants may be dynamic, depending on meteorological conditions.	Harmful effects of radiation can be reduced by minimizing the time of exposure. Light, heat, and blast energy decrease logarithmically as a function of distance from seat of blast. Terrain, forestation, structures, etc. can provide shielding by absorbing and/or deflecting radiation and radioactive contaminants.
Intentional Hazardous Material Release (fixed facility or transportation)	Solid, liquid, and/or gaseous contaminants released from fixed or mobile containers	Hours to days.	Chemicals may be corrosive or otherwise damaging over time. Explosion and/or fire may be subsequent. Contamination may be carried out of the incident area by persons, vehicles, water and wind.	Weather conditions directly affect how the hazard develops. The micro-meteorological effects of buildings and terrain can alter travel and duration of agents. Shielding in the form of sheltering in place can protect people and property from harmful effects. Non-compliance with fire and building codes, as well as failure to maintain existing fire protection and containment features, can substantially increase the damage from a hazardous materials release.

a. **Application Mode**—Application mode describes the human acts or unintended events necessary to cause the hazard to occur.
b. **Duration**—Duration is the length of time the hazard is present. For example, a chemical warfare agent such as mustard gas, if un-remediated, can persist for hours or weeks under the right conditions.
c. **Dynamic or Static Characteristics**—These characteristics of a hazard describe its tendency, or that of its effects, to either expand, contract, or remain confined in time, magnitude, and space. For example, the physical destruction caused by an earthquake is generally confined to the place in which it occurs, and it does not usually get worse unless aftershocks or other cascading failures occur; in contrast, a cloud of chlorine gas leaking from a storage tank can change location by drifting with the wind and can diminish in danger by dissipating over time.
d. **Mitigation and Exacerbating Conditions**—Mitigating conditions are characteristics of the target and its physical environment that can reduce the effects of a hazard. For example, earthen berms can provide protection from bombs; exposure to sunlight can render some biological agents ineffective; and effective perimeter lighting and surveillance can minimize the likelihood of someone approaching a target unseen. In contrast, exacerbating conditions are characteristics that can enhance or magnify the effects of a hazard. For example, depressions or low areas in terrain can trap heavy vapors, and a proliferation of street furniture (trash receptacles, newspaper vending machines, mail boxes, etc.) can provide hiding places for explosive devices.

Source: FEMA 386-7

The effects of terrorism can vary from loss of life and injuries to property damage and disruptions in services such as electricity, water supplies, transportation, or communications. Terrorist acts may have an immediate effect or a delayed effect. Terrorists often choose targets that offer limited danger to themselves and areas with relatively easy public access. Foreign terrorists look for visible targets where they can avoid detection before and after an attack such as international airports, large cities, major special events, and high-profile landmarks.

In dealing with intentional human-caused hazards, the unpredictability of human beings must be considered. People with a desire to perform criminal acts may seek out targets of opportunity that may not fall into established lists of critical areas or facilities. The City of Roseville first responders train not only to respond to organized terrorism events, but also to respond to random acts by individuals who, for a variety of reasons ranging from fear to emotional trauma to mental instability, may choose to harm others and destroy property.

While education, heightened awareness, and early warning of unusual circumstances may deter crime and terrorism, intentional acts that harm people and property are possible at any time. Public safety entities must react to the incident, locate, isolate and neutralize further damage, and conduct investigate to bring criminals to justice.

Cyber Threats

A cyber threat is an intentional and malicious crime that compromises the digital infrastructure of a person or organization, often for financial or terror-related reasons. Such attacks vary in nature and are perpetrated using digital mediums or sometimes social engineering to target human operators. Generally, attacks last minutes to days, but large-scale events and their impacts can last much longer. As information technology continues to grow in capability and interconnectivity, cyber threats become increasingly frequent and destructive. In 2014, internet security teams at Symantec and Verizon indicated that nearly 1 million new pieces of malware—malicious code designed to steal or destroy information—were created every day (Harrison 2015).

Cyber threats differ by motive, attack type and perpetrator profile. Motives range from the pursuit of financial gain to political or social aims. Cyber threats are difficult to identify and comprehend. Types of threats include using viruses to erase entire systems, breaking into systems and altering files, using someone's personal computer to attack others, or stealing confidential information. The spectrum of cyber risks is limitless, with threats having a wide-range of effects on the individual, community, organizational, and national threat (FEMA 2013).

This risk assessment includes cyber attacks and cyberterrorism under the inclusive hazard of cyber threats. The terms often are used interchangeably, though they are not the same. While all cyberterrorism is a form of cyber attack, not all cyber attacks are cyberterrorism.

Cyber Attacks

Public and private computer systems are likely to experience a variety of cyber attacks, from blanket malware infection to targeted attacks on system capabilities. Cyber attacks specifically seek to breach IT security measures designed to protect an individual or organization. The initial attack is followed by more severe attacks for the purpose of causing harm, stealing data, or financial gain. Organizations are prone to different types of attacks that can be either automated or targeted in nature. Table 15-2 describes the most common cyber attack mechanisms faced by organizations today.

Since 2013, a new type of cyber-attack is becoming increasingly common against individuals and small- and medium-sized organizations. This attack is called cyber ransom. Cyber ransom occurs when an individual downloads ransom malware, or ransomware, often through phishing or drive-by download, and the subsequent execution of code results in encryption of all data and personal files stored on the system. The victim then receives a message that demands a fee in the form of electronic currency or cryptocurrency, such as Bitcoin, for the decryption code (Figure 15-1).

Table 15-2. Common Mechanisms for Cyber Attacks

Type	Description
Socially Engineered Trojans	Programs designed to mimic legitimate processes (e.g. updating software, running fake antivirus software) with the end goal of human-interaction caused infection. When the victim runs the fake process, the Trojan is installed on the system.
Unpatched Software	Nearly all software has weak points that may be exploited by malware. Most common software exploitations occur with Java, Adobe Reader, and Adobe Flash. These vulnerabilities are often exploited as small amounts of malicious code are often downloaded via drive-by download.
Phishing	Malicious email messages that ask users to click a link or download a program. Phishing attacks may appear as legitimate emails from trusted third parties.
Password Attacks	Third party attempts to crack a user's password and subsequently gain access to a system. Password attacks do not typically require malware, but rather stem from software applications on the attacker's system. These applications may use a variety of methods to gain access, including generating large numbers of generated guesses, or dictionary attacks, in which passwords are systematically tested against all of the words in a dictionary.
Drive-by Downloads	Malware is downloaded unknowingly by the victims when they visit an infected site.
Denial of Service Attacks	Attacks that focus on disrupting service to a network in which attackers send high volumes of data until the network becomes overloaded and can no longer function.
Man in the Middle	Man-in-the-Middle attacks mirror victims and endpoints for online information exchange. In this type of attack, the attacker communicates with the victims, who believe they are interacting with a legitimate endpoint website. The attacker is also communicating with the actual endpoint website by impersonating the victim. As the process goes through, the attacker obtains entered and received information from both the victim and endpoint.
Malvertising	Malware downloaded to a system when the victim clicks on an affected ad.
Advanced Persistent Threat (APT)	An attack in which the attacker gains access to a network and remains undetected. APT attacks are designed to steal data instead of cause damage.

Source: Danielson 2015



Figure 15-1. Pop-Up Message Indicating Ransomware Infection

With millions of threats created each day, the importance of protection against cyber attacks becomes a necessary function of everyday operations for individuals, government facilities, and businesses. The increasing dependency on technology for vital information storage and the often automated method of infection means higher stakes for the success of measurable protection and education.

Cyberterrorism

Cyberterrorism is the use of computers and information, particularly over the Internet, to recruit others to an organization's cause, cause physical or financial harm, or cause a severe disruption of infrastructure service. Such disruptions can be driven by religious, political, or other motives. Like traditional terrorism tactics, cyberterrorism seeks to evoke very strong emotional reactions, but it does so through information technology rather than a physically violent or disruptive action. Cyberterrorism has three main types of objectives (Kostadinov 2012):

- **Organizational**—Cyberterrorism with an organizational objective includes specific functions outside of or in addition to a typical cyber attack. Terrorist groups today use the internet on a daily basis. This daily use may include recruitment, training, fundraising, communication, or planning. Organizational cyberterrorism can use platforms such as social media as a tool to spread a message beyond country borders and instigate physical forms of terrorism. Additionally, organizational goals may use systematic attacks as a tool for training new members of a faction in cyber warfare.
- **Undermining**—Cyberterrorism with undermining as an objective seeks to hinder the normal functioning of computer systems, services, or websites. Such methods include defacing, denying, and exposing information. While undermining tactics are typically used due to high dependence on online structures to support vital operational functions, they typically do not result in grave consequences unless undertaken as part of a larger attack. Undermining attacks on computers include the following (Waldron 2011):

  - Directing conventional kinetic weapons against computer equipment, a computer facility, or transmission lines to create a physical attack that disrupts the reliability of equipment.
  - Using electromagnetic energy, most commonly in the form of an electromagnetic pulse, to create an electronic attack against computer equipment or data transmissions. By overheating circuitry or jamming communications, an electronic attack disrupts the reliability of equipment and the integrity of data.
  - Using malicious code directed against computer processing code, instruction logic, or data. The code can generate a stream of malicious network packets that disrupt data or logic by exploiting vulnerability in computer software, or a weakness in computer security practices. This type of cyber attack can disrupt the reliability of equipment, the integrity of data, and the confidentiality of communications (Wilson 2008)

- **Destructive**—The destructive objective for cyberterrorism is what organizations fear most. Through the use of computer technology and the Internet, the terrorists seek to inflict destruction or damage on tangible property or assets, and even death or injury to individuals. There are no cases of pure cyberterrorism as of the date of this Plan.

15.1.2 Technological Hazards

Technological hazards are associated with human activities such as the manufacture, transportation, storage and the use of hazardous materials. Incidents related to these hazards are assumed to be accidental, with unintended consequences. Technological hazards in Roseville can be categorized as follows:

- Hazardous materials incidents
- Power utility losses
- Data and telecommunications disruptions

- Water and wastewater disruption
- Air and transportation accidents
- Infrastructure threats.

Hazardous Materials Incidents

Hazardous materials are present in nearly every city and county in the United States in facilities that produce, store, or use them. For example, water treatment plants use chlorine on-site to eliminate bacterial contaminants. Hazardous materials are transported along interstate highways and railways daily. Even the natural gas used in every home and business is a dangerous substance when a leak occurs. Except for severe weather and flooding, hazardous materials incidents are the hazards most likely to affect the City of Roseville.

Title 49 of the CFR lists thousands of hazardous materials, including gasoline, insecticides, household cleaning products, and radioactive materials. State regulated substances that have the greatest probability of adversely impacting the community are listed in the CCR, Title 19. The following are the most common type of hazardous material incidents:

- **Fixed-Facility Hazardous Materials Incident**—This is the uncontrolled release of materials from a fixed site capable of posing a risk to health, safety and property. It is possible to identify and prepare for a fixed-site incident because federal and state laws require those facilities to notify state and local authorities about what is being used or produced at the site.
- **Hazardous Materials Transportation Incident**—A hazardous materials transportation incident is any event resulting in uncontrolled release of materials during transport that can pose a risk to health, safety, and property. Transportation incidents are difficult to prepare for because there is little if any notice about what materials could be involved should an accident happen. Hazardous materials transportation incidents can occur anywhere, although most occur on major federal or state highways or major rail lines. In addition to materials such as chlorine that are shipped throughout the country by rail, thousands of shipments of radiological materials, mostly medical materials and low-level radioactive waste, travel by ground transportation across the United States. Many incidents occur in sparsely populated areas and affect very few people. There are occasions, however, of accidents in areas with much higher population densities, such as the January 6, 2005 train accident in Graniteville, South Carolina, that released chlorine gas killing nine, injuring 500, and causing the evacuation of 5,400 residents.
- **Interstate Pipeline Hazardous Materials Incident**—There are a significant number of interstate natural gas, heating oil, and petroleum pipelines running through California. These are used to provide natural gas to utilities in California and to transport these materials from production facilities to end users.

Power Utility Losses

A power failure is any interruption or loss of electrical service due to disruption of power generation or transmission caused by an accident, sabotage, natural hazards, equipment failure, or fuel shortage. These interruptions can last anywhere from a few seconds to several days. Power failures are considered significant only if the local emergency management organization is required to coordinate basic services such as the provision of food, water, and heating as a result. Power failures are common with severe weather and winter storm activity. However, for medically dependent residents, a power failure can present a life-threatening situation.

The City of Roseville Electric Utility is responsible for operating and maintaining the electrical transmission and distribution system in Roseville. The City supplies electricity to about 56,000 residential and business customers within the service area according to the 2014 Roseville Electric Annual Report. The distribution lines and substations deliver 324 megawatts during peak demand period from June through September.

Roseville Electric has the highest reliability in the country for municipal utilities of its size, due in large part to a redundant system with sophisticated interconnection between the facilities and immediate notification should failure occur along the distribution system. Through its load management program and load shedding agreements with large, local electric users, the City of Roseville avoided any outages during electric crises and brownouts that affected some parts of California in 2000 and 2001.

Roseville has taken a proactive approach to maintaining its reliability standards by building a local generation source—the Roseville Energy Park. The Roseville Energy Park is a natural-gas-fired, combined-cycle electrical generating facility located on an 8.9-acre site adjacent to the Pleasant Grove Wastewater Treatment Plant. Since operations began in 2007, the state-of-the-art, 160-megawatt power generation facility generates enough energy to meet 40 percent of the community's electricity needs.

Data and Telecommunications Disruptions

The loss of data and/or telecommunications is often a secondary hazard to natural and other human-caused hazards. Data and telecommunications provide a primary method for service to the community by the government and the private sector. A loss of data and telecommunications could result in loss of emergency dispatch capabilities, emergency planning services, infrastructure monitoring capabilities, access to statistical data, and loss of financial and personnel records. Losing the primary method of communication for emergency responders (radio) would severely disable their ability to respond in a timely and effective manner.

Water and Wastewater Disruption

Water or wastewater disruption is a secondary impact from a natural disaster or intentional act. The City of Roseville receives surface water from the Folsom Reservoir, a 1 million-acre-foot multi-purpose facility east of the City. A breach in the dam or the pipelines that carry water to the City's Water Treatment Plant on Barton Road in Granite Bay would have significant temporary impacts on the City until alternative water sources, including water from other regional purveyors and groundwater, are pumped and treated. Long-term disruption of the water source from Folsom Lake would have significant impacts on residences and businesses in Roseville should demand exceed secondary supplies and water conservation measures not provide enough relief to reduce demand to equal the secondary supplies.

Disruption of the City's wastewater collection and regional wastewater treatment plants at Dry Creek and Pleasant Grove Creek would also have significant citywide and regional impacts. Such disruption could result if the system were to be overwhelmed by a significant storm or discharge of materials in such quantities that the treatment plant could not adequately treat the waste. Natural hazards such as earthquake or flood, major power outages, or terrorism directed at the facilities and systems could disrupt the process of collecting and treating millions of gallons of waste. Wastewater treatment plants may also have emergencies internal to the plant such as oxygen deficiencies that render them incapable of treating waste. The disruption of service may also have significant environmental impacts on the waterways adjacent to the treatment plants.

Air and Transportation Accidents

Air and transportation accidents are incidents involving air or rail passengers resulting in death or serious injury. The region has a number of airports, including the Sacramento International Airport, as well as several smaller county or municipal airports and private air strips that enhance the potential for an air disaster.

Roseville features several major transportation routes, including Interstate 80 and Highway 65, both of which run through portions of the City. The potential for transportation accidents that block ingress, egress, and movement through the City is significant, as is the likelihood of hazardous material incidents resulting from a traffic accident.

15.1.3 Civil Disorder

Civil disorder refers to incidents that disrupt a community to the degree that law enforcement intervention is required to maintain public safety. These incidents are generally associated with controversial political, judicial, or economic issues and may occur at any time of the year, although statistics indicate that they are more frequent during summer. While Roseville has no history of civil disorder, large public gatherings associated with concerts or sports events have overburdened local law enforcement and fire protection resources in the past.

The effects of civil disorder vary with the type, severity, scope, and duration of event. Essential services (e.g., electricity, water, public transportation, communications) may be disrupted or property damage, injury and loss of life may occur. Facilities most at risk are government buildings, schools, utilities and correctional facilities.

15.2 HAZARD PROFILE

15.2.1 Past Events

State of California

Terrorism Events

According to the Governor's Office of Emergency Services Terrorism Response Plan, California has had a long history of defending the public against domestic and foreign terrorists. Domestic terrorist groups in California have been focused on political or social issues, while the limited internationally based incidents have targeted the state's immigrant communities due to foreign disputes. Advanced technologies and communication have allowed these groups to become more sophisticated and better organized, with remote members linked electronically.

Technological Hazard Incidents

No comprehensive source exists for technological hazard incidents in California. Given the complex system of transportation networks, the large population, and the number of businesses in California, incidents occur on a regular basis throughout the state, as reported by the news media.

Region

Terrorism Events

In 2005, development projects in Placer County were the subject of arson activity by an individual who claimed to be from the Earth Liberation Front or ELF, a splinter group of Earth First!, a radical environmental activist movement. ELF is a somewhat active domestic terrorism group that says it uses eco-sabotage to protect the Earth and to seek revenge on "those who are destroying the Earth and its inhabitants."

On December 3, 1999, the FBI arrested two anti-government militia members who planned a bomb attack at the Suburban Propane facility in Elk Grove, CA. The alleged plot involved a plan to blow up the Suburban Propane site, which stores about 24 million gallons of liquefied propane and is located one mile from residential homes. According to the Sacramento Bee, the plot resulted in heightened on-site security and a year-long investigation resulting in the two arrests.

Technological Hazard Incidents

Placer County and its incorporated cities have experienced many accidental hazardous materials incidents. Accidents involving high pressure gas lines in the County have caused injury and property damage. An underground Kinder Morgan pipeline failed in 2002, causing a significant spill of diesel fuel within a Rocklin

neighborhood adjacent to where the breach occurred (Former Roseville Fire Department Battalion Chief Jeff Carman, pers. com).

Air and Transportation Accidents

The Sacramento region was once the location of three large military installations: the Sacramento Army Depot, Mather Air Force Base and McClellan Air Force Base. All three have been decommissioned and transferred to civilian uses. The only active military installation is Beale Air Force Base, located to the north near Yuba City, California. A review of McClellan Fire Department history prior to the base closure identifies several responses to accidents near Roseville (see Table 15-3).

Table 15-3. Accidents Responded to by McClellan Fire Department, 1950-1980s

Timeframe	Incident
Early 1950s	Apparatus responded to Code 3 alarm at Travis Air Force Base for B-29 crash that involved a nuclear weapon
October 29, 1951	B-29 making an emergency landing crashed and caught fire on Runway 16 injuring 11 crewmen. One firefighter died.
Mid-1950s	EC-121 crashed near Watt Avenue and U Street in Sacramento
Mid-1960s	F-104 crashed next to Haggin Oaks Golf Course.
April 28, 1973	McClellan Fire Department responded to mutual aid at Roseville Rail Yard fire
1982	Multiple alarm fire including a chemical warehouse. Toxic smoke column closed Interstate 80 for several hours
Early 1980s	HH-53 helicopter crashed near PFE Road during an air show at McClellan Air Force Base. The helicopter was attempting a refueling operation with a C-130 refueler when the hose became entangled in the rotor.
Early 1980s	F-111 crashed near Woodland

Source: McClellan Fire Department History

While the risk of military aircraft accidents in the area has been reduced with the closure of McClellan Air Force Base, which was the closest military base to the City of Roseville, the region is not immune to air transportation accidents. On February 16, 2000, an aircraft crashed after take-off from the Sacramento Mather Airport in Rancho Cordova, California. The cargo flight was bound for Dayton, Ohio and all three crewmembers were killed. The cause of the accident was a mechanical failure. The aircraft crashed into an automobile salvage yard.

Local

Air and Transportation Accidents

On February 12, 2006, a Glasair II-S FT kit plane crashed into a home at 1302 Longfellow Drive in Roseville (see Figure 15-2). The pilot was reported to be performing aerial acrobatics when he lost control of the plane and it crashed. The pilot, his passenger, and a resident in the house were killed, and the home was determined to be a total loss. The fire spread to an adjacent home and caused significant damage, however the residents escaped injury.



Figure 15-2. February 12, 2006 Aircraft Crash into Residence

Arson Events

On October 21, 2010, an arsonist set fire to the Roseville Galleria Mall that caused an estimated $55 million in property damage (see Figure 15-3). Police responded to the mall after a call from the tenant at GameSpot. They said a young male had entered, said he had a gun, and told them to get out. When police arrived, the male, who did not have a gun, had locked himself in the store. Once barricaded, he started a fire. The blaze destroyed an entire section of the mall, which is a core of the Sacramento economy. With over 240 stores operated by Westfield, the mall – built in 2000 and renovated in 2008 for $270 million – has generated $3.2 million in annual sales tax for the region. Reasons for the arson are unknown. The suspect suffered from mental illness.



Figure 15-3. October 21, 2010 Arson Fire at Galleria Mall

Terrorism Events

Terrorism incidents in Roseville have been limited to individuals seeking to cause damage at Roseville schools. Pipe bombs have been left at a school facility in one past occurrence. No WMDs have been used in a terrorist attack in Roseville.

Technological Hazard Incidents

The City of Roseville has had a number of accidental incidents at the Roseville Rail Yard, private businesses and City facilities. The Fire Department has been called to both the Oakmont High School pool and the Roseville Aquatics Center for chlorine leaks. Sewage spills have occurred on occasion and overflowed into the City's creeks. Roseville Rail Yard accidents have included derailments and leaks of toxic chemicals from transporting hazardous materials in the wrong type of railcars.

The worst human-caused disaster in Roseville's history occurred on April 28, 1973 when a train loaded with munitions bound for Vietnam caught fire in the Roseville Yard (see Figure 15-4). No lives were lost, but significant damage to property in Roseville and jurisdictions in Sacramento County occurred during the 18 hours of explosions. In 1997, a number of unexploded bombs were discovered at the yard during construction of a modernization project (see Figure 15-5).

Roseville's history parallels that of the transcontinental railroad. The federal government passed the act to build the transcontinental railroad in 1862 and shortly thereafter the Central Pacific Railroad was started in Sacramento in 1863. A northern route for the first transcontinental rail line was selected when the South seceded from the Union during the Civil War, and Trustees Charles Crocker, Mark Hopkins, Collis P. Huntington and Leland Stanford started construction on this northern line. The line extended from Sacramento to Rocklin by May 1864 and then construction across the Sierra Nevada Mountains began.

The first structure in Roseville was built in 1864 to serve as a freight and passenger depot for the fledgling railroad. In December 1905, a decision by the Central Pacific Railroad to move the division headquarters from Rocklin to Roseville meant a development boom for Roseville. The junction of the Central Pacific Railroad and the California Central, a north-south line became Roseville, where the largest artificial ice plant in the world operated to keep California's fruit and vegetables fresh as they were transported by rail car to the East. The Pacific Fruit Exchange Ice Plant operated from 1908 to 1974 when all of Southern Pacific's 21,000 rail cars were self-refrigerating.

During wartime, Roseville was a hub of activity as troops and war materials moved through the Roseville rail yards. Thousands of munitions shipments moved through Roseville during World Wars I and II, the Korean and Vietnam conflicts, and Desert Storm.

The largest human-caused disaster in the local area occurred on April 28, 1973 when a wooden floor in a munitions boxcar caught fire from brake shoe sparks. A train engine pulling 103 cars, including 21 Department of Defense freight cars with 7,056 Mark 81 bombs, was loaded at the Navy's ammunition depot in Hawthorne, Nevada on their way to western ports and the Vietnam War.

As the train pulled in to the Roseville yard just west of the Roseville city limits, one of the cars caught fire and the flames spread, igniting other freight cars on the tracks, which were 21 rails wide. Nearly every car was loaded with cargo including paint, lumber, and fertilizer. The most dramatic explosions occurred when cars carrying liquid propane caught fire resulting in explosions that blew out windows five miles away and could be heard 100 miles away. Metal and wood was thrown 3,000 feet into the air.

The result was a series of explosions that caused damages of more than $5.6 million in Roseville and the neighboring communities of Citrus Heights, Antelope, and North Highlands. No lives were lost, but over 100 people were treated for assorted cuts and bruises caused by broken glass and flying debris.







After 18 hours of explosions, Army munitions teams recovered 1,200 unexploded bombs scattered around the area and collected another 300 from rail cars. Aerial photographs from that time show a railroad smoldering and piled with twisted track, shattered cars, and scraps of metal from bomb casings. Much of the debris was buried in the 10-foot-deep craters left by the blast.

Milestones & Memories: the Story of Roseville, California, 1850-2000 by Leonard "Duke" Davis

Figure 15-4. 1973 Roseville Rail Yard Disaster

In 1997, Union Pacific Railroad began work on a $130 million project to modernize the Roseville train yard, including significant automation improvements and the replacement of 86 miles of track with 136 miles of new track.

During project grading, backhoe operators uncovered a Mark 81 bomb intact. Bomb disposal experts from Moffett Field in Mountain View, California were flown in by the Sacramento Sheriff's Department to dispose of the bomb, which they do by digging a pit and exploding the ordnance. When another eight bombs were discovered at the western end of the yard in Antelope, California unexploded ordnance experts from Moffett Field were called back and made the decision to place the bombs in pits and build berms around them. The Sacramento County Sheriff evacuated 300 to 400 homes near the rail yard, and at 2 a.m. blew up the bombs. The explosions shattered windows, cracked walls, and rained shrapnel through the roofs of nearby homes

In all, recovered materials included 16 unexploded MK 81 bombs; 11 partial fragments containing explosive residue; 8,625 pounds (4.31 tons) of bomb fragments; and 131,560 pounds (65.78 tons) of ferrous material. Experts found the bombs were not fused (armed), making them less likely to accidentally detonate. The bombs not destroyed on-site were packaged and transported to a facility in Colfax, Louisiana for detonation.



Figure 15-5. 1997 Bomb Discovery

With growth in the region and in trips through the region to tourist destinations such as the ski resorts at Lake Tahoe, the number of traffic accidents has been steadily increasing. Fatal traffic accidents since 2009 are shown in Table 15-4. Truck with trailer accidents account for a small percentage of the City's reported traffic accidents, but they represent the highest potential for hazardous materials incidents on roadways in the City of Roseville.

Table 15-4. Traffic Accident Counts—2009 to 2014

	2009	2010	2011	2012	2013	2014
Vehicles Involved in Fatal Accidents	10	8	8	12	10	1
Fatalities	6	6	5	6	2	1

Source: http://www.city-data.com/accidents/acc-Roseville-California.html

15.2.2 Location

Large population centers, high visibility tourist attractions, and critical infrastructure accessible to the public present security challenges of an ongoing nature in California. The network of highways, railways, ports and airports used to transport significant amounts of hazardous materials poses a significant technological hazards threat. Hazardous materials incidents may occur anywhere in Placer County. Multiple incidents may happen simultaneously, and all typically require a multi-agency, multi-jurisdictional response. The following sections describe the local areas with the greatest likelihood of hazardous materials incidents, as identified in the *Roseville Hazardous Materials Contingency Plan*.

Transportation Routes

The following transportation facilities have the potential to be affected by human-caused hazards:

- Interstate 80 and State Route 65 bisect the City.
- The J.R. Davis Yard in Roseville, the largest train yard west of the Mississippi, is a major Union Pacific switching center built in 1907 (see Figure 15-6). The 850-acre yard includes 136 miles of track. The site includes a former railcar rebuilding facility, the Antelope Yard, fueling areas, and diesel servicing facilities. The site has been designated as contaminated by the federal government, with substances including volatile organics, chlorinated solvents, polynuclear aromatic hydrocarbons, and heavy metals present due to decades of continuous use as a railroad repair and switching facility. Remediation is ongoing at the site.
- Sacramento International Airport in northwestern Sacramento County operates continuously with two major runways and thousands of passengers traveling via commercial and private airlines. Several major airlines operate out of Sacramento International Airport, with most flying light- to medium-weight passenger jets. Approach and takeoff patterns are usually over rural farmland; however, occasionally patterns are adjusted over more populated locations including Roseville. The City is more than 20 miles from Sacramento International Airport and is not in the direct flight path for the airport, although planes do cross Roseville continuously at high altitudes.
- Additional airports within a 20-mile radius of Roseville include the Lincoln and Auburn Airports in Placer County, Beale Air Force Base (34 miles to the north and the closest active military installation), McClellan Airfield, and the Yuba County airport. The instrument-landing approach to Runway 16 at McClellan crosses a portion of the western edge of the Sierra Vista Specific Plan Area. Aircraft on approach fly as low as 1,600 feet at Baseline Road (approximately 4 miles from the runway threshold). Aircraft using McClellan Airpark include aircraft as large as Boeing 747 and 707 aircraft, in addition to Coast Guard C-130s. Additionally, the National Guard flies T-38 aircraft and Blackhawk helicopters out of Mather Air Force Base.
- Sutter Roseville Medical Center maintains a helistop for critically injured patients flown to the hospital. At one time, the facility was limited to accepting one helicopter. If another patient was being transported

to the medical center, the Roseville Fire Department had to respond to the helipad and emergency medical personnel were on standby should anything occur with more than one helicopter using the helipad. The landing area has been expanded and now the helistop has the capacity to accept more than one helicopter at any one time.

- Emergency and public safety helicopter traffic as well as media aircraft and small commercial aircraft frequently fly over the interstates to respond to emergencies and provide public information via local news media.
- Roseville has a number of established truck routes with a higher potential for hazardous material incidents to occur as a result of traffic incidents, as shown in Figure 15-7.



Figure 15-6. The J.R. Davis Yard in Roseville, the Largest Train Yard West of the Mississippi

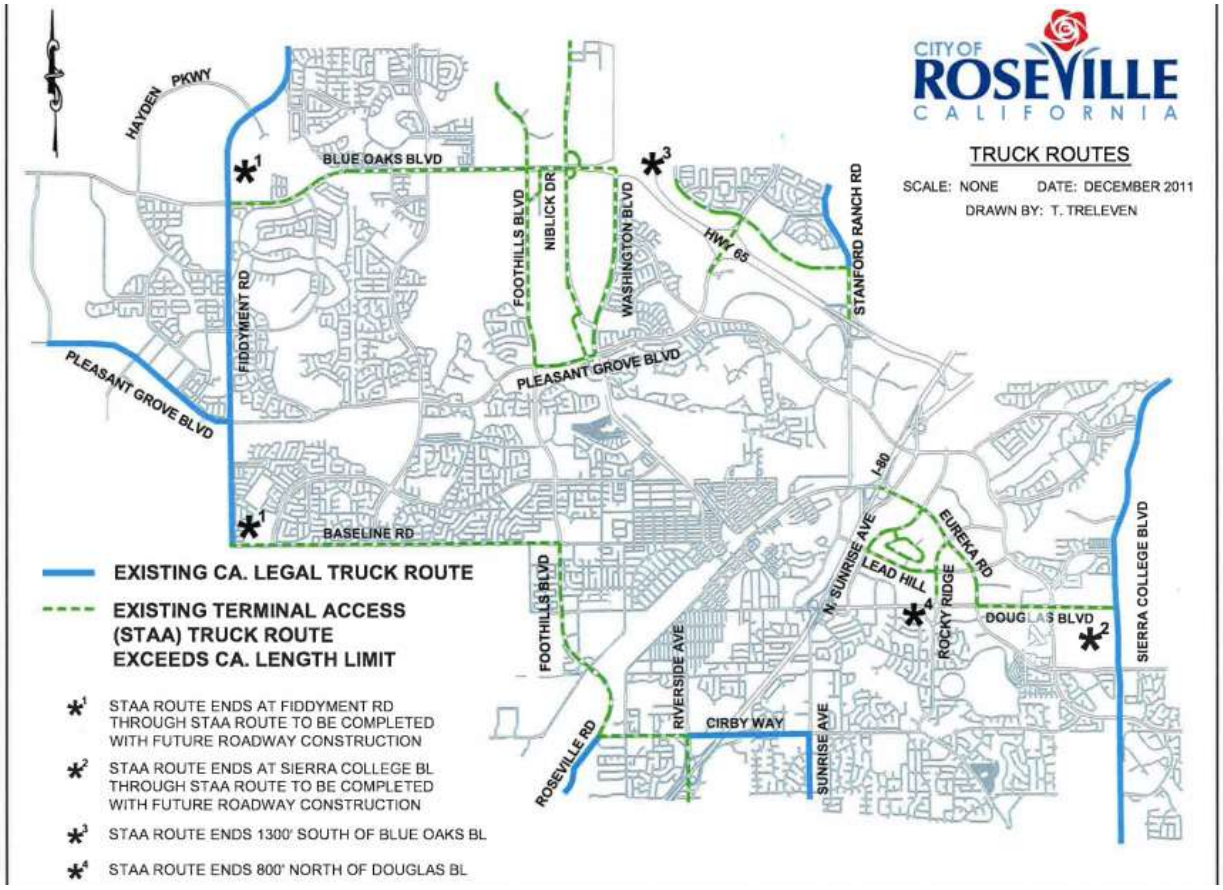


Figure 15-7. Roseville Truck Routes with High Potential for Hazardous Materials Incidents

Pipelines

The Kinder Morgan company owns 3 miles of pipelines generally parallel to the Union Pacific railroad tracks in Roseville that transport high volumes of natural gas through the City (Figure 15-8 shows the company's national pipelines). Other natural gas pipelines run along Interstate 80 with connections between Roseville and Chico. The route to Chico travels through residential areas from the tank farm in Rocklin. The trans-Sierra route from the tank farm in Rocklin to Reno roughly follows the same track as Interstate 80. Pacific Gas and Electric maintains natural gas pipelines in and through Roseville as well.

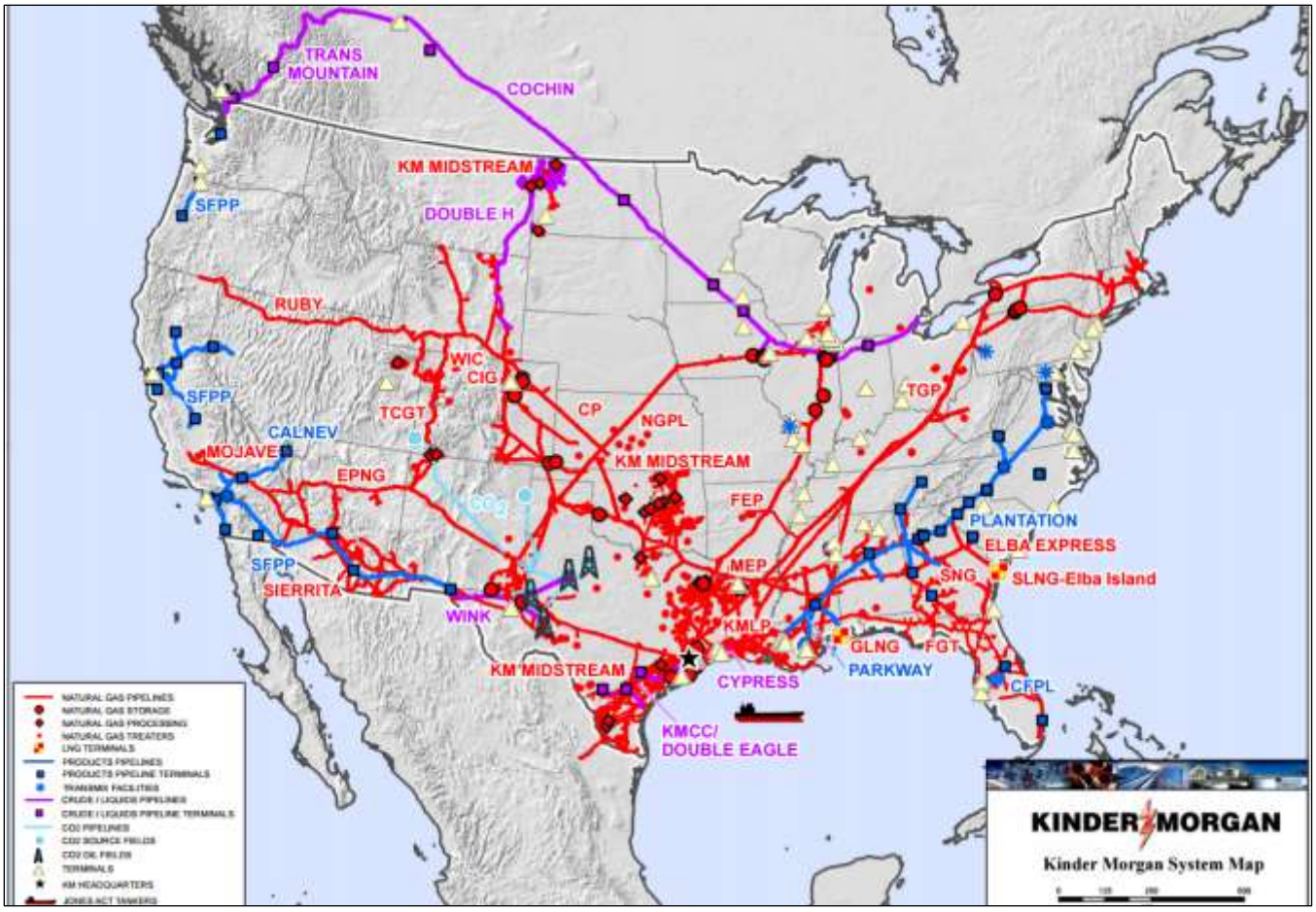


Figure 15-8. Kinder Morgan National Pipeline Map

Business and Industrial Areas

Retail, manufacturing and light industrial firms near State Route 65 (northeastern Roseville and the Sunset Industrial Area of Rocklin) are areas of concern. These facilities have the highest concentration of hazardous materials at fixed facilities in Roseville due to their manufacturing operations. Each business is required to file a detailed, confidential plan with the Roseville Fire Department regarding materials on-site and safety measures taken to protect the public.

Agricultural

Accidental releases of pesticides, fertilizers, and other agricultural chemicals may be harmful to both humans and the environment. Agricultural pesticides are transported daily in and around Roseville en route to their destination in rural areas of Placer County.

Illegal Drug Operations

Illegal operations such as laboratories for methamphetamine pose a significant hazard. Laboratory residues are often dumped along roadways or left in rented hotel rooms, creating a serious health hazard to unsuspecting individuals and to the environment.

Illegal Dumping Sites

Hazardous wastes such as used motor oil, solvents, or paint are occasionally dumped in remote areas of Placer County and Roseville or along roadways, creating a potential health hazard to unsuspecting individuals and to the environment.

Radioactive Materials

Licensed carriers transport radioactive materials along several transportation routes (Interstate 80 and the railroads) through the City of Roseville. The City is notified in advance of these shipments and commits resources as a standby measure should an accident occur.

15.2.3 Frequency

Terrorism

As of 2014, California's economy was the largest of any state in the U.S. Placer County's proximity to the state capitol presents unique conditions for terrorist attacks. The transportation, energy, and communications systems that cross the county have impacts on the local, regional, and even national economy. In general, the risks of a terrorist event involving a WMD are as follows:

- **Chemical**—The risk of a chemical event is present in the City of Roseville. The agricultural community in Placer County uses and stores significant amounts of chemicals for peaceful and productive means that could be used in destructive ways.
- **Explosives**—Pipe bomb and suspicious package events have occurred in Placer County and Roseville in the past. While none of the events has been identified as a WMD, the elements necessary to construct a WMD are readily available. Additionally, the agricultural communities maintain sufficient products and quantities for use in explosive events.
- **Radiological/Nuclear**—The major transportation arteries for vehicles or rail that cross through or near the City of Roseville contribute to the risk of a radiological event. Such products can pass unknown through any one of the regional transportation corridors.
- **Biological**—Anthrax incidents that occurred in the U.S. in October 2001 demonstrate the potential for spreading terror through biological WMDs. The introduction of Newcastle disease in the United States demonstrates how an agent can be introduced to livestock, causing harm to public health and the economy.
- **Combined Hazards**—WMD agents can be combined to have a greater total effect. When combined, the impacts of the event can be immediate and longer-term. Casualties will likely suffer from both immediate and long-term burns and contamination. Given the risks associated with chemical agents in Placer County and the City of Roseville, the possibility exists for such a combined event to occur.

Technological

Hazardous material incidents may occur at any time in the City of Roseville, given the presence of transportation routes bisecting the City, the location of businesses and industry that use hazardous materials, the presence of scattered illegitimate businesses such as clandestine drug laboratories at any given time, and the improper disposal of hazardous waste.

15.2.4 Severity

The severity of human-caused hazards could range from a minor transportation accident or power outage to a full-scale terrorist attack.

The term mass casualty incident (MCI) is often applied to transportation accidents involving air and rail travel, as well as multi-vehicle highway accidents. However, MCIs may also result from hazardous materials incidents or acts of violence, such as shootings or hostage situations. Effects may include serious injuries, loss of life, and associated property damage.

Because large numbers of patients may be involved, significant MCIs may tax local emergency medical and hospital resources, and therefore require a regional response. MCIs may occur throughout the City, day or night, at any time of the year: Interstate 80, State Route 65, and State Route 49 offer the potential for MCIs because of the heavy volume of traffic, although no highway or surface street in the City is exempt from this hazard.

The railroad tracks traversing Placer County, carrying Amtrak passengers as well as freight, also face the risk of an MCI, as do the air corridors above the county. Adverse weather may play a role in roadway, air, or rail accidents. MCIs may also result from acts of violence or terrorism, which could include a chemical, biological or radiological incident, contaminating persons and requiring mass decontamination.

In Placer County, an MCI is defined as any incident with three or more fatalities or critically injured. The first responders, including Roseville Fire, Roseville Police, and emergency room staffs at the local hospitals, follow the same protocol for an MCI whether the number of dead and injured is three, 30 or 300. Mutual aid is requested should Roseville be unable to respond appropriately with available personnel and equipment.

15.2.5 Warning Time

According to the Roseville Terrorism Contingency Plan, only 5 percent of all terrorism incidents are preceded by a warning. In the case of a technological hazard, accidents occur without predictability under circumstances that give responders little time to prepare.

15.3 SECONDARY HAZARDS

The largest secondary impact caused by human-caused hazards would be economic. Economic impacts from human-caused hazards are described in Section 15.5.5.

15.4 EXPOSURE

The risk assessment for this hazard is based on a facility's criticality and physical vulnerability:

- Criticality is a measure of the potential consequence of an accidental or terrorist event as well as the attractiveness of the facility to a potential adversary or threat. The criticality for each critical facility is based on the factors shown in Table 15-5.
- Vulnerability is a measure of the physical opportunity for an accident or an adversarial attack. This assessment takes into consideration physical design, existing countermeasures, and site layout. The vulnerability for each critical facility is based on the criteria shown in Table 15-6.

Table 15-5. Criticality Factors

Criterion	Low Criticality	Medium Criticality	High Criticality
Awareness[a]	Not known/Neighborhood	City/Region/County	State/National
Hazardous Materials[b]	None / limited and secure	Moderate to large and secure	Large, minimum or no security
Collateral Damage Potential[c]	None or low	Moderate/immediate area or within 1 mile radius	High/immediate area or within 1 mile radius

Site Population[d]	0 – 300	301 – 1,000	1,001 or greater
Public/ Emergency Function[e]	No emergency function, or could be used for emergency function in the future	Support emergency function—redundant site	Emergency function—critical service with or without redundancy

a. Awareness—How aware is the public of the existence of the facility, site, system, or location?
b. Hazardous Materials—Are flammable, explosive, biological, chemical and/or radiological materials present on site?
c. Collateral Damage Potential—What are the potential consequences for the surrounding area if the asset is attacked or damaged?
d. Site Population—What is the potential for mass causalities, based on the capacity of the facility.
e. Public or Emergency Functions—Does the facility perform a function during an emergency? Is this facility or function capable of being replicated elsewhere?

Table 15-6. Vulnerability Criteria

Criterion	Low Vulnerability	Medium Vulnerability	High Vulnerability
Accessibility[a]	Remote location, secure perimeter, tightly controlled access	Controlled access, protected or unprotected entry	Open access, unrestricted, patrolling security, sign restrictions
Automobile Proximity[b]	Not within 75' – 100'	Not within 25' – 50'	Adjacent or not within 10'
Asset Mobility[c]	Moves or is relocated frequently	Moves or is relocated occasionally	Permanent/Fixed
Proximity to other Critical Facilities[d]	Greater than 1.5 – 2 miles	Greater than 3/4 - 1 mile	Within 1/2 – 3/4 mile
Secure Design[e]	No areas for concealment of packages, air intakes are on roof, access ways are not under the structure.	Area of concealment present, greater than 25' from the structure; Air intakes located at least 10' above ground, may have under structure access drives.	Areas of concealment within 25', air intakes at ground level, under structure access drives.

a. Accessibility—How accessible is the facility or site to the public?
b. Automobile Proximity—How close can an automobile get to the facility? How vulnerable is the facility to a car bomb attack?
c. Asset Mobility—Is the facility or asset's location fixed or mobile? If mobile, how often is it moved, relocated, or repositioned?
d. Proximity to other critical facilities—If the facility is close to other critical facilities then there could be an increased probability of the facility receiving collateral damage.
e. Secure design—General evaluation of areas of obstruction, air intake locations, parking lot and road design and locations and other site design aspects.

15.4.1 Population

A human-caused hazard event could range from an isolated accident to a coordinated attack by multiple agents upon multiple targets. Large-scale incidents have the potential to kill or injure many citizens in the immediate vicinity, and may also affect people a relative distance from the initial event. Variables affecting exposure for a WMD attack and a hazardous material accident include the physical and chemical properties of the WMD, the ambient temperature, wind speed, wind direction, barometric pressure, and humidity.

Computer models are used by Roseville's Hazardous Materials teams to provide general data to first responders to advise evacuations or sheltering in place. With so many variables to determine "toxic endpoints" as defined by the California Environmental Protection Agency, distances are difficult to forecast. In general, those close to the City's transportation corridors or businesses with acutely hazardous materials are more at risk for some sort of effect. Each chemical incident will be different and the scenarios are too numerous to describe in this Plan.

Hazardous materials pose a significant risk to emergency response personnel. All potential first responders and follow-on emergency personnel in the City of Roseville currently are and will be properly trained to the level of emergency response actions required of their individual position at the response scene. Hazardous materials also pose a serious long-term threat to public health and safety, property and the environment.

15.4.2 Property

According to the City of Roseville's 2035 General Plan, there were 49,998 housing units in the City as of 2010. Single-family detached residential units account for 75.7 percent of the total developed residential units in Roseville according to the City's current General Plan. The total number of units by type of dwelling unit is shown in Table 15-7.

Table 15-7. Residential Dwelling Units in the City of Roseville as of 2012

Type of Unit	Existing Citywide Units
Single Family	35,809
Mobile Home	491
Multi-Family (>=3 units attached)	10,988
Total	**47,288**

Source: City of Roseville 2035 General Plan, Housing Element

Roseville has over 27 million square feet of developed non-residential land uses covering over 3,000 acres city-wide. A majority of this development has occurred since the mid-1980s when the specific plan process was established and large tracts of land were entitled for development. Roseville and Placer County are among the fastest growing communities in California, making them a higher profile target for terrorism. New development has been the target of arson fires and eco-terrorism in the County.

15.4.3 Critical Facilities and Infrastructure

There are no high profile federal or state buildings in Roseville. Critical facilities are limited to City facilities, Placer County facilities, and other government facilities such as the U.S. Post Office, private utility infrastructure and administrative offices, and medical facilities. Roseville's civic facilities are designed to welcome the public, with convenient parking and customer service areas. Except for the Roseville Police Facility, there are limited secure areas that are restricted to the public. Based on the criticality factors and vulnerability criteria described above, these facilities are all at risk because of their accessibility, automobile accessibility, and lack of a secure or hardened design.

Several of Roseville's critical emergency response facilities are located adjacent to the Roseville Rail Yard and pressurized underground pipelines, including the Roseville Civic Center, a primary location for City staff and services (see Figure 15-9), the Roseville Fire Department, which houses administration functions in Fire Station No. 1, and the City's emergency operations center. Significant regional critical facilities such as the Placer County courts and the main office for the U.S. Post Office are also close to the rail yard.



Figure 15-9. Roseville Civic Center

Several factors make gathering places such as the Roseville Civic Center vulnerable to human-caused hazards:

- All are accessible to the general public, to benefit aesthetically pleasing design and customer service.
- Design features, including types of building materials, and screened enclosures for mechanical equipment and solid waste, limit visibility and may contribute to the damage incurred should an intentional or accidental event occur.
- Automobile access is required in the design of most buildings in Roseville, with disabled access parking and easily accessible parking a valued feature.
- Most high population centers do not feature any limitations to access by the public or vehicles, although restricted access to large employment center sites with acutely hazardous materials is built into the design at these facilities.

15.4.4 Environment

The risk of human-caused hazards to the environment is considerable. Hazardous materials spilled along roads or railways could easily pollute rivers, streams, wetlands, riparian areas and adjoining fields. Other hazardous materials released into the air could severely impact plant and animal species. The City of Roseville recognizes this risk and has taken steps to reduce the risk exposure to the natural environment. By reducing the risk exposure to the built environment, the City will also mitigate potential losses to the natural environment.

15.5 VULNERABILITY

15.5.1 Population

Although human-caused hazards have not resulted in a large number of deaths in this area, this type of hazard can be deadly and widespread. Injuries and casualties were not estimated for this hazard. Any individuals exposed to human-caused hazards are considered to be at risk, particularly those working as first responder professionals.

15.5.2 Property

All structures in Roseville are physically vulnerable to a human-caused hazard. The emphasis on accessibility, the opportunity for roof access, driveways underneath some structures, unmonitored areas, the proximity of many structures to transportation corridors and underground pipelines, and the potential for a terrorist to strike any structure randomly all have an impact on the vulnerability of structures. Specific vulnerabilities are on file with the Roseville Fire Department as part of a State Homeland Security Assessment Survey and surveys conducted to complete this mitigation plan.

15.5.3 Critical Facilities and Infrastructure

Most critical facilities and infrastructure in Roseville would be vulnerable to human-caused hazards, including utilities, data and telecommunications systems, and transportation facilities.

15.5.4 Environment

The environment vulnerable to a human-caused hazard is the same as the environment exposed to the hazard. While human-caused disasters have caused significant damage to the environment, estimating damage can be difficult. Loss estimation platforms such as HAZUS-MH are not equipped to measure environmental impacts of these types of hazards. The best gauge of vulnerability of the environment would be a review of damage from past human-caused hazard events. Loss data for damage to the environment were not available at the time of this Plan update. Capturing this data from future events could be beneficial in measuring the vulnerability of the environment for future updates.

15.5.5 Economic impacts

Economic impacts from human-caused hazards could be significant. The cost of a terrorist act would be felt in terms of loss of life and property, disruption of business activity and long-term emotional impacts. Recovery would take significant resources at the local level.

Utility losses could cause a reduction in employment, wholesale and retail sales, utility repairs, and increased medical risks. The City may lose sales tax and property taxes, and the finances of private utility companies and the businesses that rely on them would be disrupted.

The economic impact of data and telecommunications losses can be great, as computer security breaches, crime conducted via the world wide web such as identify theft, and many more forms of human-caused economic losses occur daily. Millions of dollars are lost each year as criminals and cyberterrorists steal sensitive information and funds from individuals and organizations.

The economic impacts would be significant if a transportation facility were rendered impassable. The loss of a roadway or railway would have serious effects on the City's economy and ability to provide services. Loss of travel routes on Interstate 80 or State Route 65 would result in loss of commerce, and may impact the City's ability to provide emergency services to its citizens by delaying response times or limiting routes for equipment such as fire apparatus, police vehicles, and ambulances. Fuel deliveries would also be impacted.

The effects of re-routed traffic could also have a serious impact on local roadways. For example, the closure of the roadway at Folsom Dam has resulted in severe local traffic and the closure of businesses in downtown Folsom due to lack of traffic along the Dam Road route. Heavy traffic on routes through central Roseville already occur at peak commute times when Interstate 80 is congested. Traffic control may burden the City's Public Works Department. Mass transit services would be impacted as routes may be delayed or forced to be detoured, causing economic impacts on Roseville transit and on those who ride buses in Roseville.

15.6 FUTURE TRENDS IN DEVELOPMENT

The potential for human-caused hazards in Roseville is not likely to lessen or prohibit development in Roseville. The threat of human-caused hazards and the availability of Homeland Security Funds will influence future development of the City's critical facilities. Multi-purpose facilities such as the Mahany Library (which also includes a community center and the public access studio) can be used as both an emergency response command center on the west side of Roseville and an information center to inform the public through the internet and broadcast facilities that will be on site.

15.7 REVIEW OF EXISTING ORDINANCES, PROGRAMS, AND PLANS

15.7.1 City of Roseville Emergency Response Plan

Adopted on July 21, 2004 and updated in 2010, the Roseville Emergency Operations Plan addresses the planned response to emergency situations associated with natural disasters, technological (human-caused) emergencies, and war emergency operations in or affecting the City of Roseville. The plan is an operational plan as well as a reference document for pre-emergency planning and emergency operations. It establishes the following:

- An emergency management organization to mitigate any significant emergency or disaster affecting the City of Roseville
- Policies, responsibilities and procedures to protect the health and safety of citizens, public and private property, and the environment from the effects of natural and human-caused emergencies and disasters
- Operational concepts and procedures associated with field response to emergencies, emergency operations center activities, and the recovery process
- A framework for implementing the Standardized Emergency Management System in Roseville.

The Emergency Operations Plan outlines the natural and human-caused hazards most likely to occur in Roseville. It provides significant detail for each responding section assigned to City staff and mutual aid agencies prior to an emergency—management, operations, planning, logistics and finance. Roseville's Emergency Preparedness Manager conducts periodic tabletop and simulated exercises in conjunction with the Placer County Office of Emergency Services and affiliated agencies such as Sutter Roseville Medical Center and Kaiser Permanente Medical Center to ensure that staff is prepared and adequate resources are in place prior to any incident.

City of Roseville departments and other agencies providing emergency response within the City will review this plan at least annually in association with the Multi-Hazard Mitigation Steering Committee. A comprehensive review and subsequent gap analysis report was conducted on the Roseville Emergency Operations Plan in conjunction with the 2016 hazard mitigation planning process. Prioritized recommendations for revisions were provided to the City of Roseville.

15.7.2 City of Roseville Terrorism Contingency Plan

The City of Roseville Terrorism Contingency Plan was prepared in 2004 with grant funds provided through Cal OES by the U.S. Department of Homeland Security. The plan was prepared in collaboration with the Placer

County Office of Emergency Services, Placer County staff and representatives of the six incorporated cities in the Placer County Operational Area. The Terrorism Plan provides an overview of how the Emergency Operations Plan will be activated, how resources will be organized, and how staff will respond with state and federal resources. Specifically, the Terrorism Plan has the following provisions:

- Identifies how local, state, and federal response resources are integrated.
- Establishes a common response protocol to terrorist threats and events.
- Implements existing mutual aid programs.
- Outlines a unified strategic plan for all responders.

The Terrorism Plan is on file with the City of Roseville Fire Department. The City's Emergency Response Manager conducts training for all those assigned responsibilities as part of the plan in addition to coordinating with the Placer County Office of Emergency Services and other agencies charged with protecting the public in the event of a terrorist attack.

15.7.3 City of Roseville Hazardous Materials Contingency Plan

The Hazardous Materials Contingency Plan, completed in September 2004, identifies non-terrorist related hazardous materials responsibilities in order for the City to prepare, respond and recover from an event. The objectives of the Hazardous Materials Plan are as follows:

- Establish policies and responsibilities for protecting the health and safety of the general population and visitors in the City of Roseville and surrounding communities, the environment, and public and private property from the effects of accidental hazardous materials incidents.
- Identify the emergency response organizations that are responsible for managing hazardous materials incidents in or near the City of Roseville.
- Establish operational concepts for staffing, training, operating and supporting the City of Roseville hazardous materials team. The Hazardous Materials Plan is coordinated with the Placer Operational Interagency Response Team Hazard Plan.
- Direct all individuals, agencies, and departments referenced in the Hazardous Materials Plan to develop standard operating procedures and emergency response checklists that are consistent with the Hazardous Materials Plan and the City's Emergency Operations Plan.

15.7.4 State of California Certified Unified Program Agency

The City of Roseville is a State of California Certified Unified Program Agency. This designation identifies the City as a licensing agency for six hazardous-material-related programs. It enables the City of Roseville to implement its own hazardous materials emergency response program. Mutual aid agreements are also in place for incident response. Each business that responds yes to any of the following questions must submit a Unified Program Consolidated Form with facility information to the Roseville Fire Department:

- **Hazardous Materials**—Do you have on-site hazardous materials at or above 55 gallons for liquids, 500 pounds for solids, or 200 cubic feet for compressed gases, or the applicable threshold for an extremely hazardous substance specified in federal law; or do you handle radiological materials in quantities for which an emergency plan is required pursuant to applicable law?
- **Underground Storage Tank**—Do you have on-site underground storage tanks?
- **Above-Ground Storage Tank**—Do you have on-site above-ground storage tanks for storage of petroleum?
- **Hazardous Waste**—Do you operate a facility that generates, recycles, or treats hazardous waste, among other activities?

The Fire Department requires existing and proposed businesses to submit lists of hazardous materials they use. The list is maintained by the Fire Department Life Safety/Hazardous Materials Officer and updated periodically.

15.7.5 Roseville Police Department

Following the provisions and emergency response, mitigation, and recovery structure of the State Emergency Management System, the federally mandated National Incident Management System, and the National Response Plan, the Roseville Police Department is prepared to meet the challenge of intentional criminal acts, including acts of terrorism, as well as technological, accidental, or natural hazards in the following ways:

- Activation of local emergency response plans using multi-disciplinary resources, including but not limited to regional municipal and county law enforcement, the Joint Terrorism Task Force overseen by the FBI, the Department of Justice Anti-Terrorism Information Center, state and federal military personnel, and private resource agencies
- Deployment of local tactical resources to mitigate human-caused acts of terrorism or intentional business disruption, including SWAT, hostage negotiators, rapid containment team, the tactical communications team, and explosive ordnance personnel as necessary
- Use of the Crime Scene Investigations Unit for post-incident evidence collection and investigation
- Intake, processing, analysis, and investigation of all incidents with the potential for large-scale impact in a professional, timely manner.

15.7.6 Roseville Public Safety Communications

Communications personnel are prepared to take the following actions:

- Appropriately recognize and document citizens' reports of suspicious activity.
- Deploy appropriate resources to prevent, investigate, mitigate, and provide recovery services following incidents of human caused hazards, as well as natural and technological disasters.
- Coordinate resource management of personnel, equipment, and facilities during established crisis incidents.
- Work within the framework of the State Emergency Management System to provide emergency communications to field units and emergency operations personnel during emergency events.
- Deploy mutual aid assistance in support of local, state, and national entities during crisis incidents.
- Provide life-saving pre-arrival instructions on emergency medical incidents, both large-scale and of an individual nature.

15.7.7 Roseville Fire Department

Training

Roseville Fire Department personnel are highly trained to handle all aspects of emergency service. All first response personnel are trained in incident command, advanced firefighting skills, basic life support, essential rescue skills, and basic hazardous materials response. All first response personnel are trained to meet or exceed the following state training certification levels: Firefighter I & II, CPR, Emergency Medical Technician I, Hazmat First Responder Operations Decon and ICS 200.

To support these first responders, specialized teams of personnel are trained and certified in tower rescue, above/below grade rescue, confined space rescue, trench rescue, technical rescue, swift water rescue, dive rescue, specialized hazardous materials response, hazardous materials railcar and tank truck response, terrorism response, multi-casualty management, and advanced life support.

The department's staffing includes a full-time training officer who oversees the Fire Training Division. In addition to the training officer, the department draws from a cadre of state certified ICS, fire, EMS, hazmat and technical rescue instructors to conduct regular training exercises to maintain and enhance competency of personnel in all aspects of emergency response. The department also sends personnel to the National Fire Academy, California Specialized Training Institute, Hazmat Continuing Challenge and other off site programs for advanced certifications and training.

The Fire Department maintains a state-of-the-art training facility within the city limits. The Fire Training Center includes two classrooms, a six-story burn tower, command center and other specialized training props such as above- and below-grade vaults, tanks, cargo tanks and a rail tank car. The Roseville Fire Training Center has been state certified as a regional fire academy and for Hazardous Materials Technician / Specialist, Urban Search and Rescue Systems and Confined Space training.

In addition to training in-service response personnel, the Roseville Fire Training Center hosts a regional fire academy in cooperation with Sierra College. The Roseville Fire Training Center also provides regional training to other fire agencies, some of which are under contract with the Department of Homeland Security. Regular regional training includes the Hazardous Materials Technician / Specialist series, Low Angle Rope Rescue, Trench Rescue, Confined Space Rescue, and Urban Search and Rescue Systems I.

Response Time and Mutual Aid

The Roseville Fire Department is a fully functional agency that primarily provides fire suppression and emergency medical services for the urban environment of the City. The department operates eight stations. The department has eight paramedic engine companies, with a minimum staffing of three, two paramedic truck companies with a minimum staffing of four, and one battalion chief. The department also operates a hazardous materials response unit (cross-staffed the truck company); five grass/wildland units, and one technical rescue unit (cross-staffed by engine companies). The department maintains four reserve engines and one reserve truck.

The Fire Department has established a Standards of Response Coverage Plan that includes a travel time standard of 4 minutes from the time the apparatus leaves the station to the arrival of the first engine on scene. Due to significant growth in the City, additional fire stations are needed to achieve this response time. Fire Station 9 opened in May 2013 to serve the new development anticipated in West Roseville.

The City of Roseville has mutual aid agreements with local fire departments and districts in surrounding Placer County and Sacramento County. These personnel cooperate in the same training program as the City firefighters to ensure a high level of competency even with borrowed resources. The department participates in the statewide mutual aid system to bring additional resources from anywhere in California or the nation if this level of aid does not meet the incident needs.

Hazardous Materials Response

Hazardous Materials Listing

All hazardous materials handlers that store in excess of 55 gallons of liquid, 500 pounds of solids, or 200 cubic feet of gas are required to submit Hazardous Materials Management Business Plans to the Roseville Fire Department. These plans provide emergency contact information, site-specific chemical inventories, and vicinity and facility maps. Facilities storing materials that are "acutely" hazardous and in excess of the quantities in CCR, Title 19, Tables I, II or III must submit a more comprehensive Risk Management Plan, which includes off-site consequences analysis, maintenance, and training programs, and an executive summary. Owners/operators of above-ground tanks containing in excess of 660 gallons of petroleum hydrocarbons (or an aggregate quantity of 1,320 gallons) must comply with the California Aboveground Petroleum Storage Act, which requires the preparation of a spill prevention, control, and countermeasure plan.

Development Review Process

The Fire Department reviews any development proposal that may be impacted by or cause an impact related to the storage, handling, or disposal of hazardous materials. A Hazardous Materials Management Plan and, if necessary, a Risk Management Prevention Plan are required as part of the development process per state law. When considering any use, the City analyses the use of toxic or hazardous materials requiring the filing of a business plan for emergency response pursuant to Section 25503.5 of the California Health and Safety Code or materials identified in Section 5194, Title 8 of the CCR. All users must submit a list of hazardous and toxic materials with a qualified discussion of potential chronic and acute long-term health effects, including effects on children, and effects from acute short-term or chronic long-term exposure.

In addition, a plan must be submitted specifying procedures for mitigating the emissions of toxic substances and groundwater monitoring and for identifying methods of hazardous waste disposal. All projects must be reviewed for compliance with the Placer County Hazardous Waste Management Plan.

Intergovernmental Coordination

The Roseville Fire Department works cooperatively with other local and state agencies in a coordinated effort to inform and educate the public regarding the storage, handling, and disposal of household hazardous materials. This includes continued coordination with the Placer County Hazardous Materials Response Teams.

Hazardous Waste Drop-off

The City of Roseville partners with public and private entities to remove household hazardous waste from Roseville's waste stream. The disposals include the following:

- **Household Hazardous Waste Collection**—The Western Placer Waste Management Authority provides a collection service for household hazardous waste. Residents can transport waste to the Authority's facility north of Roseville or schedule a pickup through the Roseville Solid Waste Division.
- **Used Electronic Equipment**—The Materials Recovery Facility accepts old televisions and other electronic waste.
- **Used Motor Oil Recycling**—There are six locations in Roseville designated for used motor oil recycling drop-off.
- **Sharps (or Needles)**—Roseville residents who use medical needles for in-home care are encouraged to purchase sharps containers, which hold 100 needles, at a nominal cost from several drug stores in the City. Residents are asked to dispose of all medical needles and containers properly so they do not enter the waste stream.

Interagency Cooperation for Emergency Response

The City of Roseville Fire Department responds in accordance with the City of Roseville Hazardous Materials Emergency Response Plan to hazardous materials emergencies. Both the California Highway Patrol and the City of Roseville have developed a Hazardous Materials Emergency Plan that discusses the participants' responsibilities, organization and operation to be complied with in the event of a hazardous materials emergency, including clean-up and decontamination procedures.

Hazardous Materials Truck Route

The City of Roseville does not have specific truck routes for hazardous materials. The City does have established truck routes in the city limits, and in the event hazardous materials are to be transported within the city limits, a permit is required from the Roseville Police Department. Typically, trucks with bulk deliveries of hazardous materials use State Route 65 to Blue Oaks Boulevard and then access any of the north-south corridors, including

Washington Boulevard, Industrial Avenue, and Foothills Boulevard where local businesses use hazardous materials in their business activities.

Routes for hazardous materials are coordinated with the California Department of Transportation (Caltrans), the California Highway Patrol, and the Roseville Police, Fire, and Public Works Departments.

Since Blue Oaks Boulevard remains incomplete, there is a risk of hazardous material being transported on bulk trucks through residential areas to reach the Pleasant Grove Wastewater Treatment Plant and the Energy Park. The same is true for transportation of hazardous material to the Booth Road plant, but chlorine gas is no longer used for disinfection there (nor at other water plants serving Roseville).

Hazardous Materials Fee Program

The Roseville Fire Department has adopted a fee schedule for hazardous material permitting, storage, use, handling, and generation. The department also charges for fire and life safety inspections, plan review, and miscellaneous activities such as a Hazardous Materials Business Plan Review.

15.8 SCENARIO

Two human-caused hazard scenarios could have a significant impact on the City of Roseville:

- The first scenario would involve hazardous materials being transported via rail or highway (Interstate 80) across the planning area. The release of hazardous materials via intentional or unintentional means could impact large population centers within the City. Advance knowledge of these shipments and their contents would play a role in preparedness for this scenario, thus reducing its potential impact. The biggest issue in response to hazardous material is material identification and containment.
- The second scenario would be a terrorist event at a large gathering place such as a mall or event center. Terrorist events happen with little or no warning. With a population in excess of 120,000 people, Roseville does possess potential targets for terrorist activities. The City has taken steps to assess these sites as well as probable scenarios in its Terrorism Contingency Plan.

15.9 ISSUES

Future actions needed at the local level to address human-caused hazards include but are not limited to the following:

- Continue all facets of emergency preparedness training for police, fire, public works, and city manager/public information staff in order to respond quickly in the event of a human-caused disaster. Enhance awareness training for all City employees to recognize threats or suspicious activity in order to prevent an incident from occurring.
- Continue all facets of the City's hazardous materials team training and response through commitment of resources from the Fire Department budget and the addition of funding through the Sacramento Regional Homeland Security budget.
- Continue to improve response times for public safety throughout the City so as to reduce exposure to human-caused incidents. The City will maintain appropriate staffing levels of public safety personnel to address vulnerabilities identified in this chapter.
- Train first responders and all appropriate City staff to implement protocols contained in the City of Roseville Terrorism Response Plan.
- Continue to implement the City of Roseville Hazardous Materials Contingency Plan with enhancements as warranted by the type of uses in the City and new technologies in preventing hazardous materials incidents.

- Continue to work proactively with Union Pacific Railroad regarding the following:
  - Placards and labeling of containers
  - Emergency plans and coordination
  - Standardized response procedures
  - Notification of the types of materials being transported through Roseville on at least an annual basis
  - Random inspections of transporters as allowed by Union Pacific
  - Installation of mitigating techniques along the rail yard at critical locations
  - Routine hazard communication initiatives
  - Enhancing security along the rail corridor should the alert system go higher than Orange
  - Continuously looking to the use of safer alternative products to conduct rail transport operations.
- Continue regular testing of the alarm system along the Union Pacific railroad tracks in Central Roseville.
- Utilize Crime Prevention Through Environmental Design (CPTED) in future planning efforts as well as enhancing existing infrastructure and buildings to prevent or mitigate human-cause incidents. CPTED is an urban planning design process that integrates crime prevention with neighborhood design and community development. CPTED is based on the theory that the proper design and effective use of the built environment can reduce crime and the fear of crime and improve the quality of life. CPTED creates an environment where the physical characteristics, building layout, and site planning allow inhabitants to become key agents in ensuring their own security.
- Work with the private sector to enhance and create Business Continuity Plans in the event of an emergency.
- Relocate or construct a redundant Emergency Operations Center farther from the Roseville Rail Yard and floodplain.
- Maintain an emergency services information line that the public can contact 24 hours a day during an emergency incident to ask questions of emergency staff.
- Coordinate with all Roseville school districts to ensure that their emergency preparedness plans include preparation for human-caused incidents.
- Encourage local businesses to adopt Information Technology and telecommunications recovery plans.
- Promote 72-hour self-sufficiency through the Emergency Preparedness Manager's efforts, the Roseville website, Roseville Coalition of Neighborhood Associations, and other media.
- Continue to share the human-caused hazard risk and preparedness presentation given at the public meetings and City Council workshop as part of this preparedness effort.
- Maintain the on-line Citizens Advisory Panel of 2,400 households and periodically e-mail emergency preparedness information including human-caused hazard preparedness instructions and reminders.

Future actions needed at the regional level to address human-caused hazards include but are not limited to the following:

- Participate in regional, state and federal efforts to gather terrorism information at all levels and keep public safety officials briefed at all times regarding any local threats. Staff will then further develop response capabilities based on emerging threats.
- Participate in the Cal OES Disaster Resistant California annual conference and other training sessions sponsored by regional, state and federal agencies.
- Participate in regional training exercises per the requirements of Homeland Security Presidential Directive #8 in support of national preparedness. These training exercises, sponsored by the Sacramento Regional Office of Homeland Security, will test and evaluate the ability to coordinate the activities of city, county and state government first responders, volunteer organizations and the private sector in responding to terrorism and technological hazards. The trainings will enhance interagency coordination,

provide training to staff, test response and recovery capabilities, and activate the National Incident Management System and the mutual aid system.

- Review existing automatic/mutual aid agreements with other public safety agencies to identify opportunities for enhancement.

16. PLANNING AREA RISK RANKING

A risk ranking was performed for the hazards of concern described in this Plan. This risk ranking assesses the probability of each hazard's occurrence as well as its likely impact on the people, property, and economy of the planning area. When available, estimates of risk were generated with data from Hazus-MH or GIS analysis using methodologies promoted by FEMA. For hazards of concern with less robust datasets, qualitative assessments were used. The results are used in establishing mitigation priorities.

The climate change hazard was not ranked because its impacts are factored into each individual hazard and thus are peripherally included in this assessment. The human-health and human-caused hazards were not ranked because they are not considered natural hazards.

16.1 PROBABILITY OF OCCURRENCE

The probability of occurrence of a hazard is indicated by a probability factor based on likelihood of annual occurrence:

- High—Hazard event is likely to occur within 25 years (Probability Factor = 3)
- Medium—Hazard event is likely to occur within 100 years (Probability Factor =2)
- Low—Hazard event is not likely to occur within 100 years (Probability Factor =1)
- No exposure—There is no probability of occurrence (Probability Factor = 0)

The assessment of hazard frequency is generally based on past hazard events in the area. Table 16-1 summarizes the probability assessment for each hazard of concern for this Plan.

Table 16-1. Probability of Hazards

Hazard Event	Probability (high, medium, low)	Probability Factor
Dam Failure	Low	1
Drought	High	3
Earthquake	High	3
Flooding	Medium	2
Landslide	Low	1
Severe Weather	High	3
Wildfire	High	3

16.2 IMPACT

Hazard impacts were assessed in three categories: impacts on people, impacts on property and impacts on the local economy. Numerical impact factors were assigned as follows:

- **People**—Values were assigned based on the percentage of the total ***population exposed*** to the hazard event. The degree of impact on individuals will vary and is not measurable, so the calculation assumes for

simplicity and consistency that all people exposed to a hazard because they live in a hazard zone will be equally impacted when a hazard event occurs. An element of subjectivity can be used in assigning values for impacts on people. Impact factors were assigned as follows:

- High—50 percent or more of the population is exposed to a hazard (Impact Factor = 3)
- Medium—25 percent to 49 percent of the population is exposed to a hazard (Impact Factor = 2)
- Low—25 percent or less of the population is exposed to the hazard (Impact Factor = 1)
- No impact—None of the population is exposed to a hazard (Impact Factor = 0)

- **Property**—Values were assigned based on the percentage of the total ***property value exposed*** to the hazard event:

  - High—30 percent or more of the total assessed property value is exposed to a hazard (Impact Factor = 3)
  - Medium—15 percent to 29 percent of the total assessed property value is exposed to a hazard (Impact Factor = 2)
  - Low—14 percent or less of the total assessed property value is exposed to the hazard (Impact Factor = 1)
  - No impact—None of the total assessed property value is exposed to a hazard (Impact Factor = 0)

- **Economy**—Values were assigned based on the percentage of the total ***property value vulnerable*** to the hazard event. Values represent estimates of the loss from a major event of each hazard in comparison to the total assessed value of the property exposed to the hazard. For some hazards, such as wildfire, landslide and severe weather, vulnerability was considered to be the same as exposure due to the lack of loss estimation tools specific to those hazards. Loss estimates separate from the exposure estimates were generated for the earthquake and flood hazards using Hazus-MH.

  - High—Estimated loss from the hazard is 20 percent or more of the total exposed property value (Impact Factor = 3)
  - Medium—Estimated loss from the hazard is 10 percent to 19 percent of the total exposed property value (Impact Factor = 2)
  - Low—Estimated loss from the hazard is 9 percent or less of the total exposed property value (Impact Factor = 1)
  - No impact—No loss is estimated from the hazard (Impact Factor = 0)

Each category of impact was assigned a weighting factor to reflect its significance: impact on people was given a weighting factor of 3; impact on property was given a weighting factor of 2; and impact on the economy was given a weighting factor of 1. Table 16-2, Table 16-3 and Table 16-4 summarize the impacts for each hazard.

Table 16-2. Impact on People from Hazards

Hazard Event	Impact (high, medium, low)	Impact Factor	Multiplied by Weighting Factor (3)
Dam Failure	High	3	9
Drought[a]	None	0	0
Earthquake	High	3	9
Flooding	Low	1	3
Landslide	Low	1	3
Severe Weather	High	3	9
Wildfire	Medium	2	6

a. All people in the planning area would be exposed to drought, but the impact on the safety of individuals is expected to be minimal.

Table 16-3. Impact on Property from Hazards

Hazard Event	Impact (high, medium, low)	Impact Factor	Multiplied by Weighting Factor (2)
Dam Failure	High	3	6
Drought[a]	None	0	0
Earthquake	High	3	6
Flooding	Low	1	2
Landslide[b]	Low	0	0
Severe Weather	High	3	6
Wildfire	High	3	6

a. All properties in the planning area would be exposed to drought, but the impact on properties is expected to be minimal.
b. Impact on property is less than 0.5% and thus registers as 0.

Table 16-4. Impact on Economy from Hazards

Hazard Event	Impact (high, medium, low)	Impact Factor	Multiplied by Weighting Factor (1)
Dam Failure	High	3	3
Drought	Low	1	1
Earthquake	Low	1	1
Flooding	Low	1	1
Landslide	Low	1	1
Severe Weather	Low	1	1
Wildfire	Low	0	0

16.3 RISK RATING AND RANKING

The risk rating for each hazard was determined by multiplying the probability factor by the sum of the weighted impact factors for people, property and operations, as summarized in Table 16-5.

Based on these ratings, a priority of high, medium or low was assigned to each hazard. The hazards ranked as being of highest concern are earthquake, severe weather, and wildfire. Hazards ranked as being of medium concern are flood and dam failure. The hazards ranked as being of lowest concern are drought and landslide. Table 16-6 shows the hazard risk ranking.

Table 16-5. Hazard Risk Rating

Hazard Event	Probability Factor	Sum of Weighted Impact Factors	Total (Probability x Impact)
Dam Failure	1	18	18
Drought	3	1	3
Earthquake	3	16	48
Flooding	2	6	12
Landslide	1	4	4
Severe Weather	3	16	48
Wildfire	3	12	36

Table 16-6. Hazard Risk Ranking

Hazard Ranking	Hazard Event	Category
1	Severe Weather	High
2	Earthquake	High
3	Wildfire	High
4	Dam Failure	Medium
5	Flood	Medium
6	Landslide	Low
7	Drought	Low

Part 3. Mitigation Strategy

17. GUIDING PRINCIPLE, GOALS, OBJECTIVES, AND PREVIOUS ACTION STATUS

Hazard mitigation plans must identify goals for reducing long-term vulnerabilities to identified hazards (44 CFR Section 201.6(c)(3)(i)). For the purposes of this Plan, goals and objectives are defined as follows:

- **Goals** are general guidelines that explain what is to be achieved. They are usually broad-based, policy-type statements, long-term, and represent global visions. Goals help define the benefits that the Plan is trying to achieve. The success of the hazard mitigation plan should be measured by the degree to which its goals have been met (that is, by the actual benefits in terms of hazard mitigation).
- **Objectives** are short-term aims which, when combined, form a strategy or course of action to meet a goal. Unlike goals, objectives are specific and measurable.

After establishing a guiding principle for this hazard mitigation plan, the City of Roseville developed goals and objectives for the initial plan through discussions, research, and meetings of the Steering Committee and based on input from stakeholders and the public. Information for this process was garnered from the public involvement strategy, the risk assessment, and review of the California and Placer County hazard mitigation plans.

The Steering Committee identified seven goals, working from a catalog of goal statements created through review of other similar plans and FEMA planning guidance. Once the goals were established, objectives that meet multiple goals were selected through a similar exercise.

For the 2016 Plan, the Steering Committee reviewed the goals and objectives established for the previous plan to determine if they still fulfill the vision of reducing risk in the planning area. It was determined that the goals and objectives are still relevant to the vision.

17.1 GUIDING PRINCIPLE

A guiding principle or a mission statement for a plan is a written declaration of the plan's core purpose and focus. It normally remains unchanged over time, regardless of a change to the plan's goals or objectives. Though not required for DMA compliance, the incorporation of a guiding principle provides a clear, singular message that can be a focal point throughout all facets of the planning process. The City of Roseville developed the following guiding principle for 2016 to be carried through to subsequent updates to the hazard mitigation plan:

> *Through community partnerships, establish a plan to reduce vulnerability to hazards in order to protect the health, safety, welfare, and economy of the City.*

17.2 GOALS

The goals for the 2016 Plan, consistent with the hazards identified in this plan, are as follows:

- G-1: Protect lives and reduce injury.
- G-2: Promote hazard mitigation as an integrated policy.

- G-3: Protect the continuity of local government to ensure no significant disruption of services during or due to a disaster.
- G-4: Improve community emergency management preparedness, collaboration and outreach.
- G-5: Minimize or reduce damage to property, including critical facilities.
- G-6: Develop and implement mitigation strategies that optimize public funds in an efficient and cost-effective way.
- G-7: Monitor and support the natural environment's capacity to deal with the impacts of natural hazards, taking into account the potential impacts of global climate change.

17.3 OBJECTIVES

The Steering Committee selected the objectives listed in Table 17-1 to meet multiple goals. The objectives serve as a stand-alone measurement of a mitigation action rather than as a subset of a goal. Achievement of the objectives is a measure of the effectiveness of a mitigation strategy. The objectives are also used to help establish priorities.

Table 17-1. Objectives for 2011 Multi-Hazard Mitigation Plan

Objective Number	Objective Statement	Goals for which it can be applied
O-1	Consider the impacts of hazards on future land uses in the City of Roseville by coordinating with other planning mechanisms such as the General Plan and land-use code development.	1, 2, 5, 7
O-2	Protect and sustain reliable local emergency operations and communication facilities during and after disasters.	1, 3, 4
O-3	Develop new or enhance existing early warning response systems and plans.	1, 3, 4, 5
O-4	Seek to enhance emergency response capabilities through improvements to infrastructure and City programs.	1, 4, 5
O-5	Enhance the understanding of all present and future hazards that impact the City of Roseville and the risk they pose.	1, 3, 4, 5, 7
O-6	Seek mitigation projects that provide the highest degree of hazard protection at the least cost.	1, 5, 6
O-7	Seek to update information on natural, environmental, and human-caused hazards, vulnerabilities, and mitigation measures by coordinating planning efforts and creating partnerships with appropriate local, private, county, state, and federal agencies.	1, 2, 3, 4, 5, 7
O-8	Seek to implement codes, standards, and policies that will protect life and property, including natural habitat, from the impacts of hazards within the City of Roseville.	1, 2, 3, 5, 6
O-9	Educate the public on preparedness for and mitigation of potential impacts of hazards on the City of Roseville.	1, 2, 4
O-10	Support efforts to retrofit, purchase, or relocate structures in high hazard areas, including those known to be repetitively damaged.	3, 5, 6

17.4 STATUS OF PREVIOUS ACTIONS

The City of Roseville develops an annual Progress Report which includes the status of previous actions. This Progress Report details completed actions as well as those actions added outside of the 5-year update cycle. A copy of the 2015 Progress Report is located in Appendix B.

18. MITIGATION ALTERNATIVES

Catalogs of hazard mitigation alternatives were developed that present a broad range of alternatives to be considered for use in the planning area, in compliance with 44 CFR (Section 201.6(c)(3)(ii)). One catalog was developed for each hazard of concern evaluated in this Plan. The catalogs present alternatives that are categorized in two ways:

- By who would have responsibility for implementation:
  - Individuals (personal scale)
  - Businesses (corporate scale)
  - Government (government scale).
- By what the alternative would do:
  - Manipulate the hazard
  - Reduce exposure to the hazard
  - Reduce vulnerability to the hazard
  - Increase the ability to respond to or be prepared for the hazard.

Hazard mitigation actions recommended in this Plan were selected from among the alternatives presented in the catalogs. The catalogs provide a baseline of mitigation alternatives that are backed by a planning process, are consistent with the established goals and objectives, and are within the capabilities of the City of Roseville to implement. Some of these actions may not be feasible based on the selection criteria identified for this Plan. The purpose of the catalog was to provide a list of what could be considered to reduce risk of the flood hazard within the planning area. Actions in the catalog that are not included for the action plan were not selected for one or more of the following reasons:

- The action is not feasible.
- The action is already being implemented.
- There is an apparently more cost-effective alternative.
- The action does not have public or political support.

The catalogs for each hazard are presented in Table 18-1 through Table 18-9.

Table 18-1. Alternatives to Mitigate the Dam Failure Hazard

Personal-Scale	Corporate-Scale	Government-Scale
• **Manipulate the hazard:** ○ **None** • **Reduce exposure to the hazard:** ○ **Relocate out of dam failure inundation areas.** • **Reduce vulnerability to the hazard:** ○ **Elevate home to appropriate levels.** • **Increase the ability to respond to or be prepared for the hazard:** ○ **Learn about risk reduction for the dam failure hazard.** ○ **Learn the evacuation routes for a dam failure event.** ○ **Educate yourself on early warning systems and the dissemination of warnings.**	• **Manipulate the hazard:** ○ Remove dams. ○ Remove levees. ○ Harden dams. • **Reduce exposure to the hazard:** ○ Replace earthen dams with hardened structures. • **Reduce vulnerability to the hazard:** ○ Flood-proof facilities within dam failure inundation areas. • **Increase the ability to respond to or be prepared for the hazard:** ○ Educate employees on the probable impacts of a dam failure. ○ Develop a continuity of operations plan.	• **Manipulate the hazard:** ○ Remove dams. ○ Remove levees. ○ Harden dams. • **Reduce exposure to the hazard:** ○ Replace earthen dams with hardened structures ○ Relocate critical facilities out of dam failure inundation areas. ○ Consider open space land use in designated dam failure inundation areas. • **Reduce vulnerability to the hazard:** ○ Adopt higher regulatory floodplain standards in mapped dam failure inundation areas. ○ Retrofit critical facilities within dam failure inundation areas. • **Increase the ability to respond to or be prepared for the hazard:** ○ Map dam failure inundation areas. ○ Enhance emergency operations plan to include a dam failure component. ○ Institute monthly communications checks with dam operators. ○ Inform the public on risk reduction techniques ○ Adopt real-estate disclosure requirements for the re-sale of property located within dam failure inundation areas. ○ Consider the probable impacts of climate in assessing the risk associated with the dam failure hazard. ○ Establish early warning capability downstream of listed high hazard dams. ○ Consider the residual risk associated with protection provided by dams in future land use decisions.

Table 18-2. Alternatives to Mitigate the Drought Hazard

Personal-Scale	Corporate-Scale	Government-Scale

• **Manipulate the hazard:**
  ○ **None**
• **Reduce exposure to the hazard:**
  ○ **None**
• **Reduce vulnerability to the hazard:**
  ○ **Drought-resistant landscapes**
  ○ **Reduce water system losses**
  ○ **Modify plumbing systems (through water saving kits)**
• **Increase the ability to respond to or be prepared for the hazard:**
  ○ **Practice active water conservation**
	• **Manipulate the hazard:**
	  ○ None
	• **Reduce exposure to the hazard:**
	  ○ None
	• **Reduce vulnerability to the hazard:**
	  ○ Drought-resistant landscapes
	  ○ Reduce private water system losses
	• **Increase the ability to respond to or be prepared for the hazard:**
	  ○ Practice active water conservation
		• **Manipulate the hazard:**
		  ○ Groundwater recharge through stormwater management
		• **Reduce exposure to the hazard:**
		  ○ Identify and create groundwater backup sources
		• **Reduce vulnerability to the hazard:**
		  ○ Reduce water system losses
		  ○ Distribute water saving kits
		  ○ Increase use of recycled water
		  ○ Diversify water supply diversion points
		• **Increase the ability to respond to or be prepared for the hazard:**
		  ○ Public education on drought resistance
		  ○ Identify alternative water supplies for times of drought; mutual aid agreements with alternative suppliers
		  ○ Implement drought contingency plan
		  ○ Develop criteria “triggers” for drought-related actions
		  ○ Improve accuracy of water supply forecasts

Table 18-3. Alternatives to Mitigate the Earthquake Hazard

Personal-Scale	Corporate-Scale	Government-Scale
• **Manipulate the hazard:** ○ **None** • **Reduce exposure to the hazard:** ○ **Locate outside of hazard area (off soft soils)** • **Reduce vulnerability to the hazard:** ○ **Retrofit structure (anchor house structure to foundation)** ○ **Secure household items that can cause injury or damage (such as water heaters, bookcases, and other appliances)** ○ **Build to higher design** • **Increase the ability to respond to or be prepared for the hazard:** ○ **Practice "drop, cover, and hold"** ○ **Develop household mitigation plan, such as creating a retrofit savings account, communication capability with outside, 72-hour self-sufficiency during an event** ○ **Keep cash reserves for reconstruction** ○ **Become informed on the hazard and risk reduction alternatives available.** ○ **Develop a post-disaster action plan for your household**	• **Manipulate the hazard:** ○ None • **Reduce exposure to the hazard:** ○ Locate or relocate mission-critical functions outside hazard area where possible • **Reduce vulnerability to the hazard:** ○ Build redundancy for critical functions and facilities ○ Retrofit critical buildings and areas housing mission-critical functions • **Increase the ability to respond to or be prepared for the hazard:** ○ Adopt higher standard for new construction; consider "performance-based design" when building new structures ○ Keep cash reserves for reconstruction ○ Inform your employees on the possible impacts of earthquake and how to deal with them at your work facility. ○ Develop a continuity of operations plan	• **Manipulate the hazard:** ○ None • **Reduce exposure to the hazard:** ○ Locate critical facilities or functions outside hazard area where possible • **Reduce vulnerability to the hazard:** ○ Harden infrastructure ○ Provide redundancy for critical functions ○ Adopt higher regulatory standards • **Increase the ability to respond to or be prepared for the hazard:** ○ Provide better hazard maps ○ Provide technical information and guidance ○ Enact tools to help manage development in hazard areas (e.g., tax incentives, information) ○ Include retrofitting and replacement of critical system elements in capital improvement plan ○ Develop strategy to take advantage of post-disaster opportunities ○ Warehouse critical infrastructure components such as pipe, power line, and road repair materials ○ Develop and adopt a continuity of operations plan ○ Initiate triggers guiding improvements (such as <50% substantial damage or improvements) ○ Further enhance seismic risk assessment to target high hazard buildings for mitigation opportunities. ○ Develop a post-disaster action plan that includes grant funding and debris removal components.

Table 18-4. Alternatives to Mitigate the Flooding Hazard

Personal-Scale	Corporate-Scale	Government-Scale
• **Manipulate the hazard:** ○ **Clear storm drains and culverts** ○ **Use low-impact development techniques** • **Reduce exposure to the hazard:** ○ **Locate outside of hazard area** ○ **Elevate utilities above base flood elevation** ○ **Use low-impact development techniques** • **Reduce vulnerability to the hazard:** ○ **Raise structures above base flood elevation** ○ **Elevate items within house above base flood elevation** ○ **Build new homes above base flood elevation** ○ **Flood-proof structures** • **Increase the ability to respond to or be prepared for the hazard:** ○ **Buy flood insurance** ○ **Develop household plan, such as retrofit savings, communication with outside, 72-hour self-sufficiency during and after an event**	• **Manipulate the hazard:** ○ Clear storm drains and culverts ○ Use low-impact development techniques • **Reduce exposure to the hazard:** ○ Locate critical facilities or functions outside hazard area ○ Use low-impact development techniques • **Reduce vulnerability to the hazard:** ○ Build redundancy for critical functions or retrofit critical buildings ○ Provide flood-proofing when new critical infrastructure must be located in floodplains • **Increase the ability to respond to or be prepared for the hazard:** ○ Keep cash reserves for reconstruction ○ Support and implement hazard disclosure for sale of property in risk zones. ○ Solicit cost-sharing through partnerships with others on projects with multiple benefits.	• **Manipulate the hazard:** ○ Maintain drainage system ○ Institute low-impact development techniques on property ○ Dredging, levee construction, and providing regional retention areas ○ Structural flood control, levees, channelization, or revetments. ○ Stormwater management regulations and master planning ○ Acquire vacant land or promote open space uses in developing watersheds to control increases in runoff • **Reduce exposure to the hazard:** ○ Locate or relocate critical facilities outside of hazard area ○ Acquire or relocate identified repetitive loss properties ○ Promote open space uses in identified high hazard areas via techniques such as: planned unit developments, easements, setbacks, greenways, sensitive area tracks. ○ Adopt land development criteria such as planned unit developments, density transfers, clustering ○ Institute low impact development techniques on property ○ Acquire vacant land or promote open space uses in developing watersheds to control increases in runoff • **Reduce vulnerability to the hazard:** ○ Harden infrastructure, bridge replacement program ○ Provide redundancy for critical functions and infrastructure ○ Adopt regulatory standards such as freeboard standards, cumulative substantial improvement or damage, lower substantial damage threshold; compensatory storage, non-conversion deed restrictions. ○ Stormwater management regulations and master planning. ○ Adopt “no-adverse impact” floodplain management policies that strive to not increase the flood risk on downstream communities. • **Increase the ability to respond to or be prepared for the hazard:** ○ Produce better hazard maps ○ Provide technical information and guidance ○ Enact tools to help manage development in hazard areas (stronger controls, tax incentives, and information) ○ Incorporate retrofitting or replacement of critical system elements in capital improvement plan ○ Develop strategy to take advantage of post-disaster opportunities ○ Warehouse critical infrastructure components ○ Develop and adopt a continuity of operations plan ○ Consider participation in the Community Rating System ○ Maintain and collect data to define risks and vulnerability ○ Train emergency responders ○ Create an elevation inventory of structures in the floodplain ○ Develop and implement a public information strategy ○ Charge a hazard mitigation fee ○ Integrate floodplain management policies into other planning mechanisms within the planning area. ○ Consider the probable impacts of climate change on the risk associated with the flood hazard ○ Consider the residual risk associated with structural flood control in future land use decisions ○ Enforce National Flood Insurance Program ○ Adopt a Stormwater Management Master Plan

Table 18-5. Alternatives to Mitigate the Landslide Hazard

Personal-Scale	Corporate-Scale	Government-Scale
• **Manipulate the hazard:** ○ **Stabilize slope (dewater, armor toe)** ○ **Reduce weight on top of slope** ○ **Minimize vegetation removal and the addition of impervious surfaces.** • **Reduce exposure to the hazard:** ○ **Locate structures outside of hazard area (off unstable land and away from slide-run out area)** • **Reduce vulnerability to the hazard:** ○ **Retrofit home** • **Increase the ability to respond to or be prepared for the hazard:** ○ **Institute warning system, and develop evacuation plan** ○ **Keep cash reserves for reconstruction** ○ **Educate yourself on risk reduction techniques for landslide hazards**	• **Manipulate the hazard:** ○ Stabilize slope (dewater, armor toe) ○ Reduce weight on top of slope • **Reduce exposure to the hazard:** ○ Locate structures outside of hazard area (off unstable land and away from slide-run out area) • **Reduce vulnerability to the hazard:** ○ Retrofit at-risk facilities • **Increase the ability to respond to or be prepared for the hazard:** ○ Institute warning system, and develop evacuation plan ○ Keep cash reserves for reconstruction ○ Develop a continuity of operations plan ○ Educate employees on the potential exposure to landslide hazards and emergency response protocol.	• **Manipulate the hazard:** ○ Stabilize slope (dewater, armor toe) ○ Reduce weight on top of slope • **Reduce exposure to the hazard:** ○ Acquire properties in high-risk landslide areas. ○ Adopt land use policies that prohibit the placement of habitable structures in high-risk landslide areas. • **Reduce vulnerability to the hazard:** ○ Adopt higher regulatory standards for new development within unstable slope areas. ○ Armor/retrofit critical infrastructure against the impact of landslides. • **Increase the ability to respond to or be prepared for the hazard:** ○ Produce better hazard maps ○ Provide technical information and guidance ○ Enact tools to help manage development in hazard areas: better land controls, tax incentives, information ○ Develop strategy to take advantage of post-disaster opportunities ○ Warehouse critical infrastructure components ○ Develop and adopt a continuity of operations plan ○ Educate the public on the landslide hazard and appropriate risk reduction alternatives.

Table 18-6. Alternatives to Mitigate the Severe Weather Hazard

Personal-Scale	Corporate-Scale	Government-Scale
• **Manipulate the hazard:** ○ **None** • **Reduce exposure to the hazard:** ○ **None** • **Reduce vulnerability to the hazard:** ○ **Insulate house** ○ **Provide redundant heat and power** ○ **Insulate structure** ○ **Plant appropriate trees near home and power lines ("Right tree, right place" National Arbor Day Foundation Program)** • **Increase the ability to respond to or be prepared for the hazard:** ○ **Trim or remove trees that could affect power lines** ○ **Promote 72-hour self-sufficiency** ○ **Obtain a NOAA weather radio.** ○ **Obtain an emergency generator.**	• **Manipulate the hazard:** ○ None • **Reduce exposure to the hazard:** ○ None • **Reduce vulnerability to the hazard:** ○ Relocate critical infrastructure (such as power lines) underground ○ Reinforce or relocate critical infrastructure such as power lines to meet performance expectations ○ Install tree wire • **Increase the ability to respond to or be prepared for the hazard:** ○ Trim or remove trees that could affect power lines ○ Create redundancy ○ Equip facilities with a NOAA weather radio ○ Equip vital facilities with emergency power sources.	• **Manipulate the hazard:** ○ None • **Reduce exposure to the hazard:** ○ None • **Reduce vulnerability to the hazard:** ○ Harden infrastructure such as locating utilities underground ○ Trim trees back from power lines ○ Designate snow routes and strengthen critical road sections and bridges • **Increase the ability to respond to or be prepared for the hazard:** ○ Support programs such as "Tree Watch" that proactively manage problem areas through use of selective removal of hazardous trees, tree replacement, etc. ○ Establish and enforce building codes that require all roofs to withstand snow loads ○ Increase communication alternatives ○ Modify land use and environmental regulations to support vegetation management activities that improve reliability in utility corridors. ○ Modify landscape and other ordinances to encourage appropriate planting near overhead power, cable, and phone lines ○ Provide NOAA weather radios to the public

Table 18-7. Alternatives to Mitigate the Wildfire Hazard

Personal-Scale	Corporate-Scale	Government-Scale
• **Manipulate the hazard:** ○ **Clear potential fuels on property such as dry overgrown underbrush and diseased trees** • **Reduce exposure to the hazard:** ○ **Create and maintain defensible space around structures** ○ **Locate outside of hazard area** ○ **Mow regularly** • **Reduce vulnerability to the hazard:** ○ **Create and maintain defensible space around structures and provide water on site** ○ **Use fire-retardant building materials** ○ **Create defensible spaces around home** • **Increase the ability to respond to or be prepared for the hazard:** ○ **Employ techniques from the National Fire Protection Association's Firewise Communities program to safeguard home** ○ **Identify alternative water supplies for fire fighting** ○ **Install/replace roofing material with non-combustible roofing materials.**	• **Manipulate the hazard:** ○ Clear potential fuels on property such as dry underbrush and diseased trees • **Reduce exposure to the hazard:** ○ Create and maintain defensible space around structures and infrastructure ○ Locate outside of hazard area • **Reduce vulnerability to the hazard:** ○ Create and maintain defensible space around structures and infrastructure and provide water on site ○ Use fire-retardant building materials ○ Use fire-resistant plantings in buffer areas of high wildfire threat. • **Increase the ability to respond to or be prepared for the hazard:** ○ Support Firewise community initiatives. ○ Create /establish stored water supplies to be used for firefighting.	• **Manipulate the hazard:** ○ Clear potential fuels on property such as dry underbrush and diseased trees ○ Implement best management practices on public lands. • **Reduce exposure to the hazard:** ○ Create and maintain defensible space around structures and infrastructure ○ Locate outside of hazard area ○ Enhance building code to include use of fire resistant materials in high hazard area. • **Reduce vulnerability to the hazard:** ○ Create and maintain defensible space around structures and infrastructure ○ Use fire-retardant building materials ○ Use fire-resistant plantings in buffer areas of high wildfire threat. ○ Consider higher regulatory standards (such as Class A roofing) ○ Establish biomass reclamation initiatives • **Increase the ability to respond to or be prepared for the hazard:** ○ More public outreach and education efforts, including an active Firewise program ○ Possible weapons of mass destruction funds available to enhance fire capability in high-risk areas ○ Identify fire response and alternative evacuation routes ○ Seek alternative water supplies ○ Become a Firewise community ○ Use academia to study impacts/solutions to wildfire risk ○ Establish/maintain mutual aid agreements between fire service agencies. ○ Create/implement fire plans ○ Consider the probable impacts of climate change on the risk associated with the wildfire hazard in future land use decisions

Table 18-8. Alternatives to Mitigate Health Hazards

Personal-Scale	Corporate-Scale	Government-Scale
• **Manipulate the hazard:** ○ **None** • **Reduce exposure to the hazard:** ○ **Eliminate or reduce environments on private property that favor mosquito infestation** • **Reduce vulnerability to the hazard:** ○ **Immunization** • **Increase the ability to respond to or be prepared for the hazard:** ○ **Get informed**	• **Manipulate the hazard:** ○ None • **Reduce exposure to the hazard:** ○ Eliminate or reduce environments on private property that favor mosquito infestation • **Reduce vulnerability to the hazard:** ○ Immunize employees • **Increase the ability to respond to or be prepared for the hazard:** ○ Inform employees on human health hazards	• **Manipulate the hazard:** ○ Mosquito abatement • **Reduce exposure to the hazard:** ○ Eliminate or reduce environments on public property that favor mosquito infestation • **Reduce vulnerability to the hazard:** ○ Immunize employees • **Increase the ability to respond to or be prepared for the hazard:** ○ Collaborate with the Placer County Health Department to ensure the health and welfare of the community ○ Public education on mosquito abatement and general human health issues

Table 18-9. Alternatives to Mitigate Human-Cause Hazards

Personal-Scale	Corporate-Scale	Government-Scale
• **Manipulate the hazard:** ○ **None** • **Reduce exposure to the hazard:** ○ **None** • **Reduce vulnerability to the hazard:** ○ **None** • **Increase the ability to respond to or be prepared for the hazard:** ○ **Increase awareness of vulnerability to threats** ○ **Neighborhood watch program** ○ **Keep informed** ○ **Develop an emergency response plan** ○ **Report suspicious activities**	• **Manipulate the hazard:** ○ None • **Reduce exposure to the hazard:** ○ Incorporate anti-terrorism and security mitigation measures in site and layout design of facilities ○ Consider site security in landscape design of facilities • **Reduce vulnerability to the hazard:** ○ Restrict access by implementing controlled access zones ○ Increase security measures ○ Install physical barriers around critical facilities ○ Employ parking restrictions as a means to reduce vulnerability • **Increase the ability to respond to or be prepared for the hazard:** ○ Become a partner (stakeholder) in mitigation and prevention ○ Educate employees ○ Develop an emergency response plan ○ Develop a Continuity of Operations Plan ○ Use liberal signage techniques to inform and increase capability of users of facilities	• **Manipulate the hazard:** ○ None • **Reduce exposure to the hazard:** ○ Construct new critical facilities with clear zones. ○ Retrofit existing critical facilities • **Reduce vulnerability to the hazard:** ○ Restrict access by implementing controlled access zones ○ Reduce single-point vulnerabilities such as: redundancy for critical lifelines and infrastructure ○ Install physical barriers around critical facilities ○ Provide regular education to personnel regarding cyber attacks • **Increase the ability to respond to or be prepared for the hazard:** ○ Educate public on threats and vulnerability ○ Enhance emergency response capability by contingency planning for specific events based on identified vulnerabilities ○ Consider performance-based zoning as a land use alternative to mitigate impacts of human-caused hazards ○ Employ Crime Prevention Through Environmental Design (CPTED techniques in design of public facilities ○ Consider providing incentives for mitigation ○ Develop a City THIRA ○ Establish secure communications between multiple entities to communicate sensitive information.

19. ACTION PLAN AND IMPLEMENTATION

19.1 HAZARD MITIGATION ACTION PLAN

The Steering Committee reviewed the catalogs of hazard mitigation alternatives and selected actions to be included in a hazard mitigation action plan. The selection of actions was based on the risk assessment of identified hazards of concern and the defined Roseville hazard mitigation goals and objectives. Table 19-1 lists the recommended hazard mitigation actions that make up the action plan. The timeframe indicated in the table is defined as follows:

- Short Term = to be completed in 1 to 5 years
- Long Term = to be completed in greater than 5 years
- Ongoing = currently being funded and implemented under existing programs.

Table 19-1. Action Plan

Hazards Addressed	Funding Options	Timeframe	Objectives Met	In Previous Plan? (# from previous plan)
Lead Agency: Central Services Department				
Action #F-20— Retrofit the City's Downtown library by sealing the exterior and installing a flood door to protect against flood damage should Dry Creek overspill the existing floodwall.				
Flood	Grant funding (PDM, HMGP, and FEMA) based on benefits exceeding costs	Long term	6, 10	Yes (F-21)
Lead Agency: City Council				
Action #HC-3—Seek to establish appropriate staffing levels of public safety personnel to address vulnerabilities identified through an incremental targeted study that provides immediate needs as well as anticipated needs in 1 year, 5 years, and 10 years.				
Human-Caused	General Fund	Short term	2, 4	Yes (HC-3)
Lead Agency: City Manager's Office				
Action #HH-3—Collaborate with the Placer County Mosquito Abatement District to review resource protection policies that conflict with human health protection in the City of Roseville and work to resolve these policy issues				
Human Health	Currently budgeted for under the General Fun	Short term	5, 6, 7, 9	Yes (HH-3)
Lead Agency: Public Affairs & Communications Department				
Action #HH-2—Support the public education efforts of the Placer County Health Department and the Placer Mosquito Abatement District				
Human Health	Currently budgeted for under the General Fund	Short term	5, 6, 7, 9	Yes (HH-2)
Action #MH-2—Continue to maintain the hazard mitigation page on City website that provides following types of information: • The Hazard Management Plan and its progress reports • Hazard-specific information • Mitigation information by hazard, with specific emphasis on private property • Emergency response and warning information • Links to county, state, and federal related agencies				
	General Fund; PDM grant funding	Short term	2, 3, 5, 6, 9	Yes (MH-2)
Lead Agency: Development Services Department				
Action #EQ-1—Perform building-specific, structural seismic vulnerability assessment of City-owned critical facilities constructed prior to 1980 (including infrastructure). Included in this assessment will be recommended mitigation alternatives that meet goals and objectives of this Plan.				
Earthquake	General Fund; Possible grant funding under PDM program	Long term	5, 10	Yes (EQ-1)
Action #EQ-2—Incorporate earthquake mitigation measures for private property into existing City-sponsored outreach programs such as printed media and the City's website.				
Earthquake	City General fund	Short term	1, 9, 10, 11	Yes (EQ-2)
Action #EQ-3—Reassess the overall vulnerability to the earthquake hazard using the best available science and technology as it becomes available. State-sponsored programs, Seismic Hazards Mapping Act, and future FEMA- sponsored initiatives are anticipated to create a wealth of knowledge regarding this hazard that did not exist during the preparation of this Plan.				
Earthquake	General Fund; Possible grant funding under PDM program	Short term	1, 5, 7, 9	Yes (EQ-3)
Action #F-1—The City shall designate all areas identified as the 100-year floodplain. The boundaries of the 100-year floodplain shall be as specified in the floodplain designations section of this component of the City's General Plan. Floodplain areas shall be preserved as specified in the open space and conservation element. Such preservation may include required dedication to the City. If needed, modify the City's ordinances to include floodplain use regulations consistent with the goals, policies, and implementation measures of the safety, land use, open space and conservation, and parks and recreation elements of the City's General Plan.				
Flood	Currently funded by General Fund allocation	Long term	1, 6, 7	Yes (F-1)

Hazards Addressed	Funding Options	Timeframe	Objectives Met	In Previous Plan? (# from previous plan)
Action #F-2—Refer any development proposal that has a direct or indirect impact on flood protection to Public Works for comment. In addition, forward such proposals to other agencies as applicable, including the U.S. Army Corps of Engineers, California Central Valley Flood Protection Board, FEMA, California Department of Fish and Wildlife, Placer County Resource Conservation District, and Placer County Flood Control District. Consider the comments of the agencies during the development review process.				
Flood	Currently funded by General Fund allocation	Short term	1, 5, 7	Yes (F-2)
Action #F-9—Ensure that future specific plans and specific plan amendments are consistent with the goals and policies of the General Plan. The specific plans shall include the designation and preservation of floodplain areas and adjacent habitat. Provisions shall be incorporated to ensure that public infrastructure, utilities, and emergency services remain functional during flood conditions. Such infrastructure and facilities include water, sewer and gas mains, telephone and electric lines, streets and bridges, hospitals, and fire and police stations. Financing mechanisms shall be explored to fund necessary flood protection improvements and maintenance. Development agreements may be used to secure implementation and funding provisions. (Specific plans have 100% cost recovery by developers).				
Flood	Specific plans have 100% cost recovery by developers	Long term	1, 6, 7, 8	Yes (F-9)
Action #F-11—Require a master drainage plan as part of the approval process for all specific plans and large development projects as determined by the Public Works director. The master drainage plan should consider cumulative regional drainage and flooding mitigation. The plan's intent is to ensure that the overall rate of runoff from a project does not exceed predevelopment levels. If necessary, this objective shall be achieved by incorporating run-off control measures to minimize peak flows and/or assistance in financing or otherwise implementing comprehensive drainage plans.				
Flood	General Fund; Developer-based funding under specific plan requirements	Long term	1, 6, 8	Yes (F-11)
Action #LS-2— Continue to implement policies adopted by the General Plan that promote open space land uses within identified steep slope areas of Roseville. The City of Roseville Northeast Roseville Specific Plan and Stoneridge Specific Plans include the identified steep slope areas within Roseville. Both Plan Areas have continuing development.				
Landslide	General Fund; Developer-based funding and specific plan requirements	Short term	1, 6, 8	Yes (LS-2)
Action #MH-1—Continue to maintain Office of Emergency Services certification of all City inspectors for post-disaster damage assessment.				
Multi-Hazard	General Fund	Short term	2, 7	Yes (MH-1)
Lead Agency: Environmental Utilities Department (EUD)				
Action #D-1—Perform a groundwater recharge feasibility study to determine the most cost-effective way to replenish groundwater resources within Roseville.				
Drought	Water utility funds; General fund; Developer-based funding under specific plan requirements	Long term	5, 6	Yes (D-1)
Action #D-2—Implement aquifer storage and recovery program that uses direct injection technique in areas identified as appropriate.				
Drought	Water Construction Fund	Long term	6, 8	Yes (D-2)
Action #D-3—Continue to implement the Environmental Utility Department's recycled water program and seek all opportunities to expand its coverage, currently focusing on urban growth areas. The City pumps recycled water through a system of purple pipes completely separate from potable (drinking water) pipes. The City pumps the recycled water to customers such as streetscapes, golf courses and parks, where it irrigates turf and shrubs. Using recycled water for uses such as landscape irrigation reduces demand on the potable water system, creating a more reliable water supply for the entire City. Recycled water is not subject to the effects of drought.				
Drought	Water utility rates, developer-based fees under specific plan requirements	Short term	6, 8	Yes (D-3)
Action #D-4—Promote active water conservation techniques and strategies to private property owners through Roseville-sponsored outreach projects such as printed media and the City's website.				
Drought	Currently funded by General Fund allocation	Short term	5, 9	Yes (D-4)
Action #HC-5—Address vulnerabilities identified in vulnerability assessment of water facilities performed by the Environmental Utilities Department in response to EPA initiative.				
Human-Caused	EUD CIP, and EPA grant funding	Long term	5, 7	Yes (HC-5)

Hazards Addressed	Funding Options	Timeframe	Objectives Met	In Previous Plan? (# from previous plan)
Action #SW-4—Enhance and implement strategies for debris management and removal during severe weather events.				
	General Fund	Short term	6, 8	Yes (SW-5)
Lead Agency: Information Technology Division				
Action #HC-9—Protect the City's data, technology infrastructure and staff against malicious cyber-attacks and Cyber terrorism, such as but not limited to: • Identity Theft • Virus/Malware/Ransomware/Spyware/Spam/Phishing • Network and system attacks • Web site hacking • Denial-of-service attacks				
Human-Caused	General Fund	Short term	2, 5, 7	Yes (HC-9)
Action #MH-7—Strive to maintain high availability of essential communication services				
Multi-Hazard	EUD CIP, General Fund	Ongoing	2, 3, 4, 7	Yes (MH-7)
Action #MH-8—Secure the City's physical locations that contain technology infrastructure				
Multi-Hazard	EUD CIP, General Fund	Ongoing	2, 3, 4, 7	Yes (MH-8)
Lead Agency: Parks, Recreation & Libraries Department: Open Space Division				
Action #F-12—Continue the Parks, Recreation & Libraries Department's regular creek maintenance program within the City's creeks and floodplain areas. This program clears and removes debris that could contribute to blockage and flooding and may include the removal of silt. This is only done in areas of high risk to flood damage or where property or facilities are threatened by flooding.				
Flood	Currently funded by General Fund allocation	Ongoing	8	Yes (F-12)
Action #F-21—Continue the Tree Mitigation Fund program administered by the Open Space Division in conjunction with non-profit organizations. The planting of oak trees in the open spaces adjacent to riparian zones increases infiltration and slows storm water surges.				
Flood	General Fund	Ongoing	1, 5, 7, 9	Yes (F-22)
Action #F-22—Manage beaver dam sites for flood control protection and habitat restoration after dam removal. One primary issue is impacts to floodwater capacity of creeks. Part of the desired comprehensive approach to beaver management includes establishment of quantitative and qualitative "carrying capacity," including acre-feet of flood capacity lost. Implement a standard monitoring and reporting process to track beaver dam locations, population, and impacts. Gain regulatory approval for beaver management techniques such as biological control and habitat manipulation using the most benign options first.				
Flood	Currently funded by General Fund allocation	Ongoing	1, 6, 8	Yes (F-23)
Action #WF-1—Continue "Goat Grazing" program for removal of grassland in areas of Roseville potentially vulnerable to wildfire. Implement goat grazing in City open space and preserve areas for fire and invasive plant species management and native plant restoration.				
Wildfire	General Fund; Community Facilities District funding; PDM grant funding	Ongoing	6, 9	Yes (WF-2)
Action #MH-4—Implement an "Adopt an Open Space" program in coordination with the open space management program. Develop "adoption contracts" with neighborhoods, organizations, businesses, etc., describing the level of stewardship and the terms of the "adoption." Publicize these activities through online resource directory and other media to encourage participation.				
Multi-Hazard	General Fund; Community Facilities District funding; PDM grant funding	Short term	1, 5, 7, 9	Yes (MH-4)
Action #MH-5—Develop and disseminate best practices information to private property owners whose land is adjacent to open space areas describing stewardship opportunities and owners' role in preserving beneficial uses of open space areas (including vernal pool grassland and creek or riparian uses). Offer classes to provide in-depth information, such as demonstration projects, techniques for ecologically friendly weed abatement and vegetation control, and creating a backyard habitat compatible with open space areas.				
Multi-Hazard	General Fund; PDM grant funding	Short term	1, 5, 7, 9	Yes (MH-5)
Action #MH-6—Work with the Roseville City School District, local high school districts, and non-profit organizations to promote ecology-oriented curricula and stewardship activities. Identify resource and administrative barriers that may be limiting schools' abilities to more actively participate in stewardship, and work collaboratively to identify solutions.				
Multi-Hazard	General Fund; PDM grant funding	Long term	1, 5, 7, 9	Yes (MH-6)

Hazards Addressed	Funding Options	Timeframe	Objectives Met	In Previous Plan? (# from previous plan)
Lead Agency: Police and Fire Department				
Action #DF-1—Create a dam failure element for the City's emergency response plan that includes a phased warning protocol in response to the findings of the Folsom Dam Containment Dike Risk Assessment.				
Dam Failure	General Fund; Department of Homeland Security (DHS) grant funding	Short term	2, 3, 4, 9	Yes (DF-1)
Action #F-19—Implement recommendation of Downtown Roseville Specific Plan to relocate the Public safety Building				
Flood	Grant funding (PDM, HMGP, and FEMA) based on benefits exceeding costs	Short term	6, 10	Yes (F-20)
Action #HC-1—Commit support to initiatives within the Sacramento-Roseville-Arden-Arcade Metropolitan Statistical Area; continue to seek funding from other federal sources to fund its initiatives				
Human-Caused	General Fund	Short term	2, 7	Yes (HC-1)
Action #HC-2—Enhance emergency response capability of City by contingency planning for specific events based on identified vulnerabilities.				
Human-Caused	General Fund; DHS grant funding	Short term	2, 3, 4, 9	Yes (HC-2)
Action #HC-4—Prepare a site-specific vulnerability assessment of City- owned critical facilities that use the best available science and technology with regards to human-caused hazards.				
Human-Caused	General Fund; DHS grant funding	Short term	2, 5, 7	Yes (HC-4)
Action #HH-1—Continue to collaborate with the Placer County Health Department to ensure the health and welfare of the community				
Human Health	Currently budgeted for under the General Fund	Short term	5, 6, 7, 9	Yes (HH-1)
Action #SW-3—Continue education/outreach programs to improve winter preparedness and minimize loss of life or injury.				
	General Fund	Short term	6, 9	Yes (SW-4)
Action #WF-2—Enhance existing City public outreach programs to include information on fire safety, defensible spaces, and areas of concern.				
Wildfire	General Fund; Grant funding under PDM program and HMGP	Short term	6, 9	Yes (WF-3)
Action #MH-3—Establish/maintain a post-disaster action plan to be part of the City Emergency operations plan that will include following elements: • Procedures for public information • Post-disaster damage assessment • Grant writing • Code enforcement • Redundant operations				
Multi-Hazard	General Fund; PDM Grant Funding	Short term	2, 3, 4, 7	Yes (MH-3)
Lead Agency: Public Works Department				
Action #F-3—Continue City participation in the National Flood Insurance Program and the Community Rating System (CRS). Seek CRS classification improvements within capabilities of City programs, including adoption and administration of FEMA-approved ordinances and flood insurance rate maps (FIRM).				
Flood	Currently funded by General Fund allocation	Short term	1, 5, 9	Yes (F-3)
Action #F-4—Maintain Roseville's compliance and good standing under the National Flood Insurance program.				
	General Fund	Short term	2, 3, 4, 5, 10	Yes (F-4)
Action #F-5—Continue the City's outreach program to flood-prone property owners and the citizens of Roseville, to help make them aware of the flood threat and how best to deal with them.				
Flood	Currently funded by General Fund allocation	Short term	5, 9	Yes (F-5)

Hazards Addressed	Funding Options	Timeframe	Objectives Met	In Previous Plan? (# from previous plan)
Action #F-6—Continue to pursue a regional approach to flood issues by remaining actively involved in the Placer County Flood Control District. This involvement includes cooperation in the development of a comprehensive regional database. Continue to participate in regional flooding studies, including the Auburn Creek/Coon Creek/Pleasant Grove Creek flood mitigation plan and the Dry Creek watershed flood control plan.				
Flood	Currently funded by General Fund allocation	Long term	1, 5, 7	Yes (F-6)
Action #F-7—Continue City coordination with other agencies on issues of flood control. Coordination between the City and adjacent jurisdictions occurs through several mechanisms, including distribution of development proposals for review and comment. Continue City cooperation with federal, state, and local agencies, including the U.S. Army Corps of Engineers, California Central Valley Flood Protection Board, FEMA, California Department of Fish and Wildlife, Placer County Resource Conservation District, and the Placer County Flood Control District.				
Flood	Currently funded by General Fund allocation	Short term	1, 5, 7	Yes (F-7)
Action #F-8—Continue to develop, implement, and expand the Flood Alert and Early Warning Program systems and integrate the systems with other local jurisdictions to form a regional warning program.				
Flood	General Fund; Possible grant funding (PDM, HMGP, and Flood Mitigation Assistance)	Long term	2, 3	Yes (F-8)
Action #F-10—Monitor and regularly update City flood studies, modeling, and associated land use, zoning, and other development regulations at a minimum of every 5 years or whenever information becomes available that would significantly modify previous data. New information could include new studies, change in City policy, consideration of a major development project or specific plan, or implementation of a flood control project.				
Flood	General Fund; FEMA map modernization; Developer-based funding and specific plan requirements	Long term	1, 5, 7	Yes (F-10)
Action #F-13—Continue annual inspection and maintenance program of City storm drain systems. Review after every major storm system function and performance. This program removes debris that could contribute to blockage of the storm drain system.				
Flood	Currently funded by General Fund allocation and; gas tax	Short term	8	Yes (F-13)
Action #F-14—Complete the final two phases of the Cirby/Linda/Dry Creek flood control project (Phase 1 and 2). Five of the seven phases of this project have been completed at a cost of about $18,000,000. The basis for determining viability of this project will be a benefit /cost analysis to determine if project meets federal grant eligibility requirements.				
Flood	General Fund; Impact fees; Grant funding (PDM and HMGP) based on benefits exceeding costs	Long term	6, 8, 10	Yes (F-14)
Action #F-15—Analyze alternative improvements to the Cirby/Linda/Dry Creek flood control project that may be cost effective in the flood-prone areas of Roseville: • Dry Creek from Darling Way to Riverside Avenue • Area on Dry Creek upstream of Folsom Road in the Columbia Avenue/Marilyn Avenue/Bonita Street area • Linda Creek near Champion Oaks Drive/Samoa Way/Hurst Way area • Cirby Creek in the Trimble Way/Zien Court area				
Flood	General Funds; Developer-based funds, grant funding (PDM, HMGP, and FEMA) based on benefits exceeding costs	Long term	6, 8, 10	Yes (F-15)
Action #F-16—Replace the Huntington Drive/Cirby Creek culvert with a bridge to protect Queens Court/Huntington Drive area. The Public Works Department oversees this project.				
Flood	General Fund; CIP, developer-based funds, grant funding (PDM, HMGP, and FEMA) based on benefits exceeding costs	Long term	6, 10	Yes (F-16)
Action #F-17—Divert the main drainage storm drain system down Crestmont Avenue to Cirby Way and then into Dry Creek so that the existing system will not exceed capacity. If system capacity is exceeded, the intersection on Cirby Way and Crestmont Avenue and nearby homes will flood during major flood events.				
Flood	General Fund; CIP, developer-based funds, grant funding (PDM, HMGP, and FEMA) based on benefits exceeding costs	Short term	6, 10	Yes (F-17)

Hazards Addressed	Funding Options	Timeframe	Objectives Met	In Previous Plan? (# from previous plan)
Action #F-18—Continue to promote and sponsor programs to buy out, relocate, and flood-proof existing flood-prone structures within Roseville.				
Flood	Grant funding (PDM, HMGP, and FEMA) based on benefits exceeding costs	Short term	6, 10	Yes (F-18)
Action #F-23 – Develop the City's multi-use, multi-benefit stormwater retention project within the Pleasant Grove Creek Watershed, the Reason Farms Stormwater Retention Project.				
Flood	Developer-based funds, grant funding (PDM, HMGP, and FEMA) based on benefits exceeding costs	Long term	6, 10	No
Action #HC-10 – Improve evacuation transportation routes within the City of Roseville by removing traffic constrictions.				
Human Caused	Developer-based funds, grant funding (PDM, HMGP, and FEMA) based on benefits exceeding costs	Long term	6, 10	No
Action #LS-1—Once California Geological Survey completes soils mapping for the Roseville vicinity under the Seismic Hazards Mapping Act, reassess landslide hazard using best available data to gauge the true vulnerability to this hazard.				
Landslide	General Fund; Developer-based funding and specific plan requirements; Possible grant funding under PDM program	Long term	1, 5, 7	Yes (LS-1)
Lead Agency: Roseville Electric				
Action #HC-6—Maintain compliance with California Energy Commission ("CEC") license conditions for the operations of the Roseville Energy Park ("REP") with respect to Hazardous Material Management				
Human-Caused	EUD CIP, General Fund	Short term	5, 7	Yes (HC-6)
Action #HC-7—Maintain compliance with state and local laws and regulations for the operation of the Roseville Power Plant #2.				
Human-Caused	EUD CIP, General Fund	Long term	2, 5, 7	Yes (HC-7)
Action #HC-8—Maintain compliance with North American Electric Reliability Corporation mandatory reliability standards related to plant operation, sabotage reporting and critical infrastructure protection (cyber security.				
Human-Caused	EUD CIP, General Fund	Short term	2, 5, 7	Yes (HC-8)
Action #SW-1—Continue the Shade Tree Program, an energy conservation rebate program provided by Roseville Electric				
Severe Weather	Roseville Electric operational budget	Short term	7, 9	Yes (SW-2)
Action #SW-2—Continue ongoing line clearing and weed abatement of electrical utility facilities in order to reduce public exposure to vegetation hazards and maintain higher reliability during severe weather conditions.				
Severe Weather	CIP	Short term	2	Yes (SW-3)
Action #SW-5—Continue to operate the Roseville Energy Park to support the City's electrical requirements and maintain service continuity during severe weather events.				
Severe Weather	EUD CIP, General Fund	Short term	5, 7	Yes (SW-6)
Action #SW-6— Continue to operate Roseville Power Plant #2 to support the City's electrical requirements and maintain service continuity during severe weather events.				
Severe Weather	General Fund	Short term	5, 7	Yes (SW-7)

19.1.1 Benefit-Cost Review

The action plan must be prioritized according to a benefit/cost analysis of the proposed projects and their associated costs (44 CFR, Section 201.6(c)(3)(iii)). The benefits of proposed projects were weighed against estimated costs as part of the project prioritization process. The benefit/cost analysis was not of the detailed variety required by FEMA for project grant eligibility under the Hazard Mitigation Grant Program (HMGP) and Pre-Disaster Mitigation (PDM) grant program. A less formal approach was used because some projects may not be implemented for up to 10 years, and associated costs and benefits could change dramatically in that time. Therefore, a review was performed of the apparent benefits versus the apparent cost of each project. Parameters were established for assigning subjective ratings (high, medium, and low) to the costs and benefits of these projects.

Cost ratings were defined as follows:

- **High**—Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).
- **Medium**—The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.
- **Low**—The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.

Benefit ratings were defined as follows:

- **High—**Project will provide an immediate reduction of risk exposure for life and property.
- **Medium—**Project will have a long-term impact on the reduction of risk exposure for life and property, or project will provide an immediate reduction in the risk exposure for property.
- **Low—**Long-term benefits of the project are difficult to quantify in the short term.

Using this approach, projects with positive benefit versus cost ratios (such as high over high, high over medium, medium over low, etc.) are considered cost-beneficial and are prioritized accordingly.

For many of the strategies identified in this action plan, the City may seek financial assistance under the HMGP or PDM programs, both of which require detailed benefit/cost analyses. These analyses will be performed on projects at the time of application using the FEMA benefit-cost model. For projects not seeking financial assistance from grant programs that require detailed analysis, the City reserves the right to define "benefits" according to parameters that meet the goals and objectives of this Plan.

19.1.2 Action Plan Prioritization

Table 19-2 lists the priority of each action, based on the qualitative benefit-cost review, the number of plan objectives achieved, and the availability of funding:

19.1.3 Analysis of Mitigation Actions

Each recommended action was classified based on the hazard it addresses and the type of mitigation it involves. Table 19-3 shows the classification based on this analysis.

19.2 ADOPTION

A hazard mitigation plan must include documentation of formal adoption by the governing body of the jurisdiction requesting federal approval of the plan (44 CFR Section 201.6.c.5). This Plan will be submitted to Cal OES and the ISO prior to adoption for a pre-adoption review. Once the Plan has been determined to comply with the criteria specified under the DMA, Cal OES will forward it to FEMA Region IX for review and approval.

ISO is responsible for determining compliance for the CRS program. Since this Plan will be a key element in the City meeting the prescribed requirements for a CRS rating of Class 1, ISO will be asked to review the Plan for CRS Activity 510 compliance. Once pre-adoption approval has been granted by Cal OES, FEMA Region IX and the ISO, the City will initiate its process to formally adopt the Plan.

Table 19-2. Prioritization of Mitigation Actions

Action #	# of Objectives Met	Benefits	Costs	Do Benefits Equal or Exceed Costs?	Is project Grant Eligible?	Can Project be Funded under Existing Programs/ Budgets?	Priority (High, Med., Low)[a]
DF-1	4	High	Low	Yes	Yes	Yes	High
D-1	2	Medium	Low	Yes	No	Yes	Medium
D-2	2	Medium	Medium	Yes	No	Yes	Medium
D-3	2	High	Low	Yes	No	Yes	High
D-4	2	High	Low	Yes	No	Yes	High
EQ-1	2	Medium	Medium	Yes	Yes	Yes	Medium
EQ-2	4	High	Low	Yes	No	Yes	High
EQ-3	4	Medium	Low	Yes	Yes	Yes	Medium
F-1	3	High	Low	Yes	No	Yes	High
F-2	3	High	Low	Yes	No	Yes	High
F-3	3	High	Low	Yes	No	Yes	High
F-4	5	High	Low	Yes	No	Yes	High
F-5	2	High	Low	Yes	No	Yes	High
F-6	3	High	Low	Yes	No	Yes	High
F-7	3	High	Low	Yes	No	Yes	High
F-8	2	High	Medium	Yes	Yes	Yes	Medium
F-9	3	High	Low	Yes	No	Yes	High
F-10	3	High	Medium	Yes	Yes	Yes	Medium
F-11	3	Medium	Medium	Yes	No	Yes	Medium
F-12	1	High	Medium	Yes	Yes	Yes	Medium
F-13	3	Medium	Low	Yes	No	Yes	Medium
F-14	3	High	High	Yes	Yes	No	Low
F-15	3	Medium	Medium	Yes	Yes	Yes	Medium
F-16	2	High	High	Yes	Yes	No	Low
F-17	2	High	Medium	Yes	Yes	No	Medium
F-18	2	High	Medium	Yes	Yes	No	Medium
F-19	2	Medium	High	No	Yes	No	Low
F-20	2	High	High	Yes	Yes	No	Low
F-21	4	High	Low	Yes	No	Yes	High
F-22	3	High	Low	Yes	No	Yes	High
F-23	2	High	High	Yes	Yes	No	Medium
LS-1	3	Low	Low	Yes	Yes	Yes	Low
LS-2	3	High	Low	Yes	No	Yes	High
SW-1	2	High	Low	Yes	No	Yes	High
SW-2	1	High	Low	Yes	No	Yes	High
SW-3	2	Medium	Low	Yes	No	Yes	Medium
SW-4	2	Medium	Medium	Yes	No	Yes	Medium
SW-5	2	High	Low	Yes	No	Yes	High
SW-6	2	High	Low	Yes	No	Yes	High
WF-1	2	High	Low	Yes	No	Yes	High
WF-2	2	Medium	Low	Yes	No	Yes	Medium
MH-1	2	Medium	Low	Yes	No	Yes	Medium

Action #	# of Objectives Met	Benefits	Costs	Do Benefits Equal or Exceed Costs?	Is project Grant Eligible?	Can Project be Funded under Existing Programs/ Budgets?	Priority (High, Med., Low)[a]
MH-2	5	High	Low	Yes	No	Yes	High
MH-3	4	Medium	Low	Yes	Yes	Yes	Medium
MH-4	4	Medium	Low	Yes	Yes	Yes	Medium
MH-5	4	Medium	Low	Yes	Yes	Yes	Medium
MH-6	4	Medium	Low	Yes	Yes	Yes	Medium
MH-7	4	High	Low	Yes	No	Yes	High
MH-8	4	High	Low	Yes	No	Yes	High
HC-1	2	Medium	Low	Yes	No	Yes	Medium
HC-2	4	Medium	Low	Yes	No	Yes	Medium
HC-3	2	High	Low	Yes	No	Yes	High
HC-4	3	Medium	Medium	Yes	Yes	Yes	Medium
HC-5	2	High	High	Yes	Yes	Yes	Low
HC-6	2	High	Low	Yes	Yes	Yes	High
HC-7	3	High	Low	Yes	No	Yes	High
HC-8	3	High	Low	Yes	No	Yes	High
HC-9	3	High	Low	Yes	No	Yes	High
HC-10	2	High	High	Yes	Yes	No	Medium
HH-1	4	Medium	Low	Yes	No	Yes	Medium
HH-2	2	High	Low	Yes	No	Yes	High
HH-3	4	High	Low	Yes	No	Yes	High

a. Priorities defined as follows:

- High Priority—A project that meets multiple objectives, has benefits that exceed cost, has funding secured or is an ongoing project and meets eligibility requirements for the HMGP or PDM grant program. High priority projects can be completed in the short term (1 to 5 years).
- Medium Priority—A project that meets goals and objectives, that has benefits that exceed costs, and for which funding has not been secured but that is grant eligible under HMGP, PDM or other grant programs. Project can be completed in the short term, once funding is secured. Medium priority projects will become high priority projects once funding is secured.
- Low Priority—A project that will mitigate the risk of a hazard, that has benefits that do not exceed the costs or are difficult to quantify, for which funding has not been secured, that is not eligible for HMGP or PDM grant funding, and for which the time line for completion is long term (1 to 10 years). Low priority projects may be eligible for other sources of grant funding from other programs.

Table 19-3. Analysis of Mitigation Actions

Hazard	Actions That Address the Hazard, by Mitigation Type[a]					
	Prevention[a]	Property Protection[b]	Public Education and Awareness[c]	Natural Resource Protection [d]	Emergency Services[e]	Structural Projects[f]
Dam Failure					DF-1	
Drought	D-1, D-2, D-3, D-4					
Earthquake	EQ-3	EQ-1	EQ-2			
Flooding	F-1, F-2, F-3, F-4, F-6, F-7, F-9, F-10, F-11, F-21, F-22	F-13, F-18, F-19, F-20	F-5	F-1, F-21, F-22, F-23	F-8, F-12	F-14, F-15, F-16, F-17, F-23
Landslide	LS-1, LS-2					
Severe Weather	SW-1, SW-6	SW-2, SW-4	SW-3		SW-5	
Wildfire	WF-1		WF-2			
Multiple Hazards	MH-2, MH-3, MH-4	MH-8	MH-5, MH-6	MH-4	MH-1, MH-7	
Health Hazards	HH-1, HH-2		HH-2			
Human-Caused Hazards	HC-3, HC-5, HC-6, HC-7, HC-8, HC-9	HC-4			HC-1, HC-2, HC-3, HC-8, HC-10	

a. **Prevention**—Government, administrative or regulatory actions that influence the way land and buildings are developed to reduce hazard losses. Includes planning and zoning, floodplain laws, capital improvement programs, open space preservation, and stormwater management regulations.
b. **Property Protection**—Modification of buildings or structures to protect them from a hazard or removal of structures from a hazard area. Includes acquisition, elevation, relocation, structural retrofit, storm shutters, and shatter-resistant glass.
c. **Public Education and Awareness**—Actions to inform citizens and elected officials about hazards and ways to mitigate them. Includes outreach projects, real estate disclosure, hazard information centers, and school-age and adult education.
d. **Natural Resource Protection**—Actions that minimize hazard loss and preserve or restore the functions of natural systems. Includes sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.
e. **Emergency Services**—Actions that protect people and property during and immediately after a hazard event. Includes warning systems, emergency response services, and the protection of essential facilities.
f. **Structural Projects**—Actions that involve the construction of structures to reduce the impact of a hazard. Includes dams, setback levees, floodwalls, retaining walls, and safe rooms.

Simultaneous with this process, the draft action plan will be sent to the following agencies with a request for review and comment:

- Placer County Office of Emergency Services
- City of Rocklin
- Sacramento County Department of Water Resources
- California Department of Water Resources
- City of Citrus Heights
- Placer County Flood Control District.

Final FEMA approval was granted on _____, 2016. The Roseville City Council adopted the Plan through Resolution ##-## on _____, 2016. A copy of the resolution is provided in Figure 19-1. The City of Roseville is considered eligible for the benefits afforded under the Disaster Mitigation Act as of this date.



Figure 19-1. Resolution Adopting the Roseville Hazard Mitigation Plan

19.3 PLAN MAINTENANCE STRATEGY

A hazard mitigation plan must present a plan maintenance process that includes the following (44 CFR Section 201.6(c)(4)):

- A method and schedule for monitoring, evaluating, and updating the mitigation plan
- A process for incorporating the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate
- A strategy for continuing public participation through the plan maintenance process.

This section details the formal process that will ensure that the hazard mitigation plan remains an active and relevant document and that the City of Roseville maintains its eligibility for applicable funding sources. The plan maintenance process includes a schedule for monitoring and evaluating the Plan annually and producing an updated plan every five years. This section also describes how public participation will be integrated throughout the plan maintenance and implementation process. It explains how the mitigation strategies outlined in this Plan will be incorporated into existing planning mechanisms and programs, such as comprehensive land-use planning processes, capital improvement planning, and building code enforcement and implementation. The Plan's format allows sections to be reviewed and updated when new data become available, resulting in a plan that will remain current and relevant.

Pursuant to 44CFR 201.6(c)(4)(i), the following matrix provides a synopsis of responsibilities for plan monitoring, evaluation, and update which are discussed in further detail in sections 19.3.1 to 19.3.4 of this Plan:

Task	Approach	Timeline	Lead Responsibility	Support Responsibility
Monitoring	Preparation of status updates and action implementation tracking as part of submission to the Steering Committee for annual progress report. Deputy City Manager or Designee is responsible for initiating status updates with identified secondary responsibility departments.	Annual (July-September)	Deputy City Manager or Designee	• Central Service Dept. • City Council • City Manager's Office • Public Affairs/Communication Dept. • Development Services Dept. • Environmental Utilities Dept. • Information Technology Div. • Parks/Rec/Libraries: Open Space Div. • Police and Fire Dept. • Public Works Dept. • Roseville Electric
Evaluation	Review the status of previous actions as submitted by the monitoring task lead and support entities noted above to assess the effectiveness of the plan; complete and finalize the Annual Progress Report.	Annual (September) – prior to CRS recertification process on October 1	Planning Team • City Manager's Office • Public Works • Fire Dept. • Development Svcs • Technical Consultant	Steering Committee • City Manager's Office • Public Works • Fire Dept. • Development Svcs • Communications • Public Volunteers • Local businesses/organizations

Task	Approach	Timeline	Lead Responsibility	Support Responsibility
Update	The Planning Team will call the Steering Committee to reconvene, at a minimum, every 5 years to guide a comprehensive update to review and revise the Plan.	Every 5 years or upon comprehensive update to General Plan or major disaster	Planning Team • City Manager's Office • Public Works • Fire Dept. • Development Svcs • Technical Consultant	Steering Committee • City Manager's Office • Public Works • Fire Dept. • Development Svcs • Communications • Public Volunteers • Local businesses/organizations

19.3.1 Plan Implementation

The hazard mitigation plan includes a range of action items to reduce losses from hazard events. Together, the action items provide a framework for activities that the City can choose to implement over the next five years. The effectiveness of the Plan depends on the incorporation of the action items into existing City plans, policies, and programs.

The Roseville City Manager's Office and the Development Services Department will be jointly responsible for monitoring the Plan's implementation and maintenance through existing City programs. The Deputy City Manager or designated appointee will assume lead responsibility for facilitating plan implementation and maintenance meetings. Although the City Manager's Office will have primary department responsibility for review, coordination, and promotion, plan implementation and evaluation will be a shared responsibility among all departments and agencies identified as lead agencies in the mitigation action plan (see Chapter).

19.3.2 Steering Committee

The Steering Committee is a volunteer body that contributed greatly to the development of the initial and updated plans. The initial committee oversaw the development of the initial plan and made recommendations on key elements of the Plan, including a maintenance strategy. An oversight committee with representation similar to the initial Steering Committee then took an active role in the maintenance strategy. By maintaining progress reports, and keeping the Plan dynamic, Roseville was able to successfully complete many of the actions identified in the initial action plan. A reactivated Steering Committee then oversaw development of the 2011 and 2016 Plan updates.

A Steering Committee of not more than 14 members, as determined by the Roseville City Manager's Office, should remain involved in key elements of the proposed maintenance strategy. The Steering Committee will convene annually to perform annual reviews of the updated plan and its implementation. The make-up of this Steering Committee will strive for no less than 50 percent representation from citizens, citizen groups, and stakeholders within the planning area. Previous and existing members will be given the option to remain involved in the process.

A technical subcommittee with a make-up similar to the subcommittee used for initial plan development could be used in the plan maintenance strategy, at the discretion of the planning team and the Steering Committee.

19.3.3 Annual Progress Report

The minimum task of the annual Steering Committee meetings will be the evaluation of the progress of the 2016 Plan. This review will include the following:

- Summary of any hazard events that occurred during the prior year and their impact on the planning area
- Review of successful mitigation actions identified in the 2016 Plan
- Brief discussion about why targeted strategies were not completed
- Re-evaluation of the action plan to determine if the timeline for identified projects needs to be amended (such as changing a long-term project to a short-term project because of funding availability)
- Recommendations for new projects
- Changes in or potential for new funding options (grant opportunities)
- Impacts of any other planning programs or actions in the City that involve hazard mitigation

The planning team created a template to guide the Steering Committee in preparing a progress report during the previous planning process. The Steering Committee will provide feedback to the planning team on items included in the template. The planning team will continue to use this progress report template to prepare a formal annual report on the progress of the 2016 Plan. This report will be used as follows:

- Posted on the City website on the page dedicated to the hazard mitigation plan
- Announced on multiple social media platforms
- Provided to the local media through a press release
- Presented to the Roseville City Council
- Provided as part of the CRS annual re-certification package.

The CRS program requires an annual recertification to be submitted by October 1 of every calendar year for which the community has not received a formal audit. To meet this recertification timeline, the planning team will strive to complete the progress report process between June and September every year.

19.3.4 Plan Update

Section 201.6.d.3 of 44 CFR requires that local hazard mitigation plans be reviewed, revised if appropriate, and resubmitted for approval in order to remain eligible for benefits awarded under the DMA. The City of Roseville intends to update its hazard mitigation plan on a 5-year cycle. This cycle may be accelerated to less than 5 years based on the following triggers:

- A Presidential Disaster Declaration that impacts the City of Roseville
- A hazard event that causes loss of life
- A comprehensive update of the City of Roseville General Plan

It will not be the intent of this update process to start from scratch and develop a complete new hazard mitigation plan. Based on needs identified by the planning team, this update will, at a minimum, include the following elements:

- The update process will be convened through a Steering Committee.
- The hazard risk assessment will be reviewed and updated using best available information and technologies.
- The action plan will be reviewed and revised to account for any actions completed, dropped, or changed and to account for changes in the risk assessment or new City policies identified under other planning mechanisms, as appropriate (such as the General Plan).
- The draft update will be sent to appropriate agencies and organizations for comment.

- The public will be given an opportunity to comment on the update prior to adoption.
- The Roseville City Council will adopt the updated Plan.

19.3.5 Continuing Public Involvement

The public will continue to be apprised of hazard mitigation actions through the City website and by providing copies of the annual progress reports to the media. Copies of the 2016 Plan will be distributed to the Roseville City Library System. Upon initiation of the update process, a new public involvement strategy will be initiated based on guidance from the Steering Committee. This strategy will be based on the needs and capabilities of the City at the time of the update. At a minimum, this strategy will include the use of local media outlets within the planning area.

19.3.6 Incorporation into Other Planning Mechanisms

The City began planning for the impacts of hazards through the Safety Element of its 1992 General Plan. The hazard mitigation plan update process provided the City with an opportunity to review and expand on policies contained in the General Plan. The City views the General Plan and the hazard mitigation plan as complementary documents that work together to reduce risk exposure to the citizens of Roseville. A comprehensive update to the General Plan will trigger an update to the hazard mitigation plan. Many of the ongoing recommendations identified in the 2016 Plan are programs recommended by the General Plan. Processes and programs that the City will coordinate with the hazard mitigation plan recommendations include the following:

- City emergency response plan
- Capital improvement programs
- Roseville municipal code
- Community design guidelines
- Stormwater management program

Some action items do not need to be implemented through regulation. Instead, these items can be implemented through the creation of new educational programs, continued interagency coordination, or improved public participation.

Plan Integration During the 2011 RMHMP Performance Period

The 2011 RMHMP identified 24 actions related to plan integration. Due to the nature of plan integration, these actions were identified as ongoing initiatives and were carried over into the 2016 Plan update. Plan integration actions remain ongoing, as they serve as a benchmark for annual progress reporting and encourage the use of the Plan as a living document. During the performance period of the 2011 plan, 23 of the identified actions resulted in measurable plan integration of 2011 RMHMP goals, risk assessment, or recommendations into the following plans and programs:

- Specific Plans and Specific Plan Amendments
- Master Drainage Plan requirements for Specific Plans
- Groundwater Environmental Impact Report
- Water Recycling Master Plan
- Debris Management Plan (Completed in conjunction with the 2016 planning process)

Specific information regarding how each of these plans and programs integrated 2011 RMHMP information is available in the 2015 Progress Report located in Appendix B.

Plan Integration for the 2016 Mitigation Action Plan

Implementation of the 2016 mitigation action plan has and will continue to enhance and expand the integration efforts of the 2011 Plan. Inter-agency coordination occurred through involvement by local, regional, state and federal stakeholders involved in and consulted with during the planning process. This coordination is expected to continue through Steering Committee activities, annual progress reporting, implementation coordination, and the continued public engagement.

As the plan is implemented, all City agencies will use information from this updated plan as the best available science and data on natural hazards impacting the City of Roseville. 24 actions related to plan integration have been recommended for continued implementation in this Plan.

REFERENCES

Cal-Adapt. 2016. http://cal-adapt.org/ Exploring California's Climate Change Research.

California Department of Water Resources (CA DWR). 2013. http://www.water.ca.gov/waterplan/ The California Water Plan

CA DWR. 2016. http://www.water.ca.gov/climatechange/ Climate Change

CA DWR. 2016a. http://www.water.ca.gov/damsafety/FAQAnswer/index.cfm Frequently Asked Questions

California Department of Finance. 2016. http://www.dof.ca.gov/Forecasting/Demographics/Estimates/e-1/ Population Estimates for Cities, Counties, and the State – January 1, 2015 and 2016

California Emergency Management Agency, et al. 2012. http://resources.ca.gov/docs/climate/APG_Understanding_Regional_Characteristics.pdf California Adaptation Planning Guide: Understanding Regional Characteristics.

CAL FIRE. 2012. http://frap.cdf.ca.gov/. California Department of Forestry and Fire Prevention. 2012. Fire and Resource Assessment Program. Website mapping and data, 2012.

Danielson, Tess. 2015. http://www.businessinsider.com/ransomware-is-everywhere-but-this-software-can-save-you-2015-10 How to avoid the curse of Ransomware.

Federal Emergency Management Agency (FEMA). 1982. http://www.archives.gov/federal-register/codification/executive-order/11988.html Executive Order 11988-Floodplain management

FEMA. 2001. Understanding Your Risks; Identifying Hazards and Determining your Risks. FEMA (386-2). August 2001

FEMA. 2002. Getting Started; Building support for Mitigation Planning; FEMA (386-1). September 2002

FEMA. 2003. Developing the Mitigation Plan; Identifying Mitigation Actions and Implementing Strategies. FEMA (386-3). April 2003

FEMA. 2003. Integrating Manmade Hazards into Mitigation Planning. FEMA (386-7). September 2003

FEMA. 2004. http://www.damsafety.org/media/Documents/PDF/fema-333.pdf Federal Guidelines for Dam Safety

FEMA. 2007. FEMA, National Flood Insurance Program, Community Rating System; CRS Coordinator's Manual FIA-15/2007 OMB No. 1660-0022

FEMA. 2013. http://www.fema.gov/news-release/2013/10/18/be-cyber-smart-stay-cyber-secure Be Cyber Smart, Stay Cyber Secure

FEMA. 2015. https://www.fema.gov/national-dam-safety-program National Dam Safety Program

FEMA. 2016. https://www.fema.gov/disasters Disaster Declarations

FEMA. 2016a. http://www.fema.gov/what-mitigation What is Mitigation?

Harrison, Virginia. 2015. http://money.cnn.com/2015/04/14/technology/security/cyber-attack-hacks-security/. CNN Money

Intergovernmental Panel on Climate Change. 2014. http://www.ipcc.ch/report/ar5/wg2/ Climate Change 2014: Impacts, Adaptation, and Vulnerability

International Strategy for Disaster Reduction. 11/11/2008. "Disaster Risk Reduction Strategies and Risk Management Practices: Critical Elements for Adaptation to Climate Change"

Iverson, R.M., 2004, Granular avalanches across irregular three-dimensional terrain: 1. theory and computation, Journal of Geophysical Research, v. 109, F01014, doi: 10.1029/2003JF000085. 14 p.

Kostadinov, Dimitar. 2012. http://resources.infosecinstitute.com/cyberterrorism-distinct-from-cybercrime/ Cyberterrorism Defined

Michigan Tech University. n.d. http://www.geo.mtu.edu/UPSeis/intensity.html How Are Earthquake Magnitudes Measured?

National Archives. 2016. http://www.archives.gov/federal-register/codification/executive-order/11990.html Executive Order 11990 -Protection of wetlands

NASA. 2016. http://climate.nasa.gov/vital-signs/carbon-dioxide/ Global Climate Change – Vital Signs of the Planet. Carbon Dioxide.

NASA. 2015. http://www.nasa.gov/audience/forstudents/5-8/features/nasa-knows/what-is-climate-change-58.html What are Climate and Climate Change?

NASA. 2004. http://www.nasa.gov/home/hqnews/2004/jul/HQ_04252_glaciers.html Retreating Glaciers Spur Alaskan Earthquakes

NOAA. 2016. https://www.ncdc.noaa.gov/stormevents/. NOAA, National Climatic Data Center website, Storm Events Database

Northern California Earthquake Data Center. 2014. UC Berkeley Seismological Laboratory. Dataset. doi:10.7932/NCEDC.

Office of Federal Lands Highway. United States Department of Transportation, Federal Highway Administration. 2016. https://flh.fhwa.dot.gov/programs/erfo/ Emergency Relief for Federally Owned Roads (ERFO)

Office of the Press Secretary. 2015. https://www.whitehouse.gov/the-press-office/2015/01/30/executive-order-establishing-federal-flood-risk-management-standard-and- Executive Order – Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input

Placer County. 2016. Placer County Local Hazard Mitigation Plan Update.

Placer County Office of Economic Development. 2014. Placer County Economic and Demographic Profile.

Rickenmann, Dieter and Weber, Daniel. 2000. ftp://ftp.wsl.ch/pub/rickenmann/Rickenmann-pdf/2000/Rickenmann-Weber-2000_DFHM.pdf Debris Flow Hazards Mitigation: Mechanics, Prediction, and Assessment.

Roseville. 2015. City of Roseville General Plan 2035.

Roseville. 2015a. Urban Water Management Plan.

Roseville. 2010. http://www.roseville.ca.us/visiting/history_of_roseville/default.asp History of Roseville on City of Roseville Website, accessed 2016

Roseville. n.d. https://www.roseville.ca.us/civicax/filebank/blobdload.aspx?blobid=18782 Sustainability Efforts

Roseville. 2010a. https://roseville.ca.us/civicax/filebank/blobdload.aspx?blobid=18854 Special Presentation – City of Roseville Communitywide Sustainability Action Plan.

Savage, S. B., and K. Hutter. 1991. Dynamics of avalanches of granular materials from initiation to run-out. Part 1: Analysis, Acta Mech., 86, 201–223, doi:10.1007/BF01175958.

Seattle Office of Emergency Management. 2014. http://www.seattle.gov/Documents/Departments/Emergency/PlansOEM/SHIVA/SHIVAv6.3Final.pdf Seattle Hazard Identification and Vulnerability Assessment.

Spatial Hazard Events and Losses Database for the United States maintained by the University of South Carolina's (USC) Hazard Research Lab

United States Army Corps of Engineers. 2011. http://planning.usace.army.mil/toolbox/library/ERs/ER1100_2_1156_28Oct11.pdf Safety of Dams - Policies and Procedures

United States Census. 2010. Data from 2010 U.S. Census. U.S. Census Bureau.

United States Census. 2016. http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml American FactFinder

United States Department of Transportation. n.d. https://www.environment.fhwa.dot.gov/projdev/tdmmitig2.asp Mitigation of Environmental Impacts

United States Environmental Protection Agency. 2013. https://www3.epa.gov/climatechange/glossary.html Glossary

United States Global Change Research Program. 2009. https://nca2009.globalchange.gov/ Global Change Impacts in the United States: 2009 Report

United States Geological Survey (USGS). 1989. http://pubs.usgs.gov/gip/earthq4/severity_text.html The Severity of an Earthquake. U.S. Government Printing Office: 1989-288-913.

USGS. 2008. An Atlas of ShakeMaps for Selected Global Earthquakes. U.S. Geological Survey Open-File Report 2008-1236. Prepared by Allen, T.I., Wald, D.J., Hotovec, A.J., Lin, K., Earle, P.S. and Marano, K.D.

USGS. 2010. PAGER—Rapid Assessment of an Earthquake's Impact. U.S. Geological Survey Fact Sheet 2010-3036. September 2010.

USGS. n.d. http://landslides.usgs.gov/learn/ls101.php Landslides 101

Washington Department of Ecology. 2014. http://www.ecy.wa.gov/programs/sea/landslides/about/about.html Puget Sound Landslides The website of the Washington Department of Ecology.

Weather Channel. 2016. https://weather.com/weather/monthly/l/USCA0957:1:US Roseville

Wilson, C. 2008. Botnets, Cybercrime, and Cyberterrorism. Federation of American Scientists.

GLOSSARY

ACRONYMS

Cal EMA—California Emergency Management Agency
CAL FIRE—California Department of Forestry and Fire Protection
Cal OES— California Office of Emergency Services
CBC—California Building Code
CCR—California Code of Regulations
CDBG-DR—Community Development Block Grant Disaster Recovery grants
CEQA—California Environmental Quality Act
CIP—Capital Improvements Plan
CFR—Code of Federal Regulations
CPTED—Crime Prevention Through Environmental Design
CRS—Community Rating System
DFIRM—Digital Flood Insurance Rate Map
DHS—Department of Homeland Security
DMA —Disaster Mitigation Act
DWR—Department of Water Resources
EOP—Emergency Operations Plan
EPA—U.S. Environmental Protection Agency
ESA—Endangered Species Act
EUD—Environmental Utilities Department
FEMA—Federal Emergency Management Agency
FIRM—Flood Insurance Rate Map
FRAP—Fire and Resource Assessment Program
GIS—Geographic Information System
HAZUS-MH—Hazards, United States-Multi Hazard
HMGP—Hazard Mitigation Grant Program
IBC—International Building Code
MCI—Multi-Casualty Incident
MM—Modified Mercalli Scale
MND— Mitigated Negative Declaration
NEHRP—National Earthquake Hazards Reduction Program

NFIP—National Flood Insurance Program
NIMS—National Incident Management System
NOAA—National Oceanic and Atmospheric Administration
OES—Office of Emergency Services
OSPOMP—Open Space Preserve Overarching Management Plan
PCFCD—Placer County Flood Control District
PCWA—Placer County Water Agency
PDM—Pre-Disaster Mitigation Grant Program
PGA—Peak Ground Acceleration
RMC—Roseville Municipal Code
SARS—Severe acute respiratory syndrome
SEMS—Standardized Emergency Management System
SFHA—Special Flood Hazard Area
SJWD—San Juan Water District
SPI—Standardized Precipitation Index
STEMI—ST-elevation myocardial infarction
UBC—Uniform Building Code
ULOP—Urban Level of Flood Protection
USBR—U.S. Bureau of Reclamation
USGS—United States Geological Survey
VHF— Viral Hemorrhagic Fevers
WMD—Weapon of Mass Destruction
WNV—West Nile Virus

DEFINITIONS

100-Year Flood: The term "100-year flood" can be misleading. The 100-year flood does not necessarily occur once every 100 years. Rather, it is the flood that has a 1 percent chance of being equaled or exceeded in any given year.. Thus, the 100-year flood could occur more than once in a relatively short period of time. The Federal Emergency Management Agency (FEMA) defines it as the 1 percent annual chance flood, which is now the standard definition used by most federal and state agencies and by the National Flood Insurance Program (NFIP).

Acre-Foot: An acre-foot is the amount of water it takes to cover 1 acre to a depth of 1 foot. This measure is used to describe the quantity of storage in a water reservoir. An acre-foot is a unit of volume. One acre foot equals 7,758 barrels; 325,829 gallons; or 43,560 cubic feet. An average household of four will use approximately 1 acre-foot of water per year.

Act of Terrorism: According to the Federal Bureau of Investigation (FBI), an act of terrorism is "a violent act or an act dangerous to human life, in violation of the criminal laws of the United States or of any state, to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social goals." Acts of terrorism are intentional, criminal, and malicious and can be foreign or domestic, depending on the origin, base, and objectives of the terrorist or organization. Acts of terrorism can involve the use of weapons of

mass destruction, arson, and incendiary, explosive, and armed attacks; industrial sabotage and intentional hazardous materials releases; agro-terrorism; and cyber-terrorism.

Asset: An asset is any man-made or natural feature that has value, including, but not limited to, people; buildings; infrastructure, such as bridges, roads, sewers, and water systems; lifelines, such as electricity and communication resources; and environmental, cultural, or recreational features such as parks, wetlands, and landmarks.

Base Flood: The flood having a 1% chance of being equaled or exceeded in any given year, also known as the "100-year" or "1% chance" flood. The base flood is a statistical concept used to ensure that all properties subject to the National Flood Insurance Program (NFIP) are protected to the same degree against flooding.

Basin: A basin is the area within which all surface water – whether from rainfall, snowmelt, springs, or other sources – flows to a single water body or watercourse. The boundary of a river basin is defined by natural topography, such as hills, mountains, and ridges. Basins are also referred to as "watersheds" and "drainage basins."

Benefit: A benefit is a net project outcome and is usually defined in monetary terms. Benefits may include direct and indirect effects. For the purposes of benefit-cost analysis of proposed mitigation measures, benefits are limited to specific, measurable, risk reduction factors, including reduction in expected property losses (buildings, contents, and functions) and protection of human life.

Benefit/Cost Analysis: A benefit/cost analysis is a systematic, quantitative method of comparing projected benefits to projected costs of a project or policy. It is used as a measure of cost effectiveness.

Benioff Earthquake: Sometimes called "deep quakes," these occur in the Pacific Northwest when the Juan de Fuca plate breaks up underneath the continental plate, approximately 30 miles beneath the earth's surface.

Building: A building is defined as a structure that is walled and roofed, principally aboveground, and permanently fixed to a site. The term includes manufactured homes on permanent foundations on which the wheels and axles carry no weight.

Capability Assessment: A capability assessment provides a description and analysis of a community's current capacity to address threats associated with hazards. The assessment includes two components: an inventory of an agency's mission, programs, and policies, and an analysis of its capacity to carry them out. A capability assessment is an integral part of the planning process in which a community's actions to reduce losses are identified, reviewed, and analyzed, and the framework for implementation is identified. The following capabilities were reviewed under this assessment:

- Legal and regulatory capability
- Administrative and technical capability
- Fiscal capability

Certified Unified Program Agency: An agency (such as the City of Roseville) certified to act as a licensing agency for six hazardous materials-related programs. The Certified Unified Program Agency enables the City of Roseville to implement its own hazardous materials emergency response program. Mutual aid agreements are also in place for incident response. Each business that deals with hazardous materials generally must submit a Unified Program Consolidated Form with facility information to the Roseville Fire Department.

Civil Disorder: Civil disorder results from incidents intended to disrupt a community to the degree that law enforcement intervention is required to maintain public safety. Civil disorder is generally associated with controversial political, judicial, or economic issues and events and may occur at any time, although statistics indicate that civil disorder is more frequent during the summer months. Although the City of Roseville does not

have a history of civil disorder or rioting, large public gatherings, often associated with concerts or sports events, have overburdened local law enforcement and fire protection resources in the past. The effects of civil disorder and riots vary and depend on the type of event and its severity, scope, and duration. Essential services (such as electricity, water, public transportation, and communications) may be disrupted, and property damage, injuries, and loss of life may occur.

Communicable Disease: For the purposes of this Plan, communicable diseases include severe acute respiratory syndrome (SARS), flu, small pox, and diseases carried by insects. Diseases carried by insects include plague (fleas), encephalitis, malaria, West Nile virus (mosquitoes), and Lyme disease (ticks).

Community Rating System (CRS): The CRS is a voluntary program under the NFIP that rewards participating communities (provides incentives) for exceeding the minimum requirements of the NFIP and completing activities that reduce flood hazard risk by providing flood insurance premium discounts.

Critical Facility: A critical facility is vital to the City's ability to provide essential services and protect life and property. Loss of a critical facility would result in a severe economic or catastrophic impact. Under the Roseville hazard mitigation plan definition, critical facilities include the following:

- Police stations, fire stations, vehicle and equipment storage facilities, and emergency operations centers needed for disaster response before, during, and after hazard events
- Public and private utilities and infrastructure vital to maintaining or restoring normal services to areas damaged by hazard events
- Hospitals, nursing homes, and housing likely to contain occupants who may not be sufficiently mobile to avoid death or injury during a hazard event
- Structures or facilities that produce, use, or store highly volatile, flammable, explosive, toxic, and/or water-reactive materials

Crustal Earthquake: Crustal quakes occur at a depth of 5 to 10 miles beneath the earth's surface and are associated with fault movement within a surface plate.

Dam: A dam is any artificial barrier or controlling mechanism that can or does impound 10 acre-feet or more of water.

Dam Failure: Dam failure refers to a partial or complete breach in a dam (or levee) that impacts its integrity. Dam failures occur for a number of reasons, such as flash flooding, inadequate spillway size, mechanical failure of valves or other equipment, freezing and thawing cycles, earthquakes, and intentional destruction.

Debris Avalanche: Volcanoes are prone to debris and mountain rock avalanches that can approach speeds of 100 mph.

Debris Flow: Dense mixtures of water-saturated debris that move down-valley; looking and behaving much like flowing concrete. They form when loose masses of unconsolidated material are saturated, become unstable, and move down slope. The source of water varies but includes rainfall, melting snow or ice, and glacial outburst floods.

Debris Slide: Debris slides consist of unconsolidated rock or soil that has moved rapidly down slope. They occur on slopes greater than 65 percent.

Depth of Flooding: The depth of flooding is difference between regulatory flood elevation and the elevation of the lowest grade adjacent to a structure.

Disaster Mitigation Act of 2000 (DMA); The DMA is Public Law 106-390 and is the latest federal legislation enacted to encourage and promote proactive, pre-disaster planning as a condition of receiving financial assistance under the Robert T. Stafford Act. The DMA emphasizes planning for disasters before they occur. Under the DMA, a pre-disaster hazard mitigation program and new requirements for the national post-disaster hazard mitigation grant program (HMGP) were established.

Drainage Basin: A basin is the area within which all surface water (whether from rainfall, snowmelt, springs, or other sources) flows to a single water body or watercourse. The boundary of a river basin is defined by natural topography, such as hills, mountains, and ridges. Drainage basins are also referred to as "watersheds" and "basins." The City of Roseville is located within portions of two major drainage basins: the Pleasant Grove Creek Basin and the Dry Creek Basin. Pleasant Grove Creek and its tributaries drain most of the western and central areas of the City, and the Dry Creek Basin and its tributaries drain the remainder of the City. The Dry Creek system has year-round flows in its major watercourses, and the Pleasant Grove Creek system is intermittent, with only seasonal flows. As a result, portions of the City lie within a flood hazard area. However, since 1950, there have been no reports of structural flood damage along Pleasant Grove Creek and there are presently no structures subject to flooding within the Pleasant Grove Creek Basin.

Drought: Drought is a period of time without substantial rainfall or snowfall from one year to the next. Drought can also be defined as the cumulative impacts of several dry years or a deficiency of precipitation over an extended period of time, which in turn results in water shortages for some activity, group, or environmental function. A hydrological drought is caused by deficiencies in surface and subsurface water supplies. A socioeconomic drought impacts the health, well being, and quality of life or starts to have an adverse impact on a region. Drought is a normal, recurrent feature of climate and occurs almost everywhere.

Duration: For the purposes of this Plan, duration is defined as the length of time that a hazard occurs. For example, the duration of a tornado can be minutes, but release of a chemical warfare agent such as mustard gas can persist for hours or weeks if not remediated.

Earthquake: An earthquake is defined as a sudden slip on a fault, volcanic or magmatic activity, and sudden stress changes in the earth that result in ground shaking and radiated seismic energy. Earthquakes can last from a few seconds to over 5 minutes, and have been known to occur as a series of tremors over a period of several days. The actual movement of the ground in an earthquake is seldom the direct cause of injury or death. Casualties may result from falling objects and debris as shocks shake, damage, or demolish buildings and other structures.

Exposure: Exposure is defined as the number and dollar value of assets considered to be at risk during the occurrence of a specific hazard.

Extent: The extent is the size of an area affected by a hazard.

Fire Behavior: Fire behavior refers to the physical characteristics of a fire and is a function of the interaction between the fuel characteristics (such as type of vegetation and structures that could burn), topography, and weather. Variables that affect fire behavior include the rate of spread, intensity, fuel consumption, and fire type (such as underbrush versus crown fire).

Fire Frequency: Fire frequency is the broad measure of the rate of fire occurrence in a particular area. An estimate of the areas most likely to burn is based on past fire history or fire rotation in the area, fuel conditions, weather, ignition sources (such as human or lightning), fire suppression response, and other factors.

Flash Flood: A flash flood occurs with little or no warning when water levels rise at an extremely fast rate

Flood Insurance Rate Map (FIRM): FIRMs are the official maps on which the Federal Emergency Management Agency (FEMA) has delineated the Special Flood Hazard Area (SFHA).

Flood Insurance Study: A report published by the Federal Insurance and Mitigation Administration for a community in conjunction with the community's Flood Insurance rate Map. The study contains such background data as the base flood discharges and water surface elevations that were used to prepare the FIRM. In most cases, a community FIRM with detailed mapping will have a corresponding flood insurance study.

Floodplain: Any land area susceptible to being inundated by flood waters from any source. A flood insurance rate map identifies most, but not necessarily all, of a community's floodplain as the Special Flood Hazard Area (SFHA).

Floodway: Floodways are areas within a floodplain that are reserved for the purpose of conveying flood discharge without increasing the base flood elevation more than 1 foot. Generally speaking, no development is allowed in floodways, as any structures located there would block the flow of floodwaters.

Floodway Fringe: Floodway fringe areas are located in the floodplain but outside of the floodway. Some development is generally allowed in these areas, with a variety of restrictions. On maps that have identified and delineated a floodway, this would be the area beyond the floodway boundary that can be subject to different regulations.

Fog: Fog refers to a cloud (or condensed water droplets) near the ground. Fog forms when air close to the ground can no longer hold all the moisture it contains. Fog occurs either when air is cooled to its dew point or the amount of moisture in the air increases. Heavy fog is particularly hazardous because it can restrict surface visibility. Severe fog incidents can close roads, cause vehicle accidents, cause airport delays, and impair the effectiveness of emergency response. Financial losses associated with transportation delays caused by fog have not been calculated in the United States but are known to be substantial.

Freeboard: Freeboard is the margin of safety added to the base flood elevation.

Frequency: For the purposes of this Plan, frequency refers to how often a hazard of specific magnitude, duration, and/or extent is expected to occur on average. Statistically, a hazard with a 100-year frequency is expected to occur about once every 100 years on average and has a 1 percent chance of occurring any given year. Frequency reliability varies depending on the type of hazard considered.

Fujita Scale of Tornado Intensity: Tornado wind speeds are sometimes estimated on the basis of wind speed and damage sustained using the Fujita Scale. The scale rates the intensity or severity of tornado events using numeric values from F0 to F5 based on tornado wind speed and damage. An F0 tornado (wind speed less than 73 miles per hour [mph]) indicates minimal damage (such as broken tree limbs), and an F5 tornado (wind speeds of 261 to 318 mph) indicates severe damage.

General Plan: California state law requires that every county and city prepare and adopt a comprehensive long-range plan to serve as a guide for community development. The plan must consist of an integrated and internally consistent set of goals, policies, and implementation measures. In addition, the plan must focus on issues of the greatest concern to the community and be written in a clear and concise manner. City actions, such as those relating to land-use allocation, annexations, zoning, subdivision and design review, redevelopment, and capital improvements, must be consistent with such a plan. The City of Roseville's general plan serves these purposes. As the principle planning document that directs the City's growth and land use, the general plan is as an integral part of the Roseville hazard mitigation plan. A technical update to Roseville's general plan was completed in January 2003.

Goal: A goal is a general guideline that explains what is to be achieved. Goals are usually broad-based, long-term, policy-type statements and represent global visions. Goals help define the benefits that a plan is trying to achieve.

The success of the Roseville hazard mitigation plan, once implemented, should be measured by the degree to which its goals have been met (that is, by the actual benefits in terms of actual hazard mitigation).

Geographic Information System (GIS): GIS is a computer software application that relates data regarding physical and other features on the earth to a database for mapping and analysis.

Hazard: A hazard is a source of potential danger or adverse condition that could harm people and/or cause property damage. Natural hazards include floods, winds, and earthquakes. Man-made hazards include acts of terrorism and hazardous material spills.

Hazardous Material: A hazardous material is a substance or combination of substances that (1) can cause or contribute to an increase in mortality or serious irreversible or incapacitating reversible illnesses, or (2) pose a present or potential hazard to human life, property, or the environment. Hazardous materials could cause these effects because of their quantity, concentration, or physical, chemical, or infectious characteristics. Hazardous waste is included in the City's working definition of hazardous material.

Hazardous Material Incident: This type of incident involves the accidental or intentional release of hazardous materials to the environment. Such incidents typically occur as fixed facility incidents or transportation incidents. It is possible to identify and prepare for a fixed facility incident because federal and state laws require facilities to notify state and local authorities about hazardous materials used or produced at the facility. Transportation incidents are more difficult to prepare for because there is little (if any) notice about the materials involved. Except for severe weather and flooding, hazardous materials incidents are the most likely hazards to affect the City of Roseville.

Hazard Mitigation Grant Program (HMGP): Authorized under Section 202 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, the HMGP is administered by FEMA and provides grants to states, tribes, and local governments to implement hazard mitigation actions after a major disaster declaration. The purpose of the program is to reduce the loss of life and property due to disasters and to enable mitigation activities to be implemented as a community recovers from a disaster

Hazards U.S. Hazard (HAZUS-MH) Loss Estimation Program: HAZUS-MH is a GIS-based program used to support the development of risk assessments as required under the DMA. The HAZUS-MH software program assesses risk in a quantitative manner to estimate damages and losses associated with natural hazards. HAZUS-MH is FEMA's nationally applicable, standardized methodology and software program and contains modules for estimating potential losses from earthquakes, floods, and wind hazards. HAZUS-MH has also been used to assess vulnerability (exposure) for other hazards facing Roseville.

Hydraulics: Hydraulics is the branch of science or engineering that addresses fluids (especially water) in motion in rivers or canals, works and machinery for conducting or raising water, the use of water as a prime mover, and other fluid-related areas.

Hydrology: Hydrology is the analysis of waters of the earth. For example, a flood discharge estimate is developed by conducting a hydrologic study.

Intensity: For the purposes of this Plan, intensity refers to the measure of the effects of a hazard.

Inventory: The assets identified in a study region comprise an inventory. Inventories include assets that could be lost when a disaster occurs and community resources are at risk. Assets include people, buildings, transportation, and other valued community resources.

Landslide: Landslides can be described as the sliding movement of masses of loosened rock and soil down a hillside or slope. Fundamentally, slope failures occur when the strength of the soils forming the slope exceeds the pressure, such as weight or saturation, acting upon them.

Large Gathering Places: For the purposes of this Plan, such places are defined as follows:

- Any facility listed as a Type A-2.1 in the California Uniform Building Code (UBC) because it has an assembly room with an occupant load of 300 or more without a stage (34 locations in Roseville)
- Any buildings listed as E-1 used for educational purposes through the 12th grade by 50 or more persons for more than 12 hours per week or 4 hours any 1 day (29 buildings in Roseville)
- Any facility likely to have an occupancy of greater than 300, such as a large employment centers, retail centers, cultural centers, and places of worship

Lightning: Lightning is an electrical discharge resulting from the buildup of positive and negative charges within a thunderstorm. When the buildup becomes strong enough, lightning appears as a "bolt," usually within or between clouds and the ground. A bolt of lightning instantaneously reaches temperatures approaching 50,000ºF. The rapid heating and cooling of air near lightning causes thunder. Lightning is a major threat during thunderstorms. In the United States, 75 to 100 Americans are struck and killed by lightning each year (see http://www.fema.gov/hazard/thunderstorms/thunder.shtm).

Liquefaction: Liquefaction is the complete failure of soils, occurring when soils lose shear strength and flow horizontally. It is most likely to occur in fine grain sands and silts, which behave like viscous fluids when liquefaction occurs. This situation is extremely hazardous to development on the soils that liquefy, and generally results in extreme property damage and threats to life and safety.

Local Government: Any county, municipality, city, town, township, public authority, school district, special district, intrastate district, council of governments (regardless of whether the council of governments is incorporated as a nonprofit corporation under State law), regional or interstate government entity, or agency or instrumentality of a local government; any Indian tribe or authorized tribal organization, or Alaska Native village or organization; and any rural community, unincorporated town or village, or other public entity.

Magnitude: Magnitude is the measure of the strength of an earthquake, and is typically measured by the Richter scale. As an estimate of energy, each whole number step in the magnitude scale corresponds to the release of about 31 times more energy than the amount associated with the preceding whole number value.

Mass movement: A collective term for landslides, mudflows, debris flows, sinkholes and lahars.

Mitigation: A preventive action that can be taken in advance of an event that will reduce or eliminate the risk to life or property.

Mitigation Actions: Mitigation actions are specific actions to achieve goals and objectives that minimize the effects from a disaster and reduce the loss of life and property.

Nolte Future Floodplain: The Nolte Future Floodplain is the portion of the regulatory floodplain based on the Roseville City of Roseville Floodplain Analysis published by Nolte and Associates in August 1986. This analysis used hydrologic parameters that better represented the observed flooding scenarios that caused flooding in Roseville. The study also used hydrologic parameters based on projected growth for the region assuming total development of the watershed instead of existing conditions used by FEMA. This approach generated a floodplain area greater than that reflected of on the FIRM for portions of Roseville. Although this study was never formally adopted, it is used by the City as the best available information for regulatory and land- use programs such as the specific plan program and improvement standards.

Objective: For the purposes of this Plan, an objective is defined as a short-term aim that, when combined with other objectives, forms a strategy or course of action to meet a goal. Unlike goals, objectives are specific and measurable.

Peak Ground Acceleration: Peak Ground Acceleration (PGA) is a measure of the highest amplitude of ground shaking that accompanies an earthquake, based on a percentage of the force of gravity.

Preparedness: Preparedness refers to actions that strengthen the capability of government, citizens, and communities to respond to disasters.

Presidential Disaster Declaration: These declarations are typically made for events that cause more damage than state and local governments and resources can handle without federal government assistance. Generally, no specific dollar loss threshold has been established for such declarations. A Presidential Disaster Declaration puts into motion long-term federal recovery programs, some of which are matched by state programs, designed to help disaster victims, businesses, and public entities.

Probability of Occurrence: The probability of occurrence is a statistical measure or estimate of the likelihood that a hazard will occur. This probability is generally based on past hazard events in the area and a forecast of events that could occur in the future. A probability factor based on yearly values of occurrence is used to estimate probability of occurrence.

Regulatory Floodplain: This term refers to an area regulated by the City of Roseville as floodplain through its land-use regulations and improvement standards. It includes areas identified by FEMA and published on FIRMs and additional areas identified by Roseville as being susceptible to flooding. These areas are delineated based on detailed hydrologic and hydraulic floodplain modeling that meets or exceeds FEMA criteria for mapping and modeling floodplains. The flood event used to delineate these boundaries is referred to as "the regulatory flood" in this Plan to differentiate it from the "base flood" used by FEMA. The City of Roseville designates the 100-year floodplain area on its land-use map in accordance with best available floodplain information as determined by the Public Works Director. In many portions of the City, the Nolte Future Floodplain (May 1987) has been used to designate floodplain boundaries. When Nolte Future Floodplain information does not exist or does not represent the best available information, new floodplain information is generated by the project proponent. New floodplain information is generally developed (1) consistent with build-out development assumptions used by the Nolte Future Floodplain analysis, and (2) in compliance with the most recent Placer County floodplain manual. Floodplain boundaries can normally be terminated where the 100-year floodplain narrows to a width of 200 feet or less and where the associated drainage area is less than 300 acres. Precise termination of boundaries must be approved by the Public Works Director.

Repetitive Loss Property: Any NFIP-insured property that, since 1978 and regardless of any changes of ownership during that period, has experienced:

- Four or more paid flood losses in excess of $1000.00; or
- Two paid flood losses in excess of $1000.00 within any 10-year period since 1978 or
- Three or more paid losses that equal or exceed the current value of the insured property.

Return Period (or Mean Return Period): This term refers to the average period of time in years between occurrences of a particular hazard (equal to the inverse of the annual frequency of occurrence).

Riverine: Of or produced by a river. Riverine floodplains have readily identifiable channels. Floodway maps can only be prepared for riverine floodplains.

Risk: Risk is the estimated impact that a hazard would have on people, services, facilities, and structures in a community. Risk measures the likelihood of a hazard occurring and resulting in an adverse condition that causes

injury or damage. Risk is often expressed in relative terms such as a high, moderate, or low likelihood of sustaining damage above a particular threshold due to occurrence of a specific type of hazard. Risk also can be expressed in terms of potential monetary losses associated with the intensity of the hazard.

Risk Assessment: Risk assessment is the process of measuring potential loss of life, personal injury, economic injury, and property damage resulting from hazards. This process assesses the vulnerability of people, buildings, and infrastructure to hazards and focuses on (1) hazard identification; (2) impacts of hazards on physical, social, and economic assets; (3) vulnerability identification; and (4) estimates of the cost of damage or costs that could be avoided through mitigation.

Risk Ranking: This ranking serves two purposes, first to describe the probability that a hazard will occur, and second to describe the impact a hazard will have on the people, property, and economy of Roseville. Risk estimates for the City are based on the methodology that the City used to prepare the risk assessment for this Plan. The following equation shows the risk ranking calculation:

Risk Ranking = Probability + Impact (people + property + economy)

Robert T. Stafford Act: The Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 100-107, was signed into law on November 23, 1988. This law amended the Disaster Relief Act of 1974, Public Law 93-288. The Stafford Act is the statutory authority for most federal disaster response activities, especially as they pertain to FEMA and its programs.

Sinkhole: A collapse depression in the ground with no visible outlet. Its drainage is subterranean. It is commonly vertical-sided or funnel-shaped.

Slab: This refers to one or more layers of snow in which the grains are bonded together. A slab initially fails over a large area instead of at a single point.

Special Flood Hazard Area: The base floodplain delineated on a Flood Insurance Rate Map. The SFHA is mapped as a Zone A in riverine situations and zone V in coastal situations. The SFHA may or may not encompass all of a community's flood problems

Stakeholder: Business leaders, civic groups, academia, non-profit organizations, major employers, managers of critical facilities, farmers, developers, special purpose districts, and others whose actions could impact hazard mitigation.

Steering Committee: The Steering Committee is the Roseville City Council-approved group that oversaw all phases of the hazard mitigation plan's development. The members of this committee included key city personnel, citizens, and other stakeholders from within the planning area.

Stream Bank Erosion: Stream bank erosion is common along rivers, streams and drains where banks have been eroded, sloughed or undercut. However, it is important to remember that a stream is a dynamic and constantly changing system. It is natural for a stream to want to meander, so not all eroding banks are "bad" and in need of repair. Generally, stream bank erosion becomes a problem where development has limited the meandering nature of streams, where streams have been channelized, or where stream bank structures (like bridges, culverts, etc.) are located in places where they can actually cause damage to downstream areas. Stabilizing these areas can help protect watercourses from continued sedimentation, damage to adjacent land uses, control unwanted meander, and improvement of habitat for fish and wildlife.

Steep Slope: Different communities and agencies define it differently, depending on what it is being applied to, but generally a steep slope is a slope in which the percent slope equals or exceeds 25%. For this study, steep slope is defined as slopes greater than 33%.

Subduction Zone Earthquake: This type of quake occurs along two converging plates, attached to one another along their interface. When the interface between these two plates slips, a sudden, dramatic release of energy results, propagated along the entire fault line.

Sustainable Hazard Mitigation: This concept includes the sound management of natural resources, local economic and social resiliency, and the recognition that hazards and mitigation must be understood in the largest possible social and economic context.

Technical Subcommittee: This City of Roseville group convened to provide guidance, support, and feedback to the planning team during all phases of Roseville hazard mitigation plan development. The technical subcommittee consisted of key staff from City departments integral to implementing City programs pertinent to hazard mitigation.

Technological Hazard: A technological hazard arises from human activities such as the manufacture, transportation, storage, and use of hazardous materials. Technological hazards are assumed to be accidental in nature, with unintended consequences.

Thunderstorm: A thunderstorm is a storm with lightning and thunder produced by cumulonimbus clouds. Thunderstorms usually produce gusty winds, heavy rains, and sometimes hail. Thunderstorms are usually short in duration (seldom more than 2 hours). Heavy rains associated with thunderstorms can lead to flash flooding during the wet or dry seasons.

Tornado: A tornado is a violently rotating column of air extending between and in contact with a cloud and the surface of the earth. Tornadoes are often (but not always) visible as funnel clouds. On a local scale, tornadoes are the most intense of all atmospheric circulations, and winds can reach destructive speeds of more than 300 mph. A tornado's vortex is typically a few hundred meters in diameter, and damage paths can be up to 1 mile wide and 50 miles long.

Vulnerability: Vulnerability describes how exposed or susceptible an asset is to damage. Vulnerability depends on an asset's construction, contents, and the economic value of its functions. Like indirect damages, the vulnerability of one element of the community is often related to the vulnerability of another. For example, many businesses depend on uninterrupted electrical power. Flooding of an electric substation would affect not only the substation itself but businesses as well. Often, indirect effects can be much more widespread and damaging than direct effects.

Water Supply Strategy: A water supply strategy is a comprehensive approach to ensure water reliability for Roseville's customers. The City has a diverse set of water supply options, including surface water contracts, recycled water, and groundwater wells to ensure that even after a period of dry years, a combination of available water supplies and water conservation measures will ensure that the community has adequate water. The City has contracts for surface water with three agencies

Watershed: A watershed is an area that drains downgradient from areas of higher land to areas of lower land to the lowest point, a common drainage basin.

Weapon of Mass Destruction (WMD): WMDs include chemical, biological, radiological, nuclear, and explosive weapons associated with terrorism.

West Nile Virus: West Nile virus is a recent natural hazard affecting California. Mosquitoes transmit this potentially deadly disease to livestock and humans alike. West Nile virus first struck the northern hemisphere in Queens, New York, in 1999 and killed four people. In 2003, all 50 states warned of an outbreak from any of the 30 mosquito species known to carry it. From 62 severe cases in 1999, confirmed human cases of the virus spread

to 39 states in 2002 and killed 284 people. Less than 1 percent of those infected develop severe illness. People over 50 years of age appear to be at high risk for the severe aspects of the disease.

Wildfire: These terms refer to any uncontrolled fire occurring on undeveloped land that requires fire suppression. The potential for wildfire is influenced by three factors: the presence of fuel, topography, and air mass. Fuel can include living and dead vegetation on the ground, along the surface as brush and small trees, and in the air such as tree canopies. Topography includes both slope and elevation. Air mass includes temperature, relative humidity, wind speed and direction, cloud cover, precipitation amount, duration, and the stability of the atmosphere at the time of the fire. Wildfires can be ignited by lightning and, most frequently, by human activity including smoking, campfires, equipment use, and arson.

Windstorm: Windstorms are generally short-duration events involving straight-line winds or gusts exceeding 50 mph. These gusts can produce winds of sufficient strength to cause property damage. Windstorms are especially dangerous in areas with significant tree stands, exposed property, poorly constructed buildings, mobile homes (manufactured housing units), major infrastructure, and aboveground utility lines. A windstorm can topple trees and power lines; cause damage to residential, commercial, critical facilities; and leave tons of debris in its wake.

Zoning Ordinance: The zoning ordinance designates allowable land use and intensities for a local jurisdiction. Zoning ordinances consist of two components: a zoning text and a zoning map.

Appendix A. Public Outreach Materials

City of Roseville Survey: 2016 Hazard Mitigation Plan Update Questionnaire

1. Survey Introduction

City of Roseville Hazard Mitigation Questionnaire

A range of natural and man-made disasters can affect any community. The City of Roseville works diligently to mitigate threats and prepare for disasters, and has been recognized nationally for its level of excellence in the area of hazard mitigation. This ensures our community minimizes the impact of adversity and can recover as quickly as possible.

To remain at this high level of preparedness, we need your help to identify and plan for future disasters. Data collected through this survey will help the City of Roseville Multi-Hazard Mitigation Committee:

- **Assess our residents' level of awareness regarding disasters;**
- **Determine areas vulnerable to various types of disasters;**
- **Coordinate activities to reduce the risk of injury or property damage in the future; and,**
- **Update the City of Roseville Hazard Mitigation Plan.**

The City of Roseville Hazard Mitigation Plan is required to be updated every five years by the federal Disaster Mitigation Act of 2000.

The Plan details the risks of both natural and manmade hazards in Roseville and includes programs and projects that can help reduce the exposure of City residents and businesses should an event occur in Roseville. The Plan also makes the City eligible for federal pre-disaster and post-disaster assistance. The City has been very successful to date in securing funds for projects in Roseville to lessen the risks associated with natural hazards in Roseville.

This survey consists of three sets of questions: The first section consists of demographic information that will be used in evaluating the responses to the questionnaire. The second section is about the potential hazards near you and whether your knowledge of potential hazards influenced your decision to choose where you live. The last section is about your experience and knowledge of natural and manmade hazards in general, and steps your household has taken to prepare for disasters.

Thank you for taking the time to participate in the 2016 Hazard Mitigation Questionnaire!

City of Roseville Survey: 2016 Hazard Mitigation Plan Update Questionnaire

2. About You

First, please tell us about yourself. This information will aid the City's Multi-Hazard Mitigation Plan Steering Committee in evaluating the responses to this questionnaire. The answers will be used only for the preparation of this Plan and will not be provided to any other group or interest.

1. How much is your gross household income?

- ◯ $20,000 or less
- ◯ $20,001 to $49,999
- ◯ $50,000 to $74,999
- ◯ $75,000 to $99,999
- ◯ $100,000 or More

2. Do you work in Roseville?

- ◯ Yes
- ◯ No

3. Please indicate the primary language spoken in your household.

- ◯ English
- ◯ Spanish
- ◯ Other (please specify)
- ◯ Other Indo-European Language
- ◯ Asian and Pacific Island Languages

4. Which of the following digital media outlets do you subscribe to receive news and information about the City of Roseville?

Select all that apply.

- ☐ Facebook
- ☐ Twitter
- ☐ Nextdoor
- ☐ Other (please specify)
- ☐ E-mail and/or text messages
- ☐ Alert Roseville

City of Roseville Survey: 2016 Hazard Mitigation Plan Update Questionnaire

3. Location

Please tell us about where you live and if the potential impacts of natural or manmade hazards influenced your decision.:

* 5. Do you live in Roseville?

- Yes
- No

6. Do you own or rent your place of residence?

- Own
- Rent

7. How long have you lived in at your current residence?

- Less than a year
- 1 – 2 years
- 3 – 5 years
- 6 – 10 years
- 11 – 15 years
- 16 – 20 years
- More than 20 years
- I don't live in Roseville

* 8. When you moved into your home, did you consider the impact a natural or human-caused disaster could have on your home?

- Yes
- No

* 9. Was the presence of a natural hazard risk zone (e.g., dam failure zone, flood zone, landslide hazard area, high fire risk area) disclosed to you by a real estate agent, seller, or landlord before you purchased or moved into your home?

- Yes
- No

* 10. Is your residence located in or near a FEMA designated floodplain?

- Yes
- No
- Not Sure

11. Is your residence located in a dam failure zone?

- Yes
- No
- Not sure

* 12. Do you have flood insurance?

- Yes
- No
- Not Sure

* 13. Is your residence located near an earthquake fault?

- Yes
- No
- Not Sure

* 14. Do you have earthquake insurance?

- ◯ Yes
- ◯ No
- ◯ Not Sure

* 15. Is your property located in an area at risk for wildfires?

- ◯ Yes
- ◯ No
- ◯ Not Sure

16. Have you ever had problems securing homeowners or renters insurance due to risks from hazards?

- ◯ Yes
- ◯ No

If "yes," what hazard was the cause of the difficulty?

17. Do you support policies to restrict or prohibit development in designated hazard zones?

- ◯ Yes
- ◯ No

* indicates a question that requires an answer.

City of Roseville Survey: 2016 Hazard Mitigation Plan Update Questionnaire

4. Hazard Knowledge

The next set of questions is about your experience and knowledge of natural and manmade hazards and steps your household has taken to prepare for disasters:

18. Which of the following natural hazard events have you or has anyone in your household experienced within the past 20 years in Roseville? (Check all that apply)

- ☐ Dam Failure
- ☐ Drought
- ☐ Earthquake
- ☐ Epidemic/Pandemic (flu, avian flu, H1N1, West Nile)
- ☐ Extreme Heat
- ☐ Flood
- ☐ Freeze
- ☐ Landslide & Other Earth Movements (non-seismic induced landslides and earth movements;subsidence;sinkholes;geologic hazard)
- ☐ Severe Weather (wind, lightning, winter storm, etc.)
- ☐ Wildfire
- ☐ None
- ☐ Other (please specify)

* 19. How concerned are you about the following natural hazards in Roseville? (Please check one for each hazard)

	Not concerned	Somewhat concerned	Concerned	Very concerned	Extremely concerned
Dam Failure					
Drought					
Earthquake					
Epidemic/Pandemic (flu, avian flu, H1N1, West Nile, Ebola)					
Extreme Heat					
Flood					
Freeze					
Landslide & Other Earth Movements (non-seismic induced landslides and earth movements;subsidence;sinkholes;geologic hazard)					
Severe Weather (wind, lightning, winter storm, etc.)					
Wildfire					
Other Natural Hazard					

If you are concerned about a natural hazard not listed above, please specify.

* 20. How concerned are you with the following manmade hazards in Roseville? (Check all that apply)

	Not concerned	Somewhat concerned	Concerned	Very concerned	Extremely concerned
Energy Shortage					
Act of Terrorism					
Hazardous Materials Release					
Cyber Threats					
Other Human-Caused Hazard					

If you are concerned about a human-caused hazard not listed above, please specify.

* 21. The FEMA website - Ready.gov - provides important information on how to prepare you and your family in the event of a disaster.

How prepared is your household for a natural or human-caused hazard event? (Check one)

- ◯ Not at all Prepared
- ◯ Somewhat Prepared
- ◯ Adequately Prepared
- ◯ Well Prepared
- ◯ Very Well Prepared

* 22. How would you expect to be notified in case of an immediate threat caused by a natural or human-caused hazard.

Select all that apply.

- ☐ Television
- ☐ Radio
- ☐ Facebook
- ☐ Twitter
- ☐ Nextdoor
- ☐ Alert Roseville
- ☐ Other (please specify)

23. FEMA suggests that households have at least 3 days of food, water, and vital supplies (e.g. medications) in hand in the event of a disaster. How many days of food, water, and vital supplies does your family have on hand in the event of a disaster?

◯ 1 ◯ 2 ◯ 3 ◯ 4 ◯ 5 ◯ 6 ◯ 7 ◯ 8 ◯ 9 ◯ 10 ◯ None

24. How prepared are you to get along without electricity or natural gas for one to five days?

- ◯ Not at all prepared
- ◯ Somewhat prepared
- ◯ Very prepared

25. Where would you expect to find useful information to help you be prepared?

Select all that apply.

- ☐ Television
- ☐ Internet
- ☐ Social Media
- ☐ Newspaper/magazine
- ☐ Other (please specify)
- ☐ City of Roseville Public Library
- ☐ Public government meetings
- ☐ Schools/academic institutions

26. Which of the following steps has your household already undertaken to prepare for a natural or manmade disaster?

Select all that apply.

- [ ] Received first aid/CPR training
- [ ] Made a fire escape plan
- [ ] Designated a meeting place
- [ ] Identified utility shutoffs
- [ ] Community Emergency Response Training (CERT)
- [ ] Prepared a disaster supply kit
- [ ] Installed smoke detectors on each level of the house
- [ ] Stored food and water
- [ ] Stored flashlights and batteries
- [ ] Stored a battery-powered radio
- [ ] Stored a fire extinguisher
- [ ] Stored medical supplies (first aid kit, medications)
- [ ] Other (please specify)

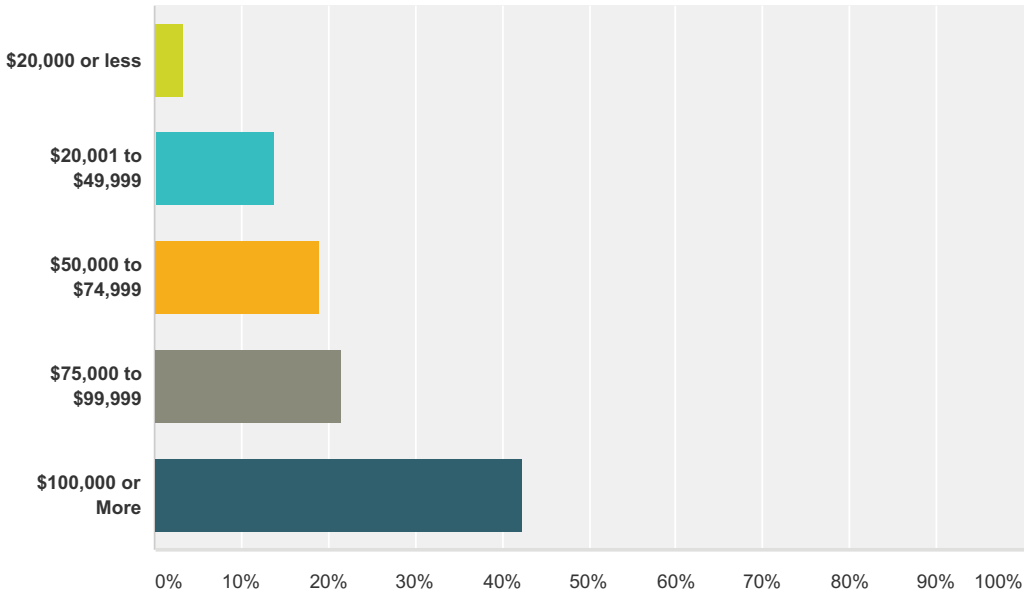
27. Please provide any additional comments you would like to share with the City of Roseville Planning Team.

* indicates a question that requires an answer.

28. If you would like to receive information regarding upcoming public events and other participatory opportunities regarding hazard mitigation, please provide your email address below.

Q1 How much is your gross household income?

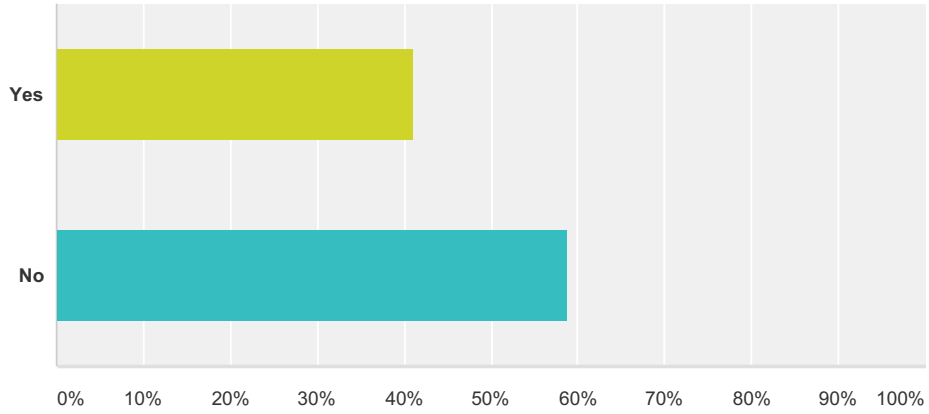
Answered: 641 Skipped: 30



Answer Choices	Responses	
$20,000 or less	**3.28%**	21
$20,001 to $49,999	**13.73%**	88
$50,000 to $74,999	**19.03%**	122
$75,000 to $99,999	**21.53%**	138
$100,000 or More	**42.43%**	272
Total		**641**

Q2 Do you work in Roseville?

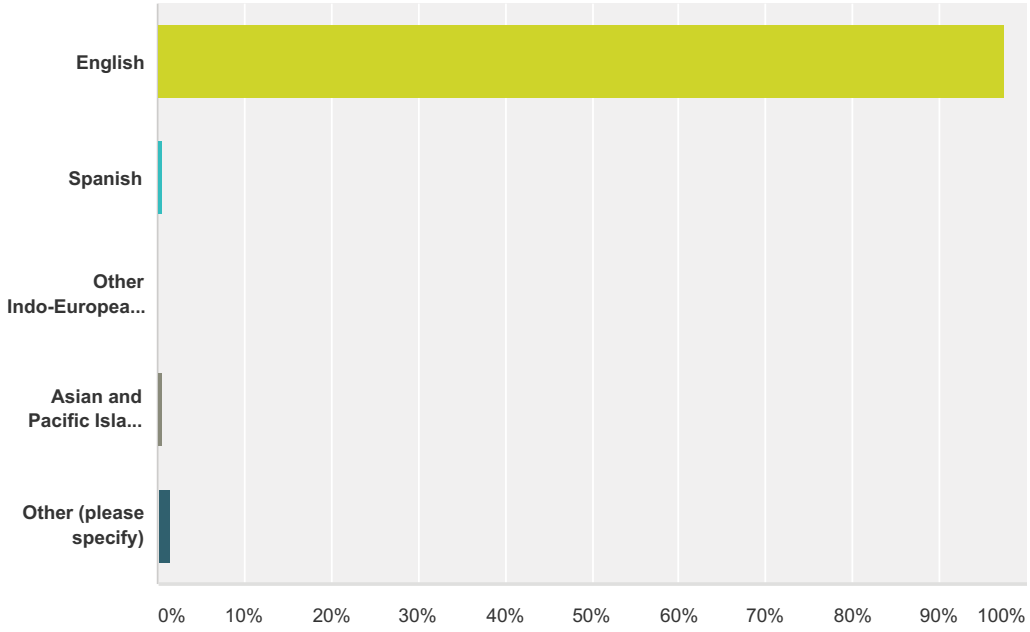
Answered: 650 Skipped: 21



Answer Choices	Responses	
Yes	**41.23%**	268
No	**58.77%**	382
Total		**650**

Q3 Please indicate the primary language spoken in your household.

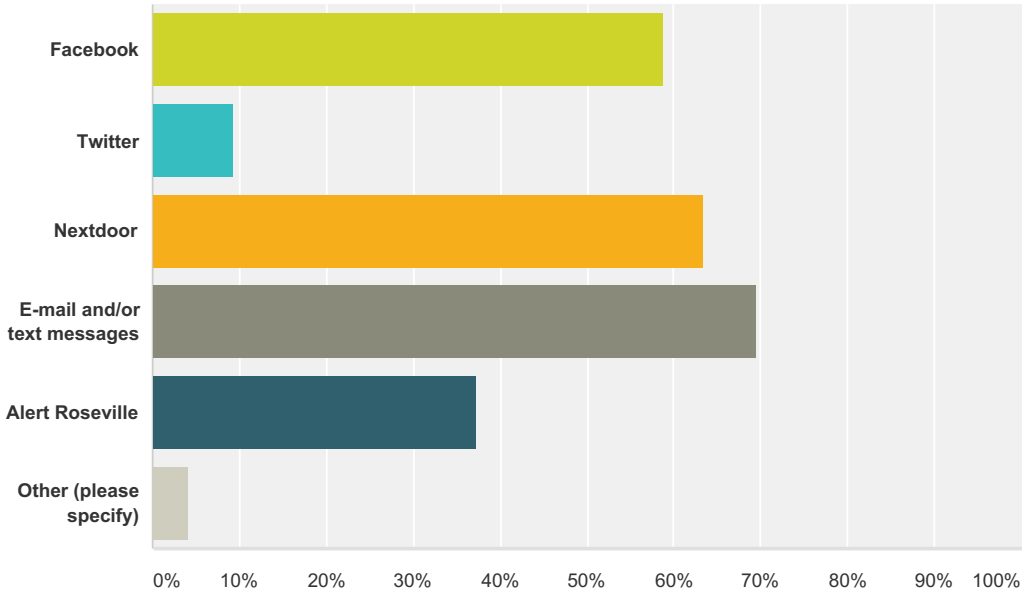
Answered: 662 Skipped: 9



Answer Choices	Responses	
English	**97.43%**	645
Spanish	**0.60%**	4
Other Indo-European Language	**0.00%**	0
Asian and Pacific Island Languages	**0.60%**	4
Other (please specify)	**1.36%**	9
Total		**662**

Q4 Which of the following digital media outlets do you subscribe to receive news and information about the City of Roseville? Select all that apply.

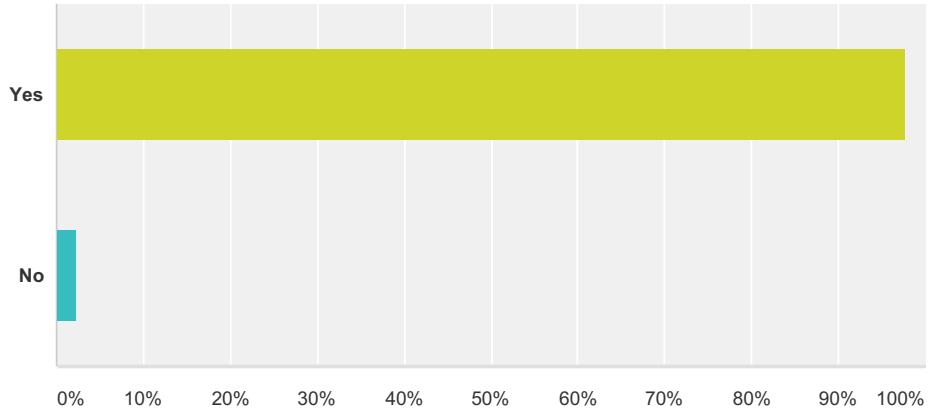
Answered: 658 Skipped: 13



Answer Choices	Responses	
Facebook	**58.97%**	388
Twitter	**9.42%**	62
Nextdoor	**63.37%**	417
E-mail and/or text messages	**69.45%**	457
Alert Roseville	**37.39%**	246
Other (please specify)	**4.10%**	27
Total Respondents: 658		

Q5 Do you live in Roseville?

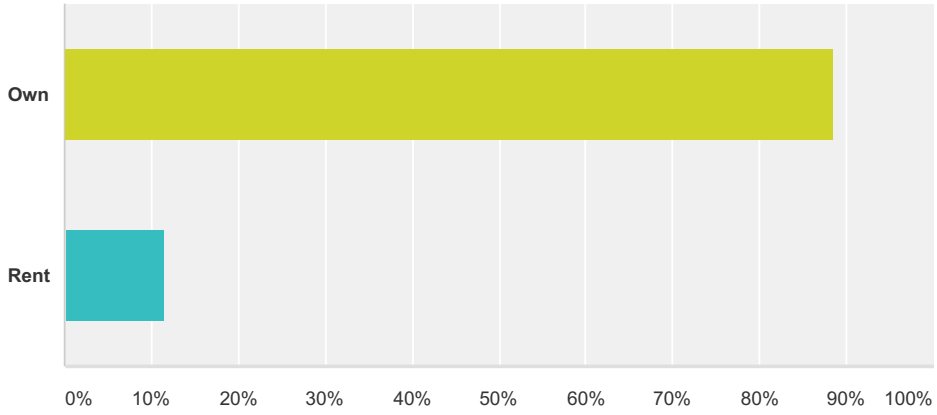
Answered: 646 Skipped: 25



Answer Choices	Responses	
Yes	**97.68%**	631
No	**2.32%**	15
Total		**646**

Q6 Do you own or rent your place of residence?

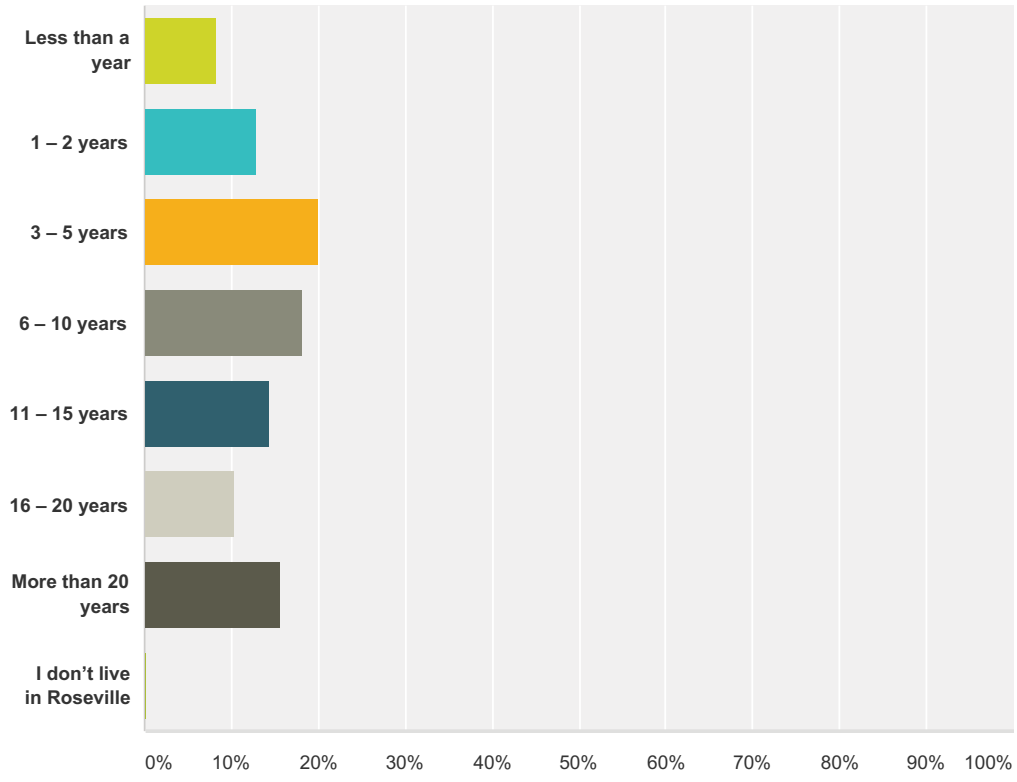
Answered: 641 Skipped: 30



Answer Choices	Responses	
Own	**88.46%**	567
Rent	**11.54%**	74
Total		**641**

Q7 How long have you lived in at your current residence?

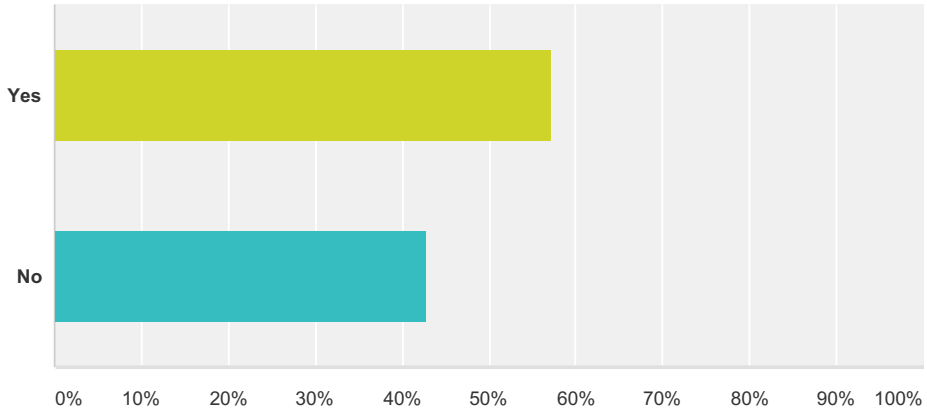
Answered: 642 Skipped: 29



Answer Choices	Responses	
Less than a year	**8.41%**	54
1 – 2 years	**12.93%**	83
3 – 5 years	**19.94%**	128
6 – 10 years	**18.22%**	117
11 – 15 years	**14.33%**	92
16 – 20 years	**10.44%**	67
More than 20 years	**15.58%**	100
I don't live in Roseville	**0.16%**	1
Total		**642**

Q8 When you moved into your home, did you consider the impact a natural or human-caused disaster could have on your home?

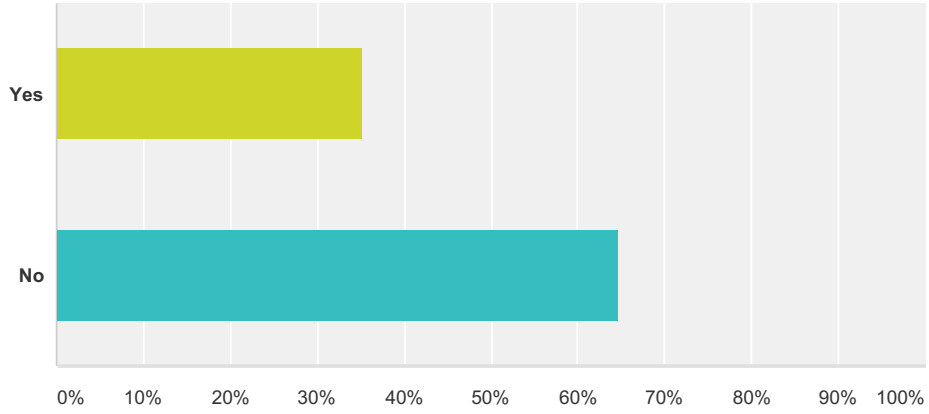
Answered: 646 Skipped: 25



Answer Choices	Responses	
Yes	**57.12%**	369
No	**42.88%**	277
Total		**646**

Q9 Was the presence of a natural hazard risk zone (e.g., dam failure zone, flood zone, landslide hazard area, high fire risk area) disclosed to you by a real estate agent, seller, or landlord before you purchased or moved into your home?

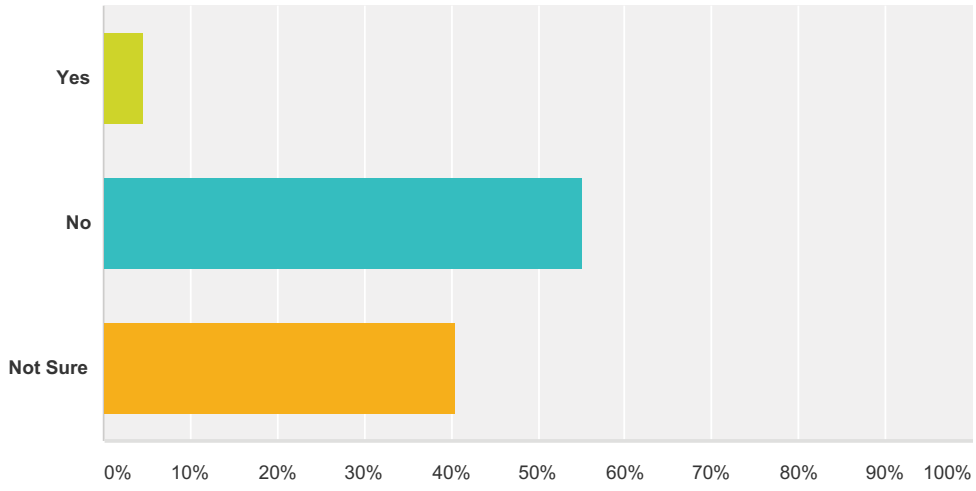
Answered: 646 Skipped: 25



Answer Choices	Responses	
Yes	**35.29%**	228
No	**64.71%**	418
Total		**646**

Q10 Is your residence located in or near a FEMA designated floodplain?

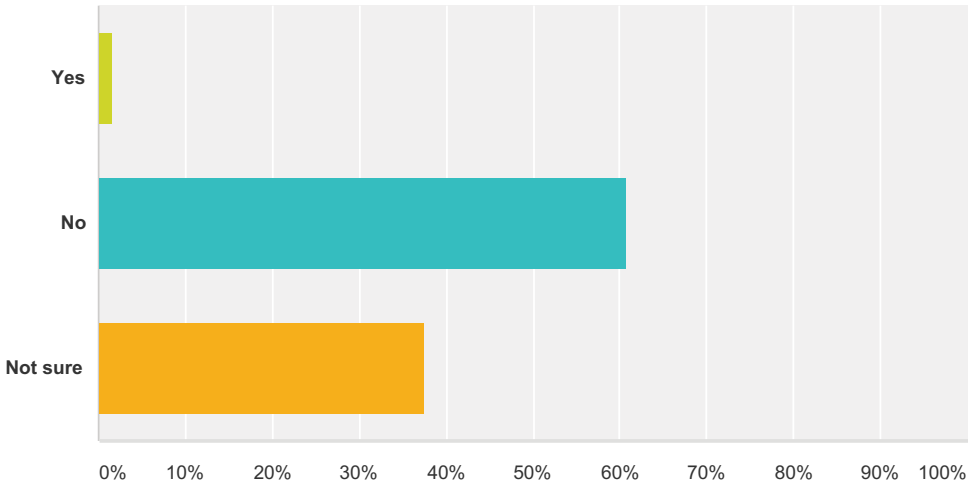
Answered: 646 Skipped: 25



Answer Choices	Responses	
Yes	**4.49%**	29
No	**55.11%**	356
Not Sure	**40.40%**	261
Total		**646**

Q11 Is your residence located in a dam failure zone?

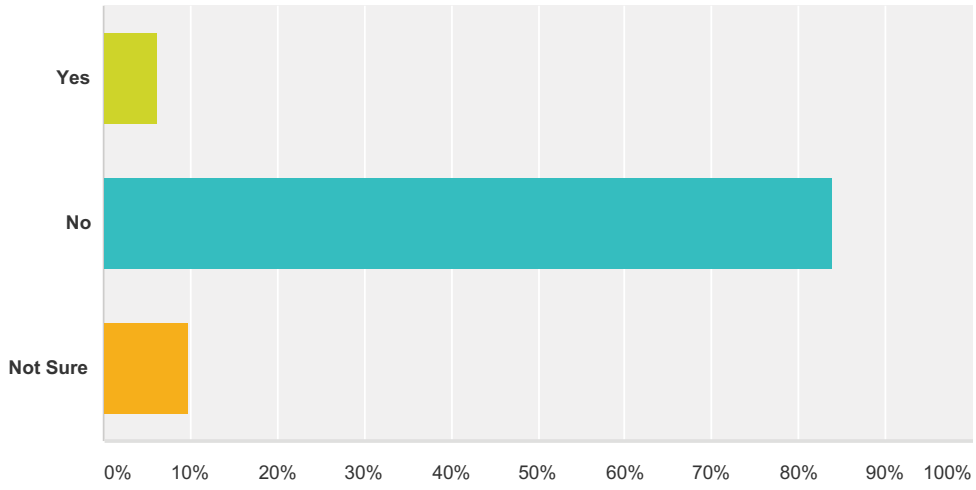
Answered: 642 Skipped: 29



Answer Choices	Responses	
Yes	**1.71%**	11
No	**60.75%**	390
Not sure	**37.54%**	241
Total		**642**

Q12 Do you have flood insurance?

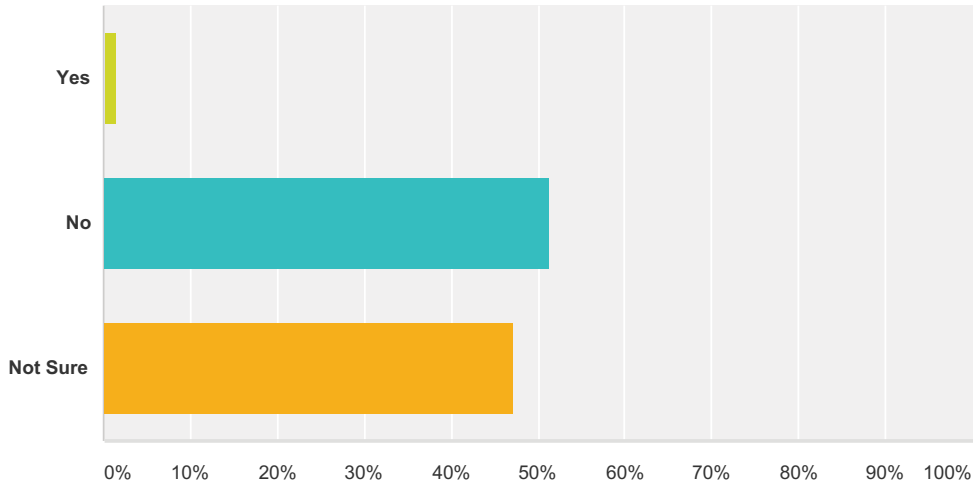
Answered: 646 Skipped: 25



Answer Choices	Responses	
Yes	**6.19%**	40
No	**83.90%**	542
Not Sure	**9.91%**	64
Total		**646**

Q13 Is your residence located near an earthquake fault?

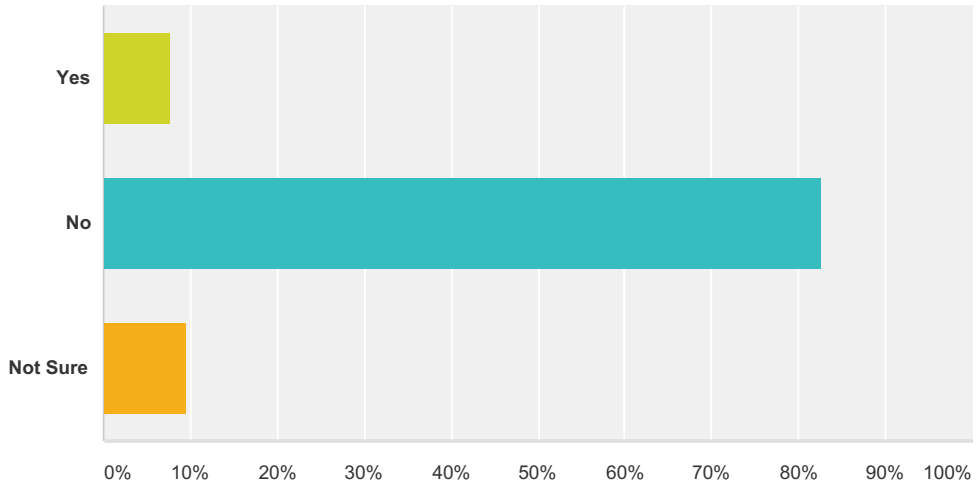
Answered: 646 Skipped: 25



Answer Choices	Responses	
Yes	**1.39%**	9
No	**51.39%**	332
Not Sure	**47.21%**	305
Total		**646**

Q14 Do you have earthquake insurance?

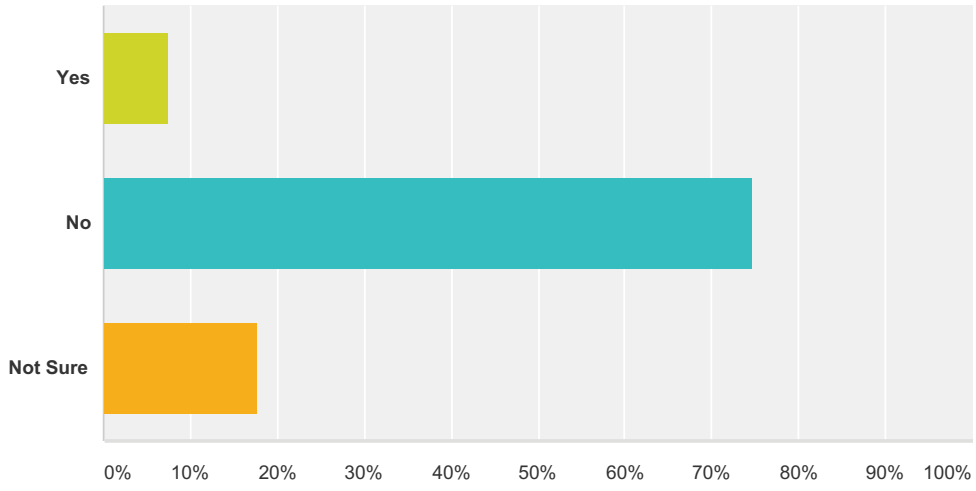
Answered: 646 Skipped: 25



Answer Choices	Responses	
Yes	**7.74%**	50
No	**82.66%**	534
Not Sure	**9.60%**	62
Total		**646**

Q15 Is your property located in an area at risk for wildfires?

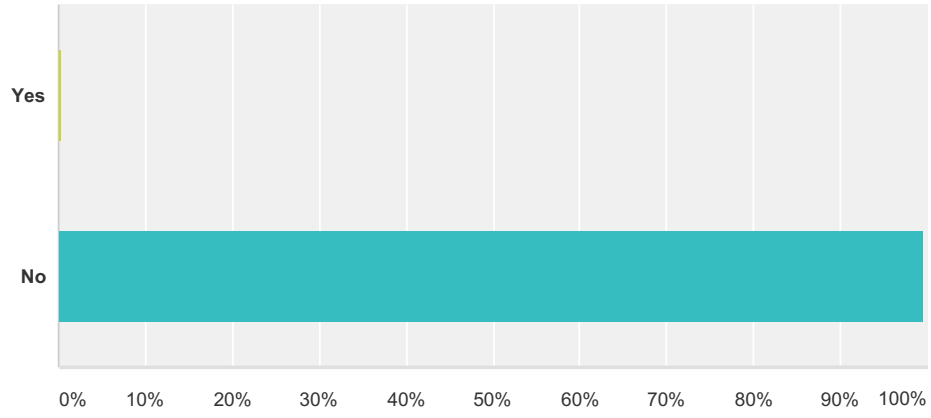
Answered: 646 Skipped: 25



Answer Choices	Responses	
Yes	**7.59%**	49
No	**74.77%**	483
Not Sure	**17.65%**	114
Total		**646**

Q16 Have you ever had problems securing homeowners or renters insurance due to risks from hazards?

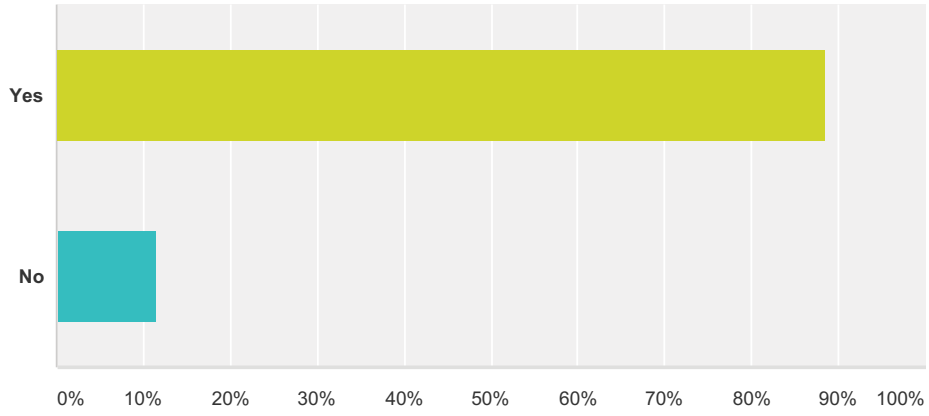
Answered: 641 Skipped: 30



Answer Choices	Responses	
Yes	**0.47%**	3
No	**99.53%**	638
Total		**641**

Q17 Do you support policies to restrict or prohibit development in designated hazard zones?

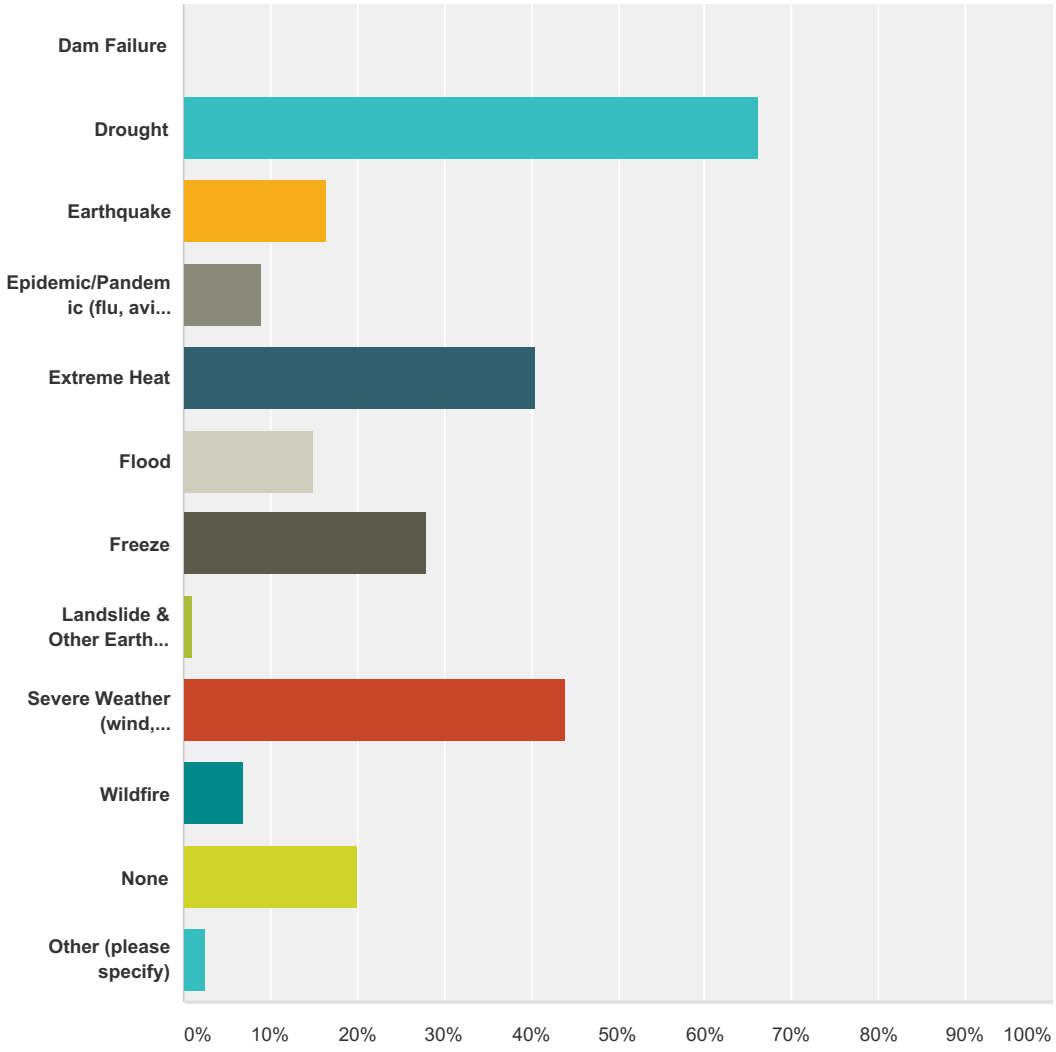
Answered: 623 Skipped: 48



Answer Choices	Responses	
Yes	**88.60%**	552
No	**11.40%**	71
Total		**623**

Q18 Which of the following natural hazard events have you or has anyone in your household experienced within the past 20 years in Roseville? (Check all that apply)

Answered: 556 Skipped: 115

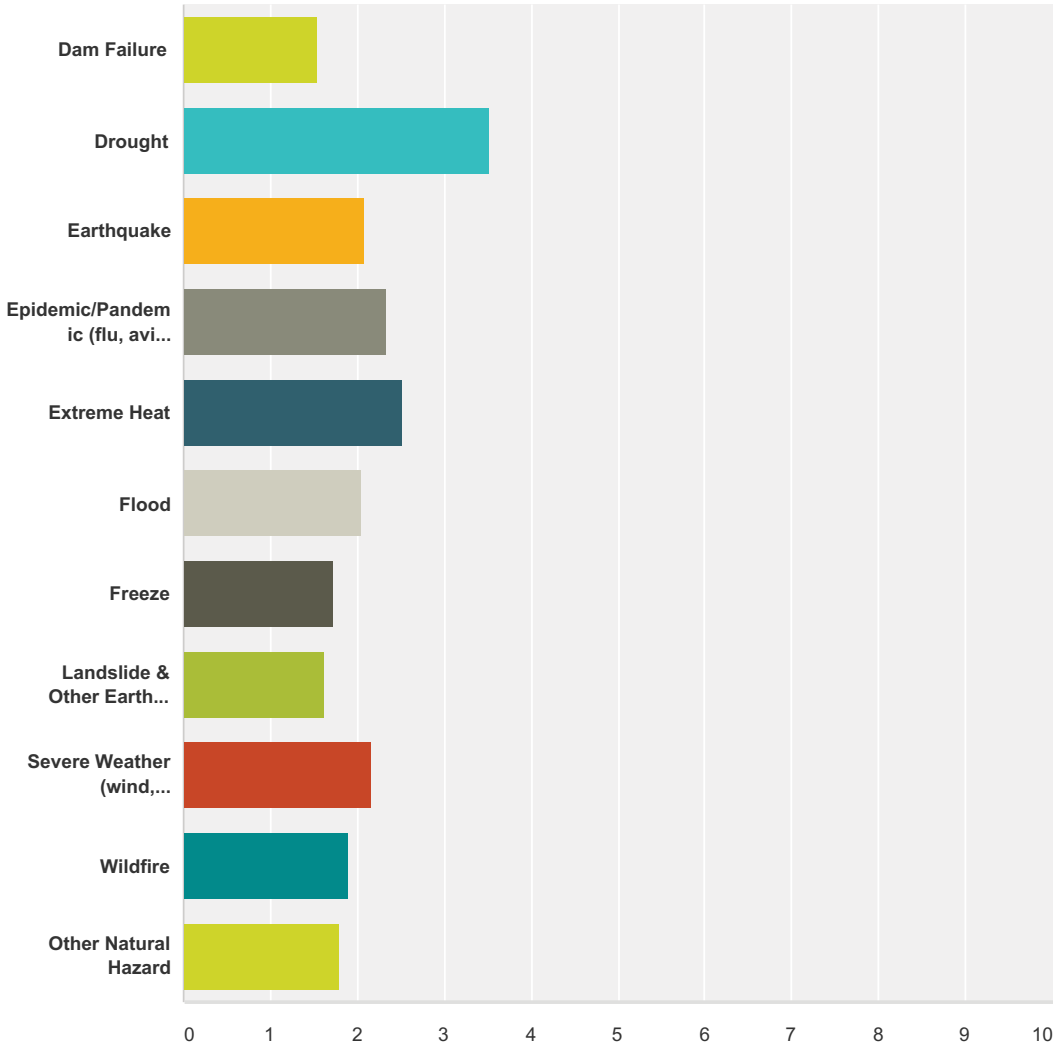


Answer Choices	Responses	
Dam Failure	**0.00%**	0
Drought	**66.19%**	368
Earthquake	**16.55%**	92
Epidemic/Pandemic (flu, avian flu, H1N1, West Nile)	**8.99%**	50
Extreme Heat	**40.47%**	225
Flood	**15.11%**	84
Freeze	**27.88%**	155

Landslide & Other Earth Movements (non-seismic induced landslides and earth movements;subsidence;sinkholes;geologic hazard)	**1.08%**	6
Severe Weather (wind, lightning, winter storm, etc.)	**44.06%**	245
Wildfire	**6.83%**	38
None	**19.96%**	111
Other (please specify)	**2.52%**	14
Total Respondents: 556		

Q19 How concerned are you about the following natural hazards in Roseville? (Please check one for each hazard)

Answered: 562 Skipped: 109

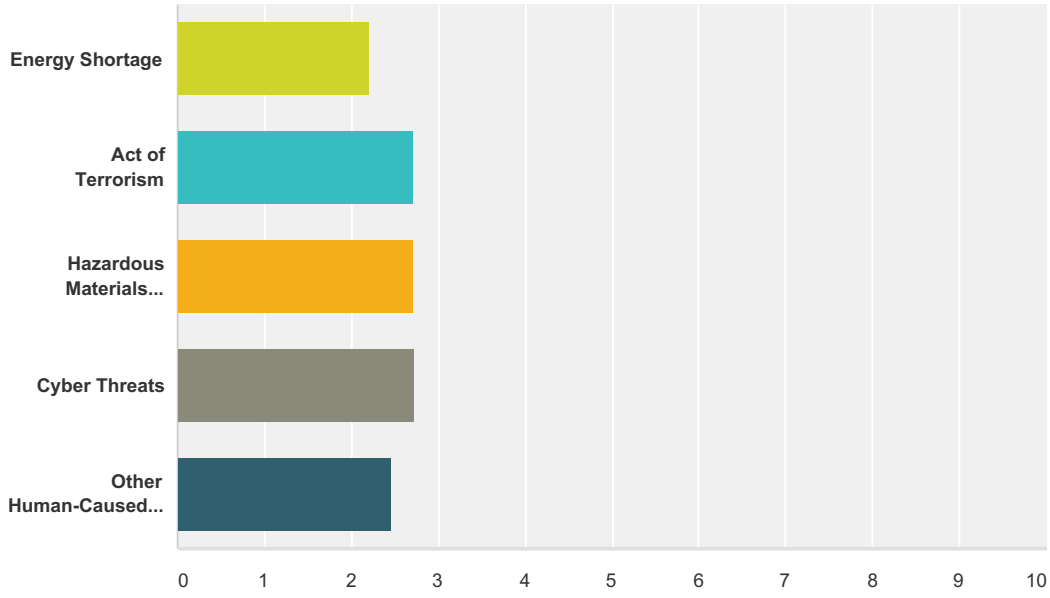


	Not concerned	Somewhat concerned	Concerned	Very concerned	Extremely concerned	Total	Weighted Average
Dam Failure	**64.76%** 351	**22.51%** 122	**8.86%** 48	**2.03%** 11	**1.85%** 10	542	1.54
Drought	**7.10%** 38	**12.15%** 65	**25.42%** 136	**32.52%** 174	**22.80%** 122	535	3.52
Earthquake	**32.15%** 172	**38.88%** 208	**20.00%** 107	**5.98%** 32	**2.99%** 16	535	2.09
Epidemic/Pandemic (flu, avian flu, H1N1, West Nile, Ebola)	**28.01%** 149	**31.58%** 168	**25.38%** 135	**8.46%** 45	**6.58%** 35	532	2.34
Extreme Heat	**24.54%** 132	**27.14%** 146	**26.02%** 140	**15.99%** 86	**6.32%** 34	538	2.52

Flood	**38.14%** 201	**32.83%** 173	**18.98%** 100	**6.07%** 32	**3.98%** 21	527	2.05
Freeze	**52.31%** 272	**29.23%** 152	**12.50%** 65	**4.04%** 21	**1.92%** 10	520	1.74
Landslide & Other Earth Movements (non-seismic induced landslides and earth movements;subsidence;sinkholes;geologic hazard)	**60.30%** 319	**25.33%** 134	**8.70%** 46	**3.21%** 17	**2.46%** 13	529	1.62
Severe Weather (wind, lightning, winter storm, etc.)	**30.78%** 165	**35.45%** 190	**22.95%** 123	**7.65%** 41	**3.17%** 17	536	2.17
Wildfire	**50.37%** 270	**25.19%** 135	**14.18%** 76	**5.22%** 28	**5.04%** 27	536	1.89
Other Natural Hazard	**53.80%** 262	**25.05%** 122	**13.76%** 67	**3.08%** 15	**4.31%** 21	487	1.79

Q20 How concerned are you with the following manmade hazards in Roseville? (Check all that apply)

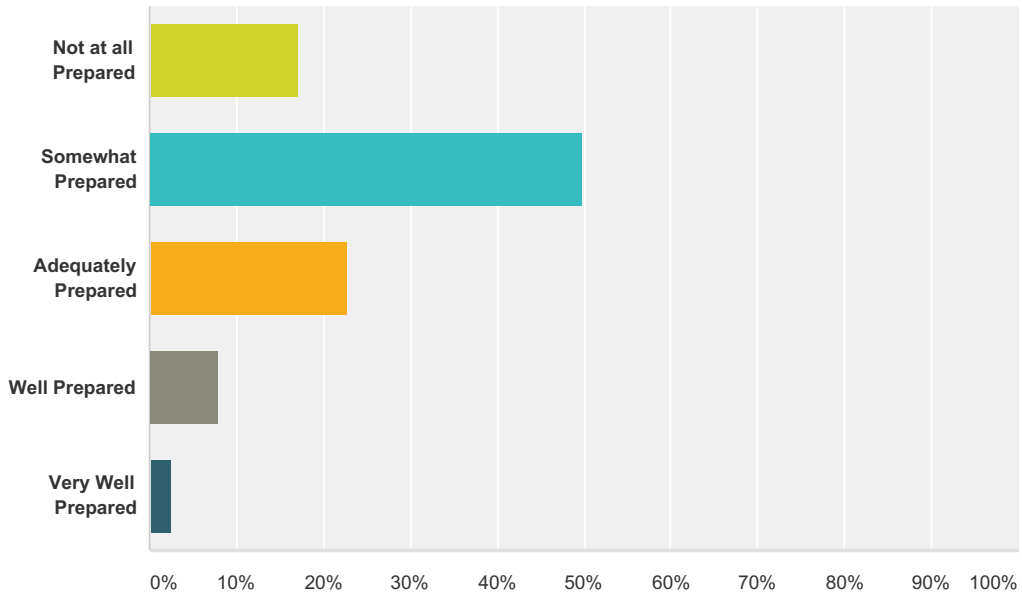
Answered: 562 Skipped: 109



	Not concerned	Somewhat concerned	Concerned	Very concerned	Extremely concerned	Total	Weighted Average
Energy Shortage	**28.30%** 150	**37.55%** 199	**22.83%** 121	**7.36%** 39	**3.96%** 21	530	2.21
Act of Terrorism	**16.76%** 90	**30.54%** 164	**26.63%** 143	**16.95%** 91	**9.12%** 49	537	2.71
Hazardous Materials Release	**15.92%** 85	**32.02%** 171	**26.97%** 144	**15.17%** 81	**9.93%** 53	534	2.71
Cyber Threats	**15.99%** 86	**29.93%** 161	**28.07%** 151	**17.47%** 94	**8.55%** 46	538	2.73
Other Human-Caused Hazard	**25.20%** 125	**29.84%** 148	**25.81%** 128	**11.49%** 57	**7.66%** 38	496	2.47

Q21 The FEMA website - Ready.gov - provides important information on how to prepare you and your family in the event of a disaster.How prepared is your household for a natural or human-caused hazard event? (Check one)

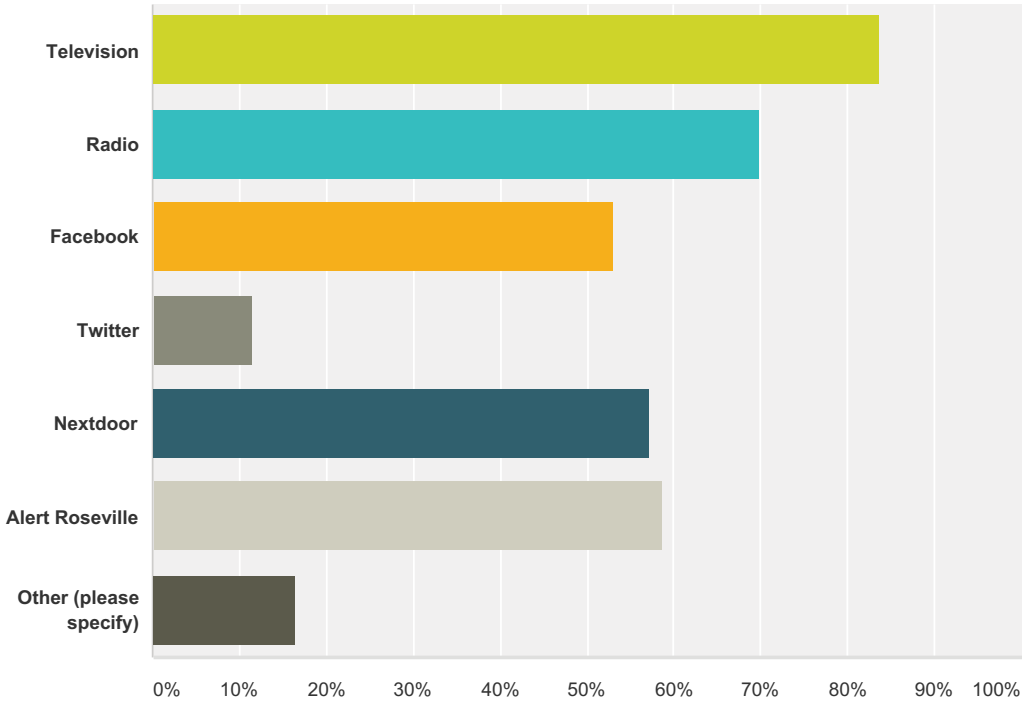
Answered: 562 Skipped: 109



Answer Choices	Responses	
Not at all Prepared	**17.08%**	96
Somewhat Prepared	**49.82%**	280
Adequately Prepared	**22.78%**	128
Well Prepared	**7.83%**	44
Very Well Prepared	**2.49%**	14
Total		**562**

Q22 How would you expect to be notified in case of an immediate threat caused by a natural or human-caused hazard.Select all that apply.

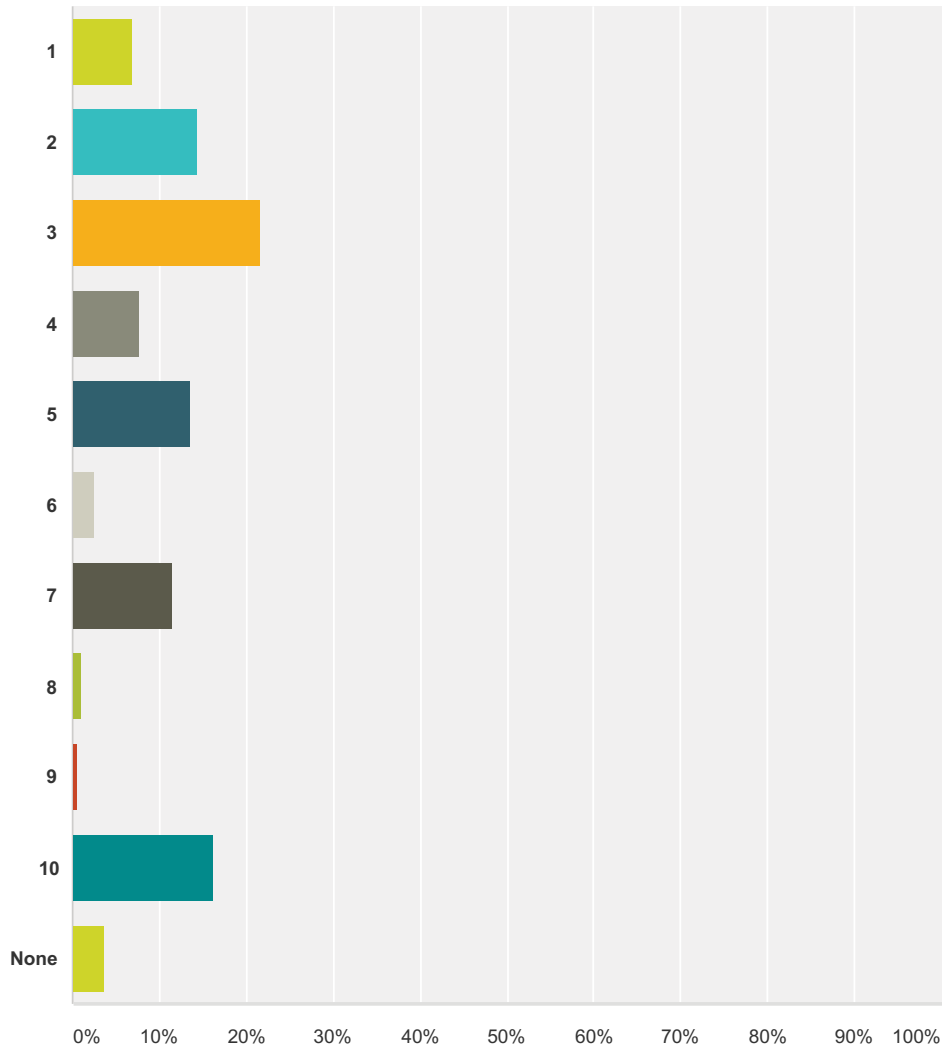
Answered: 562 Skipped: 109



Answer Choices	Responses	
Television	**83.81%**	471
Radio	**69.93%**	393
Facebook	**53.02%**	298
Twitter	**11.57%**	65
Nextdoor	**57.12%**	321
Alert Roseville	**58.72%**	330
Other (please specify)	**16.55%**	93
Total Respondents: 562		

Q23 FEMA suggests that households have at least 3 days of food, water, and vital supplies (e.g. medications) in hand in the event of a disaster. How many days of food, water, and vital supplies does your family have on hand in the event of a disaster?

Answered: 556 Skipped: 115

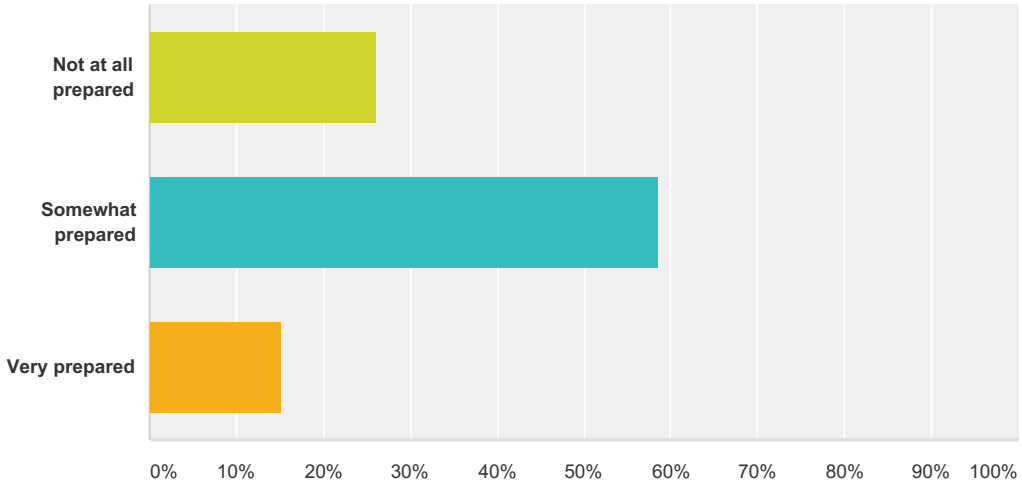


Answer Choices	Responses	
1	**6.83%**	38
2	**14.39%**	80
3	**21.76%**	121
4	**7.73%**	43
5	**13.67%**	76

6	**2.52%**	14
7	**11.51%**	64
8	**1.08%**	6
9	**0.54%**	3
10	**16.19%**	90
None	**3.78%**	21
Total		**556**

Q24 How prepared are you to get along without electricity or natural gas for one to five days?

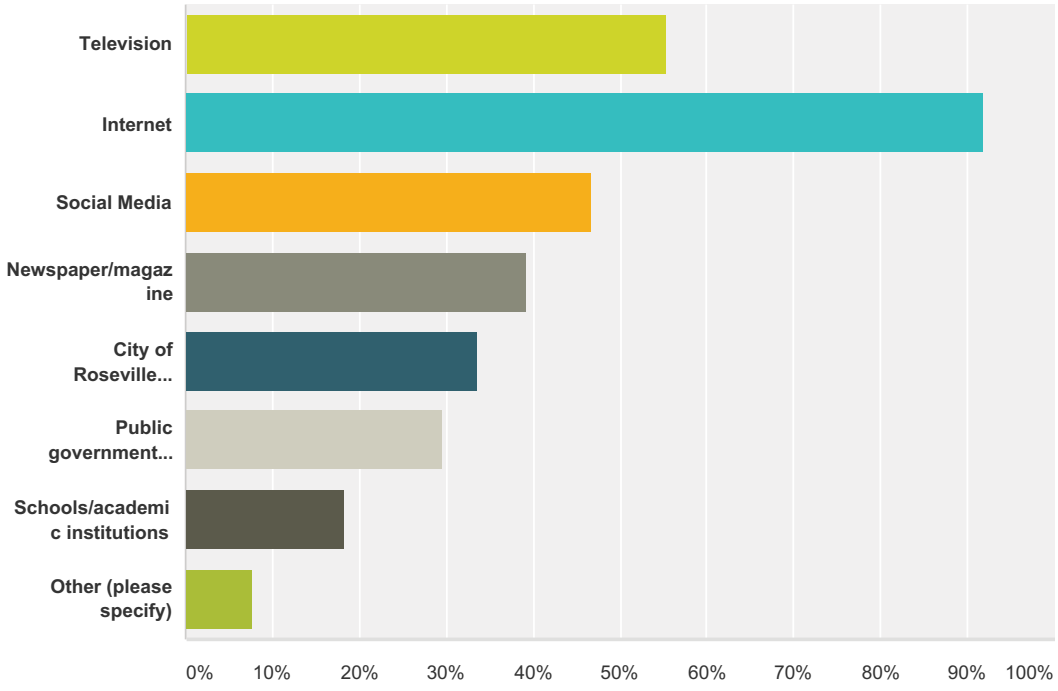
Answered: 558 Skipped: 113



Answer Choices	Responses	
Not at all prepared	**26.16%**	146
Somewhat prepared	**58.60%**	327
Very prepared	**15.23%**	85
Total		**558**

Q25 Where would you expect to find useful information to help you be prepared?Select all that apply.

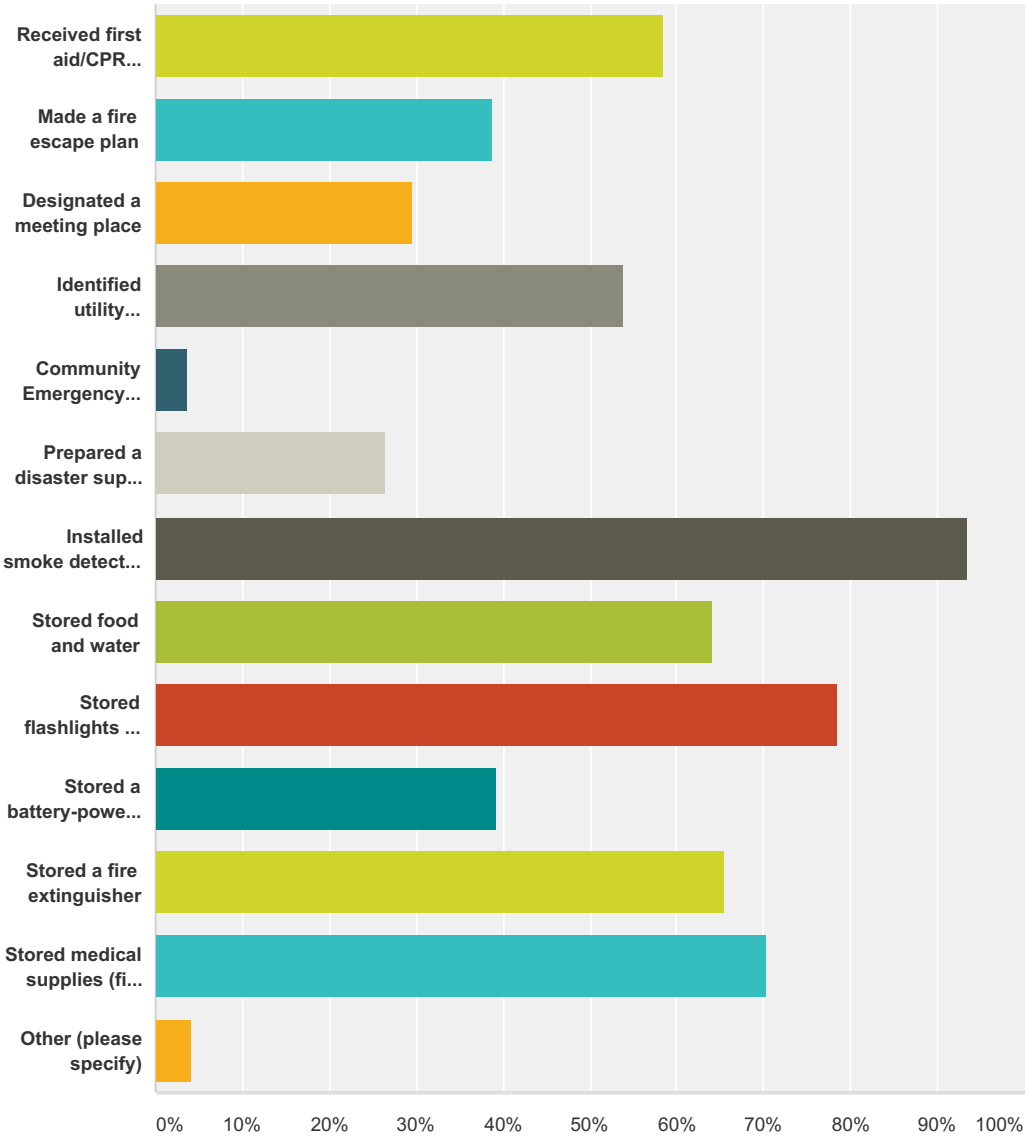
Answered: 560 Skipped: 111



Answer Choices	Responses	
Television	**55.36%**	310
Internet	**91.79%**	514
Social Media	**46.79%**	262
Newspaper/magazine	**39.29%**	220
City of Roseville Public Library	**33.57%**	188
Public government meetings	**29.64%**	166
Schools/academic institutions	**18.39%**	103
Other (please specify)	**7.68%**	43
Total Respondents: 560		

Q26 Which of the following steps has your household already undertaken to prepare for a natural or manmade disaster?Select all that apply.

Answered: 558 Skipped: 113



Answer Choices	Responses	
Received first aid/CPR training	**58.42%**	326
Made a fire escape plan	**38.89%**	217
Designated a meeting place	**29.57%**	165
Identified utility shutoffs	**53.94%**	301
Community Emergency Response Training (CERT)	**3.76%**	21

Prepared a disaster supply kit	**26.52%**	148
Installed smoke detectors on each level of the house	**93.55%**	522
Stored food and water	**64.16%**	358
Stored flashlights and batteries	**78.49%**	438
Stored a battery-powered radio	**39.25%**	219
Stored a fire extinguisher	**65.59%**	366
Stored medical supplies (first aid kit, medications)	**70.25%**	392
Other (please specify)	**4.12%**	23
Total Respondents: 558		

Q27 Please provide any additional comments you would like to share with the City of Roseville Planning Team.

Answered: 65 Skipped: 606

Q28 If you would like to receive information regarding upcoming public events and other participatory opportunities regarding hazard mitigation, please provide your email address below.

Answered: 223 Skipped: 448

From: City of Roseville <Roseville@public.govdelivery.com>
Sent: Tuesday, March 1, 2016 8:59 AM
To:
Subject: City of Roseville News - March 1, 2016





Downtown Roseville update

It will be a busy couple years for city building projects in Downtown Roseville. All of the projects are part of the Downtown Specific Plan designed through a community visioning process in 2009. The highly popular Vernon Street Town Square and roundabout at Washington Boulevard and Oak Street are examples of projects already completed in accordance with the plan.

Current projects include an office building at 316 Vernon Street, the Oak Street Parking facility, a new downtown Fire Station, three pedestrian bridges and bike trail connections through downtown.

Find out more



Leaks can run, but they can't hide! Every day during Fix a Leak Week, visit the Roseville Utility Exploration Center to learn where water-wasting leaks hide around home, and learn how to fix them. Use a dye tablet to find toilet leaks, get your hands on a variety of sprinklers, and enter for a chance to win a smart timer or other water-saving technology. Best of all, it is free.

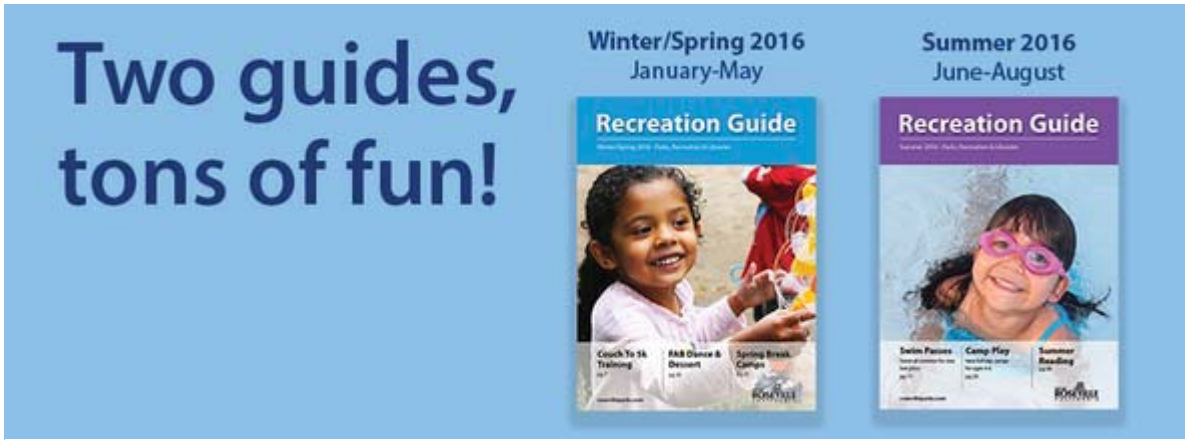
For more information call 916-746-1550 or visit the Fix A Leak Week page.



Roseville explores creating waste into energy

Work is underway right now to develop a project that would one day help power one of the city's wastewater treatment plants or provide fleet vehicle fuel using Compressed Natural Gas (CNG). This project is in its infancy and more work is needed to see this effort become a reality. But we're hard at work behind the scenes to bring this project online within the next three to five years.

For more information



Download them now at roseville.ca.us/guide



Affordable Housing Information & Workshop

The City of Roseville Affordable Housing Program is offering down payment assistance for qualified households to purchase affordable homes at a new Lennar community in West Roseville.

The City and Lennar will host an affordable housing workshop to provide more information about the program, **5:30 p.m., Wednesday, March 9** in the Roseville City Council Chambers, 311 Vernon Street in Roseville.

Find out more.



Do you know your risk...

. . .when it comes to flood, earthquake or any natural or man made disaster here in Roseville? Do you and your family have a three day supply ...of food and water should a disaster occur?

While a range of natural and man-made disasters can affect any community, the City of Roseville is always taking steps to reduce the risk to residents and businesses. We need your input to remain prepared and ensure our community can recover as quickly as possible, should a disaster occur. Please help us by taking a few minutes to complete this community survey

---



Apply for up to $200 toward a new commuter bike

Apply for an opportunity to receive up to $200 toward a new commuter bike. Bucks for Bikes helps commuters start using an active, clean, traffic-relieving mode of travel—bicycling! **Submit your application by 5 p.m., Monday, March 21.** This is made possible by the City of Roseville and Placer County Transportation Planning Agency.

Find out more.



Superhero Storytime

We are all super heroes! Visit the Martha Riley Library on the 4th Tuesday of the month through May and we'll explore the everyday superheroes of our city. From 1-1:30 p.m., Miss Lisa will guide us through stories, songs, and activities to discover the super hero in you. Then, come explore the Utility Exploration Center from 1:30 - 2 p.m. to discover play time with special activities to help practice your superhero skills. These fun events are free.

For more information call 916-746-1550.



UPCOMING CITY MEETINGS

Meeting agendas and minutes

City Council Meeting - 7 p.m., Wednesday, March 2

Planning Commission Meeting - 7 p.m., Thursday, March 10

Parks and Recreation Commission Meeting - 7 p.m., Monday, March 7

Transportation Commission Meeting - 7 p.m., Tuesday, March 15

Public Utilities Commission Meeting - 7 p.m., Tuesday, March 22

Multi-Hazard Mitigation Plan Steering Committee Meeting - 5:30 p.m., Tuesday, March 1, Civic Center Meeting Rooms 1 & 2

Unless otherwise noted, Council and Commission meetings are held in the Roseville City Council Chambers at 311 Vernon Street. Meetings held in the City Council Chambers can be viewed live online or later on demand.

AlertRoseville

If we can't reach you, we can't alert you. Sign up now.

311 Vernon Street, Roseville, CA 95678

(916) 774-5200 | www.roseville.ca.us

Unsubscribe/Update profile

This email was sent to hdyda@roseville.ca.us using GovDelivery, on behalf of: City of Roseville · 311 Vernon St. Roseville · CA 95678

powered by govDELIVERY get the word out.

From: City of Roseville <Roseville@public.govdelivery.com>
Sent: Tuesday, August 2, 2016 8:33 AM
To:
Subject: City of Roseville News - August 2, 2016





Roseville named 11th healthiest city in U.S.

Roseville is the 11th healthiest city in the United States, according to Niche.com.

The ranking provides a comprehensive assessment of the general levels of health among residents in Roseville.

This grade takes into account key indicators of personal health, such as smoking, excessive alcoholic consumption, rates of obesity, as well as the availability and proximity of fitness facilities, doctors, and mental health practitioners, in an attempt to measure an area's performance in health and fitness.

You can read more about the rankings here.



Roseville among 25 safest cities in the country

Roseville has been ranked among the 25 safest cities in the US! Niche.com ranked U.S. cities over 100,000 population for safety, based on FBI crime statistics.

Roseville Police Chief Daniel Hahn said, “It takes more a good police department to create a safe city. It also takes city leaders who put public safety first; and a community that won’t settle for anything less, and is willing to get involved to make it happen. We’re very blessed in Roseville to have all three.”

See the rankings here.



Roseville recognized as national flood protection leader

FEMA has again been recognized Roseville as the national leader in flood preparation. Roseville is the only city in the country to hold FEMA's top flood control rating. Roseville's top rating means flood insurance discounts of up to 45% for residents and businesses.

Find out more



National Night Out is tonight

National Night Out is considered America's night out against crime.

We encourage you to lock your home and connect with your neighbors at one of the 40 National Night Out community events in Roseville.

Not sure if your neighborhood is hosting an NNO party? Visit the Roseville Coalition of Neighborhood Associations website at www.RCONA.org to contact your neighborhood association.

Find out more



Talk trash with Curby

You know where trash comes from, but where does it go? Join the Utility Exploration Center **Saturday, August 27** for free family fun at Curby's Waste-a-Palooza!

Fight the unflushables in the Sewer Swim, defend against Trashville and talk trash with Curby to test your knowledge in our quiz show. Challenge yourself in the game room where you can reuse, rethink, recycle and help knock out excess waste.

Grab a water repair LEGO® City set for just $10 (while supplies last) in the activity room for a fun build-it activity!

Find out more

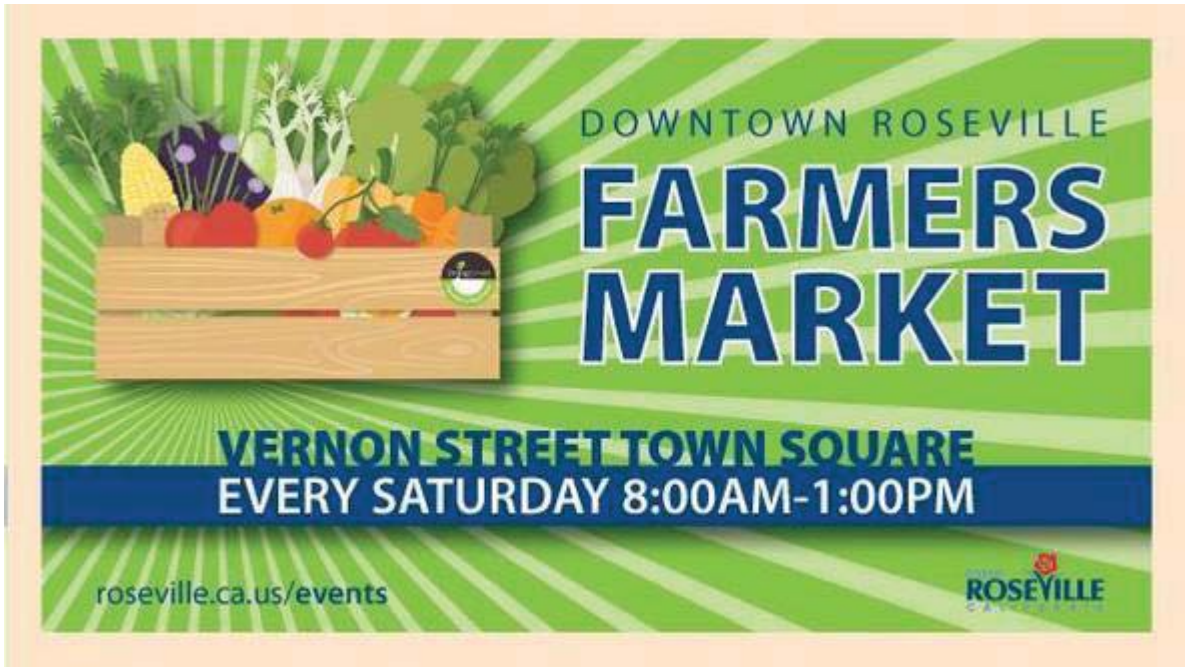


Tired of the traffic backups?

Traffic is one of the topics we hear most about from you. There is a plan to raise about $1.6 billion to fund highway projects, public transit expansion, local street maintenance and improvements including Highway 65 widening and the Highway 65 / I-80 interchange.

With other funding being more difficult to obtain, a ballot measure to increase retail sales tax by a half percent to raise funds for transportation improvements in Placer County was placed on the November 8, 2016, presidential general election ballot by the Placer County Board of Supervisors.

Find out more



Street resurfacing ahead for parts of Roseville

Resurfacing is scheduled **to begin late summer/fall** for residential streets in the Foothills/Junction and West Park neighborhoods.



Some more heavily traveled roads in Roseville will also be resurfaced this summer. The specific roads and schedule can be found here.

Regular roadway maintenance reduces the need for major costly street repairs in the future by protecting Roseville streets.

Check out this short video to learn more about how we prioritize road maintenance.



Tri County Job Fair to be held August 18

The Tri County Job Fair provides an excellent opportunity for job seekers to meet with businesses within the region and demonstrate their qualifications. This year's event will be held from **9 a.m. - noon, Thursday, August 18 at William Jessup University.**

For more information and to register

Learn about planned changes to 916 area code

The 916 area code we use in Roseville is expected to use up its available prefixes by December 2018. The California Public Utilities Commission (CPUC) will be holding a public meeting to discuss proposed changes and to get public feedback on their plan at **1 p.m., Tuesday, August 16** in the Roseville Civic Center's Meeting Rooms 1 & 2.

The CPUC is proposing adding an additional area code to the region. The proposal would allow current customers to keep their area code. Beginning in June 2018, customers requesting new phone numbers may be assigned a new area code.

Find out more

Comment on city's Draft Multi-Hazard Mitigation Plan

You are invited to review and provide comments on the 2016 City of Roseville Multi-Hazard Mitigation Plan.

This plan details the risks of both natural and manmade hazards in Roseville and includes programs and projects to help reduce the exposure of city residents and businesses should an event occur. By having a plan in place, Roseville is eligible for federal pre-disaster and post-disaster assistance.

Input on the plan can be submitted through Friday, August 19, 2016.

View the plan and find out more



UPCOMING CITY MEETINGS

Meeting agendas and minutes

City Council Meeting - 7 p.m., Wednesday, August 3

Planning Commission Meeting - 7 p.m., Thursday, August 11

Parks and Recreation Commission Meeting - September meeting canceled

Transportation Commission Meeting - August meeting canceled

Public Utilities Commission Meeting - 7 p.m., Tuesday, August 23

Unless otherwise noted, Council and Commission meetings are held in the Roseville City Council Chambers at 311 Vernon Street. Meetings held in the City Council Chambers can be viewed live online or later on demand.

AlertRoseville

If we can't reach you, we can't alert you. Sign up now.

311 Vernon Street, Roseville, CA 95678

(916) 774-5200 | www.roseville.ca.us

Unsubscribe/Update profile

This email was sent to hdyda@roseville.ca.us using GovDelivery, on behalf of: City of Roseville · 311 Vernon St. Roseville · CA 95678

powered by govDELIVERY get the word out.

From: City of Roseville <Roseville@public.govdelivery.com>
Sent: Tuesday, August 16, 2016 9:18 AM
To:
Subject: City of Roseville News - August 16, 2016





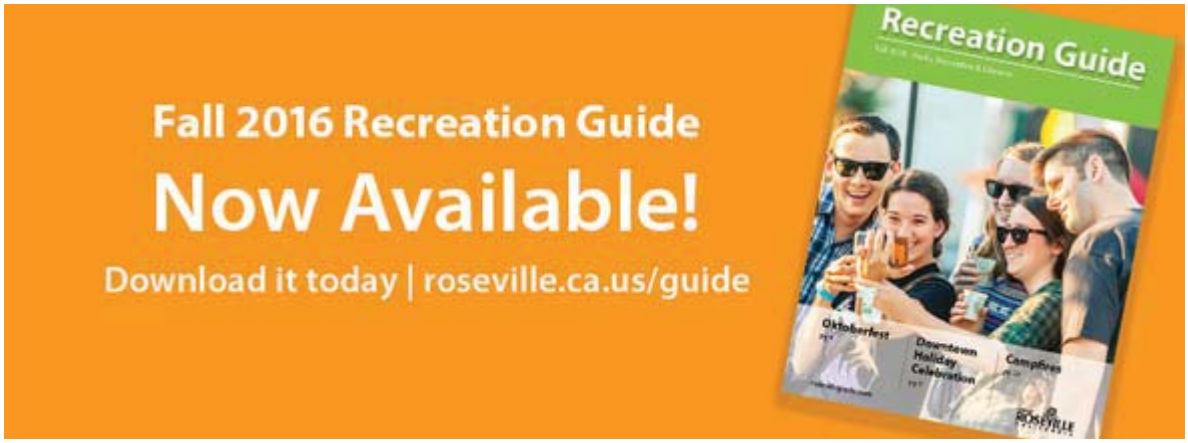
Be safe heading back to school

All Roseville-area high school and elementary schools will be back in session this week. That means traffic around those schools will be congested.

Read on for a refresher course on back-to-school safety.

Walking or biking to school is a great idea. To combat the common fear that walking to school isn't safe, City of Roseville traffic engineers and the Safe Routes to School Coordinators have designated safe routes for students of all ages and abilities.

Learn about our Safe Routes to School program



Unemployment rate drops to 3.8 percent in Roseville



The unemployment rate in Roseville is in the lowest 4 percent in the state, 20th of 482 cities in California.

“The leading job sector is healthcare, and healthcare-related businesses,” said Roseville Economic Development Director Chris Robles.

“We have Kaiser, the largest employer in the city, and then Sutter is also one of our top employers. Then we have Adventist Health, which is also a significant employer in the city. Their west coast headquarters are here in Roseville.”

"A part of Roseville’s economic growth is correlated with education levels; namely a more educated work force. The local population over age 25 with a bachelor’s degree or higher was over 39 percent as of 2014 – a growth margin of 5 percent since 2010, correlating with the increase in educated workforce members and growing employment figures."

Read more in this article from the Roseville Press Tribune.





Talking traffic

Traffic is one of the topics we hear most about from you. There is a plan to raise about $1.6 billion to fund highway projects, public transit expansion, local street maintenance and improvements including Highway 65 widening and the Highway 65 / I-80 interchange.

With other funding being more difficult to obtain, a ballot measure to increase retail sales tax by a half percent to raise funds for transportation improvements in Placer County was placed on the November 8, 2016, presidential general election ballot by the Placer County Board of Supervisors.

Find out more



Woodcreek Oaks widening project workshop

We invite you to a community workshop to learn more about the Woodcreek Oaks Widening Project. The project team will be available to answer questions in an informal format.

Exhibits showing the project features and anticipated schedule will be on display.

Wednesday, August 24
5 - 7 p.m.
Martha Riley Library, Reading Room 3
1501 Pleasant Grove Blvd

The proposed project will widen the segment of Woodcreek Oaks Boulevard, from Crimson Ridge way south to 600 feet north of Pleasant Grove Boulevard, into the median to a four lane road.

This project also proposes to widen the bridge over the south branch of Pleasant Grove Creek to accommodate the additional roadway.

The new Campus Oaks development will widen Woodcreek Oaks Boulevard from Blue Oaks Blvd south to Crimson Ridge Way, and is expected to be constructed by the end of 2016.

Find out more





Trail resurfacing this week

Portions of Roseville trails system will be resurfaced this week. Notices of the upcoming closures will be posted at the trail entrances. While the resurfacing is underway, barricades will mark where the trails are closed. After the resurfacing is complete and the trail has reopened to the public, striping and sweeping will be performed.

Find out more

Street resurfacing ahead for parts of Roseville



Resurfacing is scheduled **to begin late summer/fall** for residential streets in the Foothills/Junction and West Park neighborhoods.

Some more heavily traveled roads in Roseville will also be resurfaced this summer. The specific roads and schedule can be found here.

Regular roadway maintenance reduces the need for major costly street repairs in the future by protecting Roseville streets.

Check out this short video to learn more about how we prioritize road maintenance.





Tri County Job Fair to be held August 18

The Tri County Job Fair provides an excellent opportunity for job seekers to meet with businesses within the region and demonstrate their qualifications. This year's event will be held from **9 a.m. - noon, Thursday, August 18 at William Jessup University.**

For more information and to register



Comment on city's Draft Multi-Hazard Mitigation Plan

You are invited to review and provide comments on the 2016 City of Roseville Multi-Hazard Mitigation Plan.

This plan details the risks of both natural and manmade hazards in Roseville and includes programs and projects to help reduce the exposure of city residents and businesses should an event occur. By having a plan in place, Roseville is eligible for federal pre-disaster and post-disaster assistance.

Input on the plan can be submitted through Friday, August 19, 2016.

View the plan and find out more



UPCOMING CITY MEETINGS

Meeting agendas and minutes

City Council Meeting - 7 p.m., Wednesday, August 17

Planning Commission Meeting - 7 p.m., Thursday, August 25

Parks and Recreation Commission Meeting - September meeting canceled

Transportation Commission Meeting - August meeting canceled

Public Utilities Commission Meeting - 7 p.m., Tuesday, August 23

Senior Commission Workshop - 11 a.m., Tuesday, August 23 at Maidu Community Center

Unless otherwise noted, Council and Commission meetings are held in the Roseville City Council Chambers at 311 Vernon Street. Meetings held in the City Council Chambers can be viewed live online or later on demand.

AlertRoseville

If we can't reach you, we can't alert you. Sign up now.

311 Vernon Street, Roseville, CA 95678

(916) 774-5200 | www.roseville.ca.us



Unsubscribe/Update profile

This email was sent to hdyda@roseville.ca.us using GovDelivery, on behalf of: City of Roseville · 311 Vernon St. Roseville · CA 95678

powered by govDELIVERY get the word out.

Appendix B. 2015 Progress Report

Roseville Multi-Hazard Mitigation Plan
2015 PROGRESS REPORT

Reporting Period

August 2014 through July 2015

Background

Following a tradition of progressive and innovative planning, the City of Roseville City Council approved an update to the Roseville Multi-Hazard Mitigation Plan (RMHMP) on January 3, 2011. The RMHMP details the City's vision for reducing risk from all hazards, identifying resources, information, and strategies for risk reduction. In accordance with requirements of the Disaster Mitigation Act of 2000, the City completed a 10-month process to update its 2005 RMHMP in a way that provided as many tangible benefits for the City as possible from a single planning effort. These benefits are associated with grant funding eligibility and maintaining the nation's only Class 1 rating under FEMA's Community Rating System (CRS). The plan was approved by FEMA Region IX for compliance with Section 201.6, Chapter 44 of the Code of Federal Regulations on March 28, 2011. By completing this process, the City complied with the Disaster Mitigation Act and maintained eligibility for hazard mitigation grant funding opportunities afforded under the Robert T. Stafford Act. The plan is available to the public through the City of Roseville Public Library online at the following website:

https://www.roseville.ca.us/fire/preparedness/hazard_mitigation_plan.asp

Benefits of Mitigation Planning

Maintenance of this plan enables the City of Roseville to pursue hazard mitigation grant funding administered by FEMA under the Robert T Stafford Act. A FEMA-approved Hazard Mitigation Plan is a principal prerequisite for this funding. Roseville has leveraged funding from this program in the past to significantly reduce the City's risk associated with natural hazards.

Summary Overview of the Plan's Progress

The performance period for the Hazard Mitigation Plan began on March 28, 2011, with FEMA's final approval. The initial performance period for this plan is 5 years, with an update anticipated before March 2016. As of the most recent reporting period, the performance period is 82 percent complete. The Hazard Mitigation Plan identified 63 hazard mitigation initiatives to be pursued during the 5-year performance period. As of the most recent reporting period, the following progress can be reported:

- 51 out of 63 initiatives (81%) reported ongoing action toward completion.
- 10 out of 63 initiatives (16%) reported no action taken.
- 1 out of 63 initiatives (2%) was completed.
- 1 initiative was removed due to elimination of a program.

Purpose

The purpose of this report is to provide the Roseville City Council, stakeholders and citizens an annual update on implementation of the action plan identified in the RMHMP. The objective of the annual evaluation is to ensure a continuous planning process that keeps the RMHMP dynamic and responsive to the needs of the stakeholders. This report was prepared by the planning team. It was reviewed and confirmed by the RMHMP Steering Committee, in accordance with Section 7.4 of the Plan, at the Steering Committee's annual meeting on November 3, 2015. This report discusses the following:

- Natural hazard events that have occurred within the last year
- Changes in risk exposure within the planning area
- Mitigation success stories
- Review of the action plan
- Changes in capability in the planning area that could impact plan implementation
- Recommendations for changes/enhancement

The RMHMP Steering Committee

The update to the RMHMP was overseen by a steering committee appointed by the Roseville City Council and made up of stakeholders in the planning area. During the plan's development, the Steering Committee agreed that it would remain as a body to oversee the maintenance of the plan as established in Chapter 7. The Steering Committee continues to exist and function as organized in its established ground rules. At a minimum, it provides technical review and oversight on development of the annual progress report. It is anticipated the Steering Committee's role in overall plan implementation will evolve, based on the hazard mitigation needs of the city. Annual turnover in its membership is monitored via the progress report. For this reporting period, the Steering Committee membership is as indicated in Table 1.

TABLE 1
2015 STEERING COMMITTEE MEMBERS

Name	Title	Jurisdiction or Agency
Rob Jensen	Acting City Manager	City Manager's Office
Jason Rizzi	Emergency Preparedness Manager	Fire Department
Wayne Wiley	Associate Planner	Development Services Dept.
Carl Walker	Senior Engineer/Floodplain Manager	Public Works Dept.
Helen Dyda	Public Information Specialist	Communications Dept.
Grace Keller	Resident	Community Emergency Response Team
Erik Angle	Emergency Preparedness Program	Sutter Roseville Medical Center
Brenette Macintosh	Safety Officer	Consolidated Communications
Mark Lacher	Risk Manager	Consolidated Communications
Mark Smith	Resident	RCONA Treasurer
Rod Rodriguez	Senior Emergency Services Specialist	Placer County OES
Rick Stalker	Stalker & Burnett RE Group	Placer County Association of Realtors
Michael Algots	Manager - Hazardous Materials	Union Pacific Railroad

Natural Hazard Events in the Planning Area

During the reporting period, the following hazard events affected the planning area:

- Due to the continuation of drought conditions, in May 2015, the City of Roseville announced further water-use restrictions for Roseville water customers. The restrictions were placed in response to Governor Brown's Executive Order and the State Water Resources Control Board's drought emergency action requiring a 25 percent statewide water-use reduction goal. In order to meet the State's goal, City of Roseville water customers were required to reduce water consumption by 28 percent over their use in 2013. For residential customers, the most noticeable change includes watering day restrictions for outdoor irrigation. Watering days for residential turf will be limited to two days per week, Monday and Friday only, before 10 a.m. and after 8 p.m. Commercial customers will have watering days limited to Monday and Thursday.

  In addition to restricted watering days, Roseville also incorporated additional water-use reduction strategies to achieve more water savings:

  – Water waste is prohibited.

  – Washing hardscape is prohibited, unless for health and safety concerns.

  – New or expanded landscape is limited to drought tolerant trees, shrubs and ground-cover irrigated on a drip irrigation system.

  – Fountains, ponds and decorative pools must be drained (unless ponds contain fish.)

  – Covers are required for all new pools and spas.

  – Low volume drip irrigation systems that irrigate at less than two gallons per hour are exempt from day of week watering restrictions.

- December 10-12, 2014: Over a three-day period, from December 10th to December 12, 2014, The National Weather Service forecasted a major winter storm to impact Northern California. All reasonable data from the National Weather Service estimated that the City of Roseville would receive 3.6 inches of rain from the storm event. Additionally, severe winds were forecasted to be a major factor in the event. In preparation of the storm event, the City of Roseville Fire Department chose to activate a Limited Emergency Operations Center (LEOC) at the Fire Department Administrative Headquarters, located at 401 Oak Street. The LEOC was staffed for a 36-hour period. The Placer County Office of Emergency Services was also activated during the storm event.

Changes in Risk Exposure in the Planning Area

The RMHMP update addressed the probable impact of the following natural hazard events in the City of Roseville:

- Dam failure
- Drought
- Earthquake
- Flood
- Landslides
- Human-caused hazards
- Human health hazards
- Severe weather
- Wildland fire

There was an F-0 tornado occurrence during the reporting period. Damage associated with the event was minimal. The occurrence of this event should be acknowledged in future updates to the risk assessment for

this plan. There were no other events during the reporting period that would alter or change the probability of occurrence or ranking of risk for the natural hazards addressed by the RMHMP.

Mitigation Success Stories

During the current reporting period, the City had a number of mitigation success stories that reflect the City's commitment to multi-hazard mitigation and the philosophy that the City Council and staff are responsible for the good stewardship of City resources.

Deployment of Everbridge Notification System and Alert Roseville

Using a Homeland Security grant, the City, along with Placer, Sacramento, and Yolo counties, implemented the Everbridge Mass Notification system. This is a robust and popular system that is used globally. The system will be used for both emergency and non-emergency notification of the public. In preparation for the deployment, over 100 city staff members from 13 city departments were trained in its use. Special courses were designed for public safety officials, including dispatchers, fire department chief officers, and police managers.

"Alert Roseville" (aka "Opt-In") went live in August 2014. This internet site was established to help members of the public register their contact information into the Everbridge system. A significant media and outreach program was developed to advertise the importance of getting this information from the public. The "Opt-In" portal will be explained at every public education event the Fire Department attends. Currently approximately 2,050 public members are signed up in the "Opt-In" portion of Everbridge. A significant increase is anticipated with the aggressive outreach program. To make this system really effective, the City will actively pursue getting those residents with primary cell phone service signed up to the Everbridge system. This is a high priority for the City.

Emergency Operation Center Drills, Incident Activations, and Training

Establishment of the Emergency Management Team

In October 2014, the City of Roseville established the Emergency Management Team, which is a standing committee, whose mission is to plan and prioritize emergency preparedness activities, training, and facilities of the City's Emergency Management Organization. The Emergency Management is comprised of at least one member of each City department and meets monthly to:

- Develop the organizational framework for implementation of the California Standardized Emergency Management System (SEMS) and the National Incident Management System (NIMS) within the City of Roseville.
- Ensure that each City department has the resources and training to function effectively in the roles outlined in the City's Emergency Operations Plan (EOP).
- Plan and develop a minimum of two Emergency Operations Center (EOC) exercises annually.
- Develop and maintain EOC facilities that provide an effective location to conduct EOC operations.
- Develop and maintain technology resources within the EOC necessary to gather and disseminate information effectively.

Preseason Flood Coordination

On October 30, 2014, City Floodplain Management staff presented the 2014-15 Preseason Flood Coordination and Severe Weather Plan Update to the City's Emergency Management Team. The update

included information on the 2014-15 winter weather outlook from the Climate Prediction Center and an overview of the changes to the City's Flood Warning & Response Plan. The most significant change to the Flood Warning & Response Plan was the addition of a Floodwall & Levee Failure component to the Plan.

EOC Activation—Levee Failure Exercise

On May 11, 2015, City Emergency Management staff conducted a four-hour EOC activation drill. This exercise was a full activation of the Emergency Management Organization, including Department Operations Centers (DOC). The exercise centered on a levee failure scenario, which included the flooding of an assisted living facility. This exercise emphasized the need for multiple Incident Actions Plans from various City departments.

Roseville Galleria Exercise

On May 27, 2015 the Roseville and Rocklin Regional SWAT Team, Roseville Rapid Containment Team, Explosive Ordnance Disposal Team, Placer County Special Enforcement Team, FBI and Roseville Fire Department's Tactical Medics, conducted a full scale training exercise at the Roseville Galleria. This was the third straight year Roseville's Public Safety teams and the Galleria have come together for critical incident planning and response training. This year's exercise was designed to address responses to improvised explosive devices by Public Safety and Galleria personnel.

The drill required unified command for organizing and deploying resources, coordinated response to multiple threats, and the ability to establish inter-operable communications across the agencies. Each FBI Field Office across the country was required to conduct a similar drill in coordination with local resources and our city was selected by FBI-Sacramento to be the lead partner agency out of all of the cities in the Sacramento FBI Field Office which covers most of the Central Valley from Fresno up to Oregon. Our drill was the first drill conducted in the country under this training requirement and was monitored from FBI HQ in Washington DC.

MCI 2015—Countywide First Responder Exercise

On June 17, 2015 the Roseville Police and Fire Department, Rocklin Fire, South Placer Fire, American Medical Response, the National Guard, the Officer of Emergency Services and the Sutter Roseville Medical Center all participated in a regional planning and training exercise at Sutter Roseville. The exercise was centered on a mock helicopter crash. Public Safety's planning and training objectives included the development of a unified command structure as identified by the Incident Command Structure as well as planning and response to security needs on the hospital's grounds.

Terrorism Threat Assessments

On May 7, 2014 Roseville Police Department staff performed a threat assessment of Roseville Electric's Power Plant, consisting of a "real-world "vulnerability and site security test at that location with unsuspecting employees Electric personnel.

A similar terrorism threat assessment was conducted in October 2014 at the Civic Center as well as Roseville Fire Station #1. Locations for the threat assessment were expanded to include Fire Stations #2, #5, and #9. Roseville Police Department plans to conduct future assessments for Fire Stations #3 and #4 in July and August of 2015.

Community Preparedness Education

In support of Homeland Security Presidential Directive/HSPD-8, the Sutter-Roseville Medical Center (SRMC) Emergency Preparedness Program rolled out the "Emergency Preparedness and You" community education program. This program focused on how individuals can be safe and prepared when disasters

strike. A version of this program was also rolled-out to healthcare staff, to provide staff readiness and add resiliency. To date, the SRMC Emergency Preparedness Program has provided training for over two hundred students.

Reorganization of the Emergency Operations Center

The City's Emergency Preparedness Manager, working closely with the Central Services and Information Technology—GIS staff, have revised the layout of the City's Emergency Operations Center, and have included new technology to assist with the presentation and dissemination of geographic information during an EOC activation. Computers with access to GIS data and overhead projector displays have replaced the use of ineffective Plexiglas-topped tables and grease pens to supplement Planning Section briefings within the EOC. The new technology also allows for better communication between the EOC and the City's Department Operation Centers, located throughout the City.

Department of Water Resources—Flood Fight Methods Training

On March 18, 2015 State of California Department of Water Resources staff provided a one-day Flood Fight Methods training exercise for the City's Public Works—Street Maintenance and Park Maintenance—Open Space Division staff. The Flood Fight Methods training is designed to assist public agencies with the implementation of corrective temporary methods utilized while combatting flood-related problems. The training consisted of four hours of classroom presentation and an afternoon of instruction on the techniques used to construct various sandbag structures and erosion protection methods.

Sutter Roseville Medical Center (SRMC)

Sutter Roseville Medical Center (SRMC) prides itself in the quality it provides in the realm of patient care and excelling above national standards and best practice. The **SRMC Emergency Preparedness Program** is no different. Disasters strike daily all over the globe. California is no exception. For the benefit of the staff, patients, visitors and the community and with the strong support of our leadership and the Emergency Preparedness Committee, SRMC continues on the ongoing journey of Emergency Preparedness and quality best practices. In the past year, SRMC has demonstrated the following in **Mitigation Success Stories** in Emergency Preparedness:

- **Master Exercise Practitioner (MEP) Certification:** The SRMC EP Coordinator completed the national level certification from FEMA/DHS as that of **Master Exercise Practitioner (MEP)**. With this this certifies that the coordinator has obtained and demonstrated competency in high level of disaster exercise design, from Table Top; functional and Full Scale Disaster Exercise. Due to the difficulty in being accepted into this program and the challenge of the program, as of now there are only 2,300 individuals certified with MEP in the country.
- **National Level Instructor Certification:** The SRMC EP Coordinator completed the national level certification from FEMA/DHS as that of a national level **Certified Instructor**. The course is conducted in two phases: fundamental principles and applied principle. During the fundamental principles phase participants receive an overview of adult learning, task analysis, risk and hazard analysis, learning objectives and lesson plans, communication skills, instructional delivery and multimedia, testing and evaluations, and after action reviews. Then, during the applied principles phase, participants put these lessons into practice through a series of practice training sessions. With this this certifies that the coordinator has obtained and demonstrated competency and the ability to interact and instruct adult learners.
- **Disaster Education:** Sutter Roseville Medical Center (SRMC) EP Program prides itself on education. Our education program for 2015 is holding 45 courses on Emergency Preparedness and has also worked with TEEX and FEMA for bringing their courses and staff here to teach as well. The EP Program coordinator had the honor of teaching a lecture at the FEMA National Training

Center in February of 2014 and March 2015 teaching lectures at the Emergency Nurse's Association (ENA) and Association of Critical Care Nurses (AACN) conference in April 2014 and July 2015. Annually in December, SRMC hosts the EMS-a-Palooza educational event at the facility. Speakers from all aspects of emergency care, from Trauma, Burns and Pediatrics, provide presentations to not only Sutter Health staff but all of our hospitals throughout the region and our EMS community partners. The Emergency Preparedness Program Coordinator for Sutter Roseville Medical Center which provided an in-depth lecture on lecture on **Active Shooter Response for EMS and Healthcare.**

- **Disaster Exercises:** Sutter Roseville Medical Center (SRMC) held 20 Disaster exercises in the past year. These exercises are based on the identified Risks from our annual Hazard Vulnerability Assessment (HVA). Some exercises worthy of note due to their exceptional Interagency Cooperation and Participation were:
  - **2014 Ebola Response Exercise:** This tested the facility's ability to manage victims infected by the Ebola Virus Disease. This drill assisted in the designing and development of the EVD Response Training Program for SRMC.
  - **2015 Helipad Emergency Response Blackhawk Crash Exercise:** As SRMC is the Primary Receiving facility for the Air National Guard with back country rescues, SRMC held a **two-day** Full Scale Exercise which tested our ability to manage not only a surge of victims from a massive earthquake caused landslide but also a crash onto the helipad of a Medical Blackhawk Helicopter. This exercise had the participation with Roseville Fire Department, Rocklin Fire Department, Roseville Police Department and the California Air National Guard.
- **Emergency Preparedness Development- Hospital Incident Command System (HICS) Update:** The SRMC Emergency Preparedness Coordinator was selected by the California Emergency Management Authority (EMSA) to be a member of the national level committee that assisted in the development and review of the Hospital Incident Command System 2014 Updates. These updates are utilized all across the country at hospitals for incident response.
- **Emergency Preparedness Development- Hazardous Materials and Decontamination for Healthcare Facilities Course Update:** The SRMC Emergency Preparedness Coordinator was selected by the California State Training Institute (CSTI) to be a member of the committee that assisted in the development and review of the Hazardous Materials and Decontamination for Healthcare Facilities 2014 Course updates. These updates are utilized all across the country at hospitals for hazardous materials incident response. Additionally, portions of the plan from SRMC in regards to Vulnerable Populations was included in the teaching materials as **Best Practice** examples.
- **Emergency Preparedness Development- Management of Aggressive Behavior (MAB) Program and Course Update:** The SRMC Emergency Preparedness Coordinator, with Regional Safety and Security, on management and development team for the new and updated Violence in the Workplace Training Course and Policy Development and representing Sutter Health at CalOSHA Meetings. This will ensure the facility and Sutter Health is compliant with HSC 1257.8 and 1257.9 and with the new AB 1299 and drafted potential changes that were submitted to Cal OSHA related to SB 1299.
- **Community Involvement- Placer County Emergency Medical Control Committee Chair:** The SRMC Emergency Preparedness Coordinator is the co-chair of the Placer County Emergency Medical Control Committee. In this role, the chair coordinates meetings with all responders from the Placer County Region and reviews and approves policies and procedures for the region.
- **Community Involvement-City of Roseville Police and Fire Safety Fair:** The SRMC Emergency Preparedness Coordinator partnered with the City of Roseville Police Department and the city of Roseville Fire Department for their Second Annual City of Roseville Police and Fire Safety Fair. In this SRMC EP Program and SRMC had a booth on Emergency Preparedness, Safety and the medical center itself. On this day, over 500 brochures, coloring books on safety and emergency preparedness

were handed out. Also, 300 Bike Safety Lights were handed out as well. Due to our active participation, the City of Roseville Police Department donated $500.00 back to our Foundation to be used for Trauma or emergency Services.

2014 Ebola Response

Emerging Infectious diseases, such as the 2014 Ebola virus outbreak, can significantly impact the health and safety of the citizens of Roseville. With the outbreak being monitored for a potential spread to California, the Roseville Fire Department (RFD) worked cooperatively with its regional partners to develop operational procedures and to obtain the necessary equipment to respond safely if necessary. The RFD continues to be proactive with its regional partners on training, protective equipment and is prepared to respond to an Ebola outbreak, or any other emerging infectious disease.

Oil Train Response Plan

The City of Roseville is situated in a rail corridor that connects the Sierra Nevada Mountains to the San Francisco Bay. With the increased production of crude oil in North America, shipments have increased in recent years with the commodity currently traveling through the City of Roseville. The Roseville Fire Department (RFD) working with cooperating agencies throughout Placer and Nevada Counties developed an operational plan to respond to a rail emergency involving crude oil transport. The plan is maintained by the county of Placer Office of Emergency Services and is incorporated in regional training exercises.

Review of the Action Plan

This section reviews the action plan and lists the status of each initiative from the hazard mitigation plan, grouped by the agency or department responsible for its completion. The action plan matrix in Table 2 provides the following information:

- Initiative number and brief summary; initiative numbers are coded by hazard type as follows:
  - DF = dam failure
  - D = drought
  - EQ = earthquake
  - F = flood
  - HC = human-caused hazards
  - HH = human health hazards
  - LS = landslides
  - SW = severe weather
  - WF = wildland fire
  - MH = multiple hazards
- Indication of whether any action has been taken
- Current timeline
- Indication of whether the project priority has changed
- Status (complete, ongoing or no progress)
- Comments, including the following information:
  - Was any element of the initiative carried out during the reporting period?
  - If no action was completed, why?
  - Is the timeline for implementation for the initiative still appropriate?
  - If the initiative was completed, does it need to be changed or removed from the action plan?

Part 4 of the plan provides detailed descriptions of each initiative and the prioritization process.

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Central Services Department Initiatives				
Initiative #F-21—Retrofit the city's Downtown library by sealing the exterior and installing a flood door to protect against flood damage should Dry Creek overspill the existing floodwall.				
No	Long Term	No	No action was completed on this initiative during the reporting period. Priority and time line remain as assigned. Project priority should be changed to medium and time line should be cahnged to long-term pendiong the indentification of funding for this project.	No Progress
City Council Initiatives				
Initiative #HC-3—Seek to establish appropriate staffing levels of public safety personnel to address vulnerabilities identified.				
Yes	Short Term	No	The Police and Fire Chiefs meet quarterly with the City Manager to discuss staffing levels and needs based on current trends, population growth, and calls for service. The Police Department Completed a "Request for Proposals," titled, Roseville Police Department Staffing Study. This RFP requested a professional, independent firm to assess the adequacy of current staffing levels for both sworn and non-sworn staff in the police department, and a sound methodology to project future staffing. Police and City Attorney staff reviewed the submittals and conducted interviews. The PD selected Matrix Consulting to complete the Staffing Study, which was approved by the City Council in October, 2015. The study is scheduled to commence in November, 2015.	Ongoing
City Manager's Office Initiatives				
Initiative #HH-3—Collaborate with the Placer County Mosquito Abatement District to review resource protection policies that conflict with human health protection in the City of Roseville and work to resolve these policy issues				
Yes	Short Term	No	The Placer Mosquito Abatement District and Roseville Environmental Coordinator is working together to both protect open space and wetland areas while limiting the amount of habitat for mosquitoes and vectors.	Ongoing
Public Affairs & Communications Department Initiatives				
Initiative #HH-2—Support the public education efforts of the Placer County Health Department and the Placer Mosquito Abatement District				
Yes	Short Term	No	The City supports the public education efforts of the Health Department and Mosquito Abatement District through print, government access television, social media channels, and web materials. The City has also had significant assistance from the District on public outreach efforts for rodent control through presentations at neighborhood meetings. The Placer Mosquito Abatement District purchased a building in Roseville at 2021 Opportunity Drive and moved a majority of the operations to Roseville. This will enhance the availability of resources in closer proximity to Roseville residents and the mosquito-breeding areas west of Roseville.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #MH-2—Continue to maintain the hazard mitigation page on City website that provides following types of information: • The Hazard Management Plan and its progress reports • Hazard-specific information • Mitigation information by hazard, with specific emphasis on private property • Emergency response and warning information • Links to county, state, and federal related agencies				
Yes	Short Term	No	This is an on-going action. The City continues to maintain its website as specified in the plan maintenance section of the plan. The website can be viewed at: http://www.roseville.ca.us/fire/preparedness/hazard_mitigation_plan.asp	Ongoing
Development Services Department Initiatives				
Initiative #EQ-1—Perform building-specific, structural seismic vulnerability assessment of City- owned critical facilities constructed prior to 1980 (including infrastructure). Included in this assessment will be recommended mitigation alternatives that meet goals and objectives of this plan.				
No	Long Term	Yes	Major construction on any city-owned building would require an assessment of the seismic vulnerability. The City will be applying for a Planning Grant under FEMA's various Hazard Mitigation Grant programs. This initiative will be included in the scope of work for updating the risk assessment to the plan. Priority should be changed to medium while timeline should be changed to long-term	No Progress
Initiative #EQ-2—Incorporate earthquake mitigation measures for private property into existing City-sponsored outreach programs such as printed media and the City's website.				
Yes	Short Term	No	The California Building Officials (CALBO) website has consumer web pages and one in particular regarding Seismic Safety. The site will be upgraded and improved over time with more value to the average consumer regarding measures to improve earthquake safety.	Ongoing
Initiative #EQ-3—Reassess the overall vulnerability to the earthquake hazard using the best available science and technology as it becomes available. State-sponsored programs, Seismic Hazards Mapping Act, and future FEMA-sponsored initiatives are anticipated to create a wealth of knowledge regarding this hazard that did not exist during the preparation of this plan.				
Yes	Short Term	No	Council has updated the maps for the Roseville area. The Public Works Department and Building Division anticipate review and implementation of the new mapping in conjunction with the International Building Council in 2008. The seismic risk assessment of the plan was updated using FEMA's enhanced HAZUS model (MR04) during the plan update process. The 2010 California Building Code based upon the International Building Code has been adopted by the City.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #F-1—The City shall designate all areas identified as the 100-year floodplain. The boundaries of the 100-year floodplain shall be as specified in the floodplain designations section of this component of the city's general plan. Floodplain areas shall be preserved as specified in the open space and conservation element. Such preservation may include required dedication to the City. If needed, modify the City's ordinances to include floodplain use regulations consistent with the goals, policies, and implementation measures of the safety, land use, open space and conservation, and parks and recreation elements of the City's general plan.				
Yes	Long Term	No	The city continued to implement its ongoing protocols and standard for identifying, mapping, and preserving the 100 yr floodplain during this reporting period. This initiative will continue to be implemented on an on-going basis, with a high priority. To comply with the new state Urban Level of Flood Protection, the City has contracted with a qualified engineering firm to determine the 200-year water surface elevation for the City's streams and areas that could potentially be inundated with 3 feet or more of floodwater during a 200-yr storm event.	Ongoing
Initiative #F-2—Refer any development proposal that has a direct or indirect impact on flood protection to Public Works for comment. In addition, forward such proposals to other agencies as applicable, including the U.S. Army Corps of Engineers, California Central Valley Flood Protection Board, FEMA, California Department of Fish and Game, Placer County Resource Conservation District, and Placer County Flood Control District. Consider the comments of the agencies during the development review process.				
Yes	Short Term	No	The city continued to implement its ongoing protocols and standard for reviewing flooding impacts that may be caused by new developments and forward such developments to other agencies as applicable during this reporting period. This initiative will continue to be implemented on an ongoing basis, with a high priority. The PCFCD has completed a region-wide update of the Dry Creek Watershed Flood Control Plan in November 2011.	Ongoing
Initiative #F-9—Ensure that future specific plans and specific plan amendments are consistent with the goals and policies of the general plan. The specific plans shall include the designation and preservation of floodplain areas and adjacent habitat. Provisions shall be incorporated to ensure that public infrastructure, utilities, and emergency services remain functional during flood conditions. Such infrastructure and facilities include water, sewer and gas mains, telephone and electric lines, streets and bridges, hospitals, and fire and police stations. Financing mechanisms shall be explored to fund necessary flood protection improvements and maintenance. Development agreements may be used to secure implementation and funding provisions. (Specific plans have 100% cost recovery by developers).				
Yes	Long Term	No	The city continued to implement its protocols and standard for reviewing proposed public infrastructure, utilities, and other emergency services so that they would remain functional during flood during this reporting period. This initiative will continue to be implemented on an ongoing basis, with a high priority. The Sierra Vista and Creekview Specific Plans were adopted by the City. The Amoruso Ranch and Placer Ranch Specific Plans are currently begin processed. The areas designated as floodplain and/or natural resource conservation areas will be preserved as permanent open space, consistent with General Plan policy and this action item.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #F-11—Require a master drainage plan as part of the approval process for all specific plans and large development projects as determined by the Public Works director. The master drainage plan should consider cumulative regional drainage and flooding mitigation. The plan's intent is to ensure that the overall rate of runoff from a project does not exceed predevelopment levels. If necessary, this objective shall be achieved by incorporating run-off control measures to minimize peak flows and/or assistance in financing or otherwise implementing comprehensive drainage plans.				
Yes	Long Term	No	Master Drainage plans and flood studies have been prepared for the Sierra Vista and Creekview Specific Planning areas. The City is working with developers to prepare these studies for the Amoruso Ranch and Placer Ranch Specific Plans. The priority and timeline for this initiative will remain as assigned	Ongoing
Initiative #LS-2— Continue to implement policies adopted by the general plan that promote open space land uses within identified steep slope areas of Roseville. The City of Roseville Northeast Roseville Specific Plan and Stoneridge Specific Plans include the identified steep slope areas within Roseville. Both plan areas have continuing development.				
Yes	Short Term	No	The City of Roseville Northeast Roseville Specific Plan and Stoneridge Specific Plans include the identified steep slope areas within Roseville. Both plan areas have continuing development. When individual projects are submitted, for example a housing development along a ravine in the Stoneridge area, all City development departments and the Fire Department enforce the General Plan, Specific Plan, City construction standards and individual project conditions to protect the steep slope open space that is dedicated to the City as part of the final maps for the projects.	Ongoing
Initiative #MH-1—Continue to maintain Office of Emergency Services certification of all City inspectors for post-disaster damage assessment.				
Yes	Short Term	No	All building inspectors are certified by the Office of Emergency Services and have been recertified this year. The Building Division will continue to make sure staff keeps their certifications updated and that the certifications are documented per the International Accreditation requirements.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Environmental Utilities Department Initiatives				
Initiative #D-1—Perform a groundwater recharge feasibility study to determine the most cost-effective way to replenish groundwater resources within Roseville.				
Yes	Long Term	No	The City completed a program-wide Environmental Impact Report review under the California Environmental Quality Act requirements. The Environmental Impact Report was adopted by the City Council on March 21, 2012. The City received an operating permit from the State Water Quality Control Board in 2012. The City has implemented this action by injecting excess treated surface water into two existing wells in 2013 and is constructing two additional groundwater wells with partial grant funding by the California Department of Water Resources. A long term ASR operations plan is being developed. The City is also the lead agency within the Western Placer Groundwater Management Plan area.	Ongoing
Initiative #D-2—Implement aquifer storage and recovery program that uses direct injection technique in areas identified as appropriate.				
Yes	Long Term	No	EU has implemented this action by injecting treated drinking water into two wells in early 2013. Two more wells will be completed in 2014 to increase the injection capabilities, and a long term ASR operations plan is being developed.	Ongoing
Initiative #D-3—Continue to implement the Environmental Utility Department's recycled water program and seek all opportunities to expand its coverage, currently focusing on urban growth areas. The City pumps recycled water through a system of purple pipes completely separate from potable (drinking water) pipes. The City pumps the recycled water to customers such as streetscapes, golf courses and parks, where it irrigates turf and shrubs. Using recycled water for uses such as landscape irrigation reduces demand on the potable water system, creating a more reliable water supply for the entire City. Recycled water is not subject to the effects of drought.				
Yes	Short Term	No	A Water Recycling Master Plan has been developed and is being implemented. This includes expanding recycled water in the region as well as finding opportunities in the existing service areas. Recycled water is considered as a resource in all new development areas being considered.	Ongoing
Initiative #D-4—Promote active water conservation techniques and strategies to private property owners through Roseville-sponsored outreach projects such as printed media and the City's website.				
Yes	Short Term	No	Conservation efforts are an ongoing initiative of the Water Division and have been increased and accelerated in all areas due to the unprecedented drought conditions facing the state.	Ongoing
Initiative #F-19—Set back and raise the sewer ponds levees at the Dry Creek Sewer Plant so raw sewage will not enter Dry Creek.				
Yes	Short Term	No	The construction of the Dry Creek Wastewater Treatment Plan Levee Relocation Project was completed in November 2011.	Complete

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #HC-5—Address vulnerabilities identified in vulnerability assessment of water facilities performed by the Environmental Utilities Department in response to EPA initiative.				
Yes	Long Term	No	A Water System Security CIP was completed several years ago by the Environmental Utilities Department and continues to be updated as new facilities come on line. The project enhanced the physical security of water facilities with video monitoring and access control. Timeline for this initiative has been changed from long-term to on-going.	Ongoing
Initiative #SW-5—Enhance and implement strategies for debris management and removal during severe weather events.				
Yes	Short Term	No	No change in the debris management and removal strategy that adopted in 2009. The Parks and Open Space Divisions implemented an Emergency action plan for storm situations. The Open Space Division Department purchased a new bucket truck this fiscal year that aids in the removal of hazardous and storm damaged trees.	Ongoing
Information Technology Department Initiatives				
Initiative #HC-9—Protect the city's data, technology infrastructure and staff against malicious cyber-attacks and Cyber terrorism, such as but not limited to: • Identity Theft • Virus/Malware/Spyware/Spam • Network and system attacks • Web site hacking • Denial-of-service attacks				
Yes	Short Term	No	The Information Technology Department uses several strategies and technologies to combat Cyber-attacks including: • Anti-phishing capability • Internet content filtering • PCI-DSS compliance • Virus, malware, spyware and spam scanning • Perimeter firewalls report and prevent intrusions • Secure authentication • Encryption • EOC Cyber Security Incident Exercises	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #MH-7—Strive to maintain high availability of essential communication services				
Yes	Short Term	No	For the Communication and Information Systems: The city has multiple, fully functional data centers which provide redundant hardware infrastructure. In the event of an extended outage; procedures are in place to restore essential communication and information services. The city's primary radio system has redundant components throughout. In addition the Police and Fire departments have alternative and independent systems in case the primary system fails. One of the current production data centers is scheduled to be relocated at the end of the 2016 calendar year. This move will reduce the risk of flooding as it moves the critical technology infrastructure further away from the nearby creek. The City is at present, working on an enterprise wide Business Impact Analysis study. This report will look at all information systems and services to evaluate and rank the level of impact to the City. This Business Impact Analysis report will be the primary input to developing a revised, more comprehensive Disaster Recovery/Business Continuity Plan.	Ongoing
Initiative #MH-8—Secure the city's physical locations that contain technology infrastructure				
Yes	Short Term	No	Both of the cities data centers are armed with perimeter alarm systems and internal and external security cameras. Also access to these sites is restricted to a limited number of city employees. In addition, vendors and visitors will be required to sign in and be escorted.	Ongoing
Parks and Recreation Department Open Space Division Initiatives				
Initiative #F-12—Continue the Parks and Recreation Department's regular creek maintenance program within the City's creeks and floodplain areas. This program clears and removes debris that could contribute to blockage and flooding and may include the removal of silt. This is only done in areas of high risk to flood damage or where property or facilities are threatened by flooding.				
Yes	Long Term	No	The city continued to implement its ongoing protocol of inspecting and maintaining its creeks and streams during the reporting period. The Department of Fish and Wildlife executed a five-year Routine Maintenance Agreement with the City in April 2010 for work that is ongoing this summer. During the reporting period, the City of Roseville worked with the Placer County Resource Conservation District to remove Red Sesbania from stream segments within the Dry Creek basin. This initiative will continue to be implemented on an ongoing basis, with a higb priority. The City will continue to seek grant funding opportunities from FEMA and state agencies, when available, to assist in funding Arundo eradication along infested stream channels in the Dry Creek watershed.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #F-22—Continue the Tree Mitigation Fund program administered by the Open Space Division in conjunction with non-profit organizations. The planting of oak trees in the open spaces adjacent to riparian zones increases infiltration and slows storm water surges.				
Yes	Short Term	No	The Tree Mitigation program for native oak woodland restoration uses oak mitigation funds for projects in the open spaces. Over 7000 trees have been planted to date.	Ongoing
Initiative #F-23—Manage beaver dam sites for flood control protection and habitat restoration after dam removal. One primary issue is impacts to floodwater capacity of creeks. Part of the desired comprehensive approach to beaver management includes establishment of quantitative and qualitative "carrying capacity," including acre-feet of flood capacity lost. Implement a standard monitoring and reporting process to track beaver dam locations, population, and impacts. Gain regulatory approval for beaver management techniques such as biological control and habitat manipulation using the most benign options first.				
Yes	Short Term	No	The Park Maintenance—Open Space Division continues to use a Geographical Information Systems (GIS) database for tracking beaver dam locations and coordinates beaver removal per the City's Beaver Management Policy and Nuisance Abatement Ordinance.	Ongoing
Initiative #WF-2—Continue "Goat Grazing" program for removal of grassland in areas of Roseville potentially vulnerable to wildfire. Implement goat grazing in City open space and preserve areas for fire and invasive plant species management and native plant restoration.				
Yes	Short Term	No	The Fire Department and the Open Space Division continue working together to implement a goat grazing program. Approximately 400 goats have been utilized for the grazing of open space preserves. Goats provide an innovative, environmentally sensitive way to reduce fire fuel load by keeping open space vegetation under control. Projects completed in 2012-2013 include the open space area located east of Dry Creek near Lincoln Estates to Linda Creek. Grazing reduces fuel load by removing thatch and thinning woody plants and also removes non-native vegetation.	Ongoing
Initiative #MH-4—Implement an "Adopt an Open Space" program in coordination with the open space management program. Develop "adoption contracts" with neighborhoods, organizations, businesses, etc., describing the level of stewardship and the terms of the "adoption." Publicize these activities through online resource directory and other media to encourage participation.				
Yes	Long Term	No	During the reporting period, the City has implemented an "Adopt a Creek" program. The Adopt a Creek program is administered by the City's Park Maintenance—Open Space Division. The City publicizes the program at the following website: http://www.roseville.ca.us/eu/stormwater_management/public_involvement_opportunities.asp	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #MH-5—Develop and disseminate best practices information to private property owners whose land is adjacent to open space areas describing stewardship opportunities and owners' role in preserving beneficial uses of open space areas (including vernal pool grassland and creek or riparian uses). Offer classes to provide in-depth information, such as demonstration projects, techniques for ecologically friendly weed abatement and vegetation control, and creating a backyard habitat compatible with open space areas.				
No	Short Term	Yes	No actions towards the completion of this initiative were completed during the reporting period. This will continue to be a short-term initiative with a high priority pending funding.	No Progress
Initiative #MH-6—Work with the Roseville City School District, local high school districts, and non-profit organizations to promote ecology-oriented curricula and stewardship activities. Identify resource and administrative barriers that may be limiting schools' abilities to more actively participate in stewardship, and work collaboratively to identify solutions.				
No	Short Term	No	No actions towards the completion of this initiative were completed during the reporting period. This will continue to be an ongoing initiative with a medium priority pending funding.	No Progress
Police and Fire Department Initiatives				
Initiative #DF-1—Create a dam failure element for the City's emergency response plan that includes a phased warning protocol in response to the findings of the Folsom Dam Containment Dike Risk Assessment.				
Yes	Short Term	Yes	The City of Roseville and the Placer County Office of Emergency Services has obtained a grant from the California Department of Water Resources to fund revisions to the City's and County's Dam Failure Emergency Response Plan under the DWR Flood Emergency Response Project grant program. The funding will assist in creating a dam failure element in the City's Emergency Response Plan during the next year.	Ongoing
Initiative #F-20—Implement recommendation of Downtown Roseville Specific Plan to relocate the Public safety Building				
Yes	Short Term	No	The City plans to grade the parking lot and building pad for the future relocation of Fire Station #1 in 2014. The fire station will be relocated from it's current location at the intersection of Oak Street and Grant Street to the intersection of Oak Street and Lincoln Street. Building construction is planned to begin in 2015.	Ongoing
Initiative #HC-1—Commit support to Sacramento Urban Area Security Initiative; continue to seek funding from other federal sources to fund its initiatives				
Yes	Short Term	No	Roseville hosts various training courses designed to support the regional Urban Areas Security Initiative (UASI) program. The City hosts a lot of classes for the UASI and they provide us with free seats in the classes in return. The Fire Chief continues to participate on the Joint Terrorism task Force Executive Committee (JTTF). The Police Department continues to support and participate in the Joint Terrorism Task Force by having three officers identified as liaisons to the Sacramento Regional Threat Assessment Center (SacRTAC). These officers communicate with the SacRTAC and disseminate security unclassified information to Roseville officers.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #HC-2—Enhance emergency response capability of City by contingency planning for specific events based on identified vulnerabilities.				
Yes	Short Term	No	The Fire Department's Hazmat Team has completed one Type I recertification since 2006 and is currently in the process of going through another one right now. The City's Training Division has determined that all new employees who are required to have the basic and intermediate level of ICS training (ICS 100, 200, 700, 800) obtain training and certification through FEMA's Online Emergency Management Institute's Independent Study program. Certificates are provided at the completion of the courses, and maintained in the form of individual transcripts by FEMA. Audits for compliance are completed by the training division annually. Those employees required to have advanced level ICS courses (ICS 300, 400) have been identified by the City's Training Division based on NIMS requirements. ICS 300-400 training is provided annually in multiple 16-hour blocks. The FEMA exercise mandates have been meet and exceeded. In October of 2009, the H1N1 virus EOC activation was completed and included the activation of a South Placer Point of Distribution (POD) for the H1N1 virus vaccination. In May of 2010, the EOC was activated for the "MCI 2010 Homeland Security Exercise" comprising of the cities of Roseville, Rocklin and surrounding jurisdictions. In 2011, the City participated in the "Golden Guardian" full scale exercise that was hosted by California Emergency Management Agency (CalEMA). This scenario centered on a catastrophic release of Folsom Lake due to a dam failure. In 2012 the EOC staff conducted an enhanced tabletop exercise that practiced Continuity of Operations Plans (COOP). The exercise scenario included a major explosion of a natural gas main in the Civic Center area. Again in 2012, the city participated and hosted the "MCI 2012 Homeland Security Exercise" that included a major chemical release with a fast moving vapor cloud into neighboring jurisdictions. This was a full scale exercise with a complete activation of the entire EOC staff.	Ongoing
Initiative #HC-4—Prepare a site-specific vulnerability assessment of City- owned critical facilities that use the best available science and technology with regards to human-caused hazards.				
Yes	Short Term	No	Through the California Emergency Management Agency, Critical Infrastructure Protection Section and the 2008 Buffer Zone Protection Program, an assessment of the Sutter Roseville Medical Center was conducted. While SRMC is not city-owned, it is designated the City's medical provider.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #HH-1—Continue to collaborate with the Placer County Health Department to ensure the health and welfare of the community				
Yes	Short Term	No	The City Manager's Office, Fire Department, and Communications Division collaborate with the Placer County Health Department on issues that affect the health and welfare of Roseville residents and visitors.	Ongoing
Initiative #SW-4—Continue education/outreach programs to improve winter preparedness and minimize loss of life or injury.				
Yes	Short Term	No	Educational materials are included on the city's web site on an ongoing basis, as well as a weekly tip sheet sent to all local media (print/broadcast). Web content is available to any viewer with a personal computer and Internet access. Typically there is also at least one city-authored column in the Roseville Press-Tribune on this topic per year—which reaches 40,000 readers.	Ongoing
Initiative #WF-3—Enhance existing City public outreach programs to include information on fire safety, defensible spaces, and areas of concern.				
Yes	Short Term	No	The Fire Department continually evaluates the efficiency and effectiveness of its public education programs. Comparison with other accredited fire agencies reveals that our performance standards meet those of other agencies. Outreach efforts include seasonal safety messages through the media and City website. Public education programs have been reduced, with the primary focus being assembly type presentations at several elementary schools. The fire department has taken an active role in the Neighborhood Association Meetings by having the on-duty staff to attend when possible. This allows the department to update it's citizens on various services and programs, as well as allows the citizens to voice any questions or concerns they have.	Ongoing
Initiative #MH-3—Establish/maintain a post-disaster action plan to be part of the City Emergency operations plan that will include following elements: • Procedures for public information • Post-disaster damage assessment • Grant writing • Code enforcement • Redundant operations				
No	Short Term	No	No action was taken on this initiative during the reporting period. The City is still committed to completing this action in the performance period of the plan. However, the City will pursue grants to complete this task.	No Progress

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Public Works Department Initiatives				
Initiative #F-3—Continue City participation in the National Flood Insurance Program and the Community Rating System (CRS). Seek CRS classification improvements within capabilities of City programs, including adoption and administration of FEMA-approved ordinances and flood insurance rate maps (FIRM).				
Yes	Short Term	No	The City of Roseville continued to participate in the CRS program, and re-certified its participation during the reporting period. The City's CRS Class I classification became effective on October 1, 2006. Flood Insurance policy holders within the City for property owners in flood areas will receive up to a 45% premium reduction based on the classification. Roseville is the first and only CRS Class 1 community in the nation. This initiative will continue to be implemented on an ongoing basis, with a high priority. The City has maintained its Class 1 rating through the reporting period.	Ongoing
Initiative #F-4—Maintain Roseville's compliance and good standing under the National Flood Insurance program.				
Yes	Short Term	No	A Community Assistance Visit (CAV) was last performed on the City of Roseville on November 1, 2011. The CAV is the principle means by which FEMA monitors a community's NFIP compliance. This CAV found that the City was in full compliance and in is in good standing under the NFIP.	Ongoing
Initiative #F-5—Continue the City's outreach program to flood-prone property owners and the citizens of Roseville, to help make them aware of the flood threat and how best to deal with them.				
Yes	Short Term	No	This is an on-going action that is a part of the City's CRS program.	Ongoing
Initiative #F-6—Continue to pursue a regional approach to flood issues by remaining actively involved in the Placer County Flood Control District. This involvement includes cooperation in the development of a comprehensive regional database. Continue to participate in regional flooding studies, including the Auburn Creek/Coon Creek/Pleasant Grove Creek flood mitigation plan and the Dry Creek watershed flood control plan.				
Yes	Long Term	No	The City continued to be actively involved in the Placer County Flood Control District (PCFCD) and participate in regional flooding studies during this reporting period. Staff from the Floodplain Management Division attends the meetings on a monthly basis and a Councilmember serves on the District Board. The PCFCD is developing the Antelope Creek Flood Control Project, which is a regional flood control project, located within the City of Roseville. City staff will be assisting the PCFCD with the development and construction of the regional flood control project, scheduled for construction in 2015. This initiative will continue to be implemented on an ongoing basis, with a high priority.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #F-7—Continue City coordination with other agencies on issues of flood control. Coordination between the City and adjacent jurisdictions occurs through several mechanisms, including distribution of development proposals for review and comment. Continue City cooperation with federal, state, and local agencies, including the U.S. Army Corps of Engineers, California Central Valley Flood Protection Board, FEMA, California Department of Fish and Game, Placer County Resource Conservation District, and the Placer County Flood Control District.				
Yes	Short Term	No	The City continued to coordinate with other outside agencies on issues of flood control during this reporting period. The coordination typically occurs on a project-by-project basis and agencies are included in the meetings based on their particular jurisdiction or expertise. This initiative will continue to be implemented on an on-going basis, with a high priority. The City is also actively involved with the State's new Flood-Safe program.	Ongoing
Initiative #F-8—Continue to develop, implement, and expand the Flood Alert and Early Warning Program systems and integrate the systems with other local jurisdictions to form a regional warning program.				
Yes	Long Term	No	The City continues to develop, implement, and expand the Flood Alert system. New "ALERT" software was installed and the Flood Warning web site was updated. Durig the reporting period, the City and the Placer County Flood Control District applied a State Department of Water Resources Flood Emergency Response Projects grant to upgrade the Flood Alert System data transmission system to the "ALERT-2" protocol. While the grant application was not sucessful during the current grant cycle, the City and PCFCD will apply for funding in future grant cycles. This initiative will continue to be implemented on an ongoing basis with a high priority.	Ongoing
Initiative #F-10—Monitor and regularly update City flood studies, modeling, and associated land use, zoning, and other development regulations at a minimum of every 5 years or whenever information becomes available that would significantly modify previous data. New information could include new studies, change in City policy, consideration of a major development project or specific plan, or implementation of a flood control project.				
Yes	Long Term	No	The City has updated the Pleasant Grove Creek flood studies. The City also participated with the 2011 update to PCFCD's Dry Creek flood study. The studies have also determined the 200-year WSE to comply with the implementation of the Urban Level of Flood Protection criteria. The priority and timeline for this initiative will remain as assigned.	Ongoing
Initiative #F-13—Continue annual inspection and maintenance program of City storm drain systems. Review after every major storm system function and performance. This program removes debris that could contribute to blockage of the storm drain system.				
Yes	Short Term	No	The City continued to implement its ongoing protocol of inspecting and maintaining its storm drain system during the reporting period. This initiative will continue to be implemented on an ongoing basis with a high priority.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #F-14—Complete the final two phases of the Cirby/Linda/Dry Creek flood control project (Phase 1 and 2). Five of the seven phases of this project have been completed at a cost of about $18,000,000. The basis for determining viability of this project will be a benefit /cost analysis to determine if project meets federal grant eligibility requirements.				
No	Long Term	No	No actions towards the completion of this initiative were completed during the reporting period. This will continue to be a long-term initiative with a low priority pending funding.	No Progress
Initiative #F-15—Analyze alternative improvements to the Cirby/Linda/Dry Creek flood control project that may be cost effective in the flood-prone areas of Roseville: • Dry Creek from Darling Way to Riverside Avenue • Area on Dry Creek upstream of Folsom Road in the Columbia Avenue/Marilyn Avenue/Bonita Street area • Linda Creek near Champion Oaks Drive/Samoa Way/Hurst Way area • Cirby Creek in the Trimble Way/Zien Court area				
No	Long Term	No	No actions towards the completion of this initiative were completed during the reporting period. This will continue to be a long-term initiative with a low priority pending funding. The City continues to pursue opportunities to acquire flood prone properties and remove them from the floodplain as a viable alternative to structural flood control.	No Progress
Initiative #F-16—Replace the Huntington Drive/Cirby Creek culvert with a bridge to protect Queens Court/Huntington Drive area. The Public Works Department oversees this project.				
No	Long Term	Yes	The City is continuing to research grants that may be available for this project. The City has the 25% match for the project. The priority for this project has been changed to medium and the time line has been changed to long term pending the identification of funding for this project.	No Progress
Initiative #F-17—Divert the main drainage storm drain system down Crestmont Avenue to Cirby Way and then into Dry Creek so that the existing system will not exceed capacity. If system capacity is exceeded, the intersection on Cirby Way and Crestmont Avenue and nearby homes will flood during major flood events.				
Yes	Short Term	No	Funds were allocated for this initiative in the 07/08 capital improvements budget but were diverted to fix a culvert on Atlantic Street in downtown Roseville rather than replacing this culvert. A portion of the project, consisting of the 48-inch outfall into Linda Creek and the storm drain pipe crossing South Cirby Way at the intersection of Piedmont Way, was constructed in 2010. The priority and timeline for this initiative will remain as assigned. Funding was replaced with the approval of the FY 2011/12 budget.	Ongoing
Initiative #F-18—Continue to promote and sponsor programs to buy out, relocate, and flood-proof existing flood-prone structures within Roseville.				
Yes	Short Term	No	The City will continue to pursue the acquisition of additional target properties with a high priority. The City has targeted the property on Riverside Dr for grant funding under the FY-2013 HMA grant cycle. Completion of this project will be contngent upon grant award.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #LS-1—Once California Geological Survey completes soils mapping for the Roseville vicinity under the Seismic Hazards Mapping Act, reassess landslide hazard using best available data to gauge the true vulnerability to this hazard.				
No	Long Term	No	There was no mapping performed by CAGS in the Roseville vicinity under the Seismic Hazards Mapping Act during the reporting period. Time line and priority for this project will remain unchanged, pending action by CAGS.	No Progress
Roseville Electric Initiatives				
Initiative #HC-6—Maintain compliance with California Energy Commission ("CEC") license conditions for the operations of the Roseville Energy Park ("REP") with respect to Hazardous Material Management				
Yes	Short Term	No	The operation of the REP is in compliance with the CEC license conditions including the preparation of a Business Plan and a Risk Management Plan (RMP) submitted to the City's Fire Department and the CEC. In addition, a Vulnerability Assessment has been prepared and Site Security measures have been implemented to ensure that neither the REP site nor a shipment of hazardous material is the target of unauthorized access.	Ongoing
Initiative #HC-7—Maintain compliance with state and local laws and regulations for the operation of the Roseville Power Plant #2.				
Yes	Long Term	No	All operating and compliance permits are being maintained by the power generation staff. Compliance with state and local laws is an ongoing practice.	Ongoing
Initiative #HC-8—Maintain compliance with North American Electric Reliability Corporation mandatory reliability standards related to plant operation, sabotage reporting and critical infrastructure protection (cyber security.				
Yes	Short Term	No	Establishing compliance through development, implementation and adherence to policies and procedures	Ongoing
Initiative #SW-1—Continue ongoing program of conversion of overhead utilities to underground service.				
Yes	Short Term	No	This Program is no longer being implemented by the City. Action should be removed from action plan at the next update.	No Progress
Initiative #SW-2—Continue the Shade Tree Program, an energy conservation rebate program provided by Roseville Electric				
Yes	Short Term	No	Although temporarily suspended due to the drought, this ongoing program will continue upon reactivation to offer Roseville residents a rebate for trees that they select, purchase and plant at their own convenience. Rebates are limited to 6 trees per household and available to Roseville Electric customers only.	Ongoing
Initiative #SW-3—Continue ongoing line clearing and weed abatement of electrical utility facilities in order to reduce public exposure to vegetation hazards and maintain higher reliability during severe weather conditions.				
Yes	Short Term	No	This is an ongoing program of Roseville Electric to both protect the public from hazards and to maintain the reliability of electricity service to Roseville Electric's more than 56,000 customers.	Ongoing

TABLE 2.
ACTION PLAN MATRIX

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Initiative #SW-6—Continue to operate the Roseville Energy Park to support the City's electrical requirements and maintain service continuity during severe weather events.				
Yes	Short Term	No	The Roseville Energy Park (REP), which opened in October 2007, is producing power and provides additional electric support to meet the City's electrical needs. In the event of a transmission line outage, the REP will help maintain electric service continuity. The Operations Department's Emergency Action Plan (EAP) specifically addresses severe weather operations in Section 5.9. The severe weather EAP will ensure continuity of operations while securing the safety of personnel and equipment.	Ongoing
Initiative #SW-7— Continue to operate Roseville Power Plant #2 to support the City's electrical requirements and maintain service continuity during severe weather events.				
Yes	Short Term	No	Roseville Power Plant #2 is operated from the Roseville Energy Park Control Room. The Operations Department's Emergency Action Plan (EAP) specifically addresses severe weather operations in Section 5.9. The severe weather EAP will ensure continuity of operations while securing the safety of personnel and equipment.	Ongoing

Planning Area Changes That May Impact Plan Implementation

The planning area for the City changed with the adoption of 3 new Specific plans. The impacts of these changes will be addressed at the next update to this plan.

Recommendations for Changes or Enhancements

Based on the review of this report by the RMHMP Steering Committee, the following recommendations will be noted for future updates or revisions to the plan.

- The Information Technology Department has recommended that Initiatives MH-3 and MH-7 be combined into a single initiative
- Include information on the potential impacts of the Biggerts/Waters Flood Insurance Reform Act in annual mailings to floodplain residents.
- Continue to hold a pre-rainy season meeting with all key departments and stakeholders, such as the meeting held on December 10, 2013 to review the City's Flood Warning & Response Plan.
- Continue to train with WebEOC to enhance communication with the county. Continue to offer classes prior to every EOC exercise; last year over 100 city staff received a WebEOC refresher class.
- Try to better forecast impacts on city storm drains from debris accumulations.
- Consider training in street closure in a flood scenario for street workers.

- Data from stream gauges was not a representation of actual emergencies in the field. During flooding events, field observers should be deployed to known street flooding locations, even if no gauge information indicates flooding at those locations.
- Continue to evaluate (and add as appropriate) new social media channels, which have proven essential for public and media communication in emergencies.
- The growth of recreational access to and residential units adjacent to the Pleasant Grove Creek oak forest in the Woodcreek, Crocker Ranch, and Fiddyment Farms neighborhoods increases the frequency, risk, and human impact of wildland fires. These increases may require fire and safety personnel reviews of first responder vehicle access to newly populated sections of the creek, updates of resident fire emergency notification and evacuation procedures, and creation or updates of interagency coordination procedures for resident relocation.
- Create different wording for the WebEOC initiative
- Enhance the drought hazard profile based on new information available on current drought situation in CA.
- Enhance human caused hazard profile to include discussion on cyber-terrorism.
- Create separation between natural and non-natural hazards of concern in part II of the plan

Public review notice: *The contents of this report are considered to be public knowledge and have been prepared for total public disclosure. Copies of the report have been provided to the Roseville City Council and local media outlets. The report is also posted on the City of Roseville Multi-Hazard Mitigation Plan website. Any questions or comments regarding the contents of this report should be directed to:*

Jason Rizzi
City of Roseville
311 Vernon St.
Roseville, CA 95678
(916) 774-5802
jrizzi@roseville.ca.us

Appendix C. Steering Committee Meeting Information

TETRA TECH

MEETING SUMMARY

Date of Meeting:	November 3, 2015
Subject:	1st Steering Committee (SC) meeting
Project Name:	City of Roseville Multi-Hazard Mitigation Plan –Update
In Attendance:	**Steering Committee**- Grace Keller (Chair), Rob Jensen, Jason Rizzi, Wayne Wiley, Carl Walker, Brian Jacobson (for Helen Dyda), Erik Angle, Brenette Macintosh, Mark Lacher, Rod Rodriguez, Rick Stalker, Jim Williams **Planning Team**- Rob Flaner
Not Present:	Mark Smith, Michael Algots
Summary Prepared by:	Rob Flaner- 11/17/2015
Project No.:	103S4157
Quorum- Yes or No	Yes

Item	Action

Welcome and Introductions

- Chair, Grace Keller opened the meeting with brief group introduction.
- Round table introductions by all in attendance.
- Agenda was reviewed with no request for changes.
- There were no members of the public present and no public comment received by the Committee.
- Handouts provided included: Agenda, 2015 Progress report, work-plan for the plan update, Steering Committee ground rules, table of contents from the 2011 Multi-hazard mitigation plan.

Why are you here? Purposes for planning

Rob Flaner, the City's planning consultant from Tetra Tech, Inc. provided the committee and overview of the drivers for a hazard mitigation plan, and the Steering Committee's role in the process. There are 2 principle drivers for the City having a hazard mitigation plan; the Disaster Mitigation Act of 2000 (DMA) and the Community Rating System (CRS).

- **The DMA**- Federal legislation that stipulates that communities must have an approved all hazard mitigation plan to eligible for certain federal grant programs administered by the Federal Emergency Management Agency (FEMA). The City of Roseville has leveraged many of these grant programs in the past and wanted to continue to be eligible to pursue that funding, so it developed its hazard mitigation plan.
- **The CRS**- This is a FEMA program that is part of the National Flood Insurance Program (NFIP) that rewards participating communities for exceeding the minimum requirements of the NFIP

Item	Action

by lowering the costs of flood insurance in participating communities. Communities are rated on a scale of 1-10, with class 1 being the best with up to a 45% reduction in flood insurance premiums. The City of Roseville is the nation's highest rated community, and the only CRS class 1. To achieve that designation, the City need to have a mitigation plan that met very prescriptive planning requirements

So utilizing these 2 drivers, the City developed its 1st hazard mitigation plan in 2005. That plan was updated in 2010, which is now being updated with this process. FEMA and CRS require that these plans be reviewed and updated every 5 years. Each of the planning processes were overseen bay steering committee made up of community stakeholders city officials. This plan update process will follow suit and has been scripted to meet CRS class 1 planning requirements.

2015 Annual progress report

The City has prepared a 2015 annual progress report for the 2011 Multi-hazard Mitigation plan in accordance with the plan maintenance chapter (chapter 7) of the plan. The progress report provides and overview of the plan and provides a status report of the 63 initiatives that were identified in the 2011 plan.

The performance period for the Hazard Mitigation Plan began on March 28, 2011, with FEMA's final approval. The initial performance period for this plan is 5 years, with an update anticipated before March 2016. As of the most recent reporting period, the performance period is 82 percent complete. The Hazard Mitigation Plan identified 63 hazard mitigation initiatives to be pursued during the 5-year performance period. As of the most recent reporting period, the following progress can be reported:

- 51 out of 63 initiatives (81%) reported ongoing action toward completion.
- 10 out of 63 initiatives (16%) reported no action taken.
- 1 out of 63 initiatives (2%) was completed.
- 1 initiative was removed due to elimination of a program.

The SC review the progress report, and made the following recommendations for changes before transmittal to City Council:

- Add a short write-up on the Ebola exercise conducted during the reporting period to the hazard events section.
- Add a short write-up about the City's "Oil by Rail" plan in the mitigation success story section of the plan.
- Rob was asked to provide an overview of all the recommended changes/enhancements for the plan from the prior progress reports to the SC at the next meeting.

Erik Angle will write a paragraph about the Ebola exercise

Jason Rizzi will write a paragraph about the Oil by Rail Plan

Rob Flaner will provide a summary of all the annual recommendations from the annual plans to the next meeting

Item	Action
After the discussion on the progress report, the SC approved the report as amended for transmittal to City Council (Motion – Jason Rizzi, Second – Rob Jensen). Carl Walker will present the Progress Report to Council via GIM on or before December 16th.	Carl Walker will present the Progress Report to Council via GIM on or before December 16th
2015/2016 Plan Update Work plan Rob went over the scope of work for the plan update. The handout provided to the SC was the actual contact scope of work from Tetra Tech's contract with the City. The work plan is broken down in to 6 phases: • Phase 1-Organize and review • Phase 2-Update/Enhance the Risk Assessment • Phase 3-Engage the Public • Phase 4- PPI Framework • Phase 5-Assemble the updated Plan • Phase 6- Plan Adoption	
The current plan will expire on March 28, 2016. Plan expiration is not a big issue, unless the City's current pending grant application for the acquisition of 645 Riverside Dr. is not funded prior to March 28, 2016. This grant application has been held up by FEMA due to procedural requirements. Both Rob and Carl do not believe, that plan expiration will be an issue for this grant, however, they will seek clarification for both CalOES and FEMA Region IX. There may be a need to expedite the timeline for this project based on direction received from FEMA and the State.	Rob and Carl will reach out to CalOES and FEMA region IX to determine if an expedited schedule is warranted in order to process the grant for 645 Riverside Dr.
Steering Committee Ground Rules Since Steering Committee meetings will be conducted as open public meetings, the SC will need to have established ground rules for operation during the plan update process. The ground rules confirmed by the SC for the last plan update were provided to the SC. Rob went thru each of the components of the ground rules to make sure the current SC understood their application, and to seek input for changes or enhancements. The following changes were recommended by the SC for the 2015/2016 SC ground rules: • Grace Keller was re-confirmed as Chairperson, and Wayne Wiley was confirmed as Vice-Chairperson for the next performance period of the plan. • The quorum for the SC will remain as 50% plus 1, which will be 8 members for this plan update process. • SC members will have the option to designate an alternate and these alternates will have full voting privileges when they attend a SC meeting in the place of a primary SC member. SC members wishing to designate an alternate will inform the planning team by Friday, November 20th.	SC members wishing to designate an alternate should inform planning team by Friday, November 20th, 2015.

Item	Action
• The city's standard protocol for receiving public comment at City Council meetings was incorporated in to the ground rules. • The standard meeting date/time will strive for the 1st Tuesday of each month, from 6:00 to 8:00 PM at the Roseville City offices at 311 Vernon St.	
The SC voted to approve the ground rules as amended (Motion – Rick Stalker, Second – Mark Lacher). Carl will make sure that the final ground rules are posted on the Mitigation Plan website as soon as possible.	Carl to poste the final ground rules on the mitigation plan website.
Hazards of Concern The table of contents from the last plan illustrating the hazards of concern addressed was provided to the SC as a hand out. Rob explained that local hazard mitigation plans are required to be consistent with the State Hazard Mitigation plan as far as the hazards of concern addressed by a plan. So in other words, id the State plan says that Placer County and the City of Roseville is susceptible to a certain hazard, then the Roseville and Placer County plans should assess those hazards in their individual mitigation plans. The 2011 Roseville Multi-Hazard Mitigation Plan assessed: Dam Failure, Drought, Earthquake, Flood, Human Caused hazards, Human health hazards, Landslide, severe weather, and wildfire. These hazards were consistent with the last CA State hazard Mitigation plan.	
The Steering Committee was asked to do some homework prior to the next SC meeting as follow: All to read Chapter 11-18 of the 2011 plan and answer the following questions: • Is there another hazard we need to assess? • Since California will have Climate Change (Future Conditions) as a stand-alone risk, how should we accomplish that in our plan? All to read Goal section and answer the following questions: • Are the Goals still valid? • Do we need to add any new Goals? All to review the Annual reports for the last five years.	SC members to do homework as described.
Meeting was adjourned at 8:00 PM The next Steering Committee meeting is:	

Item	Action

November 30th from 6:00 PM to 8:00 PM
Roseville City Hall
311 Vernon St., Roseville, CA 95678

TETRA TECH

MEETING SUMMARY

Date of Meeting:	November 30, 2015
Subject:	2nd Steering Committee (SC) meeting
Project Name:	City of Roseville Multi-Hazard Mitigation Plan –Update
In Attendance:	**Steering Committee**- Grace Keller (Chair), Rob Jensen, Jason Rizzi, Wayne Wiley, Carl Walker, Helen Dyda, Erik Angle, Brenette Macintosh, Mark Lacher, Rick Stalker, Jim Williams, Paul Holt, Joe Van Zant **Planning Team**- Rob Flaner
Not Present:	Mark Smith, Rod Rodriguez, Michael Algots
Summary Prepared by:	Rob Flaner- 12/14/2015
Project No.:	103S4157
Quorum- Yes or No	Yes

Item	Action

Welcome and Introductions

- Vice-Chair, Wayne Wiley opened the meeting with a brief group introduction.
- Round table introductions by all in attendance.
- Agenda was reviewed with no request for changes.
- Meeting summary for Steering Committee (SC) Meeting #1 were reviewed and approved.
- There were no members of the public present and no public comment received by the SC.
- Handouts provided included: Agenda, Meeting #1 summary, example guiding principles and mission statements, the 2012 plan Goals and Objectives, Planning area map for the 2016 plan update, recommendations for changes and enhancements from the 2015 annual progress report.
- Chair, Grace Keller assumed leadership of the meeting upon her arrival.

Progress Report Recommendations

At the last SC meeting, the committee requested to see the changes and enhancement sections from the past progress reports. Rob provided the SC a handout that summarized the notations for changes and enhancements to the plan from the 2012 through 2014 progress reports. Rob led a discussion with the SC on what recommendations for changes or enhancements should be included in the 2015 progress report. The following recommendations were requested by the SC:

Item	Action
• Create different wording for the WebEOC initiative • Enhance the drought hazard profile based on new information available on current drought situation in California. • Enhance the human-caused hazard profile to include a discussion on cyber-terrorism. • Enhance the human health hazard profile to include a discussion on Ebola. • Create separation between natural and non-natural hazards of concern in part II of the plan. Rob and Carl will finalize the 2015 progress report for posting on the City website and submittal to the City Council Carl asked the SC to review the planning area map that was provided as a handout. Carl explained to the SC that the planning area for the City has changed dramatically since the initial planning effort in 2005. The City has and will continue to grow that the direction of its General Plan and Specific Planning process. The map handout illustrated the new specific plan areas that will need an assessment in the 2016 update. **<u>Confirm the Hazards of Concern</u>** The SC was asked at the last meeting to review the 2012 Roseville HMP and the 2013 CA State Hazard Mitigation plan and come to this meeting prepared to confirm the hazards of concern to be addressed by the 2016 plan update. After discussion of their observations from this review, the SC confirmed the following hazards of concern for the 2016 plan update, inclusive of the newly identified cyber terrorism and Ebola components of human-caused and human health hazards, respectively: • Dam Failure • Drought • Earthquake • Flood • Human caused - Terrorism & Weapons of Mass Destruction - Technological - Civil Disorder - ***Cyber terrorism*** • Human Health - Influenza - Small Pox - Viral Hemorrhagic Fevers - Plague - Tularemia - Mosquito-borne Disease - Lyme Disease	Rob and Carl to final finalize the 2015 progress report for posting on the City website and submittal to City Council

Item	Action

  - Anthrax
  - Severe Acute Respiratory Syndrome
  - Extreme weather
  - ***Ebola***
- Landslide
- Severe Weather
- Wildfire-to include a discussion/profile on air quality issues

Additionally, the 2016 update will include a stand-alone chapter on climate change that will discuss qualitatively the possible impacts of climate change on each of the above hazards of concern. There will be separation created in the plan between the natural and non-natural hazards since they will be profiled and ranked differently. The risk ranking of the plan will only consider the natural hazards of concern.

Guiding Principle/ Vision/Mission Statement

A guiding principle or a mission statement for a plan is a written declaration of a plan's core purpose and focus that normally remains unchanged over time, regardless of a change to the plan's goals or objectives. Rob explained to the SC that the last 2 versions of the Roseville Hazard Mitigation plan did not identify a guiding principle or mission statement. These are not required components for DMA compliance, however, Rob explained to the SC that they are beneficial, as they provide a clear, singular message that can be the focal point for public engagement. Rob explained to the SC that he was unaware as to why the past Steering Committees chose to not identify a guiding principle, however, this SC could identify one for the 2016 update. The SC received a handout that listed several example mission statements from other planning efforts for reference and review. After reviewing the handout, Rob asked the SC if they wanted a guiding principle/ statement for the 2016 plan update. The consensus of the SC agreed on identifying a guiding principle. After discussion, the SC settled on the following guiding principle for the 2016 plan update:

Through community partnerships, establish a plan to reduce vulnerability to hazards in order to protect the health, safety, welfare, and economy of the City.

Confirm Goals

The SC received a handout that listed the 7 goals from the 2012 plan. Rob explained that the initial 2005 plan included 7 goals that were slightly enhanced during the 2012 plan update process. Rob asked the SC to review the 7 goals and identify any additions, deletions, or enhancements to the goals for the 2016 update. One change was requested by the SC. This change involved replacing "maintain, enhance, and restore" with "monitor and support" on Goal #7. The SC confirmed the following goals for the 2016 plan update:

Item	Action

G-1: Protect lives and reduce injury.

G-2: Promote hazard mitigation as an integrated policy.

G-3: Protect the continuity of local government to ensure no significant disruption of services during or due to a disaster.

G-4: Improve community emergency management preparedness, collaboration and outreach.

G-5: Minimize or reduce damage to property, including critical facilities.

G-6: Develop and implement mitigation strategies that optimize public funds in an efficient and cost-effective way.

G-7: Monitor and support the natural environment's capacity to deal with the impacts of natural hazards, taking into account the potential impacts of global climate change.

Confirm Objectives

The SC received a handout that listed the 10 objectives from the 2012 plan. Rob explained that the initial 2005 plan included 10 objectives that were slightly enhanced during the 2012 plan update process. Rob asked the SC to review the 10 objectives and identify any additions, deletions, or enhancements to the goals for the 2016 update. The SC requested minor changes to objectives # 5, 7, and 10. The SC confirmed the following objectives for the 2016 plan update:

O-1: Consider the impacts of hazards on future land uses in the City of Roseville by coordinating with other planning mechanisms such as the general plan and land-use code development.

O-2: Protect and sustain reliable local emergency operations and communication facilities during and after disasters.

O-3: Develop new or enhance existing early warning response systems and plans.

O-4: Seek to enhance emergency response capabilities through improvements to infrastructure and City programs.

O-5: Enhance the understanding of all present and future hazards that may impact the City of Roseville and the risk they pose.

O-6: Seek mitigation projects that provide the highest degree of hazard protection at the least cost.

O-7: Seek to update information on natural, environmental, and human-caused hazards, vulnerabilities, and mitigation measures by coordinating

Carl to post the final Guiding Principle, Goals and Objectives on the City HMP website

Item	Action

planning efforts and creating partnerships with appropriate local, private, county, state, and federal agencies.

O-8: Seek to implement codes, standards, and policies that will protect life and property, including natural habitat, from the impacts of hazards within the City of Roseville.

O-9: Educate the public on preparedness for and mitigation of potential impacts of hazards on the City of Roseville.

O-10: Support efforts to retrofit, purchase, or relocate structures in high hazard areas, including those known to be repetitively damaged.

Public Involvement Strategy

Discussion on this topic was tabled until the next meeting due to the lack of time.

The meeting adjourned at 8:00 PM

The next Steering Committee meeting is:

January 5th from 6:00 PM to 8:00 PM
Roseville City Hall
311 Vernon St., Roseville, CA 95678

TETRA TECH

MEETING SUMMARY

Date of Meeting:	January 5, 2016
Subject:	3rd Steering Committee (SC) meeting
Project Name:	City of Roseville Multi-Hazard Mitigation Plan –Update
In Attendance:	**Steering Committee**- Grace Keller (Chair), Jason Rizzi, Wayne Wiley, Carl Walker, Helen Dyda, Erik Angle, Brenette Macintosh, Mark Lacher, Joe Van Zant, Rick Stalker, Michael Algots, Jim Williams, Paul Holt, Dom Casey, Jamie Garret **Planning Team**- Rob Flaner, Jessica Cerutti
Not Present:	Rob Jensen, Rod Rodriguez
Summary Prepared by:	Jessica Cerutti – 01/08/16
Project No.:	103S4157
Quorum- Yes or No	Yes

Item	Action

Welcome and Introductions

- Chair Grace Keller opened the meeting with a brief group introduction.
- Round table introductions by all in attendance.
- Agenda was reviewed with no request for changes.
- Meeting summary for Steering Committee (SC) Meeting #2 were reviewed and approved.
- There were no members of the public present and no public comment received by the SC.
- Handouts provided included: Agenda, Meeting #2 summary, Critical Facilities definition, Risk Assessment Update, Copy of the City of Roseville 2010 Public Survey.

Risk Assessment Update

Rob opened the discussion on the risk assessment (RA) update by indicating little change. He said that Tetra Tech is still data mining and addressing identified data gaps.

Rob and Carl revealed that they are adjusting the RA to reflect the Preliminary Flood Insurance rate Map (PFIRM) as the best available data for this plan update. Carl explained that the updated RA for flood will use the PFIRM received from FEMA on December 28th as the basis of the flood RA instead of the current effective FIRM. Carl said that the PFIRM provides a new study on Pleasant Grove Creek and will be best suited for inclusion into the 2016 plan update for enhanced future impact assessments.

Item	Action

Public Involvement Strategy

CRS Requirements

Rob reviewed the Community Rating System (CRS) requirements for public engagement, noting that the City of Roseville is already fulfilling most requirements through inviting public participation during committee meetings and maintaining a public facing website. He stressed that such initiatives must be maintained and public engagement must continue.

To survey or not to survey

Rob presented the SC with the 2010 Roseville HMP public survey and posed the question of whether or not the survey should be updated and distributed for the 2016 initiative. He said that to truly reap the benefits of the survey, the public must be provided a minimum of 30 days to maximize participation. He stressed that distribution of the survey may not necessarily be conducive to the expedited timeline for HMP completion, noting that the current target submission to FEMA is March 2016. This led to a discussion on the ramifications of extending the target submission. Rob mentioned that the City is still able to submit a LOI with an expired plan. Additionally, he said that HMGP approval can take anywhere from 6-8 months after initial submission. Carl noted that the only project that may be affected by an extended submission of the HMP to FEMA would be the acquisition project associated with 645 Riverside. Rob added that the City should be afforded some latitude regarding this project due to the lag in progress caused by CalOES and FEMA. At this point, Carl suggested to extend the HMP process to afford ample time to maximize public participation.

SC to review the previous survey by January 8 and return comments to Jessica.

Grace noted that the Flood Control District and FEMA will be meeting during late January and recommended engaging FEMA to be put on the agenda. Jason followed up by recommending that participating in RCONA meeting may be beneficial for furthering public outreach.

Carl and Jason to introduce the Roseville HMP initiative and public survey to the County CCO meeting, if possible.

PPI Subcommittee

Rob initiated a discussion regarding the next item on the agenda – the Program for Public Information (PPI). He noted that this is an option for additional CRS credit. Given the City's current outreach initiatives, Rob said that it makes sense to capture them in a formalized program. He said that the PPI would be an annex to the plan, as the process for PPI planning will extend beyond the 2016 HMP effort. Carl requested additional information regarding the PPI, after which the subcommittee will meet – tentatively at the end of January. The PPI subcommittee is tentatively identified as follows:

- Carl Walker
- Jason Rizzi
- Helen Dyda
- Jamie Garrett
- Rick Stalker
- Paul Holt
- Michael Algots

Jessica to develop and send an overview of the PPI initiative, inclusive of requirements and considerations.

Item	Action

Confirm Critical Facilities Definition

Next, Rob reviewed the previous iterations of the critical facility definitions from the 2005 and 2010 plans. He stated that, at a minimum, the City should use the CRS standard definition. He provided additional examples for review and asked the SC for their views on the definition. The SC agreed that the standard definition should be used with some modification. The following definition was constructed and subsequently approved by the SC with a motion to approve from Joseph Van Zant and a second from Rick Stalker:

> *A structure or other improvement, public or private, that, because of its function, size, service area, or uniqueness, has the potential to cause serious bodily harm, extensive property damage, or disruption of vital socioeconomic activities if it is destroyed or damaged or if its functionality is impaired. Critical facilities may include, but is not limited to, health and safety facilities, utilities, government facilities, hazardous materials facilities, and transportation infrastructure.*

General Plan Update/New CA General Planning Law

Wayne updated the SC on current general Plan initiatives, including a discussion of SB 379. During this discussion, Wayne indicated that SB 379 will require a climate change component beginning with the first plan adopted after January 2017. As a result, the 2016 mitigation planning initiative will not be required to contain climate change, however Rob indicated that the previously discussed climate change chapter will serve as a segue into the post-2017 requirement.

Emergency Operations Plan Review

Rob indicated that the EOP review was currently underway. He stressed that an anticipated gap will include disabilities, access, and functional needs issues given the recent string of Americans with Disabilities Act lawsuits taking place around the country.

Debris Management Plan

Jessica introduced the SC to the debris management planning initiative. She provided the SC with an overview of debris management operations and stressed the need for a strong plan that follows recently updated Public Assistance Program and Policy Guide 10-point Debris Management Plan Checklist. Paul and Mike volunteered to serve on the debris management planning committee given their advanced knowledge of hazardous materials and debris management practices.

Jessica to send out the 10-point Debris Management Checklist for SC review and reference.

Jason to include Paul and Mike in the debris management planning process.

Item	Action
As a final action before meeting adjournment, Rick requested a copy of the SC contact information.	Carl to send Rick SC contact information

The meeting adjourned at 7:47 PM

The next Steering Committee meeting is:

February 2nd from 6:00 PM to 8:00 PM
Roseville City Hall
311 Vernon St., Roseville, CA 95678

TETRA TECH

MEETING SUMMARY

Date of Meeting:	February 2, 2016
Subject:	4th Steering Committee (SC) meeting
Project Name:	City of Roseville Multi-Hazard Mitigation Plan –Update
In Attendance:	**Steering Committee**- Grace Keller (Chair), Jason Rizzi, Wayne Wiley, Carl Walker, Helen Dyda, Brenette Macintosh, Mark Lacher, Joe Van Zant, Rick Stalker, Michael Algots, Jim Williams, Paul Holt, Jaime Garret **Planning Team**- Rob Flaner, Jessica Cerutti
Not Present:	Rob Jensen, Rod Rodriguez, Erik Angle, Dom Casey
Summary Prepared by:	Jessica Cerutti – 02/08/16
Project No.:	103S4157
Quorum- Yes or No	Yes

Item	Action

Welcome and Introductions

- Chair Grace Keller opened the meeting with a brief group introduction.
- Agenda was reviewed with no request for changes.
- Meeting summary for Steering Committee (SC) Meeting #3 were reviewed and approved.
- There were no members of the public present and no public comment received by the SC.
- Handouts provided included: Agenda, Meeting #3 summary, Debris Management Plan Checklist, Risk Assessment Update, 2016 Roseville Public Questionnaire, PPI Overview, 2011 Mitigation Catalog.

Risk Assessment Update

Rob opened the discussion on the risk assessment (RA) update by thanking Carl for the receipt of additional data, including flood data that provided the missing links on the assessor's data. Rob indicated that this missing data provides a key for making the overall RA more robust.

Next, Rob mentioned that there were previous issues with the LiDAR data, stating that the data received was not based on a bare earth model. He then said that Carl was able to acquire the formatted bare earth LiDAR model that FEMA is using for the Preliminary DFRIM, which will further strengthen the RA.

Rob next stated that the RA results will be available by the next SC meeting. During the next meeting, these results will be reviewed for the earthquake, flood, and dam failure hazards with all updated inventories. He said that

Rob to provide RA results by Feb. 26th

Item	Action
review of this information is key, as it will be the primary deliverable to share with the public. Rob said that Tetra Tech will work towards getting the SC the RA data by Friday, February 26th in order to provide an opportunity for SC review prior to the next meeting. He said that this data will come from Hazus and explained that the RA used a user defined, more specific model than simply using the Hazus pre-identified data. He requested that the SC review the RA methodology from the previous plan in preparation of reviewing the 2016 RA data.	SC to review the previous plan methodology for RA in preparation of 2016 RA review.
Next, Rob talked about the hazard layers, saying that some datasets were provide by the California Geological Survey. He also spoke about the dam failure hazard, reminding the SC that this profile was originally developed during the previous planning process. He said that this hazard focused on analysis and results, but did not include specific mapping due to operational security. The SC agreed that general evacuation and inundation maps with arrows are permissible, but no specific mapping should be used that identifies definitive locations of the dam failure hazard due to security concerns.	
Public Involvement Strategy	
Survey	
The SC reviewed the final survey for distribution and discussed the timeline for deploying the survey in relation to the remaining timeline for the project. Jason recommended that communications should take the lead on deploying the survey through various means. Helen suggested running the survey for approximately 2 weeks. She also indicated that they would provide a follow up email and post to potential respondents before the survey is closed to remind potential participants to take the survey.	Helen and Jaime to deploy the survey via social media platforms and other channels.
Public Meeting	
Rob then began a discussion on the public meeting. He said that the public meeting is dependent upon the availability of RA data. Grace recommended the use of the Utility Center. Jason said that he would check with the Parks and Rec Department to find out Center availability, but recommended against late March due to Spring Break, noting that many residents will likely be out of town during this time. Helen and Jaime recommended adding an option at the end of the survey where residents could provide their email address to remain informed on upcoming public meetings.	Jessica to add email option to end of survey.
Rob requested information regarding the potential format of the public meeting. The SC agreed that an open house format would be the best. Potential booth participants could include RCONA, Union Pacific, Red Cross, CERT, and others. Jason mentioned the Saturday open houses for the fire department as a potential vehicle for a captive audience. Helen recommended the Earth Day festivities on April 16th as a possible vehicle for the public meeting. In addition, she indicated that the Food Truck Mania event would be an ideal time to advertise for the public meeting	SC will provide input regarding the Planning Team's recommendations for a tentative schedule and begin preliminary event planning in March.

Item	Action

Public Involvement - PPI

Carl started the conversation about the PPI by saying that the City would like to make the PPI more of an all hazards program that fulfills CRS requirements while simultaneously providing additional outreach considerations on other hazard issues. Jessica indicated that this is an ideal program, noting that a PPI allows for CRS credit based on topics outside of the six priority topics. She said that these additional topics can be general preparedness, all-hazards based.

Jessica then took the SC through an overview of the PPI development process. She reviewed each of the seven steps, beginning with the establishment of a PPI Committee. She noted that at the previous SC meeting, a list of tentative PPI committee members was discussed. From this list, the final committee will be selected based on CRS requirements.

Jess and Carl to discuss final PPI committee.

Jessica then discussed Step 2 of the process, drawing attention to the need to identify target areas and target audiences. She noted that this next step can only be conducted after the development of the RA which will allow the PPI committee to make a data-based determination on what specific areas to target. She reviewed the rest of the requirements of the PPI, including a reiteration on topics and annual review requirements

Alternatives Analysis

Rob next discussed the alternatives analysis, bringing the SC's attention to the previous Mitigation Catalog. Rob reminded the SC that this catalog development is part of the statutory requirement to develop a comprehensive range of alternatives considered for actions in the plan. He noted that the catalog separates actions into a personal, corporate, and governmental scale and identifies opportunities to reduce risk.

Rob mentioned that the SC did not perform a Strengths, Weaknesses, Opportunities, and Obstacles (SWOO) session during the last planning process (2011 MHMP Update) and asked the SC if they would like to conduct a SWOO session for the 2016 initiative. He reminded the SC that they last SWOO session was held nearly 10 years ago, and that some risks have changed. For example, he noted that during the initial planning process, dam risk was unknown. New RA results will provide a better understanding of the dam hazard and how they relate to SWOO.

Jason requested best practices from other jurisdictions and their SWOO results as a reference, noting that while some risks need to be reassessed as part of the catalog process, others have remained the same. Rob recommended an abbreviated SWOO session during the next SC meeting,

Item	Action

for all-hazards, but specifically recommended focusing on newly identified risks, such as dam failure and cyber threats.

Grace asked Rob to conduct a sample SWOO to give the SC an idea of what to expect during the next meeting. Rob used Health Hazards as a sample:

- Strengths
  - Active community, parks and rec, available health programs
- Weaknesses
  - Homeless population
  - Elderly population – unable to call for help, alone in houses
- Opportunities
  - Change in potential funding to establish a program
  - Identify new opportunities to reduce risk
  - Seniors First – visitors already trained, opportunity for coordination
- Obstacles
  - Limited funding
  - Organizational resources lacking

With no further comments, the meeting adjourned at 8:00 PM

The next Steering Committee meeting is:

March 1st from 5:30 PM to 8:00 PM

Roseville City Hall
311 Vernon St., Roseville, CA 95678

TETRA TECH

MEETING SUMMARY

Date of Meeting:	March 1, 2016
Subject:	5th Steering Committee (SC) meeting
Project Name:	City of Roseville Multi-Hazard Mitigation Plan –Update
In Attendance:	**Steering Committee**- Grace Keller (Chair), Jason Rizzi, Wayne Wiley, Carl Walker, Erik Angle, Helen Dyda, Brenette Macintosh, Mark Lacher, Joe Van Zant, Rick Stalker, Michael Algots, Jim Williams, Jaime Garret **Planning Team**- Rob Flaner, Jessica Cerutti
Not Present:	Rob Jensen, Rod Rodriguez, Dom Casey
Summary Prepared by:	Jessica Cerutti – 03/10/16
Project No.:	103S4157
Quorum- Yes or No	Yes

Item	Action

Welcome and Introductions

- Chair Grace Keller opened the meeting with a brief group introduction.
- Agenda was reviewed with no request for changes.
- Meeting summary for Steering Committee (SC) Meeting #4 were reviewed and approved.
- Two members of the public were presented and invited to comment at this time.
    - Both members of the public expressed interest in the planning process. On indicated an increased interest in understanding the concept of the plan, including how manmade hazard such as cyber are terrorism will be incorporated. SC members offered additional information regarding the background of hazard mitigation planning, including the emphasis on natural hazards.
- Handouts provided included: Agenda, Meeting #4 Summary, Preliminary Risk Assessment Results, and Preliminary Public Information Survey Results.

Risk Assessment Update

Rob opened the discussion on the risk assessment (RA) update by reviewing the essential terminology regarding the risk assessment data provided in the handout. He reminded the SC that FEMA is looking to quantify risk and avoided loss in monetary amounts. He reviewed the definition of assets in General Building Stock and Critical facilities. He noted that general building stock is where residents live and shop on a daily basis while critical infrastructure refers to the definition decided upon by the SC during SC Meeting #2.

Item	Action

Next, Rob reviewed the purpose of HAZUS – the program used to conduct the Roseville risk assessment. He noted that the updated risk assessment used HAZUS 5.1 and updated inventory, including new LiDAR data based on terrain and an updated value of identified assets. Additionally, Rob noted that the updated risk assessment contains new loss estimations for dam failure, earthquake, and flood. Rob said that expected changes occurred with the inclusion of better data, specifically regarding an increased floodplain due to the annexation of Sierra Vista and Creekview and new shake maps for seismic assessment.

From there, Rob explained that the actual risk ranking is based on HAZUS outputs on a level 2-user defined level. He explained that this meant that the assessment was conducted on a property-specific level instead of a general block level. Rob noted that this granular level of assessment provides increased capability for informed hazard ranking and overall mitigation planning.

Rob next reviewed the results of each hazard run, noting that the assessment is not complete for all anticipated models – particularly for landslide due to soil class discrepancies and the 10-, 50-, and 500-year flood scenarios. Rob noted that outside of flood and earthquake, the other hazards are given an estimate on potential damages in table format due to existing limitations in the HAZUS program.

Rob said that the April 16th Earth Day HAZUS work stations will rely on correct information in order to provide information to the public.

Public Involvement Strategy

Earth Day

Next, Rob reviewed the public outreach strategy, noting that Roseville's April 16th Earth Day event at Mahany Park will be the foundation for the first public meeting. He explained the format, saying that there will be two HAZUS workstations, easels displaying maps, and hard copies of the survey available for attendees to complete. Carl and Jason discussed the issues associated with displaying information related to the dam failure hazard. Carl noted that the public survey results indicated a need to provide some information on dam failure, but consideration must be made regarding the exposure of potentially sensitive information.

Carl to confirm SC participation in Earth Day activities.

Additionally, Rob requested the involvement of the SC as support staff during the Earth Day activities from 10:00am to 3:00pm. Carl requested that the SC sign up for times in which they would be available to support the initiative. The SC provided an initial schedule to Carl at this time. Carl also suggested the possibility of including a raffle giveaway to encourage participation, noting that an emergency preparedness Go-Bag would be a beneficial prize.

Rob closed the discussion on Earth Day by noting that the SC would not meet during the month of April due to the Earth Day event.

Survey Results

Item	Action
Jessica reviewed the initial survey results. She stressed that the purpose of this survey was twofold: to assess the understanding of hazards at a community level and to assess the specific concerns for the community. She drew attention to the associated handout and noted that Jaime and Helen's public outreach resulted in 653 responses. First, Jessica reviewed the respondent top choices for receiving news and information about the City, noting that email and text messaging was the top selection for information, next was the social media platform, Nextdoor, followed Facebook, and Alert Roseville. Next, Jessica noted that nearly 98% of respondents live in Roseville, and over half of the respondents work outside of Roseville. Jessica explained that this is a key factor in outreach, as families may be separated during a disaster. Jessica noted that while most respondents were aware of their location within or outside of a floodplain, approximately 40% were not sure. She described this as an indication of a need for additional outreach that can be targeted during the development of the PPI. Likewise, a large percentage (approximately 38%) indicated that they were unsure whether their residence was located in a dam failure zone or not. Jessica reviewed the assessment of the public top natural hazard threats. Drought was the top hazard threat, followed by extreme temperatures, epidemic, severe weather, earthquake, flood, wildfire, freeze and other hazards. She noted that multiple respondents cited radon as a natural hazard of concern. The SC agreed to take this information into consideration during the next LHMP update and possible include radon exposure as a future hazard of concern.	Tetra Tech to update hazard mitigation Best Practices based on SWOO results.

SWOO Session

Rob led the SC in the conduction of the SWOO Session. He began the session by explaining that the SC will focus on an overall programmatic assessment of Roseville, followed by a hazard specific assessment for the hazards of dam failure and cyber threats.

With no further comments, the meeting adjourned at 8:00 PM

The next Steering Committee meeting is:

August 2nd from 6:00 PM to 8:00PM
Roseville City Hall
311 Vernon St., Roseville, CA 95678

TETRA TECH

MEETING SUMMARY

Date of Meeting:	August 2, 2016
Subject:	6th Steering Committee (SC) meeting
Project Name:	City of Roseville Multi-Hazard Mitigation Plan –Update
In Attendance:	**Steering Committee**- Grace Keller (Chair), Jason Rizzi, Wayne Wiley, Carl Walker, Helen Dyda, Erik Angle, Brenette Macintosh, Mark Lacher, Joe Van Zant, Rick Stalker, Michael Algots, Jim Williams, **Public:** Michael Zasso **Planning Team**- Rob Flaner, Jessica Cerutti
Not Present:	Rob Jensen, Rod Rodriguez, Dom Casey, Jaime Garret
Summary Prepared by:	Jessica Cerutti – 08/17/2016
Project No.:	103S4157
Quorum- Yes or No	Yes

Item	Action

Welcome and Introductions

- Chair Grace Keller opened the meeting with a brief group introduction.
- Agenda was reviewed with no request for changes.
- Meeting summary for Steering Committee (SC) Meeting #5 were reviewed and approved.
- There were no public comment received by the SC.
- Handouts provided included: Agenda, Meeting #3 summary, Draft RMHMP.

Project Overview

Rob Flaner began the discussion by indicating that the SC Meeting 6 doubled as a public meeting to review the Draft RMHMP. Carl stated that the public review period started on July 18th and would end on August 19th with an anticipated submittal to CalOES and FEMA by August 29th. From there, Carl said that Approval Pending Adoption is expected by October 18, with a target date to present the plan before City Council on November 2nd.

From there, Rob, provided an overview of the entire process and plan. He noted that this plan is a requirement to apply for certain federal funding programs – namely mitigation programs. Rob noted that the specific process undertaken by the City was driven by Community Rating System (CRS) requirements.

Item	Action

Rob continued by explaining that the risk assessment conducted as part of this process is the hub of the mitigation wheel. He said that risk is probability multiplied by impact, and that the resulting ranking allowed the City to compare results and categorize hazards as high, medium, or low risk,

Rob next described the capability assessment. He said that the capability assessment serves a dual purpose. One purpose is to identify existing drivers and support for implementing mitigation strategies. The second purpose is to identify potential deficiencies that could be remedied as a mitigation item. He noted debris management as an example. He explained that the City identified the need for a debris management plan as a result of the previous capability assessment. As a result, a debris management plan was recommended and subsequently completed by the City.

Next, Rob described the importance of goals and objectives. He reminded the SC that this initiative is the third comprehensive update undertaken by the City. He noted that the goals and objectives from the previous plan were carried over into the 2016 plan with some minor adjustments to focus on climate change.

Finally, Carl and Wayne described the process for CEQA, namely the initial study/mitigated negative declaration designation (IS/MND). They indicated that pursuit of the IS/MND was based on the expectation that projects identified in the Plan would undergo a full CEQA review once they are initiated.

Public Involvement Strategy

During the discussion on public engagement, Jessica noted that a large part of the success of Roseville's 2016 public engagement strategy was due to the successful implementation of Nextdoor as an outreach tool. She noted that the survey received a strong response in correlation with Nextdoor releases. Carl thanked the efforts of Helen and Jaime in coordinating the public outreach efforts.

Action Items/Next Steps

- Finalize plan based on public comments
- Submit to CalOES/FEMA for Review

With no further comments, the meeting adjourned at 7:00pm

Exhibit B – City of Roseville Municipal Code 14.09

Roseville Municipal Code

Title 14 PUBLIC UTILITIES

Chapter 14.09 WATER CONSERVATION

14.09.010 Short title.

This chapter may be cited as the Water Conservation and Drought Mitigation Ordinance. (Ord. 5311 § 2, 2014; Ord. 2413 § 2, 1991.)

14.09.020 General provisions.

A. Purpose. The purpose of this chapter is to ensure compliance with all federal, state and local requirements relating to water conservation and drought mitigation for the protection of public health, safety and welfare by:

1. Reducing the per capita water consumption throughout the City of Roseville (the "city") during years of normal precipitation and during years of drought;

2. Protecting and conserving the city's supply of water during specified times of emergency and/or crisis;

3. Minimizing and/or eliminating the waste of water through voluntary compliance or punitive action, if necessary;

4. Promoting the use of drip irrigation and other low volume irrigation methods that reduce outdoor water use by applying water more efficiently than traditional irrigation methods;

5. No person shall use, or cause to be used, any city water for landscape irrigation between the hours of 10:00 a.m. and 8:00 p.m., unless the city manager, or designee provides prior written consent to a different time limitation. A waiver may be granted for turf areas if the landscape contains too many irrigation valves to complete an irrigation event within the watering window.

6. Upon city declaration of a water shortage, the city manager, or designee, may impose revised and/or additional limitations on outdoor water use, as specified in Section 14.09.040, and no person shall use, or cause to be used, city water in violation of such limitations while the water shortage remains in effect.

B. Scope. The provisions of this chapter shall apply to all customers, users and/or recipients (hereinafter "users") of the city's potable and recycled water service within the city's territorial limits.

C. Administration and Enforcement. The city manager, or designee, including, but not limited to, an enforcement officer as defined herein, shall administer, implement, and enforce the provisions of this chapter. For purposes of this chapter an "enforcement officer" means any city employee or agent of the city with the authority to enforce any provision of this chapter and the authority to make any decision on behalf of the city manager required or called for by this chapter.

D. Compliance. All provisions of this chapter are subject to the compliance procedures set forth in this chapter unless otherwise expressly stated herein.

E. Notification. The city manager, or designee, shall determine the means by which the city shall notify its water users of drought stage determinations and any applicable upgrade or downgrade of such determinations or restrictions. Notification may be achieved through mass media, newspaper, public notice, mailings, utility billings or by any combination of such notice, or by other means as determined by

the city manager, or designee. (Ord. 5491 § 1, 2015; Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.030 Definition of water waste.

Any of the following acts or omissions, whether willful or negligent, shall constitute the waste of water:

A. Causing or permitting water to leak, discharge, flow or run to waste into any gutter, sanitary sewer, watercourse or public or private storm drain, or to any adjacent property, from any tap, hose, faucet, pipe, sprinkler, pond, pool, waterway, fountain or nozzle. In the case of irrigation, "discharge," "flow" or "run to waste"

means that the earth intended to be irrigated has been saturated with water to the point that excess water flows over or through the earth to waste. In the case of washing, "discharge," "flow" or "run to waste" means that water in excess of that necessary to wash, wet or clean the dirty or dusty object, such as an automobile, sidewalk, or parking area, flows to waste.

B. Allowing water fixtures (including, but not limited to, toilets, faucets, shower heads) or heating or cooling devices to leak or run to waste.

C. Maintaining ponds, waterways, decorative basins or swimming pools without water recirculation devices.

D. Backwashing so as to discharge to waste swimming pools, decorative basins or ponds in excess of the frequency necessary to ensure the healthful condition of the water or in excess of that required by standards for professionally administered maintenance or to address structural considerations, as determined by the city manager, or designee.

E. Operation of an irrigation system that applies water to an impervious surface or that is in disrepair.

F. Use of a water hose not equipped with a control nozzle capable of completely shutting off the flow of water except when positive pressure is applied.

G. Irrigation of landscaping during rainfall or 48 hours after a measurable rain event.

H. Overfilling of any pond, pool or fountain which results in water discharging to waste. (Ord. 5491 § 2, 2015; Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 3834 § 3, 2002; Ord. 2413 § 2, 1991.)

14.09.040 Water conservation and drought stages.

The following water conservation and drought stages are hereby established:

A. Basic Water Conservation Stage ("Basic Stage"). The basic stage shall exist when the city's water supply is adequate to meet all projected demands as determined by the city manager, or designee.

B. Stage One Drought. A stage one drought shall exist when the city's water supply is adequate to meet 90 percent of projected demands as determined by the city manager, or designee. An objective of a stage one drought condition is to reduce water usage up to 10 percent. Water shortage surcharges shall be implemented as set forth in Section 14.08.095.

C. Stage Two Drought. A stage two drought shall exist when the city's water supply is adequate to meet 80 percent of projected demands as determined by the city manager, or designee. An objective of a stage two drought condition is to reduce water usage up to 20 percent. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095.

D. Stage Three Drought. A stage three drought shall exist when the city's water supply is adequate to meet 70 percent of projected demands as determined by the city manager or designee. An objective of a stage three drought condition is to reduce water usage up to 30 percent. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095.

E. Stage Four Drought. A stage four drought shall exist when the city's water supply is adequate to meet 60 percent of projected demands as determined by the city manager or designee. An objective of a stage four drought condition is to reduce water usage up to 40 percent. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095.

F. Stage Five Drought. A stage five drought shall exist when the city's water supply is adequate to meet 50 percent or less of projected demands as determined by the city manager, or designee. An objective of a stage five drought condition is to reduce water usage up to 50 percent. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095. (Ord. 5491 § 3, 2015; Ord. 5311 § 2, 2014; Ord. 4724 § 3, 2009; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.050 Determination of drought staging—Effect of well water.

In determining the water conservation and drought stage in effect, the city manager, or designee, shall take into account only surface water available and able to be delivered from the Bureau of Reclamation and the Placer County Water Agency. Well water shall not be considered. In the event that this would result in a determination of a stage three drought or higher, groundwater wells may be activated to increase the supply to a stage two drought level. However, in no case shall well water be considered as an alternative to declaration of a stage one or stage two drought. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.060 Basic stage restrictions.

During the basic water conservation stage, the following restrictions shall be in force:

Water shall be used for beneficial purposes only; all unnecessary and wasteful uses (as defined in Section 14.09.030) of water are prohibited.

A. Water shall be confined to the user's property and shall not be allowed to run off to adjoining properties, or to the roadside or to the gutter. Care shall be taken not to water past the point of saturation.

B. Free-flowing hoses for all uses are prohibited. Automatic shut-off devices shall be attached on any hose or filling apparatus in use.

C. All leaks (including irrigation systems, pipes, fixtures, pools, ponds, fountains and waterways) shall be repaired within five calendar days or less if warranted by the severity of the problem as determined in the discretion of the city manager, or designee.

D. All pools, spas, and ornamental fountains/ponds shall be equipped with a recirculation pump and shall be constructed to be leak-proof. Pool draining and refilling shall be allowed only to the extent

required for health, maintenance, or structural considerations, and must otherwise comply with all applicable federal, state and local stormwater management program requirements, including, but not limited to, the urban stormwater quality management and discharge control ordinance set forth in Chapter 14.20 of Title 14 of the City of Roseville Municipal Code.

E. Landscaping.

1. All landscaping installed in the City of Roseville shall comply with the water efficient landscape requirements adopted by resolution of the city council.

2. Irrigation of new landscaping shall be allowed on any day of the week for a period of 30 days after the new landscaping is planted, unless the city manager, or designee, provides prior written consent to extend this time period based on plant type and the season when the new landscaping is planted. After the 30 days, irrigation days and run times should be decreased to settings appropriate for an established landscape.

3. Upon city declaration of a water shortage, the city manager may impose revised and/or additional limitations on the irrigation of new landscaping, as specified in Sections 14.09.060 through 14.09.100, and no person shall use, or cause to be used, city water in violation of such limitations while the water shortage remains in effect. A waiver may be granted to irrigate during an establishment period for actively used turf areas and/or sports fields. Allowance shall also be made for irrigation testing and repairs.

F. All site reviews shall include an evaluation of using recycled water. Recycled water shall be required if economically feasible. (Ord. 5491 § 4, 2015; Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2762 § 1, 1993; Ord. 2413 § 2, 1991.)

14.09.070 Stage one drought restrictions.

During a stage one drought, the following restrictions may be required, as determined by the city manager and upon notification pursuant to Section 14.09.020(E):

A. All basic stage restrictions required by Sections 14.09.030 and 14.09.060 shall continue in place, except to the extent they are replaced by more restrictive conditions imposed by this section.

B. Residential users and non-residential users shall reduce water usage up to 10 percent.

C. Residential water users shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of November – last day of February: up to one day per week irrigation on Monday of each week, if needed.

2. 1st day of March – last day of April and 1st day of September – last day of October: up to two days per week irrigation on Monday and Friday of each week, if needed.

3. 1st day of May – last day of August: up to three days per week irrigation on Monday, Wednesday and Friday of each week, if needed.

D. Nonresidential water users (including without limitation, commercial, industrial, church, cemeteries, and publicly owned users) shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of November – last day of February: up to one day per week irrigation on Monday of each week, if needed.

2. 1st day of March – last day of April and 1st day of September – last day of October: up to two days per week irrigation on Monday and Thursday of each week, if needed.

3. 1st day of May – last day of August: up to three days per week irrigation on Monday, Thursday and Saturday of each week, if needed.

E. The limitations specified in subsections C and D shall not apply to a properly functioning low volume landscape irrigation system, the irrigation on container plants, or to the irrigation of new landscaping that is subject to the provisions of Section 14.09.060(E). Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

F. References in this section to any day of the week shall mean the period beginning at 12:00 a.m. on that day and ending 24 hours later.

G. City park sites shall, as an aggregate, reduce usage up to 10 percent.

H. Washing streets, parking lots, driveways, sidewalks or buildings, except as necessary for health or sanitary purposes or pursuant to a term or condition in a permit issued by a state or federal agency, is prohibited.

I. Water shall not be served at restaurants except by request.

J. Water shortage surcharges shall be implemented as set forth in Section 14.08.095. (Ord. 5491 § 5, 2015; Ord. 5311 § 2, 2014; Ord. 4724 § 3, 2009; Ord. 4629 § 1, 2008; Ord. 2817 § 1, 1994; Ord. 2636 § 1, 1992; Ord. 2413 § 2, 1991.)

14.09.080 Stage two drought restrictions.

During a stage two drought, the following restrictions may be required, as determined by the city manager and upon notification pursuant to Section 14.09.020(E):

A. All basic stage and stage one restrictions required by Sections 14.09.060 and 14.09.070 shall continue in place, except to the extent they are replaced by more restrictive conditions imposed by this section.

B. Residential users and non-residential landscapes shall reduce water usage up to 20 percent.

C. City park sites shall, as an aggregate, reduce usage up to 20 percent.

D. Residential water users shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of November – last day of February: up to one day per week irrigation on Monday of each week, if needed.

2. 1st day of March – last day of April and 1st day of September – last day of October: up to two days per week irrigation on Monday and Friday of each week, if needed.

3. 1st day of May – last day of August: up to three days per week irrigation on Monday, Wednesday and Friday of each week, if needed.

E. Nonresidential water users (including without limitation, commercial, industrial, church, cemeteries, and publicly owned users) shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of November – last day of February: up to one day per week irrigation on Monday of each week, if needed.

2. 1st day of March – last day of April and 1st day of September – last day of October: up to two days per week irrigation on Monday and Thursday of each week, if needed.

3. 1st day of May – last day of August: up to three days per week irrigation on Monday, Thursday and Saturday of each week, if needed.

F. The limitations specified in subsections D and E shall not apply to a properly functioning low volume landscape irrigation system, the irrigation on container plants, or to the irrigation of new landscaping that is subject to the provisions of Section 14.09.060(E). Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

G. References in this section to any day of the week shall mean the period beginning at 12:00 a.m. on that day and ending 24 hours later.

H. Washing of vehicles or boats is prohibited except:

1. When using a hose that is equipped with a control nozzle capable of completely shutting off the flow of water except when positive action or pressure to maintain the flow of water is applied; or

2. When washed in either an automatic or manual commercial car wash that recirculates its water and uses high pressure/low volume wash systems.

3. Temporary car washes, held for fundraising purposes, are encouraged to partner with an automatic commercial car wash that recirculates its water and uses high pressure/low volume wash systems. If run independently, the participants must use a hose nozzle that completely shuts off the flow of water when not in use and must comply with all applicable federal, state and local stormwater management program requirements, including, but not limited to, the urban stormwater quality management and discharge control ordinance set forth in Chapter 14.20 of Title 14 of the City of Roseville Municipal Code.

I. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095. (Ord. 5491 § 6, 2015; Ord. 5311 § 2, 2014; Ord. 4724 § 3, 2009; Ord. 4629 § 1, 2008; Ord. 2611 § 1, 1992.)

14.09.090 Stage three drought restrictions.

During a stage three drought, the following restrictions may be required, as determined by the city manager and upon notification pursuant to Section 14.09.020(E):

A. All basic stage, stage one, and stage two restrictions required by Sections 14.09.060, 14.09.070 and 14.09.080 shall continue in place, except to the extent they are replaced by more restrictive conditions imposed by this section.

B. Residential users and non-residential landscapes are to reduce water usage up to 30 percent.

C. City park sites shall, as an aggregate, reduce usage up to 30 percent.

D. Residential water users shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of September – last day of April: up to one day per week irrigation on Monday of each week, if needed.

2. 1st day of May – last day of August: up to two days per week irrigation on Monday and Friday of each week, if needed.

E. Nonresidential water users (including without limitation, commercial, industrial, church, cemeteries, and publicly owned users) shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of September – last day of April: up to one day per week irrigation on Monday of each week, if needed.

2. 1st day of May – last day of August: up to two days per week irrigation on Monday and Thursday of each week, if needed.

F. The limitations specified in subsections D and E shall not apply to a properly functioning low volume landscape irrigation system, the irrigation on container plants, or to the irrigation of new landscaping that is subject to the provisions of Section 14.09.060(E). Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

G. References in this section to any day of the week shall mean the period beginning at 12:00 a.m. on that day and ending 24 hours later.

H. New or expanded landscaping is limited to drought-tolerant trees, shrubs, and ground-cover and be irrigated using a low volume irrigation system. No new turf shall be planted, hydroseeded, or laid, unless prior written consent is received from the city manager. Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

I. Except where recycled water is used, golf courses shall reduce irrigation up to 30 percent.

J. All decorative fountains, decorative (i.e., nonswimming) pools, and decorative waterways shall be drained and made dry. Such fountains, pools, and waterways shall not be refilled until the city has returned to the basic water conservation stage. Fountains, ponds or pools that are filled with recycled water are not subject to this provision. Decorative ponds that contain fish as a feature shall be exempt from this restriction as long as the system is maintained in good working order with measures taken to reduce the volume of makeup water required for evaporative losses.

K. Except where recycled or other non-potable water is used or as otherwise provided in this subsection, use of water for dust control is prohibited. Dust control shall be augmented by hardened, temporary travel routes with materials that are accepted by the city manager, city engineer, or designee. Potable water is allowed for construction water only where and to the extent required for public health and safety reasons.

L. New swimming pools and spas may be filled after construction using customer's metered water at then existing water rates. All new pools must include a means for minimizing evaporative loss, such as a pool cover, at time of final inspection by the city. After being filled with water for the first time, all pools and spas shall be subject to the requirements of Section 14.09.060(D).

M. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095. (Ord. 5491 § 7, 2015; Ord. 5311 § 2, 2014; Ord. 4724 § 3, 2009; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.100 Stage four drought restrictions.

During a stage four drought, the following restrictions may be required, as determined by the city manager and upon notification pursuant to Section 14.09.020(E):

A. All basic stage, stage one, stage two, and stage three restrictions required by Sections 14.09.060, 14.09.070, 14.09.080 and 14.09.090 shall continue in place, except to the extent they are replaced by more restrictive conditions imposed by this section.

B. Residential customers and non-residential landscapes are to reduce water usage up to 40 percent.

C. City park sites shall, as an aggregate, reduce usage up to 40 percent.

D. Residential water users shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of September – last day of April: No irrigation allowed.

2. 1st day of May – last day of August: up to one day per week irrigation on Monday, if needed.

E. Nonresidential water users (including without limitation, commercial, industrial, church, cemeteries, and publicly owned users) shall be permitted to irrigate with city water on the following schedule, unless the city manager, or designee, provides prior written consent to a different irrigation pattern:

1. 1st day of September – last day of April: No irrigation allowed.

2. 1st day of May – last day of August: up to one day per week irrigation on Monday of each week, if needed.

F. The limitations specified in subsections D and E shall not apply to a properly functioning low volume landscape irrigation system, the irrigation on container plants, or to the irrigation of new landscaping that is subject to the provisions of Section 14.09.060(E). Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

G. References in this section to any day of the week shall mean the period beginning at 12:00 a.m. on that day and ending 24 hours later.

H. Installation of any new landscaping is prohibited unless irrigation is provided through connection to an active recycled water system. In the case of new construction, the city's building official will issue a temporary final upon completion of the structural development of the property. When the city has returned to a stage two drought restriction, landscaping installation can be completed and a building final will become available upon inspection by the city.

I. Except where recycled water is used, golf courses shall reduce irrigation up to 40 percent.

J. Automobiles or equipment shall be washed only at commercial establishments that recycle their water or by equipment and means that separates debris and recycles wash water for continual use.

K. Existing pools shall not be emptied and refilled using city water unless required for health or safety reasons until the city has returned to a stage two drought restriction. Pools may be re-filled only to the extent necessary to replace evaporative losses.

L. No commitments shall be made to provide water service as part of any new land use entitlement (general plan, specific plan or amendments requesting new water allocations) until the city has returned to a stage two drought restriction. Currently approved specific plans with accompanying development agreements and projects or properties that have received water allocations in advance of full entitlements may be issued building permits so long as they comply with the remainder of this chapter.

M. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095. (Ord. 5491 § 8, 2015; Ord. 5311 § 2, 2014; Ord. 4724 § 3, 2009; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.110 Stage five drought restrictions.

During a stage five drought, the following restrictions may be required, as determined by the city manager and upon notification pursuant to Section 14.09.020(E):

A. All basic stage, or stage one, stage two, stage three and stage four restrictions required by Sections 14.09.060, 14.09.070, 14.09.080, 14.09.090 and 14.09.100 shall continue in place, except to the extent they are replaced by more restrictive conditions imposed by this section.

B. Residential users are to reduce water usage up to 50 percent.

C. Except where recycled water is used, water users shall reduce landscape irrigation as follows:

1. Turf shall not be irrigated.

2. Trees and shrubs may be irrigated with a properly functioning low volume landscape irrigation system or by use of a handheld hose equipped with a nozzle capable of completely shutting off the flow of water except when positive action or pressure to maintain the flow of water is applied. Low volume irrigation means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip or drip lines irrigating at less than two gallons per hour. These systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

D. Filling new or existing swimming pools and spas with city water is prohibited.

E. Water shortage surcharges and excess water use charges shall be implemented as set forth in Section 14.08.095. (Ord. 5491 § 9, 2015; Ord. 5311 § 2, 2014; Ord. 4724 § 3, 2009; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.120 Determination of drought tolerance.

Where this chapter permits or prohibits acts based upon whether or not a planting, tree, shrub, or groundcover is “drought tolerant” the determination shall be made based upon Sunset’s *Western Garden Book* (most recent edition), or UC Davis Arboretum’s “All Stars” plant database (www.arboretum.ucdavis.edu). Where this chapter permits or prohibits acts based upon whether a form of

irrigation is “low volume drip irrigation” the determination shall be made by the director, or designee, whose determination shall be final. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.130 Determination of landscape water consumption reductions.

Whenever this chapter requires a reduction in consumption of water for irrigation purposes, the base year for measurement shall be the last year that the basic water conservation stage was in effect or a date specified by the Governor or state agency. If that data is not available for a property, allocations will be based on water use for similar properties. The city manager or designee may elect to base a reduction on the base year or on a landscape water consumption calculation if use was, in the city manager’s or designee’s, sole opinion, either excessive or extraordinarily low. For landscaping installed subsequent to the base year, the calculations shall be based on landscape water consumption calculations submitted with the landscape plan, or water consumption the previous year, whichever is less. (Ord. 5491 § 10, 2015; Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2817 § 1, 1994; Ord. 2413 § 2, 1991.)

14.09.140 Violations.

It is unlawful for any user and/or person to violate any provision or fail to comply with any of the requirements of this chapter. Causing, permitting, aiding, abetting or concealing a violation of any provision of this chapter shall constitute a violation of this chapter. A violation of the provisions of this chapter shall occur irrespective of the negligence or intent of the violator and a violation of or failure to comply with any of the requirements of this chapter may be charged as either an infraction or a misdemeanor in the discretion of the city attorney. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 3834 § 3, 2002; Ord. 2413 § 2, 1991.)

14.09.150 Enforcement authority.

A. Whenever the city manager, or designee (including, but not limited to, an enforcement officer), determines that a user and/or person has violated any provision of, or failed to meet a requirement of, this chapter, an administrative citation pursuant to Chapter 2.50 or a written compliance order pursuant to Chapter 2.52 may be issued to any user and/or person responsible for the violation.

B. Any compliance order issued may require without limitation any or all of the following:

1. The allocation of a particular amount of water to a given user and/or person responsible for the violation;
2. The issuance of a fine;
3. The installation of a flow restriction device;
4. The performance of monitoring, analyses, and reporting;
5. That violations shall cease and desist; and/or
6. The discontinuation of water service.

The compliance order shall set forth a deadline within which the requirements of the compliance order must be completed. Said compliance order shall further advise that, should the violator fail to comply with the compliance order within the established deadline, a hearing on the compliance order shall be set.

(Ord. 5491 § 11, 2015; Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 3034 § 3, 2002; Ord. 2817 § 1, 1994; Ord. 2413 § 2, 1991.)

14.09.160 Hearing.

If full compliance is not achieved within the time specified in the compliance order, a hearing on the compliance order shall be set pursuant to Chapter 2.52. All penalties and remedies authorized by Chapter 2.52 shall apply to violations of this chapter. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.170 Appeal.

Any user and/or person receiving a compliance order under Section 14.09.150 may appeal the determination of the director, or designee, to a hearing panel drawn from the membership of the board of appeals. The notice of appeal must be received by the city's environmental utilities department within 10 days from the date of the compliance order. Notice of hearing and hearing on the appeal will be conducted pursuant to the requirements of Chapter 2.52. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.180 Separate offense for each day.

Any user and/or person that violates any provision of this chapter shall be guilty of a separate offense for each and every day during any portion of which any such user and/or person commits, continues, permits, or causes a violation thereof, and shall be punished accordingly. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.190 Public nuisance.

In addition to the enforcement processes and penalties hereinbefore provided, any condition caused or permitted to exist in violation of any of the provisions of this chapter is a threat to public health, safety, and welfare, and is declared and deemed a nuisance, and may be summarily abated or restored by the city at the violator's expense, and/or a civil action to abate, enjoin, or otherwise compel the cessation of such nuisance may be initiated and/or taken by the city. (Ord. 5311 § 2, 2014; Ord. 4629 § 1, 2008; Ord. 2413 § 2, 1991.)

14.09.200 Remedies not exclusive.

Remedies under this chapter are in addition to and do not supersede or limit any and all other remedies, civil or criminal. The remedies provided for herein shall be cumulative and not exclusive. (Ord. 5311 § 2, 2014; Ord. 4629 § 2, 2008.)

14.09.210 Judicial review.

Any decision of the hearing panel shall be final. Any user and/or person aggrieved by an order of the hearing panel may obtain review of the order in the Superior Court by filing with the Court a petition for

writ of mandate within 90 days pursuant to California Code of Civil Procedure Section 1094.6. (Ord. 5311 § 2, 2014; Ord. 4629 § 2, 2008.)

14.09.220 Chapter severable.

The provisions of this chapter are severable. The city council declares that it would have adopted the remainder of this chapter even if any of its provisions are declared unlawful or unenforceable. (Ord. 5311 § 2, 2014; Ord. 4629 § 2, 2008.)

Exhibit C – Adoption Resolution

A copy of the adoption resolution will be included in the adopted version of the Water Shortage Contingency Plan.